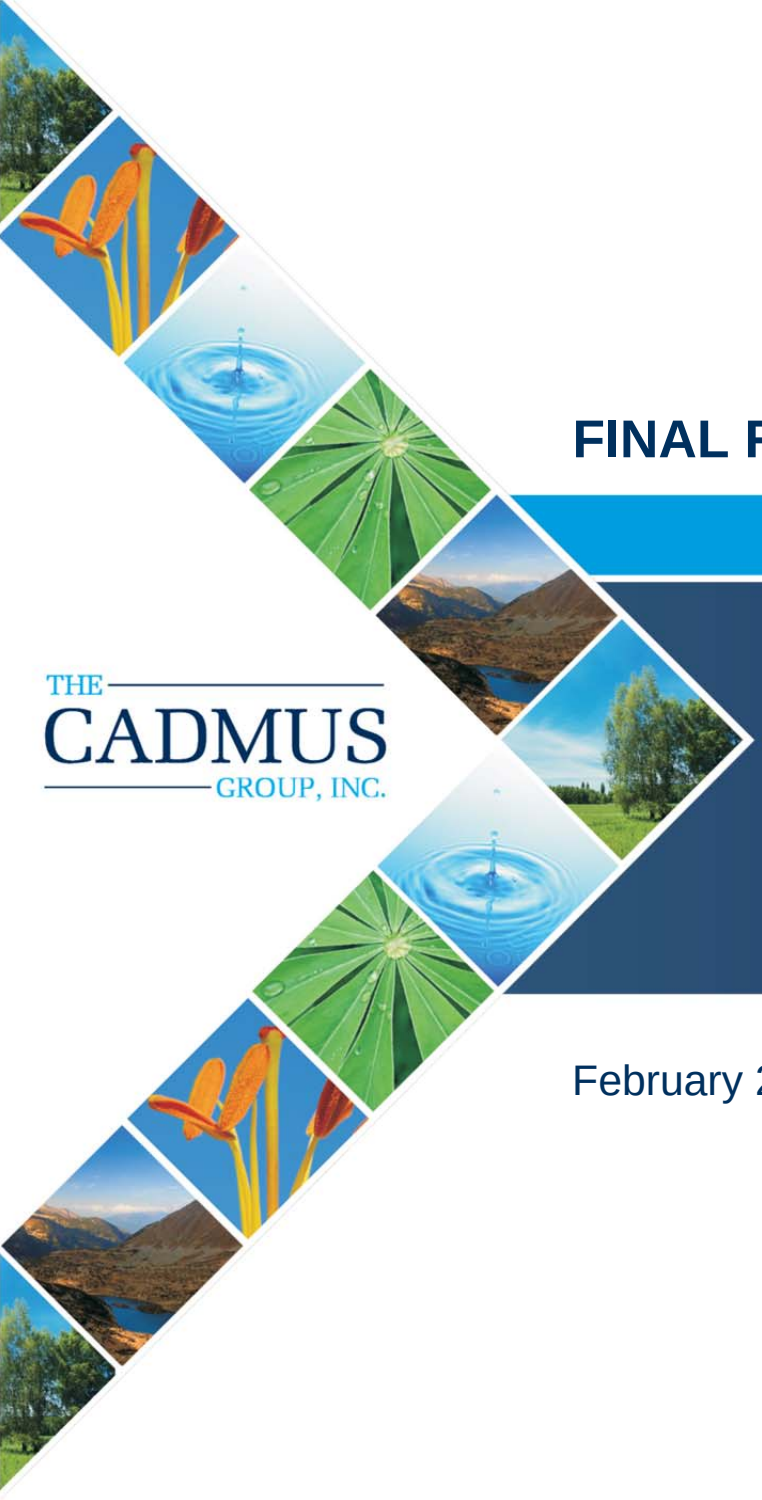

THE CADMUS GROUP, INC.

FINAL REPORT

Assessment of Energy and Capacity Savings Potential in Iowa

February 28, 2012

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EXECUTIVE SUMMARY

Chapter 35 of the 1999 Iowa Administrative Code (199 IAC 35) sets forth the Iowa Utility Board (IUB) rules to implement legislation enacted in 1990 and modified in 1996, requiring Iowa's investor-owned utilities to "file with the Board an assessment of the potential for energy and capacity savings from actual and projected customer usage by applying commercially available technology and improved operating practices to energy-using equipment and buildings."

In compliance with this requirement, the Iowa Utility Association selected, through a competitive bidding process, The Cadmus Group, Inc., (Cadmus) and its sub-contractors Nexant, Inc. (Nexant), and First Tracks Consulting (First Tracks), to assess the remaining potential for energy and capacity savings within the service territories of Iowa's three largest investor-owned utilities. Referred to collectively as "the Utilities," Alliant Energy Corporation (Alliant, electricity and natural gas), Black Hills Energy (Black Hills, natural gas only), and MidAmerican Energy Company (MidAmerican, electricity and natural gas) serve approximately 72% of Iowa's electric customers and 85% of the state's natural gas customers.

Study Scope

This study builds upon five previous assessments of potential in Iowa, conducted since 1989, particularly the most recent (2008) study, led by Cadmus (formerly, Quantec, LLC).[1] The assessment builds upon the substantial primary data collection activities from the 2008 study, updating the data based on recent studies commissioned by the Utilities, DSM achievements of the Utilities in the intervening years, and current customer and load forecasts. This information was supplemented with data from several secondary data sources. The compiled data provided a complete characterization of both the current state of energy consumption in the Utilities' service area and the landscape forecast in the absence of future DSM.

Although this study addresses the same overall objectives as the 2008 assessment, the two studies differ in individual components considered, reflecting the changing landscape of demand-side management (DSM), both in Iowa and across the nation. Table 1 shows key components of each study. The 2012 study excluded the earlier study's primary data collection, assessments of new non-AMI demand response and renewable resources, and review of code compliance, while adding an assessment of market potential for energy efficiency.

[1] *Assessment of Energy and Capacity Savings Potential in Iowa*, prepared for the Iowa Utility Association, prepared by Quantec, LLC, Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group, February, 2008.

Table 1. Key Components of 2008 and 2012 Assessments

Study Component	2008 Assessment	2012 Assessment
Primary Data Collection	✓	
Energy Efficiency—Technical Potential	✓	✓
Energy Efficiency—Economic Potential	✓	✓
Energy Efficiency—Market Potential		✓
Demand Response—Potential from Expansion of Legacy Programs	✓	✓
Demand Response—Potential from AMI-Enabled Options	✓	✓
Demand Response—Potential from New Programs without AMI	✓	
Renewable Resources	✓	
Effects of Free-ridership and Spillover	✓	✓
Code Compliance	✓	

The resources and technologies considered in this assessment are informed by the Chapter 35 rules and discussions with the Utilities and stakeholders. Assessments of DSM potential are naturally influenced by prevailing rules and considerations, as well as factors such as weather, customer demographics, and economic assumptions that will lead to differences between study results. Therefore, the results of potential studies may not be readily comparable across jurisdictions. The following points related to this study's scope should be considered in comparing results to other potential assessments:

- Emerging technologies (deemed not commercially available at the time of this study) are excluded from technical and economic potentials, but included in market potentials.
- Early replacement of end-use equipment is not considered in this assessment; equipment is assumed to be upgraded at the time of natural replacement.
- As the assessment covers 10 years, there may be remaining potential for long-lived equipment beyond the study's time horizon.
- Active generating options, such as renewable and combined heat and power (CHP) are excluded from the assessment.
- The identified technical and economic potentials represent gross savings and some measures may not be appropriate for inclusion in utility programs due to potentially high freeridership rates.

Although emerging technologies, equipment early replacement, and on-site generation are excluded from the technical and economic potential, this should not preclude the Utilities from considering these options in their program offerings.

Energy Efficiency

Technical and Economic Potentials

The energy-efficiency assessment quantified the amount of energy that could be saved in the Utilities' service territories from 2014 to 2023. The assessment included efficient technologies and practices widely commercially available at the time of the study,[2] accounting for known

[2] The market potential scenario considers emerging technologies.

changes in codes and standards, technical limitations (technical potential), and societal cost-effectiveness (economic potential).

Table 2 shows forecasted[3] 2023 baseline electric sales and potential by sector. Study results indicate 8,446 GWh of technically feasible electric energy-efficiency potential by 2023, the end of the 10-year planning horizon, with approximately 6,872 GWh of these resources proving cost-effective. Identified economic potential represents a reduction of 19% of forecasted load in 2023. The residential sector represents the largest portion of technical and economic potential, at 42% and 40%, respectively. The commercial sector represents the second-largest contributor to technical and economic potential, at 32% for each, while industrial potential accounts for 26% and 28% of technical and economic potential, respectively.

Table 2. Technical and Economic Electric Energy-Efficiency Potential (Cumulative in 2023) by Sector

		Technical Potential		Economic Potential	
Sector	Base Case Sales (MWh)	MWh	% of Base Sales	MWh	% of Base Sales
Residential	9,197,928	3,548,837	39%	2,772,993	30%
Commercial	7,857,412	2,702,650	34%	2,181,608	28%
Industrial	18,293,266	2,189,166	12%	1,910,047	10%
Total	35,348,606	8,440,653	24%	6,864,648	19%

Table 3 presents 2023 forecasted baseline natural gas sales and potential by sector.[4] As shown, study results indicate over 37 million therms of technically feasible natural gas energy-efficiency potential by 2023. The estimated economic potential of 25.5 million therms amounts to 24% of forecasted load in 2023, and over 2 million peak day therms.

Table 3. Technical and Economic Natural Gas Energy-Efficiency Potential (Cumulative in 2023) by Sector

		Technical Potential		Economic Potential	
Sector	Base Case Sales (Thousand therms)	Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Residential	671,594	274,172	41%	175,823	26%
Commercial	335,581	92,129	27%	73,649	22%
Industrial	62,616	5,591	9%	5,280	8%
Total	1,069,791	371,892	35%	254,752	24%

As with electric potential, the residential sector represents the largest portion of technical and economic potential, at about 74% and 69%, respectively. Almost all remaining potential lies in the commercial sector, with a small portion (5.3 million therms) deriving from industrial applications.

[3] Forecasted sales have been based on baseline forecasts developed by Cadmus, as described in Section 1, and do not necessarily match official utility forecasts.

[4] As specified in the Chapter 35 rules, gas transport customers are excluded from the analysis.

Market Potential

Assessment of market potential, a new component of this study, examined savings that might be achievable under an aggressive acquisition scenario where:

- Utilities offer incentives of 100% of incremental measure costs;
- Financing is available to further address first-cost barriers; and
- Additional economic potential becomes available from emerging technologies.

To address the first aspect, Cadmus analyzed publicly available data on recent energy-efficiency experiences for IOUs across the nation, conducting regression analysis to estimate relationships between increased incentive spending and savings levels achieved. Based on this analysis, and beginning with the Utilities' 2010 program activity, up to 90% and 65% of electric and natural gas economic potential, respectively, may be achievable, over the 10-year study horizon. However, acquisition of these resources would require significantly higher utility expenditures than those currently occurring in Iowa or elsewhere in the nation.

To assess financing's potential effects, Cadmus reviewed available literature regarding the success of such programs. It is important to note this financing would only apply to a subset of measures included in the economic potential, namely those with full costs differing from incremental costs. The research indicates the availability of financing, in addition to 100% incentives, likely will not significantly impact measure adoption.

Finally, Cadmus researched measures not currently widely available commercially, but that are expected to become available over the next five to 10 years. In most cases, these measures represent incremental improvements over measures already included in the technical and/or economic potential identified in this study. The analysis found emerging technologies may increase electric market potential by up to 3%, with no impact expected on natural gas potentials.

Results of the market potential analysis are intended to provide a realistic upper bound to the estimates of economic potential and do not necessarily represent "program" potential or utility targets. The estimated savings may be realized through market transformation or improved codes and standards and may not be available or suitable for inclusion in utility program offerings. For example, the electric potential includes a substantial amount of savings from LEDs and CFLs replacing minimum standard bulbs. However, if the new lighting standards cause CFLs to become the de facto standard, the amount of savings available for utility DSM program acquisition could be greatly reduced.

Comparison to 2008 Assessment

While the 2008 Assessment utilized the best available information at the time, much has changed over the past four years and, thus, many data and assumptions have been updated in this study. The key differences are these:

- Updated utility sales, customer, and avoided cost forecasts;
- Changes in building codes and equipment standards; and
- Increased measure saturations due to utility program accomplishments.

The 10-year technical and economic electric and natural gas potentials from each study, by sector, are presented in Table 4 and Table 5, respectively. As shown, electric technical potentials have decreased, largely driven by updated codes and standards, particularly with regard to residential lighting. However, due to increased electric avoided costs, the fraction of technical potential deemed cost-effective has increased, and system-wide electric economic potentials have increased by only 1% above 2008 levels. The natural gas technical potential has similarly decreased, with decreased avoided costs contributing to a corresponding decrease in economic potential.

Table 4. Comparison of 10-Year Electric Technical and Economic Potentials

	Technical Potential (GWh)		Economic Potential (GWh)	
Sector	2008 Assessment	2012 Assessment	2008 Assessment	2012 Assessment
Residential	4,937	3,549	3,215	2,773
Commercial	2,695	2,703	1,563	2,182
Industrial	2,136	2,189	1,999	1,910
Total	9,767	8,440	6,777	6,865

Table 5. Comparison of 10-Year Natural Gas Technical and Economic Potentials

	Technical Potential (Thousand Therms)		Economic Potential (Thousands Therms)	
Sector	2008 Assessment	2012 Assessment	2008 Assessment	2012 Assessment
Residential	265,320	274,172	186,540	175,823
Commercial	132,240	92,129	90,130	73,649
Industrial	8,970	5,591	8,970	5,280
Total	406,530	371,892	285,640	254,752

Demand Response

The 2008 Assessment estimated demand savings potential for a variety of demand-response program options, including firm (e.g., residential direct load control [DLC]) and non-firm (e.g., critical peak pricing) strategies. In addition to actual potential estimates, the study resulted in two key findings:

1. Large overlap occurs between eligible populations for similar programs, and implementing new programs may affect participation in demand-response programs currently offered by the two electric utilities.
2. Regarding billing systems in place in 2008, the study did not allow for implementation of price-based options, such as real-time or critical peak pricing. However, these strategies could become feasible if and when the Utilities move to an Advanced Metering Infrastructure (AMI).

Based on these findings, the Utilities have continued to offer their long-running, successful Residential DLC and Nonresidential Interruptible programs in their 2009–2013 Energy Efficiency Plans (EEPs). Building on the conclusions drawn from the 2008 Assessment, this study focused on two questions:

- What potential exists for expansion of utilities' current demand response programs?
- What opportunities would be available if and when utilities implement an AMI?

Expansion of Legacy Programs

As both electric utilities have operated successful demand response programs for many years, the assessment of demand response potential primarily focused on establishing the upper bounds of customer participation, based on the experience of utilities offering similar programs. Cadmus gathered data on comparable programs from across the nation to develop possible expansion scenarios for each of the current demand response programs.

The 2010 program accomplishments, 2008 study results, and potential under each scenario for Residential Direct Load Control (DLC) and Nonresidential Interruptible programs are shown in are shown in Table 6 and Table 7, respectively.

Table 6. Forecasted Residential DLC Impacts in 2023 (MW)

		10-Year Potential			
		2008 Study	2012 Study		
Utility	2010 Program Achievements	Base Case	Base Case	Moderate Expansion	Aggressive Expansion
Alliant	33	53	35	37	46
MidAmerican	31	72	32	35	43

Table 7. Forecasted Nonresidential Interruptible Impacts in 2023 (MW)

		10-Year Potential			
		2008 Study	2012 Study		
Utility	2010 Program Achievements	Base Case	Base Case	Moderate Expansion	Aggressive Expansion
Alliant	264	291	296	304	354
MidAmerican	193	170	238	422	492

As shown, based on updated benchmarking data, estimates of available 10-year potential for the Residential DLC program have decreased from those presented in the 2008 Assessment. Nonresidential Interruptible expansion scenarios indicate potential has increased since the 2008 Assessment, though it should be recognized that decisions around appropriate levels of load to hold under contract are heavily influenced by utilities' unique objectives and resource needs.

AMI-Enabled Options

Analysis of AMI-enabled demand programs was a qualitative exercise, given data quantifying impacts of AMI-enabled programs has been drawn almost exclusively from utility pilot programs, and may not be appropriate for extrapolation to larger markets. Consequently, potential energy and demand savings related to AMI cannot be reliably quantified at this time. Nevertheless, this study outlines a number of potential options that may provide viable savings sources if Iowa electric utilities implement AMI.

From initial pilot results, AMI appears to expand demand reduction capabilities of residential demand response programs, though the extent of this expansion remains to be seen, as program persistence issues have not been thoroughly studied. Additionally, studies of the reliability and security of these programs and enabling technologies remain in progress. Further, how AMI-enabled programs and traditional programs overlap, and how demand savings may shift, still must be understood before specific estimates of demand reduction can be determined.

From improving operability rates of existing DLC programs to offering new demand response programs to customers, who otherwise would not sign up for traditional DLC programs, AMI will likely expand utilities' demand reduction capabilities.

Assessment of the Net-to-Gross Ratio

In addition to estimating energy and capacity savings potential, the 2008 assessment investigated the use of net-to-gross (NTG) adjustments, specifically freeridership and spillover effects.[5] The assessment defined the freeridership and spillover concepts, discussed the background and policy implications of these concepts, and provided examples of studies that attempted to measure their magnitudes. The study concluded with a recommendation that Iowa's investor-owned utilities (IOUs) assume an NTG ratio of 1.0 across all programs for the energy-efficiency plans implemented during the 2009–2013 program cycle.

This report provides additional and more recent information to update findings from the 2008 study, seeking to determine whether the recommended NTG ratio of 1.0 remains appropriate.

As part of the current research, Cadmus reviewed treatment of freeridership and spillover in 32 jurisdictions, relying on regulatory filings, technical planning materials, and evaluation reports. The review resulted in the following key findings:

- Methods for measuring NTG elements are inexact. Despite considerable technical progress in measurement techniques for freeridership, spillover, and market effects, concerns exists about the potential bias in these methods and the reliability of their results.
- NTG estimates tend to have small impacts on the societal cost test (the basis for economic analysis of energy-efficiency programs in Iowa), and, therefore, likely do not affect cost-effectiveness of measures and programs.

[5] *Assessment of Energy and Capacity Savings Potential in Iowa—Appendix G*, prepared for the Iowa Utility Association, prepared by Quantec, LLC, Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group, February, 2008.

- Many jurisdictions have assumed an NTG ratio of 1.0 at the portfolio level.
- Of the 32 jurisdictions surveyed, freeridership is considered in most (60%), participant spillover in 11 (34%), and nonparticipant spillover in nine (28%). The incidence of cases where only freeridership is assessed suggests an asymmetrical treatment of spillover and freeridership effects. Should spillover be included, it is likely many NTG ratios will be near or greater than 1.0. More than two-thirds of all evaluation studies reviewed in a recent best-practices study had a NTG value of approximately 1.0.

Given these findings, it appears reasonable that gross savings be used as the basis for reporting and target compliance. However, utilities should design effective programs that minimize freeridership. This entails: (1) regularly monitoring the saturation of measures within their own service areas and in other jurisdiction; and (2) using this information to revise their programs and their incentive structures periodically.

1. GENERAL APPROACH AND METHODOLOGY

This assessment relies on industry best practices, analytic rigor, and flexible and transparent tools to accurately estimate the potential for energy and capacity savings in the Utilities' service territory between 2014 and 2023. This section outlines each step of the assessment process, with results presented in the following sections, and supplemental material provided in the accompanying appendices.

Energy Efficiency

This study distinguishes between three distinct types of energy-efficiency potential:

- **Technical potential**[6] refers to savings available from adoption of energy-efficiency measures and practices, considering physical constraints to installation, but not cost-effectiveness or market barriers. Measures must be widely commercially available and proven at the time of the study, and the study assumes equipment will be upgraded during natural replacement or through new construction.
- **Economic potential** serves as a subset of technical potential, containing only measures with a benefit-to-cost ratio greater than or equal to 1.0, based on the Iowa Societal Cost Test (as defined in the Chapter 35 Rules).
- **Market potential** represents a realistic upper bound to potential savings from cost-effective efficiency programs that could be achieved offering incentives up to 100% of incremental cost, availability of financing to cover additional up-front costs, adoption of emerging technologies, and other best practices for efficiency programs.

This section describes methods and data sources used to estimate each type of potential.

Base Case Forecasting

Estimating energy-efficiency potentials begins by establishing an accurate baseline forecast of energy sales in the absence of future demand-side management (DSM) activity. While each utility officially forecasts sales by rate class, this analysis requires forecasts at an end-use level, fully capturing effects of changing codes and standards. As such, utility customer forecasts have been combined with detailed end-use level data on equipment saturations, fuel shares, penetrations of efficient equipment, equipment replacement rates, and known codes and standards, producing alternate baseline forecasts from which to assess potential.

Characterizing base-case conditions requires extensive data collection. As this assessment did not include primary data collection, Cadmus began by cataloguing data collected and developed during the 2008 assessment. For end uses and segments, where the Utilities offered rebates for efficient equipment, Cadmus used data from the Utilities' DSM tracking databases to update saturations of efficient equipment. For example, the previous assessment included on-site visits to count light sockets and measure current compact fluorescent lamp (CFL) saturations. Since then, Alliant and MidAmerican have aggressively pursued savings from CFLs, considerably

[6] This definition is analogous to the "phase-in technical potential," described in the Chapter 35 Rules.

increasing this saturation. For each utility, the number of bulbs rebated was used to calculate a per-customer increase in saturation. These adjustments to current saturations of efficient equipment proved critical to avoid overstating remaining potential.

Additionally, the importance of accurately accounting for changes in codes and standards over the planning horizon cannot be overstated. Not only do these changes affect customers' energy consumption patterns and behaviors, but they establish which energy-efficiency measures will continue to produce savings over minimum requirements. This study captures current efficiency requirements as well as those enacted, but not yet taking effect.

The base case forecast particularly accounts for:

- Iowa's adoption of the 2009 International Energy Conservation Code (2009 IECC) for new construction;
- Provisions of the Energy Independence and Security Act of 2007 (EISA), affecting general service lighting and motors;
- The Department of Energy's 2009 rulemaking, setting standards for commercial fluorescent lighting, beginning in 2012; and
- Recent federal standards relating to residential heating, cooling, water heating, and appliances.

Creating a Database of Energy-Efficiency Measures

To estimate technical, economic, and market potentials for energy efficiency, this study relies on an extensive database of efficient equipment and practices. Measures considered in this study drew upon:

- Measures currently offered by the Utilities;
- Those included in regional and national database (e.g., California DEER and ENERGY STAR®); and
- Cadmus' internal library, compiled through our extensive experience conducting similar studies.

After compiling the initial list of measures, a qualitative screening process, as specified in the Chapter 35 rules, eliminated certain types of measures from consideration. Qualitative screening criteria included:

- Commercial availability;
- Applicability to Iowa's climate; and
- Effects on demand during peak periods.

The measures qualitatively screened out of the technical and economic potentials assessment, along with applicable sector, fuel, and reason for exclusion, are shown in Table 8. Emerging technologies were assessed as part of the market potential analysis.

Table 8. Measures Failing Qualitative Screening

Sector	Fuel	Measure	Reason for Exclusion
Both	Electricity	Advanced Modulating HVAC Compressors	Emerging technology.
Both	Electricity	Heat Pump Dryers	Emerging technology.
Both	Electricity	Water Heaters - Tankless	Increased peak demand
Commercial	Electricity	Active Chilled Beam Cooling with DOAS	Emerging technology.
Commercial	Electricity	LED Replacement of Linear Fluorescent	Emerging technology.
Commercial	Electricity	Ventilation and Energy Recovery	Emerging technology.
Commercial	Electricity	Advanced Rooftop Packaged AC	Emerging technology.
Commercial	Electricity	Hot-Humid Rooftop Unit with Dual Enthalpy	Emerging technology.
Commercial	Electricity	Liquid Desiccant Hybrid AC	Emerging technology.
Residential	Electricity	Advanced All-Climate Heat Pump	Emerging technology.
Residential	Electricity	Hot-Dry Air Conditioners	Emerging technology.
Residential	Electricity	Multifamily Building Best Practices	Emerging technology.
Residential	Electricity	On-Demand Recirculation Pumps	Emerging technology.
Residential	Electricity	Optimized Residential Duct Work	Emerging technology.
Residential	Electricity	Robust Central Air Conditioners	Emerging technology.
Residential	Electricity	Water Heaters - Add-On Heat Pump	Emerging technology.
Residential	Electricity	Water Heaters - Ground Source Heat Pump	Emerging technology.
Residential	Electricity	Water Heaters - Northern Climate Heat Pump	Emerging technology.
Residential	Natural Gas	High-Efficiency Gas Fired Rooftop Unit	Emerging technology.
Residential	Natural Gas	Water Heaters - Condensing Tankless	Emerging technology.
Residential	Natural Gas	Water Heaters - Non-Condensing Gas Hybrid	Emerging technology.

For each measure passing the qualitative screen, Cadmus compiled several types of data necessary to fully characterize each measure. Whenever possible, these data drew upon Iowa-specific sources, such as primary data collection from the 2008 assessment, utility tracking databases, or other studies performed by utilities. When Iowa-specific data were not available, Cadmus utilized the most appropriate regional and/or national sources, tailoring the data to Iowa, when possible.

Each measure had the following key data elements:

- Efficient and baseline equipment, labor, and O&M costs;
- Annual energy savings;
- Effective useful life;
- Technical feasibility; and
- Current saturation.

For modeling energy-efficiency potential, measures were separated into two distinct classes:

- ***Equipment measure*s** save energy by upgrading the efficiency of end-use equipment at the time of that equipment's replacement (e.g., high-efficiency gas furnaces). In the absence of early replacement of functional equipment, equipment turnover and replacement rates are defined by the equipment's average effective useful life. In a study spanning 10 years, long-lived equipment may not completely turnover during the planning horizon, and additional opportunities may exist beyond the study's close.
- ***Retrofit measures*** save energy by reducing end-use consumption without replacing end-use equipment. Such measures include: insulation, faucet aerators, and lighting controls. This study assumes these measures, in existing construction, have been installed in equal amounts during each of the 10 years. Retrofit measure installation rates in new construction are defined by the utilities' new construction forecasts.

Estimating Technical Potential

Technical potential represents total energy saved from all measures, only adjusting for physical constraints. For example, high levels of wall insulation can be placed in a certain percentage of homes, and, of those, a certain share may already have this insulation in place. Consequently, technical potential would only include technically feasible homes without measures in place.

Another important technical potential aspect assumes installation of the highest-efficiency equipment wherever possible. For example, this study examined SEER 14.5, 15, 16, and 18 central air conditioners in residential applications, with technical potential assuming that, as equipment fails or new homes are built, customers will install SEER 18 units, regardless of costs. Competing retrofit measures have been treated the same way, assuming installation of the highest-saving measures where technically feasible.

In estimating technical potential, one cannot merely sum up savings from individual measure installations, as significant interactive effects can result from installation of complementary measures. For example, upgrading a furnace in a home where insulation measures have already been installed can be expected to produce less saving than in an un-insulated home. The analysis of technical potential accounts for two types of interaction:

- **Interactions between equipment and non-equipment measures:** As equipment burns out, technical potential assumes it will be replaced with higher-efficiency equipment, which reduces average consumption across all customers. Reduced consumption causes non-equipment measures to save less than they would have, had the equipment remained at a constant average efficiency. Similarly, as non-equipment measures are installed, savings realized by replacing equipment decrease.
- **Interactions between non-equipment measures:** Two retrofit measures applying to the same end use may not affect each other's savings. For example, installing a low-flow showerhead does not affect savings realized from installing a faucet aerator. Insulating hot water pipes, however, would cause the water heater to operate more efficiently, thus reducing savings from either measure. The method in this assessment accounted for this interaction by "stacking" interactive measures—iteratively reducing baseline

consumption as measures are installed, thus lowering the savings from subsequent measures.

While theoretically, all retrofit opportunities in existing construction (often called "discretionary" or "instantaneous" resources) could be acquired in the study's first year, this would skew the potential for equipment measures, and provides an inaccurate picture of measure-level potential. Therefore, the study assumes realization of these opportunities in equal annual amounts over the 10-year planning horizon. Applying this assumption, natural equipment turnover rates, and other adjustments described above, annual incremental and cumulative potential is estimated by utility, fuel, sector, segment, construction vintage, end use, and measure.

Estimating Economic Potential

Economic potential represents the subset of technical potential that is deemed cost effective. Consistent with Chapter 35's definition of the Societal Cost Test,[7] a measure can be deemed cost-effective if its present-value benefits meet or exceed its present-value costs. The measure's cost results simply from the difference in upfront costs between the measure and the baseline technology. In some cases (such as retrofits), the cost used equals the measure's full cost.

Calculating a measure's societal benefits proves far more complex, relying on significant economic and load data such as:

- **End-use load shapes.** End-use consumption patterns by costing period are applied to electric and natural gas measures, capturing the time-differentiated value of energy savings and determining the amount of savings during peak periods.
- **Externality factors.** As specified in the Rules, an externality factor is applied to avoided energy and capacity costs, accounting for societal costs of supplying energy. This factor adds an additional 10% to electric avoided energy and capacity benefits, and an additional 7.5% to natural gas energy and capacity benefits.
- **Line losses.** Line losses represent energy lost between the generator and the customer meter. Thus, energy and capacity savings at the customer meter are grossed up, capturing the true value of savings. Such values vary by utility, fuel, and sector, and may differ for energy and demand.
- **Societal discount rate.** As specified in the Rules, the societal discount rate equals the 12-month average of the 10-year and 30-year Treasury Bonds rates at the time of this study, which uses a nominal discount rate of 5.63% for all utilities.
- **Utility avoided energy costs** are utility-specific projections of energy generating or purchasing costs. Electric costs are analyzed by season, weekday/weekend, and on- and off-peak periods, whereas natural gas costs are assessed monthly.

[7] This study did not assess other standard cost-effectiveness tests. The Utilities will consider these perspectives in developing the 2014–2018 Energy Efficiency Plans.

- **Utility avoided capacity costs** are utility-specific projections of the cost of supplying energy during peak periods, which is assumed to be the system peak hour for an electric utility, and the system peak day for a natural gas utility.
- **Values of other resources.** Some measures save non-energy resources, such as water or detergent. Value for these resources have been determined and applied consistently across utilities.

These data have been combined with measure-level data to calculate a variety of benefits for each measure. The benefits, described as follows, have been added and compared to the measure's costs to determine whether the measure proved cost-effective from the societal perspective:

- **Energy benefits:** The present value of conserved energy over a measure's life, calculated by applying the appropriate line loss and externality factor to avoided energy forecasts, spreading over the measure's load shape, and discounting back to present terms using the societal discount rate. For measures saving electricity and natural gas (e.g., insulation in homes with a gas furnace and central air conditioner), benefits from both fuels have been considered.
- **Capacity benefits:** The present value of conserved capacity over a measure's life, calculated by applying the appropriate line loss and externality factor to avoided capacity forecasts, and multiplying by the measure's savings in the peak period, and discounting back to present terms using the societal discount rate. As with energy benefits, for measures saving electricity and natural gas (e.g., insulation in homes with a gas furnace and central air conditioner), benefits from both fuels have been considered.
- **Non-energy benefits:** The value of applicable non-energy benefits, such as water or detergent, considered over the measure's life, and discounted back to present terms using the societal discount rate.

As evident from the information sources and methods used to quantify societal benefits, the measures' cost-effectiveness varies between utilities, based on projections of energy and capacity costs and line loss values. As such, this study calculated cost-effectiveness separately for each utility, leading to differences in economic potential, presented later in this report.[8]

Based on the results of the cost-effectiveness analysis, and using the same method described in the technical potential section, above, an alternate sales forecast the annual incremental and cumulative potential for each cost-effective measure has been calculated.

[8] Differences in economic potential across utilities are a function of customer characteristics and current saturations of end uses and efficiency measures.

Assessing Market Potential

Market—or achievable—potential generally is defined as the portion of economic potential expected to be reasonably achievable over the course of the planning horizon, given certain assumptions regarding market barriers and behavioral factors that may inhibit consumers' participation in utility-sponsored energy-efficiency programs. In this assessment, market potential is defined more narrowly, as the amount of savings that might be achieved, assuming: incentive payments up to 100% of incremental measure cost; financing availability; exemplary program design and implementation practices; and emergence of new technologies, currently not widely available in the marketplace.

Methods for estimating achievable potential vary across potential assessment studies. These methods fall into three general categories.

1. The first group of methods (such as those used in assessments of energy-efficiency potential in California) is based on a conventional market diffusion model, and assumes first-cost as the primary participation barrier. In this approach, market potential is hypothesized to depend on the return from energy-efficiency investments, and the effects of incentives on enhancing that return. Due to limited data available to establish the empirical relationship between consumers' expectations about returns on investments, this relationship often must be hypothesized.
2. The second group of methods typically rely on self-reports to determine consumers' willingness to participate in energy-efficiency programs. The approach involves asking a representative sample of potential participants about their willingness to adopt a measure or participate in a program, under given incentive amounts—generally expressed as a fraction of the incremental measure cost. These studies result in a demand curve for conservation measures, which relates willingness to participate as a function of respondents' shares of incremental measure costs.
3. Benchmarking, used in this assessment, provides the third method for determining market potential. This method incorporates certain elements from the first two method groups, but primarily relies on historical market penetration achieved by a representative sample of relevant programs to determine what might be achievable over a longer term.

In this assessment, Cadmus relied on the empirical statistical relationship between program expenditures (both incentive and non-incentive) and energy savings, based on historical performance data for a representative sample of utility-sponsored electric and natural gas programs in various jurisdictions. Cadmus used analysis results to estimate the likely maximum market potential for utility-sponsored electric and natural gas programs in Iowa under the study's specific assumptions. Data sources and analytic methods follow below, with results presented in Section 3.

The Effects of Increased Incentives

Form 861 of the Energy Information Administration (EIA) served as the primary data source for assessing electric market potential, providing energy savings, program expenditures, revenues, and retail sales reported by approximately 75 investor-owned utilities from 2004 through 2010.[9]

As natural gas utilities do not report energy-efficiency program results in universal datasets similar to EIA Form 861, Cadmus compiled publicly available documents from utilities and other program administrators reporting annual energy-efficiency results to create a comparable dataset. Performance data for 2010 programs for 14 portfolios were included in the analysis. The 14 selected portfolios represented those most relevant for informing market potential for Iowa utilities, using the following criteria:

- Portfolios operating for at least three years.
- Serving territories with at least 10 quadrillion Btu of annual sales.
- Portfolios in "Northern Tier" states, with climates most similar to Iowa. (As a practical matter, this criterion eliminated only two southern California utilities and one New Mexico utility from the data set.)
- Portfolios providing publicly available data, which, at a minimum, included the following information:
  - Natural gas spending separated from electric spending;
  - Spending differentiated between incentives and other costs; and
  - Annual energy savings.

Given these criteria, Cadmus developed a list of 14 portfolios spanning nine states, as shown in Table 9, below.

For each utility and program administrator listed in Table 9, data on natural gas sales, revenue, and average rates were collected from EIA Form 176, normalizing savings and spending across service areas of different sizes.

Using these data, Cadmus developed regression equations to estimate effects increased incentives would have on portfolio-level electric and natural gas savings for Iowa utilities. Data on current program activity and incentive spending were derived from the utilities' 2010 Annual Reports.

[9] Although Form 861 contains data for a larger number of utilities and a longer time series, back to 1999, the information tends to be incomplete and lack some variables of interest for this study.

Table 9. Natural Gas Utility Portfolios Included in the Benchmarking Analysis

Utility/Program Administrator	State
Pacific Gas & Electric	California
Public Service Co. of Colorado	Colorado
Yankee Gas Services	Connecticut
Connecticut Natural Gas	Connecticut
Southern Connecticut Gas	Connecticut
Avista Corp	Idaho
National Grid	Massachusetts
NStar	Massachusetts
Northern States Power	Massachusetts
Questar	Utah
Puget Sound Energy	Washington
Avista Corp	Washington
Cascade Natural Gas	Washington
Wisconsin Focus on Energy	Wisconsin

Effects of Financing Availability

Offering incentives covering full incremental costs may not be sufficient to offset first-cost barriers for all measures. For example, if a customer with low insulation levels chooses to upgrade to insulation exceeding minimum building code, a utility incentive may only cover costs above and beyond code-required levels. In this case, remaining cost could be substantial. Cadmus reviewed secondary literature on the success of financing programs to quantify the effect this option could have on market potential.

It should be noted that, in many cases, measures have the same full and incremental costs. Moreover, for equipment replacement, the study assumes equipment would be upgraded per its natural replacement cycles, and baseline costs would be incurred, regardless of whether an efficient unit would be installed.

Effects of Emerging Technologies

As specified in the Chapter 35 Rules, only measures commercially available were included in the technical and economic potential. However, the market potential is designed to include measures expected to become commercially available and cost-effective within the next five to 10 years, as these measures could provide savings over the course of the next round of EEPs. While these measures will increase available potential, their effects cannot merely be added to the identified economic potential for two reasons:

- First, many of these measures will supplant existing technologies; so only the incremental increase in efficiency creates new potential.
- Second, due to interactive effects, these measures will reduce potential from other measures included in the technical and economic potential. That is, emergence of a more efficient heat pump not only supplants the potential attributed to currently available technologies, but will reduce the potential attributable to shell measures.

To determine impacts on market potential, Cadmus developed a list of emerging measures drawn from secondary sources, such as DOE and ACEEE, providing estimates of efficiency levels and savings. Cadmus then determined how these measures overlapped with measures already considered in the study, and estimated incremental savings and potential from the emerging technologies. For measures without a complementary choice within the measure list, Cadmus apportioned estimates of national long-term potential to the Utilities' territory.

Demand Response

The 2008 Assessment estimated demand savings potential for a variety of demand-response program options, including firm (e.g., residential direct load control [DLC]) and non-firm (e.g., critical peak pricing) strategies. In addition to actual potential estimates, the study resulted in two key findings:

1. Large overlap occurs between eligible populations for similar programs, and implementing new programs may affect participation in demand-response programs currently offered by the two electric utilities.
2. Billing systems in place during the 2008 study did not allow implementation of price-based options, such as real-time or critical peak pricing. However, these strategies could become feasible if and when the utilities move to an Advanced Metering Infrastructure (AMI).

Based on these findings, the utilities continued to offer their long-running, successful Residential DLC and Nonresidential Interruptible programs in their 2009–2013 Energy Efficiency Plans (EEPs). Building on the conclusions drawn from the 2008 Assessment, this study focused on two questions:

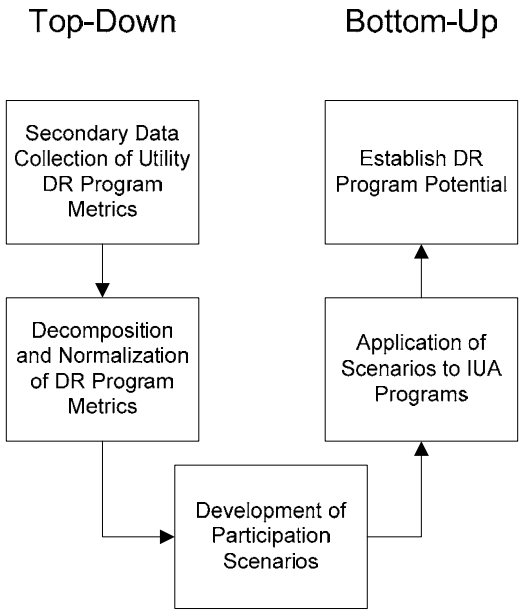
- What potential exists for expansion of utilities' current demand response programs?
- What opportunities would be available if and when utilities implement an AMI?

The methodology for assessing these questions follows this section.

Expansion of Legacy Programs

As both electric utilities have operated successful demand response programs for many years, the assessment of demand response potential primarily focused on establishing the upper bounds of customer participation, based on the experience of utilities offering similar programs. After developing a database of participation data from other, comparable utilities, a bottom-up methodology established the estimated market potential. Figure 1 illustrates the general process.

Figure 1. General Demand Response Potential Assessment Methodology



Secondary Data Collection and Analysis

The key metrics used to compare utility programs (and, subsequently, to estimate remaining potential) were current participation levels. As customer counts, peak loads, and program impacts can vary greatly across utilities, identified metrics sought to normalize for these effects. For residential DLC programs, "participation" was defined as the percentage of eligible customers (for example, residential customers with central air conditioners) currently enrolled in the program. Nonresidential interruptible programs used a metric of the percentage of nonresidential demand during the system peak under contract.

While calculating these participation rates for Iowa utilities proved relatively straightforward, greater difficulty resulted in collecting data on other utilities' program achievements due to reporting differences. Data on utility program achievements, customer counts, and peak demand derived from an array of sources, including:

- Federal Energy Regulatory Commission (FERC) 2010 Assessment of Demand Response and Advanced Metering Demand Response Survey Data;
- United States Energy Information Administration (EIA) Database;

- Utility integrated resource plans (IRP);
- Utility annual reports; and
- Utility demand response program evaluation reports.

Based on data collected from these sources, participation rates, defined above, were calculated for each utility program, based on 2010 data (with the most recent data available, in most cases).

Participation Scenario Development

Data collected indicated wide ranges of participation rates across utilities. The programs at the extremes (extremely high or low participation) were reviewed in additional depth, and some were removed as outliers, based on unique program differences or unreliable data.

Calculated participation rates allowed establishment of two potential expansion scenarios:

1. **Moderate expansion:** The amount of potential available if Iowa utilities' participation rates increased to the upper quartile of the reviewed utilities.
2. **Aggressive expansion:** The amount of potential available if Iowa utilities' participation rates increased to industry-leading participation rates.

These scenarios were compared to a "baseline" scenario, where Iowa utilities continued at current participation levels.

Under each expansion scenario, assumed participation rates were applied to Iowa utility customers, loads, and per-participant impacts to identify demand savings to be realized.

Though demand response strategies primarily focus on reducing demand during peak periods, reduced demand can also translate into energy savings. However, such energy savings cannot be calculated by merely multiplying demand impacts by an event's duration, as this neglects some or all demand may have shifted to off-peak periods, rather than be avoided entirely.

For example, in a central air conditioning DLC program, energy savings occur during the curtailment event, but temperatures in homes rise, and units must work harder after the event to achieve the desired temperatures. Similarly, if a commercial customer sheds load by temporarily adjusting processes (such as slowing production or shutting down some portion of a facility), it may have to increase production or use more of its facilities following an event. This phenomenon, commonly called "snapback," must be captured to reliably quantify energy savings attributable to these programs.

Quantifying snapback for a given demand response program proves quite difficult, as variations between demand response strategies and differences in participating customers can greatly impact snapback effects. For example, a region's temperature fluctuation greatly affects snapback. In climates where temperatures remain relatively high after the end of an event, a demand response program generally experiences a higher snapback amounts. If an event ends at a time of day when temperatures begin to decline, the snapback would be lower. Similarly, customers enrolled in nonresidential interruptible programs may retain on-site generation capabilities, and experience no snapback effects.

Consequently, Cadmus reviewed secondary data on observed and assumed snapback effects for utilities across the nation, providing estimates of the likely energy-savings range that could be realized from these demand response strategies.

AMI Enabled Demand Response

While the prevalence of AMIs has increased significantly since 2008's Assessment, few utilities have established AMI-specific demand response programs. Existing offerings primarily remain in pilot forms, and do not offer data that could be reliably extrapolated to quantify available potential for large-scale programs. Thus, this study presents a qualitative assessment of how utilities currently use AMI to reduce system peaks, and anticipates opportunities that may emerge in the next several years, if Iowa utilities implement AMI.

Freeridership and Spillover

This task largely updated the 2008 Assessment, reviewing current practices for assessing freeridership and spillover, and determining how jurisdictions across the country accounted for these effects. To provide a robust and complete assessment for use in future decisions regarding treatment of NTG in Iowa, and to provide the Utilities with recommendations for methods regarding mitigation of freerider effects, Cadmus conducted a thorough review of commission orders, legislative mandates, energy-efficiency program evaluations, and assumed values from jurisdictions across the nation, as described in Section 5.

2. ENERGY EFFICIENCY: TECHNICAL AND ECONOMIC POTENTIAL

Scope of Analysis

The assessment of energy-efficiency resources primarily sought to produce reasonable estimates of savings available in each utility's service territory over a 10-year planning horizon (2014-2023), thus informing creation of the 2014–2018 EEPs. Technical and economic potential for residential, commercial, and industrial[10] sectors were assessed separately for each utility, divided by fuel type. Within each utility's sector-level assessment, the study further distinguished among market segments or industry types, and their respective applicable end uses. Analysis included: 10 residential segments (existing and new construction for single-family, multifamily, manufactured, low-income single-family, and low-income multifamily); 24 commercial segments (12 building types within existing and new construction); and 18 industrial segments.

Analysis began by assessing the technical potential for 359 unique electric and 155 unique gas energy-efficiency measures passing the qualitative screening process, as described in Section 1 (and shown in Table 10), representing a comprehensive set of electric and natural gas energy-efficiency measures applicable to Iowa's climate and customer characteristics.

Table 10. Energy-Efficiency Measure Counts

Sector	Electric Measure Counts	Natural Gas Measure Counts
Residential	132 unique, 632 permutations	61 unique, 281 permutations
Commercial	164 unique, 1,580 permutations	71 unique, 657 permutations
Industrial	63 unique, 255 permutations	23 unique, 92 permutations

This list included measures analyzed in the 2008 Assessment (which may be active in current utility programs), and new measures that have become commercially available over the past five years. Considering all permutations of these measures across applicable customer sectors, market segments, fuels, and end uses, resulted in customized data, compiled and analyzed for over 4,000 measures. Appendix A.2 describes all measures analyzed, and Appendix A.3 presents technical details and economic potential for all permutations.[11]

The remainder of this section is organized into two parts:

- A summary of resource potentials by fuel; and
- Detailed sector-level results.

[10] The industrial sector includes sales and potential for agriculture and street lighting.
[11] Economic potential in Appendix A.3 has been aggregated to the state level.

Summary of Results: Electricity

Table 11 and Table 12 show forecasted[12] 2023 baseline electric sales and potential by utility and sector, respectively. Study results indicate 8,446 GWh of technically feasible electric energy-efficiency potential by 2023, the end of the 10-year planning horizon, with approximately 6,872 GWh of these resources cost-effective. Identified economic potential amounts to 19% of forecasted load in 2023.

Savings have been based on forecasts of future consumption, absent utility program activities. While consumption forecasts account for past savings each utility has acquired, estimated potential is inclusive of—not in addition to—current or forecasted program savings.

As shown in Table 11, though utility-specific technical and economic potential are a function of baseline sales, they are roughly comparable, when analyzed in percentage terms. Differences in technical potential as a percent of baseline sales are driven by differences in distributions of customers by segment, and other utility-specific customer characteristics. In addition to these differences, economic potential varies due to differences in utility avoided energy and capacity costs.

Table 11. Technical and Economic Electric Energy-Efficiency Potential (Cumulative in 2023) by Utility

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
Alliant	15,465,326	3,839,043	25%	926	3,294,806	21%	803
MidAmerican	19,883,278	4,601,610	23%	1,110	3,569,842	18%	885
Total	35,348,604	8,440,653	24%	*	6,864,648	19%	*

* Due to differences in timing of utility system peaks, demand impacts could not be aggregated across utilities.

[12] Forecasted sales have been based on baseline forecasts developed by Cadmus, as described in Section 1, and do not necessarily match official utility forecasts.

Table 12 provides each sector's technical and economic potentials. The residential sector represents the largest portion of technical and economic potential, at 42% and 40%, respectively. The commercial sector represents the second-largest contributor to technical and economic potential, at 32% of each, while industrial potential accounts for 26% and 28% of technical and economic potential, respectively.

Table 12. Technical and Economic Electric Energy-Efficiency Potential (Cumulative in 2023) by Sector

Sector	Base Case Sales (MWh)	Technical Potential		Economic Potential	
		MWh	% of Base Sales	MWh	% of Base Sales
Residential	9,197,928	3,548,837	39%	2,772,993	30%
Commercial	7,857,412	2,702,650	34%	2,181,608	28%
Industrial	18,293,266	2,189,166	12%	1,910,047	10%
Total	35,348,606	8,440,653	24%	6,864,648	19%

Table 13 shows the electric measures with the highest expected 10-year technical potential, and whether each is cost-effective in all, some, or no applications.

Table 13. Top Electric Technical Measures and Cost-Effectiveness Results[13]

Sector	Measure Name	Cost-Effective Applications
Residential	LED	All
Commercial	Fluorescent Reduced Wattage	Some
Industrial	Integrated Plant Energy Management	All
Residential	TV - ENERGY STAR	Some
Residential	ECM Motor - Air Conditioner/Electric/Gas Furnace	All
Industrial	High Bay Fluorescent High Output Packages	All
Commercial	Daylighting Controls	Some
Commercial	LED Lamp Package	All
Commercial	Induction Lighting Package	Some
Commercial	Retro-Commissioning	Some

Cost-effectiveness varies by utility due to differences in avoided costs, but can also differ by segment or construction vintage due to differences in savings and/or incremental costs. As shown, residential and commercial lighting measures represent six of the top 10 electric technical measures, with additional large savings opportunities for industrial plan energy management, ENERGY STAR televisions, efficient motors, and retro-commissioning. All of these measures were deemed cost-effective in at least some applications, with half economic in all instances.

[13] Measure-by-measure economic potential is provided in Appendix A.3.

Table 14 compares identified 10-year technical and economic electric potentials to results from the 2008 Assessment.

Table 14. Comparison of 10-Year Electric Technical and Economic Potentials

Sector	Technical Potential (GWh)		Economic Potential (GWh)	
	2008 Assessment	2012 Assessment	2008 Assessment	2012 Assessment
Residential	4,937	3,549	3,215	2,775
Commercial	2,695	2,703	1,563	2,182
Industrial	2,136	2,195	1,999	1,916
Total	9,767	8,446	6,777	6,872

Residential potentials, both technical and economic, have declined, primarily driven by utility program activity as well as changes in minimum building codes and equipment standards. While the commercial sector has seen increased efficiency requirements, technical potentials have risen marginally compared to the 2008 Assessment due to availability of new advanced technologies, such as LED lighting. Economic potentials saw greater increases, driven by increased electric avoided costs and declining measure costs for certain measures. Industrial technical potential also increased in the 2012 assessment, while economic potential showed a marginal decrease.

Summary of Results: Natural Gas

Table 15 and Table 16 present 2023 forecasted baseline sales and potential by sector and utility, respectively.[14] As shown, study results indicate over 37 million therms of technically feasible natural gas energy-efficiency potential by 2023, the end of the 10-year planning horizon. The identified economic potential of 25.5 million therms amounts to 24% of forecasted load in 2023 and over 2 million peak day therms.

As with electric potential, technical and economic potential result as a function of baseline sales, and are roughly comparable across utilities when analyzed in percentage terms. Again, differences are driven by utility customer characteristics and avoided costs.

Table 15. Technical and Economic Gas Energy-Efficiency Potential (Cumulative in 2023) by Utility

Utility	Base Case Sales (Thousand therms)	Technical Potential			Economic Potential		
		Thousand Therms	% of Base Sales	Peak Day Thousand Therms	Thousand Therms	% of Base Sales	Peak Day Thousand Therms
Alliant	267,040	90,767	34%	732	61,574	23%	515
Black Hills	169,983	60,754	36%	486	42,507	25%	348
MidAmerican	632,769	220,371	35%	1,785	150,670	24%	1,262
Total	1,069,791	371,892	35%	3,003	254,751	24%	2,125

[14] As specified in the Chapter 35 rules, gas transport customers are excluded from the analysis.

Table 16 provides each sector's technical and economic potentials. As with electric potential, the residential sector represents the largest portion of technical and economic potential, at about 74% and 69%, respectively. Almost all remaining potential lies in the commercial sector, with a small portion (5.3 million therms) from industrial applications.

Table 16. Technical and Economic Natural Gas Energy-Efficiency Potential (Cumulative in 2023) by Sector

Sector	Base Case Sales (Thousand therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Residential	671,594	274,172	41%	175,823	26%
Commercial	335,581	92,129	27%	73,649	22%
Industrial	62,616	5,591	9%	5,280	8%
Total	1,069,791	371,892	35%	254,752	24%

Table 17 shows the natural gas measures with the highest estimated 10-year technical potential, and whether each is cost-effective in all, some, or no applications.

Table 17. Top Natural Gas Technical Measures and Cost-Effectiveness Results

Sector	Measure Name	Cost-Effective Applications
Residential	Duct Sealing	Some
Residential	Window Upgrades	None
Commercial	Retro-Commissioning	Some
Residential	Infiltration Reduction	All
Residential	Insulation - Basement Wall	All
Residential	Insulation - Attic/Ceiling	Some
Residential	Insulation – Floor	None
Residential	Home Energy Management System	Some
Residential	Water Heater - Tankless	None
Commercial	Green Roof	None

Cost-effectiveness varies by utility due to differences in avoided costs, but can also differ by segment or construction vintage due to differences in savings and/or incremental costs. As shown, most of the top measures are improvements to residential building shell, with commercial retro-commissioning also representing a large amount of technical potential. Only two of the top 10 measures are cost-effective in all applications, whereas four do not pass the economic screen in any instance.

Table 18 compares identified 10-year technical and economic natural gas potentials to results of the 2008 Assessment.

Table 18. Comparison of 10-Year Natural Gas Technical and Economic Potentials

Sector	Technical Potential (Thousand Therms)		Economic Potential (Thousands Therms)	
	2008 Assessment	2012 Assessment	2008 Assessment	2012 Assessment
Residential	265,320	274,172	186,540	175,823
Commercial	132,240	92,129	90,130	73,649
Industrial	8,970	5,591	8,970	5,280
Total	406,530	371,892	285,640	254,752

Economic potentials for all sectors have decreased in this assessment, largely due to significantly lower avoided energy costs.

Detailed Results

Residential Sector: Electricity

Residential customers in Iowa account for about one-quarter of forecasted electricity retail sales. The single-family, manufactured, multifamily, and low-income dwellings comprising this sector present a variety of potential savings sources, including: equipment efficiency upgrades (e.g., air conditioning, refrigerators); improvements to building shells (e.g., insulation, windows, air sealing); and increases in lighting efficiency (e.g., CFLs, LED interior lighting).

As shown in Table 19, based on resources included in this assessment, residential sector electric economic potential is estimated at 2,775 GWh over 10 years, corresponding to a 30% reduction (33% for Alliant and 28% for MidAmerican) in 2023 residential consumption,/

Table 19. Residential Sector Electric Energy-Efficiency Potential by Utility (Cumulative in 2023)

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
Alliant	3,852,109	1,485,069	39%	443	1,275,181	33%	399
MidAmerican	5,345,819	2,063,768	39%	615	1,497,812	28%	497
Total	9,197,928	3,548,837	39%	*	2,772,993	30%	*

* Due to differences in timing of utility system peaks, demand impacts cannot be aggregated across utilities.

As shown in Figure 2, single-family homes represent 71% of total economic residential potential, followed by low-income, multifamily, and manufactured homes. Each home type's proportion of baseline sales serve as the primary drivers, but other factors, such as heating fuel sources, play important roles in determining potential. For example, manufactured homes typically have higher electric heating saturations than other home types, increasing their relative shares of the potential. Conversely, lower-use per customer for multifamily units decreases this potential, as some measures may not be cost-effective at lower consumption levels.

Figure 2. Residential Sector Electric Economic Potential by Segment (Cumulative in 2023)

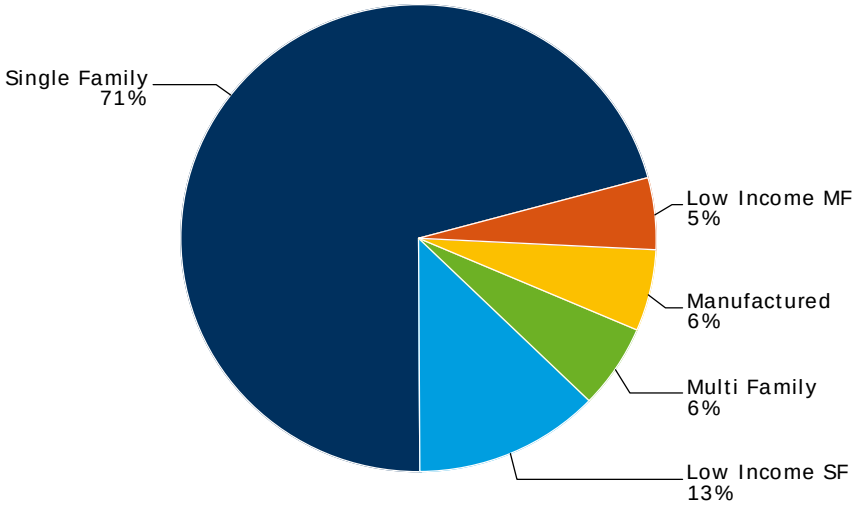
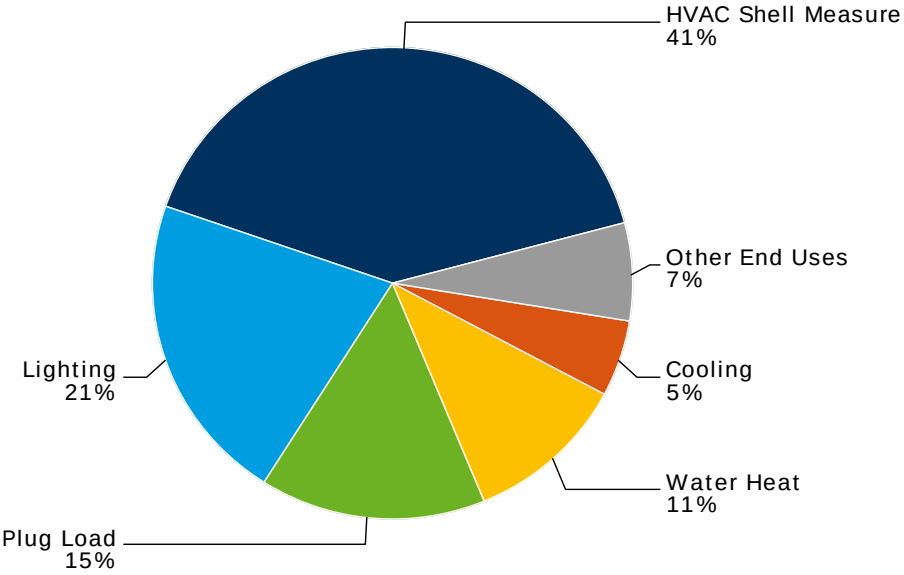


Figure 3 presents the distribution of electric economic potential by measure type.

Figure 3. Residential Sector Electric Economic Potential by Measure Type



Note: 'Other End Uses' includes:
Refrigerator: 3%, Freezer: 2%, Dryer: <1%, Pool Pump: <1%, Heat Pump: <1%

The largest portion of economic potential in the residential sector (41%) results from heating and cooling savings achieved through shell measures. Cooling measures account for nearly 50% of HVAC shell measure savings while ventilation and heating measures account for approximately 25% and 20%, respectively. A small amount of shell measure savings comes from homes with heat pumps. ECM motors, duct sealing, infiltration reduction, radiant barriers, and whole-house

fans, account for over 60% of the identified shell measure savings. Lighting measures, primarily LED and CFL bulbs, account for the next largest slice (21%), followed by various plug load end uses and water heating. Table 20 provides technical and economic potentials by end-use category.

Table 20. Residential Sector Electric Energy-Efficiency Potential by End-Use Category (Cumulative in 2023)

End Use	Base Case Sales (GWh)	Technical Potential		Economic Potential	
		GWh	% of Base Sales	GWh	% of Base Sales
Computer	210	64	30%	64	30%
Cooking	296	33	11%	0	0%
Cooling	1,456	817	56%	699	48%
Dehumidifier	283	26	9%	26	9%
Dryer	596	59	10%	22	4%
Heat Pump	168	94	56%	85	50%
Heating	787	380	48%	221	28%
Lighting	817	588	72%	588	72%
Other Plug Load	1,164	191	16%	104	9%
Pool Pump	20	10	51%	10	51%
Refrigerators and Freezers	981	221	22%	148	15%
Set Top Box	206	113	55%	113	55%
Television	699	278	40%	116	17%
Ventilation and Circulation	682	273	40%	273	40%
Water Heat	834	403	48%	305	37%
Total	9,199	3,550	39%	2,774	30%

Residential Sector: Natural Gas

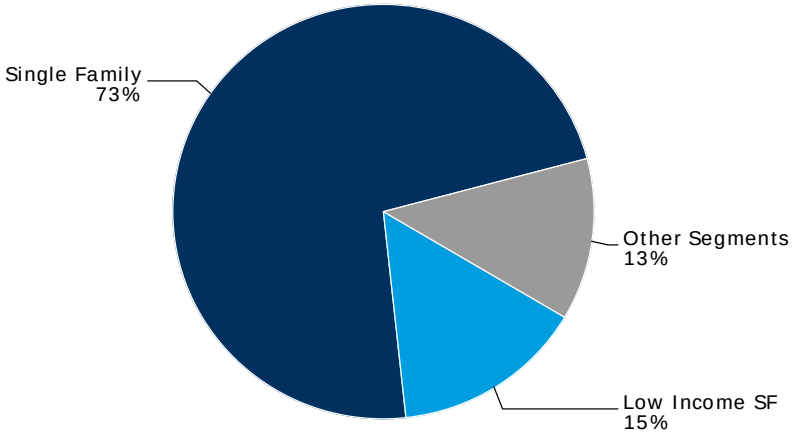
As shown in Table 21, based on resources included in this assessment, natural gas economic potential in the residential sector is estimated at about 176 million therms over the 10-year planning horizon, corresponding to a 26% reduction (27% for Alliant, 27% for Black Hills, and 26% for MidAmerican) in 2023 residential consumption.

Table 21. Residential Sector Natural Gas Energy-Efficiency Potential by Utility (Cumulative in 2023)

Utility	Base Case Sales (Thousands of therms)	Technical Potential			Economic Potential		
		Thousand Therms	% of Base Sales	Peak Day Thousand Therms	Thousand Therms	% of Base Sales	Peak Day Thousand Therms
Alliant	142,565	62,444	44%	531	37,922	27%	345
Black Hills	105,983	44,238	42%	376	28,891	27%	258
MidAmerican	423,046	167,490	40%	1,422	109,010	26%	974
Total	671,594	274,172	41%	2,329	175,823	26%	1,578

As shown in Figure 4, single-family homes represent 73% of total economic residential potential, followed by low-income, multifamily, and manufactured homes, with results extremely similar to electric potential, with manufactured homes representing a smaller percentage due to lower saturations of gas heating equipment.

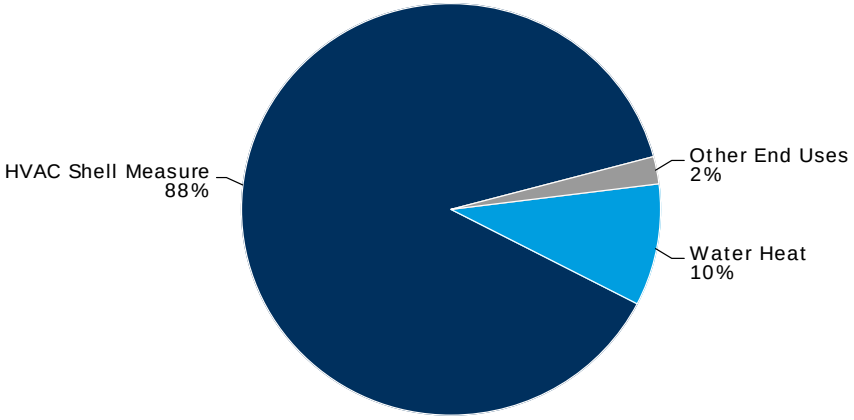
Figure 4. Residential Sector Gas Economic Potential by Segment



Note: 'Other Segments' includes:
Manufactured: 5%, Multi Family: 4%, Low Income MF: 4%

Figure 5 presents distributions of natural gas economic potential by measure type. The largest portion of economic potential in the residential sector (88%) comes from shell measures, followed by water heating (10%). Duct sealing, infiltration reduction, basement and attic insulation, and home energy management systems account for nearly 75% of shell measure savings.

Figure 5. Residential Sector Natural Gas Economic Potential by Measure Type (Cumulative in 2023)



Note: 'Other End Uses' includes:
Heat Central Furna: 2%, Pool Heat: <1%

Table 22 provides technical and economic potential by end-use category.

Table 22. Residential Sector Natural Gas Energy-Efficiency Potential by End-Use Category (Cumulative in 2023)

End Use	Base Case Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Cooking	15,526	1,579	10%	0	0%
Dryer	6,591	654	10%	0	0%
Heat Central—Boiler	24,758	9,889	40%	6,028	24%
Heat Central—Furnace	452,542	218,107	48%	152,577	34%
Other	64,002	0	0%	0	0%
Pool Heat	1,513	377	25%	340	23%
Water Heat	106,662	43,565	41%	16,877	16%
Total	671,594	274,171	41%	175,822	26%

Commercial Sector: Electricity

As shown in Table 23, based on resources included in this assessment, electric economic potential in the commercial sector is estimated at just over 2,180 GWh over the 10-year planning horizon, corresponding to a 28% reduction (29% for Alliant and 27% for MidAmerican) of forecasted 2023 commercial consumption.

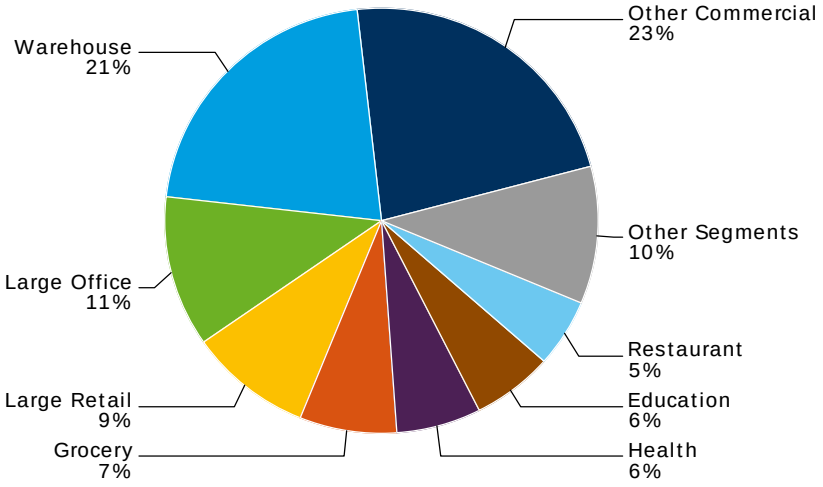
Table 23. Commercial Sector Electric Energy-Efficiency Potential by Utility (Cumulative in 2023)

Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
Alliant	3,969,210	1,377,058	35%	358	1,148,549	29%	292
MidAmerican	3,888,201	1,325,592	34%	343	1,033,059	27%	257
Total	7,857,411	2,702,650	34%	*	2,181,608	28%	*

* Due to differences in timing of utility system peaks, demand impacts cannot be aggregated across utilities.

As shown in Figure 6, miscellaneous buildings and warehouses represent the largest shares (23% and 21%, respectively) of economic potential in the commercial sector. The miscellaneous segment combines customers not fitting into one of the other categories and those that would, but do not having sufficient information to be classified. The commercial sector also provides considerable savings opportunities in offices (14%), retail (11%), and grocery (7%) segments. Moderate savings amounts are expected to be available in education, health, restaurants, and lodging facilities.

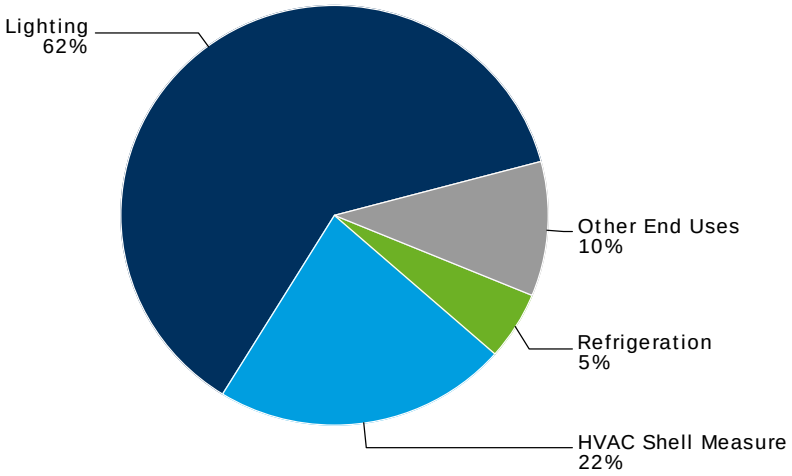
Figure 6. Commercial Sector Electric Economic Potential by Segment (Cumulative in 2023)



Note: 'Other Segments' includes:
Small Office: 3%, Convenience: 3%, Lodging: 3%, Small Retail: 2%

Figure 7 presents distributions of electric economic potential by measure types. The largest portion of economic potential in the commercial sector (62%) comes from lighting, followed by HVAC shell measures (22%). Cooling and ventilation each account for about one-third of shell measure savings, with heat pumps and electric heating accounting for 24% and 6%, respectively. Retro-commissioning, variable frequency drives, ECM motors, variable refrigerant flow systems for heat pumps, and programmable thermostats account for nearly 73% of the shell measure savings.

Figure 7. Commercial Sector Electric Economic Potential by Measure Type (Cumulative in 2023)



Note: 'Other End Uses' includes:
Plug Load: 5%, Water Heat: 4%, Cooling: 1%, Heat Pump: <1%, Other: <1%, Cooking: <1%, Dryer: <1%

Table 24 provides technical and economic potential by end-use category.

Table 24. Commercial Sector Electric Energy-Efficiency Potential by End-Use Category (Cumulative in 2023)

End Use	Base Case Sales (GWh)	Technical Potential		Economic Potential	
		GWh	% of Base Sales	GWh	% of Base Sales
Cooking	73	4	5%	1	2%
Cooling	844	304	36%	205	24%
Dryer	226	0	0%	0	0%
Heat Pump	366	153	42%	124	34%
Heating	352	82	23%	30	9%
Lighting	3,540	1,605	45%	1,353	38%
Other	25	2	8%	1	5%
Plug Load	974	121	12%	104	11%
Refrigeration	584	150	26%	115	20%
Ventilation and Circulation	680	191	28%	162	24%
Water Heat	192	90	47%	87	45%
Total	7,856	2,702	34%	2,182	28%

Commercial Sector: Natural Gas

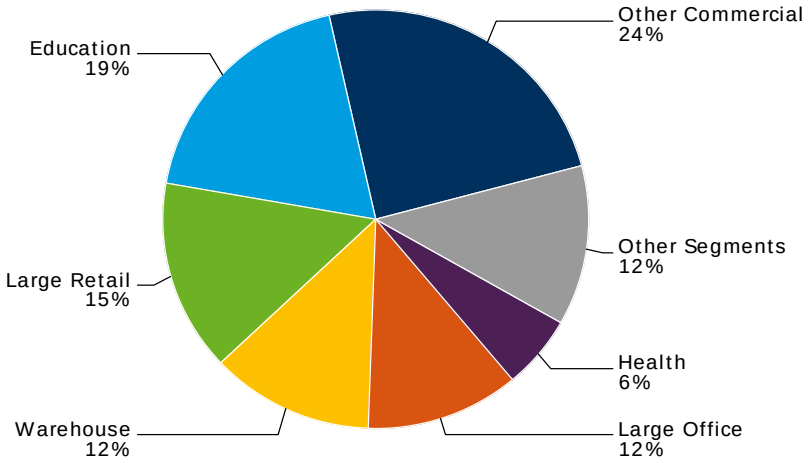
The commercial sector represents about one-third of both technical and economic gas energy-efficiency potential. The 73.6 million therms of economic potential over 10 years, corresponds to a 22% reduction (23% for Alliant and Black Hills and 21% for MidAmerican) of forecasted 2023 commercial consumption, as shown in Table 25.

Table 25. Commercial Sector Natural Gas Energy-Efficiency Potential by Utility (Cumulative in 2023)

Utility	Base Case Sales (Thousand Therms)	Technical Potential			Economic Potential		
		Thousand Therms	% of Base Sales	Peak Day Thousand Therms	Thousand Therms	% of Base Sales	Peak Day Thousand Therms
Alliant	90,558	25,191	28%	193	20,683	23%	162
Black Hills	57,302	15,941	28%	109	13,076	23%	89
MidAmerican	187,721	50,997	27%	358	39,890	21%	283
Total	335,581	92,129	27%	660	73,649	22%	534

As shown in Figure 8, miscellaneous buildings and education facilities represent the largest shares of economic potential in the commercial sector (24% and 19%, respectively). As with the commercial electric sector, the miscellaneous segment is composed of a combination of customers not fitting into one of the other categories and those that would fit, but have insufficient enough information to be classified. Considerable savings opportunities are expected in the commercial sector's retail (15%), office (15%), and warehouse (12%) segments. Moderate savings amounts can be expected in health, restaurants, and lodging, and grocery facilities.

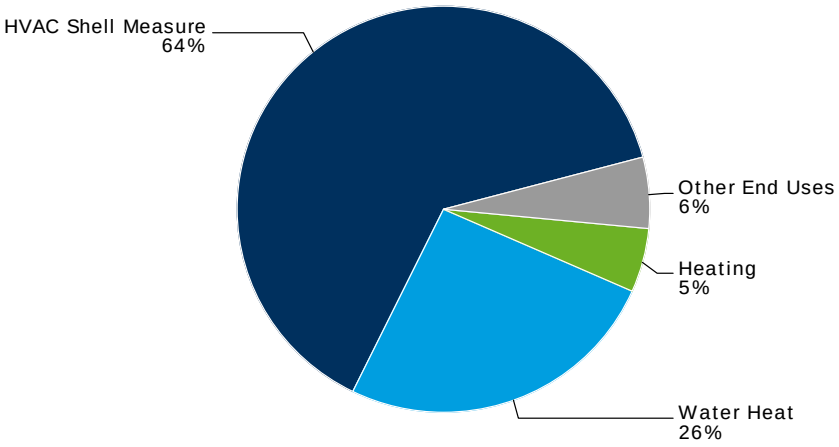
Figure 8. Commercial Sector Natural Gas Economic Potential by Segment



Note: 'Other Segments' includes:
Small Office: 3%, Restaurant: 3%, Small Retail: 2%, Grocery: 2%, Lodging: 2%, Convenience: <1%

Figure 9 presents distributions of natural gas economic potential by measure type. The largest portion of economic potential in the commercial sector (64%) comes from HVAC shell measures, followed by water heating (26%). More than 63% of the shell measure savings comes from furnace applications, with the remainder attributable to boiler measures. Retro-commissioning, demand controlled ventilation systems, variable air-volume systems, boiler reset controls, and infiltration control account for nearly 95% of shell measure savings.

Figure 9. Commercial Sector Natural Gas Economic Potential by Measure Type (Cumulative in 2023)



Note: 'Other End Uses' includes:
Boiler: 5%, Cooking: <1%, POOL HEAT: <1%

Table 26 provides technical and economic potential by end-use category.

Table 26. Commercial Sector Gas Energy-Efficiency Potential by End Use Category (Cumulative in 2023)

End Use	Baseline Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Sales	Thousand Therms	% of Base Sales
Boiler	71,649	23,222	32%	20,644	29%
Cooking	14,149	556	4%	556	4%
Dryer	948	0	0%	0	0%
Heating	179,088	47,624	27%	33,527	19%
Pool Heat	240	34	14%	34	14%
Water Heat	69,507	20,692	30%	18,888	27%
Total	335,581	92,128	27%	73,649	22%

Industrial Sector: Electricity

Technical and economic energy-efficiency potentials were estimated for major end uses within 18 major industries, including agriculture and street lighting.[15] Across all industries, economic potential totals approximately 1,916 GWh over 10 years, corresponding to a 10% reduction (11% for Alliant and 10% for MidAmerican) of forecasted 2023 industrial consumption, as shown in Table 27.

Table 27. Industrial Sector Electric Energy-Efficiency Potential by Utility (Cumulative in 2023)

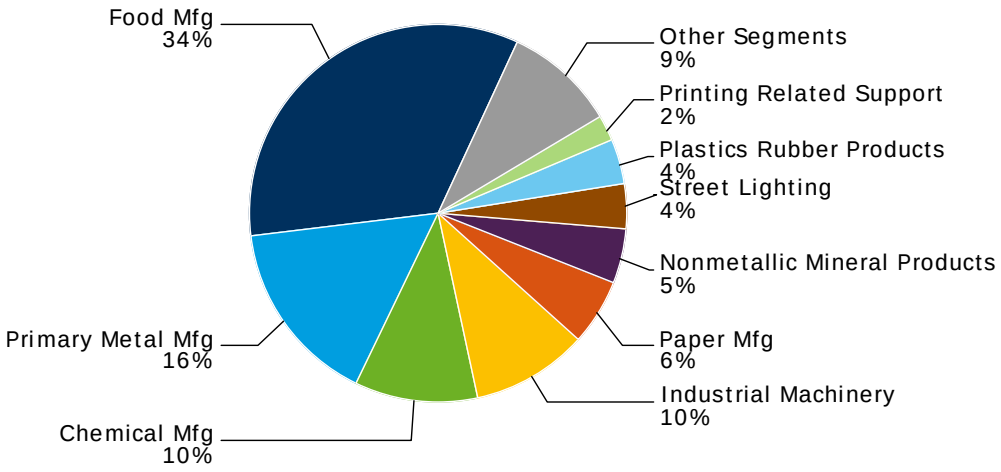
Utility	Base Case Sales (MWh)	Technical Potential			Economic Potential		
		MWh	% of Base Sales	MW	MWh	% of Base Sales	MW
Alliant	7,644,007	976,916	13%	125	871,076	11%	112
MidAmerican	10,649,258	1,212,250	11%	152	1,038,971	10%	131
Total	18,293,265	2,189,166	12%	*	1,910,047	10%	*

* Due to differences in timing of utility system peaks, demand impacts cannot be aggregated across utilities.

As shown in Figure 10, food processing and primary metal manufacturing facilities represent approximately one-half of the economic potential in the industrial sector (34% and 16%, respectively). Considerable savings opportunities are also expected in the industrial sector's chemical manufacturing segment (10%).

[15] Industries analyzed varied by utility, based on customer and sales distributions

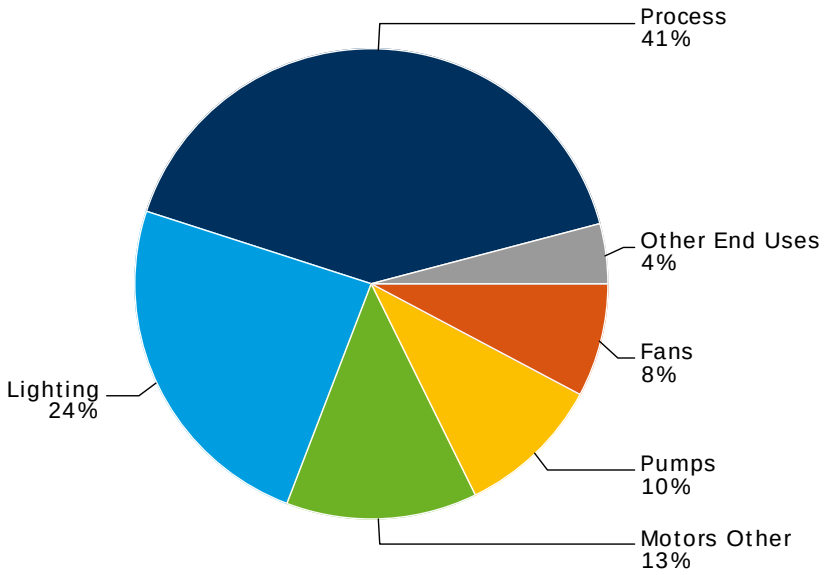
Figure 10. Industrial Sector Electric Economic Potential by Segment (Cumulative in 2023)



Note: 'Other Segments' includes:
Transportation Equipment Mfg: 2%, Fabricated Metal Products: 1%, Instruments: 1%, Wood Product Mfg: 1%
Miscellaneous Mfg: 1%, Electrical Equipment Mfg: <1%, Agriculture: <1%, Mining: <1%
Furniture Mfg: <1%

The majority of electric economic potential in the industrial sector (41%) can be attributed to gains in process efficiency (such as heating, cooling, and compressed air), followed by lighting improvements (24%) and motor system improvements (mainly fans and pumps). As shown in Table 28 and Figure 11, a small amount of additional potential exists for other facility improvements.

Figure 11. Industrial Sector Electric Economic Potential by Measure Type



Note: 'Other End Uses' includes:
HVAC: 4%, Other: <1%

Table 28. Industrial Sector Electric Energy-Efficiency Potential by End-Use Category (Cumulative in 2023)

End Use	Baseline Sales (GWh)	Technical Potential		Economic Potential	
		(GWh	% of Base Sales	GWh	% of Base Sales
Fans	1,056	162	15%	148	14%
HVAC	1,655	170	10%	77	5%
Indirect Boiler	219	0	0%	0	0%
Lighting	1,379	577	42%	463	34%
Motors Other	3,485	288	8%	251	7%
Other	585	2	0%	2	0%
Process—Air Compressor	1,099	248	23%	248	23%
Process—Electro Chemical	1,860	0	0%	0	0%
Process—Heat	2,676	70	3%	68	3%
Process—Other	234	3	1%	3	1%
Process—Refrigeration and Cooling	2,426	463	19%	461	19%
Pumps	1,622	206	13%	190	12%
Total	18,296	2,189	12%	1,911	10%

Industrial Sector: Natural Gas

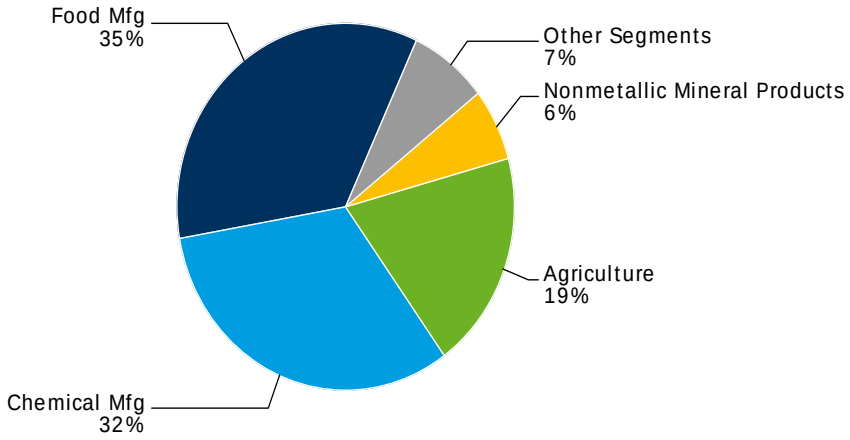
Most industrial processes and end uses rely on electricity; therefore, the industrial sector represents an extremely small portion of natural gas baseline sales and potential. As shown in Table 29, across all industries, economic potential totals approximately 5.3 million therms over 10 years, corresponding to an 8% reduction (9% for Alliant, 8% for Aquila, and 8% for MidAmerican) in forecasted 2023 industrial consumption.

Table 29. Industrial Sector Natural Gas Energy-Efficiency Potential by Utility (Cumulative in 2023)

Utility	Base Case Sales (Thousand Therms)	Technical Potential			Economic Potential		
		Thousand Therms	% of Base Sales	Peak Day Thousand Therms	Thousand Therms	% of Base Sales	Peak Day Thousand Therms
Alliant	33,917	3,132	9%	8	2,969	9%	8
Black Hills	6,697	575	9%	1	540	8%	1
MidAmerican	22,002	1,884	9%	5	1,770	8%	5
Total	62,616	5,591	9%	14	5,279	8%	14

Due to the composition of industries using natural gas in Iowa, over 67% of the economic potential lies in the food processing (35%) and chemical manufacturing (32%) segments. As shown in Figure 12, substantial savings opportunities also exist in agriculture (19%) and nonmetallic mineral products (6%).

Figure 12. Industrial Sector Gas Economic Potential by Segment



Note: 'Other Segments' includes:
Industrial Machinery: 2%, Primary Metal Mfg: 2%, Paper Mfg: 1%, Printing Related Support: <1%
Fabricated Metal Products: <1%, Transportation Equipment Mfg: <1%, Plastics Rubber Products: <1%, Wood Product Mfg: <1%
Miscellaneous Mfg: <1%, Electrical Equipment Mfg: <1%, Furniture Mfg: <1%, Instruments: <1%

Almost all baseline consumption occurs in boilers and process heating (87%); thus, these end uses account for 97% of the economic potential. As shown in and Figure 13, the remaining potentials result in HVAC improvements and other (non-heating) process improvements.

Figure 13. Industrial Sector Gas Economic Potential by Measure Type (Cumulative in 2023)

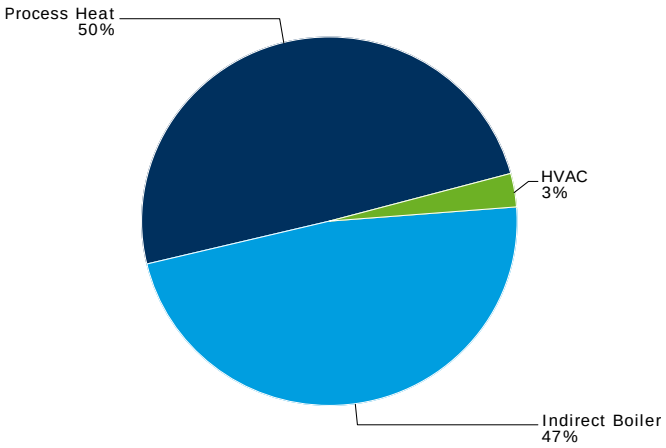


Table 30. Industrial Sector Natural Gas Energy-Efficiency Potential by End-Use Category (Cumulative in 2023)

End Use	Baseline Sales (Thousand Therms)	Technical Potential		Economic Potential	
		Thousand Therms	% of Base Case	Thousand Therms	% of Base Case
HVAC	3,694	210	6%	157	4%
Indirect Boiler	32,829	2,506	8%	2,506	8%
Other	1,919	0	0%	0	0%
Process—Heat	21,063	2,874	14%	2,616	12%
Process—Other	3,110	0	0%	0	0%
Total	62,615	5,590	9%	5,279	8%

3. ENERGY EFFICIENCY: MARKET POTENTIAL

Market potential, as defined in this study, represents savings that might be achievable under an aggressive acquisition scenario, assuming: incentive payments up to 100% of incremental measure costs; financing availability; exemplary program design and implementation practices; and emergence of new technologies, currently not widely available in the marketplace. This section presents research results in each of these areas, and examines its implications regarding realistic market potential levels in Iowa.

The results of the market potential analysis are intended to provide context to the estimates of economic potential and do not necessarily represent utility targets or "program potential." These savings may be realized through market transformation or improved codes and standards and may not be available or appropriate for utility programs. For example, the electric potential includes a substantial amount of savings from LEDs and CFLs replacing minimum standard bulbs. However, if the new lighting standards cause CFLs to become the de facto standard, the amount of savings available for utility DSM program acquisition could be greatly reduced.

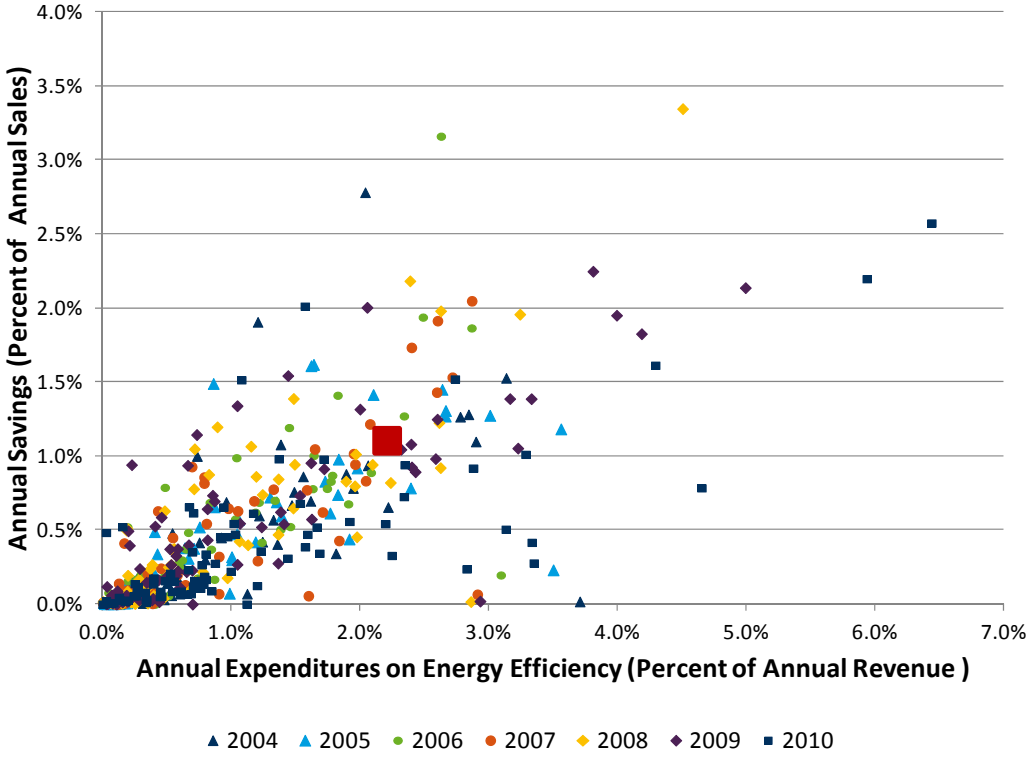
Effects of Increased Incentives

Due to key differences in measure characteristics and customer demographics, and the differing composition of programs and portfolios, one must separately assess incentives' effects on measure adoption for each fuel. While using similar methods, the two analyses adopted rely on fuel-specific potential and benchmarking data. The analyses' results follow.

Electricity

As described in Section 1, analysis quantifying the amount of electric market potential available, given incentives covering the entire incremental measure cost, has been based on portfolio-level data derived from EIA Form 861. Figure 14 shows relationships from 2004 to 2010 between savings (as a fraction of retail sales) and incentive payments (as a fraction of annual retail revenues) for the 75 utilities in the dataset. The figure suggests a generally linear relationship, with relationships that can be examined using regression analysis. The center of the larger red square indicates the average spending and savings for Iowa's electric IOUs in 2010.

Figure 14. Scatter Plot of DSM Savings and DSM Expenditures



The following regression equation estimated the statistical relationship between incentives and savings:

$$\log(\%\ \text{Savings}) = \beta_{0+}\ \beta_1 \log\left(\frac{\text{Incentive}}{\text{Revenue}}\right) + \beta_2 \log\left(\frac{\text{Other Costs}}{\text{Revenue}}\right) + \beta_3 \log(\text{Rate}) + \beta_4 \text{Log}(\text{Time})$$

This formulation states energy-efficiency savings is a function of: incentive payments (Incentive); non-incentive program expenditures (Other Costs), including program administration, marketing, and operating expenses; average per-unit cost of delivered energy (Rate); and time (Time). The rate term included in the equation accounts for the propensity to conserve energy and can be expected to run higher in jurisdictions with high rates. The time variable captures trends resulting from exogenous factors affecting program activity from 2004 to 2010. The equation parameters were estimated using a logarithmic specification with the panel data shown in Figure 14.

The analysis shows a relatively strong overall relationship between savings and the explanatory variables, indicated by a coefficient of determination (R^2) of 0.6, meaning 60% of the savings variation can be explained by the equation's explanatory variable (see Table 31). All estimated parameters have the correct sign, and are statistically significant at the 90% or higher level of statistical confidence, indicating a probability less than 10% that results might be due to chance. Coefficients for the incentive term and other expenditures are statistically significant at the 99% confidence level.

Table 31. Electric Model Terms and Coefficients

Model Term	Coefficient	Standard Error	P-Value
Intercept	0.94	0.54	0.08
Log (Incentive / Revenue)	0.44	0.05	< 0.01
Log (Other Costs / Revenue)	0.57	0.07	< 0.01
Log (Rate)	0.32	0.21	0.12
Log (Time)	-0.26	0.12	0.03

As the equation's terms are expressed in logarithmic form, estimated coefficients for each term in the equation represent the elasticity of savings with respect to that term. For example, as seen in Table 31, the estimated coefficient of incentives as a percent of revenue is 0.44, suggesting a 1% increase in incentives will likely lead to a 0.44% increase in savings. Using this parameter, one can estimate the maximum market potential achievable if incentives increase to 100% of incremental measure cost.

As the estimated coefficient on incentive amount measures the marginal impacts of higher incentives, a starting point for incentive amounts must be assumed. Available information on Iowa's electric utilities in 2010 indicates, on average, incentives covered approximately 40% of incremental measure costs across the energy-efficiency programs in their portfolios. A scenario assuming incentives at 100% of incremental costs thus requires a 150% increase ([100% - 40%] / 40%) increase in current incentive outlays.

Non-incentive expenditures, such as marketing, outreach, planning, and administration, have traditionally been assumed to be relatively fixed. This study's findings indicate this might not be the case. Indeed, the 0.57 estimated elasticity for non-incentive expenditures (shown in Table 31) suggests a positive and statistically significant correlation between non-expenditures and market penetration, and that these expenditures may even be more effective in expanding the market potential than incentives.

This finding is not surprising, given that first-cost is not necessarily the primary barrier in all sectors, and highlights that success in effectively promoting energy-efficiency programs depends on the total marketing effort, consisting not only of incentives, but of effective communication, education, and dissemination of information. Program administrators must examine and choose an appropriate mix of these investments, based on the unique characteristics of their service territories, customer needs, and characteristics of programs and products they offer.

In further analyzing EIA data, Cadmus found a statistically significant positive correlation between incentive payments and non-incentive expenditures of approximately 20%. That is, as incentives increase, so do non-incentive expenditures, and one cannot consider a scenario with drastically increased incentive payments without considering an accompanying rise in non-incentive costs.

Using 2010 reported portfolio savings and expenditures, revenues, and retail sales for the two electric utilities, Cadmus estimates that, if incentives for electric programs increase to 100% of incremental measure costs, up to 90% of estimated statewide economic electric potential will likely be achievable (see Table 32). As shown, however, budgets would need to increase by more than twofold at these incentive levels. As discussed, this increase in incentive spending would

likely lead to additional spending on program administration, further increasing program budgets to over $113 million annually.

Table 32. Expected Electric Market Potential If Incentives Increase to 100% of Incremental Costs

Data Value	Statewide Value (2010)
Total Energy Efficiency Program Expenditures	$53,975,612
Total Energy Efficiency Program Expenditures % of Revenue	2.2%
Incentive % of Incremental Measure Cost	40%
Actual Savings % of Retail Sales	1.12%
Estimated Elasticity of Savings Relative to Incentives	0.44%
Actual Energy Efficiency Savings (MWh)	378,578
Change in % Savings at Incentives of 100% of Incremental Cost	66%
Projected Annual Energy Efficiency Savings (MWh)	628,440
Projected Annual Program Expenditures	$113,292,323
Estimated Annual Economic Potential (MWh)	687,221
Market Potential % of Economic Potential	91%

The analysis further shows the associated electric energy savings would likely produce statewide life-cycle benefits of approximately $450 million. The estimated costs and benefits do not account for potential future decreases in measure costs as energy-efficient technologies improve over time.

A market potential up to 90% of economic potential is extremely high, compared to results of other potential studies and market potential levels deemed achievable in other jurisdictions. Given economic potentials, relative to technical potentials, are also higher than in most jurisdictions, the identified market potential may not be realistically achievable.

A review of over 100 electric energy-efficiency potential studies completed since 2000, across 37 states, shows the estimates of economic potential exceeded 80% of technical potential (as seen in this study) in only 10 cases. These 10 studies estimate a maximum achievable potential of less than 60% of economic potential, a level significantly below that estimated in this study. Planning study results in several regions with long histories of aggressive energy-efficiency resource acquisition programs also supports the supposition that, relative to the identified potential in this study, market potential up to 90% might be exaggerated.

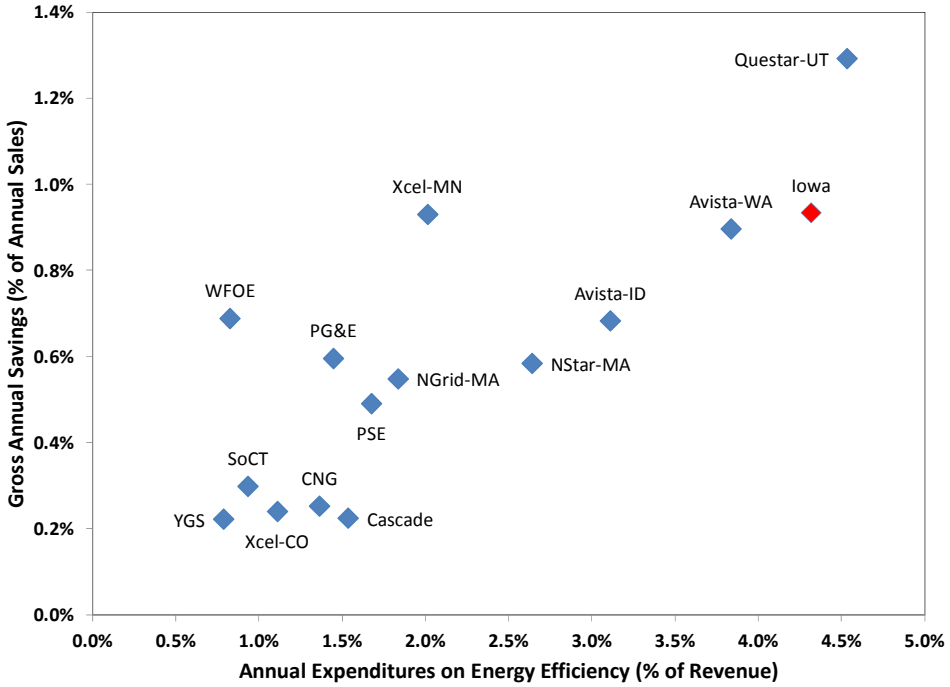
In the Pacific Northwest, for example, 85% of economic potential has been considered a maximum feasible level, which is consistent with findings of potential studies in California. In that state, a 2003 study of statewide electric energy-efficiency potentials estimated that, under the most aggressive scenario, assuming incentives of 100% of measures costs and total market awareness, 73% of the economic potential identified in the study would be achievable.[16]

[16] California Statewide Commercial-Sector Energy Efficiency Potential Study, Xenergy Inc, 2002.

Natural Gas

Due to the lack of centralized natural gas energy-efficiency portfolio data, Cadmus compiled information on 14 natural gas energy-efficiency portfolios, based on the criteria presented in Section 1. Cadmus used these data, presented in Figure 15, to perform a similar regression analysis (as described in the electric section, above).

Figure 15. Scatter Plot of Energy-Efficiency Savings and Expenditures



Cadmus specified a regression equation similar to that for electricity to estimate relationships between natural gas savings and incentives. As data were limited to 2010 results, the equation has no "Time" term:

$$\log(\%\ \text{Savings}) = \beta_{0+}\ \beta_1 \log\left(\frac{\text{Incentive}}{\text{Revenue}}\right) + \beta_2 \log\left(\frac{\text{Other Costs}}{\text{Revenue}}\right) + \beta_3 \log(\text{Rate})$$

As shown in Table 34, estimated coefficients for the incentive and other expenditure terms are positive, while the coefficient for the rate term has a negative sign, which appears counter-intuitive. This coefficient, however, also has a large margin of error and is statistically insignificant.

Table 33. Natural Gas Model Terms and Coefficients

Model Term	Coefficient	Standard Error	P-Value
Intercept	-0.89	1.15	0.453
Log (Incentive / Revenue)	0.49	0.16	0.009
Log (Other Costs / Revenue)	0.15	0.17	0.394
Log (Rate)	-0.62	0.54	0.272

Of the three estimated coefficients, only the incentive term (the critical term in the equation) is statistically significant at the 90% confidence level. The weaker overall performance of the estimated relationship for natural gas (as compared to electric) in the regression model is largely a result of the significantly smaller sample size.

As shown in Table 34, the estimated coefficient of incentives as a percent of revenue is 0.49, suggesting a 1% increase in incentive spending can be associated with a 0.49% increase in savings, a result generally consistent with the results found in the electric analysis. The coefficient for other spending is much smaller (and statistically less significant) than the electric result, suggesting, while savings also increase with other costs, first costs may be the primary barrier.

Table 34. Natural Gas Model Terms and Coefficients

Model Term	Coefficient	Standard Error	P-Value
Intercept	-0.89	1.15	0.453
Log (Incentive / Revenue)	0.49	0.16	0.009
Log (Other Costs / Revenue)	0.15	0.17	0.394
Log (Rate)	-0.62	0.54	0.272

Available information on Iowa's electric utilities in 2010 indicates incentives covered approximately 42% of incremental measure costs across all programs in the three utility's portfolios. A scenario assuming incentives at 100% of incremental costs thus requires an increase of 138% ([100% - 42%] / 42%) in current incentive outlays.

Using 2010 energy-efficiency program savings and expenditures, revenues and retail sales for the three natural gas utilities, Cadmus estimates that, if incentives for natural gas programs increase to 100% of incremental measure costs, the achievable fraction of economic potential might increase to approximately 65% of the estimated economic potential (see Table 35).

Table 35. Expected Achievable Natural Gas Market Potential If Incentives Increase to 100% of Incremental Costs

Data Value	Statewide Value (2010)
Total Energy Efficiency Program Expenditures	$37,851,535
Total Energy Efficiency Program Expenditures % of Revenue	4.1%
Incentive % of Incremental Measure Cost	42%
Actual Savings % of Retail Sales	0.92%
Estimated Elasticity of Savings Relative to Incentives	0.49%
Actual Energy Efficiency Savings (thousand therms)	9,682
Change in % Savings at Incentives of 100% of Incremental Cost	62%
Projected Annual Energy Efficiency Savings (thousand therms)	15,661
Projected Annual Program Expenditures	$74,951,818
Estimated Annual Economic Potential (thousand therms)	25,475
Market Potential % of Economic Potential	65%

As annual statewide savings relative to retail sales are currently lower for natural gas than electricity, the analysis projects a lower share of the economic potential as achievable, given it would be more difficult for natural gas programs to ramp up to maximal savings levels. As

shown, however, budgets would need to increase twofold at these incentive levels. As discussed, this increase in incentive spending would likely lead to additional spending on program administration, further increasing program budgets to $75 million dollars annually. The analysis further shows the associated natural gas energy savings would likely produce statewide life-cycle benefits of over $100 million.

Effects of Financing Availability

Market potential depends on a number of factors, including retail energy rates, energy-efficiency measure costs, and the program's ability to overcome a host of market barriers recognized in the energy-efficiency literature to impede adoption of energy-efficiency measures and practices by consumers, including high first costs. These barriers tend to vary in severity, depending on customer sectors, local energy market conditions, and other, hard-to-quantify factors. Ultimately, market potential is a function of consumers' willingness and ability to participate in programs.

Financing options (in the form of loan programs) are mechanisms used to help mitigate effects from lack of capital—or high-cost financing—on consumers' ability to participate in energy-efficiency programs. Studies of financing and loan programs, including two recent reports by ACEEE, have found energy-efficiency loan programs have minimal effects on consumers' participation in energy-efficiency programs.

The findings of one ACEEE study[17] suggest participation rates tend to be generally low across programs. Compared to numbers of eligible customers in classes served by these programs, more than half the programs had participation rates below 0.5%. The highest participation rate was reported at 3%, experienced by only two surveyed programs. The report concludes these programs generally have not successfully achieved appreciable market penetration, and, importantly, sound program design does not appear to guarantee success.

A survey of on-bill financing programs found similar results. In a 2011 report, ACEEE examined 19 of 31 on-bill financing programs, structured as on-bill loans or on-bill tariffs in 20 states.[18] The study found less than 1%[19] of the eligible customers participated in these programs, despite several of these programs having been available for nearly 20 years.[20]

In light of extremely high economic potential levels assumed available under a 100% incentive scenario, and the performance of financing programs to date, it is unlikely availability of financing would increase market potential beyond that achievable assuming a 100% incentive.

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[17] Hays, Sara, et. al., *What Have We Learned From Energy Efficiency Financing Programs*, ACEEE, Report Number U115, September 2011.

[18] Bell, Catherine J., et. al., *On-Bill Financing for Energy Efficiency Improvements: A Review of Current Program Challenges, Opportunities, and Best Practices*, Report Number E118, December 2011.

[19] This number represents the average found by ACEEE for the programs reviewed. There have been cases where individual utilities have achieved higher penetration rates for on-bill financing programs, such as Cedar Falls Utility in Iowa.

[20] See also Byrd, D.J. and R.S. Cohen, A Roadmap to Energy Efficiency Loan Financing, Memorandum to U.S. Department of Energy, April 2011.

Effects of Emerging Technologies

In addition to commercially available technologies included in the assessment of technical and economic potentials, Cadmus considered the potential for emerging technologies in the context of market potential. Emerging energy-efficient technologies are those expected to become commercially available and cost-effective within the next five to 10 years.

The primary sources used to identify potential measures and corresponding savings data were reports published by ACEEE. Since the mid-1990s, ACEEE has published reports on *Emerging Energy-Saving Technologies and Practices in the Building Sector*.[21] In 2009 and 2011, reports focused on HVAC and hot water systems, respectively. ACEEE currently is investigating emerging lighting technologies, but, as results of this research are not available at this time, Cadmus referenced work conducted through DOE's CALiPER program.[22]

Generally, these technologies are higher-efficiency replacements for measures already included in the assessment. For example, Advanced Northern Heat Pumps (SEER 16/HSPF 9.6) are a more efficient variant of SEER 16/HSPF 9.0 heat pumps, already included. Active Chilled Beam Cooling with DOAS (dedicated outdoor air system) proves the exception: this measure represents an alternate building design, replacing standard duct systems with integrated features, combining lighting, water-cooled convective heat exchange surfaces, and ventilation. In short, it utilizes pumps to deliver cool water instead of fans to blow cold air.

The analysis assumes replacement measures for existing, cost-effective measures will, in turn, become cost-effective over the planning horizon. In these cases, Cadmus estimated additional potential savings for these measures relative to the comparable measure's economic potential. That is, using the example measure above, additional potential for the SEER 16/HSPF 9.6 heat pump is incremental to the SEER 16/HSPF 9.0 unit. However, if the measure supplanted by this emerging technology does not pass the economic screen, no additional economic potential is assumed for the emerging technology. That is, existing technology would first need to become economically feasible before being supplanted by an emerging technology. For example, as existing natural gas tankless water heaters do not pass the economic screen, it is assumed condensing tankless water heaters will not pass either.

Measures identified through this research, along with applicable sectors, fuels, and end uses, are listed in Table 36. Though ACEEE reports addressed more measures, only those in Table 36 achieved efficiency levels greater than economic measures already in the measure list.

[21] http://www.aceee.org/topics/emerging-technologies-and-practices
[22] http://www1.eere.energy.gov/buildings/ssl/caliper.html

Table 36. Emerging Technologies

Sector	Fuel	End Use	Technology	Additional Market Potential (MWh or thousand therms)
Residential	Electric	Water Heating	Add-On Heat Pump Water Heater	27,426
Residential	Electric	HVAC	Optimized Residential Duct Work	763
Residential	Electric	Water Heating	Singe Family On-Demand Recirculation Pumps	1,615
Residential	Electric	HVAC	Multifamily Building Best Practices	43,599
Residential	Gas	Water Heating	Condensing Tankless Water Heater	0
Commercial	Electric	Lighting	LED Replacement of Linear Fluorescent	62,915
Commercial	Electric	HVAC	Active Chilled Beam Cooling with DOAS	2,338
Commercial	Electric	HVAC	Ventilation and Energy Recovery	34,214

The additional market potential from the emerging technologies is estimated at 73,403 MWh in the residential sector and 99,468 MWh in the commercial sector, assuming 90% of economic potential is achievable (given 100% incentives). If realized, these additional savings would increase the electric market potential, shown in Table 32, by about 3%. Cadmus did not identify additional natural gas potential from emerging technologies. Appendix A.5 describes each measure included in the analysis.

4. DEMAND RESPONSE POTENTIAL

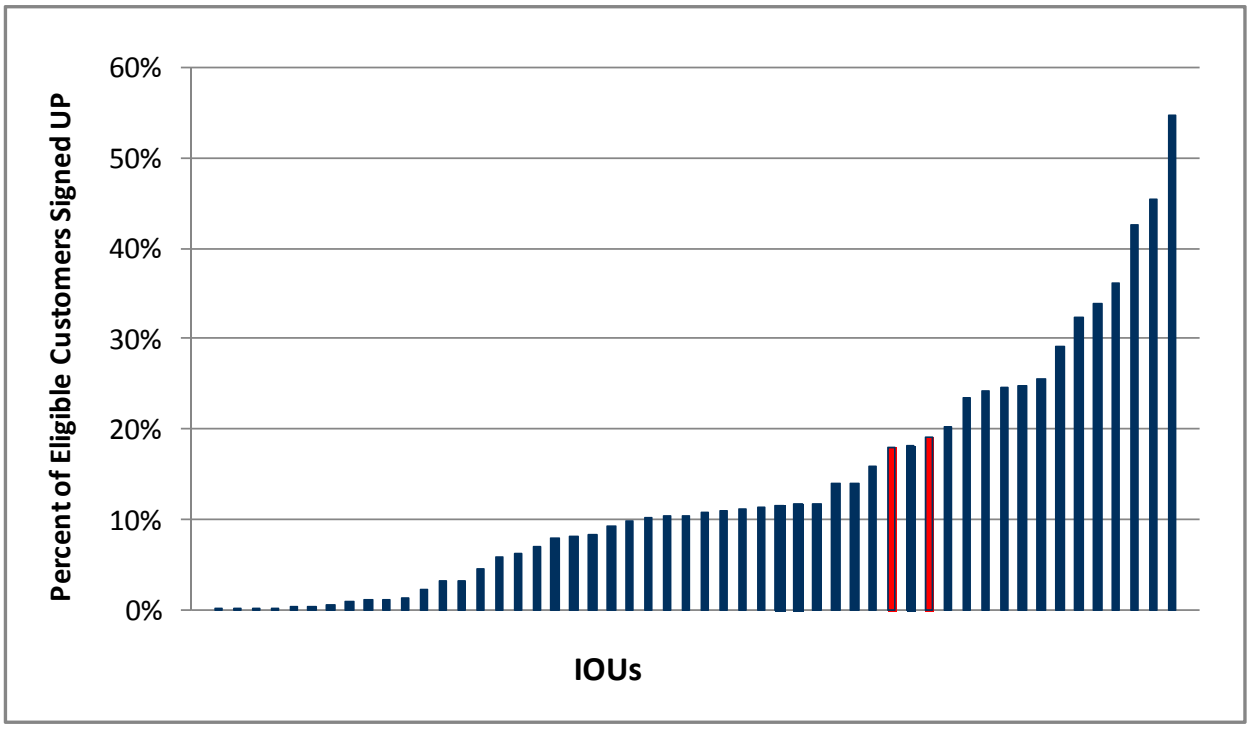
Potential for Expanding Legacy Programs

Residential DLC

As discussed in Section 1, the key metric for the residential DLC analysis was the fraction of eligible customers currently participating, with eligible customers defined as those with residential electric service and central air conditioners. Based on 2010 program activity, residential customer counts, and saturation data from the 2007 Residential Appliance Saturation Survey, Cadmus estimated similar currently participation rates for Iowa DLC programs: 19% and 18% for Alliant and MidAmerican, respectively.

Based on secondary data collected, Cadmus calculated participation rates for an additional 51 residential DLC programs for investor-owned utilities (IOUs) from across the nation. Figure 16 shows the calculated participation for each of these utilities in 2010, with Iowa utilities shown in red.

Figure 16. Participation Rates for 2010 IOU Residential DLC Programs



As program participation serves as the key driver of residential DLC impacts, Cadmus established three scenarios to quantify available potential for Iowa utilities, based on differing program participation levels. Participation levels in the moderate and aggressive expansion scenarios have been based on average participation in the upper-tier and industry-leading IOU programs, respectively.

Assumed participation rates are:

- Baseline: maintaining current program participation levels.
- Moderate expansion: achieving 20% program participation.
- Aggressive expansion: achieving 25% program participation.

To estimate peak demand impacts under each scenario, Cadmus multiplied participation rates by eligible customer forecasts for each utility, calculating the number of participating customers, then multiplying this number by per-participant values currently used by Iowa utilities, to calculate program-level demand impacts. Table 37 compares estimated 10-year potential under each scenario to the 2008 Assessment and each utility's 2010 accomplishments. As shown in Table 37identified potential is lower than in the 2008 Assessment, based on updated data on actual program achievements.

Table 37. Forecasted Residential DLC Impacts in 2023 (MW)

		10-Year Potential			
		2008 Study	2012 Study		
Utility	2010 Program Achievements	Base Case	Base Case	Moderate Expansion	Aggressive Expansion
Alliant	33	53	35	37	46
MidAmerican	31	72	32	35	43

Secondary research into snapback effects indicated residential DLC programs typically see energy savings reductions of 40% to 70% due to snapback.[23] Actual energy saved by these programs is a function not only of demand under contract, but also of the duration and frequency of events. However, based on the secondary literature, Cadmus expect per-hour MWh potential to be roughly half of the MW values presented in Table 37.

Nonresidential Interruptible

Participation in interruptible programs will vary greatly across utilities due to the following:

- The value of capacity savings;
- Eligibility requirements;
- Utility incentives;
- Prevalence of standby generation; and
- Who implements the program (utility vs. third-party aggregator).

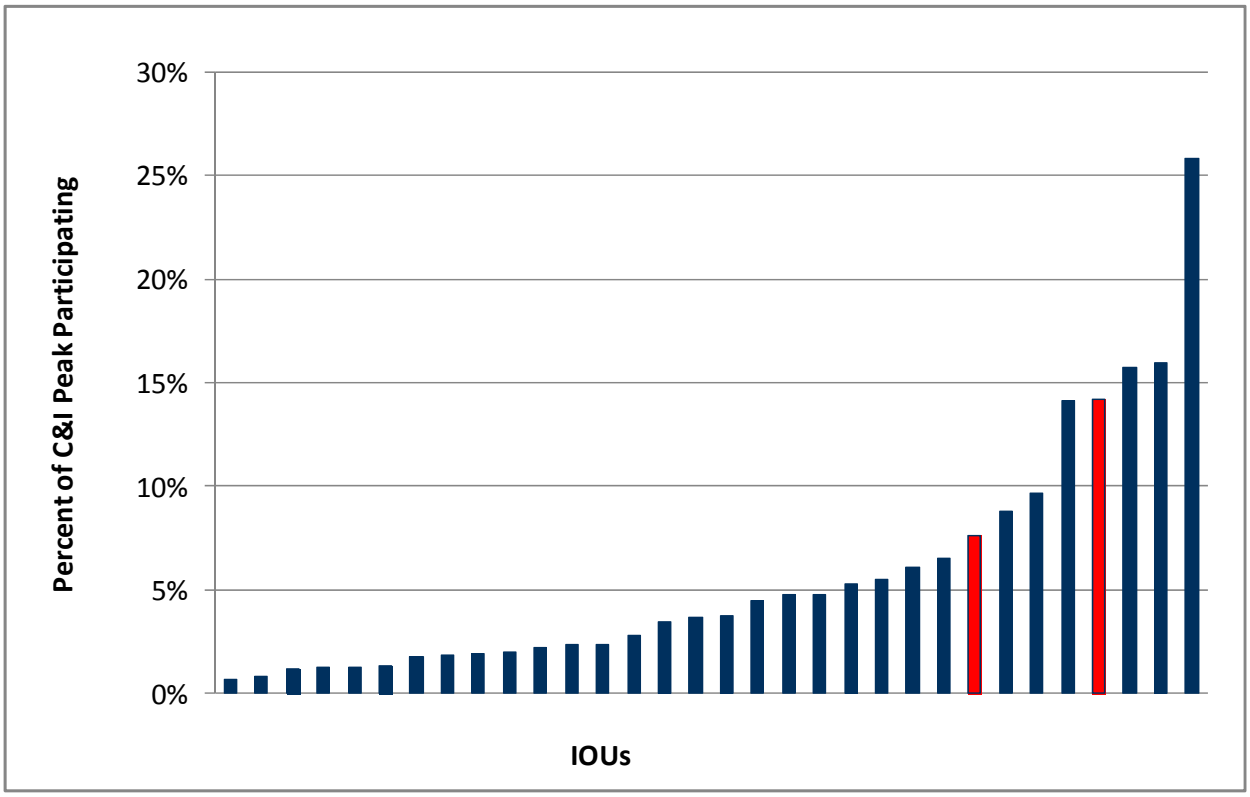
These caveats aside, Cadmus collected data on IOU programs similar to those offered in Iowa to assess opportunities for program growth.

Unlike the residential sector, due to large differences in demand between nonresidential customers, the percent of eligible *load* enrolled (rather than customers) serves as the key metric in assessing program participation. However, as data on eligible loads by utility are not readily

[23] Appendix B lists programs reviewed.

available for most utilities, Cadmus used total nonresidential demand during the system peak hour as a proxy. Using this metric and based on 2010 programs, Alliant and MidAmerican have currently enrolled 14% and 8% of eligible load, respectively. Figure 17 shows similar information collected for an additional 30 IOUs with similar programs, with Iowa utilities appearing as red bars.

Figure 17. Participation Rates for 2010 IOU Nonresidential Interruptible Programs



As program participation serves as the key driver of nonresidential interruptible impacts, Cadmus established three scenarios to quantify available potential for Iowa utilities, based on differing program participation levels. Participation levels in the moderate and aggressive expansion scenarios have been based on average participation in the upper-tier and industry-leading IOU programs, respectively, with the assumed participation rates:

- Baseline: maintaining current program participation levels.
- Moderate expansion: achieving 15% program participation.
- Aggressive expansion: achieving 17.5% program participation.

For each scenario, the percent increase in participation over 2010 activity has been used to calculate each utility's potential. As noted, utilities must consider their current and projected resource needs to determine whether these program participation levels are desirable and prudent.

Table 38 compares estimated 10-year potential under each scenario to the 2008 Assessment and each utility's 2010 accomplishments.

Table 38. Forecasted Nonresidential Interruptible Impacts in 2023 (MW)

		10-Year Potential			
		2008 Study	2012 Study		
Utility	2010 Program Achievements	Base Case	Base Case	Moderate Expansion	Aggressive Expansion
Alliant	264	291	296	304	354
MidAmerican	193	170	238	422	492

As in the residential sector, snapback effects, and thus energy savings attributable to demand response strategies, can vary greatly across utilities. Though literature on the likely snapback effects for nonresidential programs is limited, available data indicate that the effect may be around 50%.

Opportunities With AMI

Analysis of AMI-enabled demand programs was a qualitative exercise, given data quantifying impacts of AMI-enabled programs has been drawn almost exclusively from utility pilot programs, and may not be appropriate for extrapolation to larger markets. Consequently, potential energy and demand savings related to AMI cannot be reliably quantified at this time. Nevertheless, this study outlines a number of potential options that may provide viable savings sources if Iowa electric utilities implement AMI.

Overview of AMI-Enabled Demand Response

At the highest level, AMI's addition enables two-way communication for the mass-market of utility customers. Such two-way communication enables two primary opportunities. First, collection of near real-time interval meter data becomes possible as smart meters record interval meter reads, and send data back to the utility. Second, AMI enables communication from the utility to the customer, with the utility sending signals to the customer's meter, which can be used to specify changes in dynamic pricing or to control various appliances.

AMI technology does not present a new idea: many utilities have installed similar systems strategically for their larger C&I customers. Its strategic aspect arises regarding cost-effectiveness, as non-AMI systems have been inappropriate for installation in some situations, due to costs outweighing benefits. Such systems have often relied on dedicated Internet connections and advanced metering.

AMI enables a much lower per-meter cost for such advanced capabilities. By deploying system-wide communication networks, AMI systems reduce communication costs, and open doors to more cost-effective smart meter installations. Thus, as the C&I market has utilized various forms of advanced metering, the residential and small commercial market will likely realize much greater impacts from AMI.

Consequently, our research focused on residential, AMI-enabled opportunities. AMI can automate load reductions within a home or business through use of demand response enabling technology, which can be remotely signaled when utilities call demand response events, thus

reducing an appliance's load through control strategies established by the utility or the customer. AMI-enabled demand response technologies include the following:

- **Smart thermostats:** Devices similar to programmable thermostats, but receiving and reacting to utility pricing and signals. Customers using smart thermostats typically program devices to react in specific ways when demand response events occur. For example, a customer may choose to raise the temperature set point by four degrees during an event to reduce load. Smart thermostats automate this process.
- **Smart appliances:** Smart appliances typically are very efficient versions of traditional appliances, equipped with AMI communication capabilities. They can receive event notifications or pricing signals, modifying operations to reduce demand during demand response events. For example, a smart refrigerator, when signaled with a relatively high electric price, may cycle its refrigerant compressor to reduce peak consumption. Other smart appliances include: water heaters, lighting, clothes washers and dryers, and dishwashers.
- **Load control devices:** AMI load control devices resemble traditional load control devices, except they communicate over AMI systems, and have an added benefit of communicating their status; so non-operable devices can be more readily repaired.
- **Home energy management systems (HEMS):** In advanced homes utilizing HEMS to control operations such as HVAC, lighting, appliances and security, adding AMI allows HEMS' to control systems to reduce demand when signaled through an AMI network.

In addition to demand response enabling technologies, other AMI-enabled technologies improve communication of energy usage from the utility to consumer. Traditionally, customers have received monthly utility bills that report consumption and charge customers for their aggregate monthly consumption, a system that somewhat disconnects customers from immediate connections between their actions and energy consumption. However, AMI enables near real-time feedback, informing customers of their energy consumption much more quickly. Examples of enhanced communication devices include the following:

- **Personal Web portals:** These portals offer customized Websites customers can use to monitor interval consumption. Such systems allow customers to analyze their consumption over time periods they choose to view. Increasingly, these systems employ advanced analytics to provide customers with even more useful information. For example, some systems allow customers to benchmark their performance against those of neighbors with similar homes. Some systems allow customers to specify what they wish their utility bills to be, and the portal provides recommended actions they should take to meet these goals.
- **In-home displays (IHD):** These are standalone devices, typically communicating with smart meters to show customers their energy consumption and current utility pricing. These devices allow customers to better understand their energy consumption.
- **Energy Orb:** These standalone devices, which change color as energy rates change or as demand response events are called, signal customers to take appropriate actions to reduce their electric demand.

Program Examples

AMI Enabled DLC

As noted, AMI adoption creates opportunities to control appliances within customers' homes and businesses. In some ways, they differ little from current DLC programs: individual load reductions from activities such as cycling central air conditioners may not differ from load reductions resulting from currently deployed DLC programs. However, AMI improves upon DLC by implementing two-way communication. Most residential DLC programs experience lower demand reduction capabilities due to malfunctioning DLC devices. As traditional systems cannot communicate their status to the utility, these devices often remain inoperable until discovered through inspections. Utilities typically experience 10% to 20% losses due to non-operable DLC devices. With AMI-enabled DLC, non-operable devices can be more readily detected, and inoperability rates can typically be decreased to between 2% and 5%.

AMI Enabled Dynamic Pricing

Dynamic pricing has encountered a limiting factor in that traditional utility meters cannot record or transmit the interval data required to reconcile customer consumption. However, as AMI enables such communication, it allows implementation of dynamic pricing programs. To date, the majority of dynamic pricing data have resulted from pilot evaluations, which have been plagued with potential bias, stemming from early adopters' reporting results, as these individuals may use AMI capabilities more than average customers. Nevertheless, preliminary pilot results have been somewhat promising.

The Brattle Group recently synthesized results of 109 AMI-enabled dynamic pricing pilots, finding the majority of pilots resulted in load reductions of up to 16%, with a 12% median demand reduction.[24] The majority of these pilots relied on customers taking action when prompted through signaling techniques such as telephone calls, e-mails, and text messages.

Brattle also examined 39 AMI-enabled dynamic pricing programs, utilizing various combinations of enabling technologies. These programs showed consistently higher savings than programs without enabling technologies, with a median demand reduction of 23%.

Summary of AMI-Enabled Demand Response Opportunities

From initial pilot results, AMI appears to expand demand reduction capabilities of residential demand response programs, though the extent of this expansion remains to be seen, as program persistence issues have not been thoroughly studied. Additionally, studies of the reliability and security of these programs and enabling technologies remain in progress. Further, how AMI-enabled programs and traditional programs overlap, and how demand savings may shift, still must be understood before specific estimates of demand reduction can be determined.

From improving operability rates of existing DLC programs to offering new demand response programs to customers, who otherwise would not sign up for traditional DLC programs, AMI will likely expand utilities' demand reduction capabilities.

[24] Ahmed Faruqui and Palmer, J. "Dynamic Pricing of Electricity and its Discontents." The Brattle Group. August 2011.

5. ASSESSMENT OF THE NET-TO-GROSS RATIO

Definitions

Net-to-gross (NTG) assessments primarily seek to determine energy savings attributable to energy-efficiency programs by explicitly accounting for ***freeridership*** (energy savings likely to have occurred in the program's absence) and ***spillover*** (energy savings induced but not subsidized by the program). Savings resulting from this calculation are the "net" program savings, and the ratio of net program savings to gross savings is the NTG ratio.

About Freeridership

Freeridership subtracts from gross energy savings likely to have occurred through adoption of energy-efficiency measures by participants, independent of the program. That is, participants are considered freeriders if they would have adopted the same energy-saving measures at the same time, in the same quantity, and at the same efficiency level, had the program not existed.

About Spillover

Spillover adjustment adds energy savings from adoption of high-efficiency measures outside the program, but likely induced by the program. These additional energy savings are assumed to derive from greater knowledge and awareness of energy-efficient options resulting directly from the program's availability and influence.

Spillover can occur within participant and nonparticipant populations. For example, participants in a program may be motivated to adopt high-efficiency measures beyond those subsidized by a program. Simultaneously, the knowledge, awareness, and availability of measures caused by a program may induce nonparticipants to adopt the same energy-efficient measures.

For most programs, the number of eligible nonparticipants far outnumbers participants; thus, potential exists for large spillover impacts within this population.

About Program-Induced Market Effects

A third possible adjustment is program-induced market effects[25]—that is, any change the program causes to operations of supply chains in energy-efficiency markets. For example, the programs may result in:

- Manufacturers changing the efficiency of their products;
- Wholesalers and retailers changing their stocking decisions, reacting to shifts in demand for more efficient goods caused by IOU programs; and/or
- Architects and builders adopting energy-efficient practices.

[25] Note that some literature includes nonparticipant spillover as part of market effects.

These market effects can be significant, especially in upstream programs implemented through point-of-sale discounts. Such transformational market effects are, arguably, the ideal achievements of energy-efficiency programs, and can have long-lasting impacts. However, it is broadly accepted that these impacts can be difficult to measure for at least two reasons:

- Identifying these consumers in the larger populations can be difficult, as they may not be aware they participated in a program.
- A large number of factors may influence consumers' purchasing decisions.

Thus, measuring and attributing these effects to particular energy-efficiency programs has been a significant measurement and evaluation challenge.

Treatment of Freeridership and Spillover

Depending on the relative magnitudes of freeridership and spillover, NTG may be less than, greater than, or equal to 1.0. However, in jurisdictions where freeridership is the only measured effect, NTG never takes a value greater than 1.0.

Applying NTG also affects the cost-effectiveness of IOU programs. The Iowa Chapter 35 rules specify the method and assumptions for cost-effectiveness tests, including the Societal Cost Test (SCT), the standard for determination of cost-effectiveness in Iowa. The rules have been based on the Standard Practice Manual (SPM) for Economic Analysis of Demand-Side Management Programs, established by the California Public Utilities Commission (CPUC).[26]

In calculating benefits for the Total Resource Cost (TRC) test, the CPUC observed: "…ratepayers, through the energy-efficiency revenue requirements collected to fund these programs, incur a cost for freerider participants that must not be ignored in the formulation of the TRC test."[27] (The same observation applies to the SCT, which is a variant of the TRC.)

Due to ambiguity regarding how to fold in freerider considerations on the equation's cost side, the CPUC (in its 2007 Clarification Memo) modified the original method for calculating TRC costs by adding a transfer incentive (INC) recapture term to the initial TRC cost equation, as follows:

$$\text{TRC Costs} = \text{PRC} + \text{NTG}*\text{PC} + \text{UIC} + (1.0-\text{NTG})*\text{INC}$$

Where,

PRC = program administrator costs

PC = participant device costs (*before* INC is received)

UIC = (for fuel substitution programs) utility increase supply costs

[26] The SPM describes procedures for determining cost-effectiveness of energy-efficiency programs from five perspectives: resource allocation efficiency (Total Resource Cost); the utility (Utility Cost Test); participants (Participant Cost Test); society (Societal Cost Test); and ratepayers (Rate Impact Measure).

[27] 2007 SPM Clarification Memo, D.07-09-043, pages 154-158, California Public Utilities Commission, 2007.

NTG = net-to-gross ratio

INC = incentive costs, restricted to include only dollar benefits.

According to the CPUC, adding the INC term to the TRC formulation ensures removal of freerider costs does not remove program costs that become utility-revenue requirements, consistent with the test's intent and purpose. Given administrative costs normally represent only a small percentage of total resource costs, freeridership impacts on TRC (and SCT) results tend to be small.

Treatment of NTG Across Jurisdictions

The definition, measurement, and treatment of freeridership—and of NTG in general—vary across jurisdictions in the United States. Some jurisdictions include both freeridership and spillover in defining net savings, while others allow only freeridership to be counted. In several cases, freeridership and spillover are measured separately, and incorporated in NTG, while other jurisdictions estimate NTG without specifying freeridership and spillover individually. Finally, in some cases, measurement of NTG—or its components—may not be required. Instead, gross savings, adjusted for actual installation rates, are used as the measure of program impacts. This is also the case with regional transmission organization (RTOs), such as the New England independent system operator (ISO-NE), where verified gross savings serve as the basis for verification of energy-efficiency bids into the forward energy market.

Cadmus compiled data on 32 jurisdictions active in energy efficiency to determine how NTG is defined, and whether it is used as an adjustment to gross savings. The survey established the following highlights:

- All but six of these jurisdictions (81%) have energy-efficiency resource standards (EERS) in place, setting minimum performance requirements, either as legislative or regulatory mandates or voluntary goals.
- No requirements exist for NTG calculations in 12 jurisdictions (38%).
- In 17 jurisdictions (53%), freeridership is included in determination of program savings. In seven of these jurisdictions (41%), freeridership is applied at the measure level.[28]
- In 10 jurisdictions (31%), NTG calculations include freeridership and either participant or nonparticipant spillover effects.
- In the majority of cases where NTG is calculated, it is applied prospectively for planning purposes. In these jurisdictions, utilities rely on adjusted gross savings for reporting compliance with targets, but are required to use deemed freeridership values in their program plans.
- Participant spillover is measured in 12 jurisdictions (37%) in the sample, while nonparticipant spillover is taken into account in 10 (31%).
- The incidence of cases only assessing freeridership suggests asymmetrical treatment of spillover and freeridership effects.

[28] New Jersey applies freeridership only to appliance recycling programs.

For a list of jurisdictions reviewed, and the NTG activity in each, see Appendix C.

Examples of NTG Values

Table 39 lists deemed NTG values adopted by the CPUC for the 2009–2011 program cycle. Although these NTG values do not include spillover effects, the CPUC allowed evaluations of the 2006–2008 energy-efficiency programs to contain an examination and estimation of participant spillover. As seen, NTG estimates vary widely across market sectors and measures. On average, NTG ratios are lower in the residential sector than in the commercial and industrial sectors, mainly due to the high freeridership in upstream programs.

Table 39. California Program Deemed NTG Ratios

Program	Average NTG	Maximum NTG (Measure)	Minimum NTG (Measure)
Residential			
Lighting	0.78	0.85 (Multiple)	0.60 (CFL ≤30 watt)
Appliance Replacement	0.70	0.85 (Clothes washer 15% above standard)	0.41 (Dishwasher EF>0.58)
Appliance Recycling	0.66	0.702 (Freezer)	0.614 (Refrigerator)
Water Heating	0.76	0.85 (multiple)	0.58 (Water Heater EF>0.62)
HVAC	0.67	0.85 (Programmable thermostat with direct install)	0.49 (Programmable thermostat with prescriptive rebate)
Multifamily	0.84	1.0 (Boiler controls)	0.76 (Lighting)
New Construction	0.53	0.62 (Lighting)	0.48 (Whole building single family RNC)
Residential Audits	0.80	N/A	N/A
Default Values	0.78	0.85 (New measures with <5% market share)	0.70 (New measures with ≥5% market share)
Nonresidential			
Lighting	0.78	0.85 (Multiple)	0.60 (CFL ≤30 watt)
HVAC	0.74	0.85 (Multiple)	0.50 (Multiple)
Refrigeration	0.68	0.82 (Refrigeration in NRNC)	0.46 (Strip door curtains)
Motors	0.84	N/A	N/A
Water Heating	0.64	0.82 (Water heating in new construction)	0.46 (Water heating in existing buildings)
Building Shell	0.93	N/A	N/A
Whole Building	0.70	N/A	N/A
Custom	0.75	0.85 (Multiple)	0.64 (Multiple)
Agricultural	0.50	0.75 (Vacuum pump VSD)	0.26 (Plate cooler)
Audits	0.41	0.48 (Lighting/cooling 20 to 100 kW)	0.29 (Lighting/cooling less than 20 kW)
Retrocommissioning	0.95	1.0 (Gas measures)	0.90 (Electric measures)
Local Govt Partnerships	0.68	N/A	N/A
Default Values	0.78	0.85 (New measures with <5% market share)	0.70 (New measures with ≥5% market share)

Source: 2008 Database for Energy-Efficient Resources
(http://www.deeresources.com/deer0911planning/downloads/DEER2008_NTG_ValuesAndDocumentation_080530.zip)
Version 2008.2.05 December 16, 2008

To date, only one evaluation (NYSERDA)[29] has estimated spillover effects for a new construction program. The evaluation showed a 46% freeridership rate (consistent with Table 39), and a combined participant-and-nonparticipant spillover rate of 54%, more than offsetting the freeridership estimate.

Measuring Freeridership and Spillover

A variety of methods and analytic techniques have been used to measure or to account for freeridership and/or NTG in general. Despite apparent differences, these methods and techniques tend to fall into one of two categories: statistical and self-report.

Statistical Methods

Statistical methods are based on the general difference-in-differences approach, where actual energy consumption is measured for program participants and a comparable group of nonparticipants in two time periods: before and after program implementation. Using statistical methods:

- Participants are exposed to program treatment in the second period, but not in the first.
- The comparison (nonparticipant) group is not exposed to treatment during either period.

Implemented properly, with a well-chosen control group, this approach removes potential biases related to the unique characteristics of participants, and biases from comparisons over time, which could result from non-program related trends (so-called "naturally occurring conservation"). Net program impacts are then calculated by subtracting the average change in nonparticipants' consumption from the average change in the participant group.

This approach is sometimes implemented within an econometric framework for the following reasons: (1) controlling for the residual difference between the two groups; (2) evaluating the sensitivity of savings to various factors; and (3) estimating savings for bundles of measures. It cannot, however, be used for measuring NTG for individual measures. Moreover, this approach does not provide estimates for the individual NTG components—freeridership, spillover, and market effects.

The approach is also not well suited to estimating NTG in large commercial and industrial energy-efficiency programs. Due to the heterogeneity of these customers, it often can be impractical to identify an appropriately comparable group of nonparticipants. Also, as energy savings in these programs are often a small fraction of total consumption, it can be difficult to isolate consumption changes resulting from implementation of energy-efficiency measures. Moreover, this method is not recommended for upstream programs or new construction programs (where the lack of a pre-program period limits the effectiveness of the approach).

[29] *New Construction Program (NCP) Market Characterization and Assessment*, prepared for New York State Energy Research and Development Authority, prepared by Summit Blue Consulting, LLC, August, 2008.

Self-Report Methods

Studies relying on self-reporting are more common than those relying on statistical methods. At a basic level, these methods directly involve asking participants questions about what they would have done in the program's absence. Responses are then scaled, weighted, and combined to produce a composite freeridership score (or index) for each respondent. Scores are then weighted (by savings) and averaged to produce a program-level freeridership fraction.

The self-report approach does not produce an NTG ratio. The other NTG components—spillover and market effects—must be estimated separately, and then be factored into the calculations. Surveys for determining spillover effects within groups of participants or nonparticipants are especially sensitive to variations in spillover scores. Small fractions multiplied by very large numbers of customers can dramatically boost savings.

Using surveys to assess freeridership raises concerns about response bias, particularly biases involving ***social desirability*** (the tendency of respondents to gauge their responses to conform to socially acceptable values). This well-recognized issue in social sciences has been discussed in a vast body of academic and professional literature.

Due to social desirability, respondents tend to offer what they think is the right answer, resulting in freeridership overstatement. Also, as some evaluation experts have noted, people have internal reasons—as explained by social psychology's attribution theory—motivating them to make certain decisions.

Another aspect is called the ***construct validity***. This issue stems from the fact that while survey respondents—by virtue of their participation in the program—are predisposed to conservation, the extent that their responses have been conditioned by the psychological effects of the conservation program remains unclear. Thus, what surveys measure may be the program's effect rather than what would have happened in its absence.[30] In areas with long histories of conservation programs and activities, it can be difficult to determine who is a freerider and who has been influenced by the program.[31]

In recent years, research methods have become more sophisticated, resulting in development of a series of questions and incremental answers designed to understand partial freeriders.

- In general, freerider questions ask interviewees about actions they would have taken had the program not been in place.
- For spillover, recent survey-based studies have focused mainly on participant and nonparticipant spillover. Participant surveys elicit responses about whether customers

[30] See Peters, Jane S. and Marjorie McRae., *Freeridership Measurement Is Out of Sync with Program Logic…or, We've Got the Structure Built, but What's Its Foundation*? Proceedings, ACEEE Summer Study Monterey, CA, August 2008.

[31] Friedman, Rafael, Maximizing Societal Uptake of Energy Efficiency in the New Millennium: Time for Net-to-Gross to Get Out of the Way? Proceedings, International Energy Program Evaluation Conference, Chicago, August 2007.

have purchased additional energy-efficient measures of the same type without financial assistance.

- Nonparticipant spillover surveys ask customers if they purchased efficiency measures due to their awareness of the program.
- These developments have resulted in more systematic and transparent approaches, but results remain sensitive to evaluators' subjective assumptions.

Recall presents another problem, especially regarding spillover. Studies have found interviewees have difficulty self-reporting details such as usage, size, and efficiency levels.

Partly due to inherent biases, NTG results can vary sharply, based on the method selected. For example, two studies completed in the mid-1990s found self-reported freeridership estimates can be more than 50% higher than discrete choice approaches.[32] On the other hand, a recent study of several small commercial-sector programs in California found results, derived from more advanced statistical models (based on a nested logit model specification), were nearly identical to those obtained from self reports[33] (see Table 40).

Table 40. Freeridership Rates Differences Based on Research Approach

	Discrete Choice	Self-Reported
2010 California Small Commercial Programs	77%	78%
1995 Commercial Lighting Study	22%	32% to 38%
1994 PG&E Commercial Rebate	27%	42%

For these reasons, some experts have argued estimating freeridership and spillover can be too expensive, given considerable uncertainty about the results.[34]

[32] Train, K. and E. Paquette, "A Discrete Choice Method to Estimate Freeridership, Net-to-Gross Ratios, and the Effect of Program Advertising," Energy Services Journal, Vol. 1, No. 1, 1995.

[33] Grover, Stephen, et. al., *Free to Choose? A Comparison of a Nested Logit Model with a Billing Regression Model and Self-Report Analysis in a Commercial Impact Evaluation*, Proceedings, International Energy Program Evaluation Conference, Boston, August 2011.

[34] Saxonis, William P., *Freeridership and Spillover: A Regulatory Dilemma*, Proceedings, Energy Program Evaluation Conference, Chicago, August 2007.

Cross-Program Research

The National Energy Efficiency Best Practices Study, an ongoing project sponsored by the CPUC, provides some insight into how the NTG issue has been handled in programs across the country.[35] The project seeks to identify best practices, and to communicate findings to program administrators for enhancing design of their programs.

In-depth interviews were conducted with managers of more than 100 programs in 2004 and 2005. Based on these interviews, program profiles were developed, and best practices were identified. Information was also provided regarding whether a program included a NTG adjustment, and whether this adjustment was based solely on freeridership, or if it also included spillover. Table 41 summarizes NTG values reported.

Table 41. NTG Values Identified Through the Best Practices Project

Program Area	NTG Value(s)	Freeridership Value(s)	Spillover Value(s)
Residential			
Lighting	0.57, 0.8, 1.27	5.7%, 6%	9.8%, 15%
Air Conditioning	0.8	N/A	N/A
Single Family Comprehensive	0.89, 0.93, 0.94, 0.97	3%, 4.4%	0%
Multifamily Comprehensive	0.78, 0.89	0%, 3%	N/A
New Construction	0.8, 1.0, 1.16	0%, 20%	N/A
Nonresidential			
Lighting	0.96, 1.0	N/A	N/A
HVAC	0.85, 0.96, 1.0	0%, 15%	N/A
Large Comprehensive	0.7, 0.8, 1.0, 1.06	N/A	N/A
New Construction	0.65, 0.67, 0.75, 0.81, 0.93	7%, 33%, 40%	N/A

See the Best Practices Website for detailed reports: http://www.eebestpractices.com/index.asp

More than 50% of studies reviewed either assumed or calculated an NTG value of 0.9 or greater. (In most cases, NTG values only included freeridership, or were based on a deemed NTG assumption.) Reported freeridership values varied significantly, even within program groups. Spillover effects were reported very infrequently.

Another cross-program study reviewed evaluation efforts of 50 resource acquisition programs and 31 information-only programs from the 2002–2003 California energy-efficiency programs.[36] That study found only 23 evaluations took freeridership into consideration.

Far fewer studies included efforts to account for spillover effects: three measured participant spillover, and three measured nonparticipant spillover.

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[35] This study is managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company. The website address is: http://www.eebestpractices.com/index.asp

[36] *California 2002-2003 Portfolio Energy Efficiency Program Effects and Evaluation Summary Report*, prepared for Southern California Edison and the Project Advisory Group by TecMarket Works, January 16, 2006.

Although the study stated freeridership and spillover were important considerations that should be included in evaluation research, it provided no guidelines as to which effects may have greater impacts, or whether it was appropriate to assume freeridership and spillover effects essentially cancelled each other out. However, some specific program evaluation efforts were identified, which will be reviewed in the next section of this report.

Specific Programs

This section examines measurement results for specific program types, based on data available from evaluation reports assessing both freeridership and spillover. Selection of program types was based on their expected savings potential in Iowa.

Lighting Programs

Table 42 lists results from four evaluation efforts that assessed lighting freeridership and spillover effects.[37] The majority of these programs have an estimated NTG value is 1.0 or higher, as spillover estimates are higher than freeridership estimates.

Table 42. Residential and Commercial Lighting Programs with Spillover Estimates

Sponsoring Organization	NTG Values	Freeridership Values	Spillover Values
Residential			
Efficiency Vermont*	1.19	6%	25%
Energy Trust of Oregon**	0.75	51%	26%
Efficiency Maine***	1.10	20%	30%
Nonresidential			
NYSERDA****	1.10	39%	80%

* *Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs*, prepared for the Vermont Department of Public Service, prepared by KEMA, Inc, December 2005

** *Process and Impact Evaluation of the 2007-2008 Energy Trust of Oregon Home Energy Solutions Program Volume 2,* prepared for the Energy Trust of Oregon, prepared by Opinion Dynamics Corporation, January, 2010.

*** *Process and Impact Evaluation of the Efficiency Main Lighting Program*, prepared for Efficiency Main, prepared by Nexus Market Research, Inc., and RLW Analytics, Inc., 2007.

**** *New York's System Benefits Charge Program Evaluation and Status Report—Year Ending December 31, 2010,* prepared for the New York Public Service Commission, prepared by NYSERDA, March, 2011.

[37] Note: the NYSERDA NTG value does not equal (1 - freeridership + spillover), which is the formula used by most programs, but uses (1-freeridership) * (1 + spillover). Note also that the efficiency Vermont values represent a more recent study than that identified in Table 39.

Nonresidential Large Comprehensive Programs

Programs in this category promote procurement and installation of high-efficiency energy technologies by providing incentive payments and design/audit assistance, in some cases, to partially offset incremental equipment costs. Customers can receive incentives for customized projects based on calculating the amount of kWh saved, or based on a measurement-and-verification procedure. Providing incentives to shorten payback periods and assistance to quantify equipment performance increases the adoption of new technologies (see Table 43).

Table 43. Nonresidential Large Comprehensive Programs with Spillover Effects

Sponsoring Organization	NTG Values	Freeridership Values	Spillover Values
Wisconsin Power & Light*	0.91	44%	34%
NYSERDA**	1.23	35%	58%
CA Standard Performance Contract	0.7	30%	N/A

* *Shared Savings Decision-Making Process Evaluation Research Results,* prepared for Wisconsin Power & Light by Summit Blue Consulting, April 11 2006

** *Commercial and Industrial Performance Program (CIPP) Market Characterization, Market Assessment and Causality Evaluation*, prepared for New York State Energy Research and Development Authority, prepared by Summit Blue Consulting, LLC, May, 2007.

The SPC program in California has a relatively low NTG value of 0.7. However, this NTG estimate contains adjustments only for freeriders, and does not include spillover effects.

Cadmus also reviewed evaluations estimating spillover effects from two similar programs. Much like the California SPC program, freeridership is large, with values of 35% for NYSERDA and 44% for Wisconsin. However, these high freeridership values are largely offset by large spillover estimates, with an adjusted NTG of 0.91 for Wisconsin and 1.23 for NYSERDA.

Refrigerator and Freezer Recycling Programs

NTG estimates for appliance recycling programs tend to be well below 1.0. As shown in Table 44, these estimates in California are 0.61 for refrigerators and 0.7 for freezers. This type of program likely does not lend itself to much (if any) spillover effect, as it is unlikely many participants or nonparticipants would dispose of additional qualified refrigerators and freezers beyond those they dispose of within the program. Therefore, these low NTG values may be appropriate.

Numerous studies investigating NTG ratios for refrigerator and freezer recycling programs have been completed recently. The results from these evaluations indicate consistently sub-1.0 NTG ratios, ranging from 0.31 to 0.79 for refrigerators, and from 0.38 to 0.82 for freezers (see Table 44).

Table 44. Reported NTG Ratios for Appliance Recycling Programs

Study	Study Year	Refrigerator NTG Ratio	Freezer NTG Ratio
Rocky Mountain Power Wyoming, The Cadmus Group	2011	0.57	0.58
Ameren Illinois, The Cadmus Group	2010	0.79	0.82
Pacific Gas & Electric, The Cadmus Group	2010	0.51	N/A
Ontario Power Authority, The Cadmus Group	2008	0.48	0.52
Statewide Residential Appliance Recycling Program, ADM Associates, Inc.	2008	0.61	0.71
Wisconsin Residential Appliance Turn-In Program, PA Consulting Group,	2008	0.57	N/A
Washington Refrigerator and Freezer Recycling Program, PacifiCorp, KEMA	2007	0.31	0.56
California Statewide Residential Appliance Recycling Program, KEMA-Xenergy	2004	0.35	0.54
Sacramento Municipal Utility District, Heschong Mahone Group	2003	0.55	0.68
Southern California Edison, Xenergy	1998	0.53	0.57
Southern California Edison, Xenergy	1996	0.42	0.38

Energy-Efficient Residential Clothes Washers

Many utilities offer programs promoting ENERGY STAR residential appliances, such as clothes washers. In recent years, however, evidence has appeared that the market for energy-efficient clothes washers is being transformed, with resulting low NTG estimates. Attribution for this market transformation may lie with the ENERGY STAR program, and not with local utility financial incentive programs. If so, this would indicate very little spillover (especially nonparticipant spillover) from this program.

Efficiency Vermont[38] has evaluated energy-efficient clothes washers as part of its portfolio of energy-efficient appliances, offered under the efficient products portion of its residential program. In 2001, Efficiency Vermont estimated the NTG ratio for this program element as only 0.38. In 2004, Efficiency Vermont re-estimated NTG, and results showed an even lower value of 0.17.

These studies did not specifically address spillover. However, the evaluation report noted the high saturation of ENERGY STAR clothes washers in the marketplace not as a local phenomenon, but as a national phenomenon, inferring attribution for spillover would require a national rather than local effort.

Despite this very low NTG value, Efficiency Vermont plans to continue administering rebates for ENERGY STAR clothes washers to maintain the good relationships with retailer channels built up over many years.

[38] *Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs*, prepared for the Vermont Department of Public Service, prepared by KEMA, Inc, December 2005

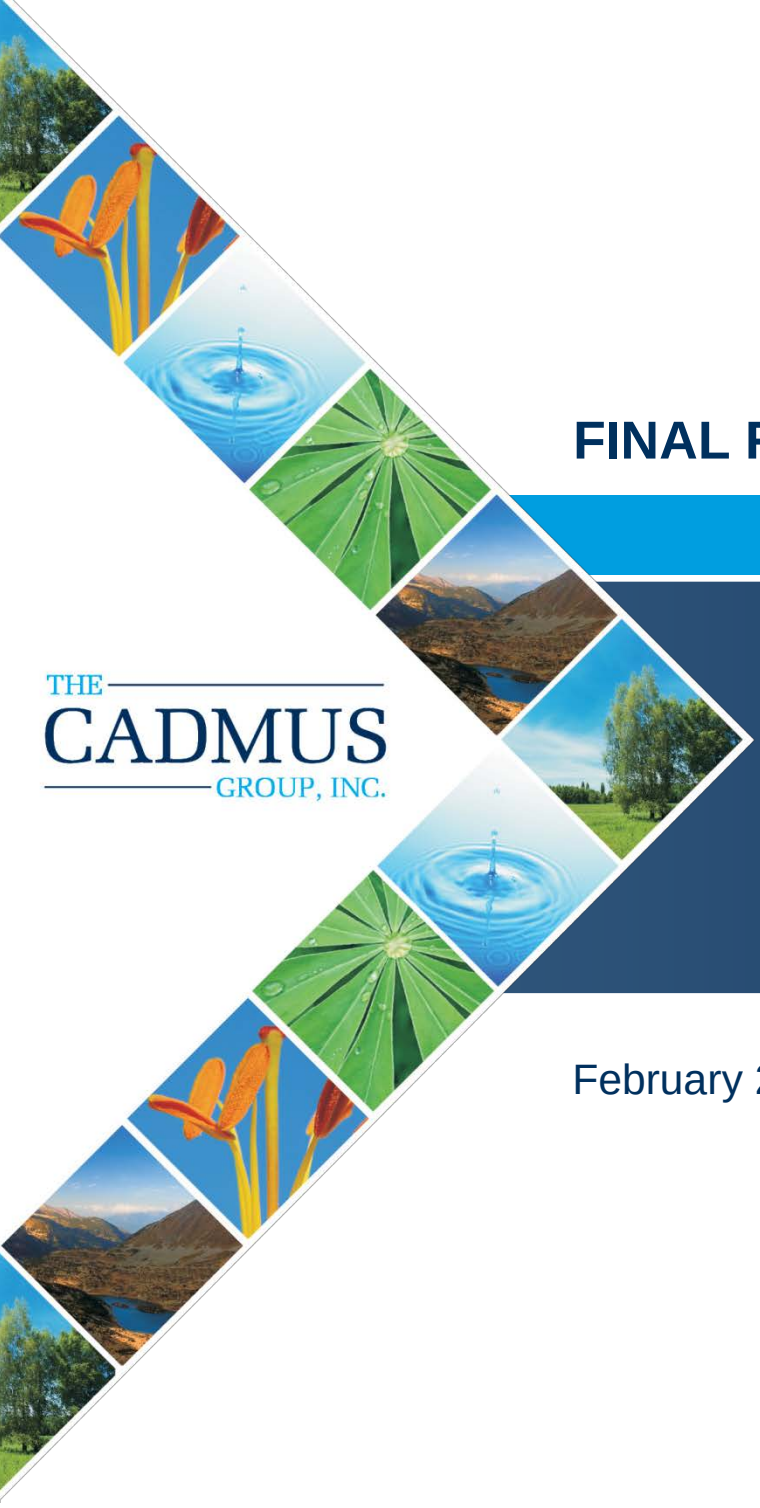
Conclusions

Cadmus' examination of the methods, assumptions, and policies used to address NTG resulted in these key findings.

- ***Methods for measuring NTG elements, particularly spillover, are imprecise.*** The methods for calculating freerider and spillover effects exhibit considerable limitations, and little consensus exists among evaluation experts on best methods. Methods used to calculate NTG have inherent biases, particularly those based on self-reporting (the most common approach). These biases can significantly affect NTG analysis results.
- ***NTG estimates would have a small impact on the societal benefit test.*** If the benefit-cost tests were run with net impacts, programs with an NTG ratio of less than one would have administrative costs spread over fewer participants. Given administrative costs normally represent only a small percentage of program expenditures, this impact would be minor.
- ***Many states have assumed a NTG ratio of 1.0***. A review of NTG methods and application of NTG in 32 jurisdictions conducted by Cadmus found that 13 (40%) did not adjust savings for freeridership. In a recent decision by the CPUC, IOUs will report gross savings as the measure for compliance.
- ***A study of best-practices programs found more than two-thirds of all identified programs had an NTG value of approximately 1.0.*** Approximately half of the studies (49%) either assumed or calculated a NTG value of 1.0, and 68% of the studies had NTG values between 0.9 and 1.0. In most cases, NTG values, when used by a program, were only based on freeridership values. Consequently, an even higher percentage of programs would have a NTG ratio of approximately 1.0 if spillover were examined.
- ***Assuming a NTG ratio of 1.0 may be conservative in certain cases***. Research indicates some programs, particularly those for lighting, routinely achieve NTG ratios well over 1.0 when spillover is examined. Even in programs where high freeridership is reported, spillover effects are largely ignored. If properly accounted for, spillover effects may offset freeridership to a large extent.

Given these findings, it appears reasonable that gross savings be used as the basis for reporting and target compliance. However, utilities should make efforts to design effective programs that minimize freeridership through the following techniques:

1. ***Regularly track the saturation of measures within their own service areas and in other jurisdictions.*** For example, ENERGY STAR clothes washers continue to gain market share throughout the country, and freeridership will likely increase, resulting in an NTG of less than 1.0.
2. ***Carefully monitor market responses to particular programs, and set incentive levels that minimize freeridership.*** As programs mature and market shares for efficiency measures increase, program administrators may be inclined to reduce incentive levels. Paradoxically, however, freeridership tends to be higher in programs with low incentives, as lower incentives are less likely to motivate customers to adopt efficiency measures. Thus, incentive levels should be carefully reviewed and set at values that motivate a substantial number of participants to install efficiency measures.



THE CADMUS GROUP, INC.

FINAL REPORT: VOLUME 2

Assessment of Energy and Capacity Savings Potential in Iowa: Appendices

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Volume 2. Table of Contents

Table A.1.1. Residential Electric Saturations, Fuel Shares, and UECs

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average UEC - Existing	Weighted Average UEC - New
Low Income Multi Family	Central Cooling	56%	100%	1,369.75	937.14
Low Income Multi Family	Central Heating	70%	19%	8,561.00	5,959.00
Low Income Multi Family	Computer	48%	100%	230.84	230.84
Low Income Multi Family	Cooking Oven	100%	85%	282.75	282.75
Low Income Multi Family	Cooking Range	99%	85%	128.20	128.20
Low Income Multi Family	Copier	7%	100%	142.35	142.35
Low Income Multi Family	Dehumidifier	36%	100%	713.50	713.50
Low Income Multi Family	Dryer	40%	89%	641.59	641.59
Low Income Multi Family	DVD	60%	100%	25.31	25.31
Low Income Multi Family	Exterior Lighting	143%	100%	78.71	78.71
Low Income Multi Family	Freezer	16%	100%	596.90	596.90
Low Income Multi Family	Heat Pump	0%	100%	7,556.22	6,152.51
Low Income Multi Family	Home Audio System	56%	100%	101.50	101.50
Low Income Multi Family	Interior Specialty Lighting	716%	100%	37.99	37.99
Low Income Multi Family	Interior Standard Lighting	1613%	100%	34.28	34.28
Low Income Multi Family	Microwave	97%	100%	148.38	148.38
Low Income Multi Family	Monitor	82%	100%	64.46	64.46
Low Income Multi Family	Other Plug Load	100%	100%	319.33	319.33
Low Income Multi Family	Printer	53%	100%	72.34	72.34
Low Income Multi Family	Refrigerator	101%	100%	634.89	634.89
Low Income Multi Family	Room Cooling	22%	100%	333.42	333.42
Low Income Multi Family	Room Heating	15%	92%	6,591.97	4,588.43
Low Income Multi Family	Set Top Box	51%	100%	262.84	262.84
Low Income Multi Family	Television	179%	100%	184.05	184.05
Low Income Multi Family	Ventilation and Circulation	70%	100%	475.00	327.00
Low Income Multi Family	Water Heat	100%	23%	2,338.63	2,237.16
Low Income Single Family	Central Cooling	42%	100%	2,377.24	1,808.20
Low Income Single Family	Central Heating	90%	1%	14,000.00	11,664.00
Low Income Single Family	Computer	94%	100%	230.84	230.84
Low Income Single Family	Cooking Oven	112%	48%	282.75	282.75
Low Income Single Family	Cooking Range	110%	48%	128.20	128.20
Low Income Single Family	Copier	14%	100%	142.35	142.35
Low Income Single Family	Dehumidifier	36%	100%	713.50	713.50
Low Income Single Family	Dryer	93%	68%	851.68	851.68
Low Income Single Family	DVD	120%	100%	25.31	25.31
Low Income Single Family	Exterior Lighting	216%	100%	78.71	78.71
Low Income Single Family	Freezer	54%	100%	595.93	595.93
Low Income Single Family	Heat Pump	1%	100%	14,773.10	12,285.55
Low Income Single Family	Home Audio System	87%	100%	101.50	101.50
Low Income Single Family	Interior Specialty Lighting	1081%	100%	37.99	37.99
Low Income Single Family	Interior Standard Lighting	2435%	100%	34.28	34.28
Low Income Single Family	Microwave	107%	100%	148.38	148.38
Low Income Single Family	Monitor	126%	100%	64.46	64.46
Low Income Single Family	Other Plug Load	100%	100%	760.12	760.12
Low Income Single Family	Pool Pump	0%	100%	1,456.50	1,456.50
Low Income Single Family	Printer	75%	100%	72.34	72.34
Low Income Single Family	Refrigerator	117%	100%	629.27	629.27
Low Income Single Family	Room Cooling	32%	100%	333.42	333.42
Low Income Single Family	Room Heating	4%	100%	10,780.00	8,981.28
Low Income Single Family	Set Top Box	77%	100%	262.84	262.84
Low Income Single Family	Television	267%	100%	184.05	184.05
Low Income Single Family	Ventilation and Circulation	93%	100%	743.00	629.60
Low Income Single Family	Water Heat	100%	31%	3,540.56	3,386.94
Manufactured	Central Cooling	75%	100%	2,008.03	1,179.32
Manufactured	Central Heating	95%	9%	12,725.00	9,005.00
Manufactured	Computer	73%	100%	230.84	230.84

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average UEC - Existing	Weighted Average UEC - New
Manufactured	Cooking Oven	102%	27%	282.75	282.75
Manufactured	Cooking Range	100%	23%	128.20	128.20
Manufactured	Copier	8%	100%	142.35	142.35
Manufactured	Dehumidifier	36%	100%	713.50	713.50
Manufactured	Dryer	93%	95%	691.05	691.04
Manufactured	DVD	129%	100%	25.31	25.31
Manufactured	Exterior Lighting	147%	100%	78.71	78.71
Manufactured	Freezer	43%	100%	576.03	576.03
Manufactured	Heat Pump	0%	100%	12,044.36	9,586.15
Manufactured	Home Audio System	92%	100%	101.50	101.50
Manufactured	Interior Specialty Lighting	734%	100%	37.99	37.99
Manufactured	Interior Standard Lighting	1652%	100%	34.28	34.28
Manufactured	Microwave	106%	100%	148.38	148.38
Manufactured	Monitor	100%	100%	64.46	64.46
Manufactured	Other Plug Load	100%	100%	715.74	715.74
Manufactured	Printer	62%	100%	72.34	72.34
Manufactured	Refrigerator	106%	100%	580.27	580.27
Manufactured	Room Cooling	8%	100%	329.16	329.16
Manufactured	Room Heating	2%	100%	9,798.25	6,933.85
Manufactured	Set Top Box	94%	100%	262.84	262.84
Manufactured	Television	275%	100%	184.05	184.05
Manufactured	Ventilation and Circulation	95%	100%	669.00	498.00
Manufactured	Water Heat	100%	45%	3,259.79	3,115.97
Multi Family	Central Cooling	56%	100%	1,361.12	931.23
Multi Family	Central Heating	70%	19%	8,561.00	5,959.00
Multi Family	Computer	48%	100%	230.84	230.84
Multi Family	Cooking Oven	100%	85%	282.75	282.75
Multi Family	Cooking Range	99%	85%	128.20	128.20
Multi Family	Copier	7%	100%	142.35	142.35
Multi Family	Dehumidifier	36%	100%	713.50	713.50
Multi Family	Dryer	40%	89%	620.09	620.08
Multi Family	DVD	60%	100%	25.31	25.31
Multi Family	Exterior Lighting	143%	100%	78.71	78.71
Multi Family	Freezer	16%	100%	564.19	575.22
Multi Family	Heat Pump	0%	100%	7,547.59	6,146.76
Multi Family	Home Audio System	56%	100%	101.50	101.50
Multi Family	Interior Specialty Lighting	716%	100%	37.99	37.99
Multi Family	Interior Standard Lighting	1613%	100%	34.28	34.28
Multi Family	Microwave	97%	100%	148.38	148.38
Multi Family	Monitor	82%	100%	64.46	64.46
Multi Family	Other Plug Load	100%	100%	319.33	319.33
Multi Family	Printer	53%	100%	72.34	72.34
Multi Family	Refrigerator	101%	100%	567.93	570.08
Multi Family	Room Cooling	22%	100%	329.19	329.19
Multi Family	Room Heating	15%	92%	6,591.97	4,588.43
Multi Family	Set Top Box	51%	100%	262.84	262.84
Multi Family	Television	179%	100%	184.05	184.05
Multi Family	Ventilation and Circulation	70%	100%	475.00	327.00
Multi Family	Water Heat	100%	23%	2,327.88	2,225.18
Single Family	Central Cooling	72%	100%	2,476.05	1,486.15
Single Family	Central Heating	94%	2%	13,994.00	12,092.00
Single Family	Computer	94%	100%	230.84	230.84
Single Family	Cooking Oven	110%	67%	282.75	282.75
Single Family	Cooking Range	104%	66%	128.20	128.20
Single Family	Copier	14%	100%	142.35	142.35
Single Family	Dehumidifier	36%	100%	713.50	713.50
Single Family	Dryer	97%	74%	823.13	823.13
Single Family	DVD	120%	100%	25.31	25.31

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average UEC - Existing	Weighted Average UEC - New
Single Family	Exterior Lighting	216%	100%	78.71	78.71
Single Family	Freezer	69%	100%	571.32	570.06
Single Family	Heat Pump	1%	100%	13,971.37	12,320.39
Single Family	Home Audio System	87%	100%	101.50	101.50
Single Family	Interior Specialty Lighting	1081%	100%	37.99	37.99
Single Family	Interior Standard Lighting	2435%	100%	34.28	34.28
Single Family	Microwave	107%	100%	148.38	148.38
Single Family	Monitor	126%	100%	64.46	64.46
Single Family	Other Plug Load	100%	100%	760.12	760.12
Single Family	Pool Pump	2%	100%	1,456.50	1,456.50
Single Family	Printer	75%	100%	72.34	72.34
Single Family	Refrigerator	143%	100%	549.02	548.46
Single Family	Room Cooling	13%	100%	327.14	327.14
Single Family	Room Heating	2%	100%	10,775.38	9,310.84
Single Family	Set Top Box	77%	100%	262.84	262.84
Single Family	Television	267%	100%	184.05	184.05
Single Family	Ventilation and Circulation	94%	100%	795.00	666.00
Single Family	Water Heat	100%	23%	3,519.64	3,364.38

Table A.1.2. Residential Gas Saturations, Fuel Shares, and UECs

Segment	End Use	Saturation	Gas Fuel Share	Weighted Average UEC - Existing	Weighted Average UEC - New
Low Income Multi Family	Cooking Oven	100%	23%	22.85	22.85
Low Income Multi Family	Cooking Range	100%	23%	23.62	23.62
Low Income Multi Family	Dryer	49%	13%	23.96	23.96
Low Income Multi Family	Heat Central Boiler	2%	100%	594.90	488.91
Low Income Multi Family	Heat Central Furnace	96%	96%	381.96	272.15
Low Income Multi Family	Other	100%	100%	57.94	57.94
Low Income Multi Family	Water Heat	100%	50%	131.90	125.62
Low Income Single Family	Cooking Oven	112%	53%	22.85	22.85
Low Income Single Family	Cooking Range	110%	55%	23.62	23.62
Low Income Single Family	Dryer	93%	32%	31.80	31.80
Low Income Single Family	Heat Central Boiler	5%	100%	795.53	591.40
Low Income Single Family	Heat Central Furnace	94%	100%	636.92	539.52
Low Income Single Family	Other	100%	100%	57.94	57.94
Low Income Single Family	Water Heat	100%	79%	192.38	183.22
Manufactured	Cooking Oven	104%	78%	22.85	22.85
Manufactured	Cooking Range	100%	80%	23.62	23.62
Manufactured	Dryer	93%	6%	26.70	26.70
Manufactured	Heat Central Boiler	0%	0%	702.85	458.30
Manufactured	Heat Central Furnace	96%	94%	560.36	404.24
Manufactured	Other	100%	100%	57.94	57.94
Manufactured	Water Heat	100%	40%	177.82	169.35
Multi Family	Cooking Oven	100%	23%	22.85	22.85
Multi Family	Cooking Range	100%	23%	23.62	23.62
Multi Family	Dryer	49%	13%	23.96	23.96
Multi Family	Heat Central Boiler	2%	100%	577.75	474.81
Multi Family	Heat Central Furnace	96%	96%	371.50	264.69
Multi Family	Other	100%	100%	57.94	57.94
Multi Family	Water Heat	100%	50%	128.26	122.15
Single Family	Cooking Oven	109%	31%	22.85	22.85
Single Family	Cooking Range	104%	33%	23.62	23.62
Single Family	Dryer	97%	26%	31.80	31.80
Single Family	Heat Central Boiler	4%	100%	796.62	731.54
Single Family	Heat Central Furnace	95%	94%	636.74	553.77
Single Family	Other	100%	100%	57.94	57.94
Single Family	Pool Heat	2%	66%	257.56	257.56
Single Family	Water Heat	100%	74%	186.28	177.41

Table A.1.3. Commercial Electric Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Convenience	Computers	100%	100%	0.0852	0.0852
Convenience	Cooking	5%	5%	0.1800	0.1854
Convenience	Cooling DX	80%	100%	4.0876	3.1591
Convenience	Exterior Lighting	0%	100%	0.1275	0.1275
Convenience	Fax	100%	100%	0.0483	0.0483
Convenience	Flat Screen Monitors	100%	100%	0.0252	0.0252
Convenience	Freezers	0%	100%	0.0050	0.0050
Convenience	Heat Pump	20%	100%	13.0347	8.8713
Convenience	Heating	80%	37%	15.3842	12.7527
Convenience	Interior Lighting	100%	100%	13.7670	9.6196
Convenience	Other	100%	100%	0.9883	1.0182
Convenience	Other Plug Load	100%	100%	1.7177	1.8056
Convenience	Photo Copiers	100%	100%	0.1853	0.1853
Convenience	Printers	100%	100%	0.0213	0.0213
Convenience	Refrigeration	100%	100%	6.2000	6.3875
Convenience	Vending Machine	100%	100%	0.7164	0.7164
Convenience	Ventilation and Circulation	80%	100%	1.7965	1.1450
Convenience	Water Heat	100%	57%	0.6374	0.6374
Education	Computers	100%	100%	0.5064	0.5064
Education	Cooking	100%	71%	0.1800	0.1855
Education	Cooling Chillers	36%	100%	1.7781	1.1658
Education	Cooling DX	45%	100%	1.6645	1.1958
Education	Dryer	100%	25%	0.4762	0.4908
Education	Exterior Lighting	100%	100%	0.1276	0.1276
Education	Fax	100%	100%	0.0030	0.0030
Education	Flat Screen Monitors	100%	100%	0.0021	0.0021
Education	Freezers	24%	100%	0.0035	0.0035
Education	Heat Pump	18%	100%	8.3391	6.2868
Education	Heating	82%	13%	10.5897	13.2352
Education	Interior Lighting	100%	100%	4.9963	3.2318
Education	Other	100%	100%	0.0371	0.0382
Education	Other Plug Load	100%	100%	2.3160	2.4151
Education	Photo Copiers	100%	100%	0.0093	0.0093
Education	Printers	100%	100%	0.0585	0.0585
Education	Refrigeration	100%	100%	0.5000	0.5153
Education	Refrigerators	240%	100%	0.0310	0.0310
Education	Servers	100%	100%	0.0195	0.0195
Education	Vending Machine	100%	100%	0.1242	0.1242
Education	Ventilation and Circulation	100%	100%	2.2653	1.4949
Education	Water Heat	100%	45%	0.5120	0.5120
Grocery	Computers	100%	100%	0.0980	0.0980
Grocery	Cooking	100%	78%	1.8500	1.9031
Grocery	Cooling DX	69%	100%	4.1302	3.1591
Grocery	Exterior Lighting	100%	100%	0.1275	0.1275
Grocery	Fax	100%	100%	0.0187	0.0187
Grocery	Flat Screen Monitors	100%	100%	0.0110	0.0110
Grocery	Freezers	21%	100%	0.0050	0.0050
Grocery	Heat Pump	12%	100%	13.4765	8.8713
Grocery	Heating	88%	5%	10.6828	6.0988
Grocery	Interior Lighting	100%	100%	11.1163	7.7675
Grocery	Other	100%	100%	0.2897	0.2980
Grocery	Other Plug Load	100%	100%	1.8086	1.8774
Grocery	Photo Copiers	100%	100%	0.0704	0.0704
Grocery	Printers	100%	100%	0.0379	0.0379
Grocery	Refrigeration	100%	100%	20.3938	20.9792
Grocery	Refrigerators	210%	100%	0.0434	0.0434

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Grocery	Servers	100%	100%	0.0811	0.0811
Grocery	Vending Machine	100%	100%	0.1413	0.1413
Grocery	Ventilation and Circulation	100%	100%	1.7965	0.7509
Grocery	Water Heat	100%	56%	0.6374	0.6374
Health	Computers	100%	100%	0.3245	0.3245
Health	Cooking	100%	78%	0.4300	0.4431
Health	Cooling Chillers	33%	100%	2.0891	1.7307
Health	Cooling DX	52%	100%	2.8367	2.0998
Health	Dryer	100%	25%	0.7874	0.8113
Health	Exterior Lighting	100%	100%	0.1276	0.1276
Health	Fax	100%	100%	0.0028	0.0028
Health	Flat Screen Monitors	100%	100%	0.0028	0.0028
Health	Freezers	63%	100%	0.0099	0.0099
Health	Heat Pump	14%	100%	6.0692	4.5777
Health	Heating	86%	31%	3.8805	6.0862
Health	Interior Lighting	100%	100%	8.8816	5.6241
Health	Other	100%	100%	0.0542	0.0559
Health	Other Plug Load	100%	100%	2.9659	3.0800
Health	Photo Copiers	100%	100%	0.0115	0.0115
Health	Printers	100%	100%	0.0625	0.0625
Health	Refrigeration	100%	100%	0.5000	0.5152
Health	Refrigerators	620%	100%	0.0866	0.0866
Health	Servers	100%	100%	0.0328	0.0328
Health	Vending Machine	100%	100%	0.0958	0.0958
Health	Ventilation and Circulation	100%	100%	2.1327	1.5329
Health	Water Heat	100%	58%	1.6191	1.6191
Large Office	Computers	100%	100%	0.8154	0.8154
Large Office	Cooling Chillers	36%	100%	2.1107	1.3117
Large Office	Cooling DX	64%	100%	2.5735	1.8147
Large Office	Exterior Lighting	100%	100%	0.1275	0.1275
Large Office	Fax	100%	100%	0.0072	0.0072
Large Office	Flat Screen Monitors	100%	100%	0.0072	0.0072
Large Office	Freezers	140%	100%	0.0062	0.0062
Large Office	Heat Pump	.	100%	7.6462	6.9102
Large Office	Heating	100%	8%	2.6647	7.6805
Large Office	Interior Lighting	100%	100%	6.1002	3.8161
Large Office	Other	100%	100%	0.0000	0.0000
Large Office	Other Plug Load	100%	100%	1.4565	1.5522
Large Office	Photo Copiers	100%	100%	0.0293	0.0293
Large Office	Printers	100%	100%	0.1309	0.1309
Large Office	Refrigerators	1371%	100%	0.0546	0.0546
Large Office	Servers	100%	100%	0.1835	0.1835
Large Office	Vending Machine	100%	100%	0.0938	0.0938
Large Office	Ventilation and Circulation	100%	100%	1.3502	0.8597
Large Office	Water Heat	100%	60%	0.2651	0.2651
Large Retail	Computers	100%	100%	0.1396	0.1396
Large Retail	Cooking	100%	100%	0.2200	0.2267
Large Retail	Cooling Chillers	32%	100%	1.5325	1.7302
Large Retail	Cooling DX	63%	100%	2.0556	2.0736
Large Retail	Exterior Lighting	100%	100%	0.3178	0.3178
Large Retail	Fax	100%	100%	0.0147	0.0147
Large Retail	Flat Screen Monitors	100%	100%	0.0099	0.0099
Large Retail	Freezers	50%	100%	0.0056	0.0056
Large Retail	Heat Pump	5%	100%	6.9479	6.1071
Large Retail	Heating	95%	5%	7.7826	14.7330
Large Retail	Interior Lighting	100%	100%	9.7237	5.9607
Large Retail	Other	100%	100%	0.1077	0.1110
Large Retail	Other Plug Load	100%	100%	1.1143	1.1659

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Large Retail	Photo Copiers	100%	100%	0.0643	0.0643
Large Retail	Printers	100%	100%	0.0346	0.0346
Large Retail	Refrigeration	100%	100%	0.5000	0.5153
Large Retail	Refrigerators	492%	100%	0.0492	0.0492
Large Retail	Servers	100%	100%	0.0311	0.0311
Large Retail	Vending Machine	100%	100%	0.1310	0.1310
Large Retail	Ventilation and Circulation	100%	100%	1.1246	0.9163
Large Retail	Water Heat	100%	59%	0.2830	0.2830
Lodging	Computers	100%	100%	0.0729	0.0729
Lodging	Cooking	100%	79%	0.5762	0.5937
Lodging	Cooling DX	61%	100%	1.6647	1.0511
Lodging	Dryer	100%	25%	1.7149	1.7671
Lodging	Exterior Lighting	100%	100%	0.1900	0.1900
Lodging	Fax	100%	100%	0.0045	0.0045
Lodging	Flat Screen Monitors	100%	100%	0.0021	0.0021
Lodging	Freezers	180%	100%	0.0250	0.0250
Lodging	Heat Pump	11%	100%	8.3584	8.4035
Lodging	Heating	89%	27%	3.2880	5.1570
Lodging	Interior Lighting	100%	100%	5.0482	2.3778
Lodging	Other	100%	100%	0.0000	0.0000
Lodging	Other Plug Load	100%	100%	1.1202	1.1760
Lodging	Photo Copiers	100%	100%	0.0180	0.0180
Lodging	Printers	100%	100%	0.0143	0.0143
Lodging	Refrigeration	100%	100%	0.2542	0.2619
Lodging	Refrigerators	1758%	100%	0.2184	0.2184
Lodging	Servers	100%	100%	0.0062	0.0062
Lodging	Vending Machine	100%	100%	0.1799	0.1799
Lodging	Ventilation and Circulation	100%	100%	0.4288	0.3998
Lodging	Water Heat	100%	31%	4.1315	4.1315
Other Commercial	Computers	100%	100%	0.1375	0.1375
Other Commercial	Cooking	100%	91%	0.1936	0.1995
Other Commercial	Cooling Chillers	11%	100%	1.5529	1.2259
Other Commercial	Cooling DX	75%	100%	2.7473	1.9591
Other Commercial	Dryer	100%	25%	7.2914	7.5130
Other Commercial	Exterior Lighting	100%	100%	0.1460	0.1460
Other Commercial	Fax	100%	100%	0.0151	0.0151
Other Commercial	Flat Screen Monitors	100%	100%	0.0067	0.0067
Other Commercial	Freezers	11%	100%	0.0063	0.0063
Other Commercial	Heat Pump	14%	100%	8.6341	6.7725
Other Commercial	Heating	86%	11%	8.1420	8.0388
Other Commercial	Interior Lighting	100%	100%	7.7999	5.1430
Other Commercial	Other	100%	100%	0.0000	0.0000
Other Commercial	Other Plug Load	100%	100%	1.6231	1.6885
Other Commercial	Photo Copiers	100%	100%	0.0565	0.0565
Other Commercial	Printers	100%	100%	0.0334	0.0334
Other Commercial	Refrigeration	100%	100%	0.1760	0.1814
Other Commercial	Refrigerators	107%	100%	0.0547	0.0547
Other Commercial	Servers	100%	100%	0.0195	0.0195
Other Commercial	Vending Machine	100%	100%	0.1088	0.1088
Other Commercial	Ventilation and Circulation	100%	100%	1.5964	1.0761
Other Commercial	Water Heat	100%	52%	1.1770	1.1770
Restaurant	Computers	100%	100%	0.0848	0.0848
Restaurant	Cooking	100%	10%	7.0078	7.2297
Restaurant	Cooling DX	90%	100%	6.1213	3.4583
Restaurant	Exterior Lighting	0%	100%	0.1423	0.1423
Restaurant	Fax	100%	100%	0.0267	0.0267
Restaurant	Flat Screen Monitors	100%	100%	0.0090	0.0090
Restaurant	Freezers	11%	100%	0.0139	0.0139

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Restaurant	Heat Pump	20%	100%	12.6439	8.0340
Restaurant	Heating	80%	37%	8.8831	5.9672
Restaurant	Interior Lighting	100%	100%	7.8854	6.7153
Restaurant	Other	100%	100%	0.0000	0.0000
Restaurant	Other Plug Load	100%	100%	1.3742	1.4395
Restaurant	Photo Copiers	100%	100%	0.1150	0.1150
Restaurant	Printers	100%	100%	0.0254	0.0254
Restaurant	Refrigeration	100%	100%	5.3532	5.5227
Restaurant	Refrigerators	110%	100%	0.1217	0.1217
Restaurant	Servers	100%	100%	0.0239	0.0239
Restaurant	Vending Machine	100%	100%	0.1383	0.1383
Restaurant	Ventilation and Circulation	80%	100%	3.4872	2.4785
Restaurant	Water Heat	100%	57%	4.2178	4.2178
Small Office	Computers	100%	100%	0.8154	0.8154
Small Office	Cooling DX	86%	100%	2.1054	1.6486
Small Office	Exterior Lighting	100%	100%	0.1268	0.1268
Small Office	Fax	100%	100%	0.0072	0.0072
Small Office	Flat Screen Monitors	100%	100%	0.0072	0.0072
Small Office	Freezers	6%	100%	0.0062	0.0062
Small Office	Heat Pump	14%	100%	7.6462	6.9102
Small Office	Heating	86%	10%	8.2818	12.8051
Small Office	Interior Lighting	100%	100%	5.9762	3.4139
Small Office	Other	100%	100%	0.3343	0.3447
Small Office	Other Plug Load	100%	100%	0.6047	0.6727
Small Office	Photo Copiers	100%	100%	0.0293	0.0293
Small Office	Printers	100%	100%	0.1309	0.1309
Small Office	Refrigerators	61%	100%	0.0546	0.0546
Small Office	Servers	100%	100%	0.1835	0.1835
Small Office	Vending Machine	100%	100%	0.0938	0.0938
Small Office	Ventilation and Circulation	100%	100%	1.3502	1.1432
Small Office	Water Heat	100%	49%	0.2725	0.2725
Small Retail	Computers	100%	100%	0.1396	0.1396
Small Retail	Cooling DX	90%	100%	2.5588	1.6126
Small Retail	Exterior Lighting	100%	100%	0.1276	0.1276
Small Retail	Fax	100%	100%	0.0147	0.0147
Small Retail	Flat Screen Monitors	100%	100%	0.0099	0.0099
Small Retail	Freezers	6%	100%	0.0056	0.0056
Small Retail	Heat Pump	10%	100%	8.1803	7.0515
Small Retail	Heating	90%	5%	20.4863	19.0883
Small Retail	Interior Lighting	100%	100%	8.5053	5.4991
Small Retail	Other	100%	100%	0.0000	0.0000
Small Retail	Other Plug Load	100%	100%	1.9731	2.0514
Small Retail	Photo Copiers	100%	100%	0.0643	0.0643
Small Retail	Printers	100%	100%	0.0346	0.0346
Small Retail	Refrigerators	61%	100%	0.0492	0.0492
Small Retail	Servers	100%	100%	0.0311	0.0311
Small Retail	Vending Machine	100%	100%	0.1310	0.1310
Small Retail	Ventilation and Circulation	100%	100%	1.1246	0.6714
Small Retail	Water Heat	100%	50%	0.2909	0.2909
Warehouse	Computers	100%	100%	0.0787	0.0787
Warehouse	Cooling Chillers	13%	100%	0.2544	0.1909
Warehouse	Cooling DX	63%	100%	0.4220	0.2773
Warehouse	Exterior Lighting	100%	100%	0.0638	0.0638
Warehouse	Fax	100%	100%	0.0049	0.0049
Warehouse	Flat Screen Monitors	100%	100%	0.0023	0.0023
Warehouse	Freezers	10%	100%	0.0015	0.0015
Warehouse	Heat Pump	7%	100%	2.6325	2.4736
Warehouse	Heating	76%	5%	7.4836	7.6559

Segment	End Use	Saturation	Electric Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Warehouse	Interior Lighting	100%	100%	3.7981	2.5466
Warehouse	Other	100%	100%	0.0000	0.0000
Warehouse	Other Plug Load	100%	100%	0.2573	0.2723
Warehouse	Photo Copiers	100%	100%	0.0181	0.0181
Warehouse	Printers	100%	100%	0.0162	0.0162
Warehouse	Refrigerators	95%	100%	0.0130	0.0130
Warehouse	Servers	100%	100%	0.0168	0.0168
Warehouse	Vending Machine	100%	100%	0.0462	0.0462
Warehouse	Ventilation and Circulation	83%	100%	0.7043	0.4452
Warehouse	Water Heat	100%	59%	0.1284	0.1284

Table A.1.4. Commercial Gas Saturations, Fuel Shares, and EUIs

Segment	End Use	Saturation	Gas Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Convenience	Cooking	5%	5%	0.1881	0.1880
Convenience	Furnace	80%	70%	0.5321	0.4350
Convenience	Other	0%	100%	0.0000	0.0000
Convenience	Other Space Heating	15%	10%	0.2998	0.2997
Convenience	Water Heat	100%	50%	0.1517	0.1517
Education	Boiler	73%	98%	0.4952	0.4825
Education	Cooking	73%	29%	0.1077	0.1077
Education	Dryer	5%	75%	0.0077	0.0070
Education	Furnace	12%	98%	0.5288	0.4977
Education	Other	100%	100%	0.0000	0.0000
Education	Other Space Heating	0%	98%	0.4830	0.4830
Education	Water Heat	100%	55%	0.1101	0.1101
Grocery	Boiler	0%	50%	0.5348	0.4484
Grocery	Cooking	64%	22%	0.2628	0.2622
Grocery	Furnace	77%	96%	0.5332	0.4350
Grocery	Other	100%	100%	0.0000	0.0000
Grocery	Other Space Heating	23%	98%	0.8633	0.8613
Grocery	Water Heat	100%	44%	0.1517	0.1517
Health	Boiler	33%	98%	0.4703	0.3991
Health	Cooking	62%	22%	0.0000	0.0000
Health	Dryer	40%	75%	0.0155	0.0140
Health	Furnace	31%	98%	0.5156	0.4266
Health	Other	100%	100%	0.0000	0.0000
Health	Other Space Heating	5%	98%	0.0214	0.0213
Health	Water Heat	100%	42%	0.2552	0.2552
Large Office	Boiler	23%	93%	0.3877	0.3452
Large Office	Furnace	32%	80%	0.4186	0.3727
Large Office	Other	100%	100%	0.0000	0.0000
Large Office	Other Space Heating	3%	98%	0.1183	0.1183
Large Office	Water Heat	100%	40%	0.1187	0.1187
Large Retail	Boiler	23%	94%	0.3648	0.3419
Large Retail	Furnace	48%	96%	0.3839	0.3779
Large Retail	Other	100%	100%	0.0000	0.0000
Large Retail	Other Space Heating	17%	98%	0.0540	0.0540
Large Retail	Water Heat	100%	48%	0.1561	0.1561
Lodging	Boiler	48%	96%	0.4751	0.4593
Lodging	Cooking	58%	21%	0.1353	0.1352
Lodging	Dryer	38%	75%	0.0395	0.0357
Lodging	Furnace	24%	96%	0.4844	0.4906
Lodging	Other	100%	100%	0.0000	0.0000
Lodging	Other Space Heating	9%	98%	0.1720	0.1719
Lodging	Pool Heat	10%	70%	0.2899	0.2896
Lodging	Water Heat	100%	69%	0.3184	0.3184
Other Commercial	Boiler	0%	50%	0.4349	0.4072
Other Commercial	Cooking	5%	9%	0.1063	0.1061
Other Commercial	Dryer	2%	75%	0.1658	0.1497
Other Commercial	Furnace	54%	96%	0.4594	0.4005
Other Commercial	Other	100%	100%	0.0000	0.0000
Other Commercial	Other Space Heating	22%	98%	0.1119	0.1117
Other Commercial	Water Heat	100%	48%	0.2053	0.2053
Restaurant	Cooking	100%	98%	1.7401	1.7342
Restaurant	Furnace	80%	70%	0.4814	0.3231
Restaurant	Other	0%	100%	0.0000	0.0000
Restaurant	Other Space Heating	15%	10%	0.3578	0.3566
Restaurant	Water Heat	100%	85%	0.6140	0.6140
Small Office	Furnace	48%	96%	0.4194	0.3727

Segment	End Use	Saturation	Gas Fuel Share	Weighted Average EUI - Existing	Weighted Average EUI - New
Small Office	Other	100%	100%	0.0000	0.0000
Small Office	Other Space Heating	17%	98%	0.2719	0.2712
Small Office	Water Heat	100%	48%	0.1187	0.1187
Small Retail	Furnace	74%	96%	0.3832	0.3769
Small Retail	Other	100%	100%	0.0000	0.0000
Small Retail	Other Space Heating	16%	98%	0.1109	0.1107
Small Retail	Water Heat	100%	50%	0.1561	0.1561
Warehouse	Boiler	11%	94%	0.3165	0.3084
Warehouse	Furnace	56%	96%	0.3977	0.3879
Warehouse	Other	100%	100%	0.0000	0.0000
Warehouse	Other Space Heating	22%	98%	0.0110	0.0110
Warehouse	Water Heat	100%	41%	0.1081	0.1081

Table A.1.5. Industrial Electric End-Use Percentages by Segment

End Use	Agriculture	Chemical Mfg	Electrical Equipment Mfg	Fabricated Metal Products	Food Mfg	Furniture Mfg	Industrial Machinery	Instruments	Mining	Miscellaneous Mfg	Nonmetallic Mineral Products	Paper Mfg	Plastics Rubber Products	Primary Metal Mfg	Printing Related Support	Street Lighting	Transportation Equipment Mfg	Wood Product Mfg
Fans	15%	7%	5%	7%	3%	7%	6%	4%	0%	5%	8%	15%	7%	4%	7%	0%	4%	10%
HVAC	15%	7%	15%	10%	8%	16%	23%	28%	0%	25%	6%	5%	11%	3%	19%	0%	19%	5%
Indirect Boiler	0%	2%	0%	0%	2%	2%	0%	1%	0%	2%	0%	4%	1%	0%	1%	0%	1%	1%
Lighting	4%	4%	12%	9%	7%	17%	15%	12%	0%	17%	5%	4%	9%	3%	12%	100%	15%	7%
Motors Other	25%	16%	10%	19%	17%	19%	18%	8%	88%	20%	22%	30%	20%	18%	20%	0%	10%	29%
Other	11%	3%	4%	3%	4%	6%	4%	8%	0%	6%	3%	2%	4%	1%	6%	0%	5%	4%
Process AirComp	0%	17%	11%	8%	3%	8%	7%	1%	0%	5%	9%	4%	8%	4%	8%	0%	10%	12%
Process Electro Chemical	0%	10%	0%	2%	0%	0%	0%	1%	0%	0%	0%	1%	0%	32%	0%	0%	1%	1%
Process Heat	15%	5%	23%	20%	6%	8%	7%	11%	6%	10%	22%	3%	16%	29%	3%	0%	13%	7%
Process Other	0%	1%	3%	3%	1%	0%	2%	8%	5%	1%	3%	1%	0%	1%	0%	0%	3%	0%
Process Refrig and Cooling	5%	13%	8%	7%	40%	5%	6%	12%	0%	6%	7%	6%	13%	1%	9%	0%	9%	6%
Pumps	10%	16%	10%	12%	7%	12%	11%	7%	1%	3%	14%	24%	13%	3%	13%	0%	10%	18%

Table A.1.6. Industrial Gas End-Use Percentages by Segment

End Use	Agriculture	Chemical Mfg	Electrical Equipment Mfg	Fabricated Metal Products	Food Mfg	Furniture Mfg	Industrial Machinery	Instruments	Mining	Miscellaneous Mfg	Nonmetallic Mineral Products	Paper Mfg	Plastics Rubber Products	Primary Metal Mfg	Printing Related Support	Street Lighting	Transportation Equipment Mfg	Wood Product Mfg
Fans	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
HVAC	5%	2%	21%	15%	5%	47%	39%	40%	0%	52%	4%	3%	20%	7%	19%	0%	40%	7%
Indirect Boiler	56%	59%	18%	16%	56%	7%	26%	48%	100%	17%	5%	58%	47%	10%	14%	0%	20%	30%
Lighting	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Motors Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	3%	3%	0%	1%	3%	0%	3%	3%	0%	4%	12%	9%	2%	2%	0%	0%	2%	2%
Process AirComp	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Process Electro Chemical	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Process Heat	33%	28%	58%	67%	33%	47%	32%	8%	0%	22%	78%	26%	26%	78%	68%	0%	36%	57%
Process Other	4%	9%	3%	0%	4%	0%	0%	3%	0%	4%	1%	4%	5%	3%	0%	0%	2%	4%
Process Refrig and Cooling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pumps	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Apppendix A.2. Measure Descriptions

A.2.1. Residential Electric Retrofit Measure Descriptions

A.2.2. Commercial Electric Retrofit Measure Descriptions

A.2.3. Industrial Electric Measures

APPENDIX A.2.1. RESIDENTIAL ELECTRIC RETROFIT MEASURE DESCRIPTIONS

Heating and Cooling

Attic Fan. Draws cool outdoor air inside through open windows, and exhausts hot indoor air through attics to the outside. An attic fan simply and inexpensively cools a house when outdoor temperatures fall below indoor temperatures.

Ceiling Fan With and Without Light Fixture. ENERGY STAR®-qualified ceiling fans use improved motors and blade designs to improve fan efficiency. The fans do not create cooler temperatures; rather, ceiling fans with light fixtures reduce energy consumption by using efficient CFLs in place of incandescent bulbs.

Tune-up—Air Conditioner, Air Source, and Ground Source Heat Pump. Proper system tune-up/maintenance ensures refrigerant charges and airflows through evaporator coils are properly tested and correctly adjusted—two factors affecting system efficiency. Maintenance includes changing filters and cleaning coils to maintain the overall performance and efficiency of units.

Construction—ICF. Building a concrete home with insulating concrete forms (ICFs) saves energy. The greater insulation, tighter construction, and temperature-moderating mass of the walls conserve heating and cooling energy much more effectively than conventional wood-frame walls.

Construction—SIP. Structural insulated panels (SIPs) use continuous foam insulation throughout the panel, providing excellent energy efficiency and low air infiltration levels. The baseline is standard wood framing.

Cool Roofs. ENERGY STAR-qualified cool roofs, with reflective coatings, can lower roof surface temperatures by up to 100ºF, thereby decreasing amounts of heat transferred into a building. Cool roofs can help reduce amounts of air conditioning needed in buildings, and can reduce peak cooling demand by 10% to 15%.[1] This measure could be considered a passive measure.

Desuperheaters—Air Conditioner and Air Source and Ground Source Heat Pump. Desuperheaters are heat recovery devices that transfer heat from the air conditioning or heat pump units to domestic water heaters. Normally, this heat would be transferred to the ground or air. A desuperheater provides supplemental water heating only when heat pumps operate in a cooling mode.[2] The baseline is no desuperheater.

Doors. Composite or steel doors with foam cores increase overall insulation, thus slowing heat loss. This measure includes adding a thermal door with a resistance value of R-4.8 or R-10 to houses with neither thermal nor storm doors (R-2.9).

[1] http://www.aceee.org/consumer/cooling

[2] http://www1.eere.energy.gov/femp/procurement/eep_groundsource_heatpumps.html

Duct Sealing. Duct sealing cost-effectively saves energy, improves air and thermal distribution (comfort and ventilation), and reduces cross contamination between different zones in the building (i.e., smoking vs. non-smoking, bio-aerosols, localized indoor air pollutants). Table 1 summarizes the different infiltration values compared in the measure.

Table 1. Duct Air Infiltration Levels

Measure Infiltration	Baseline Infiltration
8 CFM / 100 sqft of CFA	Existing CFM / 100 sqft of CFA
4 CFM / 100 sqft of CFA	Existing CFM / 100 sqft of CFA
4 CFM / 100 sqft of CFA	8 CFM / 100 sqft of CFA

Electronically Commutated Motor (ECM)—Air Conditioner/Electric/Gas Furnace ECM Fan and Air Source Heat Pump. ECMs are smaller, variable-speed motors that operate from a single-phase power source, which consumes less power than standard motors in ventilation and circulation systems. The baseline measure is a standard-efficiency motor.

Green Roof. The added mass and thermal resistance of green roofs reduces building heating and cooling loads. These systems reduce ambient temperatures around a roof, decreasing a building's urban heat island effect, reducing the ambient temperature of the roof's surface, and slowing the transfer of heat into the building, thus reducing cooling costs. They also provide added insulation to the roof structure, reducing heating requirements in the winter.[3]

Heat Exchangers Air-to-Air. An air-to-air heat exchanger mechanically ventilates homes in colder climates. During winter, it transfers heat from the air exhausted to fresh, outside air entering the home. Fifty to 80% of the heat normally lost in exhausted air is returned to the house. Air-to-air heat exchangers can be installed as part of a central heating and cooling system or in walls or windows. Wall and window-mounted units resemble air conditioners, and will ventilate one room or area.[4]

Heat Pump—Ductless Mini-Split. Ductless heat pumps move heat to or from the air, cooling and heating homes without the need for costly ductwork. This heating method has an HSPF value of 8.2, consuming less energy than baseboard heating with an HSPF value of 1.

Infiltration Reduction. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. Filling gaps in windows with synthetic filler prevents drafts and heating/cooling loss. Table 2 summarizes the different infiltration values compared in the measure.

Table 2. Air Infiltration Levels

Measure Infiltration	Baseline Infiltration
4.0 ACH50	Existing Infiltration (10 ACH50)
7.0 ACH50	Existing Infiltration (10 ACH50)
4.0 ACH50	7.0 ACH50

[3] http://www.toolbase.org/Technology-Inventory/Roofs/green-roofs
[4] http://cipco.apogee.net/res/reevhex.asp

Insulation—Attic/Ceiling. This measure represents an increase in R-value. Adding insulation in existing buildings increases the thermal performance and brings the resistance value up to and past code, depending on vintage. Table 3 summarizes the different resistance values compared in the measure.

Table 3. Ceiling R-Value Comparison

Measure Insulation	Baseline Insulation
R-38	R-15.7
R-49	R-15.7
R-49	R-38

Insulation—Basement Wall. Adding insulation to basement or crawlspace walls increases a concrete foundation's thermal performance (only for existing homes). Table 4 summarizes the different resistance values compared in the measure.

Table 4. Basement Wall

Measure Insulation	Baseline Insulation
R-10	Average Existing Insulation (R-2.1)
R-15	Average Existing Insulation (R-2.1)

Insulation—Duct. Adding insulation around heating system ducts reduces heat loss to unconditioned spaces. This measure adds R-8 insulation to non-insulated ducts.

Insulation—Floor. Adding insulation to the floor increases the overall resistance value, slowing heat transfer from basements to the upper levels. This measure brings existing R-1.8 insulation up to R-30.

Insulation—Rim/Band Joist. An uninsulated band joist can account for a significant portion of a building's heat loss, as the only barrier between the building's inside from outside is provided by 2 inches of wood and the siding material covering it. Heat loss through an uninsulated band joist increases when a basement is kept warmer, or contains heating or water heating equipment. Insulating a band joist with R-10 insulation easily improves a building's energy efficiency. The baseline is no insulation.

Insulation—Siding. Vinyl siding with foam backing proves more durable than other siding materials, and adds R-3 insulation to overall wall insulation level savings on heating and cooling costs.

Insulation—Skirting. Substantial heat can be lost through open areas under manufactured homes, resulting in cold, uncomfortable floors. Even in an insulated floor, significant heat escapes due to convective heat transfer from the easy flow of cold winds underneath the home. This measure compares a manufactured home with skirting, insulated with R-19 insulation, to a home without skirting.

Insulation—Slab. Substantial heat can be lost through an uninsulated slab, resulting in cold, uncomfortable floors. Even if foundation walls have been insulated vertically under the slab,

significant heat escapes from the slab edge closest to the cold outside air. This measure compares a slab insulated with R-15 insulation to a slab insulated to code R-10.

Insulation—Wall. Wall insulation slows the transfer of heat, and reduces heating and cooling loads in houses. Table 5 compares different insulation levels.

Table 5. Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-13	R-2.1
R-20 or R-13 w/ R-5 sheathing	R-2.1
R-21 + R-5 Sheathing	R-20 or R-13 w/ R-5 sheathing

Quality Installation—Central Air Conditioner (CAC) and Heat Pump. Quality installation of a CAC or heat pump includes: proper sizing of equipment, and correct refrigerant charge and airflow. By properly sizing HVAC equipment rather than using "rules of thumb," a system load tool, such as Air Conditioning Contractors of America (ACCA) guidelines for sizing HVAC equipment (ACCA Manual J Residential Load Calculation), results in optimum equipment operating efficiency and better control.[5]

Radiant Barrier (ceiling). Radiant barriers generally consist of a thin piece of aluminum installed in buildings to help reduce solar heat gain from during summer and to help trap heat during winter. These work by reducing heat transfers between air spaces of the roof deck and the attic floor.

Solar Attic Fan. Forced attic fan ventilation reduces residential heat gains from ceilings. A solar fan removes the need to provide the motor energy, and runs conveniently, when the sun shines. The baseline uses passive ventilation without a fan.

Thermostat—Multi-Zone. A multi-zone programmable thermostats automatically control set point temperatures for multiple areas (rooms or zones), ensuring HVAC systems do not run during low-occupancy hours. The baseline for this measure is a programmable thermostat with central control only.

Thermostat—Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Thermostat—Wi-Fi Programmable. A Wi-Fi programmable thermostat resembles a traditional programmable thermostat, controlling set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours. In addition, users can interact and receive alerts from the thermostat via a Web portal or phone app, allowing them to adjust settings remotely, in case of unexpected, extended periods from home or early arrival back home.

Whole-House Fan. A whole house fan simply and inexpensively cools a house when outdoor temperatures fall below indoor temperatures. The fan draws cool outdoor air inside, through open windows, and exhausts hot indoor air through attics to the outside.

[5] http://www.toolbase.org/Technology-Inventory/HVAC/hvac-sizing-practice

Window—Film. Solar control window films, applied to existing windows, reduce peak demand during hot months, and conserve energy when air conditioning might be required. In addition to energy management benefits, these films reduce exposure to ultraviolet radiation and glare.[6]

Window—Shade. Window shades, such as blinds or thermal drapes, shade windows, which reduces solar heat gains and overall cooling loads on treated homes.

Window—Upgrade. This measure increases building performance by reducing U-values in existing and new construction windows, as shown in Table 6.

Table 6. High-Efficiency Window Measures

Measure U-Value	Baseline U-Value
0.35	0.53
0.30	0.35
0.22	0.35

Lighting

Daylighting Controls (Photocell)—Indoor/Outdoors. Photocells adjust lighting levels according to daylight levels rooms receives. The baseline is no daylighting controls.

LED Christmas Lighting. Typical Christmas tree lighting uses incandescent bulbs, which can be costly as well as a fire hazards. LED lights use low-wattage bulbs, saving up to 90% of holiday lighting costs.

Occupancy Sensors. In a space unoccupied for a designated amount of time, occupancy sensors turn off the lights, turning them on again once the sensor detects a person has entered the space.

Water Heat

Clothes Washer. ENERGY STAR-qualified clothes washers use less energy and water than regular washers.[7] As shown in Table 7, four efficiency levels, in units of Modified Energy Factor (MEF), and steam clothes washers were compared for this measure. The MEF baseline represents the average MEF of federal standard qualified models.

Table 7. Clothes Washer Modified Energy Factor Comparisons

Measure Level	Measure MEF	Baseline MEF
ENERGY STAR	MEF = 2.0	MEF = 1.26
CEE Tier 2	MEF = 2.2	MEF = 1.26
CEE Tier 3	MEF = 2.4	MEF = 1.26
Enhanced Efficiency	MEF = 3.10	MEF = 1.26
Steam Clothes Washer	MEF = 3.10	MEF = 1.26

[6] http://www.iwfa.com/iwfa/Consumer_Info/windowfilmbenefits.html
[7] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

Dishwasher. ENERGY STAR-qualified dishwashers use advanced technology to clean dishes, using less water and energy. As shown in Table 8, two efficiency levels were compared for this measure.

Table 8. Dishwasher Efficiency Levels

Measure Level	Measure kWh/yr & Gal/Cycle	Baseline kWh/yr & Gal/Cycle
ENERGY STAR	295 kWh/yr 4.25 Gal/Cycle	355 kWh/yr 6.5 Gal/Cycle
Enhanced Efficiency	200 kWh/yr 4.0 Gal/Cycle	355 kWh/yr 6.5 Gal/Cycle

Drain Water Heat Recovery. Also called gravity film heat exchanges, these devices, which recover heat energy from domestic drain water, are used to pre-heat cold water entering hot water tanks. This minimizes temperature differences between heating set points and entering water temperatures.

Faucet Aerators. Faucet aerators, by mixing water and air, reduce the amount of water flowing through faucets. The faucet aerator creates a fine water spray, using a screen inserted in the faucet head. Table 9 presents flow rate requirements for this measure.

Table 9. Faucet Aerator Flow Rates

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.2 GPM	3.0 GPM (Existing)
2.0 GPM	2.2 GPM
1.5 GPM	2.2 GPM
0.5 GPM	2.2 GPM

* Gallons per minute

Hot Tub Covers. Many modern hot tubs have well-insulated shells, but hot tubs lose the most heat vertically, through top covers. Old hot tub covers develop "heat leaks" at the hinge-fold and shell rim, and may develop waterlogged foam-cores, resulting in covers R-values of almost 0.[8] Significant hot tub water heating savings can be realized by replacing a low R-value (R-10) existing cover with a well-insulated, new R-21 cover.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead. The showerhead creates a fine water spray through an inserted screen. This measure represents the various showerhead flow rate reduction levels shown in Table 10.

Table 10. Low-Flow Showerhead Waterflow Levels

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.5 GPM	3.0 GPM (Existing)
2.0 GPM	2.5 GPM
1.5 GPM	2.5 GPM

* Gallons per minute

[8] http://www.spadepot.com/spacyclopedia/energy-conservation.htm

Solar Hot Water. Solar water heating systems, which include storage tanks and solar collectors, take two forms: active, which have circulating pumps and controls; and passive, which do not. Either system actively increases the entering water temperature to the storage tank, reducing amounts of energy required by hot water heaters to achieve set point temperatures.[9]

Water Heater—Pipe Insulation. Adding R-4 insulation around pipes decreases heat loss. The baseline is a hot water pipe without insulation.

Water Heater—Tank Blanket/Insulation. Installing R-11 insulation on older models without insulation helps reduce stand-by losses.

Water Heater—Thermostat Setback. This measure generates savings by reducing set point temperatures from 135° to 120°F. Set point temperatures on hot water systems are often set higher than necessary.

Appliances

Removal of Secondary Refrigerator/Freezer. This refers to the environmentally friendly disposal of unneeded or non-efficient appliances, such as secondary refrigerator/freezers.

Removal of Secondary Stand-Alone Freezer. Removal of stand-alone freezers proves beneficial, given their inefficient use of energy. Proper disposal is required, as they use hazardous materials, such as Freon and CFCs.

Removal of Secondary Window Air Conditioner. Removal of secondary window air conditioners proves given their inefficient use of energy. Proper disposal is required, as they use hazardous materials, such as Freon and CFCs.

Plug Load

Cordless Phone—ENERGY STAR. ENERGY STAR-qualified cordless phones, answering machines, and combination units perform much more efficiently, using about half the energy of standard units, by incorporating improved energy performance features, such as switch-mode power supplies and "smart" chargers.[10]

Battery Chargers. Battery charging systems recharge a wide variety of cordless products, including power tools, small household appliances, and personal care products, such as electric shavers. Conventional battery chargers—even when not actively charging a product—draw as much as five to 20 times more energy than that actually stored in the battery. ENERGY STAR battery chargers, on average, use 35% less energy. The baseline is a standard battery charger.[11]

Home Energy Management System (HEMS). HEMS allow residents to link and manage their various home systems—such as entertainment, security, lighting, and thermostats—via a fast, efficient mechanism, which saves them time. Energy is saved by turning off or adjusting primary energy-consuming devices in homes, according to a schedule.

[9] http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850
[10] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CL
[11] http://www.energystar.gov/index.cfm?c=battery_chargers.pr_battery_chargers

Home Office—Server. Small-scale servers must meet energy use guidelines in "off" (less than 2 Watts) and 'idle' (50 Watts or 65 Watts, according to the category) operation modes, to ensure achieving energy savings when computers are used and performing a range of tasks as well as when they are turned off or in low power modes.[12]

Smart Strip. Energy-saving products, such as power strips with an occupancy sensor, are found in workstations where power strips are commonly used. Based on occupancy within the work area, the sensor turns on and off power to all devices, such as computers, desk lights, and audio equipment plugged into the power strip.

Other (Pool)

Pool Pump Timers. Setting a pool pump to run during off-peak times (starting after 8 p.m. and cycling off before 10 a.m.) reduces energy costs. Cycling pumps further reduce monthly costs. The baseline is a continuously running pump.

Snow Melt System Control. Snow melt system controls operate overall systems as efficiently as possible, saving energy and reducing costs. Sensors detect actual conditions on snowmelt surfaced to ensure melting begins as snow falls. The sensors also detect as soon as a surface has dried, shut the system off immediately, optimizing the system's energy efficiency. Control systems also protect all equipment, preventing damage due to extreme temperature fluctuations, and protect the snowmelt surfaces from repetitive freeze and thaw cycles. The baseline assumes manual snow melt controls.

[12] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CO

RESIDENTIAL ELECTRIC EQUIPMENT MEASURE DESCRIPTIONS

Heating and Cooling

Central Air Conditioners. This measure consists of several different air conditioner technology/efficiency levels, as summarized in Table 11. The baseline size is the same as the measure size.

Table 11. Central AC SEER Comparison

Measure SEER/EER	Baseline SEER
Federal Standard SEER 13	Federal Standard 13 SEER
ENERGY STAR SEER/EER 14.5/12	
CEE Tier 2 SEER/EER 15/12.5	
CEE Tier 3 SEER/EER 16/13	
Enhanced SEER/EER 18/14	

Heat Pump—Air or Ground Source (ASHP or GSHP). Electric heat pumps move heat to or from the air or ground to cool and heat homes. Table 12 shows the different efficiency levels compared in this measure. The baseline size is the same as the measure size.

Table 12. Heat Pump SEER/HSPF Comparisons

Measure Efficiency	Baseline SEER & HSPF
Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7
ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2	
CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5	
Enhanced SEER/EER 16/13 and HSPF 9.0	
GSHP ENERGY STAR EER 17.1 and 3.6 COP	

Room Air Conditioner (Room AC)—(8,000-13,999 BTU/HR). ENERGY STAR-qualified room air conditioners use less energy than conventional models, through improved energy performance as well as timers for better temperature control. Table 13 shows the different efficiency tiers considered in this measure.

Table 13. Room AC EER Comparisons

Measure Efficiency	Baseline SEER & HSPF
ENERGY STAR ≥ 10.8 EER	Federal Standard 9.8 EER
CEE TIER 1 ≥ 11.3 EER	
CEE TIER 2 ≥ 11.8 EER	

Lighting

Compact Fluorescent Light Bulbs (CFLs). Standard CFLs use less energy than Energy Independence and Security Act of 2007 (EISA) incandescent bulbs. This measure considers exterior, interior standard, and interior specialty lighting, and measure consumption is a weighted average of bulbs used in each condition. The baseline for this measure reflects changes over 2012–2014 to accommodate EISA.

Light Emitting Diodes (LEDs). LEDs are solid-state devices, converting electricity to light using very high efficiency, requiring significantly less energy, and providing long life. This measure considers exterior and interior standard lighting, and measure consumption is a weighted average of bulbs used in each condition. The baseline for this measure reflects changes over 2012–2014 to accommodate EISA.

Water Heat

Water Heater—Heat Pump. The heat pump moves heat from a warm reservoir (such as air), transferring this heat into hot water systems.[13] This measure assumes an energy factor (EF) of 2.0, increasing from a standard EF of 0.92 (Federal Standard, 2001).

Water Heater—Storage. High-efficiency water heaters operate more efficiently than standard electric water heaters due to reduced standby losses. This measure assumes an EF for high-efficiency water heaters of 0.95 (Federal Standard, April 2015), an increase from a standard EF of 0.92 (Federal Standard, 2001).

Water Heater—Tankless. Tankless water heaters produce the majority of energy savings by avoiding standby losses that occur when a normal storage tank is not in use. Tankless water heaters provide hot water at a preset temperature when needed, and without storage, reducing or eliminating standby losses. An EF of 0.98 is assumed for the tankless system, compared to a standard electric water heater with an EF of 0.92 (Federal Standard, 2001).[14]

Appliances

Oven—Convection. High-efficiency convection ovens operate at lower temperatures and achieve quicker cook times than standard ovens, due to fans circulating heat evenly throughout the oven. The baseline is a standard oven.

Clothes Dryer. High-efficiency dryers' features, such as moisture sensors, minimize energy usage while retaining performance. Steam clothes dryers can also save additional energy by efficiently eliminating wrinkles, requiring less dryer reruns to refresh wrinkled clothing.

Freezer, ENERGY STAR. ENERGY STAR-qualified freezers use at least 10% less energy than standard models due to improvements in insulation and compressors.

Refrigerator, ***ENERGY STAR.*** ENERGY STAR-qualified refrigerators use at least 20% less energy than standard models due to improvements in insulation and compressors.

Plug Load

Computer, ENERGY STAR. ENERGY STAR computers consume less than 2 W in "sleep" and "off" modes, and are more efficient than conventional units in "idle" modes, resulting in 30% to 65% energy savings.

[13] Description source: U.S. Department of Energy; http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12840

[14] http://www.toolbase.org/Technology-Inventory/Plumbing/tankless-water-heaters

Dehumidifier, ENERGY STAR. ENERGY STAR-qualified models have more efficient refrigeration coils, compressors, and fans than conventional models, meaning they use less energy to remove moisture. These qualified models remove the same amount of moisture as a similarly-sized standard unit, but use 10% to 20% less energy. The baseline for this measure is a standard dehumidifier.[15]

DVD, ENERGY STAR. ENERGY STAR-qualified DVD products meeting the new requirements use up to 60% less energy than standard models.[16] ENERGY STAR DVD players use only 1 Watt, as little as one-fourth the energy used by standard models, in "off" or "sleep" modes. The baseline for this measure is a standard DVD player.

Home Audio System, ENERGY STAR. According to ENERGY STAR specifications, qualified audio systems must have: default power down timing; 1 W sleep/off mode consumption; and 55% efficiency for amplifiers greater than 20 W input power.[17]

Monitor, ENERGY STAR. ENERGY STAR monitors feature: (1) an "on" mode, where the maximum allowed power varies based on the computer monitor's resolution; (2) a "sleep" mode, where computer monitor models must consume 2 Watts or less; and (3) an "off" mode, where computer monitor models must consume 1 Watt or less. The baseline equipment does not include these features.[18]

Office Copier. ENERGY STAR copy machines operate 40% more efficiently than standard office copy machines.[19]

Office Printers. ENERGY STAR printers operate 40% more efficiently than standard printers.

Set Top Box, ENERGY STAR. Set-top boxes earning ENERGY STAR prove at least 40% more efficient than conventional models.[20] The baseline measure is a standard receiver.

TV ENERGY STAR—all types. ENERGY STAR-qualified TVs use about 40% less energy than standard units.[21] ENERGY STAR models must consume no more than 1 Watt while in Sleep Mode. The baseline is a standard television, generally consuming more than 3 Watts when off.

Other (Pool)

Pool Pumps—two-speed motor. This enables pool pump motors to run at high and low speeds, rather than constantly running at full power. The baseline for this measure is a standard, one-speed motor.

Pool Pumps—VSD. The enables pool pump motors to run at variable speeds, as opposed to constantly running at full power. The baseline for this measure is a standard, one-speed motor.

[15] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DE
[16] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DP
[17] http://www.energystar.gov/index.cfm?c=audio_dvd.pr_crit_audio_dvd
[18] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.ShowProductGroup&pgw_code=MO
[19] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=IEQ
[20] http://www.energystar.gov/index.cfm?c=settop_boxes.settop_boxes
[21] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=TV

RESIDENTIAL GAS RETROFIT MEASURE DESCRIPTIONS

Heating

Boiler—Controls. Boiler controls systems have microprocessor controls, which anticipate heating load demand by calculating the rate of change of system temperatures or pressures. Controls can also provide adjustable reset points for setbacks and programmable time clock controls. The baseline assumes no controls.[22]

Boiler—Pipe Insulation. Adding R-6 insulation around pipes decreases heat loss. The baseline is a boiler pipe without insulation.

Construction—ICF. Building a concrete home with insulating concrete forms (ICFs) saves energy. The greater insulation, tighter construction, and temperature-moderating mass of the walls conserve heating and cooling energy much better than conventional wood-frame walls.

Construction—SIP. Structural insulated panels (SIPs) use continuous foam insulation throughout the panel, providing excellent energy efficiency and low air infiltration levels. The baseline is standard wood framing.

Doors. Composite or steel doors with a foam core increase overall insulation, slowing heat loss. This measure includes adding a thermal door with a resistance value of R-4.8 or R-10 to houses with neither thermal nor storm doors (R-2.9).

Duct Sealing. Duct sealing cost-effectively saves energy, improves air and thermal distribution (comfort and ventilation), and reduces cross-contamination between different zones in a building (i.e., smoking vs. non-smoking, bio-aerosols, localized indoor air pollutants). Table 14 summarizes the different infiltration values compared in the measure.

Table 14. Duct Air Infiltration Levels

Measure Infiltration	Baseline Infiltration
8 CFM / 100 sqft of CFA	Existing CFM / 100 sqft of CFA
4 CFM / 100 sqft of CFA	Existing CFM / 100 sqft of CFA
4 CFM / 100 sqft of CFA	8 CFM / 100 sqft of CFA

Green Roof. The added mass and thermal resistance of green roofs reduces building heating and cooling loads. These systems reduce ambient temperatures around the roof, decreasing the building's urban heat island effect, reducing the ambient temperature of the roof's surface, and slowing the transfer of heat into the building, thus reducing cooling costs. They also provide added insulation to the roof structure, reducing heating requirements in the winter.[23]

Home Energy Management System (HEMS). HEMS allow residents to link and manage their various home systems—such as entertainment, security, lighting, and thermostats—via a fast,

[22] http://energyexperts.org/EnergySolutionsDatabase/ResourceDetail.aspx?id=1579
[23] http://www.toolbase.org/Technology-Inventory/Roofs/green-roofs

efficient mechanism, which saves residents time. Energy is saved by turning off or adjusting a home's main, energy-consuming devices according to a schedule.

Infiltration Reduction. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. Filling gaps in windows with synthetic filler prevents drafts and heating/cooling loss. Table 15 summarizes the different infiltration values compared in the measure.

Table 15. Air Infiltration Levels

Measure Infiltration	Baseline Infiltration
4.0 ACH50	Existing Infiltration (10 ACH50)
7.0 ACH50	Existing Infiltration (10 ACH50)
4.0 ACH50	7.0 ACH50

Insulation—Attic/Ceiling. This measure represents an increase in R-value. Adding insulation in existing buildings increases thermal performance, and raises resistance values up to and past code, depending on the vintage. Table 16 summarizes the different resistance values compared in the measure.

Table 16. Ceiling R-Value Comparison

Measure Insulation	Baseline Insulation
R-38	R-15.7
R-49	R-15.7
R-49	R-38

Insulation—Basement Wall. Adding insulation to basement or crawlspace walls increases thermal performance of concrete foundation (only for existing homes). Table 17 summarizes the different resistance values compared in the measure.

Table 17. Basement Wall

Measure Insulation	Baseline Insulation
R-10	Average Existing Insulation (R-2.1)
R-15	Average Existing Insulation (R-2.1)

Insulation—Duct. Adding insulation around heating system ducts reduces heat loss to unconditioned spaces. This measure adds R-8 insulation to non-insulated ducts.

Insulation—Floor. Adding insulation to floors increases overall resistance values, and slows heat transfer from basements to upper levels. This measure brings existing R-1.8 insulation up to R-30.

Insulation—Rim/Band Joist. An uninsulated band joist can account for significant building heat loss, as the only thing barriers between inside and outside are 2 inches of wood and siding material covering that. Heat loss through an uninsulated band joist increases when basements are kept warmer, or contain heating or water heating equipment. Insulating a band joist with R-10 insulation easily improves a building's energy efficiency. The baseline is no insulation.

Insulation—Siding. Vinyl siding with foam backing proves more durable than other siding materials, and has as added benefit of adding R-3 insulation to overall wall insulation level savings on heating and cooling costs.

Insulation—Skirting. Substantial heat can be lost through an open area under a manufactured house, resulting in cold, uncomfortable floors. Even with an insulated floor, significant heat can be lost through convective heat transfer from the easy flow of cold winds underneath homes. This measure compares a manufactured home with skirting, insulated with R-19 insulation, to a home without skirting.

Insulation—Slab. Substantial heat can be lost through uninsulated slabs, resulting in cold, uncomfortable floors. Even if foundation walls have been insulated vertically under the slab, significant heat can be lost from the slab edge closest to the cold outside air. This measure compares a slab insulated with R-15 insulation to a slab insulated to code R-10.

Insulation—Wall. Wall insulation slows transfer of heat, and reduces both heating and cooling loads in houses. Table 18 compares the different insulation levels.

Table 18. Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-13	R-2.1
R-20 or R-13 w/ R-5 sheathing	R-2.1
R-21 + R-5 Sheathing	R-20 or R-13 w/ R-5 sheathing

Quality Installation—Boiler and Furnace. By properly sizing HVAC equipment with appropriate flow rates rather than using "rules of thumb," a system load tool, such as Air Conditioning Contractors of America (ACCA) guidelines for sizing HVAC equipment, ACCA Manual J Residential Load Calculation, results in optimum equipment operating efficiency and better control.[24]

Thermostat—Multi-Zone. A multi-zone, programmable thermostat controls set point temperatures automatically for multiple areas (rooms or zones), ensuring HVAC systems do not run during low-occupancy hours. The baseline for this measure is a programmable thermostat with central control only.

Thermostat—Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Thermostat—Wi-Fi Programmable. A Wi-Fi programmable thermostat operates similarly to a traditional programmable thermostat, controlling set point temperatures automatically, and ensuring HVAC systems do not run during low-occupancy hours. In addition, users can interact and receive alerts from the thermostat via a Web portal or phone app, allowing them to adjust settings remotely in case of unexpected extended periods from home or early arrivals back home.

Tune-up—Boiler and Furnace Maintenance. Proper system tune-up/maintenance ensures clean burners, combustion chambers, and heat exchange surfaces. Flame colors are checked for proper

[24] http://www.toolbase.org/Technology-Inventory/HVAC/hvac-sizing-practice

burning. Other items checked include: fan belts, blowers, safety controls, thermostat operation, proper venting, and filters. All motors are lubricated, and a combustion efficiency test is performed. Properly maintaining an existing unit keeps efficiency at the highest level possible.

Window—Upgrade. This measure represents increased building performance by reducing U-values in existing and new construction windows, as shown in Table 19.

Table 19. High-Efficiency Window Measures

Measure U-Value	Baseline U-Value
0.35	0.53
0.30	0.35
0.22	0.35

Integrated Space and Water Heat

Integrated Space Heating and Water Heating. Integrated hot water heating systems, also known as combination water and space heating systems, use energy from space-heating units in a home to heat water. These combined units feature a powerful water heater, providing space heating as a supplemental end use. Heated water from the water heater tank passes through a heat exchanger in a central handler, heating air, which then can be blown into the home's duct system. The efficiency of a combination water and space heating system can be seen through its combined appliance efficiency rating (CAE). The measure assumes a CAE of 84% or above, with a baseline of an 82% AFUE boiler and an EF 0.59 water heater.

Water Heat

Clothes Washer. ENERGY STAR-qualified clothes washers use less energy and water than regular washers.[25] Four efficiency levels, in units of Modified Energy Factor (MEF), and steam clothes washers. were compared for this measure, as shown in Table 20. The baseline MEF represents the average MEF of federal-standard qualified models.

Table 20. Clothes Washer Modified Energy Factor Comparisons

Measure Level	Measure MEF	Baseline
ENERGY STAR	MEF = 2.0	MEF = 1.26
CEE Tier 2	MEF = 2.2	MEF = 1.26
CEE Tier 3	MEF = 2.4	MEF = 1.26
Enhanced Efficiency	MEF = 3.10	MEF = 1.26
Steam Clothes Washer	MEF = 3.10	MEF = 1.26

Dishwasher. ENERGY STAR-qualified dishwashers use advanced technology to clean dishes, while using less water and energy. Water savings translate into gas savings when gas water heaters heat the water. As shown in Table 21, two efficiency levels were compared for this measure.

[25] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW

Table 21. Dishwasher Efficiency Levels

Measure Level	Measure kWh/yr & Gal/Cycle	Baseline kWh/yr & Gal/Cycle
ENERGY STAR	295 kWh/yr 4.25 Gal/Cycle	355 kWh/yr 6.5 Gal/Cycle
Enhanced Efficiency	200 kWh/yr 4.0 Gal/Cycle	355 kWh/yr 6.5 Gal/Cycle

Drain Water Heat Recovery. Also called gravity film heat exchanges, these devices recover heat energy from domestic drain water, and pre-heat cold water entering hot water tanks. This minimizes temperature differences between heating set points and entering water temperatures.

Faucet Aerators. Faucet aerators, by mixing water and air, reduce amounts of water flowing through the faucet. The faucet aerator creates a fine water spray, using a screen inserted in the faucet head. Table 22 presents flow rate requirements for this measure.

Table 22. Faucet Aerator Flow Rates

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.2 GPM	3.0 GPM (Existing)
2.0 GPM	2.2 GPM
1.5 GPM	2.2 GPM
0.5 GPM	2.2 GPM

* Gallons per minute

Hot Tub Covers. Many modern hot tubs have well-insulated shells, but most hot tub heat loss occurs vertically, though the top cover. Old hot tub covers develop "heat leaks" at the hinge-fold and shell rim, and may develop water-logged foam-cores, producing a cover with an R-value of almost 0.[26] Significant hot tub water heating savings can be realized by replacing a low R-value (R-10) existing cover with a well-insulated, new R-21 cover.

Pool Covers. Using a pool cover reduces evaporation, the largest source of pool energy loss. It takes 1 Btu (British thermal unit) to raise 1 pound of water 1 degree, but each pound of 80ºF water evaporating removes 1,048 Btus of heat from a pool.[27] The baseline measure is an uncovered pool.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead. The showerhead creates a fine water spray through an inserted screen. This measure represents various showerhead flow rate reduction levels, as shown in Table 23.

Table 23. Low-Flow Showerhead Waterflow Levels

Measure Flow Rate (GPM*)	Baseline Flow Rate (GPM)
2.5 GPM	3.0 GPM (Existing)
2.0 GPM	2.5 GPM
1.5 GPM	2.5 GPM

* Gallons per minute

[26] http://www.spadepot.com/spacyclopedia/energy-conservation.htm
[27] http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=13140

Solar Hot Water (SHW). Solar water heating systems include storage tanks and solar collectors, using two types of solar water heating systems: active, with circulating pumps and controls; and passive, which do not have these attributes. Either system actively increases entering water temperatures to storage tanks, reducing amounts of energy required by hot water heaters to achieve set point temperatures.[28]

Water Heater—Pipe Insulation. Adding R-4 insulation around pipes decreases heat loss. The baseline is a hot water pipe without insulation.

Water Heater—Tank Blanket/Insulation. Installing R-11 insulation on older models without insulation helps reduce stand-by losses.

Water Heater—Thermostat Setback. This measure generates savings by reducing set point temperatures from 135° to 120°F. A hot water system's set point temperature is often set higher than necessary.

[28] http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850

RESIDENTIAL GAS EQUIPMENT MEASURE DESCRIPTIONS

Appliances

Clothes Dryer—Moisture Sensor. High-efficiency dryers utilize features, such as moisture sensors, to minimize energy usage while retaining performance.

Oven—Convection. A high-efficiency convection oven operates at lower temperatures, achieving quicker cooking times than standard ovens, due to fans circulating heat evenly throughout the oven. The baseline is a standard oven.

Heat Central

Gas Boiler. Boilers are classified as condensing and non-condensing. Condensing boilers condense flue gas and water vapor, extracting useful heat, and improving boiler efficiency. This measure compares several boilers having different thermal efficiencies, and is applicable to new and existing construction. The boiler's overall efficiency is defined as the gross output energy, divided by the input energy, and is affected by combustion efficiency, standby losses, cycling losses, and heat transfer. Table 24 displays measure and baseline thermal efficiencies.

Table 24. Gas Boiler Efficiency Comparison

Measure AFUE	Baseline AFUE
85%	Federal Standard 82% AFUE (EISA 2007)
90%	
94%	
96%	

Gas Furnace. Improvements in furnace technology, such as new ignition and heat exchange design, have led to increased furnace efficiencies. AFUE levels considered in this measure are shown in Table 25.

Table 25. Gas Furnace Efficiency Comparison

Measure AFUE	Baseline AFUE
92%	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)
93%	
94%	
96%	

Pool Heat

Energy Efficiency Pool Heater. Gas pool heaters use natural gas or propane. As the pump circulates the pool's water, the water passes through a filter, and then to the heater. Gas burns in the heater's combustion chamber, generating heat that warms the water returning to the pool. This measure assumes an efficiency level of 88%, compared to a standard 83% efficient pool heater.

Water Heat

Water Heater—Condensing. Gas condensing water heaters have an improved design, which reduces consumption by 30%, while maintaining superior performance. The measure has an EF of 0.80, compared to a standard water heater with 0.59 EF.

Water Heater, Storage. High-efficiency storage water heaters prove more efficient than standard water heaters due to reduced standby losses. The EFs considered in this measure are shown in Table 26.

Table 26. Water Heater EF Comparison

Measure EF	Baseline EF
0.62	EF = 0.59 Federal Standard 2001
0.67	

Water Heater, Tankless. Tankless water heaters provide hot water at a preset temperature when needed, without requiring storage, thereby reducing or eliminating standby losses. An EF of 0.82 was used for the tankless system, compared to a standard water heater with an EF of 0.59.[29]

[29] http://www.toolbase.org/Technology-Inventory/Plumbing/tankless-water-heaters

APPENDIX A.2.2. COMMERCIAL ELECTRIC RETROFIT MEASURE DESCRIPTIONS

HVAC (and Envelope)

Advanced Control Technology. Advanced controls include additional features designed to save energy off-peak and improve reliability. Features on rooftop units (RTU) could include: improved fans and economizers; better controls of the fan, refrigeration cycle and economizer; and advanced monitoring and diagnostics.

Demand Controlled Ventilation. With Demand Control Ventilation (DCV), the ventilation system automatically adjusts air flow when CO_2 levels achieve a specified level. Using a CO_2 control, a minimum ventilation rate can be maintained at all times to control non-occupant contaminants, such as off-gassing from furniture, equipment, and building components. Without such equipment, as a baseline, the ventilation system would run continually.

Chiller—VSD Retrofit. A variable-speed drive (VSD) controls the chiller compressor's rotational speed to match the output capacity with part-load cooling, while maintaining full-load efficiency. The baseline for this measure is a constant-speed compressor motor with inlet vane control.

Chiller—Water Piping Loop with VSD Control. A VSD controller, with two-way valves at the cooling coils, controls the chilled water pump to vary pump speeds and chilled water flows to match the varying cooling load, reducing pumping energy requirements. The baseline is a constant speed pump with three-way valves.

Chiller—Water Reset. A water reset controller varies the temperature of chilled water in a loop, allowing increased water temperatures as cooling requirements decrease. The baseline measure is no water reset.

Chiller Air-Cooled. Screw compressors are positive displacement devices. The refrigerant chamber is actively compressed to a smaller volume by the twisting motion of two interlocking, rotating screws. Refrigerant trapped in the space enclosed between the two rotating screws is compressed as it makes its way from the inlet to the compressor's outlet. A slide valve is used to adjust the compression effect by varying the amount of compression occurring before refrigerant is discharged. Screw chillers are generally used for small- to medium-sized buildings. This unit uses air to cool the refrigerant.

Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The baseline is no commissioning.

Cool Roofs. ENERGY STAR®-qualified cool roofs have reflective coatings, which can lower roof surface temperatures by up to 100ºF, thereby decreasing amounts of heat transferred into a building. Cool roofs can help reduce amounts of air conditioning needed in buildings, and can

reduce peak cooling demand by 10% to 15%.[1] This measure could be considered a passive measure.

Cooling Tower—Two-Speed Fan Motor. A two-speed fan cycles between off, low, and high speeds to maintain the tower set point. The low-speed setting option uses less energy than a single, high-speed fan. The baseline measure is a single-speed fan motor.

Cooling Tower—VSD Fan Control. A VSD modulates the air flow; so heat rejection exactly matches the load at the desired set point, which saves energy. The baseline measure is a two-speed fan motor.

Desuperheaters—Air Conditioner and Air Source, and Ground Source Heat Pump. Desuperheaters are heat recovery devices that transfer heat from air conditioning or heat pump units to domestic water heaters. Normally, this heat would be transferred to the ground or air. A desuperheater provides supplemental water heating only when the heat pump operates in the cooling mode.[2] The baseline is no desuperheater.

Direct Digital Control System—Installation. Direct digitally controlled (DDC) systems allow both HVAC and lighting to be controlled and monitored using an electronic or digital system. For lighting, replacing the manually operated wall switches with a digital interface allows direct control of lights at a remote location anytime. For HVAC, the entire system, including pumps, motors, fans, and set points, can be digitally programmed for each unit, further increasing tighter control of the system.

Direct Digital Control System—Optimization. DDC is also known as an energy management system (EMS), which allows digital monitoring and control of HVAC and lighting systems. The control system's optimization system is upgrading a high-efficiency EMS to a premium efficiency system.

Doors. Composite or steel doors with a foam core increase overall insulation, slowing heat loss. This measure includes adding a thermal door with a resistance value of U-Factor = 0.10 or U-Factor = 0.35 to buildings with neither thermal nor storm doors (U-Factor = 0.55).

Duct Repair and Sealing. The repair and sealing of leaky ducts creates significant energy savings by ensuring conditioned air only enters occupied spaces, thereby reducing excessive runtime/loads on HVAC systems.

Electronically Commutated Motor (ECM)—Air Conditioner/Electric/Gas Furnace ECM Fan and Air Source Heat Pump. ECMs are smaller variable-speed motors, operating from a single-phase power source that consumes less power than a standard motor in the ventilation and circulation system. The baseline measure is a standard-efficiency motor.

Exhaust Hood Makeup Air. Provides exhaust air at the hood rather than allowing the hood to exhaust conditioned air in the room. The baseline measure is for conditioned air to be expelled through exhaust hoods.

[1] http://www.aceee.org/consumer/cooling

[2] http://www1.eere.energy.gov/femp/procurement/eep_groundsource_heatpumps.html

Green Roof. A green roof is a living roof, supporting soil and plant growth. A series of carefully engineered, watertight, lightweight, and long-lasting layers are applied to the roof deck. Green roofs can be incorporated into new buildings if load requirements can be met. They are suited for roofs with slopes ranging up to 20°, and are most successful when sufficient attention has been paid to selecting plants that will thrive in the local climate and conditions. One of a green roof's most significant advantages is that it last up to three times longer than a standard roof. A green roof can also buffer temperature extremes, improving a building's energy performance by dropping temperatures on the roof.

Heat Pump—Variable Refrigerant Flow System. Variable refrigerant flow (VRF) heat pump systems are enhanced versions of ductless, multi-split systems, permitting more indoor units to be connected to each outdoor unit, and providing additional features, such as simultaneous heating and cooling and heat recovery. VRF technology uses smart integrated controls, variable-speed drives, refrigerant piping, and heat recovery to provide products with attributes that include high-energy efficiency, flexible operation, ease of installation, low noise, zone control, and all-electric technology. This measure's baseline represents a package variable air volume system with electric reheat.[3]

Hotel Key Card Energy Control System. This key card system controls room HVAC and lighting during non-occupied periods. Occupancy is determined by the presence of a key card and/or additional sensors. The central system sets heating and cooling to a minimum, and turns off lighting when the key card is removed. Once the guest returns and inserts the key card, the guest has full control of the room systems.

Infiltration Control (Caulking, Weather Stripping, etc.). Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses.

Insulation—Duct. Packaged Direct Expansion (DX) and heat-pump equipment are generally coupled with a ducting system inside a building. Insulating the ducts reduces energy loss to the unconditioned plenum space. This measure assumes R-8 insulation will be installed where no insulation exists.

Insulation—Floor (Non-Slab). These measures represent an increase in R-value from existing building conditions to current state code, and to current state code to better than code R-value improvements for the floor space (non-slab). This measure brings average existing insulation of R-10 up to R-30.

Insulation—Roof. These measures represent an increase in R-value from existing building conditions to current state code, and to current state code to better than code R-value improvements. This measure brings average existing R-10 insulation up to R-20 (continuous insulation).

Insulation—Wall. These measures represent increased R-values from existing building conditions to values of R-13 + 7.5. The baseline R-10 value represents the average existing insulation level.

[3] http://eec.ucdavis.edu/ACEEE/2008/data/papers/3_228.pdf

Packaged Terminal Air Conditioner/Heat Pump (PTAC/PTHP). Also known as PTAC and PTHP units, package terminal air conditioning and heat pump equipment houses all the components (compressor, condenser and evaporator coils, expansion device, condenser and evaporator fans, and associated operating and control devices) within a single cabinet. In most cases, this package unit is installed within a space, through the wall (as in the lodging building sector). Installing a high-efficiency PTAC or PTHP saves energy when compared to federal standards.

Pipe Insulation. Adding at least 1.5-inch thick insulation to water pipes yields approximately an R-6 R-value, decreasing temperature losses and reducing demand on chilled water systems. Table 1 shows the various insulation levels considered.

Table 1. Pipe Insulation Levels

Measure Thickness (in.)	Baseline Thickness (in.)
1.5	No Insulation
3	1.5

Programmable Thermostat. A programmable thermostat automatically controls the set point temperature, ensuring the HVAC system does not run during low-occupancy hours.

Retro-Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The commissioning process can be applied to existing buildings to restore them to optimal performance. Retro-commissioning is a systematic, documented process that identifies low-cost operational and maintenance improvements in existing buildings, and brings buildings up to the design intentions in its current operation.[4,5] The baseline measure is no commissioning.

Tune-up—Air Conditioner, Air Source, and Ground Source Heat Pumps. Proper system tune-up/maintenance ensures refrigerant charges and airflows through evaporator coils have been properly tested and correctly adjusted—two factors affecting system efficiency. Maintenance includes changing filters and cleaning coils to maintain overall performance and efficiency of the unit.

Tune-up—Chiller. Proper system tune-up/maintenance ensures correct water system flow rates, temperatures of heating and cooling delivery systems (air side and water side), positions and functioning of flow control devices for air and water delivery systems, control settings and operation, and pump speeds and pressures. The baseline is an unmaintained chiller.

Variable Air-Volume Systems. A variable air volume (VAV) allows an HVAC system's volume to vary heating or cooling loads rather than over-conditioning and short-cycling. In this case, the baseline is a constant-volume system.

Window Air Conditioner (Room AC)—(8,000-13,999 BTU/HR). ENERGY STAR-qualified room air conditioners use less energy than conventional models through improved energy

[4] http://www.green.ca.gov/CommissioningGuidelines/default.htm
[5] http://cbs.lbl.gov/BPA/cct.html

performance and through timers for better temperature control. Table 2 shows the different efficiency tiers considered in this measure.

Table 2. Room AC EER Comparisons

Measure Efficiency	Baseline SEER & HSPF
ENERGY STAR ≥ 10.8 EER	Federal Standard 9.8 EER
CEE TIER 1 ≥ 11.3 EER	
CEE TIER 2 ≥ 11.8 EER	

Windows—High-Efficiency. This measure increases in building performance by reducing U-values in existing construction and new construction windows, as shown in Table 3.

Table 3. High-efficiency Window Measures

Measure U-Value	Baseline U-Value
0.55 (Code Metal Framing)	Existing Windows U = 0.67
0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67
0.30	0.55 (Code Metal Framing)

Lighting

Bi-Level Control, Stairwell Lighting. An occupancy sensor reduces light loads by 50% when a stairwell is unoccupied for a set period of time. The baseline is continuous operation at full power.

Daylighting Controls—Dimming-Continuous, Fluorescent Fixtures. A dimming switch allows light levels to vary from 0%–100% brightness. A continuously dimming switch permits variation throughout the range, increasing electricity savings. The baseline measure is operating fluorescent fixtures at full power.

Daylighting Controls—Dual Level Switches, Fluorescent Fixtures. These allow the user to vary light levels by a number of specified tiers to adjust for amounts of outside daylight. The baseline measure is operating fluorescent fixtures at full power.

Exit Sign—LED. LED exit signs use only 2 watts of power, and last over 50,000 hours, while CFL exit signs use 9 watts of power, and have a shorter life.

Exit Sign—Photoluminescent or Tritium. Photoluminescent or Tritium use zero energy, while providing lighting suitable for exit signage. Even when replacing already efficient light-emitting diode (LED) exit signs, due to this measure's zero energy consumption, the 2 watts consumed by LED signs can be eliminated.

LED Refrigeration Case Lights. LEDs are highly efficient bulbs, which can be used for refrigeration case lights—a 55% energy savings over a standard 60 W fluorescent refrigeration case light.

LED Strip Lighting. LEDs are highly efficient bulbs that can be used for strip lighting, which results in energy savings, compared to linear fluorescent strip lighting.

Lighting—CFL Lamp Package. Compact fluorescent lighting (CFL) reduction packages reduce power density, compared to baseline EISA-compliant incandescent lighting.

Lighting—Clock/Timer. This measure includes an integrated time-clock that automatically switches lighting and other loads on and off in response to time schedules, an occupancy sensor, or a building automation system.

Lighting—LED Lighting Package. LEDs are solid-state devices converting electricity to light with very high efficiencies and long life. Recently, lighting manufacturers have been able to produce "cool" white LED lighting indirectly, using ultraviolet LEDs to excite phosphors that emit a white-appearing light. This measure, applying to exterior lighting, and: landscape, merchandise, signage, and structure lighting.

Lighting—Fluorescent High Performance Package. Fluorescent lighting reduction packages, such as high-performance T8 fixtures, reduce power density, compared to baseline T8 fixtures.

Lighting—Fluorescent Reduced Wattage Package. Fluorescent lighting reduction packages, such as low-wattage T8 fixtures, reduce the power density, compared to baseline T8 fixtures.

Lighting—LED Lamp Package. LED reduction packages reduce power density when compared to baseline EISA-compliant incandescent lighting.

Lighting—LPD Package, 15%. This measure results in a 15% decrease in lighting power density (W/sqft). The baseline lighting technology is representative of all available technologies, comprising total watts per square foot for a particular building type. This includes all overhead lighting, such as T12, T8, CFLs, etc. The lighting reduction package measures reduce the lighting power density by installing higher-efficiency technologies, such as high-performance T8 or T5 tubes, high-efficiency ballasts, reflective lighting fixtures, etc.

Lighting—LPD Package, 25%. This measure results in a 25% decrease in lighting power density (W/sqft). The baseline lighting technology is representative of all available technologies making up total watts per square foot for that particular building type. This includes all overhead lighting, such as T12, T8, CFLs, etc. The lighting reduction package measures reduce the lighting power density (W/sqft) by installing higher-efficiency technologies, such as high-performance T8 or T5 tubes, high-efficiency ballasts, reflective lighting fixtures, etc.

Lighting—High Bay Fluorescent High Output Package. Fluorescent lighting reduction packages, such as T5HO (High Output) for high bay applications in warehouse and grocery facilities, reduce the power density, compared to baseline fluorescent high bay lighting.

Lighting—High Bay LED Package. LED lighting reduction packages for high bay applications, in warehouse and grocery facilities reduce the power density, compared to baseline fluorescent high bay lighting.

Lighting—High Intensity Discharge Package. Metal halide (MH), high-intensity discharge (HID) fixtures replace mercury vapor or other high-wattage fixture (e.g., quartz halogen), reducing the power density.

Lighting—Induction Lighting Package. Induction fixtures replace mercury vapor or other HID fixtures (e.g., quartz halogen), reducing the power density.

Lighting—Specialty Lamp Package. Specialty CFL and LED reduction packages reduce power density, compared to baseline specialty incandescent lighting, such as three-way bulbs.

LightLouver Daylighting System. The LightLouver® Daylighting System was developed to provide glare-free, side-daylighting and solar control. It redirects light into spaces while eliminating all direct sunlight penetration onto work surfaces, providing daylighting and solar controls for east, west, and south facing façades. The baseline for this measure would be no daylighting controls.[6]

Occupancy Sensor—High-Bay and Wall or Ceiling. This measure turns off fluorescent lighting in areas where activity is not detected. Occupancy measures can control single or multiple lighting zones. The controlled lighting wattage varies depending on the application. The baseline assumes no lighting controls.

Occupancy Sensor—Refrigerated Cases. This measure turns off fluorescent lighting in refrigerated cases when activity is not detected. The controlled lighting wattage varies, depending on the application. The baseline assumes no lighting controls.

Water Heating

Clothes Washer. ENERGY STAR-qualified clothes washers use less energy and water than regular washers.[7] Four efficiency levels, in units of Modified Energy Factors (MEFs), were compared for this measure, as shown in Table 4. The baseline MEF represents the average MEF of federal standard-qualified models.

Table 4. Clothes Washer Modified Energy Factor Comparisons

Measure Level	Measure MEF	Baseline MEF
ENERGY STAR	MEF = 2.0	MEF = 1.26
CEE Tier 2	MEF = 2.2	MEF = 1.26
CEE Tier 3	MEF = 2.4	MEF = 1.26
Enhanced Efficiency	MEF = 3.10	MEF = 1.26

Clothes Washer—Ozonating. This measure disinfects water using a supply of ozone-enriched air, which suppresses subsequent biological activity, and controls biological growth within an appliance, reducing the need to rely on hot water. The baseline measure is a standard commercial clothes washer.[8]

6 http://lightlouver.com/daylighting-partners/daylighting-optimization-program/
7 http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW
8 http://www.patentstorm.us/patents/6607672-description.html

Dishwasher Residential. Residential-sized ENERGY STAR dishwashing systems are often more appropriate for smaller commercial buildings. ENERGY STAR residential dishwashers are 10% more efficient than the federal minimum standard used as the baseline.[9]

Dishwashing—Commercial: High Temp. ENERGY STAR high-temperature commercial dishwashers have a minimal idle rate, and minimal water consumption per rack of loaded dishes, depending upon size, and average 25% more efficient operations than standard, high-temp commercial dishwashers.[10]

Dishwashing—Commercial: Low Temp. ENERGY STAR low temperature commercial dishwashers use chemicals, combined with low temperatures, to save energy, compared to standard, high-temperature commercial dishwashers.

Drainwater Heat Recovery. Drain water heat recovery devices recover heat energy from drain water, and use that heat to pre-heat cold water entering the hot water tank, minimizing the temperature rise required to achieve the water heater's set point.[11]

Faucet Aerators. Faucet aerators, by mixing water and air, reduce amounts of water flowing through a faucet. The faucet aerator creates a fine water spray through a screen inserted in the faucet head. Flow rate requirements for this measure are 0.5 gallons per minute (GPM), compared to 3.0 GPM for existing faucets.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce the amount of water flowing through the showerhead. The showerhead creates a fine water spray through a screen inserted in the showerhead. Table 5 shows flow-rate requirements for this measure.

Table 5. Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.5 (Federal Standard)	4.5 (Existing)
2.0	2.5 (Federal Standard)

Low-Flow Spray Heads. Low-flow spray valves mix water and air to reduce the amount of water flowing through the spray head, which creates a fine water spray through a screen inserted in the spray head. Table 6 shows flow rates considered in the measure.

Table 6. Low-Flow Spray Heads Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
1.6 (Code)	2.5 (Existing)
1.0	1.6 (Code)

Refrigeration with Heat Recovery. Heat recovery gathers and uses thermal energy that normally would be rejected from a system to the ambient environment; in this case, the rejected heat would be utilized by the water heater.

[9] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DW
[10] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COH
[11] www.toolbase.org/Techinventory/TechDetails.aspx?ContentDetailID=858&BucketID=6&CategoryID=9

Ultrasonic Faucet Control. Ultrasonic sensors automatically turn on and off faucet water when detecting motion at the sink. This eliminates water running continuously while customers wash hands.

Water Heater—Pipe Insulation. Adding a thickness of 1-inch insulation to hot water pipes yields approximately an R-4 R-value, decreasing temperature losses. This measure is only applicable for existing construction. The baseline measure is no insulation.

Water Heater—Tank Blanket/Insulation. Installing R-11 insulation on older models without insulation helps reduce standby losses.

Water Heater Temperature Setback. This measure generates savings by reducing the set point temperature from 130°F to 120°F.

Refrigeration

Anti-Sweat Heater Controls. Enables users to turn refrigeration display case anti-sweat heaters off when ambient relative humidity fall low enough that sweating will not occur. Without the control, the heaters generally run continuously.

Case Fans with Electronically Commutated Motor (ECM). The case fan is one component of the refrigeration system. ECMs are smaller, variable-speed motors that operate from a single-phase power source, with an electronic controller mounted in or on the motor. The baseline measure is a standard efficiency motor.

Compressor—Scroll. A component of refrigeration systems, high-efficiency scroll compressors operate up to 15% more efficiently than standard-efficiency compressors.

Compressor VSD Retrofit. The measure modulates motor speeds in response to load changes. When low-load conditions exist, current to compressor motors decrease, slowing compressor motors. The baseline is a constant-speed compressor.

Demand Control Defrost—Electric. When frost collects on evaporators, it reduces coil capacity by acting as an insulation layer, and reducing airflow between the fins. With electric defrost, resistance heat is used to warm the evaporator coil, melting frost collected there.

Demand Control Defrost—Hot Gas. With hot gas defrost, refrigerant vapor from the compressor discharge or the high-pressure receiver warms the evaporator coil and melts frost collected there.[12]

Evaporator Fans—Walk-ins. Walk-in fans are one component of refrigeration systems. High-efficiency evaporator fans typically use ECMs, generally small horsepower (HP) motors (less than 1 HP), factory programmed to run at certain speeds. ECM operate from a single-phase

[12] ParkerRefrigerationSpecialists; http://www.parker.com/literature/Refrigerating%20Specialties%20Division/90-11a.pdf

power source, with an electronic controller mounted in or on the motor. The baseline measure is a standard-efficiency evaporator fan.[13]

Floating Condenser Head Pressure Controls (Condensing Unit and Remote Condensers). This measure adds controls to float head pressures down to lower temperatures during periods of low load. The base case is a standard, multiplex system, with a fixed, condensing set point.

Glass Door Refrigerators. "Low-E" double pane thermal glass doors reduce cooling losses in refrigerated, reach-in cases.

Novelty Cooler Shutoff. A novelty cooler shutoff senses occupancy, cycling off cooling of novelty coolers when occupancy is not detected. The baseline is a novelty cooler without a controller.

Night Covers for Display Cases. Night covers help to eliminate wasted refrigeration cooling by insulating display cases. Further, they reduce heating loads of buildings through less escaped refrigerated air that must be reheated.

Refrigeration Commissioning or Recommissioning. Commissioning ensures refrigeration systems installed operate in an optimal fashion to maximize energy efficiency. Retrocommissioning checks previously commissioned equipment to ensure it continues to run efficiently. The baseline measure is no commissioning.[14]

Solid Door ENERGY STAR Refrigerators/Freezers. ENERGY STAR-labeled commercial solid door refrigerators and freezers are designed with high-efficiency components, such as ECM evaporator and condenser fan motors, hot gas anti-sweat heaters, or high-efficiency compressors. Compared to standard models, ENERGY STAR-labeled commercial solid door refrigerators and freezers save energy.[15]

Strip Curtains for Walk-Ins. Strip curtains on walk-in refrigerators reduce infiltration of warm air into refrigerated spaces by improving barriers between refrigerated and ambient air.

Other

All-In-One Office Equipment. ENERGY STAR-qualified, all-in-one office equipment saves energy through features such as low-power sleep/off mode, and energy-efficient operating modes, compared to standard, all-in-one units.

Ceiling Fan With and Without Light Fixture. ENERGY STAR-qualified ceiling fans use improved motors and blade designs to improve fan efficiency. The fans do not create cooler temperatures. Ceiling fans with light fixtures reduce energy consumption by using efficient CFLs in place of incandescent bulbs.

Convection Oven. Commercial ENERGY STAR electric convection ovens must meet specification requirements of 70% cooking energy efficiency, and idle energy rates of 1.6 kW,

[13] http://www.fishnick.com/publications/appliancereports/refrigeration/GE_ECM_revised.pdf
[14] http://cbs.lbl.gov/BPA/cct.html
[15] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF

whereas standard electric convection ovens have 65% cooking energy efficiency requirements and idle energy rates of 2 kW.[16]

Compressed Air Optimization. The measure audits the compressed air system for leaks, inefficient compressors, and controls. The baseline measure assumes audits, new compressors, or improved controls have not been applied.

Data Center—Cooling Improvements. A data center's cooling load can reduced by minimizing inefficiencies in the cooling and distribution of cooling air. These inefficiencies are typically caused by "short-circuiting" cold air, or mixing cold supply and hot return air. The baseline represents a standard data center cooling system.

Data Center—High-Efficiency Server. On average, ENERGY STAR servers are 30% more energy efficient than standard servers. This measure represents installing ENERGY STAR servers in place of conventional servers throughout an entire data center facility.[17]

Data Center—Server Virtualization. Virtualization involves replacing multiple, underutilized servers with one server, operating at a higher utility level. Many data center servers operate at 10% of capacity or less, allowing their functions to be consolidated into "virtual" servers on one unit, operating around 85% of capacity. This measure applies to the plug load end use, although it saves the cooling load by reducing power and, therefore, heat generated by equipment.

Demand Controlled Ventilation—Range Hood. Utilizing sensors and variable speed fans, hood controls reduce exhaust (and makeup) airflow when appliances are not at capacity (or have been turned off). The baseline for this measure would be no hood controls.

Fryer. Commercial ENERGY STAR-rated electric fryers have a heavy load cooking efficiency of 80% or better, and, when idle, use less than 1,000 Watts.[18] The baseline is a standard electric deep fat fryer.

Hot Food Holding Cabinet. ENERGY STAR hot food-holding cabinets use a maximum of 40Watts/cubic foot, less than the baseline measure (a conventional holding cabinet).[19]

Ice Makers (Air/Water Cooled). High-efficiency commercial ice makers use high-efficiency compressors, fan motors, and thicker insulation to achieve 15% more efficiency than the baseline measure—a conventional automatic commercial ice maker.[20]

Motor—Enhanced (Ultra-PE). Consortium for Energy Efficiency (CEE) premium efficiency "plus" (also known as "super" or "enhanced") motors operate more efficiently than standard

[16] http://www.energystar.gov/index.cfm?c=ovens.pr_comm_ovens
[17] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DC
[18] http://www.energystar.gov/index.cfm?c=fryers.pr_crit_fryers
[19] http://www.energystar.gov/index.cfm?c=hfhc.pr_hfhc
[20] Consortium for Energy Efficiency (CEE); http://www.cee1.org/com/com-kit/com-kit-equip.php3

NEMA Premium Efficiency motors.[21] This measure specifically relates to HVAC motors, ranging from 1 HP to 500 HP, depending on the building size.

Office Computer Network Energy Management. This software tool intelligently power manages computers across a network, remotely and automatically overnight, on weekends, and when not in use. This significantly lowers energy consumption without impact user productivity. Workstations operating on a local area network (LAN) or a wide area network (WAN) can implement PC power-management policies across the network to maximize energy savings by placing machines into a lower power states without interfering with end-user productivity, desktop maintenance, or upgrades.

Optimized Variable Volume Lab Hood Design. This measure allows the volumetric flow rate to vary, resulting in a constant speed through the duct, regardless of sash openings. For buildings such as universities, schools, and hospitals, which use lab hoods, savings can be obtained by using a variable—rather than constant—volume lab hood. The baseline measure is a constant volume lab hood.

Snow Melt System Control. Snow melt system controls operate overall systems as efficiently as possible to save energy and reduce costs. Sensors detect actual conditions on snowmelt surfaces, ensuring melting starts as snow falls. The sensors also detect when the surface dries, and shuts off systems immediately, optimizing the system's energy efficiency. Control systems also protect all equipment to prevent damage due to extreme temperature fluctuations, and to protect snowmelt surfaces from repetitive freeze and thaw cycles. The baseline assumes manual snow melt controls.

Steam Cooker. Commercial ENERGY STAR electric steam cookers have a 50% cooking efficiency, with idle energy rates varying, depending upon pan size.[22] A standard commercial steam cooker has a baseline efficiency of 35%.

Transformers. Industrial and commercial facilities served by three-phase power from utilities typically use low-voltage, dry-type transformers to distribute power internally at 208/120 volts. Loads commonly served by such transformers include: wall plugs, lights, fans, and equipment such as computers, printers, and small industrial machinery. Energy savings criteria are based on the proposed CEE Tier 1, the equivalent of NEMA Premium voluntary standard levels. The federal minimum standard for low-voltage dry-type transformers is based on NEMA TP-1-2002 requirements, enacted on January 1, 2007.

V***ariable Frequency Drive.*** Variable speed controls allow pump and fan motors to operate at lower speeds, while maintaining set points during partial load conditions. Energy consumption reduces when motor operations vary with loads, rather than frequently cycling on and off at constant speeds. This measure considers motor sizes ranging from 1 to 500 HP.

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[21] Consortium for Energy Efficiency' (CEE) motor nominal efficiencies are higher than NEMA federal minimum efficiency levels, which became effective in December 2010. On December 19, 2010, the 2007 Energy Independence and Security Act (EISA) updated the minimum efficiency standards for motors, where the previous NEMA Premium Efficiency specifications became the federal standard.

[22] http://www.energystar.gov/index.cfm?c=steamcookers.pr_steamcookers

Vending Machine—Controller. This measure senses occupancy, and cycles off cooling of vending machines when occupancy is not detected.

Water Coolers. ENERGY STAR coolers providing only cold water consume less than 0.16 kWh per day; a unit providing hot and cold water consumes less than 1.20 kWh per day. ENERGY STAR-qualified water coolers consume 45% less energy than standard models.[23]

[23] http://www.energystar.gov/index.cfm?c=water_coolers.pr_water_coolers

COMMERCIAL ELECTRIC EQUIPMENT MEASURE DESCRIPTIONS

HVAC

Heat Pump—Air, Water, or Ground Source (ASHP, WSHP or GSHP). Electric heat pumps move heat to or from the air, water, or ground to cool and heat homes. Air, water, and ground source heat pumps use a coefficient of performance (COP) ratio of the cooling effect produced (expressed in Btu/hr), divided by the energy input (expressed on the same basis, and as an EER Ratio). Table 7 displays the different efficiency levels compared in this measure.

Table 7. Heat Pump COP/EER Comparisons

kBTU / hr	Measure COP & EER	Baseline COP & EER
ASHP 135–240	11.1 EER, 3.3 COP	10.6 EER, 3.2 COP (Federal Standard)
WSHP 135–240	12.0 EER, 4.2 COP	10.6 EER, 3.2 COP (Federal Standard)
GSHP 135–240	16.2 EER, 3.6 COP	10.6 EER, 3.2 COP (Federal Standard)

Rooftop Direct Expansion (DX) Unit. DX systems use a refrigerant piping circuit, compressor, and refrigerant coils to transfer heat. All components are contained in a single package, typically installed on a building's roof. As a measurement of efficiency, commercial-sized units are normally rated as EER. Table 8 displays the different models compared in this measure.

Table 8. DX AC Unit EER / Advanced Technology Comparisons

kBTU / hr	Measure EER	Baseline EER
135–240	11.5	11.0
135–240	12.0	11.0

Screw chiller. Screw compressors operate as positive displacement devices. The refrigerant chamber is actively compressed to a smaller volume by the twisting motion of two interlocking, rotating screws. Refrigerant trapped in the space enclosed between the two rotating screws is compressed as it makes its way from the inlet to the compressor's outlet. A slide valve adjusts the compression effect by varying the amount of compression occurring before refrigerant discharges. Screw chillers generally are used for small- to medium-sized buildings. This measure compares different efficiencies, rated in kW/ton in Table 9.

Table 9. Screw Chiller kW/ton Comparison

Measure kW / ton	Baseline kW / ton
0.63	0.68
0.58	0.68

Water Heating

Water Heater—Heat Pump. Heat pumps move heat from a warm reservoir (such as air), transferring this heat into hot water systems.[24] This measure assumes an energy factor (EF) of 2.0, an increase from a standard EF of 0.92 (Federal Standard 2001).

Water Heater—Storage 2015 Standard. High-efficiency water heaters are more efficient than standard electric water heaters due to reduced standby losses. This measure assumes an EF for high-efficiency water heaters of 0.95 (Federal Standard April 2015), an increase from a standard EF of 0.92 (Federal Standard 2001).

Water Heater—Tankless. Tankless water heaters produce the majority of energy savings by avoiding standby losses that occur when a normal storage tank is not in use. Tankless water heaters provide hot water at a preset temperature when needed, without requiring storage, thereby reducing or eliminating standby losses. An EF of 0.98 is assumed for a tankless system, compared to a standard electric water heater with an EF of 0.92 (Federal Standard 2001).[25]

Other

Computer—ENERGY STAR. ENERGY STAR computers consume less than 2 W in "sleep" and "off" modes, and are more efficient than conventional units in "idle" mode, resulting in 30% to 65% energy savings.

Copiers—ENERGY STAR. ENERGY STAR copiers deliver the same performance as conventional equipment, power down when not in use, and operate, on average, 40% more efficiently. The baseline measure is a non-ENERGY STAR copier.[26]

Dryer—High Efficiency. High-efficiency dryers utilize features, such as moisture sensors, to minimize energy usage while retaining performance.

Fax—ENERGY STAR. ENERGY STAR fax machines enter sleep mode after inactivity. This reduces their total power consumption by 40%.[27]

Freezer, ENERGY STAR. ENERGY STAR-qualified freezers use at least 10% less energy than standard models, due to improvements in insulation and compressors.

Monitor—ENERGY STAR. ENERGY STAR monitors feature: (1) an "on" mode, where the maximum allowed power varies, based on the computer monitor's resolution; (2) a "sleep" mode, where computer monitor models must consume 2 Watts or less; and (3) as "off" mode, where computer monitor models must consume 1 Watt or less. Baseline equipment does not include these features.[28]

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[24] Description source: U.S. Department of Energy; http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12840

[25] http://www.toolbase.org/Technology-Inventory/Plumbing/tankless-water-heaters

[26] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=IEQ

[27] http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf

[28] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.ShowProductGroup&pgw_code=MO

Printers—ENERGY STAR. ENERGY STAR printers operate 40% more efficiently than standard printers.

Refrigerator, ***ENERGY STAR.*** ENERGY STAR-qualified refrigerators use at least 20% less energy than standard models, due to improvements in insulation and compressors.

Server. ***S***ervers must meet energy use guidelines in "off" (less than 2 Watts) and "idle" (either 50 Watts or 65 Watts, according on the category) modes of operation, to ensure energy savings when computers are used and performing a range of tasks as well as when turned off or in a low-power mode.[29]

Vending Machines—ENERGY STAR. ENERGY STAR new and rebuilt refrigerated beverage vending machines operate 50% more energy efficiently than standard models, through more efficient compressors, fan motors, lighting systems, and low-power mode options during non-use periods.[30]

[29] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CO
[30] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=VMCc

COMMERCIAL GAS RETROFIT MEASURE DESCRIPTIONS

HVAC (and Envelope)

Boiler—Economizer. This measure recovers heat energy, which would otherwise be lost through a boiler stack, by using a heat exchanger located on the stack to preheat boiler feed water.

Boiler—Pipe Insulation. Adding insulation around pipes decreases heat loss. The baseline is a boiler pipe without insulation. Table 10 shows thicknesses of pipe insulation compared in this measure.

Table 10. Boiler Pipe Insulation Levels

Insulation Thickness (in.)	Insulation Thickness (in.)
2 in.	1 in. (Existing)
3 in.	2 in. (Code)

Boiler Reset Controls. Boiler controls systems have microprocessor controls that anticipate heating load demand by calculating rates of system temperature or pressure changes. Controls also provide adjustable reset points for setback and programmable time clock controls. The baseline assumes no controls.[31]

Boiler—Turbulators. Turbulators improve boiler efficiency through: (1) decreasing the stack-gas temperature (a high stack gas temperature indicates heat being exhausted out the chimney); (2) more complex combustion, reflected in increased carbon dioxide; and, (3) increased flame temperatures, which indicate less air being drawn into the boiler. The efficiency improvement saves energy.[32]

Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The baseline is no commissioning.

Demand Controlled Ventilation. With DCV, the ventilation system automatically adjusts air flows when CO_2 levels rise above a specified level. Using CO_2 controls maintains a minimum ventilation rate at all times to control non-occupant contaminants, such as off-gassing from furniture, equipment, and building components. Without this, as a baseline, the ventilation system would run constantly.

Direct Digital Control System—Installation. DDC systems allow HVAC and lighting to be controlled and monitored using an electronic or digital system. For lighting, replacing manually operated wall switches with a digital interface allows direct control of lights at remote locations at any time. For HVAC, the entire system, including pumps, motors, fans, and set points, can be digitally programmed for each unit, further increasing tighter control of the system.

[31] http://energyexperts.org/EnergySolutionsDatabase/ResourceDetail.aspx?id=1579
[32] http://www.fuelefficiencyllc.com/feturb.html

Direct Digital Control System—Optimization. This measure allows digital monitoring and control of HVAC and lighting systems. Optimization of the control system includes upgrading a high-efficiency EMS to a premium efficiency system.

Doors. Composite or steel doors with foam core increase overall insulation, slowing heat loss. This measure includes adding a thermal door with a resistance value of U-Factor = 0.10, or U-Factor = 0.35 to buildings with neither thermal nor storm doors (U-Factor = 0.55).

Duct Repair and Sealing. Repair and sealing of leaky ducts creates significant energy savings by ensuring conditioned air only routes to occupied spaces, thereby reducing excessive runtimes/loads on HVAC systems.

Exhaust Hood Makeup Air. This measure provides exhaust air at the hood rather than allowing the hood to exhaust conditioned air in the room. The baseline measure is for conditioned air to be expelled through exhaust hoods.

Green Roof. A green roof, a living roof supporting soil and plant growth, uses a series of carefully engineered, watertight, lightweight, and long-lasting layers applied to the roof deck. Green roofs can be incorporated into new buildings as long as load requirements can be met, are suited for roofs with slopes ranging up to 20°, and are most successful when sufficient attention has been paid to selecting plants that will thrive in the local climate and conditions. One significant advantage a green roof afford come from lasting up to three times longer than a standard roof. A green roof can also buffer temperature extremes, improving a building's energy performance by dropping roof temperatures.

Infiltration Control. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses.

Infrared Heater. Gas-fired infrared heaters rely on gas (propane or natural gas) combustion to generate heat. Infrared heat warms people and objects at floor levels, not air in the room. This provides a major advantage, as warmed air rises to the ceiling, where it is not needed. Infrared heaters also prove advantageous in buildings with low insulation or open air areas, such as sports facilities and warehouses, as fuel does not heat the air.

Insulation—Duct. Packaged DX and heat-pump equipment generally couple with ducting systems inside a building. Insulating ducts reduces energy loss to unconditioned plenum space. This measure assumes R-8 insulation will be installed where no insulation exists.

Insulation—Floor (Non-Slab). These measures represent an increase in R-value from existing building conditions to current state code and to current state code to better than code R-value improvements for floor spaces (non-slab). This measure brings average existing R-10 insulation up to R-30.

Insulation—Roof. These measures represent an increase in R-value from existing building conditions to current state code and to current state code to better than code R-value improvements. This measure brings average existing R-10 insulation up to R-20 (continuous insulation).

Insulation—Wall. These measures represent an increase in R-value from existing building conditions to value of R-13 + 7.5. The R-10 baseline value represents the average existing insulation level.

Integrated Space Heating/Water Heating. Integrated hot water heating systems provide both space conditioning and hot water heating through one appliance or energy source. Domestic hot water is heated directly, and space heating is accomplished using a hot water heat exchanger coil, piped to the forced air heating system. Thus, a combination space/water heating system can provide high-efficiency hot water heating and space heating for the cost of one high-efficiency appliance.

Retro-Commissioning. Commissioning ensures installed energy-using systems operate in an optimal fashion to maximize energy efficiency. The commissioning process can be applied to existing buildings, restoring them to optimal performance. Retrocommissioning is a systematic, documented process that identifies low-cost operational and maintenance improvements in existing buildings, and brings buildings up to the design intentions of its current operations.[33,34] The baseline measure is no commissioning.

Thermostat Programmable. Programmable thermostats control set point temperatures automatically, ensuring HVAC systems do not run excessively during low-occupancy hours.

Tune-up—Boiler and Furnace Maintenance. Proper system tune-ups and maintenance ensures clean burners, combustion chambers, and heat exchange surfaces. Flame colors are checked for proper burning. Other items checked include: fan belts, blowers, safety controls, thermostat operation, proper venting, and filters. All motors are lubricated, and a combustion efficiency test is performed. Properly maintaining an existing unit keeps efficiency at the highest level possible.

Variable Air-Volume Systems. VAV allows an HVAC system's airflow to vary heating or cooling loads, rather than over-conditioning and short-cycling. The baseline is a constant volume system.

Vent Damper. A vent damper automatically shuts off flue pipes when burners do not run, eliminating unwanted outside air drafts.

Windows—High-Efficiency. This measure represents an increase in building performance by reducing the U-value in existing construction and new construction windows, as shown in Table 11.

Table 11. High-efficiency Window Measures

Measure U-Value	Baseline U-Value
0.55 (Code Metal Framing)	Existing Windows U = 0.67
0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67
0.30	0.55 (Code Metal Framing)

[33] http://www.green.ca.gov/CommissioningGuidelines/default.htm
[34] http://cbs.lbl.gov/BPA/cct.html

Water Heat

Clothes Washer. ENERGY STAR-qualified clothes washers use less energy and water than regular washers.[35] Four efficiency levels, in MEF units, were compared for this measure, as shown in Table 12. The baseline MEF represents the average MEF of federal standard qualified models.

Table 12. Clothes Washer Modified Energy Factor Comparisons

Measure Level	Measure MEF	Baseline MEF
ENERGY STAR	MEF = 2.0	MEF = 1.26
CEE Tier 2	MEF = 2.2	MEF = 1.26
CEE Tier 3	MEF = 2.4	MEF = 1.26
Enhanced Efficiency	MEF = 3.10	MEF = 1.26

Clothes Washer—Ozonating. This measure disinfects water using a supply of ozone-enriched air, which suppresses subsequent biological activity, and controls biological growth within an appliance, thus reducing the need to rely on hot water. The baseline measure is a standard commercial clothes washer.[36]

Demand-Controlled Circulating Systems. A demand-controlled circulating system only circulates hot water when required. The baseline measure is a continuously circulating hot water system, resulting in energy loss through pipes.

Dishwasher Residential. Residential-sized ENERGY STAR dishwashing systems are often more appropriate for smaller commercial buildings. ENERGY STAR residential dishwashers are 10% more efficient than the federal minimum standard used as the baseline.[37]

Dishwashing—Commercial: High Temp. ENERGY STAR high-temperature commercial dishwashers, with a minimal idle rate as well as a minimal amount of water consumption per rack of loaded dishes (depending upon size), average 25% more efficient operations than standard, high-temp commercial dishwashers.[38]

Dishwashing—Commercial: Low Temp. ENERGY STAR low-temperature commercial dishwashers use chemicals, combined with low temperatures, to save energy when compared to standard high-temperature commercial dishwashers.

Drainwater Heat Recovery. Drain water heat recovery devices recover heat energy from drain water, and use that heat to pre-heat cold water entering the hot water tank, minimizing temperature rises required to achieve the set point on the water heater.[39]

Faucet Aerators. Faucet aerators, by mixing water and air, reduce the amount of water flowing through a faucet. The faucet aerator creates a fine water spray through a screen inserted in the

[35] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW
[36] http://www.patentstorm.us/patents/6607672-description.html
[37] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DW
[38] http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=COH
[39] www.toolbase.org/Techinventory/TechDetails.aspx?ContentDetailID=858&BucketID=6&CategoryID=9

faucet head. Flow-rate requirements for this measure are 0.5 GPM, compared to 3.0 GPM for existing faucets.

Integrated Space Heating/Water Heating. Integrated hot water heating systems provide space conditioning and hot water heating using one appliance or energy source. Domestic hot water is heated directly, and space heating is achieved using a hot water heat exchanger coil, piped to the forced air heating system. Thus, a combination space/water heating system can provide high-efficiency hot water heating and space heating for the cost of one high-efficiency appliance.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce amounts of water flowing through the showerhead. The showerhead creates a fine water spray through an inserted screen in the showerhead. Flow-rate requirements for this measure are presented in Table 13.

Table 13. Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.5 (Federal Standard)	4.5 (Existing)
2.0	2.5 (Federal Standard)

Low-Flow Spray Heads. Low-flow spray valves mix water and air to reduce amounts of water flowing through the spray head. The spray head creates a fine water spray through a screen inserted in the spray head. Table 14 shows flow rates considered in the measure.

Table 14. Low-Flow Spray Heads Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
1.6 (Code)	2.5 (Existing)
1.0	1.6 (Code)

Refrigeration with Heat Recovery. Heat recovery gathers and uses thermal energy that normally would be rejected from the system into the ambient environment; in this case, rejected heat is utilized by the water heater.

Ultrasonic Faucet Control. Ultrasonic sensors automatically turn on and off faucet water when motion is detected at the sink. This eliminates water running continuously while washing hands.

Water Heater—Pipe Insulation. Adding 1-inch insulation to hot water pipes yields approximately an R-value of R-4, decreasing temperature losses. This measure is only applicable for existing construction. The baseline measure is no insulation.

Water Heater—Tank Blanket/Insulation. This measure installs R-11 insulation on older models without insulation, helping reduce stand-by losses.

Water Heater Temperature Setback. This measure generates savings by reducing set point temperatures from 130°F to 120°F.

COMMERCIAL GAS EQUIPMENT MEASURE DESCRIPTIONS

HVAC

Gas Boiler. Boilers are classified as condensing and non-condensing. Condensing boilers condense flue gas and water vapor, extracting useful heat and improving boiler efficiency. Boilers are also rated by their input fuel consumption, or in terms of horsepower, where 1 boiler hp = 33,520 Btuh. This measure compares several boilers with different thermal efficiencies, and is applicable to new and existing construction. The boiler's overall efficiency is defined as the gross output energy divided by the input energy, and is affected by combustion efficiency, standby losses, cycling losses, and heat transfer. Table 15 displays the measure and baseline thermal efficiencies.

Table 15. Gas Boiler Thermal-efficiency Comparison

Measure Thermal Efficiency	Baseline Thermal Efficiency
82% (Federal Standard 2013)	80% (Federal Standard)
85%	
90%	
94%	
96%	

Gas Furnace. Similar to the gas boiler measure, this furnace measure compares several different AFUE values for differing units. Table 16 displays AFUE values compared in this measure.

Table 16. Gas Furnace AFUE Comparison

Measure AFUE	Baseline AFUE
90% (Federal Standard 2013)	78% (Federal Standard)
92%	
94%	
96%	

Water Heat

Water Heater—Condensing. Gas condensing water heaters have an improved design that reduces consumption by 30%, while maintaining superior performance. The measure has an EF of 0.80, compared to a standard water heater with a 0.59 EF.

Water Heater—Storage. High-efficiency storage water heaters prove more efficient than standard water heaters due to reduced standby losses. Table 17 shows EFs considered in this measure.

Table 17. Water Heater EF Comparison

Measure EF	Baseline EF
0.62 (Federal Standard 2015)	EF = 0.59 (Federal Standard 2001)
0.67	

Water Heater—Tankless. Tankless water heaters provide hot water at preset temperatures, as needed, without storage, thereby reducing or eliminating standby losses. An EF of 0.82 was used for the tankless system, compared to a standard water heater with an EF of 0.59.[40]

Other

Dryer—High Efficiency. High-efficiency dryers have features, such as moisture sensors, minimizing energy usage while retaining performance.

[40] http://www.toolbase.org/Technology-Inventory/Plumbing/tankless-water-heaters

APPENDIX A.2.3. INDUSTRIAL ELECTRIC MEASURES

Agricultural Exhaust Fans (Rate 21 CFM/Watt+). Exhaust fans are commonly used with water misting or drenching of cows in milking barn cow wash/holding pens, and in rest and feeding facilities. Fan efficiency is expressed as airflow per unit of input energy, or cfm/watt. Higher efficiency fans uses less power to produce the same airflow.

Air Compressor Optimization. This measure involves the overall improvement of compressed air systems, including improved system design, leak repair, usage practices, more efficient dryer and storage systems, and compressor upgrades.

Automatic Milker Takeoff. The automatic take-off system presets flow levels at which milking claws are removed, preventing over-milking and reducing run-times of vacuum systems.

Block Heater Timer. Block heaters are electrical heaters designed to keep tractors and other diesel engines warm, protecting them from freeze damage and to ease starting in cold weather. A block heater is only required for a few hours to sufficiently warm an engine block, but typically operate overnight. A block heater timer saves energy by reducing the number of hours the heater runs.

Chillers (Chiller Water-Cooled, Chiller Air Cooled, Solidstate Chiller). This measure involves upgrading of chilling systems that provide process cooling. Savings results from improved chiller efficiencies.

Chiller—Water Piping Loop with Variable Speed Drive (VSD) Control. Adding VSD control to pumps on chilled water loops reduces energy used for pumping during non-peak periods. It also reduces energy waste from blending unneeded cold water with returning warmer water, a requirement of constant-speed chilled water loops during off-peak loads.

Circulating Fans. Circulating fans move ventilation air through farm buildings efficiently, ensuring adequate temperature control and ventilation. Fans meeting performance standards provide required ventilation efficiently, and use less energy than fans not meeting these performance standards

Clean Room Improvements (Change Filter Strategy, Chiller Optimize, HVAC). These measures save energy through improved clean room equipment and practices. Savings result from optimization of chiller operating parameters, upgrading to more efficient equipment, and improving filter replacement strategies.

Cleaners: Professional Wet Cleaning. The “wet” cleaning process is an environmentally-friendly alternative to traditional dry cleaning process. The wet-cleaning system uses significantly less energy per pound of processed laundry due to differences in the two processes.

Crate Heating Pads. Heat pads are fiberglass mats, embedded with heating elements. They form a warm bed midway along one side of a farrowing crate. Compared to heat lamps, heat pads offer an improved environment for piglets and sows. They have a higher initial cost than heat

lamps, but heat pads use about one-third the electricity, and last up to 15 years, compared with only 5,000 hours for a heat lamp.

Defrost Control System. Ice builds up on evaporator coils during compressor operations, creating insulating layers that reduces heat transfer through evaporator coils, and increases loads on compressors. Frost must be removed by heating, which consumes energy. The defrost control system prevents frost build-up, saving energy that would be used to remove the frost.

Desuperheaters. Desuperheaters are heat recovery devices transferring heat from air conditioning or heat pump units to domestic water heaters. Heat normally would be transferred to ground or air. A desuperheater provides supplemental water heating only when heat pumps operate in the cooling mode.[1] The baseline is no desuperheater.

Duct Repair and Sealing. Disconnected or damaged ducts are repaired, and holes or gaps in ductwork are permanently sealed. Energy savings results from reduced loss of conditioned air to unconditioned spaces, such as plenums or attics.

Electric Chip Fab Improvements (Eliminate Exhaust, Exhaust Injector, Reduce Gas Pressure). These general improvements increase efficiency in the electric chip fabrication process.

Energy-Efficient Dehumidifier. Dehumidifiers reduce humidity and ammonia levels, therefore improving hog performance, and reducing risks to workers' health. Energy-saving models have more efficient refrigeration coils, compressors, and fans than conventional models, meaning they use less energy to remove moisture.

Enhanced (Ultra-PE) Motor. This measure upgrades motors to higher nameplate efficiency values. Since NEMA Premium motors became the baseline code requirement in 2010, this measure is based off of motors exceeding NEMA Premium by at least one efficiency band.

Evaporator Fan Controller. In some refrigeration equipment, evaporator fans run continuously, regardless of whether the system operates in cooling mode, or has cycled off after reaching the setpoint. Installing an evaporator fan controller allows evaporator fans to cycle off whenever systems are not in cooling modes.

Exit Sign—LED. Retrofit or replace compact fluorescent lamp (CFL) exit signs with light-emitting diode (LED) exit signs. LED exit signs use less kWh of electricity annually to operate, compared to kWh used by CFL exit signs.

Exit Sign—Photoluminescent. Self-luminous signs stay "lit" without AC power or DC power. The signs use chemically treated panels that create luminosity.

Floating Head Pressure Controller. Retrofits of a floating head pressure controller to an existing refrigeration system allows compressor head pressures to vary with outdoor conditions. Energy efficiency increases by reducing compressor energy during non-peak conditions.

[1] http://www1.eere.energy.gov/femp/procurement/eep_groundsource_heatpumps.html

Floating Suction Pressure Controller. Installing this measure on a refrigeration system allows minimized compressor horse power by adjusting suction pressure continually for changing load conditions. Energy efficiency increases by reducing compressor energy during non-peak conditions.

Freezer-Cooler Replacement Gaskets. Replacing aging door gaskets on refrigeration equipment reduces energy wasted through leakage to the equipment's surroundings.

General Process Improvements (Material Handling; Efficient Pulp Screen; Efficient Agitator; Effluent Treatment System; Mech Pulp: Premium Process; Mech Pulp: Refine Plate Improvement; Mech Pulp: Refiner Replacement; Replace Pneumatic Conveyor; New Arc Furnace). Generic process improvements/O&M include upgrading equipment, replacing hydraulic/pneumatic equipment with electrical equipment, and using optimum size and capacity equipment.

Grain bin aeration control systems. The aeration controller is placed between a power source and the grain bin's aeration system. The controller turns on the bin's fan when outside air temperatures reach a predetermined set point. This reduces fan energy usage, compared to the baseline condition, where the fans run continuously.

Grain dryers. Grain drying removes some moisture from grain by mechanically moving air through grain after it has been harvested. Newer, energy-efficient grain drying units can use 30% to 40% less energy than older models.

Greenhouse Heat Curtain. Thermal curtains decrease heat losses in greenhouses (conduction, convection, and radiation losses). Thermal curtains are installed inside the greenhouse, typically horizontally near the greenhouse gutter line. It is assumed thermal curtains are deployed during nighttime hours and opened during daytime hours.

Heat Lamp Setback (Microzone). This measure saves energy by automatically adjusting power to heat lamps compensating for fluctuations in room temperature. Lamp life is also extended due to reduced usage. One additional benefit results from power being restored slowly after a power outage, reducing peak demand on the power utility or a backup generator.

Heat Lamp/Heating Pad Controller. This measure allows producers to adjust the heat output of bulbs or pads. By applying only the minimum power needed, energy waste is reduced and equipment life extended.

Heat Lamps. This measure provides radiant heat, warming pigs, chicks, lambs, or calves. Changing to lower wattage, higher-efficiency heat lamps helps save electricity.

Heat Pump—Ground Source. A ground source heat pump extracts ground heat in the winter (for heating), and transfers heat back into the ground in summer (for cooling). Using the ground as a relatively constant-temperature reservoir for heat transfer results in higher heating and cooling efficiencies.

Heat Reclaimer. Hot water is used to clean milk pipes and sanitize work areas. A heat reclaimer takes waste heat from the milk refrigeration process, using it to preheat water to reduce heating loads on primary water heaters.

Heat Recovery Ventilators (HRV). This equipment employs a counter-flow heat exchanger (countercurrent heat exchange) between the inbound and outbound air flow. HRV provides fresh air and improved climate control, while saving energy by reducing heating (and cooling) requirements.

High-Efficiency Plastic Injection Molders. Energy is saved by upgrading plastic injection molders to newer, high-efficiency units.

High-Efficiency Stock Tank. This equipment provides livestock with fresh water, which must be kept above freezing. Energy savings can be achieved by changing a conventional stock watering tank with an electric heater to an electric-free (solar or insulated) stock watering tank.

High-Volume Low-Speed Fans. High-volume, low-speed (HVLS) fans traditionally are used for ventilating livestock barns, keeping livestock cool in summer and warm in winter. HVLS fans use much less electricity than typical, high-speed fans, which move similar amounts of air.

High-Efficiency Ventilation System. These ventilation systems ensure adequate temperature controls and ventilation for livestock by bringing in or exhausting air to facilities. Fans meeting performance standards provide the required ventilation efficiently, using less energy than fans not meeting these performance standards.

Infrared Film for Greenhouses. Polyethylene allows more radiant heat loss than other greenhouse glazing materials. IR films are common additives to polyethylene plastics, helpign reduce heat loss from greenhouses and improve U-values of double-layer polyethylene by nearly 30% (from 0.7 to 0.5).

Insulation for Bare Suction Lines. Energy efficiency of refrigeration systems can be improved by reducing wasted cooling capacity escaping from uninsulated suction lines.

Integrated Plant Energy Management. This measure includes synergistic savings opportunities from plant-wide energy management and improvements across multiple systems, such as compressed air, pumping, and fan systems.

LED Traffic Lights. Energy savings result from upgrading standard traffic signals to high-efficiency LED equivalents.

Livestock Waterers. Energy-efficient livestock waterers have 2 inches or more of insulation, completely surrounding the inside of the waterer, and an adjustable thermostat.

Lighting—CFL Lamp Package. CFL reduction packages reduce power density, compared to baseline EISA-compliant incandescent lighting.

Lighting—Fluorescent High-Performance Package. Fluorescent lighting reduction packages, such as high-performance T8 fixtures, reduce power density, compared to baseline T8 fixtures.

Lighting—Fluorescent Reduced Wattage Package. Fluorescent lighting reduction packages, such as low-wattage T8 fixtures, reduce power density compared to baseline T8 fixtures.

Lighting—High Bay Fluorescent High-Output Package. Fluorescent lighting reduction packages, such as T5HO (High Output) for high bay applications in warehouse and grocery facilities, reduce power density compared to baseline fluorescent high bay lighting.

Lighting—High-Intensity Discharge Package. Metal halide (MH) high-intensity discharge (HID) fixtures replace mercury vapor or other high-wattage fixture (e.g., quartz halogen), which reduces power density.

Lighting—LED Lamp Package. LED reduction packages reduce power density compared to baseline EISA compliant incandescent lighting.

Low-Pressure Irrigation. Converting center-pivot irrigation systems to operate at lower pressures significantly reduces pumping energy required to distribute irrigation water.

Mechanical Subcoolers. Mechanical subcoolers cool liquid refrigerant below its saturation pressure, increasing system capacity and improving efficiency.

Milk Precooler—Dairy Plate Cooler. Milk coming from an automatic milker must be cooled to help preserve it, and to prepare it for processing and shipment. The milk pre-cooler is a heat exchanger using well water to begin cooling the milk before it enters the bulk cooling tank. Pre-cooling lowers the load on the refrigeration system, and is more efficient. The additional pump energy is more than offset by reductions in compressor energy consumption.

Motor Early Retirement. This measure encourages replacement of standard efficiency motors with premium efficiency motors before the end of their useful life.

Motor Management Plan. This measure saves energy through a number of practices associated with maintaining and operating motors through their entire life cycle. Steps include developing a repair/replace policy, regularly schedule maintenance, motor standardization, rewind criteria, and design optimization parameters.

Motor Rewind. This measure involves rewinding motors in a controlled environment to minimize or eliminate efficiency losses. Motor rewinds assume rewind techniques consistent with the Green Motors Practices Group™.

Package Terminal. Also known as PTAC and PTHP units, package terminal air conditioning and heat pump equipment houses all components (compressor; condenser and evaporator coils; expansion device; condenser and evaporator fans; and associated operating and control devices) within a single cabinet. Installing a high-efficiency PTAC or PTHP saves energy compared to the federal standard.

Power Quality-Improving Appliances. Significant reductions in electric costs can be achieved by installing devices to improve a facility's power factor, if the facility's billing structure includes a penalty for low power factors. Slight reductions in energy savings can result from

reduced resistive losses if power factor correcting devices are placed very near inductive loads, such as motors.

Programmable Ventilation Controller. Programmable ventilation controllers vary the speed of ventilation fans to meet immediate needs of a facility. Ventilation controllers ensure proper ventilation and temperature control, while minimizing run times of ventilation fans.

Pulse Cooling for Injection Molders. This measure is a retrofit of standard injection molding machines with pulse cooling units. This unit reduces wasted cooling energy during the injection molding process.

Pump System Optimization. This measure involves overall optimization of pump systems, including improved system design, enhanced flow design, better maintenance practices, and adjustments to system parameters.

Scroll Compressor. Replacing standard compressors in milk cooling systems with scroll compressors can save approximately 30% of system energy usage. Scroll compressors use dual spinning coils to compress refrigerant, providing continuous, pulse-free compressor operation, without the need for mechanical valves.

Streetlight—HPS to LED. Energy savings result from replacing standard, high-pressure sodium streetlighting with high-efficiency LED equivalents.

Strip Curtains for Walk-Ins. This measure reduces loss of chilled air from walk-in coolers through open doorways.

Switch from Belt Drive to Direct Drive. This measure improves efficiency through reductions of losses associated with belt drive systems.

Synchronous Belts. Synchronous belts contain grooves, which mate with corresponding grooves in the drive sprocket, preventing slip and reducing energy losses.

Thermostat Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Transformers. Energy-efficient transformers provide improved power quality while minimizing losses.

Variable Speed Compressor Systems. This measure improves the energy efficiency of refrigeration systems by modulating compressors to match refrigeration loads. Energy is saved by throttling compressors back during non-peak periods.

Variable Speed Drives (Variable Speed Drive Control; Variable Speed Drives for Dairy Vacuum Pumps; VFD on Cooling Tower Fans; VFDs on Small Milking Machines). This measure improves energy efficiency by matching energy used by pumps and fans with required loads. Energy is saved when system operate at a partial load, and full pump/fan capacity is not needed.

VFD Controlled Compressor. This measure improves energy efficiency of compressed air systems by modulating compressors to match facility demand for compressed air. Energy is saved by throttling compressors back during non-peak periods.

High-efficiency Evaporator Fan Motors (Walk-in PSC to ECM; Walk-in Shaded Pole to ECM). Installing high-efficiency evaporator fan motors improves the energy efficiency of refrigeration systems.

GAS MEASURES

Blowdown Steam Heat Recovery. Boiler blowdown wastes energy as blown down liquid remains at about the same temperature as steam produced. Much of this heat can be recovered by routing the blown down liquid through a heat exchanger, preheating the boiler's makeup water.

Duct Repair and Sealing. Disconnected or damaged ducts are repaired, and holes or gaps in ductwork are permanently sealed. Energy savings results from reduced loss of conditioned air to unconditioned spaces, such as plenums or attics.

Economizer. An economizer recovers heat energy, with otherwise would lost out boiler stacks. This heat energy is recovered by using a heat exchanger, located on the stack, to heat boiler feed water.[2]

High-Efficiency Process Upgrades (Efficient Boiler, Efficient Burners, Efficient Drying, Efficient Process Furnaces). Energy efficiency of various industrial processes can be increased by upgrading process equipment to higher-efficiency models.

Heat Recovery/Economizer. Energy efficiency of boiler systems can be improved by recovering heat from hot flue gases for reuse in the process. Typically, recovered heat pre-heats boiler feed water.

High-Efficiency Pulping. Various technologies can be installed to reduce energy required to produce pulp from wood products in the paper manufacturing industry.

Improved Boiler Insulation. This measure reduces heat lost through the boiler shell.

Improved Control Measures (Improved Boiler Load Control; Improved Boiler Process Control; Improved Controls; Optimized Furnace Operations). These measures improve efficiency through maintaining optimum flame temperatures, monitoring oxygen levels in flue gas, and so on. Energy efficiency is maximized by controlling the fuel/air mixture for optimum combustion of input fuels.

Oxyfuel. Converting a standard fuel furnace to an oxy-fuel furnace increases efficiency as oxygen-rich fuel burns more efficiently.

Steam Strap Upgrades (Steam Trap Maintenance; Steam Trap Replacement). Leaky and malfunctioning steam traps can waste significant energy in steam systems. Replacement or repair increases overall efficiency of steam systems.

Thermal Oxidizer Upgrades. Thermal oxidizers used to control VOCs in industrial facilities consume large amounts of natural gas to combust and incinerate pollutants. Installing a regenerative thermal oxidizer allows some wasted heat to be recovered and used for preheating or other uses.

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[2] http://crownsolutions.com/news_september05.html

Thermostat Programmable. A programmable thermostat controls set point temperatures automatically, ensuring HVAC systems do not run during low-occupancy hours.

Upgrade Burner Efficiency. Fuel burners in boilers can be replaced with high-efficiency burners, resulting in increased combustion efficiency.

Waste Heat Recovery. This is a general measure for recovering of waste heat from industrial processes.

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	Existing	76	4	$8	100%	2,428
Low Income Multi Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	New	76	4	$8	100%	151
Low Income Multi Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	Existing	0.00	4	$0.00	100%	0
Low Income Multi Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	New	0.00	4	$0.00	100%	0
Low Income Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	102	19	$176	100%	0
Low Income Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	102	19	$176	100%	0
Low Income Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Multi Family	Cool Central	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	66	19	$249	82%	1,917
Low Income Multi Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	Existing	0.00	8	$0.00	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	New	0.00	8	$0.00	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	Existing	160	15	$476	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	New	109	15	$476	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	Existing	225	15	$714	100%	2,528
Low Income Multi Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	New	153	15	$714	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	Existing	124	15	$357	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	New	84	15	$357	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	Existing	333	15	$1,192	100%	2,651
Low Income Multi Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	New	228	15	$1,192	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	Existing	0.00	15	$0.00	100%	0
Low Income Multi Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	New	0.00	15	$0.00	100%	0
Low Income Multi Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.33	20	$0.25	21%	1,029
Low Income Multi Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.22	20	$0.25	21%	38
Low Income Multi Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.34	20	$0.92	32%	78
Low Income Multi Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.24	20	$0.92	32%	4
Low Income Multi Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.61	20	$3	40%	170
Low Income Multi Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.44	20	$3	40%	8
Low Income Multi Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	40	18	$333	54%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	179	18	$960	24%	1,218
Low Income Multi Family	Cool Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	119	18	$587	54%	1,953
Low Income Multi Family	Cool Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.08	30	$13	88%	0
Low Income Multi Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	119	11	$611	13%	0
Low Income Multi Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	53	11	$611	20%	0
Low Income Multi Family	Cool Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.05	11	$0.25	42%	52
Low Income Multi Family	Cool Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.15	11	$0.44	19%	1,105
Low Income Multi Family	Cool Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.07	11	$0.19	63%	1,825
Low Income Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.08	20	$0.99	7%	140
Low Income Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.09	20	$1	7%	92
Low Income Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	17%	0
Low Income Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	17%	0
Low Income Multi Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Low Income Multi Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Low Income Multi Family	Cool Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	37	20	$375	71%	0
Low Income Multi Family	Cool Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Low Income Multi Family	Cool Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.14	20	$1	8%	43
Low Income Multi Family	Cool Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.12	20	$0.51	14%	272
Low Income Multi Family	Cool Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	28%	0
Low Income Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.24	20	$1	3%	87
Low Income Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.28	20	$1	1%	34
Low Income Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	14
Low Income Multi Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	125	5	$300	45%	0
Low Income Multi Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	New	85	5	$300	45%	0
Low Income Multi Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	122	30	$675	49%	1,534
Low Income Multi Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	83	30	$480	82%	154
Low Income Multi Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	71	19	$331	10%	0
Low Income Multi Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	49	19	$331	10%	0
Low Income Multi Family	Cool Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	55	11	$895	62%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Cool Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	41	15	$33	42%	331
Low Income Multi Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	41	15	$167	44%	562
Low Income Multi Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	28	15	$167	62%	38
Low Income Multi Family	Cool Central	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Tune-up	Existing	89	5	$200	71%	0
Low Income Multi Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	179	20	$366	10%	609
Low Income Multi Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	122	20	$366	10%	28
Low Income Multi Family	Cool Central	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.89	10	$4	76%	0
Low Income Multi Family	Cool Central	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.59	3	$7	38%	0
Low Income Multi Family	Cool Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.45	20	$19	24%	0
Low Income Multi Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.12	20	$3	73%	0
Low Income Multi Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$3	82%	0
Low Income Multi Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.32	20	$28	63%	0
Low Income Multi Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.23	20	$28	68%	0
Low Income Multi Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	21%	0
Low Income Multi Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.06	20	$0.25	21%	0
Low Income Multi Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.09	20	$0.92	32%	6
Low Income Multi Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.08	20	$0.92	32%	0
Low Income Multi Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.17	20	$3	40%	12
Low Income Multi Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.15	20	$3	40%	1
Low Income Multi Family	Cool Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Low Income Multi Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	37	11	$611	13%	0
Low Income Multi Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	24	11	$611	20%	0
Low Income Multi Family	Cool Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	0
Low Income Multi Family	Cool Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.44	19%	51
Low Income Multi Family	Cool Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	151
Low Income Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$0.99	7%	0
Low Income Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$1	7%	0
Low Income Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.00	20	$0.25	17%	0
Low Income Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	17%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Low Income Multi Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Low Income Multi Family	Cool Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Low Income Multi Family	Cool Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.03	20	$1	8%	2
Low Income Multi Family	Cool Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.03	20	$0.51	14%	19
Low Income Multi Family	Cool Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	28%	0
Low Income Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.06	20	$1	3%	6
Low Income Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.07	20	$1	1%	2
Low Income Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.00	20	$0.16	90%	1
Low Income Multi Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	37	30	$675	49%	0
Low Income Multi Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	37	30	$480	82%	0
Low Income Multi Family	Cool Room	Removal of Secondary Window Air Conditioner Unit	Proper Disposal of Window Air Conditioner Unit	Existing Non-Efficient Window Air Conditioner Unit	Per Recyled Unit	Existing	378	3	$30	22%	988
Low Income Multi Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	39	9	$308	100%	0
Low Income Multi Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	39	9	$308	100%	0
Low Income Multi Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	50	9	$575	100%	0
Low Income Multi Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	50	9	$575	100%	0
Low Income Multi Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	27	9	$41	100%	251
Low Income Multi Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	27	9	$41	100%	25
Low Income Multi Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	9	$0.00	100%	0
Low Income Multi Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	9	$0.00	100%	0
Low Income Multi Family	Cool Room	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.27	10	$4	76%	0
Low Income Multi Family	Cool Room	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.18	3	$7	38%	0
Low Income Multi Family	Cool Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.12	20	$19	24%	0
Low Income Multi Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.03	20	$3	73%	0
Low Income Multi Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.03	20	$3	82%	0
Low Income Multi Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$28	61%	0
Low Income Multi Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$28	68%	0
Low Income Multi Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	Existing	0.00	6	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Multi Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	Existing	73	6	$1,505	100%	0
Low Income Multi Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	New	73	6	$1,505	100%	0
Low Income Multi Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Low Income Multi Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	New	0.00	12	$0.00	100%	0
Low Income Multi Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	Existing	117	12	$34	100%	1,724
Low Income Multi Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	New	117	12	$34	100%	175
Low Income Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	107	11	$137	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	107	11	$137	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	107	11	$372	98%	0
Low Income Multi Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	New	107	11	$372	98%	0
Low Income Multi Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Low Income Multi Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Multi Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	55	12	$75	100%	0
Low Income Multi Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	New	55	12	$75	100%	0
Low Income Multi Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	159	12	$214	100%	0
Low Income Multi Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	New	159	12	$214	100%	0
Low Income Multi Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Low Income Multi Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	New	0.00	12	$0.00	100%	0
Low Income Multi Family	Freezer	Removal of Secondary Stand-Alone Freezer	Proper Disposal of Stand-Alone Freezer	Existing Non-Efficient Stand-Alone Freezer	Per Recyled Unit	Existing	916	5	$30	24%	2,015
Low Income Multi Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	6.17	20	$0.92	32%	363
Low Income Multi Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	6.17	20	$0.92	32%	22
Low Income Multi Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	11	20	$3	40%	733
Low Income Multi Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	11	20	$3	40%	47
Low Income Multi Family	Heat Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,284	18	$960	18%	1,520
Low Income Multi Family	Heat Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	856	18	$587	25%	1,455

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Heat Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.15	30	$13	88%	0
Low Income Multi Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	1,712	18	$1,085	0%	0
Low Income Multi Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,191	18	$1,085	75%	149
Low Income Multi Family	Heat Central	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Low Income Multi Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	856	11	$611	13%	0
Low Income Multi Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	387	11	$611	20%	0
Low Income Multi Family	Heat Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.39	11	$0.25	42%	26
Low Income Multi Family	Heat Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.13	11	$0.44	19%	1,797
Low Income Multi Family	Heat Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.56	11	$0.19	63%	3,150
Low Income Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.45	20	$0.99	7%	734
Low Income Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.70	20	$1	7%	777
Low Income Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.24	20	$0.25	17%	103
Low Income Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.24	20	$0.25	17%	5
Low Income Multi Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.24	20	$1	7%	1,329
Low Income Multi Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.93	20	$1	14%	3,281
Low Income Multi Family	Heat Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	363	20	$375	71%	704
Low Income Multi Family	Heat Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	1.24	20	$0.90	57%	5,143
Low Income Multi Family	Heat Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	2.53	20	$1	8%	212
Low Income Multi Family	Heat Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	2.20	20	$0.51	14%	1,263
Low Income Multi Family	Heat Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.79	20	$0.44	28%	111
Low Income Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.37	20	$1	3%	383
Low Income Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	5.12	20	$1	1%	150
Low Income Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.36	20	$0.16	90%	83
Low Income Multi Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	171	30	$675	49%	0
Low Income Multi Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	119	30	$480	82%	0
Low Income Multi Family	Heat Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	405	11	$895	62%	0
Low Income Multi Family	Heat Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	299	15	$33	42%	615
Low Income Multi Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	300	15	$167	44%	935

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	209	15	$167	62%	18
Low Income Multi Family	Heat Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	8.14	20	$19	24%	0
Low Income Multi Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	2.26	20	$3	73%	0
Low Income Multi Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.26	20	$3	82%	0
Low Income Multi Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	5.88	20	$28	61%	0
Low Income Multi Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	5.88	20	$28	68%	0
Low Income Multi Family	Heat Pump	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	67	19	$249	82%	0
Low Income Multi Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	21%	0
Low Income Multi Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.04	20	$0.25	21%	0
Low Income Multi Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	3.27	20	$0.92	32%	0
Low Income Multi Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.81	20	$0.92	32%	0
Low Income Multi Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	5.87	20	$3	40%	0
Low Income Multi Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	5.05	20	$3	40%	0
Low Income Multi Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	307	18	$333	54%	0
Low Income Multi Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,133	18	$960	24%	0
Low Income Multi Family	Heat Pump	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	755	18	$587	54%	0
Low Income Multi Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	Existing	280	15	$200	62%	0
Low Income Multi Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	New	222	15	$200	90%	0
Low Income Multi Family	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.24	30	$13	88%	0
Low Income Multi Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	1,511	18	$1,085	56%	0
Low Income Multi Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,230	18	$1,085	75%	0
Low Income Multi Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	Existing	0.00	9	$0.00	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	New	0.00	9	$0.00	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	701	18	$548	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	567	18	$548	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	475	18	$411	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	381	18	$411	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,056	18	$822	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	856	18	$822	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	2,576	18	$6,657	25%	0
Low Income Multi Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	2,108	18	$6,739	25%	0
Low Income Multi Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	0.00	18	$0.00	100%	0
Low Income Multi Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	0.00	18	$0.00	100%	0
Low Income Multi Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	755	11	$611	13%	0
Low Income Multi Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	399	11	$611	20%	0
Low Income Multi Family	Heat Pump	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.40	11	$0.25	42%	0
Low Income Multi Family	Heat Pump	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.00	11	$0.44	19%	0
Low Income Multi Family	Heat Pump	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.50	11	$0.19	63%	0
Low Income Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.77	20	$0.99	7%	0
Low Income Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.90	20	$1	7%	0
Low Income Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.13	20	$0.25	17%	0
Low Income Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.11	20	$0.25	17%	0
Low Income Multi Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.88	20	$1	7%	0
Low Income Multi Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.19	20	$1	14%	0
Low Income Multi Family	Heat Pump	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	307	20	$375	71%	0
Low Income Multi Family	Heat Pump	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.65	20	$0.90	57%	0
Low Income Multi Family	Heat Pump	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	1.34	20	$1	8%	0
Low Income Multi Family	Heat Pump	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	1.17	20	$0.51	14%	0
Low Income Multi Family	Heat Pump	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.30	20	$0.44	28%	0
Low Income Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.31	20	$1	3%	0
Low Income Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.71	20	$1	1%	0
Low Income Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.16	20	$0.16	90%	0
Low Income Multi Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	872	5	$300	45%	0
Low Income Multi Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	New	710	5	$300	45%	0
Low Income Multi Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	771	30	$675	49%	0
Low Income Multi Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	628	30	$480	82%	0
Low Income Multi Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	72	19	$331	10%	0
Low Income Multi Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	59	19	$331	10%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Heat Pump	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	418	11	$895	62%	0
Low Income Multi Family	Heat Pump	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	264	15	$33	42%	0
Low Income Multi Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	265	15	$167	44%	0
Low Income Multi Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	215	15	$167	62%	0
Low Income Multi Family	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Tune-up	Existing	524	5	$200	71%	0
Low Income Multi Family	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Tune-up	Existing	377	5	$200	0%	0
Low Income Multi Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	181	20	$366	10%	0
Low Income Multi Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	147	20	$366	10%	0
Low Income Multi Family	Heat Pump	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.89	10	$4	76%	0
Low Income Multi Family	Heat Pump	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.59	3	$7	38%	0
Low Income Multi Family	Heat Pump	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	4.31	20	$19	24%	0
Low Income Multi Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.19	20	$3	73%	0
Low Income Multi Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.10	20	$3	82%	0
Low Income Multi Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	3.11	20	$28	61%	0
Low Income Multi Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.86	20	$28	68%	0
Low Income Multi Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	1.54	20	$0.92	32%	98
Low Income Multi Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	1.54	20	$0.92	32%	6
Low Income Multi Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	2.77	20	$3	40%	0
Low Income Multi Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.77	20	$3	40%	0
Low Income Multi Family	Heat Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.04	30	$13	88%	0
Low Income Multi Family	Heat Room	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Low Income Multi Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	659	11	$611	13%	0
Low Income Multi Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	298	11	$611	20%	0
Low Income Multi Family	Heat Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.30	11	$0.25	42%	0
Low Income Multi Family	Heat Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.87	11	$0.44	19%	744
Low Income Multi Family	Heat Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.43	11	$0.19	63%	2,996
Low Income Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.36	20	$0.99	7%	0
Low Income Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.42	20	$1	7%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.06	20	$0.25	17%	0
Low Income Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.06	20	$0.25	17%	0
Low Income Multi Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.06	20	$1	7%	0
Low Income Multi Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.23	20	$1	14%	353
Low Income Multi Family	Heat Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.31	20	$0.90	57%	0
Low Income Multi Family	Heat Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.63	20	$1	8%	0
Low Income Multi Family	Heat Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.55	20	$0.51	14%	134
Low Income Multi Family	Heat Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.19	20	$0.44	28%	0
Low Income Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.09	20	$1	3%	43
Low Income Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.28	20	$1	1%	17
Low Income Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.09	20	$0.16	90%	0
Low Income Multi Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	131	30	$675	49%	0
Low Income Multi Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	91	30	$480	82%	0
Low Income Multi Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	2.03	20	$19	24%	0
Low Income Multi Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.56	20	$3	73%	0
Low Income Multi Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.56	20	$3	82%	0
Low Income Multi Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.47	20	$28	61%	0
Low Income Multi Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.47	20	$28	68%	0
Low Income Multi Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	Existing	22	7	$20	100%	0
Low Income Multi Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	New	22	7	$20	100%	0
Low Income Multi Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Multi Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	New	0.00	7	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	11	11	$611	13%	0
Low Income Multi Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	11	11	$611	20%	0
Low Income Multi Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	Existing	11	10	$64	25%	0
Low Income Multi Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	New	11	10	$64	25%	0
Low Income Multi Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	Existing	35	3	$4	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	New	35	3	$4	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	Existing	32	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	New	32	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	Existing	51	12	$36	100%	1,860
Low Income Multi Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	New	51	12	$36	100%	109
Low Income Multi Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	Existing	6.08	5	$18	82%	0
Low Income Multi Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	New	6.08	5	$18	82%	0
Low Income Multi Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	Existing	31	6	$6	65%	6,547
Low Income Multi Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	New	31	6	$6	65%	408
Low Income Multi Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	Existing	37	12	$28	50%	11,089
Low Income Multi Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	New	37	12	$28	50%	624
Low Income Multi Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	55	11	$611	13%	0
Low Income Multi Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	55	11	$611	20%	0
Low Income Multi Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	Existing	11	10	$64	14%	0
Low Income Multi Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	New	11	10	$64	14%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	Existing	15	5	-0.2101	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	New	15	5	-0.2101	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	Existing	14	2	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	New	14	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Multi Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	Existing	22	12	$24	100%	9,155
Low Income Multi Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	New	22	12	$24	100%	545
Low Income Multi Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	Existing	20	10	$56	17%	0
Low Income Multi Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	New	20	10	$56	17%	0
Low Income Multi Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	Existing	14	5	$0.00	100%	0
Low Income Multi Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	New	14	5	$0.00	100%	0
Low Income Multi Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	Existing	18	3	$0.99	100%	776
Low Income Multi Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	New	18	3	$0.99	100%	46
Low Income Multi Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	Existing	0.00	3	$0.00	100%	0
Low Income Multi Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	New	0.00	3	$0.00	100%	0
Low Income Multi Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	Existing	12	3	$4	36%	0
Low Income Multi Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	New	12	3	$4	36%	0
Low Income Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	65	10	$119	51%	0
Low Income Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	65	10	$119	51%	0
Low Income Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	51%	155
Low Income Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	51%	9
Low Income Multi Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	Existing	25	5	$1	29%	527

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	New	25	5	$1	29%	31
Low Income Multi Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	Existing	24	4	$8	4%	28
Low Income Multi Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	New	24	4	$8	4%	1
Low Income Multi Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	Existing	100	5	$22	62%	4,348
Low Income Multi Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	New	100	5	$22	62%	256
Low Income Multi Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	Existing	32	5	$13	100%	452
Low Income Multi Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	New	32	5	$13	100%	23
Low Income Multi Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	New	0.00	7	$0.00	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	142	13	$429	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	142	13	$429	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	170	13	$580	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	170	13	$580	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	113	13	$251	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	113	13	$251	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	56	13	$124	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	56	13	$124	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Low Income Multi Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Low Income Multi Family	Refrigerator	Removal of Secondary Refrigerator/Freezer	Proper Disposal of Refrigerator/Freezer Combo	Existing Non-Efficient Refrigerator/Freezer	Per Recyled Unit	Existing	1,140	5	$30	16%	12,915
Low Income Multi Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	164	5	$12	100%	5,296
Low Income Multi Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	164	5	$12	100%	349
Low Income Multi Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	Existing	118	5	$55	100%	5,671
Low Income Multi Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	New	118	5	$55	100%	294

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Multi Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Multi Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	Existing	280	15	$200	62%	8,883
Low Income Multi Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	New	222	15	$200	90%	616
Low Income Multi Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	Existing	0.00	20	$0.00	100%	0
Low Income Multi Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	New	0.00	20	$0.00	100%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	428	11	$789	27%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	428	11	$789	27%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	308	11	$391	24%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	308	11	$391	25%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	343	11	$565	26%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	343	11	$565	26%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	267	11	$134	20%	744
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	267	11	$134	20%	43
Low Income Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	428	11	$789	27%	0
Low Income Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	428	11	$789	27%	0
Low Income Multi Family	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	233	10	$600	43%	0
Low Income Multi Family	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	466	10	$600	0%	0
Low Income Multi Family	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	466	10	$600	0%	0
Low Income Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	155	11	$1,067	21%	0
Low Income Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	155	11	$1,067	21%	0
Low Income Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	60	11	$272	7%	0
Low Income Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	60	11	$272	7%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	545	40	$935	10%	583
Low Income Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	512	40	$935	71%	241
Low Income Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	104	10	$1	85%	1,268
Low Income Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	99	10	$1	90%	73
Low Income Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	43	10	$1	26%	8
Low Income Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	41	10	$1	28%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	12	10	$0.53	14%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	11	10	$0.53	15%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	49	10	$3	9%	64
Low Income Multi Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	172	6	$524	1%	0
Low Income Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	308	10	$8	80%	3,523
Low Income Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	293	10	$8	80%	194
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	154	10	$13	38%	43
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	146	10	$13	38%	2
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	154	10	$24	23%	511
Low Income Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	1,165	15	$6,238	15%	0
Low Income Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	1,094	15	$4,878	15%	0
Low Income Multi Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	New	0.00	7	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	1,244	13	$1,281	60%	2,644
Low Income Multi Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	New	1,185	13	$1,281	60%	142
Low Income Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	69	13	$6	30%	248
Low Income Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	69	13	$6	45%	21
Low Income Multi Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	74	13	$43	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	New	71	13	$43	100%	0
Low Income Multi Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	151	13	$17	10%	180
Low Income Multi Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	147	20	$260	0%	0
Low Income Multi Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	New	140	20	$260	0%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	445	4	$10	7%	379
Low Income Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	418	4	$10	7%	21
Low Income Single Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	Existing	76	4	$8	100%	8,359
Low Income Single Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	New	76	4	$8	100%	522
Low Income Single Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	Existing	0.00	4	$0.00	100%	0
Low Income Single Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	New	0.00	4	$0.00	100%	0
Low Income Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	102	19	$176	100%	0
Low Income Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	102	19	$176	100%	0
Low Income Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Single Family	Cool Central	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	124	19	$249	82%	4,221
Low Income Single Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	Existing	0.00	8	$0.00	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	New	0.00	8	$0.00	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	Existing	279	15	$714	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	New	212	15	$714	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	Existing	392	15	$1,071	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	New	298	15	$1,071	100%	593
Low Income Single Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	Existing	216	15	$535	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	New	164	15	$535	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	Existing	581	15	$1,788	100%	11,776
Low Income Single Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	New	442	15	$1,788	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	Existing	0.00	15	$0.00	100%	0
Low Income Single Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	New	0.00	15	$0.00	100%	0
Low Income Single Family	Cool Central	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.11	40	$2	67%	0
Low Income Single Family	Cool Central	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.11	40	$0.76	67%	250
Low Income Single Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.33	20	$0.25	45%	1,931
Low Income Single Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.23	20	$0.25	45%	71
Low Income Single Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.34	20	$0.92	61%	19

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.24	20	$0.92	61%	1
Low Income Single Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.61	20	$3	76%	616
Low Income Single Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.44	20	$3	76%	28
Low Income Single Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	79	18	$333	65%	105
Low Income Single Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	335	18	$960	33%	3,937
Low Income Single Family	Cool Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	223	18	$587	65%	3,949
Low Income Single Family	Cool Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.15	30	$13	88%	0
Low Income Single Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	223	11	$611	48%	2,625
Low Income Single Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	102	11	$611	64%	0
Low Income Single Family	Cool Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.06	11	$0.25	42%	90
Low Income Single Family	Cool Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.19	11	$0.44	19%	1,732
Low Income Single Family	Cool Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.09	11	$0.19	63%	3,249
Low Income Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.08	20	$0.99	27%	462
Low Income Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.09	20	$1	27%	332
Low Income Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Low Income Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Low Income Single Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	12%	0
Low Income Single Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	24%	0
Low Income Single Family	Cool Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	70	20	$248	71%	1,765
Low Income Single Family	Cool Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	60%	0
Low Income Single Family	Cool Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.14	20	$1	22%	97
Low Income Single Family	Cool Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.12	20	$0.51	14%	903
Low Income Single Family	Cool Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	17%	0
Low Income Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.24	20	$1	3%	150
Low Income Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.28	20	$1	2%	269
Low Income Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	33
Low Income Single Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	234	5	$300	45%	940
Low Income Single Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	New	166	5	$300	45%	0
Low Income Single Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	228	30	$675	82%	5,603
Low Income Single Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	161	30	$480	82%	303

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	134	19	$331	49%	2,738
Low Income Single Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	94	19	$331	49%	117
Low Income Single Family	Cool Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	107	11	$895	86%	0
Low Income Single Family	Cool Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	78	15	$33	67%	0
Low Income Single Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	78	15	$167	70%	775
Low Income Single Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	55	15	$167	90%	113
Low Income Single Family	Cool Central	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Tune-up	Existing	167	5	$200	71%	2,737
Low Income Single Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	335	20	$366	48%	6,705
Low Income Single Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	237	20	$366	48%	285
Low Income Single Family	Cool Central	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.55	10	$4	76%	0
Low Income Single Family	Cool Central	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.36	3	$7	38%	0
Low Income Single Family	Cool Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.45	20	$24	24%	0
Low Income Single Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.12	20	$8	73%	0
Low Income Single Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Low Income Single Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.32	20	$33	61%	0
Low Income Single Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.23	20	$33	68%	0
Low Income Single Family	Cool Room	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.02	40	$2	67%	0
Low Income Single Family	Cool Room	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.02	40	$0.76	67%	32
Low Income Single Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	45%	0
Low Income Single Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.06	20	$0.25	45%	0
Low Income Single Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.09	20	$0.92	61%	3
Low Income Single Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.08	20	$0.92	61%	0
Low Income Single Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.17	20	$3	76%	117
Low Income Single Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.15	20	$3	76%	8
Low Income Single Family	Cool Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Low Income Single Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	37	11	$611	48%	0
Low Income Single Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	24	11	$611	64%	0
Low Income Single Family	Cool Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.01	11	$0.25	42%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Cool Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.44	19%	128
Low Income Single Family	Cool Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.01	11	$0.19	63%	377
Low Income Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$0.99	27%	0
Low Income Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$1	27%	0
Low Income Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.00	20	$0.25	45%	0
Low Income Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Low Income Single Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	12%	0
Low Income Single Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	24%	0
Low Income Single Family	Cool Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	60%	0
Low Income Single Family	Cool Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.03	20	$1	22%	25
Low Income Single Family	Cool Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.03	20	$0.51	14%	150
Low Income Single Family	Cool Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	17%	0
Low Income Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.06	20	$1	3%	25
Low Income Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.07	20	$1	2%	44
Low Income Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.00	20	$0.16	90%	11
Low Income Single Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	37	30	$675	82%	0
Low Income Single Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	37	30	$480	82%	0
Low Income Single Family	Cool Room	Removal of Secondary Window Air Conditioner Unit	Proper Disposal of Window Air Conditioner Unit	Existing Non-Efficient Window Air Conditioner Unit	Per Recyled Unit	Existing	378	3	$30	22%	2,543
Low Income Single Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Single Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	39	9	$308	100%	0
Low Income Single Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	39	9	$308	100%	0
Low Income Single Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	50	9	$575	100%	0
Low Income Single Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	50	9	$575	100%	0
Low Income Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	27	9	$41	100%	631
Low Income Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	27	9	$41	100%	59
Low Income Single Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	9	$0.00	100%	0
Low Income Single Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	9	$0.00	100%	0
Low Income Single Family	Cool Room	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.09	10	$4	76%	0
Low Income Single Family	Cool Room	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.06	3	$7	38%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Cool Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.12	20	$24	24%	0
Low Income Single Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.03	20	$8	73%	0
Low Income Single Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.03	20	$8	82%	0
Low Income Single Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$33	61%	0
Low Income Single Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$33	68%	0
Low Income Single Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Low Income Single Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Single Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	Existing	73	6	$1,505	100%	0
Low Income Single Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	New	73	6	$1,505	100%	0
Low Income Single Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Low Income Single Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	New	0.00	12	$0.00	100%	0
Low Income Single Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	Existing	117	12	$34	100%	3,007
Low Income Single Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	New	117	12	$34	100%	305
Low Income Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	142	11	$137	100%	2,870
Low Income Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	142	11	$137	100%	216
Low Income Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Low Income Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Low Income Single Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	142	11	$372	98%	0
Low Income Single Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	New	142	11	$372	98%	0
Low Income Single Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Low Income Single Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	55	12	$75	100%	0
Low Income Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	New	55	12	$75	100%	0
Low Income Single Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	159	12	$214	100%	0
Low Income Single Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	New	159	12	$214	100%	0
Low Income Single Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Low Income Single Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	New	0.00	12	$0.00	100%	0
Low Income Single Family	Freezer	Removal of Secondary Stand-Alone Freezer	Proper Disposal of Stand-Alone Freezer	Existing Non-Efficient Stand-Alone Freezer	Per Recyled Unit	Existing	916	5	$30	24%	12,052
Low Income Single Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	New	0.00	10	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Heat Central	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.82	40	$2	67%	0
Low Income Single Family	Heat Central	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.82	40	$0.76	67%	61
Low Income Single Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	6.17	20	$0.92	61%	12
Low Income Single Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	6.17	20	$0.92	61%	1
Low Income Single Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	11	20	$3	76%	443
Low Income Single Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	11	20	$3	76%	29
Low Income Single Family	Heat Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	2,100	18	$960	32%	689
Low Income Single Family	Heat Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,400	18	$587	40%	585
Low Income Single Family	Heat Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.29	30	$13	88%	0
Low Income Single Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,800	18	$1,085	75%	2,638
Low Income Single Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	2,332	18	$1,085	75%	142
Low Income Single Family	Heat Central	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	3,905	15	$4,091	38%	0
Low Income Single Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,400	11	$611	48%	536
Low Income Single Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	758	11	$611	64%	0
Low Income Single Family	Heat Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.51	11	$0.25	42%	8
Low Income Single Family	Heat Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.23	11	$0.44	19%	359
Low Income Single Family	Heat Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.61	11	$0.19	63%	601
Low Income Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.45	20	$0.99	27%	337
Low Income Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.70	20	$1	27%	358
Low Income Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.24	20	$0.25	45%	34
Low Income Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.24	20	$0.25	45%	2
Low Income Single Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.24	20	$1	12%	372
Low Income Single Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.93	20	$1	24%	927
Low Income Single Family	Heat Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	595	20	$248	71%	548
Low Income Single Family	Heat Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	1.24	20	$0.90	60%	620
Low Income Single Family	Heat Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	2.53	20	$1	22%	72
Low Income Single Family	Heat Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	2.20	20	$0.51	14%	620
Low Income Single Family	Heat Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.79	20	$0.44	17%	9
Low Income Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.37	20	$1	3%	98
Low Income Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	5.12	20	$1	2%	174

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.36	20	$0.16	90%	40
Low Income Single Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	280	30	$675	82%	0
Low Income Single Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	233	30	$480	82%	0
Low Income Single Family	Heat Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	793	11	$895	86%	0
Low Income Single Family	Heat Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	490	15	$33	67%	0
Low Income Single Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	491	15	$167	70%	135
Low Income Single Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	409	15	$167	90%	25
Low Income Single Family	Heat Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	8.14	20	$24	24%	0
Low Income Single Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	2.26	20	$8	73%	0
Low Income Single Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.26	20	$8	82%	0
Low Income Single Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	5.88	20	$33	61%	0
Low Income Single Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	5.88	20	$33	68%	0
Low Income Single Family	Heat Pump	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	131	19	$249	82%	0
Low Income Single Family	Heat Pump	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.86	40	$2	67%	0
Low Income Single Family	Heat Pump	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.86	40	$0.76	67%	43
Low Income Single Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.05	20	$0.25	45%	0
Low Income Single Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.04	20	$0.25	45%	0
Low Income Single Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	3.27	20	$0.92	61%	5
Low Income Single Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.81	20	$0.92	61%	0
Low Income Single Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	5.87	20	$3	76%	124
Low Income Single Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	5.05	20	$3	76%	6
Low Income Single Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	614	18	$333	65%	19
Low Income Single Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	2,215	18	$960	33%	583
Low Income Single Family	Heat Pump	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,477	18	$587	65%	582
Low Income Single Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	Existing	438	15	$200	62%	187
Low Income Single Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	New	428	15	$200	90%	18
Low Income Single Family	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.45	30	$13	88%	0
Low Income Single Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,954	18	$1,085	75%	2,289

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	2,457	18	$1,085	75%	103
Low Income Single Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	Existing	0.00	9	$0.00	100%	0
Low Income Single Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	New	0.00	9	$0.00	100%	0
Low Income Single Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,365	18	$822	100%	0
Low Income Single Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	1,131	18	$822	100%	0
Low Income Single Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	920	18	$616	100%	0
Low Income Single Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	760	18	$616	100%	0
Low Income Single Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	2,059	18	$1,233	100%	553
Low Income Single Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	1,709	18	$1,233	100%	41
Low Income Single Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	5,055	18	$9,986	25%	0
Low Income Single Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	4,214	18	$10,109	25%	0
Low Income Single Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	0.00	18	$0.00	100%	0
Low Income Single Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	0.00	18	$0.00	100%	0
Low Income Single Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,477	11	$611	48%	454
Low Income Single Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	798	11	$611	64%	13
Low Income Single Family	Heat Pump	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.54	11	$0.25	42%	15
Low Income Single Family	Heat Pump	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.30	11	$0.44	19%	291
Low Income Single Family	Heat Pump	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.65	11	$0.19	63%	495
Low Income Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.77	20	$0.99	27%	108
Low Income Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.90	20	$1	27%	121
Low Income Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.13	20	$0.25	45%	0
Low Income Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.11	20	$0.25	45%	0
Low Income Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.88	20	$1	12%	79
Low Income Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.19	20	$1	24%	198
Low Income Single Family	Heat Pump	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	601	20	$248	71%	375
Low Income Single Family	Heat Pump	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.65	20	$0.90	60%	204
Low Income Single Family	Heat Pump	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	1.34	20	$1	22%	22
Low Income Single Family	Heat Pump	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	1.17	20	$0.51	14%	178
Low Income Single Family	Heat Pump	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.30	20	$0.44	17%	2
Low Income Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.31	20	$1	3%	28

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.71	20	$1	2%	50
Low Income Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.16	20	$0.16	90%	8
Low Income Single Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	1,709	5	$300	45%	491
Low Income Single Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	New	1,422	5	$300	45%	25
Low Income Single Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	1,508	30	$675	82%	1,399
Low Income Single Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	1,254	30	$480	82%	63
Low Income Single Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	141	19	$331	49%	0
Low Income Single Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	117	19	$331	49%	0
Low Income Single Family	Heat Pump	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	835	11	$895	86%	8
Low Income Single Family	Heat Pump	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	517	15	$33	67%	0
Low Income Single Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	518	15	$167	70%	114
Low Income Single Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	431	15	$167	90%	5
Low Income Single Family	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Tune-up	Existing	1,022	5	$200	71%	429
Low Income Single Family	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Tune-up	Existing	738	5	$200	0%	1
Low Income Single Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	354	20	$366	48%	191
Low Income Single Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	294	20	$366	48%	9
Low Income Single Family	Heat Pump	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.58	10	$4	76%	0
Low Income Single Family	Heat Pump	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.38	3	$7	38%	0
Low Income Single Family	Heat Pump	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	4.31	20	$24	24%	0
Low Income Single Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.19	20	$8	73%	0
Low Income Single Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.10	20	$8	82%	0
Low Income Single Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	3.11	20	$33	61%	0
Low Income Single Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.86	20	$33	68%	0
Low Income Single Family	Heat Room	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.63	40	$2	67%	0
Low Income Single Family	Heat Room	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.63	40	$0.76	67%	187
Low Income Single Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	1.54	20	$0.92	61%	169
Low Income Single Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	1.54	20	$0.92	61%	10
Low Income Single Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	2.77	20	$3	76%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.77	20	$3	76%	0
Low Income Single Family	Heat Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.07	30	$13	88%	0
Low Income Single Family	Heat Room	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	3,905	15	$4,091	38%	0
Low Income Single Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,078	11	$611	48%	899
Low Income Single Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	583	11	$611	64%	0
Low Income Single Family	Heat Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.39	11	$0.25	42%	23
Low Income Single Family	Heat Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.94	11	$0.44	19%	1,300
Low Income Single Family	Heat Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.47	11	$0.19	63%	2,147
Low Income Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.36	20	$0.99	27%	0
Low Income Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.42	20	$1	27%	0
Low Income Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.06	20	$0.25	45%	0
Low Income Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.06	20	$0.25	45%	0
Low Income Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.06	20	$1	12%	0
Low Income Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.23	20	$1	24%	267
Low Income Single Family	Heat Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.31	20	$0.90	60%	0
Low Income Single Family	Heat Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.63	20	$1	22%	0
Low Income Single Family	Heat Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.55	20	$0.51	14%	184
Low Income Single Family	Heat Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.19	20	$0.44	17%	0
Low Income Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.09	20	$1	3%	29
Low Income Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.28	20	$1	2%	52
Low Income Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.09	20	$0.16	90%	0
Low Income Single Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	215	30	$675	82%	0
Low Income Single Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	179	30	$480	82%	0
Low Income Single Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	New	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	2.03	20	$24	24%	0
Low Income Single Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.56	20	$8	73%	0
Low Income Single Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.56	20	$8	82%	0
Low Income Single Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.47	20	$33	61%	0
Low Income Single Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.47	20	$33	68%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	Existing	22	7	$20	100%	0
Low Income Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	New	22	7	$20	100%	0
Low Income Single Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Single Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	New	0.00	7	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	17	11	$611	48%	0
Low Income Single Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	17	11	$611	64%	0
Low Income Single Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	Existing	17	10	$64	25%	0
Low Income Single Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	New	17	10	$64	25%	0
Low Income Single Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	Existing	35	3	$4	100%	0
Low Income Single Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	New	35	3	$4	100%	0
Low Income Single Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	Existing	32	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	New	32	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	Existing	51	12	$36	100%	4,900
Low Income Single Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	New	51	12	$36	100%	288
Low Income Single Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	Existing	6.08	5	$18	82%	0
Low Income Single Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	New	6.08	5	$18	82%	0
Low Income Single Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	Existing	31	6	$6	65%	17,248
Low Income Single Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	New	31	6	$6	65%	1,074
Low Income Single Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	Existing	37	12	$28	50%	29,215
Low Income Single Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	New	37	12	$28	50%	1,643

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	83	11	$611	48%	0
Low Income Single Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	83	11	$611	64%	0
Low Income Single Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	Existing	16	10	$64	14%	0
Low Income Single Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	New	16	10	$64	14%	0
Low Income Single Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	Existing	15	5	-0.2101	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	New	15	5	-0.2101	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	Existing	14	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	New	14	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Low Income Single Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	Existing	22	12	$24	100%	24,119
Low Income Single Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	New	22	12	$24	100%	1,436
Low Income Single Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	Existing	31	10	$56	17%	0
Low Income Single Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	New	31	10	$56	17%	0
Low Income Single Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	New	0.00	10	$0.00	100%	0
Low Income Single Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	Existing	14	5	$0.00	100%	0
Low Income Single Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	New	14	5	$0.00	100%	0
Low Income Single Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Single Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	Existing	18	3	$0.99	100%	2,686

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	New	18	3	$0.99	100%	161
Low Income Single Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	Existing	0.00	3	$0.00	100%	0
Low Income Single Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	New	0.00	3	$0.00	100%	0
Low Income Single Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	Existing	12	3	$4	36%	0
Low Income Single Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	New	12	3	$4	36%	0
Low Income Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	65	10	$119	51%	0
Low Income Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	65	10	$119	51%	0
Low Income Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	51%	270
Low Income Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	51%	16
Low Income Single Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	Existing	25	5	$1	29%	920
Low Income Single Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	New	25	5	$1	29%	54
Low Income Single Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	Existing	24	4	$8	4%	49
Low Income Single Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	New	24	4	$8	4%	2
Low Income Single Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	New	0.00	5	$0.00	100%	0
Low Income Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	Existing	100	5	$22	62%	7,585
Low Income Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	New	100	5	$22	62%	447
Low Income Single Family	Pool Pump	Pool Pump - Standard Constant Speed	Constant Speed Pool Pump	Constant Speed Pool Pump	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Pool Pump	Pool Pump - Standard Constant Speed	Constant Speed Pool Pump	Constant Speed Pool Pump	Per Household	New	0.00	10	$0.00	100%	0
Low Income Single Family	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Pool Pump Timer	Existing	291	10	$89	64%	0
Low Income Single Family	Pool Pump	Pool Pumps - 2-Speed	Pool Pumps (2-Speed)	Constant Speed Pool Pump	Per Household	Existing	660	10	$165	100%	0
Low Income Single Family	Pool Pump	Pool Pumps - 2-Speed	Pool Pumps (2-Speed)	Constant Speed Pool Pump	Per Household	New	660	10	$165	100%	0
Low Income Single Family	Pool Pump	Pool Pumps - VSD	Pool Pumps (VSD)	Constant Speed Pool Pump	Per Household	Existing	1,080	10	$695	100%	0
Low Income Single Family	Pool Pump	Pool Pumps - VSD	Pool Pumps (VSD)	Constant Speed Pool Pump	Per Household	New	1,080	10	$695	100%	0
Low Income Single Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	Existing	32	5	$13	100%	1,120
Low Income Single Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	New	32	5	$13	100%	58
Low Income Single Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	New	0.00	7	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	142	13	$429	100%	0
Low Income Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	142	13	$429	100%	0
Low Income Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	170	13	$580	100%	0
Low Income Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	170	13	$580	100%	0
Low Income Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	113	13	$251	100%	0
Low Income Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	113	13	$251	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	56	13	$124	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	56	13	$124	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Low Income Single Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Low Income Single Family	Refrigerator	Removal of Secondary Refrigerator/Freezer	Proper Disposal of Refrigerator/Freezer Combo	Existing Non-Efficient Refrigerator/Freezer	Per Recyled Unit	Existing	1,140	5	$30	15%	24,850
Low Income Single Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	164	5	$12	100%	13,953
Low Income Single Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	164	5	$12	100%	920
Low Income Single Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Single Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	Existing	118	5	$55	100%	14,740
Low Income Single Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	New	118	5	$55	100%	764
Low Income Single Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Low Income Single Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	New	0.00	5	$0.00	100%	0
Low Income Single Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	Existing	438	15	$200	62%	32,657
Low Income Single Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	New	428	15	$200	90%	2,800
Low Income Single Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	Existing	0.00	20	$0.00	100%	0
Low Income Single Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	New	0.00	20	$0.00	100%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	649	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	649	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	467	11	$391	75%	4,371

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	467	11	$391	79%	184
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	519	11	$565	80%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	519	11	$565	80%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	404	11	$134	68%	4,901
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	404	11	$134	68%	281
Low Income Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	649	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	649	11	$789	83%	0
Low Income Single Family	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	352	10	$600	55%	0
Low Income Single Family	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	705	10	$600	1%	48
Low Income Single Family	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	705	10	$600	0%	12
Low Income Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	155	11	$1,067	14%	0
Low Income Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	155	11	$1,067	14%	0
Low Income Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	60	11	$272	5%	0
Low Income Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	60	11	$272	5%	0
Low Income Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	825	40	$935	27%	5,503
Low Income Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	775	40	$935	68%	654
Low Income Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	113	10	$1	85%	2,863
Low Income Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	107	10	$1	90%	144
Low Income Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	46	10	$1	26%	19
Low Income Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	44	10	$1	28%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	13	10	$0.53	14%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	12	10	$0.53	15%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	53	10	$3	9%	144
Low Income Single Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	172	6	$524	1%	0
Low Income Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	222	10	$8	80%	5,304
Low Income Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	211	10	$8	80%	254

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	111	10	$13	38%	65
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	105	10	$13	38%	3
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	111	10	$24	23%	770
Low Income Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	1,764	15	$6,238	15%	0
Low Income Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	1,656	15	$4,878	15%	0
Low Income Single Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	New	0.00	7	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	1,884	13	$1,281	60%	20,610
Low Income Single Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	New	1,794	13	$1,281	60%	1,522
Low Income Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	69	13	$6	37%	686
Low Income Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	69	13	$6	45%	42
Low Income Single Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	113	13	$43	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	New	107	13	$43	100%	0
Low Income Single Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	229	13	$17	17%	1,020
Low Income Single Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	223	20	$260	0%	0
Low Income Single Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	New	212	20	$260	0%	0
Low Income Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	674	4	$10	11%	2,033
Low Income Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	633	4	$10	11%	96
Manufactured	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	Existing	76	4	$8	100%	2,665
Manufactured	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	New	76	4	$8	100%	166
Manufactured	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	Existing	0.00	4	$0.00	100%	0
Manufactured	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	New	0.00	4	$0.00	100%	0
Manufactured	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	102	19	$176	100%	0
Manufactured	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	102	19	$176	100%	0
Manufactured	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Manufactured	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Manufactured	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Manufactured	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Cool Central	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	105	19	$249	82%	2,608
Manufactured	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	Existing	0.00	8	$0.00	100%	0
Manufactured	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	New	0.00	8	$0.00	100%	0
Manufactured	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	Existing	235	15	$476	100%	0
Manufactured	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	New	138	15	$476	100%	153
Manufactured	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	Existing	330	15	$714	100%	0
Manufactured	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	New	194	15	$714	100%	108
Manufactured	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	Existing	182	15	$357	100%	0
Manufactured	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	New	107	15	$357	100%	0
Manufactured	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	Existing	490	15	$1,192	100%	7,596
Manufactured	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	New	287	15	$1,192	100%	0
Manufactured	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	Existing	0.00	15	$0.00	100%	0
Manufactured	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	New	0.00	15	$0.00	100%	0
Manufactured	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.33	20	$0.25	45%	1,575
Manufactured	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.18	20	$0.25	45%	0
Manufactured	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.34	20	$0.92	61%	13
Manufactured	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.24	20	$0.92	61%	1
Manufactured	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.61	20	$3	76%	468
Manufactured	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.44	20	$3	76%	25
Manufactured	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	51	18	$333	61%	46
Manufactured	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	284	18	$960	33%	2,263
Manufactured	Cool Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	189	18	$587	61%	2,239
Manufactured	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	189	11	$611	56%	1,939
Manufactured	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	67	11	$611	64%	0
Manufactured	Cool Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.06	11	$0.25	61%	78
Manufactured	Cool Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.24	11	$0.44	19%	1,422
Manufactured	Cool Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.12	11	$0.19	72%	2,687
Manufactured	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.08	20	$0.99	21%	280
Manufactured	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.09	20	$1	20%	191
Manufactured	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Manufactured	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Manufactured	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Manufactured	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Manufactured	Cool Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	59	20	$366	71%	794
Manufactured	Cool Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	38%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Cool Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.14	20	$1	11%	40
Manufactured	Cool Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.12	20	$0.51	14%	443
Manufactured	Cool Central	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.09	20	$0.59	9%	66
Manufactured	Cool Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	13%	0
Manufactured	Cool Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.24	20	$1	3%	72
Manufactured	Cool Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.28	20	$1	2%	130
Manufactured	Cool Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	87%	20
Manufactured	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	199	5	$300	45%	0
Manufactured	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	New	108	5	$300	45%	0
Manufactured	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	193	30	$675	49%	2,004
Manufactured	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	105	30	$480	82%	141
Manufactured	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	113	19	$331	49%	1,692
Manufactured	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	61	19	$331	49%	0
Manufactured	Cool Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	70	11	$895	62%	0
Manufactured	Cool Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	66	15	$33	79%	0
Manufactured	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	66	15	$167	82%	511
Manufactured	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	36	15	$167	90%	57
Manufactured	Cool Central	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Tune-up	Existing	142	5	$200	71%	686
Manufactured	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	284	20	$366	48%	4,143
Manufactured	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	154	20	$366	48%	142
Manufactured	Cool Central	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.69	10	$4	76%	0
Manufactured	Cool Central	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.46	3	$7	38%	0
Manufactured	Cool Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.45	20	$24	24%	0
Manufactured	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.12	20	$8	73%	0
Manufactured	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Manufactured	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.32	20	$33	61%	0
Manufactured	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.23	20	$33	68%	0
Manufactured	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	45%	0
Manufactured	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.06	20	$0.25	45%	0
Manufactured	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.09	20	$0.92	61%	0
Manufactured	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.08	20	$0.92	61%	0
Manufactured	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.17	20	$3	76%	13
Manufactured	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.15	20	$3	76%	1
Manufactured	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	36	11	$611	56%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	23	11	$611	64%	0
Manufactured	Cool Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	61%	0
Manufactured	Cool Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.44	19%	24
Manufactured	Cool Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	72%	46
Manufactured	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$0.99	21%	0
Manufactured	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$1	20%	0
Manufactured	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.00	20	$0.25	35%	0
Manufactured	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	35%	0
Manufactured	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Manufactured	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Manufactured	Cool Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	38%	0
Manufactured	Cool Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.03	20	$1	11%	1
Manufactured	Cool Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.03	20	$0.51	14%	11
Manufactured	Cool Room	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.02	20	$0.59	9%	2
Manufactured	Cool Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	13%	0
Manufactured	Cool Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.06	20	$1	3%	2
Manufactured	Cool Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.07	20	$1	2%	3
Manufactured	Cool Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.00	20	$0.16	87%	1
Manufactured	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	37	30	$675	49%	0
Manufactured	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	37	30	$480	82%	0
Manufactured	Cool Room	Removal of Secondary Window Air Conditioner Unit	Proper Disposal of Window Air Conditioner Unit	Existing Non-Efficient Window Air Conditioner Unit	Per Recyled Unit	Existing	378	3	$30	20%	251
Manufactured	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Manufactured	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	5	$0.00	100%	0
Manufactured	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	39	9	$308	100%	0
Manufactured	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	39	9	$308	100%	0
Manufactured	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	50	9	$575	100%	0
Manufactured	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	50	9	$575	100%	0
Manufactured	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	27	9	$41	100%	67
Manufactured	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	27	9	$41	100%	7
Manufactured	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	9	$0.00	100%	0
Manufactured	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	9	$0.00	100%	0
Manufactured	Cool Room	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.13	10	$4	76%	0
Manufactured	Cool Room	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.08	3	$7	38%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Cool Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.12	20	$24	24%	0
Manufactured	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.03	20	$8	73%	0
Manufactured	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.03	20	$8	82%	0
Manufactured	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$33	61%	0
Manufactured	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$33	68%	0
Manufactured	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Manufactured	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	New	0.00	6	$0.00	100%	0
Manufactured	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	Existing	73	6	$1,505	100%	0
Manufactured	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	New	73	6	$1,505	100%	0
Manufactured	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Manufactured	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	New	0.00	12	$0.00	100%	0
Manufactured	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	Existing	117	12	$34	100%	1,243
Manufactured	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	New	117	12	$34	100%	126
Manufactured	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	119	11	$137	100%	0
Manufactured	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	119	11	$137	100%	0
Manufactured	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Manufactured	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Manufactured	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	119	11	$372	98%	0
Manufactured	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	New	119	11	$372	98%	0
Manufactured	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Manufactured	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	New	0.00	6	$0.00	100%	0
Manufactured	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	55	12	$75	100%	0
Manufactured	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	New	55	12	$75	100%	0
Manufactured	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	159	12	$214	100%	0
Manufactured	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	New	159	12	$214	100%	0
Manufactured	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Manufactured	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	New	0.00	12	$0.00	100%	0
Manufactured	Freezer	Removal of Secondary Stand-Alone Freezer	Proper Disposal of Stand-Alone Freezer	Existing Non-Efficient Stand-Alone Freezer	Per Recyled Unit	Existing	916	5	$30	16%	2,673
Manufactured	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Manufactured	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	New	0.00	10	$0.00	100%	0
Manufactured	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	6.17	20	$0.92	61%	34
Manufactured	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	6.17	20	$0.92	61%	2
Manufactured	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	11	20	$3	76%	1,335

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	11	20	$3	76%	85
Manufactured	Heat Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,908	18	$960	25%	1,376
Manufactured	Heat Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,272	18	$587	32%	1,221
Manufactured	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,545	18	$1,085	75%	6,938
Manufactured	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,801	18	$1,085	75%	315
Manufactured	Heat Central	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Manufactured	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,272	11	$611	56%	748
Manufactured	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	585	11	$611	64%	0
Manufactured	Heat Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.58	11	$0.25	61%	79
Manufactured	Heat Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.65	11	$0.44	19%	1,193
Manufactured	Heat Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.82	11	$0.19	72%	2,500
Manufactured	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.45	20	$0.99	21%	784
Manufactured	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.70	20	$1	20%	843
Manufactured	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.24	20	$0.25	35%	85
Manufactured	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.24	20	$0.25	35%	5
Manufactured	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.24	20	$1	7%	640
Manufactured	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.93	20	$1	14%	1,564
Manufactured	Heat Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	540	20	$366	71%	1,060
Manufactured	Heat Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	1.24	20	$0.90	38%	1,203
Manufactured	Heat Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	2.53	20	$1	11%	115
Manufactured	Heat Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	2.20	20	$0.51	14%	1,212
Manufactured	Heat Central	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	1.68	20	$0.59	9%	195
Manufactured	Heat Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.79	20	$0.44	13%	25
Manufactured	Heat Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.37	20	$1	3%	197
Manufactured	Heat Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	5.12	20	$1	2%	348
Manufactured	Heat Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.36	20	$0.16	87%	75
Manufactured	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	254	30	$675	49%	0
Manufactured	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	180	30	$480	82%	0
Manufactured	Heat Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	612	11	$895	62%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Heat Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	445	15	$33	79%	46
Manufactured	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	446	15	$167	82%	827
Manufactured	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	316	15	$167	90%	56
Manufactured	Heat Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	8.14	20	$24	24%	0
Manufactured	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	2.26	20	$8	73%	0
Manufactured	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.26	20	$8	82%	0
Manufactured	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	5.88	20	$33	61%	0
Manufactured	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	5.88	20	$33	68%	0
Manufactured	Heat Pump	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	107	19	$249	82%	0
Manufactured	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.05	20	$0.25	45%	0
Manufactured	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.03	20	$0.25	45%	0
Manufactured	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	3.27	20	$0.92	61%	0
Manufactured	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.81	20	$0.92	61%	0
Manufactured	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	5.87	20	$3	76%	0
Manufactured	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	5.05	20	$3	76%	0
Manufactured	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	479	18	$333	61%	0
Manufactured	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,806	18	$960	33%	0
Manufactured	Heat Pump	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,204	18	$587	61%	0
Manufactured	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	Existing	394	15	$200	62%	0
Manufactured	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	New	338	15	$200	90%	0
Manufactured	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,408	18	$1,085	75%	0
Manufactured	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,917	18	$1,085	75%	0
Manufactured	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	Existing	0.00	9	$0.00	100%	0
Manufactured	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	New	0.00	9	$0.00	100%	0
Manufactured	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,115	18	$548	100%	0
Manufactured	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	878	18	$548	100%	0
Manufactured	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	752	18	$411	100%	0
Manufactured	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	586	18	$411	100%	0
Manufactured	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,682	18	$822	100%	0
Manufactured	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	1,330	18	$822	100%	0
Manufactured	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	4,121	18	$6,657	25%	0
Manufactured	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	3,306	18	$6,739	25%	0
Manufactured	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	0.00	18	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	0.00	18	$0.00	100%	0
Manufactured	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,204	11	$611	56%	0
Manufactured	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	623	11	$611	64%	0
Manufactured	Heat Pump	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.62	11	$0.25	61%	0
Manufactured	Heat Pump	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.56	11	$0.44	19%	0
Manufactured	Heat Pump	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.78	11	$0.19	72%	0
Manufactured	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.77	20	$0.99	21%	0
Manufactured	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.90	20	$1	20%	0
Manufactured	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.13	20	$0.25	35%	0
Manufactured	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.11	20	$0.25	35%	0
Manufactured	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.88	20	$1	7%	0
Manufactured	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.19	20	$1	14%	0
Manufactured	Heat Pump	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	490	20	$366	71%	0
Manufactured	Heat Pump	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.65	20	$0.90	38%	0
Manufactured	Heat Pump	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	1.34	20	$1	11%	0
Manufactured	Heat Pump	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	1.17	20	$0.51	14%	0
Manufactured	Heat Pump	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.89	20	$0.59	9%	0
Manufactured	Heat Pump	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.30	20	$0.44	13%	0
Manufactured	Heat Pump	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.31	20	$1	3%	0
Manufactured	Heat Pump	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.71	20	$1	2%	0
Manufactured	Heat Pump	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.16	20	$0.16	87%	0
Manufactured	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	1,393	5	$300	45%	0
Manufactured	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	New	1,108	5	$300	45%	0
Manufactured	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	1,229	30	$675	49%	0
Manufactured	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	978	30	$480	82%	0
Manufactured	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	115	19	$331	49%	0
Manufactured	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	91	19	$331	49%	0
Manufactured	Heat Pump	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	651	11	$895	62%	0
Manufactured	Heat Pump	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	421	15	$33	79%	0
Manufactured	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	422	15	$167	82%	0
Manufactured	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	336	15	$167	90%	0
Manufactured	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Tune-up	Existing	834	5	$200	71%	0
Manufactured	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Tune-up	Existing	602	5	$200	0%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	288	20	$366	48%	0
Manufactured	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	229	20	$366	48%	0
Manufactured	Heat Pump	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.70	10	$4	76%	0
Manufactured	Heat Pump	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.47	3	$7	38%	0
Manufactured	Heat Pump	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	4.31	20	$24	24%	0
Manufactured	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.19	20	$8	73%	0
Manufactured	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.10	20	$8	82%	0
Manufactured	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	3.11	20	$33	61%	0
Manufactured	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.86	20	$33	68%	0
Manufactured	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	1.54	20	$0.92	61%	31
Manufactured	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	1.54	20	$0.92	61%	2
Manufactured	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	2.77	20	$3	76%	0
Manufactured	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.77	20	$3	76%	0
Manufactured	Heat Room	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Manufactured	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	979	11	$611	56%	180
Manufactured	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	450	11	$611	64%	0
Manufactured	Heat Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.45	11	$0.25	61%	5
Manufactured	Heat Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.27	11	$0.44	19%	227
Manufactured	Heat Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.63	11	$0.19	72%	429
Manufactured	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.36	20	$0.99	21%	0
Manufactured	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.42	20	$1	20%	0
Manufactured	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.06	20	$0.25	35%	0
Manufactured	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.06	20	$0.25	35%	0
Manufactured	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.06	20	$1	7%	0
Manufactured	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.23	20	$1	14%	31
Manufactured	Heat Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.31	20	$0.90	38%	0
Manufactured	Heat Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.63	20	$1	11%	0
Manufactured	Heat Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.55	20	$0.51	14%	24
Manufactured	Heat Room	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.42	20	$0.59	9%	0
Manufactured	Heat Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.19	20	$0.44	13%	0
Manufactured	Heat Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.09	20	$1	3%	4
Manufactured	Heat Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.28	20	$1	2%	7
Manufactured	Heat Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.09	20	$0.16	87%	0
Manufactured	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	195	30	$675	49%	0
Manufactured	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	138	30	$480	82%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Manufactured	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	New	0.00	10	$0.00	100%	0
Manufactured	Heat Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	2.03	20	$24	24%	0
Manufactured	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.56	20	$8	73%	0
Manufactured	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.56	20	$8	82%	0
Manufactured	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.47	20	$33	61%	0
Manufactured	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.47	20	$33	68%	0
Manufactured	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	Existing	22	7	$20	100%	0
Manufactured	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	New	22	7	$20	100%	0
Manufactured	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Manufactured	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	New	0.00	7	$0.00	100%	0
Manufactured	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	7.64	11	$611	56%	0
Manufactured	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	7.64	11	$611	64%	0
Manufactured	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	Existing	7.64	10	$64	25%	0
Manufactured	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	New	7.64	10	$64	25%	0
Manufactured	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	Existing	35	3	$4	100%	0
Manufactured	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	New	35	3	$4	100%	0
Manufactured	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	Existing	32	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	New	32	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Manufactured	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	Existing	51	12	$36	100%	1,374
Manufactured	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	New	51	12	$36	100%	81
Manufactured	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	Existing	6.08	5	$18	82%	0
Manufactured	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	New	6.08	5	$18	82%	0
Manufactured	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	Existing	31	6	$6	65%	4,837
Manufactured	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	New	31	6	$6	65%	301

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	Existing	37	12	$28	50%	8,193
Manufactured	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	New	37	12	$28	50%	461
Manufactured	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	37	11	$611	56%	0
Manufactured	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	37	11	$611	64%	0
Manufactured	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	Existing	7.49	10	$64	14%	0
Manufactured	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	New	7.49	10	$64	14%	0
Manufactured	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	Existing	15	5	-0.2101	100%	0
Manufactured	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	New	15	5	-0.2101	100%	0
Manufactured	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	Existing	14	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	New	14	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Manufactured	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	Existing	22	12	$24	100%	6,764
Manufactured	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	New	22	12	$24	100%	403
Manufactured	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	Existing	14	10	$56	17%	0
Manufactured	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	New	14	10	$56	17%	0
Manufactured	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Manufactured	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	New	0.00	10	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	Existing	14	5	$0.00	100%	0
Manufactured	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	New	14	5	$0.00	100%	0
Manufactured	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Manufactured	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	New	0.00	5	$0.00	100%	0
Manufactured	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	Existing	18	3	$0.99	100%	1,197
Manufactured	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	New	18	3	$0.99	100%	72
Manufactured	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	Existing	0.00	3	$0.00	100%	0
Manufactured	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	New	0.00	3	$0.00	100%	0
Manufactured	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	Existing	12	3	$4	36%	0
Manufactured	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	New	12	3	$4	36%	0
Manufactured	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	65	10	$119	51%	0
Manufactured	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	65	10	$119	51%	0
Manufactured	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	51%	111
Manufactured	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	51%	7
Manufactured	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	Existing	25	5	$1	29%	380
Manufactured	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	New	25	5	$1	29%	22
Manufactured	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	Existing	24	4	$8	4%	20
Manufactured	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	New	24	4	$8	4%	1
Manufactured	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	Existing	0.00	5	$0.00	100%	0
Manufactured	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	New	0.00	5	$0.00	100%	0
Manufactured	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	Existing	100	5	$22	62%	3,136
Manufactured	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	New	100	5	$22	62%	185
Manufactured	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	Existing	32	5	$13	100%	385
Manufactured	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	New	32	5	$13	100%	20
Manufactured	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Manufactured	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	New	0.00	5	$0.00	100%	0
Manufactured	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Manufactured	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	New	0.00	7	$0.00	100%	0
Manufactured	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	142	13	$429	100%	0
Manufactured	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	142	13	$429	100%	0
Manufactured	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	170	13	$580	100%	0
Manufactured	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	170	13	$580	100%	0
Manufactured	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	113	13	$251	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	113	13	$251	100%	0
Manufactured	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	56	13	$124	100%	0
Manufactured	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	56	13	$124	100%	0
Manufactured	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Manufactured	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Manufactured	Refrigerator	Removal of Secondary Refrigerator/Freezer	Proper Disposal of Refrigerator/Freezer Combo	Existing Non-Efficient Refrigerator/Freezer	Per Recyled Unit	Existing	1,140	5	$30	7%	4,480
Manufactured	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	164	5	$12	100%	7,026
Manufactured	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	164	5	$12	100%	463
Manufactured	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Manufactured	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	0.00	5	$0.00	100%	0
Manufactured	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	Existing	118	5	$55	100%	6,270
Manufactured	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	New	118	5	$55	100%	325
Manufactured	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Manufactured	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	New	0.00	5	$0.00	100%	0
Manufactured	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	Existing	394	15	$200	62%	12,505
Manufactured	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	New	338	15	$200	90%	942
Manufactured	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	Existing	0.00	20	$0.00	100%	0
Manufactured	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	New	0.00	20	$0.00	100%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	600	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	600	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	432	11	$391	83%	2,683
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	432	11	$391	83%	106
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	480	11	$565	80%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	480	11	$565	80%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	374	11	$134	81%	3,218
Manufactured	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	374	11	$134	81%	183

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	600	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	600	11	$789	83%	0
Manufactured	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	325	10	$600	57%	0
Manufactured	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	650	10	$600	0%	0
Manufactured	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	650	10	$600	0%	0
Manufactured	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	155	11	$1,067	47%	0
Manufactured	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	155	11	$1,067	47%	0
Manufactured	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	60	11	$272	16%	0
Manufactured	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	60	11	$272	16%	0
Manufactured	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	760	40	$935	19%	2,085
Manufactured	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	716	40	$935	71%	370
Manufactured	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	122	10	$1	85%	1,856
Manufactured	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	116	10	$1	90%	93
Manufactured	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	50	10	$1	26%	12
Manufactured	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	47	10	$1	28%	0
Manufactured	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	14	10	$0.53	14%	0
Manufactured	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	13	10	$0.53	15%	0
Manufactured	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	57	10	$3	9%	93
Manufactured	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	287	10	$8	80%	4,126
Manufactured	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	273	10	$8	80%	196
Manufactured	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	143	10	$13	38%	51
Manufactured	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	136	10	$13	38%	2
Manufactured	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	143	10	$24	23%	599
Manufactured	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	1,625	15	$6,238	15%	0
Manufactured	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	1,529	15	$4,878	15%	0
Manufactured	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	New	0.00	7	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	1,742	13	$1,281	60%	10,938
Manufactured	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	New	1,659	13	$1,281	60%	805
Manufactured	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	69	13	$6	14%	154
Manufactured	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	69	13	$6	20%	11
Manufactured	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	104	13	$43	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Manufactured	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	New	99	13	$43	100%	0
Manufactured	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	211	13	$17	17%	576
Manufactured	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	206	20	$260	0%	0
Manufactured	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	New	196	20	$260	0%	0
Manufactured	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	621	4	$10	5%	498
Manufactured	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	584	4	$10	5%	23
Multi Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	Existing	76	4	$8	100%	2,850
Multi Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	New	76	4	$8	100%	178
Multi Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	Existing	0.00	4	$0.00	100%	0
Multi Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	New	0.00	4	$0.00	100%	0
Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	102	19	$176	100%	0
Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	102	19	$176	100%	0
Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Multi Family	Cool Central	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	71	19	$249	82%	2,248
Multi Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	Existing	0.00	8	$0.00	100%	0
Multi Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	New	0.00	8	$0.00	100%	0
Multi Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	Existing	160	15	$476	100%	0
Multi Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	New	109	15	$476	100%	0
Multi Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	Existing	225	15	$714	100%	2,924
Multi Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	New	153	15	$714	100%	0
Multi Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	Existing	124	15	$357	100%	0
Multi Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	New	84	15	$357	100%	0
Multi Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	Existing	333	15	$1,192	100%	3,051
Multi Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	New	228	15	$1,192	100%	0
Multi Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	Existing	0.00	15	$0.00	100%	0
Multi Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	New	0.00	15	$0.00	100%	0
Multi Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.33	20	$0.25	21%	1,126
Multi Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.21	20	$0.25	21%	41
Multi Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.34	20	$0.92	32%	85
Multi Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.24	20	$0.92	32%	4
Multi Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.61	20	$3	40%	185
Multi Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.44	20	$3	40%	10

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	40	18	$333	54%	0
Multi Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	192	18	$960	24%	1,429
Multi Family	Cool Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	128	18	$587	54%	2,291
Multi Family	Cool Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.08	30	$13	88%	0
Multi Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	128	11	$611	15%	0
Multi Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	53	11	$611	20%	0
Multi Family	Cool Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.05	11	$0.25	42%	61
Multi Family	Cool Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.17	11	$0.44	19%	1,295
Multi Family	Cool Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.08	11	$0.19	63%	2,140
Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.08	20	$0.99	9%	197
Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.09	20	$1	9%	140
Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	16%	0
Multi Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	16%	0
Multi Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Multi Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Multi Family	Cool Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	40	20	$375	71%	0
Multi Family	Cool Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Multi Family	Cool Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.14	20	$1	8%	44
Multi Family	Cool Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.12	20	$0.51	14%	297
Multi Family	Cool Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	26%	0
Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.24	20	$1	3%	95
Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.28	20	$1	1%	37
Multi Family	Cool Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	17
Multi Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	134	5	$300	45%	0
Multi Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	New	85	5	$300	45%	0
Multi Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	130	30	$675	49%	1,803
Multi Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	83	30	$480	82%	181
Multi Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	76	19	$331	10%	292
Multi Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	48	19	$331	10%	0
Multi Family	Cool Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	55	11	$895	62%	0
Multi Family	Cool Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	44	15	$33	48%	449
Multi Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	44	15	$167	50%	759
Multi Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	28	15	$167	62%	46
Multi Family	Cool Central	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Tune-up	Existing	96	5	$200	71%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	192	20	$366	10%	714
Multi Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	122	20	$366	10%	32
Multi Family	Cool Central	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.95	10	$4	76%	0
Multi Family	Cool Central	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.63	3	$7	38%	0
Multi Family	Cool Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.45	20	$19	24%	0
Multi Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.12	20	$3	73%	0
Multi Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$3	82%	0
Multi Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.32	20	$28	61%	0
Multi Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.23	20	$28	68%	0
Multi Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	21%	0
Multi Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.06	20	$0.25	21%	0
Multi Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.09	20	$0.92	32%	7
Multi Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.08	20	$0.92	32%	0
Multi Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.17	20	$3	40%	15
Multi Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.15	20	$3	40%	1
Multi Family	Cool Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Multi Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	36	11	$611	15%	0
Multi Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	23	11	$611	20%	0
Multi Family	Cool Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	0
Multi Family	Cool Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.44	19%	61
Multi Family	Cool Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	180
Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$0.99	9%	0
Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$1	9%	0
Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.00	20	$0.25	16%	0
Multi Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	16%	0
Multi Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	7%	0
Multi Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	14%	0
Multi Family	Cool Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Multi Family	Cool Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.03	20	$1	8%	2
Multi Family	Cool Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.03	20	$0.51	14%	24
Multi Family	Cool Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	26%	0
Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.06	20	$1	3%	8
Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.07	20	$1	1%	3
Multi Family	Cool Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.00	20	$0.16	90%	2
Multi Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	37	30	$675	49%	0
Multi Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	37	30	$480	82%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Cool Room	Removal of Secondary Window Air Conditioner Unit	Proper Disposal of Window Air Conditioner Unit	Existing Non-Efficient Window Air Conditioner Unit	Per Recyled Unit	Existing	378	3	$30	20%	1,073
Multi Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Multi Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	5	$0.00	100%	0
Multi Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	39	9	$308	100%	0
Multi Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	39	9	$308	100%	0
Multi Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	50	9	$575	100%	0
Multi Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	50	9	$575	100%	0
Multi Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	27	9	$41	100%	296
Multi Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	27	9	$41	100%	29
Multi Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	9	$0.00	100%	0
Multi Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	9	$0.00	100%	0
Multi Family	Cool Room	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.27	10	$4	76%	0
Multi Family	Cool Room	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.18	3	$7	38%	0
Multi Family	Cool Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.12	20	$19	24%	0
Multi Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.03	20	$3	73%	0
Multi Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.03	20	$3	82%	0
Multi Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$28	61%	0
Multi Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$28	68%	0
Multi Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Multi Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	New	0.00	6	$0.00	100%	0
Multi Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	Existing	73	6	$1,505	100%	0
Multi Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	New	73	6	$1,505	100%	0
Multi Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Multi Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	New	0.00	12	$0.00	100%	0
Multi Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	Existing	117	12	$34	100%	2,023
Multi Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	New	117	12	$34	100%	205
Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	107	11	$137	100%	0
Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	107	11	$137	100%	0
Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Multi Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	107	11	$372	98%	0
Multi Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	New	107	11	$372	98%	0
Multi Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	Existing	0.00	6	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	New	0.00	6	$0.00	100%	0
Multi Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	55	12	$75	100%	0
Multi Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	New	55	12	$75	100%	0
Multi Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	159	12	$214	100%	0
Multi Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	New	159	12	$214	100%	0
Multi Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Multi Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	New	0.00	12	$0.00	100%	0
Multi Family	Freezer	Removal of Secondary Stand-Alone Freezer	Proper Disposal of Stand-Alone Freezer	Existing Non-Efficient Stand-Alone Freezer	Per Recyled Unit	Existing	916	5	$30	10%	978
Multi Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Multi Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	New	0.00	10	$0.00	100%	0
Multi Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	6.17	20	$0.92	32%	426
Multi Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	6.17	20	$0.92	32%	25
Multi Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	11	20	$3	40%	860
Multi Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	11	20	$3	40%	56
Multi Family	Heat Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,284	18	$960	18%	1,563
Multi Family	Heat Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	856	18	$587	25%	1,496
Multi Family	Heat Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.15	30	$13	88%	0
Multi Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	1,712	18	$1,085	56%	8,638
Multi Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,191	18	$1,085	56%	131
Multi Family	Heat Central	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Multi Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	856	11	$611	15%	0
Multi Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	387	11	$611	20%	0
Multi Family	Heat Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.39	11	$0.25	42%	32
Multi Family	Heat Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.13	11	$0.44	19%	1,966
Multi Family	Heat Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.56	11	$0.19	63%	3,694
Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.45	20	$0.99	9%	1,193
Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.70	20	$1	9%	1,115
Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.24	20	$0.25	16%	105
Multi Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.24	20	$0.25	16%	7
Multi Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.24	20	$1	7%	1,558

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.93	20	$1	14%	3,847
Multi Family	Heat Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	363	20	$375	71%	724
Multi Family	Heat Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	1.24	20	$0.90	57%	5,321
Multi Family	Heat Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	2.53	20	$1	8%	249
Multi Family	Heat Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	2.20	20	$0.51	14%	1,481
Multi Family	Heat Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.79	20	$0.44	26%	121
Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.37	20	$1	3%	449
Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	5.12	20	$1	1%	176
Multi Family	Heat Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.36	20	$0.16	90%	97
Multi Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	171	30	$675	49%	0
Multi Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	119	30	$480	82%	0
Multi Family	Heat Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	405	11	$895	62%	0
Multi Family	Heat Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	299	15	$33	48%	835
Multi Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	300	15	$167	50%	1,109
Multi Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	209	15	$167	62%	22
Multi Family	Heat Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	8.14	20	$19	24%	0
Multi Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	2.26	20	$3	73%	0
Multi Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.26	20	$3	82%	0
Multi Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	5.88	20	$28	61%	0
Multi Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	5.88	20	$28	68%	0
Multi Family	Heat Pump	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	67	19	$249	82%	0
Multi Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	21%	0
Multi Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.04	20	$0.25	21%	0
Multi Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	3.27	20	$0.92	32%	0
Multi Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.81	20	$0.92	32%	0
Multi Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	5.87	20	$3	40%	0
Multi Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	5.05	20	$3	40%	0
Multi Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	307	18	$333	54%	0
Multi Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,132	18	$960	24%	0
Multi Family	Heat Pump	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	754	18	$587	54%	0
Multi Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	Existing	280	15	$200	62%	0
Multi Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	New	222	15	$200	90%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.24	30	$13	88%	0
Multi Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	1,509	18	$1,085	56%	0
Multi Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	1,229	18	$1,085	56%	0
Multi Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	Existing	0.00	9	$0.00	100%	0
Multi Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	New	0.00	9	$0.00	100%	0
Multi Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	701	18	$548	100%	0
Multi Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	567	18	$548	100%	0
Multi Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	474	18	$411	100%	0
Multi Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	381	18	$411	100%	0
Multi Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,056	18	$822	100%	0
Multi Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	856	18	$822	100%	0
Multi Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	2,575	18	$6,657	25%	0
Multi Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	2,108	18	$6,739	25%	0
Multi Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	0.00	18	$0.00	100%	0
Multi Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	0.00	18	$0.00	100%	0
Multi Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	754	11	$611	15%	0
Multi Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	399	11	$611	20%	0
Multi Family	Heat Pump	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.40	11	$0.25	42%	0
Multi Family	Heat Pump	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.00	11	$0.44	19%	0
Multi Family	Heat Pump	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.50	11	$0.19	63%	0
Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.77	20	$0.99	9%	0
Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.90	20	$1	9%	0
Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.13	20	$0.25	17%	0
Multi Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.11	20	$0.25	17%	0
Multi Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.88	20	$1	7%	0
Multi Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.19	20	$1	14%	0
Multi Family	Heat Pump	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	307	20	$375	71%	0
Multi Family	Heat Pump	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.65	20	$0.90	57%	0
Multi Family	Heat Pump	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	1.34	20	$1	8%	0
Multi Family	Heat Pump	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	1.17	20	$0.51	14%	0
Multi Family	Heat Pump	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.30	20	$0.44	26%	0
Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.31	20	$1	3%	0
Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.71	20	$1	1%	0
Multi Family	Heat Pump	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.16	20	$0.16	90%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	871	5	$300	45%	0
Multi Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	New	709	5	$300	45%	0
Multi Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	770	30	$675	49%	0
Multi Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	627	30	$480	82%	0
Multi Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	72	19	$331	10%	0
Multi Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	58	19	$331	10%	0
Multi Family	Heat Pump	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	417	11	$895	62%	0
Multi Family	Heat Pump	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	264	15	$33	48%	0
Multi Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	264	15	$167	50%	0
Multi Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	215	15	$167	62%	0
Multi Family	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Tune-up	Existing	523	5	$200	71%	0
Multi Family	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Tune-up	Existing	377	5	$200	0%	0
Multi Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	181	20	$366	10%	0
Multi Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	147	20	$366	10%	0
Multi Family	Heat Pump	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.89	10	$4	76%	0
Multi Family	Heat Pump	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.59	3	$7	38%	0
Multi Family	Heat Pump	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	4.31	20	$19	24%	0
Multi Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.19	20	$3	73%	0
Multi Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.10	20	$3	82%	0
Multi Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	3.11	20	$28	61%	0
Multi Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.86	20	$28	68%	0
Multi Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	1.54	20	$0.92	32%	115
Multi Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	1.54	20	$0.92	32%	7
Multi Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	2.77	20	$3	40%	0
Multi Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.77	20	$3	40%	0
Multi Family	Heat Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.04	30	$13	88%	0
Multi Family	Heat Room	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	2,603	15	$2,727	38%	0
Multi Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	659	11	$611	15%	0
Multi Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	298	11	$611	20%	0
Multi Family	Heat Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.30	11	$0.25	42%	0
Multi Family	Heat Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.87	11	$0.44	19%	873
Multi Family	Heat Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.43	11	$0.19	63%	3,517
Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.36	20	$0.99	9%	0
Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.42	20	$1	9%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.06	20	$0.25	16%	0
Multi Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.06	20	$0.25	16%	0
Multi Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.06	20	$1	7%	0
Multi Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.23	20	$1	14%	414
Multi Family	Heat Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.31	20	$0.90	57%	0
Multi Family	Heat Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.63	20	$1	8%	0
Multi Family	Heat Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.55	20	$0.51	14%	158
Multi Family	Heat Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.19	20	$0.44	26%	0
Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.09	20	$1	3%	50
Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.28	20	$1	1%	19
Multi Family	Heat Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.09	20	$0.16	90%	0
Multi Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	131	30	$675	49%	0
Multi Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	91	30	$480	82%	0
Multi Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Multi Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	New	0.00	10	$0.00	100%	0
Multi Family	Heat Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	2.03	20	$19	24%	0
Multi Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.56	20	$3	73%	0
Multi Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.56	20	$3	82%	0
Multi Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.47	20	$28	61%	0
Multi Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.47	20	$28	68%	0
Multi Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	Existing	22	7	$20	100%	0
Multi Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	New	22	7	$20	100%	0
Multi Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Multi Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	New	0.00	7	$0.00	100%	0
Multi Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	11	11	$611	15%	0
Multi Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	11	11	$611	20%	0
Multi Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	Existing	11	10	$64	25%	0
Multi Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	New	11	10	$64	25%	0
Multi Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	Existing	35	3	$4	100%	0
Multi Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	New	35	3	$4	100%	0
Multi Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	Existing	32	2	$0.00	100%	0
Multi Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	New	32	2	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Multi Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Multi Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Multi Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Multi Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	Existing	51	12	$36	100%	2,183
Multi Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	New	51	12	$36	100%	129
Multi Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	Existing	6.08	5	$18	82%	0
Multi Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	New	6.08	5	$18	82%	0
Multi Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	Existing	31	6	$6	65%	7,685
Multi Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	New	31	6	$6	65%	479
Multi Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	Existing	37	12	$28	50%	13,017
Multi Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	New	37	12	$28	50%	732
Multi Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	55	11	$611	15%	0
Multi Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	55	11	$611	20%	0
Multi Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	Existing	11	10	$64	14%	0
Multi Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	New	11	10	$64	14%	0
Multi Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	Existing	15	5	-0.2101	100%	0
Multi Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	New	15	5	-0.2101	100%	0
Multi Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	Existing	14	2	$0.00	100%	0
Multi Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	New	14	2	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Multi Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	Existing	22	12	$24	100%	10,747
Multi Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	New	22	12	$24	100%	640
Multi Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	Existing	20	10	$56	17%	0
Multi Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	New	20	10	$56	17%	0
Multi Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Multi Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	New	0.00	10	$0.00	100%	0
Multi Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	Existing	14	5	$0.00	100%	0
Multi Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	New	14	5	$0.00	100%	0
Multi Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Multi Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	New	0.00	5	$0.00	100%	0
Multi Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	Existing	18	3	$0.99	100%	911
Multi Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	New	18	3	$0.99	100%	55
Multi Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	Existing	0.00	3	$0.00	100%	0
Multi Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	New	0.00	3	$0.00	100%	0
Multi Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	Existing	12	3	$4	36%	0
Multi Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	New	12	3	$4	36%	0
Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	65	10	$119	51%	0
Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	65	10	$119	51%	0
Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	51%	181
Multi Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	51%	11
Multi Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	Existing	25	5	$1	29%	619
Multi Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	New	25	5	$1	29%	36
Multi Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	Existing	24	4	$8	4%	33
Multi Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	New	24	4	$8	4%	2

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	Existing	0.00	5	$0.00	100%	0
Multi Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	New	0.00	5	$0.00	100%	0
Multi Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	Existing	100	5	$22	62%	5,104
Multi Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	New	100	5	$22	62%	301
Multi Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	Existing	32	5	$13	100%	531
Multi Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	New	32	5	$13	100%	28
Multi Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Multi Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	New	0.00	5	$0.00	100%	0
Multi Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Multi Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	New	0.00	7	$0.00	100%	0
Multi Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	142	13	$429	100%	0
Multi Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	142	13	$429	100%	0
Multi Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	170	13	$580	100%	0
Multi Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	170	13	$580	100%	0
Multi Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	113	13	$251	100%	0
Multi Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	113	13	$251	100%	0
Multi Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	56	13	$124	100%	0
Multi Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	56	13	$124	100%	0
Multi Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Multi Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Multi Family	Refrigerator	Removal of Secondary Refrigerator/Freezer	Proper Disposal of Refrigerator/Freezer Combo	Existing Non-Efficient Refrigerator/Freezer	Per Recyled Unit	Existing	1,140	5	$30	6%	5,617
Multi Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	164	5	$12	100%	6,216
Multi Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	164	5	$12	100%	410
Multi Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Multi Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	0.00	5	$0.00	100%	0
Multi Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	Existing	118	5	$55	100%	6,657
Multi Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	New	118	5	$55	100%	345
Multi Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Multi Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	New	0.00	5	$0.00	100%	0
Multi Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	Existing	280	15	$200	62%	10,428
Multi Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	New	222	15	$200	90%	723
Multi Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	Existing	0.00	20	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	New	0.00	20	$0.00	100%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	428	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	428	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	308	11	$391	44%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	308	11	$391	46%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	343	11	$565	46%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	343	11	$565	46%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	267	11	$134	37%	1,663
Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	267	11	$134	37%	96
Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	428	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	428	11	$789	48%	0
Multi Family	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	232	10	$600	43%	0
Multi Family	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	464	10	$600	0%	0
Multi Family	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	464	10	$600	0%	0
Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	155	11	$1,067	47%	0
Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	155	11	$1,067	47%	0
Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	60	11	$272	16%	0
Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	60	11	$272	16%	0
Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	543	40	$935	10%	662
Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	511	40	$935	71%	275
Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	104	10	$1	85%	1,498
Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	99	10	$1	90%	86
Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	43	10	$1	26%	10
Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	41	10	$1	28%	0
Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	12	10	$0.53	14%	0
Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	11	10	$0.53	15%	0
Multi Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	49	10	$3	9%	75

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Multi Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	172	6	$524	1%	0
Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	308	10	$8	80%	4,164
Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	293	10	$8	80%	228
Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	154	10	$13	38%	51
Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	146	10	$13	38%	3
Multi Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	154	10	$24	23%	604
Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	1,160	15	$6,238	15%	0
Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	1,092	15	$4,878	15%	0
Multi Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	New	0.00	7	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	1,244	13	$1,281	60%	2,914
Multi Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	New	1,185	13	$1,281	60%	162
Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	69	13	$6	10%	98
Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	69	13	$6	15%	8
Multi Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	74	13	$43	100%	0
Multi Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	New	71	13	$43	100%	0
Multi Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	150	13	$17	13%	282
Multi Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	147	20	$260	0%	0
Multi Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	New	140	20	$260	0%	0
Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	443	4	$10	13%	828
Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	417	4	$10	13%	45
Single Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	Existing	76	4	$8	100%	43,884
Single Family	Computer	Computer - Home Office ENERGY STAR	ENERGY STAR Office Computer	Standard Office Computer	Per Unit Each	New	76	4	$8	100%	2,738
Single Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	Existing	0.00	4	$0.00	100%	0
Single Family	Computer	Computer - Home Office Standard	Standard Office Computer	Standard Office Computer	Per Unit Each	New	0.00	4	$0.00	100%	0
Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	102	19	$176	100%	0
Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	102	19	$176	100%	0
Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Single Family	Cool Central	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	127	19	$249	82%	39,876
Single Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	Existing	0.00	8	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Cool Central	Central Air Conditioners - Below Standard	Below Standard SEER 10	Below Standard SEER 10	Per Household	New	0.00	8	$0.00	100%	0
Single Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	Existing	299	15	$714	100%	0
Single Family	Cool Central	Central Air Conditioners - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 (Split System)	Federal Standard 13 SEER	Per Household	New	178	15	$714	100%	0
Single Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	Existing	421	15	$1,071	100%	0
Single Family	Cool Central	Central Air Conditioners - CEE Tier 3	CEE Tier 3 SEER/EER 16/13 (Split System)	Federal Standard 13 SEER	Per Household	New	251	15	$1,071	100%	0
Single Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	Existing	232	15	$535	100%	0
Single Family	Cool Central	Central Air Conditioners - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 (Split System)	Federal Standard 13 SEER	Per Household	New	138	15	$535	100%	912
Single Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	Existing	623	15	$1,788	100%	110,784
Single Family	Cool Central	Central Air Conditioners - Enhanced	Enhanced SEER/EER 18/14 (Split System)	Federal Standard 13 SEER	Per Household	New	372	15	$1,788	100%	0
Single Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	Existing	0.00	15	$0.00	100%	0
Single Family	Cool Central	Central Air Conditioners - Standard	Federal Standard SEER 13	Federal Standard 13 SEER	Per Household	New	0.00	15	$0.00	100%	0
Single Family	Cool Central	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.09	40	$2	67%	0
Single Family	Cool Central	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.09	40	$0.76	67%	2,628
Single Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.33	20	$0.25	45%	18,314
Single Family	Cool Central	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.18	20	$0.25	45%	673
Single Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.34	20	$0.92	61%	171
Single Family	Cool Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.24	20	$0.92	61%	10
Single Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.61	20	$3	76%	5,467
Single Family	Cool Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.44	20	$3	76%	390
Single Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	65	18	$333	65%	1,103
Single Family	Cool Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	343	18	$960	33%	37,968
Single Family	Cool Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	228	18	$587	65%	37,453
Single Family	Cool Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.13	30	$13	88%	0
Single Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	228	11	$611	35%	18,633
Single Family	Cool Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	85	11	$611	64%	0
Single Family	Cool Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.05	11	$0.25	42%	951
Single Family	Cool Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.20	11	$0.44	19%	16,815
Single Family	Cool Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.10	11	$0.19	63%	31,508
Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.08	20	$0.99	23%	3,817
Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.09	20	$1	23%	2,681
Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Single Family	Cool Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Single Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	12%	0
Single Family	Cool Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	24%	0
Single Family	Cool Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	72	20	$596	71%	10,936

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Cool Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Single Family	Cool Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.14	20	$1	16%	678
Single Family	Cool Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.12	20	$0.51	14%	8,335
Single Family	Cool Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	13%	0
Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.24	20	$1	3%	1,380
Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.28	20	$1	2%	2,440
Single Family	Cool Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	434
Single Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	240	5	$300	45%	9,281
Single Family	Cool Central	Quality Install CAC	Quality Installation (QI)	Standard Installation	Per QI Install	New	137	5	$300	45%	0
Single Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	233	30	$675	82%	54,584
Single Family	Cool Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	134	30	$480	82%	3,127
Single Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	137	19	$331	49%	25,864
Single Family	Cool Central	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	78	19	$331	49%	1,229
Single Family	Cool Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	89	11	$895	86%	0
Single Family	Cool Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	80	15	$33	48%	0
Single Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	80	15	$167	51%	5,350
Single Family	Cool Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	46	15	$167	90%	1,219
Single Family	Cool Central	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Tune-up	Existing	171	5	$200	71%	26,705
Single Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	343	20	$366	48%	63,341
Single Family	Cool Central	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	196	20	$366	48%	3,009
Single Family	Cool Central	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.56	10	$4	76%	0
Single Family	Cool Central	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.37	3	$7	38%	0
Single Family	Cool Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.45	20	$24	24%	0
Single Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.12	20	$8	73%	0
Single Family	Cool Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Single Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.32	20	$33	61%	0
Single Family	Cool Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.23	20	$33	68%	0
Single Family	Cool Room	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.02	40	$2	67%	0
Single Family	Cool Room	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.02	40	$0.76	67%	0
Single Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	45%	0
Single Family	Cool Room	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.05	20	$0.25	45%	0
Single Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.09	20	$0.92	61%	7
Single Family	Cool Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.08	20	$0.92	61%	0
Single Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.17	20	$3	76%	272

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Cool Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.15	20	$3	76%	0
Single Family	Cool Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Single Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	35	11	$611	35%	0
Single Family	Cool Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	19	11	$611	64%	0
Single Family	Cool Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.01	11	$0.25	42%	0
Single Family	Cool Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.44	19%	287
Single Family	Cool Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.01	11	$0.19	63%	847
Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$0.99	23%	0
Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.02	20	$1	23%	0
Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.00	20	$0.25	45%	0
Single Family	Cool Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Single Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	12%	0
Single Family	Cool Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.00	20	$1	24%	0
Single Family	Cool Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.00	20	$0.90	57%	0
Single Family	Cool Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.03	20	$1	16%	41
Single Family	Cool Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.03	20	$0.51	14%	350
Single Family	Cool Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.00	20	$0.44	13%	0
Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.06	20	$1	3%	59
Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.07	20	$1	2%	104
Single Family	Cool Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.00	20	$0.16	90%	0
Single Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	36	30	$675	82%	0
Single Family	Cool Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	30	30	$480	82%	0
Single Family	Cool Room	Removal of Secondary Window Air Conditioner Unit	Proper Disposal of Window Air Conditioner Unit	Existing Non-Efficient Window Air Conditioner Unit	Per Recyled Unit	Existing	378	3	$30	19%	4,885
Single Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Single Family	Cool Room	Room AC - Below Standard	Below Standard 7.7 EER; 8,000-13,999 Btu	Below Standard 7.7 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	5	$0.00	100%	0
Single Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	39	9	$308	100%	0
Single Family	Cool Room	Room AC - CEE Tier 1	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	39	9	$308	100%	0
Single Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	50	9	$575	100%	0
Single Family	Cool Room	Room AC - CEE Tier 2	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	50	9	$575	100%	0
Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	27	9	$41	100%	1,383
Single Family	Cool Room	Room AC - ENERGY STAR	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	27	9	$41	100%	0
Single Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	Existing	0.00	9	$0.00	100%	0
Single Family	Cool Room	Room AC - Standard	Federal Standard 9.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Unit Each	New	0.00	9	$0.00	100%	0
Single Family	Cool Room	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.08	10	$4	76%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Cool Room	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.05	3	$7	38%	0
Single Family	Cool Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.12	20	$24	24%	0
Single Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.03	20	$8	73%	0
Single Family	Cool Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.03	20	$8	82%	0
Single Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$33	61%	0
Single Family	Cool Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$33	68%	0
Single Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Single Family	Copier	Copier - Standard	Standard Copier	Standard Copier	Per Unit Each	New	0.00	6	$0.00	100%	0
Single Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	Existing	73	6	$1,505	100%	0
Single Family	Copier	Copiers - Home Office ENERGY STAR	ENERGY STAR Office Copiers	Standard Copier	Per Unit Each	New	73	6	$1,505	100%	0
Single Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Single Family	Dehumidifier	Dehumidifier - Standard	Standard Dehumidifier	Standard Dehumidifier	Per Unit Each	New	0.00	12	$0.00	100%	0
Single Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	Existing	117	12	$34	100%	15,787
Single Family	Dehumidifier	Dehumidifiers - ENERGY STAR	ENERGY STAR Dehumidifiers	Standard Dehumidifier	Per Unit Each	New	117	12	$34	100%	1,600
Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	142	11	$137	100%	17,304
Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	142	11	$137	100%	1,339
Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Single Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	142	11	$372	98%	0
Single Family	Dryer	Clothes Dryer - Steam	Steam Clothes Dryer	Standard Dryer without Moisture Sensor	Per Unit Each	New	142	11	$372	98%	0
Single Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Single Family	Freezer	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Unit Each	New	0.00	6	$0.00	100%	0
Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	55	12	$75	100%	0
Single Family	Freezer	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer - Federal Standard 2001	Per Unit Each	New	55	12	$75	100%	0
Single Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	159	12	$214	100%	0
Single Family	Freezer	Freezer - Federal Standard September 2014	Standard Freezer - Federal Standard 2014 (NAECA)	Standard Freezer - Federal Standard 2001	Per Unit Each	New	159	12	$214	100%	0
Single Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	Existing	0.00	12	$0.00	100%	0
Single Family	Freezer	Freezer - Standard 2001	Standard Freezer - Federal Standard 2001	Standard Freezer - Federal Standard 2001	Per Unit Each	New	0.00	12	$0.00	100%	0
Single Family	Freezer	Removal of Secondary Stand-Alone Freezer	Proper Disposal of Stand-Alone Freezer	Existing Non-Efficient Stand-Alone Freezer	Per Recyled Unit	Existing	916	5	$30	15%	51,340
Single Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Single Family	Heat Central	Central Heat - Standard	Standard Central Heat	Standard Central Heat	Per Household	New	0.00	10	$0.00	100%	0
Single Family	Heat Central	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.85	40	$2	67%	0
Single Family	Heat Central	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.85	40	$0.76	67%	565

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	6.17	20	$0.92	61%	114
Single Family	Heat Central	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	6.17	20	$0.92	61%	6
Single Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	11	20	$3	76%	4,266
Single Family	Heat Central	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	11	20	$3	76%	257
Single Family	Heat Central	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	2,099	18	$960	32%	6,853
Single Family	Heat Central	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,399	18	$587	40%	5,814
Single Family	Heat Central	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.30	30	$13	88%	0
Single Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,798	18	$1,085	75%	26,165
Single Family	Heat Central	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	2,418	18	$1,085	75%	1,305
Single Family	Heat Central	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	3,905	15	$4,091	38%	0
Single Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,399	11	$611	35%	3,939
Single Family	Heat Central	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	785	11	$611	64%	0
Single Family	Heat Central	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.53	11	$0.25	42%	207
Single Family	Heat Central	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.23	11	$0.44	19%	3,579
Single Family	Heat Central	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.61	11	$0.19	63%	5,989
Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.45	20	$0.99	23%	2,875
Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	1.70	20	$1	23%	3,073
Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.24	20	$0.25	45%	338
Single Family	Heat Central	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.24	20	$0.25	45%	18
Single Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.24	20	$1	12%	3,576
Single Family	Heat Central	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.93	20	$1	24%	8,922
Single Family	Heat Central	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	594	20	$596	71%	1,392
Single Family	Heat Central	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	1.24	20	$0.90	57%	5,890
Single Family	Heat Central	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	2.53	20	$1	16%	521
Single Family	Heat Central	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	2.20	20	$0.51	14%	5,971
Single Family	Heat Central	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.79	20	$0.44	13%	61
Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	4.37	20	$1	3%	943
Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	5.12	20	$1	2%	1,672
Single Family	Heat Central	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.36	20	$0.16	90%	353
Single Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	279	30	$675	82%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Heat Central	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	241	30	$480	82%	0
Single Family	Heat Central	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	822	11	$895	86%	0
Single Family	Heat Central	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	489	15	$33	48%	0
Single Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	491	15	$167	51%	981
Single Family	Heat Central	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	424	15	$167	90%	233
Single Family	Heat Central	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	8.14	20	$24	24%	0
Single Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	2.26	20	$8	73%	0
Single Family	Heat Central	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.26	20	$8	82%	0
Single Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	5.88	20	$33	61%	0
Single Family	Heat Central	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	5.88	20	$33	68%	0
Single Family	Heat Pump	Attic Fan	Attic Fan For Summer Cooling	No Attic Fan with Central Cooling	Per Attic Fan	Existing	124	19	$249	82%	0
Single Family	Heat Pump	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.86	40	$2	67%	0
Single Family	Heat Pump	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.86	40	$0.76	67%	2,980
Single Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	Existing	0.06	20	$0.25	45%	0
Single Family	Heat Pump	Cool Roofs	Lighter Colored Shingles (White)	Standard Roof Shingles	Per Roof SqFT	New	0.03	20	$0.25	45%	0
Single Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	3.27	20	$0.92	61%	26
Single Family	Heat Pump	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.81	20	$0.92	61%	14
Single Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	5.87	20	$3	76%	695
Single Family	Heat Pump	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	5.05	20	$3	76%	426
Single Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	616	18	$333	65%	1,251
Single Family	Heat Pump	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	2,095	18	$960	33%	3,086
Single Family	Heat Pump	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	1,397	18	$587	65%	3,046
Single Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	Existing	469	15	$200	62%	1,190
Single Family	Heat Pump	ECM Motor - Air Source Heat Pump	Air Source Heat Pump ECM Fan	Standard Motor	Per ECM	New	452	15	$200	90%	1,324
Single Family	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.45	30	$13	88%	0
Single Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	Existing	2,794	18	$1,085	75%	11,786
Single Family	Heat Pump	Heat Exchanger - Air-to-Air	Air-to-Air Heat Exchanger	No Air-to-Air Heat Exchanger	Per Heat Exchanger	New	2,464	18	$1,085	75%	7,123
Single Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	Existing	0.00	9	$0.00	100%	0
Single Family	Heat Pump	Heat Pump - Below Standard	Below Standard SEER 10 and HSPF 7.2	Below Standard SEER 10 and HSPF 7.2	Per Household	New	0.00	9	$0.00	100%	0
Single Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,299	18	$822	100%	0
Single Family	Heat Pump	Heat Pump - CEE Tier 2	CEE Tier 2 SEER/EER 15/12.5 and HSPF 8.5 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	1,129	18	$822	100%	0
Single Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	880	18	$616	100%	0
Single Family	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR SEER/EER 14.5/12 and HSPF 8.2 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	754	18	$616	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	1,955	18	$1,233	100%	2,853
Single Family	Heat Pump	Heat Pump - Enhanced	Enhanced SEER/EER 16/13 and HSPF 9.0 (Split System)	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	1,710	18	$1,233	100%	2,793
Single Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	4,766	18	$9,986	25%	0
Single Family	Heat Pump	Heat Pump - Ground Source	GSHP ENERGY STAR EER 17.1 and 3.6 COP	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	4,248	18	$10,109	25%	0
Single Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	Existing	0.00	18	$0.00	100%	0
Single Family	Heat Pump	Heat Pump - Standard	Federal Standard SEER 13 and HSPF 7.7	Federal Standard SEER 13 and HSPF 7.7	Per Household	New	0.00	18	$0.00	100%	0
Single Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,397	11	$611	35%	1,749
Single Family	Heat Pump	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	800	11	$611	64%	898
Single Family	Heat Pump	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.54	11	$0.25	42%	1,081
Single Family	Heat Pump	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	1.23	11	$0.44	19%	1,503
Single Family	Heat Pump	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.61	11	$0.19	63%	2,591
Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.77	20	$0.99	23%	507
Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.90	20	$1	23%	571
Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.13	20	$0.25	45%	0
Single Family	Heat Pump	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.11	20	$0.25	45%	0
Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.88	20	$1	12%	451
Single Family	Heat Pump	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.19	20	$1	24%	1,111
Single Family	Heat Pump	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	569	20	$596	71%	1,283
Single Family	Heat Pump	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.65	20	$0.90	57%	1,068
Single Family	Heat Pump	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	1.34	20	$1	16%	91
Single Family	Heat Pump	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	1.17	20	$0.51	14%	1,055
Single Family	Heat Pump	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.30	20	$0.44	13%	93
Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.31	20	$1	3%	161
Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	2.71	20	$1	2%	292
Single Family	Heat Pump	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.16	20	$0.16	90%	545
Single Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	1,612	5	$300	45%	2,597
Single Family	Heat Pump	Quality Install Heat Pump	Quality Installation (QI)	Standard Installation	Per QI Install	New	1,422	5	$300	45%	1,709
Single Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	1,426	30	$675	82%	7,202
Single Family	Heat Pump	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	1,257	30	$480	82%	4,354
Single Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	Existing	134	19	$331	49%	0
Single Family	Heat Pump	Solar Attic Fan	Solar Electric Attic Ventilation	Standard Passive Ventilation	Per Solar Fan	New	118	19	$331	49%	0
Single Family	Heat Pump	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	837	11	$895	86%	581
Single Family	Heat Pump	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	488	15	$33	48%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	490	15	$167	51%	438
Single Family	Heat Pump	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	432	15	$167	90%	313
Single Family	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Tune-up	Existing	969	5	$200	71%	2,304
Single Family	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Tune-up	Existing	698	5	$200	0%	4
Single Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	Existing	335	20	$366	48%	986
Single Family	Heat Pump	Whole-House Fan	Whole-House Fan to Offset Central Cooling	No Whole-House Fan	Per House Fan	New	295	20	$366	48%	596
Single Family	Heat Pump	Window - Film	Window Film (SHGC Reduction=45%)	No Window Film	Per Window SqFt	Existing	0.55	10	$4	76%	0
Single Family	Heat Pump	Window - Shade	Window Shade/Blind or Thermal Drapes	No Interior Shading Device	Per Window SqFt	Existing	0.36	3	$7	38%	0
Single Family	Heat Pump	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	4.31	20	$24	24%	0
Single Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.19	20	$8	73%	0
Single Family	Heat Pump	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.10	20	$8	82%	0
Single Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	3.11	20	$33	61%	0
Single Family	Heat Pump	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	2.86	20	$33	68%	0
Single Family	Heat Room	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.65	40	$2	67%	0
Single Family	Heat Room	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.65	40	$0.76	67%	0
Single Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	1.54	20	$0.92	61%	409
Single Family	Heat Room	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	1.54	20	$0.92	61%	0
Single Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	2.77	20	$3	76%	0
Single Family	Heat Room	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	2.77	20	$3	76%	0
Single Family	Heat Room	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.07	30	$13	88%	0
Single Family	Heat Room	Heat Pump - Ductless Mini-Split	ENERGY STAR 14.5 SEER, 8.2 HSPF	Electric Baseboard Heating	Per Ductless Heat Pump	Existing	3,905	15	$4,091	38%	0
Single Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	1,077	11	$611	35%	1,589
Single Family	Heat Room	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	605	11	$611	64%	0
Single Family	Heat Room	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.41	11	$0.25	42%	0
Single Family	Heat Room	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.94	11	$0.44	19%	3,149
Single Family	Heat Room	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.47	11	$0.19	63%	5,201
Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.36	20	$0.99	23%	0
Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.42	20	$1	23%	0
Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.06	20	$0.25	45%	0
Single Family	Heat Room	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.06	20	$0.25	45%	0
Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.06	20	$1	12%	0
Single Family	Heat Room	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.23	20	$1	24%	655
Single Family	Heat Room	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.31	20	$0.90	57%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Heat Room	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.63	20	$1	16%	0
Single Family	Heat Room	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.55	20	$0.51	14%	445
Single Family	Heat Room	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.19	20	$0.44	13%	0
Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.09	20	$1	3%	72
Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	1.28	20	$1	2%	127
Single Family	Heat Room	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.09	20	$0.16	90%	0
Single Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	Existing	215	30	$675	82%	0
Single Family	Heat Room	Radiant Barrier (Ceiling)	Radiant Barrier (Ceiling)	No Radiant Barrier	Per Radiant Barrier Install	New	186	30	$480	82%	0
Single Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	Existing	0.00	10	$0.00	100%	0
Single Family	Heat Room	Room Heat - Standard	Standard Room Heat	Standard Room Heat	Per Household	New	0.00	10	$0.00	100%	0
Single Family	Heat Room	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	2.03	20	$24	24%	0
Single Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.56	20	$8	73%	0
Single Family	Heat Room	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.56	20	$8	82%	0
Single Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	1.47	20	$33	61%	0
Single Family	Heat Room	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	1.47	20	$33	68%	0
Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	Existing	22	7	$20	100%	0
Single Family	Home Audio System	Home Audio System - ENERGY STAR	ENERGY STAR Home Audio System	Standard Home Audio System	Per Unit Each	New	22	7	$20	100%	0
Single Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Single Family	Home Audio System	Home Audio System - Standard	Standard Home Audio System	Standard Home Audio System	Per Unit Each	New	0.00	7	$0.00	100%	0
Single Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	17	11	$611	35%	0
Single Family	Lighting Exterior	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	17	11	$611	64%	0
Single Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	Existing	17	10	$64	25%	0
Single Family	Lighting Exterior	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	Lighitng Controls - Daylighting Controls (Photocell) - Outdoors	No Daylighting Controls	Per Photocell Control	New	17	10	$64	25%	0
Single Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	Existing	35	3	$4	100%	0
Single Family	Lighting Exterior	Lighting - CFL	Exterior - CFL	EISA Standard	Per Lamp	New	35	3	$4	100%	0
Single Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	Existing	32	2	$0.00	100%	0
Single Family	Lighting Exterior	Lighting - EISA Backstop	Exterior - EISA Backstop	EISA Standard	Per Lamp	New	32	2	$0.00	100%	0
Single Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Single Family	Lighting Exterior	Lighting - EISA Standard	Exterior - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Single Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Single Family	Lighting Exterior	Lighting - Incandescent	Exterior - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	Existing	51	12	$36	100%	25,726
Single Family	Lighting Exterior	Lighting - LED	Exterior - LED	EISA Standard	Per Lamp	New	51	12	$36	100%	1,514
Single Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	Existing	6.08	5	$18	82%	0
Single Family	Lighting Interior Specialty	LED Christmas Lighting	LED Christmas Lighting	Incandescent Christmas Lighting	Per LED String	New	6.08	5	$18	82%	0
Single Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	Existing	31	6	$6	65%	90,550
Single Family	Lighting Interior Specialty	Lighting - CFL	Interior Specialty - CFL	EISA Standard	Per Lamp	New	31	6	$6	65%	5,641
Single Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0
Single Family	Lighting Interior Specialty	Lighting - Incandescent	Interior Specialty - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Single Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	Existing	37	12	$28	50%	153,377
Single Family	Lighting Interior Specialty	Lighting - LED	Interior Specialty - LED	EISA Standard	Per Lamp	New	37	12	$28	50%	8,628
Single Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	83	11	$611	35%	0
Single Family	Lighting Interior Standard	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	83	11	$611	64%	0
Single Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	Existing	16	10	$64	14%	0
Single Family	Lighting Interior Standard	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	Lighitng Controls - Daylighting Controls (Photocell) - Indoors	No Daylighting Controls	Per Photocell Control	New	16	10	$64	14%	0
Single Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	Existing	15	5	-0.2101	100%	0
Single Family	Lighting Interior Standard	Lighting - CFL	Interior Standard - CFL	EISA Standard	Per Lamp	New	15	5	-0.2101	100%	0
Single Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	Existing	14	2	$0.00	100%	0
Single Family	Lighting Interior Standard	Lighting - EISA Backstop	Interior Standard - EISA Backstop	EISA Standard	Per Lamp	New	14	2	$0.00	100%	0
Single Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	Existing	0.00	2	$0.00	100%	0
Single Family	Lighting Interior Standard	Lighting - EISA Standard	Interior Standard - EISA Standard	EISA Standard	Per Lamp	New	0.00	2	$0.00	100%	0
Single Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	Existing	0.00	2	$0.00	100%	0

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Lighting Interior Standard	Lighting - Incandescent	Interior Standard - Incandescent	Incandescent	Per Lamp	New	0.00	2	$0.00	100%	0
Single Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	Existing	22	12	$24	100%	126,626
Single Family	Lighting Interior Standard	Lighting - LED	Interior Standard - LED	EISA Standard	Per Lamp	New	22	12	$24	100%	7,537
Single Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	Existing	31	10	$56	17%	0
Single Family	Lighting Interior Standard	Lighting Controls - Occupancy Sensors	Wall-Switch Occupancy Sensors	No Occupancy Sensor	Per Occupancy Sensor	New	31	10	$56	17%	0
Single Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Single Family	Microwave	Microwave - Standard	Standard Microwave	Standard Microwave	Per Unit Each	New	0.00	10	$0.00	100%	0
Single Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	Existing	14	5	$0.00	100%	0
Single Family	Monitor	Monitor - Home Office ENERGY STAR	ENERGY STAR Office Monitor	Standard Office Monitor	Per Unit Each	New	14	5	$0.00	100%	0
Single Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Single Family	Monitor	Monitor - Home Office Standard	Standard Office Monitor	Standard Office Monitor	Per Unit Each	New	0.00	5	$0.00	100%	0
Single Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	Existing	18	3	$0.99	100%	14,099
Single Family	Other Plug Load	DVD System - ENERGY STAR	ENERGY STAR DVD System	Standard DVD System	Per Unit Each	New	18	3	$0.99	100%	845
Single Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	Existing	0.00	3	$0.00	100%	0
Single Family	Other Plug Load	DVD System - Standard	Standard DVD System	Standard DVD System	Per Unit Each	New	0.00	3	$0.00	100%	0
Single Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	Existing	12	3	$4	36%	0
Single Family	Plug Load Other	Battery Chargers	Energy Star Battery Chargers	Standard Battery Chargers	Per Battary Charger	New	12	3	$4	36%	0
Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	65	10	$119	51%	0
Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	65	10	$119	51%	0
Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	51%	1,415
Single Family	Plug Load Other	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	51%	83
Single Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	Existing	25	5	$1	29%	4,829
Single Family	Plug Load Other	Cordless Phone - ENERGY STAR	ENERGY STAR Cordless Phone	Standard Cordless Phone	Per Cordless Phone	New	25	5	$1	29%	284
Single Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	Existing	24	4	$8	4%	255
Single Family	Plug Load Other	Home Office - Server	ENERGY STAR Home Server	Standard Office Server	Per Home Server	New	24	4	$8	4%	12
Single Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	Existing	0.00	5	$0.00	100%	0
Single Family	Plug Load Other	Plug Load - Other	Plug Load Other	Plug Load Other	Per Household	New	0.00	5	$0.00	100%	0
Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	Existing	100	5	$22	62%	39,819
Single Family	Plug Load Other	Smart Strip	Smart Strip	Standard Power Strip	Per Smart Strip	New	100	5	$22	62%	2,345

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Plug Load Other	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	368	25	$3,318	0%	0
Single Family	Plug Load Other	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	368	25	$3,318	0%	0
Single Family	Pool Pump	Pool Pump - Standard Constant Speed	Constant Speed Pool Pump	Constant Speed Pool Pump	Per Household	Existing	0.00	10	$0.00	100%	0
Single Family	Pool Pump	Pool Pump - Standard Constant Speed	Constant Speed Pool Pump	Constant Speed Pool Pump	Per Household	New	0.00	10	$0.00	100%	0
Single Family	Pool Pump	Pool Pump Timers	Pool Pump Timers	Pool Pump No Timers	Per Pool Pump Timer	Existing	291	10	$89	64%	1,241
Single Family	Pool Pump	Pool Pumps - 2-Speed	Pool Pumps (2-Speed)	Constant Speed Pool Pump	Per Household	Existing	660	10	$165	100%	0
Single Family	Pool Pump	Pool Pumps - 2-Speed	Pool Pumps (2-Speed)	Constant Speed Pool Pump	Per Household	New	660	10	$165	100%	0
Single Family	Pool Pump	Pool Pumps - VSD	Pool Pumps (VSD)	Constant Speed Pool Pump	Per Household	Existing	1,080	10	$695	100%	8,004
Single Family	Pool Pump	Pool Pumps - VSD	Pool Pumps (VSD)	Constant Speed Pool Pump	Per Household	New	1,080	10	$695	100%	792
Single Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	Existing	32	5	$13	100%	5,879
Single Family	Printer	Printer - Home Office ENERGY STAR	ENERGY STAR Office Printer	Standard Printer	Per Unit Each	New	32	5	$13	100%	305
Single Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Single Family	Printer	Printer - Standard	Standard Printer	Standard Printer	Per Unit Each	New	0.00	5	$0.00	100%	0
Single Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Single Family	Refrigerator	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Unit Each	New	0.00	7	$0.00	100%	0
Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	142	13	$429	100%	0
Single Family	Refrigerator	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	142	13	$429	100%	0
Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	170	13	$580	100%	0
Single Family	Refrigerator	Refrigerator - CEE Tier 3	CEE Tier 3 Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	170	13	$580	100%	0
Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	113	13	$251	100%	0
Single Family	Refrigerator	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	113	13	$251	100%	0
Single Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	56	13	$124	100%	0
Single Family	Refrigerator	Refrigerator - Federal Standard September 2014	Federal Standard In 2014 (NAECA)	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	56	13	$124	100%	0
Single Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Single Family	Refrigerator	Refrigerator - Standard 2001	Standard Refrigerator - Federal Standard 2001	Standard Refrigerator - Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Single Family	Refrigerator	Removal of Secondary Refrigerator/Freezer	Proper Disposal of Refrigerator/Freezer Combo	Existing Non-Efficient Refrigerator/Freezer	Per Recyled Unit	Existing	1,140	5	$30	3%	31,191
Single Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	164	5	$12	100%	73,253
Single Family	Set Top Box	Digital Set Top Receiver - ENERGY STAR	ENERGY STAR Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	164	5	$12	100%	4,832
Single Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Single Family	Set Top Box	Digital Set Top Receiver - Standard	Standard Digital Set Top Receiver	Standard Digital Set Top Receiver	Per Unit Each	New	0.00	5	$0.00	100%	0
Single Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	Existing	118	5	$55	100%	77,387
Single Family	Television	TV - ENERGY STAR	ENERGY STAR TV	Standard TV	Per Unit Each	New	118	5	$55	100%	4,012
Single Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	Existing	0.00	5	$0.00	100%	0
Single Family	Television	TV - Standard	Standard TV	Standard TV	Per Unit Each	New	0.00	5	$0.00	100%	0
Single Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	Existing	469	15	$200	62%	186,270

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Ventilation And Circulation	ECM Motor - Air Conditioner/Electric/Gas Furnace ECM Fan	Air Conditioner/Electric/Gas Furnace ECM Fan	Standard Motor	Per ECM	New	452	15	$200	90%	16,808
Single Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	Existing	0.00	20	$0.00	100%	0
Single Family	Ventilation And Circulation	Motor - Standard	Standard Motor - Ventilation And Circulation	Standard Motor	Per Household	New	0.00	20	$0.00	100%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	649	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	649	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	467	11	$391	80%	18,281
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	467	11	$391	80%	720
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	519	11	$565	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	519	11	$565	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	404	11	$134	73%	20,482
Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	404	11	$134	73%	1,164
Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	649	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	649	11	$789	83%	0
Single Family	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	350	10	$600	55%	0
Single Family	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	701	10	$600	1%	205
Single Family	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	701	10	$600	0%	46
Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	155	11	$1,067	54%	0
Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	155	11	$1,067	54%	0
Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	60	11	$272	18%	0
Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	60	11	$272	18%	0
Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	820	40	$935	27%	21,257
Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	773	40	$935	68%	2,504
Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	113	10	$1	85%	11,207
Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	107	10	$1	90%	560

Table A.3.1. Residential Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	46	10	$1	26%	75
Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	44	10	$1	28%	0
Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	13	10	$0.53	14%	0
Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	12	10	$0.53	15%	0
Single Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	53	10	$3	9%	563
Single Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	172	6	$524	1%	0
Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	222	10	$8	80%	20,762
Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	211	10	$8	80%	985
Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	111	10	$13	38%	256
Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	105	10	$13	38%	12
Single Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	111	10	$24	23%	3,013
Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	1,753	15	$6,238	15%	0
Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	1,653	15	$4,878	15%	0
Single Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	Existing	0.00	7	$0.00	100%	0
Single Family	Water Heat	Water Heater - Below Standard	EF = 0.88 Below Standard Water Heater	EF = 0.88 Below Standard Water Heater	Per Unit Each	New	0.00	7	$0.00	100%	0
Single Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	1,884	13	$1,281	60%	76,333
Single Family	Water Heat	Water Heater - Heat Pump	Heat Pump Water Heater ENERGY STAR EF = 2.0	EF = 0.92 Federal Standard 2001	Per Unit Each	New	1,794	13	$1,281	60%	5,823
Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	69	13	$6	36%	2,568
Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	69	13	$6	43%	155
Single Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	0.00	13	$0.00	100%	0
Single Family	Water Heat	Water Heater - Storage 2001 Standard	EF = 0.92 Federal Standard 2001	EF = 0.92 Federal Standard 2001	Per Unit Each	New	0.00	13	$0.00	100%	0
Single Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	113	13	$43	100%	0
Single Family	Water Heat	Water Heater - Storage 2015 Standard	Water Heater - Storage Federal Standard April 2015 EF = 0.95	EF = 0.92 Federal Standard 2001	Per Unit Each	New	107	13	$43	100%	0
Single Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	227	13	$17	14%	3,427
Single Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	Existing	223	20	$260	0%	0
Single Family	Water Heat	Water Heater - Tankless	Tankless EF= 0.98	EF = 0.92 Federal Standard 2001	Per Unit Each	New	212	20	$260	0%	0
Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	670	4	$10	13%	9,343
Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	631	4	$10	13%	438

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	10	19	$125	100%	0
Low Income Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	10	19	$125	100%	0
Low Income Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	4.08	11	$208	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	4.08	11	$208	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Low Income Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	11	20	$314	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	9	20	$314	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	17	20	$2,038	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	14	20	$2,038	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	22	20	$2,457	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	18	20	$2,457	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	33	20	$2,895	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	27	20	$2,895	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Per Boiler Control	Existing	27	20	$383	50%	0
Low Income Multi Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6	No Insulation	Per Pipe Insulation	Existing	9	15	$44	23%	2
Low Income Multi Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Low Income Multi Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	32%	2
Low Income Multi Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.25	20	$0.92	32%	0
Low Income Multi Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	40%	4
Low Income Multi Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.46	20	$3	40%	0
Low Income Multi Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	22	18	$333	0%	0
Low Income Multi Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	82	18	$960	0%	0
Low Income Multi Family	Heat Central Boiler	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	55	18	$587	0%	0
Low Income Multi Family	Heat Central Boiler	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Low Income Multi Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	55	11	$611	13%	7
Low Income Multi Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	29	11	$611	20%	0
Low Income Multi Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.03	11	$0.25	42%	1
Low Income Multi Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.07	11	$0.44	19%	16
Low Income Multi Family	Heat Central Boiler	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.19	63%	26
Low Income Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	7%	4
Low Income Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	7%	3
Low Income Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	17%	0
Low Income Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.01	20	$0.25	17%	0
Low Income Multi Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	6
Low Income Multi Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	15

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Heat Central Boiler	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	23	20	$375	0%	0
Low Income Multi Family	Heat Central Boiler	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Low Income Multi Family	Heat Central Boiler	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	8%	1
Low Income Multi Family	Heat Central Boiler	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	4
Low Income Multi Family	Heat Central Boiler	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	28%	0
Low Income Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	2
Low Income Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	1%	1
Low Income Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	0
Low Income Multi Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	49	20	$746	0%	0
Low Income Multi Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	40	20	$746	0%	0
Low Income Multi Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	27	5	$300	38%	0
Low Income Multi Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	New	22	5	$300	38%	0
Low Income Multi Family	Heat Central Boiler	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	30	11	$895	62%	0
Low Income Multi Family	Heat Central Boiler	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	19	15	$33	42%	2
Low Income Multi Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	19	15	$167	44%	8
Low Income Multi Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	15	15	$167	62%	0
Low Income Multi Family	Heat Central Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Tune-up	Existing	27	5	$200	66%	0
Low Income Multi Family	Heat Central Boiler	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.34	20	$19	24%	0
Low Income Multi Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$3	73%	0
Low Income Multi Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$3	82%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$28	63%	0
Low Income Multi Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.24	20	$28	68%	0
Low Income Multi Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	32%	97
Low Income Multi Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.23	20	$0.92	32%	4
Low Income Multi Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	40%	208
Low Income Multi Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.42	20	$3	40%	9
Low Income Multi Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	12	18	$333	54%	0
Low Income Multi Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	53	18	$960	24%	558
Low Income Multi Family	Heat Central Furnace	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	35	18	$587	54%	899
Low Income Multi Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	7.53	20	$82	100%	147
Low Income Multi Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	5.36	20	$82	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	11	20	$220	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	7.96	20	$220	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	14	20	$498	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	10	20	$498	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	21	20	$653	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	15	20	$653	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Low Income Multi Family	Heat Central Furnace	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.00	30	$13	88%	0
Low Income Multi Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	35	11	$611	13%	0
Low Income Multi Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	16	11	$611	20%	0
Low Income Multi Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.01	11	$0.25	42%	20
Low Income Multi Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.44	19%	496
Low Income Multi Family	Heat Central Furnace	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	840
Low Income Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	7%	173
Low Income Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	7%	152
Low Income Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	17%	0
Low Income Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	17%	0
Low Income Multi Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	327
Low Income Multi Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	851
Low Income Multi Family	Heat Central Furnace	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	15	20	$375	71%	0
Low Income Multi Family	Heat Central Furnace	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Low Income Multi Family	Heat Central Furnace	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	8%	51
Low Income Multi Family	Heat Central Furnace	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	224
Low Income Multi Family	Heat Central Furnace	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	28%	0
Low Income Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	107
Low Income Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	1%	42

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	16
Low Income Multi Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	7.07	5	$300	38%	0
Low Income Multi Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	New	5.04	5	$300	38%	0
Low Income Multi Family	Heat Central Furnace	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	17	11	$895	62%	0
Low Income Multi Family	Heat Central Furnace	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	12	15	$33	42%	158
Low Income Multi Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	12	15	$167	44%	259
Low Income Multi Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	8.84	15	$167	62%	14
Low Income Multi Family	Heat Central Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Tune-up	Existing	17	5	$200	66%	0
Low Income Multi Family	Heat Central Furnace	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.35	20	$19	24%	0
Low Income Multi Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$3	73%	0
Low Income Multi Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$3	82%	0
Low Income Multi Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$28	63%	0
Low Income Multi Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.22	20	$28	68%	0
Low Income Multi Family	Other	Other	Other	Other	Per Unit Each	Existing	-55.64756	10	$0.00	100%	0
Low Income Multi Family	Other	Other	Other	Other	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Low Income Multi Family	Other	Other	Other	Other	Per Unit Each	New	-55.64756	10	$0.00	100%	0
Low Income Multi Family	Other	Other	Other	Other	Per Unit Each	New	0.00	10	$0.00	100%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	16	11	$789	26%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	16	11	$789	27%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	11	11	$391	24%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	11	11	$391	25%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	12	11	$565	26%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	12	11	$565	26%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	10	11	$134	20%	0
Low Income Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	10	11	$134	20%	0
Low Income Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	16	11	$789	27%	0
Low Income Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	16	11	$789	27%	0
Low Income Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	4.26	11	$1,067	21%	0
Low Income Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	4.26	11	$1,067	21%	0
Low Income Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	1.88	11	$272	7%	0
Low Income Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	1.88	11	$272	7%	0
Low Income Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	29	40	$935	10%	0
Low Income Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	28	40	$935	71%	0
Low Income Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	5.03	10	$1	85%	129
Low Income Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	4.79	10	$1	90%	6
Low Income Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	2.07	10	$1	26%	1
Low Income Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	1.97	10	$1	28%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	0.59	10	$0.53	14%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	0.56	10	$0.53	15%	0
Low Income Multi Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	2.36	10	$3	9%	6
Low Income Multi Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	7.83	6	$524	1%	0
Low Income Multi Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	40	20	$746	0%	0
Low Income Multi Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	38	20	$746	0%	0
Low Income Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	14	10	$8	80%	358
Low Income Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	14	10	$8	80%	16
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	7.40	10	$13	38%	4
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	7.05	10	$13	38%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Multi Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	7.40	10	$24	23%	52
Low Income Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	63	15	$6,238	15%	0
Low Income Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	60	15	$4,878	15%	0
Low Income Multi Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	32	11	$1,281	90%	0
Low Income Multi Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	New	31	11	$1,281	90%	0
Low Income Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	3.09	13	$6	30%	24
Low Income Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	3.09	13	$6	45%	2
Low Income Multi Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	Existing	10	11	$561	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	New	9	11	$561	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	4.37	11	$43	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	New	4.16	11	$43	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	14	11	$260	100%	0
Low Income Multi Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	New	13	11	$260	100%	0
Low Income Multi Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	8.28	13	$17	10%	21
Low Income Multi Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	35	20	$832	90%	0
Low Income Multi Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	New	33	20	$693	90%	0
Low Income Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	24	4	$10	7%	45
Low Income Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	23	4	$10	7%	2
Low Income Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	10	19	$125	100%	0
Low Income Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	10	19	$125	100%	0
Low Income Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Low Income Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Low Income Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	5.42	11	$208	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	5.42	11	$208	100%	0
Low Income Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Low Income Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	15	20	$471	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	11	20	$471	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	23	20	$3,057	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	17	20	$3,057	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	30	20	$3,685	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	22	20	$3,685	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	45	20	$4,342	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	33	20	$4,342	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Per Boiler Control	Existing	36	20	$383	50%	65
Low Income Single Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6	No Insulation	Per Pipe Insulation	Existing	11	15	$44	23%	14
Low Income Single Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Low Income Single Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Low Income Single Family	Heat Central Boiler	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.03	40	$2	67%	0
Low Income Single Family	Heat Central Boiler	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.03	40	$0.76	67%	11
Low Income Single Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	2
Low Income Single Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.25	20	$0.92	61%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	79
Low Income Single Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.46	20	$3	76%	4
Low Income Single Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	27	18	$333	0%	0
Low Income Single Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	110	18	$960	0%	0
Low Income Single Family	Heat Central Boiler	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	73	18	$587	0%	0
Low Income Single Family	Heat Central Boiler	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$15	88%	0
Low Income Single Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	73	11	$611	48%	178
Low Income Single Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	35	11	$611	64%	0
Low Income Single Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	4
Low Income Single Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.06	11	$0.44	19%	112
Low Income Single Family	Heat Central Boiler	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.19	63%	188
Low Income Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	27%	72
Low Income Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	27%	63
Low Income Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Low Income Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.01	20	$0.25	45%	0
Low Income Single Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	12%	56
Low Income Single Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	24%	141
Low Income Single Family	Heat Central Boiler	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	31	20	$248	0%	0
Low Income Single Family	Heat Central Boiler	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	60%	0
Low Income Single Family	Heat Central Boiler	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	22%	15

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Heat Central Boiler	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	71
Low Income Single Family	Heat Central Boiler	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	17%	0
Low Income Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	18
Low Income Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	31
Low Income Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	5
Low Income Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	66	20	$746	0%	0
Low Income Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	49	20	$746	0%	0
Low Income Single Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	36	5	$300	38%	0
Low Income Single Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	New	27	5	$300	38%	0
Low Income Single Family	Heat Central Boiler	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	37	11	$895	86%	0
Low Income Single Family	Heat Central Boiler	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	25	15	$33	67%	0
Low Income Single Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	25	15	$167	70%	39
Low Income Single Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	19	15	$167	90%	5
Low Income Single Family	Heat Central Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Tune-up	Existing	36	5	$200	66%	0
Low Income Single Family	Heat Central Boiler	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.34	20	$24	24%	0
Low Income Single Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Low Income Single Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Low Income Single Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Low Income Single Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.24	20	$33	68%	0
Low Income Single Family	Heat Central Furnace	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.03	40	$2	67%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Heat Central Furnace	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.03	40	$0.76	67%	169
Low Income Single Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	34
Low Income Single Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.23	20	$0.92	61%	1
Low Income Single Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	1,247
Low Income Single Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.42	20	$3	76%	57
Low Income Single Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	24	18	$333	65%	71
Low Income Single Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	88	18	$960	33%	2,582
Low Income Single Family	Heat Central Furnace	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	58	18	$587	65%	2,654
Low Income Single Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	12	20	$124	100%	506
Low Income Single Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	10	20	$124	100%	38
Low Income Single Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	18	20	$330	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	15	20	$330	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	24	20	$747	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	20	20	$747	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	36	20	$979	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	30	20	$979	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Low Income Single Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Heat Central Furnace	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$15	88%	0
Low Income Single Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	58	11	$611	48%	2,034
Low Income Single Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	32	11	$611	64%	0
Low Income Single Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	60
Low Income Single Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.05	11	$0.44	19%	1,270
Low Income Single Family	Heat Central Furnace	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	2,188
Low Income Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	27%	1,073
Low Income Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	27%	934
Low Income Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Low Income Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Low Income Single Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	12%	845
Low Income Single Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	24%	2,150
Low Income Single Family	Heat Central Furnace	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	25	20	$248	71%	1,609
Low Income Single Family	Heat Central Furnace	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	60%	0
Low Income Single Family	Heat Central Furnace	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	22%	217
Low Income Single Family	Heat Central Furnace	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	1,196
Low Income Single Family	Heat Central Furnace	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	17%	0
Low Income Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	296
Low Income Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	531
Low Income Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	70

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	11	5	$300	38%	0
Low Income Single Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	New	9	5	$300	38%	0
Low Income Single Family	Heat Central Furnace	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	33	11	$895	86%	0
Low Income Single Family	Heat Central Furnace	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	20	15	$33	67%	0
Low Income Single Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	20	15	$167	70%	521
Low Income Single Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	17	15	$167	90%	73
Low Income Single Family	Heat Central Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Tune-up	Existing	29	5	$200	66%	0
Low Income Single Family	Heat Central Furnace	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.35	20	$24	24%	0
Low Income Single Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Low Income Single Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$8	82%	0
Low Income Single Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Low Income Single Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.22	20	$33	68%	0
Low Income Single Family	Other	Other	Other	Other	Per Unit Each	Existing	-55.64756	10	$0.00	100%	0
Low Income Single Family	Other	Other	Other	Other	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Low Income Single Family	Other	Other	Other	Other	Per Unit Each	New	-55.64756	10	$0.00	100%	0
Low Income Single Family	Other	Other	Other	Other	Per Unit Each	New	0.00	10	$0.00	100%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	23	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	23	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	17	11	$391	75%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	17	11	$391	79%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	18	11	$565	80%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	18	11	$565	80%	0
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	14	11	$134	68%	639
Low Income Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	14	11	$134	68%	38
Low Income Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	23	11	$789	83%	0
Low Income Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	23	11	$789	83%	0
Low Income Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	4.26	11	$1,067	14%	0
Low Income Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	4.26	11	$1,067	14%	0
Low Income Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	1.88	11	$272	5%	0
Low Income Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	1.88	11	$272	5%	0
Low Income Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	43	40	$935	27%	0
Low Income Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	41	40	$935	68%	0
Low Income Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	5.24	10	$1	85%	371
Low Income Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	4.99	10	$1	90%	18
Low Income Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	2.16	10	$1	26%	2
Low Income Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	2.05	10	$1	28%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	0.61	10	$0.53	14%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	0.58	10	$0.53	15%	0
Low Income Single Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	2.46	10	$3	9%	19
Low Income Single Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	7.83	6	$524	1%	0
Low Income Single Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	58	20	$746	0%	0
Low Income Single Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	55	20	$746	0%	0
Low Income Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	10	10	$8	80%	687
Low Income Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	9	10	$8	80%	31
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	5.14	10	$13	38%	8
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	4.90	10	$13	38%	0
Low Income Single Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	5.14	10	$24	23%	100

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Low Income Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	92	15	$6,238	15%	0
Low Income Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	88	15	$4,878	15%	0
Low Income Single Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	48	11	$1,281	90%	0
Low Income Single Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	New	45	11	$1,281	90%	0
Low Income Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	3.09	13	$6	37%	86
Low Income Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	3.09	13	$6	45%	5
Low Income Single Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	New	0.00	6	$0.00	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	Existing	14	11	$561	100%	-20
Low Income Single Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	New	14	11	$561	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	6.38	11	$43	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	New	6.07	11	$43	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	21	11	$260	100%	0
Low Income Single Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	New	20	11	$260	100%	0
Low Income Single Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	12	13	$17	17%	152
Low Income Single Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	51	20	$832	90%	0
Low Income Single Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	New	49	20	$693	90%	0
Low Income Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	35	4	$10	11%	317
Low Income Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	33	4	$10	11%	14
Manufactured	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	10	19	$125	100%	0
Manufactured	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	10	19	$125	100%	0
Manufactured	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Manufactured	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Manufactured	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Manufactured	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Manufactured	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	4.55	11	$208	100%	0
Manufactured	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	4.55	11	$208	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Manufactured	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Manufactured	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	14	20	$392	100%	0
Manufactured	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	9	20	$392	100%	0
Manufactured	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	21	20	$2,547	100%	0
Manufactured	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	13	20	$2,547	100%	0
Manufactured	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	27	20	$3,071	100%	0
Manufactured	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	18	20	$3,071	100%	0
Manufactured	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	40	20	$3,619	100%	0
Manufactured	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	26	20	$3,619	100%	0
Manufactured	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Manufactured	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Manufactured	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Per Boiler Control	Existing	33	20	$383	50%	0
Manufactured	Heat Central Boiler	Boiler - Pipe Insulation	R-6	No Insulation	Per Pipe Insulation	Existing	11	15	$44	23%	0
Manufactured	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Manufactured	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Manufactured	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	0
Manufactured	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.25	20	$0.92	61%	0
Manufactured	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	0
Manufactured	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.46	20	$3	76%	0
Manufactured	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	21	18	$333	0%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	100	18	$960	0%	0
Manufactured	Heat Central Boiler	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	67	18	$587	0%	0
Manufactured	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	67	11	$611	56%	0
Manufactured	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	28	11	$611	64%	0
Manufactured	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	61%	0
Manufactured	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.08	11	$0.44	19%	0
Manufactured	Heat Central Boiler	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.19	72%	0
Manufactured	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	21%	0
Manufactured	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	20%	0
Manufactured	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Manufactured	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.01	20	$0.25	45%	0
Manufactured	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	0
Manufactured	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	0
Manufactured	Heat Central Boiler	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	28	20	$366	0%	0
Manufactured	Heat Central Boiler	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	38%	0
Manufactured	Heat Central Boiler	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	11%	0
Manufactured	Heat Central Boiler	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	0
Manufactured	Heat Central Boiler	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.07	20	$0.59	9%	0
Manufactured	Heat Central Boiler	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	13%	0
Manufactured	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	0
Manufactured	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	87%	0
Manufactured	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	60	20	$746	0%	0
Manufactured	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	39	20	$746	0%	0
Manufactured	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	33	5	$300	38%	0
Manufactured	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	New	21	5	$300	38%	0
Manufactured	Heat Central Boiler	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	29	11	$895	62%	0
Manufactured	Heat Central Boiler	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	23	15	$33	79%	0
Manufactured	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	23	15	$167	82%	0
Manufactured	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	15	15	$167	90%	0
Manufactured	Heat Central Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Tune-up	Existing	33	5	$200	66%	0
Manufactured	Heat Central Boiler	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.34	20	$24	24%	0
Manufactured	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Manufactured	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Manufactured	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Manufactured	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.24	20	$33	68%	0
Manufactured	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	14
Manufactured	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.23	20	$0.92	61%	1
Manufactured	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	512
Manufactured	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.42	20	$3	76%	24

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	18	18	$333	61%	19
Manufactured	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	78	18	$960	33%	870
Manufactured	Heat Central Furnace	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	52	18	$587	61%	864
Manufactured	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	11	20	$103	100%	169
Manufactured	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	8.19	20	$103	100%	13
Manufactured	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	16	20	$275	100%	0
Manufactured	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	12	20	$275	100%	0
Manufactured	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	22	20	$622	100%	0
Manufactured	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	16	20	$622	100%	0
Manufactured	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	32	20	$816	100%	0
Manufactured	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	23	20	$816	100%	0
Manufactured	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Manufactured	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Manufactured	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Manufactured	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Manufactured	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	52	11	$611	56%	863
Manufactured	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	24	11	$611	64%	0
Manufactured	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	61%	30
Manufactured	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.06	11	$0.44	19%	557
Manufactured	Heat Central Furnace	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.19	72%	1,056

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	21%	345
Manufactured	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	20%	295
Manufactured	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Manufactured	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Manufactured	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	207
Manufactured	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	501
Manufactured	Heat Central Furnace	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	22	20	$366	71%	472
Manufactured	Heat Central Furnace	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	38%	0
Manufactured	Heat Central Furnace	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	11%	49
Manufactured	Heat Central Furnace	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	324
Manufactured	Heat Central Furnace	Insulation - Skirting	Insulation Skirting for Manufactured Homes (R-19)	No Skirting	Per Insulated SqFt	Existing	0.07	20	$0.59	9%	70
Manufactured	Heat Central Furnace	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	13%	0
Manufactured	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	78
Manufactured	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	143
Manufactured	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	87%	21
Manufactured	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	10	5	$300	38%	0
Manufactured	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	New	7.56	5	$300	38%	0
Manufactured	Heat Central Furnace	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	25	11	$895	62%	0
Manufactured	Heat Central Furnace	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	18	15	$33	79%	0
Manufactured	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	18	15	$167	82%	197

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	13	15	$167	90%	22
Manufactured	Heat Central Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Tune-up	Existing	26	5	$200	66%	0
Manufactured	Heat Central Furnace	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.35	20	$24	24%	0
Manufactured	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Manufactured	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$8	82%	0
Manufactured	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Manufactured	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.22	20	$33	68%	0
Manufactured	Other	Other	Other	Other	Per Unit Each	Existing	-55.64756	10	$0.00	100%	0
Manufactured	Other	Other	Other	Other	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Manufactured	Other	Other	Other	Other	Per Unit Each	New	-55.64756	10	$0.00	100%	0
Manufactured	Other	Other	Other	Other	Per Unit Each	New	0.00	10	$0.00	100%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	22	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	22	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	16	11	$391	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	16	11	$391	83%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	17	11	$565	80%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	17	11	$565	80%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	13	11	$134	81%	0
Manufactured	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	13	11	$134	81%	0
Manufactured	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	22	11	$789	83%	0
Manufactured	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	22	11	$789	83%	0
Manufactured	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	4.26	11	$1,067	47%	0
Manufactured	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	4.26	11	$1,067	47%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	1.88	11	$272	16%	0
Manufactured	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	1.88	11	$272	16%	0
Manufactured	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	41	40	$935	19%	0
Manufactured	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	39	40	$935	71%	0
Manufactured	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	5.81	10	$1	85%	86
Manufactured	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	5.53	10	$1	90%	4
Manufactured	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	2.39	10	$1	26%	1
Manufactured	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	2.27	10	$1	28%	0
Manufactured	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	0.68	10	$0.53	14%	0
Manufactured	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	0.65	10	$0.53	15%	0
Manufactured	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	2.73	10	$3	9%	4
Manufactured	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	55	20	$746	0%	0
Manufactured	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	52	20	$746	0%	0
Manufactured	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	13	10	$8	80%	191
Manufactured	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	13	10	$8	80%	9
Manufactured	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	6.84	10	$13	38%	2
Manufactured	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	6.51	10	$13	38%	0
Manufactured	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	6.84	10	$24	23%	28
Manufactured	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	87	15	$6,238	15%	0
Manufactured	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	83	15	$4,878	15%	0
Manufactured	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	45	11	$1,281	90%	0
Manufactured	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	New	43	11	$1,281	90%	0
Manufactured	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	3.09	13	$6	14%	7
Manufactured	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	3.09	13	$6	20%	0
Manufactured	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	New	0.00	6	$0.00	100%	0
Manufactured	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	Existing	14	11	$561	100%	0
Manufactured	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	New	13	11	$561	100%	0
Manufactured	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	6.05	11	$43	100%	0
Manufactured	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	New	5.76	11	$43	100%	0
Manufactured	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	20	11	$260	100%	0
Manufactured	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	New	19	11	$260	100%	0
Manufactured	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	11	13	$17	17%	31
Manufactured	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	48	20	$832	90%	0
Manufactured	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	New	46	20	$693	90%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Manufactured	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	33	4	$10	5%	27
Manufactured	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	31	4	$10	5%	1
Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	10	19	$125	100%	0
Multi Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	10	19	$125	100%	0
Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Multi Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Multi Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	4.08	11	$208	100%	0
Multi Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	4.08	11	$208	100%	0
Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Multi Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Multi Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	11	20	$314	100%	0
Multi Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	9	20	$314	100%	0
Multi Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	17	20	$2,038	100%	0
Multi Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	14	20	$2,038	100%	0
Multi Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	22	20	$2,457	100%	0
Multi Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	18	20	$2,457	100%	0
Multi Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	33	20	$2,895	100%	0
Multi Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	27	20	$2,895	100%	0
Multi Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Multi Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Multi Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Per Boiler Control	Existing	27	20	$383	50%	0
Multi Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6	No Insulation	Per Pipe Insulation	Existing	9	15	$44	23%	2

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Multi Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Multi Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	32%	2
Multi Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.25	20	$0.92	32%	0
Multi Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	40%	5
Multi Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.46	20	$3	40%	0
Multi Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	22	18	$333	0%	0
Multi Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	81	18	$960	0%	0
Multi Family	Heat Central Boiler	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	54	18	$587	0%	0
Multi Family	Heat Central Boiler	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$13	88%	0
Multi Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	54	11	$611	15%	9
Multi Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	28	11	$611	20%	0
Multi Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	1
Multi Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.07	11	$0.44	19%	18
Multi Family	Heat Central Boiler	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.19	63%	30
Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	9%	6
Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	9%	5
Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	16%	0
Multi Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.01	20	$0.25	16%	0
Multi Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	7

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	18
Multi Family	Heat Central Boiler	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	22	20	$375	0%	0
Multi Family	Heat Central Boiler	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Multi Family	Heat Central Boiler	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	8%	1
Multi Family	Heat Central Boiler	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	5
Multi Family	Heat Central Boiler	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	26%	0
Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	2
Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	1%	1
Multi Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	0
Multi Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	48	20	$746	0%	0
Multi Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	39	20	$746	0%	0
Multi Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	27	5	$300	38%	0
Multi Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	New	22	5	$300	38%	0
Multi Family	Heat Central Boiler	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	30	11	$895	62%	0
Multi Family	Heat Central Boiler	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	18	15	$33	48%	3
Multi Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	18	15	$167	50%	11
Multi Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	15	15	$167	62%	1
Multi Family	Heat Central Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Tune-up	Existing	27	5	$200	66%	0
Multi Family	Heat Central Boiler	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.34	20	$19	24%	0
Multi Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$3	73%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$3	82%	0
Multi Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$28	61%	0
Multi Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.24	20	$28	68%	0
Multi Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	32%	114
Multi Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.23	20	$0.92	32%	5
Multi Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	40%	246
Multi Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.42	20	$3	40%	11
Multi Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	12	18	$333	54%	0
Multi Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	52	18	$960	24%	646
Multi Family	Heat Central Furnace	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	34	18	$587	54%	1,042
Multi Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	7.53	20	$82	100%	155
Multi Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	5.36	20	$82	100%	0
Multi Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	11	20	$220	100%	0
Multi Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	7.96	20	$220	100%	0
Multi Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	14	20	$498	100%	0
Multi Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	10	20	$498	100%	0
Multi Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	21	20	$653	100%	0
Multi Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	15	20	$653	100%	0
Multi Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Multi Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	New	0.00	10	$0.00	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Multi Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Multi Family	Heat Central Furnace	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.00	30	$13	88%	0
Multi Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	34	11	$611	15%	0
Multi Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	16	11	$611	20%	0
Multi Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.01	11	$0.25	42%	24
Multi Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.04	11	$0.44	19%	581
Multi Family	Heat Central Furnace	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	974
Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	9%	282
Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	9%	247
Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	16%	0
Multi Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	16%	0
Multi Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	7%	385
Multi Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	14%	997
Multi Family	Heat Central Furnace	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	14	20	$375	71%	0
Multi Family	Heat Central Furnace	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Multi Family	Heat Central Furnace	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	8%	58
Multi Family	Heat Central Furnace	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	264
Multi Family	Heat Central Furnace	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	26%	0
Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	126

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	1%	49
Multi Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	19
Multi Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	6.95	5	$300	38%	0
Multi Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	New	4.95	5	$300	38%	0
Multi Family	Heat Central Furnace	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	16	11	$895	62%	0
Multi Family	Heat Central Furnace	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	12	15	$33	48%	213
Multi Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	12	15	$167	50%	345
Multi Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	8.69	15	$167	62%	16
Multi Family	Heat Central Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Tune-up	Existing	17	5	$200	66%	0
Multi Family	Heat Central Furnace	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.35	20	$19	24%	0
Multi Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$3	73%	0
Multi Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$3	82%	0
Multi Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$28	61%	0
Multi Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.22	20	$28	68%	0
Multi Family	Other	Other	Other	Other	Per Unit Each	Existing	-55.64756	10	$0.00	100%	0
Multi Family	Other	Other	Other	Other	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Multi Family	Other	Other	Other	Other	Per Unit Each	New	-55.64756	10	$0.00	100%	0
Multi Family	Other	Other	Other	Other	Per Unit Each	New	0.00	10	$0.00	100%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	16	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	16	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	11	11	$391	44%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	11	11	$391	46%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	12	11	$565	46%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	12	11	$565	46%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	10	11	$134	37%	0
Multi Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	10	11	$134	37%	0
Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	16	11	$789	48%	0
Multi Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	16	11	$789	48%	0
Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	4.26	11	$1,067	47%	0
Multi Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	4.26	11	$1,067	47%	0
Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	1.88	11	$272	16%	0
Multi Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	1.88	11	$272	16%	0
Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	29	40	$935	10%	0
Multi Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	28	40	$935	71%	0
Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	5.03	10	$1	85%	152
Multi Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	4.79	10	$1	90%	7
Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	2.07	10	$1	26%	1
Multi Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	1.97	10	$1	28%	0
Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	0.59	10	$0.53	14%	0
Multi Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	0.56	10	$0.53	15%	0
Multi Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	2.36	10	$3	9%	8
Multi Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	7.83	6	$524	1%	0
Multi Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	39	20	$746	0%	0
Multi Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	37	20	$746	0%	0
Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	14	10	$8	80%	422
Multi Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	14	10	$8	80%	19
Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	7.40	10	$13	38%	5
Multi Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	7.05	10	$13	38%	0
Multi Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	7.40	10	$24	23%	61
Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	63	15	$6,238	15%	0
Multi Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	60	15	$4,878	15%	0
Multi Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	32	11	$1,281	90%	0
Multi Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	New	31	11	$1,281	90%	0
Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	3.09	13	$6	10%	9
Multi Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	3.09	13	$6	15%	1

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Multi Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	New	0.00	6	$0.00	100%	0
Multi Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	Existing	10	11	$561	100%	0
Multi Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	New	9	11	$561	100%	0
Multi Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	4.37	11	$43	100%	0
Multi Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	New	4.16	11	$43	100%	0
Multi Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	14	11	$260	100%	0
Multi Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	New	13	11	$260	100%	0
Multi Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	8.22	13	$17	13%	33
Multi Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	35	20	$832	90%	0
Multi Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	New	33	20	$693	90%	0
Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	24	4	$10	13%	97
Multi Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	23	4	$10	13%	4
Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	Existing	10	19	$125	100%	0
Single Family	Cooking Oven	Oven - Convection	Convection Oven	Standard Oven	Per Unit Each	New	10	19	$125	100%	0
Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Single Family	Cooking Oven	Oven - Standard	Standard Oven	Standard Oven	Per Unit Each	New	0.00	19	$0.00	100%	0
Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	Existing	0.00	19	$0.00	100%	0
Single Family	Cooking Range	Cooking Range - Standard	Standard Cooking Range	Standard Cooking Range	Per Unit Each	New	0.00	19	$0.00	100%	0
Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	5.42	11	$208	100%	0
Single Family	Dryer	Clothes Dryer - Moisture Sensor	Clothes Dryer w/ Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	5.42	11	$208	100%	0
Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	Existing	0.00	11	$0.00	100%	0
Single Family	Dryer	Clothes Dryer - Standard without Moisture Sensor	Standard Dryer without Moisture Sensor	Standard Dryer without Moisture Sensor	Per Unit Each	New	0.00	11	$0.00	100%	0
Single Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	16	20	$471	100%	0
Single Family	Heat Central Boiler	Boiler - 85% AFUE	85% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	15	20	$471	100%	0
Single Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	24	20	$3,057	100%	0
Single Family	Heat Central Boiler	Boiler - 90% AFUE	90% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	22	20	$3,057	100%	0
Single Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	32	20	$3,685	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Boiler	Boiler - 94% AFUE	94% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	29	20	$3,685	100%	0
Single Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	47	20	$4,342	100%	0
Single Family	Heat Central Boiler	Boiler - 96% AFUE	96% AFUE	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	43	20	$4,342	100%	0
Single Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Single Family	Heat Central Boiler	Boiler - Below Standard 80% AFUE	Below Standard 80% AFUE	Below Standard 80% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Single Family	Heat Central Boiler	Boiler - Controls	Boiler Controls	No Boiler Control	Per Boiler Control	Existing	37	20	$383	50%	356
Single Family	Heat Central Boiler	Boiler - Pipe Insulation	R-6	No Insulation	Per Pipe Insulation	Existing	11	15	$44	23%	58
Single Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Single Family	Heat Central Boiler	Boiler - Standard 82% AFUE	Federal Standard 82% AFUE (EISA 2007)	Federal Standard 82% AFUE (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Single Family	Heat Central Boiler	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.04	40	$2	67%	0
Single Family	Heat Central Boiler	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.04	40	$0.76	67%	60
Single Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	8
Single Family	Heat Central Boiler	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.25	20	$0.92	61%	0
Single Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	319
Single Family	Heat Central Boiler	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.46	20	$3	76%	15
Single Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	34	18	$333	0%	0
Single Family	Heat Central Boiler	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	112	18	$960	0%	0
Single Family	Heat Central Boiler	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	74	18	$587	0%	0
Single Family	Heat Central Boiler	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$15	88%	0
Single Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	74	11	$611	35%	541

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Boiler	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	44	11	$611	64%	0
Single Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.03	11	$0.25	42%	21
Single Family	Heat Central Boiler	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.06	11	$0.44	19%	464
Single Family	Heat Central Boiler	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.03	11	$0.19	63%	783
Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	23%	258
Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	23%	226
Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Single Family	Heat Central Boiler	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.01	20	$0.25	45%	0
Single Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	12%	232
Single Family	Heat Central Boiler	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	24%	580
Single Family	Heat Central Boiler	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	31	20	$596	0%	0
Single Family	Heat Central Boiler	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Single Family	Heat Central Boiler	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	16%	45
Single Family	Heat Central Boiler	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	288
Single Family	Heat Central Boiler	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	13%	1
Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	72
Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	128
Single Family	Heat Central Boiler	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	20
Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	67	20	$746	0%	0
Single Family	Heat Central Boiler	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	61	20	$746	0%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	37	5	$300	38%	0
Single Family	Heat Central Boiler	Quality Install Boiler	Quality Installation (QI)	Standard Installation	Per QI Install	New	34	5	$300	38%	0
Single Family	Heat Central Boiler	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	46	11	$895	86%	0
Single Family	Heat Central Boiler	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	26	15	$33	48%	0
Single Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	26	15	$167	51%	119
Single Family	Heat Central Boiler	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	24	15	$167	90%	25
Single Family	Heat Central Boiler	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per Tune-up	Existing	37	5	$200	66%	0
Single Family	Heat Central Boiler	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.34	20	$24	24%	0
Single Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Single Family	Heat Central Boiler	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.09	20	$8	82%	0
Single Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Single Family	Heat Central Boiler	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.24	20	$33	68%	0
Single Family	Heat Central Furnace	Construction - ICF	Insulated Concrete Forms - Concrete Construction	Standard Wood Framing	Per Building SqFt	New	0.03	40	$2	67%	0
Single Family	Heat Central Furnace	Construction - SIP	Structural Insulated Panels - Specialty Framing	Standard Wood Framing	Per Building SqFt	New	0.03	40	$0.76	67%	919
Single Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.26	20	$0.92	61%	173
Single Family	Heat Central Furnace	Doors	ENERGY STAR Door (R-4.8)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.23	20	$0.92	61%	7
Single Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	Existing	0.47	20	$3	76%	6,289
Single Family	Heat Central Furnace	Doors	Thermal Door (R-10)	Standard Code Door (R-2.9)	Per Door SqFt	New	0.42	20	$3	76%	304
Single Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	8 CFM/100sqft of CFA	Per Duct Sealing Installation	New	26	18	$333	65%	385
Single Family	Heat Central Furnace	Duct Sealing	4 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	90	18	$960	33%	13,918

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Furnace	Duct Sealing	8 CFM/100sqft of CFA	Existing CFM/100sqft of CFA	Per Duct Sealing Installation	Existing	60	18	$587	65%	13,800
Single Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	13	20	$124	100%	2,262
Single Family	Heat Central Furnace	Furnace - 92% AFUE	92% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	11	20	$124	100%	209
Single Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	19	20	$330	100%	0
Single Family	Heat Central Furnace	Furnace - 93% AFUE	93% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	17	20	$330	100%	0
Single Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	26	20	$747	100%	0
Single Family	Heat Central Furnace	Furnace - 94% AFUE	94% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	22	20	$747	100%	0
Single Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	38	20	$979	100%	0
Single Family	Heat Central Furnace	Furnace - 96% AFUE	96% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	33	20	$979	100%	0
Single Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	Existing	0.00	10	$0.00	100%	0
Single Family	Heat Central Furnace	Furnace - Below Standard 78% AFUE	Below Standard 78% AFUE	Below Standard 78% AFUE	Per Household	New	0.00	10	$0.00	100%	0
Single Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	Existing	0.00	20	$0.00	100%	0
Single Family	Heat Central Furnace	Furnace - Standard 90% AFUE	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Federal Standard 90% AFUE Non-Weatherized (EISA 2007)	Per Household	New	0.00	20	$0.00	100%	0
Single Family	Heat Central Furnace	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof sqft	New	0.01	30	$15	88%	0
Single Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	Existing	60	11	$611	35%	8,049
Single Family	Heat Central Furnace	Home Energy Management System	Home Energy Management System	Manual Control	Per Management System	New	34	11	$611	64%	0
Single Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	7.0 ACH50	Per Building SqFt	New	0.02	11	$0.25	42%	326
Single Family	Heat Central Furnace	Infiltration Reduction	4.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.05	11	$0.44	19%	7,000
Single Family	Heat Central Furnace	Infiltration Reduction	7.0 ACH50	Existing Infiltration (10 ACH50)	Per Building SqFt	Existing	0.02	11	$0.19	63%	11,713
Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-38 (To Code Zone 5)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.06	20	$0.99	23%	4,891

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (To Code Zone 6)	Average Existing Insulation (R-15.7)	Per Insulated SqFt	Existing	0.07	20	$1	23%	4,152
Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	Existing	0.01	20	$0.25	45%	0
Single Family	Heat Central Furnace	Insulation - Attic/Ceiling	Insulation Attic/Ceiling R-49 (Zone 5)	Code Insulation R-38 (Zone 5)	Per Insulated SqFt	New	0.00	20	$0.25	45%	0
Single Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-10 Zone 5)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	12%	4,441
Single Family	Heat Central Furnace	Insulation - Basement Wall	Insulation Basement Wall (R-15 Zone 6)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	24%	10,969
Single Family	Heat Central Furnace	Insulation - Duct	Insulation Duct (R-8)	No Duct Insulation	Per Duct Insulation Installation	Existing	25	20	$596	71%	6,419
Single Family	Heat Central Furnace	Insulation - Floor	Insulation Floor (R-30)	Average Existing Insulation (R-1.8)	Per Insulated SqFt	Existing	0.05	20	$0.90	57%	0
Single Family	Heat Central Furnace	Insulation - Rim/Band Joist	Insulation Rim and Band Joist (R-10)	No Rim And Band Joist Insulation	Per Insulated SqFt	Existing	0.10	20	$1	16%	837
Single Family	Heat Central Furnace	Insulation - Siding	Vinyl Siding with Foam Backing (R-3)	No Siding Insulation	Per Insulated SqFt	Existing	0.09	20	$0.51	9%	6,047
Single Family	Heat Central Furnace	Insulation - Slab	Insulation Slab (R-15, 4ft)	Code Insulation (R-10, 4ft)	Per Insulated SqFt	New	0.03	20	$0.44	13%	0
Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-13)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.18	20	$1	3%	1,493
Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-20 or R-13 w/ R-5 sheathing) (To Code)	Average Existing Insulation (R-2.1)	Per Insulated SqFt	Existing	0.21	20	$1	2%	2,657
Single Family	Heat Central Furnace	Insulation - Wall	Insulation Wall (R-21 + R-5 sheathing)	Code Insulation (R-20 or R-13 w/ R-5 sheathing)	Per Insulated SqFt	New	0.01	20	$0.16	90%	362
Single Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	Existing	12	5	$300	38%	0
Single Family	Heat Central Furnace	Quality Install Furnace	Quality Installation (QI)	Standard Installation	Per QI Install	New	10	5	$300	38%	0
Single Family	Heat Central Furnace	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	Programmable Thermostat - Central Control Only	Per Programmable Control System	New	35	11	$895	86%	0
Single Family	Heat Central Furnace	Thermostat - Programmable	Setback Thermostat 5-1-1, 5-2 or 7-Day	Manual Thermostat	Per Programmable Control	Existing	21	15	$33	48%	0
Single Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	Existing	21	15	$167	51%	1,975
Single Family	Heat Central Furnace	Thermostat - WiFi Programmable	WiFi Programmable Thermostat	Programmable Thermostat - Central Control Only	Per Programmable Control	New	18	15	$167	90%	390
Single Family	Heat Central Furnace	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per Tune-up	Existing	30	5	$200	66%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Heat Central Furnace	Window - Upgrade	Code Window U-Factor = 0.35 (2009 IECC)	Existing Windows U-Factor	Per Window SqFt	Existing	0.35	20	$24	24%	0
Single Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.09	20	$8	73%	0
Single Family	Heat Central Furnace	Window - Upgrade	ENERGY STAR U-Factor = 0.30	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.08	20	$8	82%	0
Single Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	Existing	0.25	20	$33	61%	0
Single Family	Heat Central Furnace	Window - Upgrade	Smart Window U-Factor = 0.22	Code Window U-Factor = 0.35 (2009 IECC)	Per Window SqFt	New	0.22	20	$33	68%	0
Single Family	Other	Other	Other	Other	Per Unit Each	Existing	-55.64756	10	$0.00	100%	0
Single Family	Other	Other	Other	Other	Per Unit Each	Existing	0.00	10	$0.00	100%	0
Single Family	Other	Other	Other	Other	Per Unit Each	New	-55.64756	10	$0.00	100%	0
Single Family	Other	Other	Other	Other	Per Unit Each	New	0.00	10	$0.00	100%	0
Single Family	Pool Heat	Pool Covers	Pool Covers	No Pool Cover	Per Pool Cover	Existing	128	5	$68	45%	325
Single Family	Pool Heat	Pool Covers	Pool Covers	No Pool Cover	Per Pool Cover	New	128	5	$68	45%	16
Single Family	Pool Heat	Pool Heaters - High Efficiency	Pool Heaters - 88% Efficiency	Pool Heaters, Standard Heaters - 83% Efficiency	Per Unit Each	Existing	14	8	$563	100%	0
Single Family	Pool Heat	Pool Heaters - High Efficiency	Pool Heaters - 88% Efficiency	Pool Heaters, Standard Heaters - 83% Efficiency	Per Unit Each	New	14	8	$563	100%	0
Single Family	Pool Heat	Pool Heaters - Standard	Pool Heaters, Standard Heaters - 83% Efficiency	Pool Heaters, Standard Heaters - 83% Efficiency	Per Unit Each	Existing	0.00	8	$0.00	100%	0
Single Family	Pool Heat	Pool Heaters - Standard	Pool Heaters, Standard Heaters - 83% Efficiency	Pool Heaters, Standard Heaters - 83% Efficiency	Per Unit Each	New	0.00	8	$0.00	100%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	23	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	23	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	17	11	$391	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	17	11	$391	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	18	11	$565	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	18	11	$565	80%	0
Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	14	11	$134	73%	3,361
Single Family	Water Heat	Clothes Washer	Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	14	11	$134	73%	201
Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	23	11	$789	83%	0
Single Family	Water Heat	Clothes Washer	Steam Clothes Washer	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	23	11	$789	83%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	4.26	11	$1,067	54%	0
Single Family	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	4.26	11	$1,067	54%	0
Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	Existing	1.88	11	$272	18%	0
Single Family	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle	Per Dishwasher	New	1.88	11	$272	18%	0
Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	Existing	43	40	$935	27%	0
Single Family	Water Heat	Drain-Water Heat Recovery	Drain-Water Heat Recovery	No Drain Water Heat Recovery	Per Drain-Water Heat Recovery System	New	40	40	$935	68%	0
Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	5.24	10	$1	85%	1,824
Single Family	Water Heat	Faucet Aerators	0.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	4.99	10	$1	90%	88
Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	2.16	10	$1	26%	12
Single Family	Water Heat	Faucet Aerators	1.5 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	2.05	10	$1	28%	0
Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	Existing	0.61	10	$0.53	14%	0
Single Family	Water Heat	Faucet Aerators	2.0 GPM	2.2 GPM (Federal Code)	Per Faucet Aerator	New	0.58	10	$0.53	15%	0
Single Family	Water Heat	Faucet Aerators	2.2 GPM (Federal Code)	Existing Faucet Aerator GPM	Per Faucet Aerator	Existing	2.46	10	$3	9%	92
Single Family	Water Heat	Hot Tub Covers	Hot Tub Covers R-21	Existing Cover R-10	Per Hot Tub Cover	Existing	7.83	6	$524	1%	0
Single Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	Existing	57	20	$746	0%	0
Single Family	Water Heat	Integrated Space Heating and Water Heating	84% CAE or Above	Standard Boiler AFUE 82% and Water Heater EF = 0.59	Per Integrated Equipment	New	55	20	$746	0%	0
Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	10	10	$8	80%	3,377
Single Family	Water Heat	Low-Flow Showerheads	1.5 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	9	10	$8	80%	154
Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	Existing	5.14	10	$13	38%	42
Single Family	Water Heat	Low-Flow Showerheads	2.0 GPM - Showerhead	2.5 GPM (Federal Code)	Per Showerhead	New	4.90	10	$13	38%	2
Single Family	Water Heat	Low-Flow Showerheads	2.5 GPM (Federal Code)	Existing Showerhead GPM	Per Showerhead	Existing	5.14	10	$24	23%	490
Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	Existing	91	15	$6,238	15%	0
Single Family	Water Heat	Solar Hot Water (SHW)	Solar Thermal Collector	Standard Storage Hot Water Heater	Per Solar Water System	New	87	15	$4,878	15%	0
Single Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	48	11	$1,281	90%	0
Single Family	Water Heat	Water Heater - Condensing	Condensing ENERGY STAR EF = 0.80 EF or = 90% TE and = 40 Gallon	EF = 0.59 Federal Standard 2001	Per Unit Each	New	45	11	$1,281	90%	0
Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	Existing	3.09	13	$6	36%	405
Single Family	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Pipe Insulation	New	3.09	13	$6	43%	24
Single Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	Existing	0.00	6	$0.00	100%	0
Single Family	Water Heat	Water Heater - Storage	Below Standard EF = 0.55	Below Standard EF = 0.55	Per Unit Each	New	0.00	6	$0.00	100%	0
Single Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	Existing	14	11	$561	100%	-80
Single Family	Water Heat	Water Heater - Storage	EF = 0.59 Federal Standard 2001	Below Standard EF = 0.55	Per Unit Each	New	14	11	$561	100%	0
Single Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	6.38	11	$43	100%	0
Single Family	Water Heat	Water Heater - Storage	EF = 0.62 Federal Standard 2015	EF = 0.59 Federal Standard 2001	Per Unit Each	New	6.07	11	$43	100%	0
Single Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	21	11	$260	100%	0
Single Family	Water Heat	Water Heater - Storage	Storage ENERGY STAR EF = 0.67 = 40 Gallon and = 75,000 Btuh	EF = 0.59 Federal Standard 2001	Per Unit Each	New	20	11	$260	100%	0

Table A.3.2. Residential Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Single Family	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Tank Wrap	Existing	11	13	$17	14%	636
Single Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	Existing	51	20	$832	90%	0
Single Family	Water Heat	Water Heater - Tankless	Tankless ENERGY STAR EF = 0.82	EF = 0.59 Federal Standard 2001	Per Unit Each	New	49	20	$693	90%	0
Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	Existing	35	4	$10	13%	1,819
Single Family	Water Heat	Water Heater - Thermostat Setback	120 Degrees	135 Degrees	Per Set-Back	New	33	4	$10	13%	83

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.03	4	$0.00	100%	236
Convenience	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.03	4	$0.00	100%	16
Convenience	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Convenience	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Convenience	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	7.51	15	$1,650	75%	0
Convenience	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	7.73	15	$1,650	75%	0
Convenience	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	3.29	12	$1,271	25%	0
Convenience	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	3.39	12	$1,271	25%	0
Convenience	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	22	12	$1,500	30%	0
Convenience	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	23	12	$1,500	30%	0
Convenience	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	54	12	$1,500	11%	0
Convenience	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	56	12	$1,500	11%	0
Convenience	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	788	15	$4,920	15%	0
Convenience	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.41	7	$1	90%	0
Convenience	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.40	15	$0.68	34%	645
Convenience	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.31	15	$0.68	34%	16
Convenience	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,503	5	$3,122	9%	0
Convenience	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,161	5	$2,001	9%	0
Convenience	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	2,255	5	$2,986	2%	0
Convenience	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Convenience	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Convenience	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	10
Convenience	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Convenience	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.12	18	$0.23	38%	218
Convenience	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	676	10	$5,450	4%	0
Convenience	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	522	10	$5,450	4%	0
Convenience	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.40	30	$10	75%	0
Convenience	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.31	30	$10	75%	0
Convenience	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.69	13	$0.38	51%	355
Convenience	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	2.18	20	$2	15%	134
Convenience	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Convenience	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Convenience	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	106	9	$88	7%	2
Convenience	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	106	9	$88	7%	0
Convenience	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.65	7	$0.30	90%	3,223
Convenience	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.17	15	$0.10	100%	0
Convenience	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.13	15	$0.10	100%	0
Convenience	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.34	15	$0.17	100%	802
Convenience	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.26	15	$0.17	100%	99
Convenience	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	451	15	$138	77%	531
Convenience	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	92	3	$48	48%	16
Convenience	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	47%	0
Convenience	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	53%	0
Convenience	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	9%	0
Convenience	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	21%	0
Convenience	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	23%	0
Convenience	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	20%	0
Convenience	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	169	9	$406	32%	0
Convenience	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	169	9	$406	32%	0
Convenience	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	216	9	$771	33%	0
Convenience	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	216	9	$771	33%	0
Convenience	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	118	9	$41	26%	31
Convenience	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	118	9	$41	26%	2
Convenience	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Convenience	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Convenience	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	27	13	$25	66%	0
Convenience	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	11	5	$0.64	62%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	33	13	$5	67%	0
Convenience	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.02	6	$0.00	100%	155
Convenience	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.02	6	$0.00	100%	12
Convenience	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Convenience	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Convenience	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Convenience	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Convenience	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Convenience	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Convenience	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	495	10	$12,500	71%	0
Convenience	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	315	10	$6,500	71%	0
Convenience	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	867	15	$200	62%	857
Convenience	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	552	15	$200	90%	52
Convenience	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	867	15	$200	21%	286
Convenience	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	552	15	$200	30%	17
Convenience	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	867	15	$200	21%	286
Convenience	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	552	15	$200	30%	17
Convenience	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	3
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	0
Convenience	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	1,321	15	$292	67%	1,419

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	842	15	$292	67%	58
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	1,321	15	$137	1%	13
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	842	15	$137	1%	1
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	1,321	15	$169	4%	91
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	842	15	$169	4%	4
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	1,321	15	$104	0%	5
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	842	15	$104	0%	0
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	1,321	15	$208	1%	29
Convenience	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	842	15	$208	1%	1
Convenience	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	1.15	7	$1	90%	0
Convenience	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.46	15	$0.68	34%	56
Convenience	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.24	15	$0.68	34%	0
Convenience	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	4,794	5	$6,244	9%	0
Convenience	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	3,262	5	$6,244	9%	0
Convenience	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	7,191	5	$5,972	2%	0
Convenience	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	26
Convenience	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	2
Convenience	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	21
Convenience	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	1
Convenience	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.39	18	$0.23	38%	152
Convenience	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,157	10	$5,450	4%	0
Convenience	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,468	10	$5,450	4%	0
Convenience	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.46	30	$10	75%	0
Convenience	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.24	30	$10	75%	0
Convenience	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.40	15	$26	5%	0
Convenience	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.74	15	$17	5%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.45	15	$0.23	100%	229
Convenience	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.31	15	$0.23	100%	20
Convenience	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.60	15	$1	5%	69
Convenience	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.71	15	$1	5%	6
Convenience	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,123	15	$540	33%	1,912
Convenience	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	764	15	$540	81%	247
Convenience	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	10	13	$0.38	51%	532
Convenience	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	6.97	20	$2	15%	112
Convenience	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Convenience	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Convenience	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Convenience	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	106	15	$150	10%	0
Convenience	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	106	15	$150	10%	0
Convenience	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	2.08	7	$0.30	90%	2,557
Convenience	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,438	15	$138	77%	422
Convenience	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	295	3	$48	48%	33
Convenience	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	295	3	$48	48%	33
Convenience	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	47%	0
Convenience	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	53%	0
Convenience	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	9%	0
Convenience	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	21%	0
Convenience	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	23%	0
Convenience	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	20%	0
Convenience	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Convenience	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Convenience	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	7.70	9	$1	59%	8,247

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	5.38	13	$1	0%	0
Convenience	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	3.16	9	$0.83	59%	2,381
Convenience	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	2.21	13	$0.83	0%	0
Convenience	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	61%	452
Convenience	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	139
Convenience	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	9
Convenience	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	320	13	$600	57%	0
Convenience	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	320	13	$600	57%	0
Convenience	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.85	11	$2	78%	0
Convenience	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.85	11	$2	78%	0
Convenience	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Convenience	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	2,435	2	$9	68%	870
Convenience	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	2,468	9	$205	42%	2,098
Convenience	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	3,836	13	$4,730	90%	516
Convenience	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	7,673	13	$3,920	76%	11,679
Convenience	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	3,215	20	$766	38%	2,447
Convenience	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	2,934	7	$458	73%	4,319
Convenience	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	5,307	15	$127	68%	129
Convenience	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	8,845	15	$849	71%	815
Convenience	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	641	2	$28	81%	1,037
Convenience	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Convenience	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Convenience	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	2,168	14	$225	12%	85
Convenience	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	1,515	14	$225	12%	4
Convenience	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	169	14	$225	69%	0
Convenience	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	118	14	$225	69%	0
Convenience	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	19%	230
Convenience	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Convenience	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Convenience	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	174	30	$448	50%	62
Convenience	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	174	30	$448	50%	5
Convenience	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Convenience	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Convenience	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Convenience	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	15
Convenience	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Convenience	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Convenience	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Convenience	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	212	25	$2,782	5%	0
Convenience	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	223	25	$2,782	0%	0
Convenience	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	28	10	$5	4%	2
Convenience	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	29	10	$5	4%	0
Convenience	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.03	6	$0.09	100%	0
Convenience	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.03	6	$0.09	100%	0
Convenience	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Convenience	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Convenience	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	63
Convenience	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	5
Convenience	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Convenience	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Convenience	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	72%	1,240
Convenience	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	18%	20
Convenience	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	838
Convenience	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	54
Convenience	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.08	10	$0.09	41%	0
Convenience	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.19	10	$0.11	41%	573
Convenience	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	2,240
Convenience	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	145
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	47%	1,137
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	47%	73
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	47%	1,228
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	47%	79
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	47%	32

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	47%	2
Convenience	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	47%	0
Convenience	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	47%	0
Convenience	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	47%	0
Convenience	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	47%	0
Convenience	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	290	10	$331	57%	0
Convenience	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	299	10	$331	57%	0
Convenience	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	471	10	$70	63%	298
Convenience	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	471	10	$70	63%	19
Convenience	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	23
Convenience	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	2
Convenience	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	76	10	$191	78%	0
Convenience	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	78	3	$49	87%	0
Convenience	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Convenience	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Convenience	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	456	4	$300	12%	0
Convenience	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	469	4	$300	12%	0
Convenience	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	5,658	5	$2,929	9%	0
Convenience	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	4,690	5	$3,122	9%	0
Convenience	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	8,487	5	$5,067	2%	0
Convenience	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	87
Convenience	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	7
Convenience	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	60
Convenience	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	4
Convenience	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.46	18	$0.23	38%	360
Convenience	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,546	10	$5,450	4%	0
Convenience	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,110	10	$5,450	4%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	1.53	30	$10	75%	0
Convenience	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	1.27	30	$10	75%	0
Convenience	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	14	13	$0.38	51%	1,193
Convenience	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	8.23	20	$2	15%	199
Convenience	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Convenience	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Convenience	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Convenience	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Convenience	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Convenience	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,697	15	$138	77%	749
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	47%	0
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	53%	0
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	9%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	21%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	23%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	20%	0
Convenience	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	476
Convenience	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	27
Convenience	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.27	10	$0.03	100%	1,184
Convenience	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.27	10	$0.03	100%	115
Convenience	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Convenience	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Convenience	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	74	10	$600	72%	0
Convenience	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	468	10	$600	0%	0
Convenience	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	468	10	$600	0%	0
Convenience	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	5%	0
Convenience	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	5%	0
Convenience	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	4%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Convenience	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	4%	0
Convenience	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	1,285	14	$442	0%	2
Convenience	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	1,285	14	$442	0%	0
Convenience	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	2,012	14	$307	0%	4
Convenience	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	2,012	14	$307	0%	0
Convenience	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	468	40	$833	60%	231
Convenience	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	468	40	$666	83%	17
Convenience	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	73	10	$4	67%	87
Convenience	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	8%	17
Convenience	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	8%	1
Convenience	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	5%	17
Convenience	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	29	10	$196	90%	0
Convenience	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	29	10	$196	90%	0
Convenience	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	2.93	13	$2	56%	11
Convenience	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	93	7	$62	5%	1
Convenience	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	318	4	$102	35%	81
Convenience	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.34	13	$0.32	75%	58
Convenience	Water Heat	Water Heating - Heat Pump ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.34	13	$0.32	75%	490
Convenience	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.00	100%	8
Convenience	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.00	100%	1
Convenience	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.03	13	$0.06	0%	0
Convenience	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.03	13	$0.06	0%	0
Education	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.20	4	$0.03	100%	5,669
Education	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.20	4	$0.03	100%	396
Education	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Education	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Education	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	62%	2,364
Education	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	62%	158
Education	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	55	15	$1,650	35%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	57	15	$1,650	35%	0
Education	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	24	12	$1,271	25%	0
Education	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	25	12	$1,271	25%	0
Education	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	166	12	$1,500	64%	0
Education	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	171	12	$1,500	64%	0
Education	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	401	12	$1,500	26%	0
Education	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	413	12	$1,500	26%	0
Education	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Education	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.12	20	$0.03	100%	0
Education	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.08	20	$0.03	100%	0
Education	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	Existing	5.33	15	$4	58%	184
Education	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	New	3.49	15	$4	85%	11
Education	Cooling Chillers	Chiller - Pipe Insulation	Code (1.5" of Insulation, Approximately R-6)	No Insulation	Per Linear Foot of Insulation	Existing	5.33	15	$4	58%	182
Education	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.25	20	$0.13	100%	1,089
Education	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.16	20	$0.13	100%	140
Education	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Education	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Cooling Chillers	Chiller - VSD Retrofit	Centrifugal Chiller - VSD Remodel for Existing	Constant Speed Motor	Per Ton	Existing	19	10	$70	38%	0
Education	Cooling Chillers	Chiller - Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only w/ Constant Speed Pump	Per Ton	Existing	50	10	$212	55%	0
Education	Cooling Chillers	Chiller - Water Reset	Install Chilled Water Reset	No Chilled Water Reset	Per Control Point	Existing	88	10	$681	81%	0
Education	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	Existing	28	20	$112	7%	26
Education	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	New	19	20	$112	7%	0
Education	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.15	7	$1	85%	0
Education	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.17	15	$0.68	64%	282
Education	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.11	15	$0.68	64%	0
Education	Cooling Chillers	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	44	15	$450	36%	327
Education	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	6,990	5	$8,259	33%	308
Education	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	4,582	5	$8,259	33%	0
Education	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	10,485	5	$14,606	6%	83
Education	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Education	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	5
Education	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	0
Education	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.05	18	$0.23	1%	2
Education	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,145	10	$5,450	62%	266
Education	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,062	10	$5,450	62%	14
Education	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.17	30	$10	75%	0
Education	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.11	30	$10	75%	0
Education	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.57	13	$0.38	9%	56
Education	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.95	20	$2	0%	2
Education	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Education	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Education	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.28	7	$0.30	68%	2,231
Education	Cooling Chillers	Tune-up - Chiller	Chiller Maintenance (Tune-up)	Unmaintained Chiller	Per SqFt	Existing	0.17	3	$0.15	16%	0
Education	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	53%	0
Education	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	60%	0
Education	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	10%	0
Education	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	12%	0
Education	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	14%	0
Education	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	12%	0
Education	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	526	15	$4,920	15%	0
Education	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.15	7	$1	90%	0
Education	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.16	15	$0.68	64%	0
Education	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.11	15	$0.68	64%	0
Education	Cooling DX	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	41	15	$450	36%	360
Education	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	6,543	5	$2,001	33%	829
Education	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	4,701	5	$8,259	33%	0
Education	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	9,815	5	$14,606	6%	0
Education	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Education	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	8
Education	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Education	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.04	18	$0.23	38%	223
Education	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,944	10	$5,450	62%	284
Education	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,115	10	$5,450	62%	20
Education	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.16	30	$10	75%	0
Education	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.11	30	$10	75%	0
Education	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.54	13	$0.38	9%	67
Education	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.89	20	$2	15%	143
Education	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Education	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Education	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Education	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	35	9	$88	7%	0
Education	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	35	9	$88	7%	0
Education	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.26	7	$0.30	90%	3,482
Education	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Education	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.07	15	$0.05	100%	0
Education	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.05	15	$0.05	100%	0
Education	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.14	15	$0.10	100%	841
Education	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.10	15	$0.10	100%	105
Education	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Education	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	490	15	$138	36%	273
Education	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	61	3	$48	48%	25
Education	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.49	15	$1	10%	742
Education	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	53%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	60%	0
Education	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	10%	0
Education	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	12%	0
Education	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	14%	0
Education	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	12%	0
Education	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	55	9	$406	32%	0
Education	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	55	9	$406	32%	0
Education	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	71	9	$771	33%	0
Education	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	71	9	$771	33%	0
Education	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	38	9	$41	26%	5
Education	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	38	9	$41	26%	0
Education	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.08	12	$0.03	10%	0
Education	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.08	12	$0.03	10%	5
Education	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.03	100%	0
Education	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.03	100%	0
Education	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Education	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Education	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	237	13	$305	66%	0
Education	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	102	5	-2.0432	62%	24
Education	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	290	13	$62	67%	170
Education	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	45
Education	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	4
Education	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Education	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Education	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Education	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Education	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Education	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Education	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	118	15	$2	33%	3,653
Education	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	33	13	$19	71%	90

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	22	13	$19	11%	12
Education	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	1,669	10	$12,500	64%	0
Education	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	1,101	10	$6,500	64%	0
Education	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	1,093	15	$200	30%	1,171
Education	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	721	15	$200	44%	76
Education	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	1,093	15	$200	3%	125
Education	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	721	15	$200	5%	8
Education	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	1,093	15	$200	49%	1,877
Education	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	721	15	$200	71%	123
Education	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Education	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	1
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	28
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	4
Education	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Education	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	Existing	712	10	$1,705	64%	0
Education	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	New	470	10	$1,705	64%	0
Education	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.27	15	$1	10%	0
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	17,810	15	$3,942	67%	10,517
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	11,753	15	$3,942	67%	470
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	17,810	15	$1,851	1%	96
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	11,753	15	$1,851	1%	4
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	17,810	15	$2,284	4%	677
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	11,753	15	$2,284	4%	30
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	17,810	15	$1,405	0%	36
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	11,753	15	$1,405	0%	2
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	17,810	15	$2,814	1%	215

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	11,753	15	$2,814	1%	10
Education	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.81	7	$1	90%	0
Education	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.18	15	$0.68	64%	0
Education	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.09	15	$0.68	64%	0
Education	Heat Pump	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	1,459	15	$450	60%	10,529
Education	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	32,782	5	$4,003	33%	1,330
Education	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	24,714	5	$4,003	33%	85
Education	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	49,173	5	$29,213	6%	0
Education	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	33
Education	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	3
Education	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	17
Education	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	1
Education	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.25	18	$0.23	38%	320
Education	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	14,752	10	$5,450	62%	799
Education	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	11,121	10	$5,450	62%	48
Education	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.18	30	$10	75%	0
Education	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.09	30	$10	75%	0
Education	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Education	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.35	15	$16	5%	0
Education	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.98	15	$10	5%	0
Education	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.27	15	$0.14	100%	474
Education	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.20	15	$0.14	100%	55
Education	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.76	15	$0.76	5%	157
Education	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.34	15	$0.87	5%	19
Education	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,179	15	$540	33%	4,854
Education	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	889	15	$540	81%	760
Education	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	5.49	13	$0.38	9%	277
Education	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.46	20	$2	15%	244
Education	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Education	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Education	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Education	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	35	15	$150	10%	0
Education	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	35	15	$150	10%	0
Education	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.33	7	$0.30	90%	4,847
Education	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	2,458	15	$138	36%	553
Education	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	310	3	$48	48%	68
Education	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	310	3	$48	48%	68
Education	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.40	15	$1	10%	845
Education	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	53%	0
Education	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	60%	0
Education	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	10%	0
Education	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	12%	0
Education	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	14%	0
Education	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	12%	0
Education	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	399	9	$107	68%	4,673
Education	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	258	9	$107	68%	205
Education	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Education	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Education	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.79	9	$1	60%	18,792
Education	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.80	13	$1	0%	0
Education	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.14	9	$0.83	60%	2,686

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	0.74	13	$0.83	0%	0
Education	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	37%	1,031
Education	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	522
Education	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	35
Education	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	105	13	$600	49%	0
Education	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	105	13	$600	49%	0
Education	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.28	11	$2	78%	0
Education	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.28	11	$2	78%	0
Education	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Education	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	3,624	4	$44	68%	570
Education	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,367	9	$205	38%	3,223
Education	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	16,460	13	$57,538	90%	0
Education	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	32,921	13	$48,310	76%	0
Education	Lighting	Lighting - High Bay Fluorescent High Output Package	High Bay Fluorescent HO Packages	Standard HID Lighting	Per Lighting Package	Existing	8,936	15	$2,377	73%	3,634
Education	Lighting	Lighting - High Bay LED Package	High Bay LED Package	Standard HID Lighting	Per Lighting Package	Existing	5,871	20	$44,706	94%	0
Education	Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	3,625	15	$2,351	67%	0
Education	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	10,017	20	$3,062	38%	3,354
Education	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	4,366	12	$2,067	73%	2,827
Education	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	19,057	15	$598	68%	213
Education	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	31,762	15	$4,981	71%	1,350
Education	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	585	6	$78	81%	416
Education	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Education	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Education	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	786	14	$225	9%	542
Education	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	509	14	$225	9%	24
Education	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	63	14	$225	62%	0
Education	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	41	14	$225	62%	0
Education	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	37%	81
Education	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Education	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	578	30	$1,115	50%	255
Education	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	578	30	$1,115	50%	17
Education	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Education	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Education	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Education	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	13
Education	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Education	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Education	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	955	25	$2,782	5%	0
Education	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	995	25	$2,782	0%	0
Education	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	204	10	$5	8%	27
Education	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	213	10	$5	8%	2
Education	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Education	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Education	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Education	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Education	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.02	6	$0.00	100%	813
Education	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.02	6	$0.00	100%	66
Education	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Education	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Education	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	79%	516
Education	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	20%	9
Education	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	318
Education	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	22
Education	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.09	41%	0
Education	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.01	10	$0.11	41%	0
Education	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	850
Education	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	58
Education	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	Existing	1,086	12	$704	95%	114
Education	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	New	1,086	12	$704	90%	7
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	33%	348
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	33%	24
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	33%	376

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	33%	25
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	33%	79
Education	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	33%	5
Education	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	33%	0
Education	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	33%	0
Education	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	33%	0
Education	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	33%	0
Education	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	250	10	$589	5%	0
Education	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	258	10	$589	5%	0
Education	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	937	10	$140	63%	260
Education	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	937	10	$140	63%	18
Education	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	10
Education	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	1
Education	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	49	10	$191	78%	0
Education	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	50	3	$49	87%	0
Education	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Education	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Education	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	Existing	1,463	12	$247	76%	24
Education	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	New	1,463	12	$247	76%	2
Education	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	Existing	849	12	$124	75%	14
Education	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	New	849	12	$124	75%	1
Education	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	393	4	$300	20%	0
Education	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	405	4	$300	20%	0
Education	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Education	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Education	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Education	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.07	100%	0
Education	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.07	100%	0
Education	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.03	100%	0
Education	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.03	100%	0
Education	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.01	100%	0
Education	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.01	100%	0
Education	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Education	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	108
Education	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	11
Education	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Education	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Education	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	1,588	15	$450	60%	6,304
Education	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	41,630	5	$3,122	33%	1,214
Education	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	52,030	5	$2,001	33%	106
Education	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	62,445	5	$2,986	6%	343
Education	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	44
Education	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	4
Education	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	20
Education	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	1
Education	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.31	18	$0.23	38%	321
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	18,733	10	$5,450	62%	802
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	23,413	10	$5,450	62%	85
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	1.05	30	$10	75%	0
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	1.32	30	$10	75%	0
Education	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	8.01	13	$0.38	9%	233
Education	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	5.66	20	$2	15%	183
Education	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Education	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Education	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Education	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Education	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	3,122	15	$138	36%	404

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.37	15	$1	10%	253
Education	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	53%	0
Education	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	60%	0
Education	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	10%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	12%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	14%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	12%	0
Education	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	388
Education	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	23
Education	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.04	10	$0.00	100%	965
Education	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.04	10	$0.00	100%	98
Education	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Education	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	487	10	$5,944	10%	0
Education	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	487	10	$5,944	10%	0
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	2,371	11	$789	33%	376
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	2,371	11	$789	33%	22
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,707	11	$391	31%	245
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,707	11	$391	31%	14
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,898	11	$565	29%	284
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,898	11	$565	29%	16
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,478	11	$134	28%	0
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,478	11	$134	28%	0
Education	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	71	10	$600	36%	0
Education	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	447	10	$600	4%	0
Education	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	447	10	$600	0%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	62%	0
Education	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	62%	0
Education	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	52%	0
Education	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	52%	0
Education	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	1,032	14	$442	28%	64
Education	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	1,032	14	$442	28%	4
Education	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	1,616	14	$307	33%	151
Education	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	1,616	14	$307	33%	9
Education	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	447	40	$833	60%	529
Education	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	447	40	$666	83%	42
Education	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	41	10	$4	67%	354
Education	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	125	10	$8	38%	114
Education	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	125	10	$8	38%	6
Education	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	279	10	$31	9%	58
Education	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	38%	102
Education	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	38%	6
Education	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	25%	104
Education	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	12	10	$196	71%	0
Education	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	12	10	$196	71%	0
Education	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	7.18	13	$2	56%	29
Education	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	89	7	$62	5%	0
Education	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	304	4	$102	15%	42
Education	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.28	13	$0.12	75%	1,259
Education	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.28	13	$0.12	75%	145
Education	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.00	100%	21
Education	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.00	100%	2
Education	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Education	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.03	13	$0.02	0%	0
Education	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.03	13	$0.02	0%	0
Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.03	4	$0.00	100%	415
Grocery	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.03	4	$0.00	100%	30
Grocery	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Grocery	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Grocery	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	516	15	$1,650	75%	0
Grocery	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	531	15	$1,650	75%	0
Grocery	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	226	12	$1,271	25%	0
Grocery	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	233	12	$1,271	25%	0
Grocery	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	1,547	12	$1,500	47%	322
Grocery	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	1,592	12	$1,500	47%	37
Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	3,745	12	$1,500	19%	251
Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	3,852	12	$1,500	19%	18
Grocery	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	770	15	$4,920	15%	0
Grocery	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.41	7	$1	90%	0
Grocery	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.41	15	$0.68	93%	2,365
Grocery	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.31	15	$0.68	93%	97
Grocery	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	10,162	5	$8,259	33%	462
Grocery	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	7,773	5	$5,556	33%	36
Grocery	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	15,244	5	$9,587	6%	131
Grocery	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Grocery	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Grocery	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	7
Grocery	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Grocery	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.12	18	$0.23	38%	295
Grocery	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	4,573	10	$5,450	54%	352
Grocery	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,497	10	$5,450	54%	23
Grocery	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.41	30	$10	75%	0
Grocery	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.31	30	$10	75%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	2.20	13	$0.38	9%	82
Grocery	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	2.20	20	$2	15%	173
Grocery	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Grocery	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Grocery	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Grocery	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	106	9	$88	7%	1
Grocery	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	106	9	$88	7%	0
Grocery	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.66	7	$0.30	90%	4,357
Grocery	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.18	15	$0.10	100%	0
Grocery	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.13	15	$0.10	100%	0
Grocery	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.34	15	$0.18	100%	988
Grocery	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.26	15	$0.18	100%	129
Grocery	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,016	15	$138	77%	719
Grocery	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	90	3	$48	48%	34
Grocery	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	31%	0
Grocery	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	35%	0
Grocery	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	6%	0
Grocery	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	41%	0
Grocery	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	46%	0
Grocery	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	40%	0
Grocery	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	169	9	$406	32%	0
Grocery	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	169	9	$406	32%	0
Grocery	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	216	9	$771	33%	0
Grocery	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	216	9	$771	33%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	118	9	$41	26%	9
Grocery	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	118	9	$41	26%	1
Grocery	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Grocery	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Grocery	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	184	13	$173	66%	0
Grocery	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	79	5	$4	62%	10
Grocery	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	226	13	$39	67%	69
Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	92
Grocery	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	8
Grocery	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Grocery	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Grocery	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Grocery	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Grocery	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Grocery	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Grocery	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	55	15	$2	33%	943
Grocery	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	15	13	$19	71%	14
Grocery	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	6.58	13	$19	11%	0
Grocery	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	1,105	10	$12,500	49%	0
Grocery	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	461	10	$6,500	49%	0
Grocery	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	867	15	$200	57%	451
Grocery	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	362	15	$200	83%	19
Grocery	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	867	15	$200	0%	0
Grocery	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	362	15	$200	0%	0
Grocery	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	867	15	$200	58%	461
Grocery	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	362	15	$200	85%	20
Grocery	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	9
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	1
Grocery	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	8,841	15	$1,956	67%	2,715
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	3,695	15	$1,956	67%	79
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	8,841	15	$919	1%	25
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	3,695	15	$919	1%	1
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	8,841	15	$1,134	4%	175
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	3,695	15	$1,134	4%	5
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	8,841	15	$697	0%	9
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	3,695	15	$697	0%	0
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	8,841	15	$1,397	1%	55
Grocery	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	3,695	15	$1,397	1%	2
Grocery	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	1.15	7	$1	90%	0
Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.63	15	$0.68	93%	534
Grocery	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.44	15	$0.68	93%	17
Grocery	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	33,160	5	$16,518	33%	237
Grocery	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	21,828	5	$16,518	33%	0
Grocery	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	49,740	5	$19,175	6%	67
Grocery	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	20
Grocery	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	2
Grocery	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	6
Grocery	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	0
Grocery	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.40	18	$0.23	38%	145
Grocery	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	14,922	10	$5,450	54%	305
Grocery	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	9,822	10	$5,450	54%	13

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.63	30	$10	75%	0
Grocery	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.44	30	$10	75%	0
Grocery	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.48	15	$27	5%	0
Grocery	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.74	15	$17	5%	0
Grocery	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.47	15	$0.24	100%	201
Grocery	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.31	15	$0.24	100%	18
Grocery	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.68	15	$1	5%	61
Grocery	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.71	15	$1	5%	5
Grocery	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,123	15	$540	33%	1,823
Grocery	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	739	15	$540	81%	239
Grocery	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	12	13	$0.38	9%	80
Grocery	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	7.21	20	$2	15%	107
Grocery	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Grocery	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Grocery	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Grocery	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	106	15	$150	10%	0
Grocery	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	106	15	$150	10%	0
Grocery	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	2.15	7	$0.30	90%	2,436
Grocery	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	3,316	15	$138	77%	402
Grocery	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	295	3	$48	48%	30
Grocery	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	295	3	$48	48%	30
Grocery	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	31%	0
Grocery	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	35%	0

Table A.3.3. Commercial Electric Measure Details

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Grocery	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	6%	0
Grocery	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	41%	9
Grocery	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	46%	1
Grocery	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	40%	0
Grocery	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	177	9	$107	68%	677
Grocery	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	124	9	$107	68%	22
Grocery	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Grocery	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Grocery	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	6.22	9	$1	59%	11,824
Grocery	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	4.34	13	$1	0%	0
Grocery	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.55	9	$0.83	59%	3,413
Grocery	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.78	13	$0.83	0%	0
Grocery	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	61%	693
Grocery	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	212
Grocery	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	15
Grocery	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	320	13	$600	76%	0
Grocery	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	320	13	$600	76%	0
Grocery	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.85	11	$2	78%	0
Grocery	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.85	11	$2	78%	0
Grocery	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Grocery	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	13,158	2	$53	68%	1,076
Grocery	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	2,666	9	$205	42%	2,594
Grocery	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	20,726	13	$25,555	90%	1,805
Grocery	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	41,452	13	$21,176	76%	14,437
Grocery	Lighting	Lighting - High Bay Fluorescent High Output Package	High Bay Fluorescent HO Packages	Standard HID Lighting	Per Lighting Package	Existing	15,494	15	$1,360	73%	3,277
Grocery	Lighting	Lighting - High Bay LED Package	High Bay LED Package	Standard HID Lighting	Per Lighting Package	Existing	10,180	20	$25,580	94%	0
Grocery	Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	6,285	15	$1,345	67%	0
Grocery	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	17,369	20	$4,140	38%	3,025
Grocery	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	15,852	7	$2,477	73%	5,339
Grocery	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	28,668	15	$3,525	68%	171
Grocery	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	47,781	15	$7,961	71%	1,082

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	3,464	2	$153	81%	1,282
Grocery	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Grocery	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Grocery	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,750	14	$225	11%	627
Grocery	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	1,223	14	$225	11%	30
Grocery	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	137	14	$225	77%	0
Grocery	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	95	14	$225	77%	0
Grocery	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Grocery	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	578	30	$1,115	50%	133
Grocery	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	578	30	$1,115	50%	9
Grocery	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Grocery	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Grocery	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Grocery	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Grocery	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	3
Grocery	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	0
Grocery	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Grocery	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	372	25	$2,782	5%	0
Grocery	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	387	25	$2,782	0%	0
Grocery	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	200	10	$5	11%	10
Grocery	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	207	10	$5	11%	1
Grocery	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.01	6	$0.03	100%	0
Grocery	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.01	6	$0.03	100%	0
Grocery	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Grocery	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Grocery	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	171
Grocery	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	14
Grocery	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Grocery	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Grocery	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	72%	6,246
Grocery	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	18%	108

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	4,219
Grocery	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	292
Grocery	Refrigeration	Compressor - Scroll	High Efficiency Scroll Compressor	Standard Reciprocating Compressor	Per Scroll Compressor HP	Existing	679	10	$140	81%	16,800
Grocery	Refrigeration	Compressor - Scroll	High Efficiency Scroll Compressor	Standard Reciprocating Compressor	Per Scroll Compressor HP	New	699	10	$140	81%	1,198
Grocery	Refrigeration	Compressor - VSD Retrofit	Refrigeration Compressor VSD Retrofit	Standard Compressor	Per Retrofit Compressor HP	Existing	761	13	$266	65%	20,556
Grocery	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.26	10	$0.09	41%	1,211
Grocery	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.63	10	$0.11	41%	2,887
Grocery	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	1,651
Grocery	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	114
Grocery	Refrigeration	Floating Head Pressure Control - Condensing Unit	Floating Head Pressure Control - Condensing Unit	No Floating Head Pressure Control	Per Condensing Unit HP	Existing	618	14	$295	46%	3,970
Grocery	Refrigeration	Floating Head Pressure Control - Condensing Unit	Floating Head Pressure Control - Condensing Unit	No Floating Head Pressure Control	Per Condensing Unit HP	New	618	14	$295	46%	275
Grocery	Refrigeration	Floating Head Pressure Control - Remote Condenser	Floating Head Pressure Control - Remote Condenser	No Floating Head Pressure Control	Per Condensing Unit HP	Existing	513	14	$232	46%	3,298
Grocery	Refrigeration	Floating Head Pressure Control - Remote Condenser	Floating Head Pressure Control - Remote Condenser	No Floating Head Pressure Control	Per Condensing Unit HP	New	513	14	$232	46%	229
Grocery	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	Existing	1,086	12	$704	74%	1,875
Grocery	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	New	1,086	12	$704	88%	160
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	42%	233
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	42%	16
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	42%	251
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	42%	17
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	42%	0
Grocery	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	42%	0
Grocery	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	42%	0
Grocery	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	42%	0
Grocery	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	42%	0
Grocery	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	42%	0
Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	6,398	10	$2,214	84%	2,451
Grocery	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	6,581	10	$2,214	84%	175
Grocery	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	471	10	$1,415	63%	0
Grocery	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	471	10	$1,415	63%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	107
Grocery	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	7
Grocery	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	501	10	$191	78%	6,343
Grocery	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	516	3	$49	87%	619
Grocery	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Grocery	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Grocery	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	Existing	1,463	12	$247	76%	513
Grocery	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	New	1,463	12	$247	76%	36
Grocery	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	Existing	849	12	$124	75%	293
Grocery	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	New	849	12	$124	75%	20
Grocery	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	2,509	4	$300	66%	3,049
Grocery	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	2,581	4	$300	66%	217
Grocery	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.07	100%	0
Grocery	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.07	100%	0
Grocery	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Grocery	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Grocery	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.10	100%	0
Grocery	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.10	100%	0
Grocery	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.04	100%	0
Grocery	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.04	100%	0
Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.01	100%	0
Grocery	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.01	100%	0
Grocery	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Grocery	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Grocery	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.01	9	$0.00	100%	147
Grocery	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.01	9	$0.00	100%	15
Grocery	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Grocery	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Grocery	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	26,286	5	$2,001	33%	171

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	15,006	5	$8,259	33%	0
Grocery	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	39,429	5	$14,606	6%	0
Grocery	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	18
Grocery	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	1
Grocery	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	4
Grocery	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	0
Grocery	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.32	18	$0.23	38%	57
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	11,828	10	$5,450	54%	75
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	6,753	10	$5,450	54%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	1.06	30	$10	75%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.60	30	$10	75%	0
Grocery	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	13	13	$0.38	9%	33
Grocery	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	5.71	20	$2	15%	31
Grocery	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Grocery	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Grocery	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Grocery	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Grocery	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Grocery	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	2,628	15	$138	77%	122
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	31%	0
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	35%	0
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	6%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	41%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	46%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	40%	0
Grocery	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	144
Grocery	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	9
Grocery	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.05	10	$0.00	100%	357
Grocery	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.05	10	$0.00	100%	37
Grocery	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	100	10	$600	66%	0
Grocery	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	627	10	$600	0%	0
Grocery	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	627	10	$600	0%	0
Grocery	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	43%	0
Grocery	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	43%	0
Grocery	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	36%	0
Grocery	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	36%	0
Grocery	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	1,285	14	$442	12%	27
Grocery	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	1,285	14	$442	12%	2
Grocery	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	2,012	14	$307	14%	53
Grocery	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	2,012	14	$307	14%	3
Grocery	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	627	40	$833	60%	323
Grocery	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	627	40	$666	83%	26
Grocery	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	81	10	$4	67%	131
Grocery	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	51%	89
Grocery	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	51%	5
Grocery	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	33%	91
Grocery	Water Heat	Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End Use	No Heat Recovery	Per Building SqFt	Existing	0.17	16	$0.91	50%	0
Grocery	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	32	10	$196	90%	0
Grocery	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	32	10	$196	90%	0
Grocery	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	10	13	$2	56%	16
Grocery	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	125	7	$62	5%	5
Grocery	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	426	4	$102	50%	162
Grocery	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.34	13	$0.15	75%	686
Grocery	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.34	13	$0.15	75%	89
Grocery	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.00	100%	11

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Grocery	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.00	100%	1
Grocery	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.03	13	$0.03	0%	0
Grocery	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.03	13	$0.03	0%	0
Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.12	4	$0.02	100%	2,599
Health	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.12	4	$0.02	100%	181
Health	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Health	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Health	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	62%	1,084
Health	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	62%	72
Health	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	177	15	$1,650	50%	0
Health	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	182	15	$1,650	50%	0
Health	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	77	12	$1,271	25%	0
Health	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	80	12	$1,271	25%	0
Health	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	531	12	$1,500	64%	0
Health	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	548	12	$1,500	64%	0
Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,287	12	$1,500	19%	68
Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,326	12	$1,500	19%	5
Health	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Health	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.15	20	$0.03	100%	0
Health	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.12	20	$0.03	100%	0
Health	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	Existing	6.26	15	$4	58%	141
Health	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	New	5.19	15	$4	85%	10
Health	Cooling Chillers	Chiller - Pipe Insulation	Code (1.5" of Insulation, Approximately R-6)	No Insulation	Per Linear Foot of Insulation	Existing	6.26	15	$4	58%	140
Health	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.30	20	$0.12	100%	893
Health	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.25	20	$0.12	100%	137
Health	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Health	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Cooling Chillers	Chiller - VSD Retrofit	Centrifugal Chiller - VSD Remodel for Existing	Constant Speed Motor	Per Ton	Existing	33	10	$70	38%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Cooling Chillers	Chiller - Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only w/ Constant Speed Pump	Per Ton	Existing	63	10	$212	49%	0
Health	Cooling Chillers	Chiller - Water Reset	Install Chilled Water Reset	No Chilled Water Reset	Per Control Point	Existing	104	10	$681	72%	0
Health	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	Existing	36	20	$112	7%	21
Health	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	New	30	20	$112	7%	0
Health	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.22	7	$1	76%	0
Health	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.20	15	$0.68	15%	0
Health	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.17	15	$0.68	15%	0
Health	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	7,600	5	$13,562	33%	0
Health	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	6,296	5	$13,562	33%	0
Health	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	11,400	5	$24,455	6%	0
Health	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0
Health	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Health	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	3
Health	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	0
Health	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.06	18	$0.23	1%	0
Health	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,420	10	$5,450	52%	177
Health	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	2,833	10	$5,450	52%	11
Health	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.20	30	$10	75%	0
Health	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.17	30	$10	75%	0
Health	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.84	13	$0.38	9%	43
Health	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.11	20	$2	0%	1
Health	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Health	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Health	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.33	7	$0.30	61%	1,540
Health	Cooling Chillers	Tune-up - Chiller	Chiller Maintenance (Tune-up)	Unmaintained Chiller	Per SqFt	Existing	0.20	3	$0.15	16%	0
Health	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	53%	0
Health	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	60%	0
Health	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	10%	0
Health	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	12%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	14%	0
Health	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	12%	0
Health	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	971	15	$4,920	15%	0
Health	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.27	7	$1	90%	0
Health	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.28	15	$0.68	15%	104
Health	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.20	15	$0.68	15%	0
Health	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	10,320	5	$5,556	18%	495
Health	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	7,639	5	$13,562	18%	0
Health	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	15,481	5	$24,455	3%	0
Health	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Health	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Health	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	5
Health	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	0
Health	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.08	18	$0.23	38%	324
Health	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	4,644	10	$5,450	52%	651
Health	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,437	10	$5,450	52%	24
Health	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.28	30	$10	75%	0
Health	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.20	30	$10	75%	0
Health	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.14	13	$0.38	9%	94
Health	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.51	20	$2	15%	202
Health	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Health	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Health	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Health	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	74	9	$88	7%	1
Health	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	74	9	$88	7%	0
Health	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.45	7	$0.30	90%	4,998
Health	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.12	15	$0.05	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.09	15	$0.05	100%	0
Health	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.23	15	$0.09	100%	1,192
Health	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.17	15	$0.09	100%	153
Health	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	774	15	$138	77%	825
Health	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	114	3	$48	48%	35
Health	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.85	15	$1	10%	1,042
Health	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	53%	0
Health	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	60%	0
Health	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	10%	0
Health	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	12%	0
Health	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	14%	0
Health	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	12%	0
Health	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	118	9	$406	32%	0
Health	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	118	9	$406	32%	0
Health	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	151	9	$771	33%	0
Health	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	151	9	$771	33%	0
Health	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	82	9	$41	26%	10
Health	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	82	9	$41	26%	1
Health	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.13	12	$0.07	10%	0
Health	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.14	12	$0.07	10%	6
Health	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.07	100%	0
Health	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.07	100%	0
Health	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Health	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Health	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	25	13	$291	66%	0
Health	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	11	5	$14	62%	0
Health	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	31	13	$72	67%	0
Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	31
Health	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	2
Health	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Health	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Health	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Health	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Health	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Health	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	120	15	$2	33%	2,461
Health	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	34	13	$19	71%	60
Health	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	24	13	$19	11%	9
Health	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	1,454	10	$12,500	64%	0
Health	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	1,045	10	$6,500	64%	0
Health	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	1,029	15	$200	24%	662
Health	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	739	15	$200	34%	47
Health	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	1,029	15	$200	16%	455
Health	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	739	15	$200	24%	32
Health	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	1,029	15	$200	42%	1,184
Health	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	739	15	$200	62%	84
Health	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	1
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	19
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	1
Health	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Health	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	Existing	620	10	$1,705	64%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	New	446	10	$1,705	64%	0
Health	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.25	15	$1	10%	0
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	15,518	15	$3,434	67%	7,085
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	11,154	15	$3,434	67%	344
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	15,518	15	$1,613	1%	64
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	11,154	15	$1,613	1%	3
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	15,518	15	$1,990	4%	456
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	11,154	15	$1,990	4%	22
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	15,518	15	$1,224	0%	24
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	11,154	15	$1,224	0%	1
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	15,518	15	$2,452	1%	145
Health	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	11,154	15	$2,452	1%	7
Health	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.59	7	$1	90%	0
Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.30	15	$0.68	15%	0
Health	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.18	15	$0.68	15%	0
Health	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	22,081	5	$11,112	18%	130
Health	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	16,654	5	$11,112	18%	7
Health	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	33,122	5	$48,911	3%	0
Health	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	39
Health	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	3
Health	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	1
Health	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	0
Health	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.18	18	$0.23	38%	164
Health	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	9,936	10	$5,450	52%	357
Health	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	7,494	10	$5,450	52%	17
Health	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.30	30	$10	75%	0
Health	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.18	30	$10	75%	0
Health	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.35	15	$14	5%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.01	15	$9	5%	0
Health	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.22	15	$0.12	100%	266
Health	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.17	15	$0.12	100%	26
Health	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.09	15	$0.70	5%	67
Health	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.82	15	$0.81	5%	7
Health	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	929	15	$540	33%	2,581
Health	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	701	15	$540	81%	321
Health	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	4.10	13	$0.38	9%	92
Health	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	3.24	20	$2	15%	112
Health	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Health	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Health	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Health	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	74	15	$150	10%	0
Health	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	74	15	$150	10%	0
Health	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.97	7	$0.30	90%	2,561
Health	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,656	15	$138	77%	486
Health	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	244	3	$48	48%	37
Health	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	244	3	$48	48%	36
Health	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.30	15	$1	10%	439
Health	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	53%	0
Health	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	60%	0
Health	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	10%	0
Health	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	12%	9
Health	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	14%	1
Health	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	12%	0
Health	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	355	9	$107	68%	2,972

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	224	9	$107	68%	127
Health	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Health	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Health	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	4.97	9	$1	62%	25,602
Health	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	3.14	13	$1	0%	0
Health	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.04	9	$0.83	62%	6,377
Health	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.29	13	$0.83	0%	0
Health	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	54%	989
Health	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	342
Health	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	23
Health	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	224	13	$600	49%	0
Health	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	224	13	$600	49%	0
Health	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.59	11	$2	78%	0
Health	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.59	11	$2	78%	0
Health	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Health	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	11,925	2	$68	68%	1,450
Health	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	2,250	9	$205	42%	4,556
Health	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	27,925	13	$49,849	90%	0
Health	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	55,851	13	$41,203	76%	28,918
Health	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	1,938	20	$5,849	38%	0
Health	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	14,366	10	$3,207	73%	7,193
Health	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	30,693	15	$150	68%	265
Health	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	51,155	15	$3,633	71%	1,678
Health	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	9,148	3	$577	81%	5,033
Health	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Health	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Health	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,398	14	$225	2%	16
Health	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	885	14	$225	2%	1
Health	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	116	14	$225	68%	0
Health	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	73	14	$225	68%	0
Health	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	37%	85
Health	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Health	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	578	30	$1,115	50%	197
Health	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	578	30	$1,115	50%	13
Health	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Health	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Health	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Health	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Health	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	10
Health	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Health	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Health	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Health	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	1,223	25	$2,782	5%	72
Health	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	1,270	25	$2,782	0%	0
Health	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	242	10	$5	34%	112
Health	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	252	10	$5	34%	8
Health	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Health	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Health	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Health	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Health	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.02	6	$0.00	100%	622
Health	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.02	6	$0.00	100%	50
Health	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Health	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Health	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	79%	369
Health	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	20%	6
Health	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	227
Health	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	15
Health	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.09	41%	0
Health	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.01	10	$0.11	41%	0
Health	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	608
Health	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	41
Health	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	Existing	1,086	12	$704	90%	83

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	New	1,086	12	$704	95%	6
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	27%	110
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	27%	7
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	27%	119
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	27%	8
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	27%	29
Health	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	27%	2
Health	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	27%	0
Health	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	27%	0
Health	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	27%	0
Health	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	27%	0
Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	231	10	$3,274	5%	0
Health	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	238	10	$3,274	5%	0
Health	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	680	10	$102	63%	146
Health	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	680	10	$102	63%	10
Health	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	8
Health	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	1
Health	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	90	10	$191	78%	0
Health	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	93	3	$49	87%	0
Health	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Health	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Health	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	Existing	1,463	12	$247	76%	19
Health	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	New	1,463	12	$247	76%	1
Health	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	Existing	849	12	$124	75%	11
Health	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	New	849	12	$124	75%	1
Health	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	363	4	$300	12%	0
Health	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	374	4	$300	12%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.05	13	$0.15	100%	0
Health	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.05	13	$0.15	100%	0
Health	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Health	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Health	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.06	13	$0.21	100%	0
Health	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.06	13	$0.21	100%	0
Health	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.09	100%	0
Health	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.09	100%	0
Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.03	100%	0
Health	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.03	100%	0
Health	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Health	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Health	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	130
Health	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	13
Health	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Health	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Health	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	14,118	5	$8,259	18%	0
Health	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	22,143	5	$5,556	18%	28
Health	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	21,177	5	$9,587	3%	0
Health	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	93
Health	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	7
Health	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	32
Health	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	2
Health	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.11	18	$0.23	38%	0
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	6,353	10	$5,450	52%	0
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	9,964	10	$5,450	52%	37
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.38	30	$10	75%	0
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.60	30	$10	75%	0
Health	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	3.66	13	$0.38	9%	162
Health	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	2.07	20	$2	15%	0
Health	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Health	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Health	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Health	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,058	15	$138	77%	593
Health	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.50	15	$1	10%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	53%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	60%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	10%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	12%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	14%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	12%	0
Health	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	214
Health	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	13
Health	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.03	10	$0.00	100%	533
Health	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.03	10	$0.00	100%	54
Health	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Health	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Health	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	1,425	10	$5,944	14%	0
Health	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	1,425	10	$5,944	14%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	2,371	11	$789	33%	328
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	2,371	11	$789	33%	20
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,707	11	$391	31%	210
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,707	11	$391	31%	12
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,898	11	$565	29%	239
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,898	11	$565	29%	14
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,478	11	$134	28%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,478	11	$134	28%	0
Health	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	314	10	$600	28%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,963	10	$600	2%	58
Health	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,963	10	$600	0%	2
Health	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	81%	0
Health	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	81%	0
Health	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	68%	0
Health	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	68%	0
Health	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	3,264	14	$442	8%	73
Health	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	3,264	14	$442	8%	4
Health	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	5,112	14	$307	9%	149
Health	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	5,112	14	$307	9%	8
Health	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	1,963	40	$833	60%	1,954
Health	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	1,963	40	$666	83%	152
Health	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	70	10	$4	67%	1,005
Health	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	103	10	$8	21%	251
Health	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	103	10	$8	21%	14
Health	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	229	10	$31	5%	128
Health	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	13%	32
Health	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	13%	2
Health	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	8%	34
Health	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	21	10	$196	86%	0
Health	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	21	10	$196	86%	0
Health	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	29	13	$2	56%	98
Health	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	392	7	$62	5%	27
Health	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	1,335	4	$102	75%	1,456
Health	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.89	13	$0.41	75%	3,854
Health	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.89	13	$0.41	75%	495
Health	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.04	13	$0.01	100%	63

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Health	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.04	13	$0.01	100%	8
Health	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.10	13	$0.08	0%	0
Health	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.10	13	$0.08	0%	0
Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.32	4	$0.06	100%	18,566
Large Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.32	4	$0.06	100%	1,305
Large Office	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Office	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Large Office	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	62%	7,742
Large Office	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	62%	521
Large Office	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Office	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.15	20	$0.02	100%	0
Large Office	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.09	20	$0.02	100%	0
Large Office	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	Existing	6.33	15	$4	58%	471
Large Office	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	New	3.93	15	$4	85%	29
Large Office	Cooling Chillers	Chiller - Pipe Insulation	Code (1.5" of Insulation, Approximately R-6)	No Insulation	Per Linear Foot of Insulation	Existing	6.33	15	$4	58%	467
Large Office	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.30	20	$0.11	100%	0
Large Office	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.19	20	$0.11	100%	0
Large Office	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Office	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Cooling Chillers	Chiller - VSD Retrofit	Centrifugal Chiller - VSD Remodel for Existing	Constant Speed Motor	Per Ton	Existing	45	10	$70	38%	488
Large Office	Cooling Chillers	Chiller - Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only w/ Constant Speed Pump	Per Ton	Existing	69	10	$212	62%	0
Large Office	Cooling Chillers	Chiller - Water Reset	Install Chilled Water Reset	No Chilled Water Reset	Per Control Point	Existing	105	10	$681	90%	0
Large Office	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	Existing	40	20	$112	7%	71
Large Office	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	New	24	20	$112	7%	0
Large Office	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.17	7	$1	95%	0
Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.21	15	$0.68	93%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.13	15	$0.68	93%	0
Large Office	Cooling Chillers	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	52	15	$450	26%	602
Large Office	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	26,974	5	$24,507	33%	829
Large Office	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	16,764	5	$24,507	33%	0
Large Office	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	40,461	5	$44,782	6%	0
Large Office	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0
Large Office	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Large Office	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	3
Large Office	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	0
Large Office	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.06	18	$0.23	1%	0
Large Office	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.21	30	$10	75%	0
Large Office	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.13	30	$10	75%	0
Large Office	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.17	13	$0.38	9%	145
Large Office	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.12	20	$2	0%	4
Large Office	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Large Office	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Large Office	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.33	7	$0.30	76%	6,421
Large Office	Cooling Chillers	Tune-up - Chiller	Chiller Maintenance (Tune-up)	Unmaintained Chiller	Per SqFt	Existing	0.21	3	$0.15	16%	0
Large Office	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	62%	0
Large Office	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	69%	0
Large Office	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	12%	0
Large Office	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	1%	0
Large Office	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	1%	0
Large Office	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	1%	0
Large Office	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	950	15	$4,920	15%	0
Large Office	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.23	7	$1	90%	0
Large Office	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.25	15	$0.68	93%	862
Large Office	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.18	15	$0.68	93%	0
Large Office	Cooling DX	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	64	15	$450	26%	1,155
Large Office	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	32,888	5	$13,562	33%	3,006

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	23,191	5	$24,507	33%	106
Large Office	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	49,333	5	$44,782	6%	435
Large Office	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Large Office	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Large Office	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	8
Large Office	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Large Office	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.07	18	$0.23	38%	975
Large Office	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.25	30	$10	75%	0
Large Office	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.18	30	$10	75%	0
Large Office	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.42	13	$0.38	9%	293
Large Office	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.37	20	$2	15%	629
Large Office	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Large Office	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Large Office	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Large Office	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	55	9	$88	7%	0
Large Office	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	55	9	$88	7%	0
Large Office	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.41	7	$0.30	90%	15,648
Large Office	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.11	15	$0.05	100%	0
Large Office	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.07	15	$0.05	100%	0
Large Office	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.21	15	$0.08	100%	3,675
Large Office	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.15	15	$0.08	100%	457
Large Office	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	986	15	$138	80%	2,694
Large Office	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	111	3	$48	48%	117
Large Office	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.77	15	$1	10%	3,265
Large Office	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	62%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	69%	0
Large Office	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	12%	0
Large Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	1%	0
Large Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	1%	0
Large Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	1%	0
Large Office	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	88	9	$406	32%	0
Large Office	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	88	9	$406	32%	0
Large Office	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	112	9	$771	33%	0
Large Office	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	112	9	$771	33%	0
Large Office	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	61	9	$41	26%	11
Large Office	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	61	9	$41	26%	1
Large Office	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Large Office	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Large Office	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	279	13	$1,957	66%	0
Large Office	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	120	5	$87	62%	0
Large Office	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	342	13	$479	67%	0
Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	222
Large Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	18
Large Office	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Office	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Office	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Office	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Large Office	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Office	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Large Office	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Office	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Office	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	82	15	$2	33%	4,428
Large Office	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	23	13	$19	71%	108
Large Office	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	14	13	$19	11%	9
Large Office	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	651	15	$200	42%	1,959
Large Office	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	415	15	$200	61%	124
Large Office	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	651	15	$200	10%	460

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	415	15	$200	14%	29
Large Office	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	651	15	$200	49%	2,268
Large Office	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	415	15	$200	71%	144
Large Office	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	2
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	36
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	4
Large Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Large Office	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.16	15	$1	10%	0
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	34,511	15	$7,638	67%	12,749
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	21,973	15	$7,638	67%	553
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	34,511	15	$3,587	1%	116
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	21,973	15	$3,587	1%	5
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	34,511	15	$4,427	4%	821
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	21,973	15	$4,427	4%	36
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	34,511	15	$2,722	0%	43
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	21,973	15	$2,722	0%	2
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	34,511	15	$5,454	1%	260
Large Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	21,973	15	$5,454	1%	11
Large Office	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.89	7	$1	90%	0
Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.23	15	$0.68	93%	0
Large Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.12	15	$0.68	93%	0
Large Office	Heat Pump	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	1,338	15	$450	43%	0
Large Office	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	97,718	5	$27,124	33%	0
Large Office	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	88,312	5	$27,124	33%	0
Large Office	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	46,577	5	$89,564	6%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	0
Large Office	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	0
Large Office	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	0
Large Office	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	0
Large Office	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.22	18	$0.23	38%	0
Large Office	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.23	30	$10	75%	0
Large Office	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.12	30	$10	75%	0
Large Office	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.34	15	$13	5%	0
Large Office	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.16	15	$8	5%	0
Large Office	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.26	15	$0.11	100%	0
Large Office	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.23	15	$0.11	100%	0
Large Office	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.56	15	$0.65	5%	0
Large Office	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.43	15	$0.75	5%	0
Large Office	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,262	15	$540	33%	0
Large Office	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	1,140	15	$540	81%	0
Large Office	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	8.17	13	$0.38	9%	0
Large Office	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.09	20	$2	15%	0
Large Office	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Large Office	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Large Office	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Large Office	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	55	15	$150	10%	0
Large Office	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	55	15	$150	10%	0
Large Office	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.22	7	$0.30	90%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	2,931	15	$138	80%	0
Large Office	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	332	3	$48	48%	0
Large Office	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	332	3	$48	48%	0
Large Office	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.39	15	$1	10%	0
Large Office	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	62%	0
Large Office	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	69%	0
Large Office	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	12%	0
Large Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	1%	0
Large Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	1%	0
Large Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	1%	0
Large Office	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	488	9	$107	68%	11,604
Large Office	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	305	9	$107	68%	495
Large Office	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Large Office	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Large Office	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	3.41	9	$1	66%	44,454
Large Office	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	2.13	13	$1	0%	0
Large Office	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.40	9	$0.83	66%	9,564
Large Office	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	0.87	13	$0.83	0%	0
Large Office	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	38%	1,789
Large Office	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	884
Large Office	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	60
Large Office	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.44	11	$2	78%	0
Large Office	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.44	11	$2	78%	0
Large Office	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Large Office	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	41,101	2	$319	68%	4,043
Large Office	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,727	9	$205	42%	8,895
Large Office	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	66,014	13	$63,081	90%	0
Large Office	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	32,029	13	$34,099	76%	30,875
Large Office	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	14,422	20	$26,771	38%	0
Large Office	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	49,513	12	$14,881	73%	20,060
Large Office	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	73,154	15	$1,099	68%	515

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	21,923	15	$13,491	71%	3,265
Large Office	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	4,646	4	$395	81%	2,068
Large Office	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Large Office	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Large Office	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	960	14	$225	3%	182
Large Office	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	601	14	$225	3%	8
Large Office	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	84	14	$225	69%	0
Large Office	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	52	14	$225	69%	0
Large Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Office	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	1,612	30	$5,078	50%	0
Large Office	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	1,612	30	$5,078	50%	0
Large Office	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Large Office	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Large Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Large Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Large Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	20
Large Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Large Office	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Office	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	1,501	25	$2,782	5%	190
Large Office	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	1,600	25	$2,782	0%	0
Large Office	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	209	10	$5	56%	260
Large Office	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	223	10	$5	56%	19
Large Office	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.01	100%	0
Large Office	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.01	100%	0
Large Office	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Office	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.06	6	$0.00	100%	3,704
Large Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.06	6	$0.00	100%	301
Large Office	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Office	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Office	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.09	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.09	100%	0
Large Office	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.04	13	$0.13	100%	0
Large Office	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.04	13	$0.13	100%	0
Large Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Large Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.02	100%	0
Large Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.02	100%	0
Large Office	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.04	9	$0.00	100%	2,074
Large Office	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.04	9	$0.00	100%	204
Large Office	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Large Office	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Large Office	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	399	15	$450	43%	0
Large Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	34,054	5	$5,556	33%	504
Large Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	98,156	5	$13,562	33%	102
Large Office	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	51,082	5	$24,455	6%	0
Large Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	34
Large Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	3
Large Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	11
Large Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	1
Large Office	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.07	18	$0.23	38%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.26	30	$10	75%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.76	30	$10	75%	0
Large Office	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	3.45	13	$0.38	9%	98
Large Office	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.42	20	$2	15%	0
Large Office	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Large Office	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Large Office	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Large Office	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Office	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,021	15	$138	80%	375
Large Office	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.34	15	$1	10%	0
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	62%	0
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	69%	0
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	12%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	1%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	1%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	1%	0
Large Office	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	596
Large Office	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	35
Large Office	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.03	10	$0.00	100%	1,483
Large Office	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.03	10	$0.00	100%	152
Large Office	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Office	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	541	10	$600	49%	61
Large Office	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	3,387	10	$600	4%	49
Large Office	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	3,387	10	$600	0%	2
Large Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	86%	0
Large Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	86%	0
Large Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	72%	0
Large Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	72%	0
Large Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	3,387	40	$833	60%	1,001
Large Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	3,387	40	$666	83%	77
Large Office	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	52	10	$4	67%	368
Large Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	21	10	$196	81%	0
Large Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	21	10	$196	81%	0
Large Office	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	42	13	$2	56%	49
Large Office	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	677	7	$62	5%	15

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Office	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	2,304	4	$102	35%	351
Large Office	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.14	13	$0.06	75%	2,131
Large Office	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.14	13	$0.06	75%	267
Large Office	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	35
Large Office	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	4
Large Office	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.01	0%	0
Large Office	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.01	0%	0
Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.05	4	$0.00	100%	2,109
Large Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.05	4	$0.00	100%	148
Large Retail	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Retail	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Large Retail	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	127	15	$1,650	75%	0
Large Retail	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	130	15	$1,650	75%	0
Large Retail	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Retail	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Retail	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	55	12	$1,271	25%	0
Large Retail	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	57	12	$1,271	25%	0
Large Retail	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	380	12	$1,500	30%	0
Large Retail	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	392	12	$1,500	30%	0
Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	920	12	$1,500	11%	0
Large Retail	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	948	12	$1,500	11%	0
Large Retail	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Retail	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.11	20	$0.03	100%	0
Large Retail	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.12	20	$0.03	100%	0
Large Retail	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	Existing	4.59	15	$4	58%	170
Large Retail	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	New	5.19	15	$4	85%	18
Large Retail	Cooling Chillers	Chiller - Pipe Insulation	Code (1.5" of Insulation, Approximately R-6)	No Insulation	Per Linear Foot of Insulation	Existing	4.59	15	$4	58%	168
Large Retail	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.22	20	$0.14	100%	0
Large Retail	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.25	20	$0.14	100%	0
Large Retail	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Cooling Chillers	Chiller - VSD Retrofit	Centrifugal Chiller - VSD Remodel for Existing	Constant Speed Motor	Per Ton	Existing	27	10	$70	38%	132
Large Retail	Cooling Chillers	Chiller - Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only w/ Constant Speed Pump	Per Ton	Existing	41	10	$212	65%	0
Large Retail	Cooling Chillers	Chiller - Water Reset	Install Chilled Water Reset	No Chilled Water Reset	Per Control Point	Existing	76	10	$681	95%	0
Large Retail	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	Existing	24	20	$112	7%	0
Large Retail	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	New	27	20	$112	7%	2
Large Retail	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.22	7	$1	100%	0
Large Retail	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.15	15	$0.68	93%	0
Large Retail	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.17	15	$0.68	93%	0
Large Retail	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	7,795	5	$9,117	33%	237
Large Retail	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	8,801	5	$9,117	33%	23
Large Retail	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	11,693	5	$16,201	6%	0
Large Retail	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0
Large Retail	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Large Retail	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	4
Large Retail	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	0
Large Retail	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.04	18	$0.23	1%	0
Large Retail	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,508	10	$5,450	23%	75
Large Retail	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,960	10	$5,450	23%	15
Large Retail	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.15	30	$10	75%	0
Large Retail	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.17	30	$10	75%	0
Large Retail	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.86	13	$0.38	9%	52
Large Retail	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.81	20	$2	0%	1
Large Retail	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Large Retail	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Large Retail	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.24	7	$0.30	80%	2,432
Large Retail	Cooling Chillers	Tune-up - Chiller	Chiller Maintenance (Tune-up)	Unmaintained Chiller	Per SqFt	Existing	0.15	3	$0.15	16%	0
Large Retail	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	60%	0
Large Retail	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	67%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	11%	0
Large Retail	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	4%	0
Large Retail	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	5%	0
Large Retail	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	4%	0
Large Retail	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	626	15	$4,920	15%	0
Large Retail	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.26	7	$1	90%	0
Large Retail	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.20	15	$0.68	93%	1,576
Large Retail	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.20	15	$0.68	93%	144
Large Retail	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	10,456	5	$24,507	33%	0
Large Retail	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	10,548	5	$9,117	33%	53
Large Retail	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	15,684	5	$16,201	6%	159
Large Retail	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Large Retail	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Large Retail	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	11
Large Retail	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Large Retail	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.06	18	$0.23	38%	457
Large Retail	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	4,705	10	$5,450	23%	428
Large Retail	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	4,746	10	$5,450	23%	34
Large Retail	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.20	30	$10	75%	0
Large Retail	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.20	30	$10	75%	0
Large Retail	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.15	13	$0.38	9%	132
Large Retail	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.09	20	$2	15%	290
Large Retail	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Large Retail	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Large Retail	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Large Retail	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	63	9	$88	7%	0
Large Retail	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	63	9	$88	7%	0
Large Retail	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.32	7	$0.30	90%	7,063
Large Retail	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.09	15	$0.06	100%	0
Large Retail	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.09	15	$0.06	100%	0
Large Retail	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.17	15	$0.10	100%	1,672
Large Retail	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.17	15	$0.10	100%	272
Large Retail	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Retail	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,045	15	$138	89%	1,352
Large Retail	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	73	3	$48	48%	42
Large Retail	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.61	15	$1	10%	1,480
Large Retail	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	60%	0
Large Retail	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	67%	0
Large Retail	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	11%	0
Large Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	4%	0
Large Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	5%	0
Large Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	4%	0
Large Retail	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	101	9	$406	32%	0
Large Retail	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	101	9	$406	32%	0
Large Retail	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	129	9	$771	33%	0
Large Retail	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	129	9	$771	33%	0
Large Retail	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	70	9	$41	26%	18
Large Retail	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	70	9	$41	26%	1
Large Retail	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Large Retail	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Large Retail	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	1,013	13	$2,844	66%	0
Large Retail	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	436	5	$104	62%	92
Large Retail	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	1,241	13	$679	67%	653
Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	257
Large Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	20
Large Retail	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Retail	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Retail	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Retail	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Large Retail	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Large Retail	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Large Retail	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Large Retail	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	56	15	$2	33%	2,108
Large Retail	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	16	13	$19	71%	22
Large Retail	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	13	13	$19	11%	0
Large Retail	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	1,430	10	$12,500	49%	0
Large Retail	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	1,165	10	$6,500	49%	0
Large Retail	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	542	15	$200	53%	1,138
Large Retail	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	442	15	$200	77%	89
Large Retail	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	542	15	$200	4%	93
Large Retail	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	442	15	$200	6%	7
Large Retail	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	542	15	$200	47%	1,017
Large Retail	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	442	15	$200	69%	80
Large Retail	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	1
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	31
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	2
Large Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Large Retail	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.13	15	$1	10%	0
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	11,441	15	$2,532	67%	6,070
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	9,322	15	$2,532	67%	326
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	11,441	15	$1,189	1%	55

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	9,322	15	$1,189	1%	3
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	11,441	15	$1,467	4%	391
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	9,322	15	$1,467	4%	21
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	11,441	15	$902	0%	21
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	9,322	15	$902	0%	1
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	11,441	15	$1,808	1%	124
Large Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	9,322	15	$1,808	1%	7
Large Retail	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.79	7	$1	90%	0
Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.22	15	$0.68	93%	0
Large Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.14	15	$0.68	93%	0
Large Retail	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	35,343	5	$49,014	33%	0
Large Retail	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	31,066	5	$49,014	33%	0
Large Retail	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	53,014	5	$32,403	6%	40
Large Retail	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	10
Large Retail	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	1
Large Retail	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	7
Large Retail	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	0
Large Retail	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.20	18	$0.23	38%	114
Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	15,904	10	$5,450	23%	146
Large Retail	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	13,979	10	$5,450	23%	9
Large Retail	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.22	30	$10	75%	0
Large Retail	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.14	30	$10	75%	0
Large Retail	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Retail	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.22	15	$16	5%	0
Large Retail	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.17	15	$10	5%	0
Large Retail	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.23	15	$0.14	100%	171

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.21	15	$0.14	100%	20
Large Retail	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.41	15	$0.79	5%	53
Large Retail	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.19	15	$0.91	5%	6
Large Retail	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Retail	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	946	15	$540	33%	1,623
Large Retail	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	832	15	$540	81%	248
Large Retail	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	7.44	13	$0.38	9%	72
Large Retail	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	3.71	20	$2	15%	87
Large Retail	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Large Retail	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Large Retail	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Large Retail	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	63	15	$150	10%	0
Large Retail	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	63	15	$150	10%	0
Large Retail	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.11	7	$0.30	90%	1,838
Large Retail	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	3,534	15	$138	89%	385
Large Retail	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	249	3	$48	48%	25
Large Retail	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	249	3	$48	48%	25
Large Retail	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.28	15	$1	10%	260
Large Retail	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	60%	0
Large Retail	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	67%	0
Large Retail	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	11%	0
Large Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	4%	1
Large Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	5%	0
Large Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	4%	0
Large Retail	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	155	9	$107	68%	2,115
Large Retail	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	95	9	$107	68%	0
Large Retail	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Large Retail	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	5.44	9	$1	52%	22,838
Large Retail	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	3.33	13	$1	0%	0
Large Retail	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.23	9	$0.83	52%	8,589
Large Retail	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.37	13	$0.83	0%	0
Large Retail	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	56%	2,272
Large Retail	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	758
Large Retail	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	50
Large Retail	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	192	13	$600	76%	0
Large Retail	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	192	13	$600	76%	0
Large Retail	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.51	11	$2	78%	0
Large Retail	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.51	11	$2	78%	0
Large Retail	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Large Retail	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	44,657	2	$300	68%	6,309
Large Retail	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	2,679	9	$205	30%	5,670
Large Retail	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	33,316	13	$68,046	90%	0
Large Retail	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	66,632	13	$56,454	76%	40,092
Large Retail	Lighting	Lighting - High Bay Fluorescent High Output Package	High Bay Fluorescent HO Packages	Standard HID Lighting	Per Lighting Package	Existing	29,784	15	$4,358	73%	10,882
Large Retail	Lighting	Lighting - High Bay LED Package	High Bay LED Package	Standard HID Lighting	Per Lighting Package	Existing	19,568	20	$81,955	94%	0
Large Retail	Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	12,083	15	$4,310	67%	0
Large Retail	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	33,387	20	$24,476	38%	10,045
Large Retail	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	53,798	12	$14,013	73%	31,301
Large Retail	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	45,481	15	$1,729	68%	446
Large Retail	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	75,803	15	$11,104	71%	2,822
Large Retail	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	11,423	3	$841	81%	7,303
Large Retail	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Large Retail	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Large Retail	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,531	14	$225	12%	2,213
Large Retail	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	938	14	$225	12%	90
Large Retail	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	106	14	$225	53%	0
Large Retail	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	65	14	$225	53%	0
Large Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	981	30	$2,740	50%	0
Large Retail	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	981	30	$2,740	50%	0
Large Retail	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Large Retail	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Large Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Large Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Large Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	6
Large Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	0
Large Retail	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Retail	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	459	25	$2,782	5%	0
Large Retail	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	480	25	$2,782	0%	0
Large Retail	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	255	10	$5	19%	38
Large Retail	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	266	10	$5	19%	3
Large Retail	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.01	6	$0.02	100%	0
Large Retail	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.01	6	$0.02	100%	0
Large Retail	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Retail	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	559
Large Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	44
Large Retail	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Retail	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Large Retail	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	74%	560
Large Retail	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	18%	9
Large Retail	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	369
Large Retail	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	24
Large Retail	Refrigeration	Compressor - Scroll	High Efficiency Scroll Compressor	Standard Reciprocating Compressor	Per Scroll Compressor HP	Existing	679	10	$140	4%	74
Large Retail	Refrigeration	Compressor - Scroll	High Efficiency Scroll Compressor	Standard Reciprocating Compressor	Per Scroll Compressor HP	New	699	10	$140	4%	5
Large Retail	Refrigeration	Compressor - VSD Retrofit	Refrigeration Compressor VSD Retrofit	Standard Compressor	Per Retrofit Compressor HP	Existing	761	13	$266	3%	90
Large Retail	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.09	41%	0
Large Retail	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.01	10	$0.11	41%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	988
Large Retail	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	65
Large Retail	Refrigeration	Floating Head Pressure Control - Condensing Unit	Floating Head Pressure Control - Condensing Unit	No Floating Head Pressure Control	Per Condensing Unit HP	Existing	618	14	$295	46%	348
Large Retail	Refrigeration	Floating Head Pressure Control - Condensing Unit	Floating Head Pressure Control - Condensing Unit	No Floating Head Pressure Control	Per Condensing Unit HP	New	618	14	$295	46%	23
Large Retail	Refrigeration	Floating Head Pressure Control - Remote Condenser	Floating Head Pressure Control - Remote Condenser	No Floating Head Pressure Control	Per Condensing Unit HP	Existing	513	14	$232	46%	289
Large Retail	Refrigeration	Floating Head Pressure Control - Remote Condenser	Floating Head Pressure Control - Remote Condenser	No Floating Head Pressure Control	Per Condensing Unit HP	New	513	14	$232	46%	19
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	29%	27
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	29%	2
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	29%	30
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	29%	2
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	29%	7
Large Retail	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	29%	0
Large Retail	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	29%	0
Large Retail	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	29%	0
Large Retail	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	29%	0
Large Retail	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	29%	0
Large Retail	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	324	10	$3,052	27%	0
Large Retail	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	334	10	$3,052	27%	0
Large Retail	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	749	10	$1,124	63%	0
Large Retail	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	749	10	$1,124	63%	0
Large Retail	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	92
Large Retail	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	6
Large Retail	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	31	10	$191	78%	0
Large Retail	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	32	3	$49	87%	0
Large Retail	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Large Retail	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Large Retail	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	254	4	$300	51%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	262	4	$300	51%	0
Large Retail	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.08	100%	0
Large Retail	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.08	100%	0
Large Retail	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Retail	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Retail	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.11	100%	0
Large Retail	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.11	100%	0
Large Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Large Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.01	100%	0
Large Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.01	100%	0
Large Retail	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Retail	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Retail	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	201
Large Retail	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	19
Large Retail	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Large Retail	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Large Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	39,589	5	$13,562	33%	0
Large Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	74,945	5	$24,507	33%	0
Large Retail	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	59,383	5	$44,782	6%	0
Large Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	21
Large Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	2
Large Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	10
Large Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	1
Large Retail	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.23	18	$0.23	38%	70
Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	17,815	10	$5,450	23%	150
Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	33,725	10	$5,450	23%	19
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.77	30	$10	75%	0
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	1.47	30	$10	75%	0
Large Retail	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	10	13	$0.38	9%	91
Large Retail	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.16	20	$2	15%	90
Large Retail	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Large Retail	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Large Retail	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	3,958	15	$138	89%	397
Large Retail	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.01	15	$1	10%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	60%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	67%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	11%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	4%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	5%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	4%	0
Large Retail	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	476
Large Retail	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	27
Large Retail	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.04	10	$0.00	100%	1,184
Large Retail	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.04	10	$0.00	100%	117
Large Retail	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Retail	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	230	10	$600	62%	0
Large Retail	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,439	10	$600	2%	13
Large Retail	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,439	10	$600	0%	0
Large Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	14%	0
Large Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	14%	0
Large Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	12%	0
Large Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	12%	0
Large Retail	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	570	14	$442	1%	1

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Large Retail	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	570	14	$442	1%	0
Large Retail	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	893	14	$307	1%	2
Large Retail	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	893	14	$307	1%	0
Large Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	1,439	40	$833	60%	557
Large Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	1,439	40	$666	83%	43
Large Retail	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	74	10	$4	67%	221
Large Retail	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	51%	166
Large Retail	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	51%	9
Large Retail	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	33%	168
Large Retail	Water Heat	Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End Use	No Heat Recovery	Per Building SqFt	Existing	0.07	16	$0.91	50%	0
Large Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	29	10	$196	81%	0
Large Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	29	10	$196	81%	0
Large Retail	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	17	13	$2	56%	27
Large Retail	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	287	7	$62	5%	8
Large Retail	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	979	4	$102	50%	279
Large Retail	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.15	13	$0.06	75%	1,189
Large Retail	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.15	13	$0.06	75%	148
Large Retail	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	19
Large Retail	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	2
Large Retail	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.01	0%	0
Large Retail	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.01	0%	0
Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.02	4	$0.00	100%	346
Lodging	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.02	4	$0.00	100%	24
Lodging	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Lodging	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Lodging	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	267	15	$1,650	49%	0
Lodging	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	275	15	$1,650	49%	0
Lodging	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	117	12	$1,271	32%	0
Lodging	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	121	12	$1,271	32%	0
Lodging	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	801	12	$1,500	47%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	826	12	$1,500	47%	0
Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,940	12	$1,500	11%	53
Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,999	12	$1,500	11%	4
Lodging	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	842	15	$4,920	15%	0
Lodging	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.13	7	$1	90%	0
Lodging	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.16	15	$0.68	44%	0
Lodging	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.10	15	$0.68	44%	0
Lodging	Cooling DX	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	41	15	$450	10%	50
Lodging	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	6,813	5	$9,117	33%	0
Lodging	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	4,302	5	$14,651	33%	0
Lodging	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	10,220	5	$26,479	6%	0
Lodging	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Lodging	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Lodging	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	3
Lodging	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	0
Lodging	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.04	18	$0.23	38%	116
Lodging	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,066	10	$5,450	49%	102
Lodging	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,936	10	$5,450	49%	0
Lodging	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.16	30	$10	75%	0
Lodging	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.10	30	$10	75%	0
Lodging	Cooling DX	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	Existing	64	15	$140	57%	129
Lodging	Cooling DX	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	New	44	15	$140	57%	0
Lodging	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.48	13	$0.38	9%	33
Lodging	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.89	20	$2	15%	77
Lodging	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Lodging	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Lodging	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Lodging	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	186	9	$88	25%	84
Lodging	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	186	9	$88	25%	5
Lodging	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.26	7	$0.30	90%	1,747

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Lodging	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.07	15	$0.03	100%	0
Lodging	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.04	15	$0.03	100%	0
Lodging	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.14	15	$0.06	100%	436
Lodging	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.08	15	$0.06	100%	44
Lodging	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Lodging	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	340	15	$138	0%	0
Lodging	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	99	3	$48	48%	12
Lodging	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	53%	0
Lodging	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	60%	0
Lodging	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	10%	0
Lodging	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	12%	0
Lodging	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	14%	0
Lodging	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	12%	0
Lodging	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	296	9	$406	45%	52
Lodging	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	296	9	$406	45%	4
Lodging	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	378	9	$771	48%	0
Lodging	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	378	9	$771	48%	0
Lodging	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	206	9	$41	38%	77
Lodging	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	206	9	$41	38%	5
Lodging	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.29	12	$0.14	10%	0
Lodging	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.30	12	$0.14	10%	7
Lodging	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.14	100%	0
Lodging	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.14	100%	0
Lodging	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Lodging	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Lodging	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	46	13	$2,232	66%	0
Lodging	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	20	5	$114	62%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	57	13	$557	67%	0
Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	25
Lodging	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	2
Lodging	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Lodging	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Lodging	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Lodging	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Lodging	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Lodging	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Lodging	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	35	15	$2	33%	252
Lodging	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	10	13	$19	71%	0
Lodging	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	9	13	$19	11%	0
Lodging	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	658	10	$12,500	34%	0
Lodging	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	613	10	$6,500	34%	0
Lodging	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	206	15	$200	18%	47
Lodging	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	193	15	$200	27%	2
Lodging	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	206	15	$200	25%	63
Lodging	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	193	15	$200	36%	3
Lodging	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	206	15	$200	37%	95
Lodging	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	193	15	$200	54%	5
Lodging	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	0
Lodging	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	3,509	15	$776	67%	727
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	3,272	15	$776	67%	45
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	3,509	15	$364	1%	7
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	3,272	15	$364	1%	0
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	3,509	15	$450	4%	47
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	3,272	15	$450	4%	3
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	3,509	15	$276	0%	2
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	3,272	15	$276	0%	0
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	3,509	15	$554	1%	15
Lodging	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	3,272	15	$554	1%	1
Lodging	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	1.09	7	$1	90%	0
Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.17	15	$0.68	44%	0
Lodging	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.11	15	$0.68	44%	0
Lodging	Heat Pump	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	1,462	15	$450	16%	547
Lodging	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	34,211	5	$18,235	33%	0
Lodging	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	34,396	5	$18,235	33%	0
Lodging	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	51,317	5	$52,958	6%	0
Lodging	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	5
Lodging	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	0
Lodging	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	3
Lodging	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	0
Lodging	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.25	18	$0.23	38%	84
Lodging	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	15,395	10	$5,450	49%	165
Lodging	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	15,478	10	$5,450	49%	11
Lodging	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.17	30	$10	75%	0
Lodging	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.11	30	$10	75%	0
Lodging	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.32	15	$10	5%	0
Lodging	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.18	15	$6	5%	0
Lodging	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.27	15	$0.08	100%	123
Lodging	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.27	15	$0.08	100%	15
Lodging	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.77	15	$0.47	5%	41
Lodging	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.86	15	$0.54	5%	5
Lodging	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Lodging	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,890	15	$540	33%	1,392
Lodging	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	1,900	15	$540	81%	223
Lodging	Heat Pump	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	Existing	324	15	$140	57%	245
Lodging	Heat Pump	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	New	352	15	$140	57%	17
Lodging	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	5.01	13	$0.38	9%	61
Lodging	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.47	20	$2	15%	56
Lodging	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Lodging	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Lodging	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Lodging	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	186	15	$150	33%	13
Lodging	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	186	15	$150	33%	1
Lodging	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.33	7	$0.30	90%	1,264
Lodging	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,710	15	$138	0%	0
Lodging	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	497	3	$48	48%	20
Lodging	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	497	3	$48	48%	20
Lodging	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	53%	0
Lodging	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	60%	0
Lodging	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	10%	0
Lodging	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	12%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	14%	0
Lodging	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	12%	0
Lodging	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	403	9	$107	68%	1,724
Lodging	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	190	9	$107	68%	54
Lodging	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Lodging	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Lodging	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.82	9	$1	26%	3,523
Lodging	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.33	13	$1	0%	0
Lodging	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.16	9	$0.83	26%	685
Lodging	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	0.54	13	$0.83	0%	0
Lodging	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	52%	443
Lodging	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	159
Lodging	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	11
Lodging	Lighting	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	Existing	195	15	$140	57%	1,411
Lodging	Lighting	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	New	99	15	$140	57%	0
Lodging	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	280	13	$600	30%	0
Lodging	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	280	13	$600	30%	0
Lodging	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	1.48	11	$2	78%	0
Lodging	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	1.48	11	$2	78%	0
Lodging	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	20%	0
Lodging	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	86,740	2	$199	68%	4,783
Lodging	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,439	9	$205	42%	1,321
Lodging	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	6,818	13	$6,300	90%	400
Lodging	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	13,637	13	$4,982	76%	3,203
Lodging	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	1,343	20	$17,181	38%	0
Lodging	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	4,493	4	$9,321	73%	23,731
Lodging	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	14,598	15	$188	68%	56
Lodging	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	24,331	15	$357	71%	357
Lodging	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	1,539	2	$38	81%	384
Lodging	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Lodging	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	795	14	$225	1%	3
Lodging	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	374	14	$225	1%	0
Lodging	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	27	14	$225	30%	0
Lodging	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	12	14	$225	30%	0
Lodging	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Lodging	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	399	30	$851	50%	0
Lodging	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	399	30	$851	50%	0
Lodging	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Lodging	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Lodging	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Lodging	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Lodging	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	7
Lodging	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	0
Lodging	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Lodging	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	415	25	$2,782	5%	0
Lodging	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	436	25	$2,782	0%	0
Lodging	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	206	10	$5	4%	2
Lodging	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	216	10	$5	4%	0
Lodging	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Lodging	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Lodging	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Lodging	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Lodging	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	72
Lodging	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	6
Lodging	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Lodging	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Lodging	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	88%	107
Lodging	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	22%	2
Lodging	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	59
Lodging	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	4

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.09	41%	0
Lodging	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.11	41%	0
Lodging	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	158
Lodging	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	11
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	27%	300
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	27%	20
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	27%	324
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	27%	22
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	27%	8
Lodging	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	27%	1
Lodging	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	27%	0
Lodging	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	27%	0
Lodging	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	27%	0
Lodging	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	27%	0
Lodging	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	132	10	$613	10%	0
Lodging	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	136	10	$613	10%	0
Lodging	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	69	10	$10	63%	7
Lodging	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	69	10	$10	63%	0
Lodging	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	4
Lodging	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	0
Lodging	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	26	10	$191	78%	0
Lodging	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	26	3	$49	87%	0
Lodging	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Lodging	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Lodging	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	208	4	$300	27%	0
Lodging	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	214	4	$300	27%	0
Lodging	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.12	13	$0.41	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.12	13	$0.41	100%	0
Lodging	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Lodging	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.16	13	$0.54	100%	0
Lodging	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.16	13	$0.54	100%	0
Lodging	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.07	13	$0.24	100%	0
Lodging	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.07	13	$0.24	100%	0
Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.04	13	$0.10	100%	0
Lodging	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.04	13	$0.10	100%	0
Lodging	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Lodging	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	13
Lodging	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	1
Lodging	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Lodging	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Lodging	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	493	15	$450	16%	228
Lodging	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	13,458	5	$24,507	33%	0
Lodging	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	21,108	5	$9,117	33%	0
Lodging	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	20,187	5	$16,201	6%	0
Lodging	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	30
Lodging	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	2
Lodging	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	13
Lodging	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	1
Lodging	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.09	18	$0.23	38%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	6,056	10	$5,450	49%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	9,498	10	$5,450	49%	12
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.32	30	$10	75%	0
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.51	30	$10	75%	0
Lodging	Space Heat	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	Existing	127	15	$140	57%	0
Lodging	Space Heat	Hotel Key Card Activated Systems	Key card system to control room HVAC and lighting during non-occupied periods	No key card system to control room, manual controls only	Per Control	New	216	15	$140	57%	25
Lodging	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	2.24	13	$0.38	9%	63

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.75	20	$2	15%	0
Lodging	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Lodging	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Lodging	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Lodging	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Lodging	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Lodging	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	672	15	$138	0%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	53%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	60%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	10%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	12%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	14%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	12%	0
Lodging	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	205
Lodging	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	12
Lodging	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.06	10	$0.00	100%	511
Lodging	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.06	10	$0.00	100%	51
Lodging	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Lodging	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	4,092	10	$5,944	33%	0
Lodging	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	4,092	10	$5,944	33%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	2,371	11	$789	56%	402
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	2,371	11	$789	56%	22
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,707	11	$391	53%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,707	11	$391	53%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,898	11	$565	50%	196
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,898	11	$565	50%	11
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,478	11	$134	47%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,478	11	$134	47%	0
Lodging	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	772	10	$600	21%	26
Lodging	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	4,831	10	$600	4%	79
Lodging	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	4,831	10	$600	0%	2
Lodging	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	62%	0
Lodging	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	62%	0
Lodging	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	52%	0
Lodging	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	52%	0
Lodging	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	8,329	14	$442	20%	106
Lodging	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	8,329	14	$442	20%	6
Lodging	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	13,045	14	$307	24%	229
Lodging	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	13,045	14	$307	24%	12
Lodging	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	4,831	40	$833	60%	1,260
Lodging	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	4,831	40	$666	83%	96
Lodging	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	105	10	$4	67%	518
Lodging	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	190	10	$8	85%	899
Lodging	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	190	10	$8	85%	49
Lodging	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	422	10	$31	10%	215
Lodging	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	38%	19
Lodging	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	38%	1
Lodging	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	25%	19
Lodging	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	42	10	$196	81%	0
Lodging	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	42	10	$196	81%	0
Lodging	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	81	13	$2	56%	68
Lodging	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	966	7	$62	5%	18
Lodging	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	3,286	4	$102	35%	441

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Lodging	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	2.28	13	$1	75%	2,604
Lodging	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	2.28	13	$1	75%	310
Lodging	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.11	13	$0.03	100%	43
Lodging	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.11	13	$0.03	100%	5
Lodging	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.25	13	$0.23	0%	0
Lodging	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.25	13	$0.23	0%	0
Other Commercial	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.05	4	$0.00	100%	4,119
Other Commercial	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.05	4	$0.00	100%	278
Other Commercial	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Other Commercial	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Other Commercial	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	81%	2,363
Other Commercial	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	81%	154
Other Commercial	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	21	15	$1,650	75%	0
Other Commercial	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	22	15	$1,650	75%	0
Other Commercial	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Other Commercial	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	9	12	$1,271	18%	0
Other Commercial	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	9	12	$1,271	18%	0
Other Commercial	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	65	12	$1,500	30%	0
Other Commercial	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	67	12	$1,500	30%	0
Other Commercial	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	159	12	$1,500	11%	0
Other Commercial	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	164	12	$1,500	11%	0
Other Commercial	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Other Commercial	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.11	20	$0.04	100%	0
Other Commercial	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.08	20	$0.04	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	Existing	4.65	15	$4	58%	138
Other Commercial	Cooling Chillers	Chiller - Pipe Insulation	Above Code (3" of Insulation, Approximately R-11)	Code (1.5" of Insulation, Approximately R-6)	Per Linear Foot of Insulation	New	3.67	15	$4	85%	9
Other Commercial	Cooling Chillers	Chiller - Pipe Insulation	Code (1.5" of Insulation, Approximately R-6)	No Insulation	Per Linear Foot of Insulation	Existing	4.65	15	$4	58%	137
Other Commercial	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.22	20	$0.18	100%	860
Other Commercial	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.17	20	$0.18	100%	126
Other Commercial	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Other Commercial	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Cooling Chillers	Chiller - VSD Retrofit	Centrifugal Chiller - VSD Remodel for Existing	Constant Speed Motor	Per Ton	Existing	17	10	$70	38%	0
Other Commercial	Cooling Chillers	Chiller - Water Piping Loop with VSD Control	VSD for Secondary Chilled Water Loop	Primary Loop Only w/ Constant Speed Pump	Per Ton	Existing	33	10	$212	62%	0
Other Commercial	Cooling Chillers	Chiller - Water Reset	Install Chilled Water Reset	No Chilled Water Reset	Per Control Point	Existing	77	10	$681	90%	0
Other Commercial	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	Existing	19	20	$112	7%	0
Other Commercial	Cooling Chillers	Chiller Air-Cooled	Chiller Air Cooled with Condenser 10.0 EER	Standard 9.562 EER	Per Ton	New	15	20	$112	7%	0
Other Commercial	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.15	7	$1	95%	0
Other Commercial	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.15	15	$0.68	44%	0
Other Commercial	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.12	15	$0.68	44%	0
Other Commercial	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,552	5	$4,375	33%	0
Other Commercial	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,225	5	$4,375	33%	0
Other Commercial	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	2,329	5	$7,393	6%	0
Other Commercial	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0
Other Commercial	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Other Commercial	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	13
Other Commercial	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	1
Other Commercial	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.04	18	$0.23	1%	0
Other Commercial	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	698	10	$5,450	4%	0
Other Commercial	Cooling Chillers	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	551	10	$5,450	4%	0
Other Commercial	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.15	30	$10	75%	0
Other Commercial	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.12	30	$10	75%	0
Other Commercial	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.48	13	$0.38	9%	42
Other Commercial	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.83	20	$2	0%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Other Commercial	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Other Commercial	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.24	7	$0.30	76%	1,880
Other Commercial	Cooling Chillers	Tune-up - Chiller	Chiller Maintenance (Tune-up)	Unmaintained Chiller	Per SqFt	Existing	0.15	3	$0.15	16%	0
Other Commercial	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	31%	0
Other Commercial	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	35%	0
Other Commercial	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	6%	0
Other Commercial	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	41%	0
Other Commercial	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	46%	0
Other Commercial	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	40%	0
Other Commercial	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	667	15	$4,920	15%	0
Other Commercial	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.25	7	$1	90%	0
Other Commercial	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.27	15	$0.68	44%	2,964
Other Commercial	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.19	15	$0.68	44%	194
Other Commercial	Cooling DX	Data Center - Cooling Improvements	Data Center - Cooling Load Improvements	Standard Data Center Cooling System	Per Data Center SqFt	Existing	2.38	4	$17	0%	0
Other Commercial	Cooling DX	Data Center - Cooling Improvements	Data Center - Cooling Load Improvements	Standard Data Center Cooling System	Per Data Center SqFt	New	1.69	4	$17	0%	0
Other Commercial	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	2,747	5	$14,651	18%	0
Other Commercial	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,959	5	$4,375	18%	0
Other Commercial	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	4,120	5	$7,393	3%	0
Other Commercial	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Other Commercial	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Other Commercial	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	110
Other Commercial	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	8
Other Commercial	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.08	18	$0.23	38%	1,781
Other Commercial	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,236	10	$5,450	4%	0
Other Commercial	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	881	10	$5,450	4%	0
Other Commercial	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.27	30	$10	75%	0
Other Commercial	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.19	30	$10	75%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.85	13	$0.38	9%	511
Other Commercial	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.46	20	$2	15%	1,118
Other Commercial	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Other Commercial	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Other Commercial	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Other Commercial	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	82	9	$88	7%	16
Other Commercial	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	82	9	$88	7%	1
Other Commercial	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.43	7	$0.30	90%	27,249
Other Commercial	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.12	15	$0.07	100%	0
Other Commercial	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.08	15	$0.07	100%	0
Other Commercial	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.23	15	$0.13	100%	6,650
Other Commercial	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.16	15	$0.13	100%	777
Other Commercial	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	824	15	$138	77%	4,502
Other Commercial	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	78	3	$48	48%	161
Other Commercial	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.82	15	$1	10%	5,687
Other Commercial	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	31%	0
Other Commercial	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	35%	0
Other Commercial	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	6%	0
Other Commercial	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	41%	0
Other Commercial	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	46%	0
Other Commercial	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	40%	0
Other Commercial	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	130	9	$406	32%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	130	9	$406	32%	0
Other Commercial	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	166	9	$771	33%	0
Other Commercial	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	166	9	$771	33%	0
Other Commercial	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	91	9	$41	26%	82
Other Commercial	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	91	9	$41	26%	5
Other Commercial	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	1.27	12	$0.63	10%	0
Other Commercial	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	1.31	12	$0.63	10%	212
Other Commercial	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.63	100%	0
Other Commercial	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.63	100%	0
Other Commercial	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Other Commercial	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Other Commercial	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	165	13	$152	66%	0
Other Commercial	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	71	5	$2	62%	186
Other Commercial	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	202	13	$34	67%	1,314
Other Commercial	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	640
Other Commercial	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	50
Other Commercial	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Other Commercial	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Other Commercial	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Other Commercial	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Other Commercial	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Other Commercial	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Other Commercial	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	HVAC Aux	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-Two-Speed Fan Motor	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	63	15	$2	33%	7,248
Other Commercial	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	Existing	18	13	$19	71%	177
Other Commercial	HVAC Aux	Cooling Tower-VSD Fan Control	Variable-Speed Tower Fans Replace Two-Speed	Cooling Tower-One-Speed Fan Motor	Per Chiller Ton	New	12	13	$19	11%	0
Other Commercial	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	598	10	$12,500	64%	0
Other Commercial	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	403	10	$6,500	64%	0
Other Commercial	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	770	15	$200	44%	3,295
Other Commercial	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	519	15	$200	64%	214
Other Commercial	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	770	15	$200	5%	380
Other Commercial	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	519	15	$200	7%	25
Other Commercial	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	770	15	$200	48%	3,606
Other Commercial	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	519	15	$200	70%	235
Other Commercial	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	3
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	105
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	1
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	7
Other Commercial	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Other Commercial	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	Existing	127	10	$1,705	64%	0
Other Commercial	HVAC Aux	Optimized Variable Volume Lab Hood Design	Optimized Variable Volume Lab Hood Design	Constant Volume Lab Hood Design	Per Lab Hood	New	86	10	$1,705	64%	0
Other Commercial	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.19	15	$1	10%	0
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	3,192	15	$706	67%	20,867
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	2,152	15	$706	67%	929
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	3,192	15	$331	1%	190
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	2,152	15	$331	1%	8

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	3,192	15	$409	4%	1,343
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	2,152	15	$409	4%	60
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	3,192	15	$251	0%	71
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	2,152	15	$251	0%	3
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	3,192	15	$504	1%	426
Other Commercial	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	2,152	15	$504	1%	19
Other Commercial	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.88	7	$1	90%	0
Other Commercial	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.28	15	$0.68	44%	0
Other Commercial	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.17	15	$0.68	44%	0
Other Commercial	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	8,634	5	$29,303	18%	0
Other Commercial	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	6,772	5	$29,303	18%	0
Other Commercial	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	12,951	5	$14,787	3%	0
Other Commercial	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	253
Other Commercial	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	19
Other Commercial	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	171
Other Commercial	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	10
Other Commercial	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.25	18	$0.23	38%	922
Other Commercial	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,885	10	$5,450	4%	0
Other Commercial	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,047	10	$5,450	4%	0
Other Commercial	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.28	30	$10	75%	0
Other Commercial	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.17	30	$10	75%	0
Other Commercial	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.60	15	$21	5%	0
Other Commercial	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.22	15	$13	5%	0
Other Commercial	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.30	15	$0.18	100%	1,396

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.23	15	$0.18	100%	137
Other Commercial	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.72	15	$0.99	5%	419
Other Commercial	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.36	15	$1	5%	42
Other Commercial	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	937	15	$540	33%	11,921
Other Commercial	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	735	15	$540	81%	1,774
Other Commercial	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	5.07	13	$0.38	9%	569
Other Commercial	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.61	20	$2	15%	699
Other Commercial	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Other Commercial	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Other Commercial	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Other Commercial	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	82	15	$150	10%	0
Other Commercial	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	82	15	$150	10%	0
Other Commercial	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.38	7	$0.30	90%	15,923
Other Commercial	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	2,590	15	$138	77%	2,647
Other Commercial	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	246	3	$48	48%	199
Other Commercial	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	246	3	$48	48%	198
Other Commercial	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.60	15	$1	10%	2,075
Other Commercial	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	31%	0
Other Commercial	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	35%	0
Other Commercial	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	6%	0
Other Commercial	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	41%	124
Other Commercial	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	46%	10
Other Commercial	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	40%	0
Other Commercial	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	311	9	$107	68%	10,269
Other Commercial	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	205	9	$107	68%	447

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Other Commercial	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Other Commercial	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	4.36	9	$1	47%	30,046
Other Commercial	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	2.88	13	$1	0%	0
Other Commercial	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.79	9	$0.83	47%	12,340
Other Commercial	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.18	13	$0.83	0%	0
Other Commercial	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	54%	4,351
Other Commercial	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	1,505
Other Commercial	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	99
Other Commercial	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	246	13	$600	57%	0
Other Commercial	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	246	13	$600	57%	0
Other Commercial	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.65	11	$2	78%	0
Other Commercial	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.65	11	$2	78%	0
Other Commercial	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Other Commercial	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	5,551	2	$29	68%	9,661
Other Commercial	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,901	9	$205	42%	15,743
Other Commercial	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	4,732	13	$8,474	90%	0
Other Commercial	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	9,465	13	$6,878	76%	70,159
Other Commercial	Lighting	Lighting - High Bay Fluorescent High Output Package	High Bay Fluorescent HO Packages	Standard HID Lighting	Per Lighting Package	Existing	8,488	15	$966	73%	38,204
Other Commercial	Lighting	Lighting - High Bay LED Package	High Bay LED Package	Standard HID Lighting	Per Lighting Package	Existing	5,577	20	$18,175	94%	0
Other Commercial	Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	3,443	15	$956	67%	0
Other Commercial	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	9,515	20	$2,194	38%	35,266
Other Commercial	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	6,687	9	$1,355	73%	47,932
Other Commercial	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	7,714	15	$273	68%	932
Other Commercial	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	12,857	15	$1,410	71%	5,901
Other Commercial	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	1,220	3	$69	81%	9,610
Other Commercial	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Other Commercial	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,228	14	$225	22%	14,042
Other Commercial	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	810	14	$225	22%	612
Other Commercial	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	77	14	$225	55%	0
Other Commercial	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	50	14	$225	55%	0
Other Commercial	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	2%	0
Other Commercial	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Other Commercial	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	290	30	$807	50%	0
Other Commercial	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	290	30	$807	50%	0
Other Commercial	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Other Commercial	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Other Commercial	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Other Commercial	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Other Commercial	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	72
Other Commercial	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	5
Other Commercial	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Other Commercial	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	200	25	$2,782	5%	0
Other Commercial	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	208	25	$2,782	0%	0
Other Commercial	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	73	10	$5	8%	53
Other Commercial	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	75	10	$5	8%	4
Other Commercial	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.01	6	$0.02	100%	0
Other Commercial	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.01	6	$0.02	100%	0
Other Commercial	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Other Commercial	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Other Commercial	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	1,309
Other Commercial	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	103
Other Commercial	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Other Commercial	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	78%	503
Other Commercial	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	19%	8
Other Commercial	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	315
Other Commercial	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	21
Other Commercial	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.09	41%	0
Other Commercial	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.00	10	$0.11	41%	0
Other Commercial	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	842
Other Commercial	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	56
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	4%	49
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	4%	3
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	4%	52
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	4%	3
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	4%	13
Other Commercial	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	4%	1
Other Commercial	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	4%	0
Other Commercial	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	4%	0
Other Commercial	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	4%	0
Other Commercial	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	4%	0
Other Commercial	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	22	10	$450	5%	0
Other Commercial	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	23	10	$450	5%	0
Other Commercial	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	630	10	$94	63%	1,938
Other Commercial	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	630	10	$94	63%	128
Other Commercial	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	114
Other Commercial	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	8
Other Commercial	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	3.52	10	$191	78%	0
Other Commercial	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	3.62	3	$49	87%	0
Other Commercial	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Other Commercial	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	35	4	$300	35%	0
Other Commercial	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	36	4	$300	35%	0
Other Commercial	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.09	100%	0
Other Commercial	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.09	100%	0
Other Commercial	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Other Commercial	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.04	13	$0.13	100%	0
Other Commercial	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.04	13	$0.13	100%	0
Other Commercial	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Other Commercial	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Other Commercial	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.02	100%	0
Other Commercial	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.02	100%	0
Other Commercial	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Other Commercial	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Servers	Data Center - High Efficiency Server	Data Center - ENERGY STAR Server	Conventional Server	Per Data Center Server	Existing	533	4	$766	81%	0
Other Commercial	Servers	Data Center - High Efficiency Server	Data Center - ENERGY STAR Server	Conventional Server	Per Data Center Server	New	533	4	$766	81%	0
Other Commercial	Servers	Data Center - Server Virtualization	Data Center - Server Virtualization Consolidate (4 to 1)	Conventional Server Arrangement	Per Data Center Server	Existing	2,213	4	$15,333	27%	0
Other Commercial	Servers	Data Center - Server Virtualization	Data Center - Server Virtualization Consolidate (4 to 1)	Conventional Server Arrangement	Per Data Center Server	New	2,213	4	$15,333	27%	0
Other Commercial	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	305
Other Commercial	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	29
Other Commercial	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Other Commercial	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Other Commercial	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	8,142	5	$9,117	18%	0
Other Commercial	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	8,038	5	$14,651	18%	0
Other Commercial	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	12,213	5	$26,479	3%	0
Other Commercial	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	401
Other Commercial	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	32
Other Commercial	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	194
Other Commercial	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	12

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.24	18	$0.23	38%	356
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	3,663	10	$5,450	4%	0
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	3,617	10	$5,450	4%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.81	30	$10	75%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.80	30	$10	75%	0
Other Commercial	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	5.89	13	$0.38	9%	456
Other Commercial	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.35	20	$2	15%	453
Other Commercial	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Other Commercial	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Other Commercial	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Other Commercial	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	2,442	15	$138	77%	1,720
Other Commercial	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.05	15	$1	10%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	31%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	35%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	6%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	41%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	46%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	40%	0
Other Commercial	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	957
Other Commercial	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	55
Other Commercial	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.04	10	$0.00	100%	2,380
Other Commercial	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.04	10	$0.00	100%	236
Other Commercial	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Other Commercial	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	284	10	$5,944	2%	0
Other Commercial	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	284	10	$5,944	2%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	2,371	11	$789	14%	2,575
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	2,371	11	$789	14%	139
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,707	11	$391	13%	1,993
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,707	11	$391	13%	107
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,898	11	$565	13%	1,958
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,898	11	$565	13%	106
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,478	11	$134	12%	1,943
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,478	11	$134	12%	104
Other Commercial	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	376	10	$600	51%	0
Other Commercial	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	2,353	10	$600	4%	237
Other Commercial	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	2,353	10	$600	0%	7
Other Commercial	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	10%	0
Other Commercial	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	10%	0
Other Commercial	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	8%	0
Other Commercial	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	8%	0
Other Commercial	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	2,372	14	$442	0%	32
Other Commercial	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	2,372	14	$442	0%	2
Other Commercial	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	3,716	14	$307	0%	67
Other Commercial	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	3,716	14	$307	0%	4

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Other Commercial	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	2,353	40	$833	60%	5,033
Other Commercial	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	2,353	40	$666	83%	376
Other Commercial	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	73	10	$4	67%	1,963
Other Commercial	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	147	10	$8	13%	299
Other Commercial	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	147	10	$8	13%	15
Other Commercial	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	326	10	$31	3%	141
Other Commercial	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	8%	130
Other Commercial	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	8%	7
Other Commercial	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	5%	148
Other Commercial	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	29	10	$196	90%	0
Other Commercial	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	29	10	$196	90%	0
Other Commercial	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	14	13	$2	56%	238
Other Commercial	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	470	7	$62	5%	74
Other Commercial	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	1,601	4	$102	35%	1,757
Other Commercial	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.65	13	$0.30	75%	9,286
Other Commercial	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.65	13	$0.30	75%	1,055
Other Commercial	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.03	13	$0.00	100%	152
Other Commercial	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.03	13	$0.00	100%	17
Other Commercial	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.07	13	$0.06	0%	0
Other Commercial	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.07	13	$0.06	0%	0
Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.03	4	$0.00	100%	353
Restaurant	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.03	4	$0.00	100%	25
Restaurant	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Restaurant	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Restaurant	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	365	15	$1,650	75%	0
Restaurant	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	376	15	$1,650	75%	0
Restaurant	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	160	12	$1,271	32%	0
Restaurant	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	165	12	$1,271	32%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	Existing	1,093	12	$1,500	30%	0
Restaurant	Cooking	Hot Food Holding Cabinets	ENERGY STAR Qualified (< 40 watts/cubic foot)	Standard Equipment	Per Hot Food Holding Cabinet	New	1,128	12	$1,500	30%	0
Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	2,646	12	$1,500	26%	336
Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	2,730	12	$1,500	26%	23
Restaurant	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	1,113	15	$4,920	15%	0
Restaurant	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.44	7	$1	90%	0
Restaurant	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.61	15	$0.68	44%	2,108
Restaurant	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.34	15	$0.68	44%	47
Restaurant	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	2,809	5	$4,375	9%	0
Restaurant	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,587	5	$2,377	9%	0
Restaurant	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	4,214	5	$3,683	2%	49
Restaurant	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Restaurant	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Restaurant	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	15
Restaurant	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Restaurant	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.18	18	$0.23	38%	555
Restaurant	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,264	10	$5,450	85%	0
Restaurant	Cooling DX	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	714	10	$5,450	85%	0
Restaurant	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.61	30	$10	75%	0
Restaurant	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.34	30	$10	75%	0
Restaurant	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	2.07	13	$0.38	51%	893
Restaurant	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	3.27	20	$2	15%	336
Restaurant	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Restaurant	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Restaurant	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Restaurant	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	85	9	$88	7%	2
Restaurant	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	85	9	$88	7%	0
Restaurant	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.97	7	$0.30	90%	8,191
Restaurant	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.26	15	$0.10	100%	0
Restaurant	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.15	15	$0.10	100%	0
Restaurant	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.51	15	$0.18	100%	2,018
Restaurant	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.29	15	$0.18	100%	187
Restaurant	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Restaurant	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	842	15	$138	77%	1,358
Restaurant	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	130	3	$48	48%	50
Restaurant	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	6%	0
Restaurant	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	7%	0
Restaurant	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	1%	0
Restaurant	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	74%	0
Restaurant	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	83%	0
Restaurant	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	72%	0
Restaurant	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	135	9	$406	32%	0
Restaurant	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	135	9	$406	32%	0
Restaurant	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	172	9	$771	33%	0
Restaurant	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	172	9	$771	33%	0
Restaurant	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	94	9	$41	26%	20
Restaurant	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	94	9	$41	26%	2
Restaurant	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Restaurant	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Restaurant	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	12	13	$257	66%	0
Restaurant	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	5.48	5	$12	62%	0
Restaurant	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	15	13	$64	67%	0
Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.01	6	$0.00	100%	129
Restaurant	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.01	6	$0.00	100%	10
Restaurant	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Restaurant	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Restaurant	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Restaurant	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Restaurant	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Restaurant	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	Existing	600	10	$12,500	19%	0
Restaurant	HVAC Aux	Demand Controlled Ventilation - Range Hood	For Range Hoods – VFD Controlled	No DCV	Per Range Hood	New	426	10	$6,500	19%	0
Restaurant	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	1,683	15	$200	56%	1,811
Restaurant	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	1,196	15	$200	81%	124
Restaurant	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	1,683	15	$200	7%	228
Restaurant	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	1,196	15	$200	10%	16
Restaurant	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	1,683	15	$200	43%	1,415
Restaurant	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	1,196	15	$200	64%	97
Restaurant	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	1
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	9
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	1
Restaurant	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	3,201	15	$708	67%	4,150
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	2,275	15	$708	67%	195
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	3,201	15	$332	1%	38
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	2,275	15	$332	1%	2
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	3,201	15	$410	4%	267
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	2,275	15	$410	4%	13

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	3,201	15	$252	0%	14
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	2,275	15	$252	0%	1
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	3,201	15	$505	1%	85
Restaurant	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	2,275	15	$505	1%	4
Restaurant	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	1.04	7	$1	90%	0
Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.69	15	$0.68	44%	464
Restaurant	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.36	15	$0.68	44%	0
Restaurant	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	5,803	5	$8,750	9%	0
Restaurant	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	3,687	5	$8,750	9%	0
Restaurant	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	8,705	5	$7,367	2%	0
Restaurant	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	43
Restaurant	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	3
Restaurant	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	25
Restaurant	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	2
Restaurant	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.37	18	$0.23	38%	223
Restaurant	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	2,611	10	$5,450	85%	0
Restaurant	Heat Pump	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,659	10	$5,450	85%	0
Restaurant	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.69	30	$10	75%	0
Restaurant	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.36	30	$10	75%	0
Restaurant	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Restaurant	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.85	15	$28	5%	0
Restaurant	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.72	15	$18	5%	0
Restaurant	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.47	15	$0.24	100%	354
Restaurant	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.29	15	$0.24	100%	28
Restaurant	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	2.25	15	$1	5%	89
Restaurant	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.47	15	$1	5%	7

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Restaurant	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	1,028	15	$540	33%	2,806
Restaurant	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	653	15	$540	81%	345
Restaurant	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	6.85	13	$0.38	51%	669
Restaurant	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	6.76	20	$2	15%	165
Restaurant	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Restaurant	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Restaurant	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Restaurant	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	85	15	$150	10%	1
Restaurant	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	85	15	$150	10%	0
Restaurant	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	2.02	7	$0.30	90%	3,752
Restaurant	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,741	15	$138	77%	620
Restaurant	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	270	3	$48	48%	47
Restaurant	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	270	3	$48	48%	47
Restaurant	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	6%	0
Restaurant	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	7%	0
Restaurant	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	1%	0
Restaurant	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	74%	33
Restaurant	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	83%	3
Restaurant	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	72%	0
Restaurant	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Restaurant	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Restaurant	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	4.41	9	$1	38%	4,175
Restaurant	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	3.76	13	$1	0%	0
Restaurant	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.81	9	$0.83	38%	1,715
Restaurant	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.54	13	$0.83	0%	0
Restaurant	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	56%	598
Restaurant	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	200
Restaurant	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	13

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	Existing	256	13	$600	30%	0
Restaurant	Lighting	LED Refrigerated Case Lighting	LED Refrigerated Case Lighting	Fluorescent	Per Refrigerated Glass Case	New	256	13	$600	30%	0
Restaurant	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.68	11	$2	78%	0
Restaurant	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.68	11	$2	78%	0
Restaurant	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Restaurant	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	9,564	2	$48	68%	4,127
Restaurant	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,764	9	$205	42%	1,811
Restaurant	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	1,796	13	$2,470	90%	361
Restaurant	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	3,593	13	$2,094	76%	6,605
Restaurant	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	760	20	$4,130	38%	0
Restaurant	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	11,522	9	$2,251	73%	20,477
Restaurant	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	4,623	15	$26	68%	138
Restaurant	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	7,705	15	$58	71%	877
Restaurant	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	1,186	3	$65	81%	2,317
Restaurant	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Restaurant	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Restaurant	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,241	14	$225	4%	48
Restaurant	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	1,057	14	$225	4%	3
Restaurant	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	63	14	$225	51%	0
Restaurant	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	54	14	$225	51%	0
Restaurant	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Restaurant	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Restaurant	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	174	30	$448	50%	0
Restaurant	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	174	30	$448	50%	0
Restaurant	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Restaurant	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Restaurant	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Restaurant	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Restaurant	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	18
Restaurant	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Restaurant	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Restaurant	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Restaurant	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	170	25	$2,782	5%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	178	25	$2,782	0%	0
Restaurant	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	28	10	$5	26%	18
Restaurant	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	29	10	$5	26%	1
Restaurant	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.02	6	$0.05	100%	0
Restaurant	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.02	6	$0.05	100%	0
Restaurant	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Restaurant	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Restaurant	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	113
Restaurant	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	9
Restaurant	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Restaurant	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Restaurant	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	Existing	767	12	$78	72%	1,614
Restaurant	Refrigeration	Anti-Sweat Heater Controls	Variable Temperature Controls (Humidistat)	Constant Controls	Per Control (Weighted by Grocery Refrigeration)	New	767	12	$78	18%	27
Restaurant	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	Existing	1,018	12	$243	37%	1,090
Restaurant	Refrigeration	Case Fans with ECM motors	ECM Motors on Evaporator Fan for Display Cases	Standard Case Fan Motor	Per ECM (Weighted by Grocery Refrigeration)	New	1,018	12	$243	37%	72
Restaurant	Refrigeration	Demand Control Defrost - Electric	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.06	10	$0.09	41%	0
Restaurant	Refrigeration	Demand Control Defrost - Hot Gas	Refrigerant Defrost	No Demand Control Defrost	Per Building SqFt	Existing	0.16	10	$0.11	41%	746
Restaurant	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	Existing	435	15	$132	69%	2,915
Restaurant	Refrigeration	Evaporator Fans - Walk-ins	High-Efficiency Evaporator Fans, Walk-in Refrigerators	Standard Evaporator Fans	Per Walk-in Fan	New	435	15	$132	69%	193
Restaurant	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	Existing	1,086	12	$704	90%	3,154
Restaurant	Refrigeration	Glass Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Glass Door Refrigerator	New	1,086	12	$704	95%	228
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	Existing	1,197	10	$140	39%	1,143
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Ice-Making Head	Standard Equipment	Per Ice Maker	New	1,197	10	$140	39%	75
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	Existing	1,293	10	$5	39%	1,235
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Remote Condensing	Standard Equipment	Per Ice Maker	New	1,293	10	$5	39%	82
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	Existing	317	10	$5	39%	32
Restaurant	Refrigeration	Ice Makers, Air Cooled	ENERGY STAR Qualified, Self-Contained	Standard Equipment	Per Ice Maker	New	317	10	$5	39%	2
Restaurant	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	Existing	894	10	$1,000	39%	0
Restaurant	Refrigeration	Ice Makers, Water-Cooled	Ice-Making Head - Water Cooled	Standard Equipment	Per Ice Maker	New	894	10	$1,000	39%	0
Restaurant	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	Existing	187	10	$850	39%	0
Restaurant	Refrigeration	Ice Makers, Water-Cooled	Self-Contained - Water Cooled	Standard Equipment	Per Ice Maker	New	187	10	$850	39%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	Existing	313	10	$413	4%	0
Restaurant	Refrigeration	Night Covers for Display Cases	Night Covers for Display Cases	No Night Covers	Per Building	New	323	10	$413	4%	0
Restaurant	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	Existing	610	10	$91	63%	465
Restaurant	Refrigeration	Novelty Cooler Shutoff	Cooler Shutoff with Controls System or Shutoff Switch	No Cooler Shutoff	Per Cooler Case	New	610	10	$91	63%	31
Restaurant	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	Existing	20	8	$3	14%	28
Restaurant	Refrigeration	Occupancy Sensor - Refrigerated Cases	Occupancy Sensor - Refrigerated Cases	No Sensor	Per Linear Foot of Refrigerated Display Case	New	20	8	$3	14%	2
Restaurant	Refrigeration	Refrigeration - Retro-Commissioning	Refrigeration Retro Commissioning (Refrigeration System Diagnostics / Operations And Maintenance)	No Retro-Commissioning	Per Refrigeration Ton	Existing	61	10	$191	78%	0
Restaurant	Refrigeration	Refrigeration - Commissioning	Commissioning (Refrigeration System Diagnostics / Operations and Maintenance for a New Unit)	No Commissioning	Per Refrigeration Ton	New	63	3	$49	87%	0
Restaurant	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Restaurant	Refrigeration	Refrigeration - Standard	Standard Refrigeration	Standard Refrigeration	Per Building SqFt	New	0.00	14	$0.00	100%	0
Restaurant	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	Existing	1,463	12	$247	76%	710
Restaurant	Refrigeration	Solid Door Freezers	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Freezer	New	1,463	12	$247	76%	47
Restaurant	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	Existing	849	12	$124	75%	407
Restaurant	Refrigeration	Solid Door Refrigerators	ENERGY STAR Qualified (Volume 0 to 50+ Cubic Feet)	Standard Equipment	Per Commercial Refrigerator	New	849	12	$124	75%	27
Restaurant	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	Existing	491	4	$300	43%	0
Restaurant	Refrigeration	Strip Curtains for Walk-Ins	Strip Curtains for Walk-Ins	No Strip Curtains for Walk-Ins	Per Walk-in	New	506	4	$300	43%	0
Restaurant	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.07	13	$0.22	100%	0
Restaurant	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.07	13	$0.22	100%	0
Restaurant	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Restaurant	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.09	13	$0.30	100%	0
Restaurant	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.09	13	$0.30	100%	0
Restaurant	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.04	13	$0.13	100%	0
Restaurant	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.04	13	$0.13	100%	0
Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.05	100%	0
Restaurant	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.05	100%	0
Restaurant	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	43
Restaurant	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	4
Restaurant	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Restaurant	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Restaurant	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	4,077	5	$14,651	9%	0
Restaurant	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	2,738	5	$4,375	9%	0
Restaurant	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	6,116	5	$7,393	2%	0
Restaurant	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	147
Restaurant	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	12
Restaurant	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	72
Restaurant	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	4
Restaurant	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.26	18	$0.23	38%	135
Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	1,834	10	$5,450	85%	0
Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	1,232	10	$5,450	85%	0
Restaurant	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.88	30	$10	75%	0
Restaurant	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.59	30	$10	75%	0
Restaurant	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	7.02	13	$0.38	51%	1,038
Restaurant	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.75	20	$2	15%	173
Restaurant	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Restaurant	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Restaurant	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Restaurant	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Restaurant	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Restaurant	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,223	15	$138	77%	652
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	6%	0
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	7%	0
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	1%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	74%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	83%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	72%	0
Restaurant	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	138
Restaurant	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	8

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.05	10	$0.00	100%	344
Restaurant	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.05	10	$0.00	100%	34
Restaurant	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Restaurant	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Restaurant	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	206	10	$600	65%	0
Restaurant	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,290	10	$600	1%	14
Restaurant	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	1,290	10	$600	0%	0
Restaurant	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	29%	0
Restaurant	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	29%	0
Restaurant	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	24%	0
Restaurant	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	24%	0
Restaurant	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	8,503	14	$442	52%	1,453
Restaurant	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	8,503	14	$442	52%	75
Restaurant	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	13,317	14	$307	62%	8,830
Restaurant	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	13,317	14	$307	62%	450
Restaurant	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	1,290	40	$833	60%	1,141
Restaurant	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	1,290	40	$666	83%	85
Restaurant	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	100	10	$4	67%	169
Restaurant	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	485	5	$39	81%	403
Restaurant	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	485	5	$39	81%	22
Restaurant	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	728	5	$30	52%	408
Restaurant	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	120	10	$196	71%	0
Restaurant	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	120	10	$196	71%	0
Restaurant	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	20	13	$2	56%	57
Restaurant	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	258	7	$62	5%	16
Restaurant	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	877	4	$102	80%	914
Restaurant	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	2.33	13	$1	75%	2,903

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Restaurant	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	2.33	13	$1	75%	297
Restaurant	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.11	13	$0.03	100%	47
Restaurant	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.11	13	$0.03	100%	5
Restaurant	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.26	13	$0.23	0%	0
Restaurant	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.26	13	$0.23	0%	0
Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.32	4	$0.06	100%	4,518
Small Office	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.32	4	$0.06	100%	300
Small Office	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Office	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Office	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	71%	2,229
Small Office	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	71%	142
Small Office	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	570	15	$4,920	15%	0
Small Office	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.21	7	$1	90%	0
Small Office	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.21	15	$0.68	34%	296
Small Office	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.16	15	$0.68	34%	0
Small Office	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,187	5	$2,377	9%	0
Small Office	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	929	5	$2,629	9%	0
Small Office	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,780	5	$4,152	2%	0
Small Office	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Small Office	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Small Office	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	24
Small Office	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	2
Small Office	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.06	18	$0.23	38%	279
Small Office	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.21	30	$10	75%	0
Small Office	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.16	30	$10	75%	0
Small Office	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.65	13	$0.38	51%	460
Small Office	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.12	20	$2	15%	177
Small Office	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Small Office	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Small Office	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	55	9	$88	7%	3
Small Office	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	55	9	$88	7%	0
Small Office	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.33	7	$0.30	90%	4,267
Small Office	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Office	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.09	15	$0.06	100%	0
Small Office	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.07	15	$0.06	100%	0
Small Office	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.17	15	$0.12	100%	1,049
Small Office	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.13	15	$0.12	100%	136
Small Office	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Office	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	356	15	$138	80%	746
Small Office	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	67	3	$48	48%	22
Small Office	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.63	15	$1	10%	904
Small Office	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	9%	0
Small Office	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	11%	0
Small Office	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	2%	0
Small Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	70%	0
Small Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	78%	0
Small Office	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	68%	0
Small Office	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	88	9	$406	32%	0
Small Office	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	88	9	$406	32%	0
Small Office	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	112	9	$771	33%	0
Small Office	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	112	9	$771	33%	0
Small Office	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	61	9	$41	26%	41
Small Office	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	61	9	$41	26%	3
Small Office	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Small Office	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	12	13	$85	66%	0
Small Office	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	5.29	5	$3	62%	0
Small Office	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	15	13	$21	67%	0
Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	55
Small Office	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	4
Small Office	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Office	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Office	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Office	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Office	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Office	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Office	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Office	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Office	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	651	15	$200	42%	852
Small Office	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	551	15	$200	61%	68
Small Office	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	651	15	$200	10%	200
Small Office	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	551	15	$200	14%	16
Small Office	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	651	15	$200	49%	987
Small Office	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	551	15	$200	71%	79
Small Office	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Office	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	6
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	1
Small Office	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Small Office	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.16	15	$1	10%	0
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	1,522	15	$337	67%	3,181

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	1,289	15	$337	67%	174
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	1,522	15	$158	1%	29
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	1,289	15	$158	1%	2
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	1,522	15	$195	4%	205
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	1,289	15	$195	4%	11
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	1,522	15	$120	0%	11
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	1,289	15	$120	0%	1
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	1,522	15	$240	1%	65
Small Office	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	1,289	15	$240	1%	4
Small Office	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.89	7	$1	90%	0
Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.23	15	$0.68	34%	0
Small Office	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.12	15	$0.68	34%	0
Small Office	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	4,311	5	$4,754	9%	0
Small Office	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	3,896	5	$4,754	9%	0
Small Office	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	6,467	5	$8,304	2%	0
Small Office	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	34
Small Office	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	3
Small Office	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	32
Small Office	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	2
Small Office	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.22	18	$0.23	38%	142
Small Office	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.23	30	$10	75%	0
Small Office	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.12	30	$10	75%	0
Small Office	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Office	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.34	15	$18	5%	0
Small Office	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.16	15	$12	5%	0
Small Office	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.26	15	$0.17	100%	211
Small Office	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.23	15	$0.17	100%	24

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.56	15	$0.89	5%	66
Small Office	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.43	15	$1	5%	8
Small Office	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Office	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	925	15	$540	33%	1,830
Small Office	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	836	15	$540	81%	315
Small Office	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	4.60	13	$0.38	51%	529
Small Office	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.09	20	$2	15%	107
Small Office	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Small Office	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Small Office	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Small Office	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	55	15	$150	10%	0
Small Office	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	55	15	$150	10%	0
Small Office	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.22	7	$0.30	90%	2,445
Small Office	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,293	15	$138	80%	422
Small Office	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	243	3	$48	48%	30
Small Office	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	243	3	$48	48%	30
Small Office	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.39	15	$1	10%	319
Small Office	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	9%	0
Small Office	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	11%	0
Small Office	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	2%	0
Small Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	70%	30
Small Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	78%	3
Small Office	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	68%	0
Small Office	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	95	9	$107	68%	0
Small Office	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	54	9	$107	68%	0
Small Office	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	189
Small Office	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	14

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	3.34	9	$1	66%	7,712
Small Office	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.91	13	$1	0%	0
Small Office	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.37	9	$0.83	66%	1,659
Small Office	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	0.78	13	$0.83	0%	0
Small Office	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	38%	446
Small Office	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	221
Small Office	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	14
Small Office	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.44	11	$2	78%	0
Small Office	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.44	11	$2	78%	0
Small Office	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Small Office	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	1,776	2	$13	68%	988
Small Office	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,642	9	$205	42%	2,174
Small Office	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	2,853	13	$7,049	90%	0
Small Office	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	5,707	13	$5,796	76%	13,523
Small Office	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	623	20	$1,157	38%	266
Small Office	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	2,140	12	$643	73%	4,904
Small Office	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	2,887	15	$48	68%	109
Small Office	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	4,812	15	$595	71%	691
Small Office	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	200	4	$17	81%	506
Small Office	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Small Office	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Small Office	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	941	14	$225	3%	45
Small Office	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	537	14	$225	3%	2
Small Office	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	82	14	$225	69%	0
Small Office	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	47	14	$225	69%	0
Small Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Office	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	174	30	$448	50%	98
Small Office	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	174	30	$448	50%	7
Small Office	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Small Office	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Small Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Small Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	23
Small Office	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Small Office	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Office	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Office	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	74	25	$2,782	5%	0
Small Office	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	83	25	$2,782	0%	0
Small Office	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	15	10	$5	49%	23
Small Office	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	17	10	$5	49%	2
Small Office	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.01	100%	0
Small Office	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.01	100%	0
Small Office	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Office	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.06	6	$0.00	100%	924
Small Office	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.06	6	$0.00	100%	71
Small Office	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Office	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Office	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.09	100%	0
Small Office	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.09	100%	0
Small Office	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.04	13	$0.13	100%	0
Small Office	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.04	13	$0.13	100%	0
Small Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Small Office	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.02	100%	0
Small Office	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.02	100%	0
Small Office	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.04	9	$0.00	100%	517
Small Office	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.04	9	$0.00	100%	48
Small Office	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Small Office	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Small Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	4,670	5	$4,375	9%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	7,220	5	$2,377	9%	0
Small Office	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	7,005	5	$3,683	2%	0
Small Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	52
Small Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	4
Small Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	34
Small Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	2
Small Office	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.24	18	$0.23	38%	49
Small Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.82	30	$10	75%	0
Small Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	1.28	30	$10	75%	0
Small Office	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	6.04	13	$0.38	51%	456
Small Office	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.43	20	$2	15%	76
Small Office	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Small Office	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Small Office	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Small Office	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Small Office	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Office	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,401	15	$138	80%	299
Small Office	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.07	15	$1	10%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	9%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	11%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	2%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	70%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	78%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	68%	0
Small Office	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	149
Small Office	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	8
Small Office	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.03	10	$0.00	100%	370
Small Office	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.03	10	$0.00	100%	36
Small Office	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Office	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Office	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	49	10	$600	49%	0
Small Office	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	307	10	$600	4%	0
Small Office	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	307	10	$600	0%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	29%	0
Small Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	29%	0
Small Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	24%	0
Small Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	24%	0
Small Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	307	40	$833	60%	75
Small Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	307	40	$666	83%	15
Small Office	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	48	10	$4	67%	77
Small Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	19	10	$196	81%	0
Small Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	19	10	$196	81%	0
Small Office	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	1.92	13	$2	56%	10
Small Office	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	61	7	$62	5%	0
Small Office	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	209	4	$102	35%	26
Small Office	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.14	13	$0.15	75%	487
Small Office	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.14	13	$0.15	75%	52
Small Office	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	8
Small Office	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	1
Small Office	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.02	0%	0
Small Office	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.02	0%	0
Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.05	4	$0.00	100%	426
Small Retail	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.05	4	$0.00	100%	29
Small Retail	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Retail	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Retail	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	588	15	$4,920	15%	0
Small Retail	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.20	7	$1	90%	0
Small Retail	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.25	15	$0.68	64%	321

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.16	15	$0.68	64%	0
Small Retail	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,608	5	$2,629	9%	0
Small Retail	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,013	5	$2,929	9%	0
Small Retail	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	2,413	5	$4,709	2%	0
Small Retail	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Small Retail	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Small Retail	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	11
Small Retail	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	1
Small Retail	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.07	18	$0.23	38%	164
Small Retail	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.25	30	$10	75%	0
Small Retail	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.16	30	$10	75%	0
Small Retail	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	1.01	13	$0.38	51%	275
Small Retail	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.36	20	$2	15%	104
Small Retail	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Small Retail	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Small Retail	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Small Retail	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	63	9	$88	7%	2
Small Retail	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	63	9	$88	7%	0
Small Retail	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.40	7	$0.30	90%	2,505
Small Retail	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.11	15	$0.08	100%	0
Small Retail	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.07	15	$0.08	100%	0
Small Retail	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.21	15	$0.14	100%	611
Small Retail	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.13	15	$0.14	100%	64
Small Retail	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	482	15	$138	89%	481

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	69	3	$48	48%	12
Small Retail	Cooling DX	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.76	15	$1	10%	532
Small Retail	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	9%	0
Small Retail	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	11%	0
Small Retail	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	2%	0
Small Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	70%	0
Small Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	78%	0
Small Retail	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	68%	0
Small Retail	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	101	9	$406	32%	0
Small Retail	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	101	9	$406	32%	0
Small Retail	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	129	9	$771	33%	0
Small Retail	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	129	9	$771	33%	0
Small Retail	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	70	9	$41	26%	23
Small Retail	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	70	9	$41	26%	2
Small Retail	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Small Retail	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Small Retail	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	50	13	$141	66%	0
Small Retail	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	21	5	$5	62%	7
Small Retail	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	61	13	$33	67%	53
Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	52
Small Retail	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	4
Small Retail	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Retail	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Retail	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Retail	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Retail	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Small Retail	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Small Retail	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Small Retail	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Small Retail	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	542	15	$200	53%	372
Small Retail	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	324	15	$200	77%	21
Small Retail	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	542	15	$200	4%	30
Small Retail	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	324	15	$200	6%	2

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	542	15	$200	47%	332
Small Retail	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	324	15	$200	69%	19
Small Retail	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	2
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	0
Small Retail	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Small Retail	HVAC Aux	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	0.13	15	$1	10%	0
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	1,414	15	$312	67%	1,225
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	844	15	$312	67%	47
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	1,414	15	$147	1%	11
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	844	15	$147	1%	0
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	1,414	15	$181	4%	79
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	844	15	$181	4%	3
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	1,414	15	$111	0%	4
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	844	15	$111	0%	0
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	1,414	15	$223	1%	25
Small Retail	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	844	15	$223	1%	1
Small Retail	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.91	7	$1	90%	0
Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.15	15	$0.68	64%	0
Small Retail	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.09	15	$0.68	64%	0
Small Retail	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	5,142	5	$5,259	9%	0
Small Retail	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	4,433	5	$5,259	9%	0
Small Retail	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	7,714	5	$9,419	2%	0
Small Retail	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	10

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	1
Small Retail	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	10
Small Retail	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	1
Small Retail	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.24	18	$0.23	38%	50
Small Retail	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.15	30	$10	75%	0
Small Retail	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.09	30	$10	75%	0
Small Retail	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.51	15	$22	5%	0
Small Retail	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.17	15	$14	5%	0
Small Retail	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.28	15	$0.20	100%	75
Small Retail	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.23	15	$0.20	100%	8
Small Retail	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	1.63	15	$1	5%	22
Small Retail	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	1.47	15	$1	5%	3
Small Retail	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	841	15	$540	33%	630
Small Retail	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	725	15	$540	81%	104
Small Retail	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	6.75	13	$0.38	51%	198
Small Retail	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.37	20	$2	15%	37
Small Retail	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Small Retail	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Small Retail	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Small Retail	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	63	15	$150	10%	0
Small Retail	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	63	15	$150	10%	0
Small Retail	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	1.30	7	$0.30	90%	842
Small Retail	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,542	15	$138	89%	161

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	221	3	$48	48%	4
Small Retail	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	221	3	$48	48%	4
Small Retail	Heat Pump	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	1.32	15	$1	10%	99
Small Retail	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	9%	0
Small Retail	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	11%	0
Small Retail	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	2%	0
Small Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	70%	0
Small Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	78%	0
Small Retail	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	68%	0
Small Retail	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	0
Small Retail	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	0
Small Retail	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	4.76	9	$1	52%	3,821
Small Retail	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	3.07	13	$1	0%	0
Small Retail	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	1.95	9	$0.83	52%	1,437
Small Retail	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.26	13	$0.83	0%	0
Small Retail	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	56%	458
Small Retail	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	153
Small Retail	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	10
Small Retail	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.51	11	$2	78%	0
Small Retail	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.51	11	$2	78%	0
Small Retail	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Small Retail	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	4,827	2	$32	68%	1,113
Small Retail	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	1,303	9	$205	30%	1,001
Small Retail	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	3,601	13	$7,356	90%	0
Small Retail	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	7,203	13	$6,103	76%	7,075
Small Retail	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	3,609	20	$2,646	38%	1,773
Small Retail	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	5,815	12	$1,514	73%	5,524
Small Retail	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	5,185	15	$213	68%	81
Small Retail	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	8,643	15	$1,372	71%	514
Small Retail	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	1,234	3	$91	81%	1,289
Small Retail	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Small Retail	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Small Retail	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	1,339	14	$225	12%	58

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	866	14	$225	12%	2
Small Retail	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	93	14	$225	53%	0
Small Retail	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	60	14	$225	53%	0
Small Retail	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	2%	0
Small Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Retail	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	174	30	$448	50%	0
Small Retail	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	174	30	$448	50%	0
Small Retail	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Small Retail	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Small Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Small Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Small Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	10
Small Retail	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	1
Small Retail	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Retail	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Retail	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	244	25	$2,782	5%	0
Small Retail	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	253	25	$2,782	0%	0
Small Retail	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	55	10	$5	34%	24
Small Retail	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	58	10	$5	34%	2
Small Retail	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.01	6	$0.02	100%	0
Small Retail	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.01	6	$0.02	100%	0
Small Retail	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Retail	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.01	6	$0.00	100%	113
Small Retail	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.01	6	$0.00	100%	9
Small Retail	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Retail	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Small Retail	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.02	13	$0.08	100%	0
Small Retail	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.02	13	$0.08	100%	0
Small Retail	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Retail	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.03	13	$0.11	100%	0
Small Retail	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.03	13	$0.11	100%	0
Small Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.05	100%	0
Small Retail	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.05	100%	0
Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.01	13	$0.01	100%	0
Small Retail	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.01	13	$0.01	100%	0
Small Retail	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Retail	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	41
Small Retail	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	4
Small Retail	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Small Retail	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Small Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	12,879	5	$2,377	9%	60
Small Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	12,000	5	$2,629	9%	2
Small Retail	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	19,319	5	$4,152	2%	6
Small Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	11
Small Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	1
Small Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	8
Small Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	0
Small Retail	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.61	18	$0.23	38%	80
Small Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	2.04	30	$10	75%	0
Small Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	1.90	30	$10	75%	0
Small Retail	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	18	13	$0.38	51%	268
Small Retail	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	10	20	$2	15%	44
Small Retail	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Small Retail	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Small Retail	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Small Retail	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Small Retail	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Retail	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	3,863	15	$138	89%	194
Small Retail	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Building SqFt	Existing	2.66	15	$1	10%	95
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	9%	0
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	11%	0
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	2%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	70%	0
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	78%	0
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	68%	0
Small Retail	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	96
Small Retail	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	5
Small Retail	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.04	10	$0.00	100%	239
Small Retail	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.04	10	$0.00	100%	23
Small Retail	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Retail	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	2,371	11	$789	5%	5
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	2,371	11	$789	5%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,707	11	$391	4%	4
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,707	11	$391	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,898	11	$565	4%	4
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,898	11	$565	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	1,478	11	$134	4%	3
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	1,478	11	$134	4%	0
Small Retail	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	58	10	$600	62%	0
Small Retail	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	365	10	$600	2%	0
Small Retail	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	365	10	$600	0%	0
Small Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	5%	0
Small Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	5%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Small Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	4%	0
Small Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	4%	0
Small Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	365	40	$833	60%	102
Small Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	365	40	$666	83%	7
Small Retail	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	57	10	$4	67%	38
Small Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	22	10	$196	81%	0
Small Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	22	10	$196	81%	0
Small Retail	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	2.28	13	$2	56%	5
Small Retail	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	73	7	$62	5%	1
Small Retail	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	248	4	$102	35%	13
Small Retail	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.15	13	$0.13	75%	222
Small Retail	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.15	13	$0.13	75%	25
Small Retail	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	4
Small Retail	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.01	13	$0.02	0%	0
Small Retail	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.01	13	$0.02	0%	0
Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	Existing	0.03	4	$0.00	100%	5,076
Warehouse	Computers	Computer - ENERGY STAR	ENERGY STAR Computer	Standard Computer	Per Building SqFt	New	0.03	4	$0.00	100%	358
Warehouse	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Warehouse	Computers	Computer - Standard	Standard Computer	Standard Computer	Per Building SqFt	New	0.00	4	$0.00	100%	0
Warehouse	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	Existing	88	5	$12	81%	2,913
Warehouse	Computers	Office Computer Network Energy Management	Office Computer Network Energy Management	No Network Management	Per Computer	New	88	5	$12	81%	199
Warehouse	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Warehouse	Cooling Chillers	Chiller - Below Code	Below Standard Chiller - 0.74 kW/ton	Below Standard Chiller - 0.74 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.01	20	$0.02	100%	0
Warehouse	Cooling Chillers	Chiller - High Efficiency	High Efficiency Chiller - 0.63 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.01	20	$0.02	100%	0
Warehouse	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.03	20	$0.09	100%	372

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Cooling Chillers	Chiller - Premium Efficiency	Premium Efficiency Chiller - 0.58 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.02	20	$0.09	100%	52
Warehouse	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Warehouse	Cooling Chillers	Chiller - Standard	Standard Chiller - 0.68 kW/ton	Standard Chiller - 0.68 kW/ton	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Cooling Chillers	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.02	7	$1	95%	0
Warehouse	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.02	15	$0.68	93%	0
Warehouse	Cooling Chillers	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.01	15	$0.68	93%	0
Warehouse	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	939	5	$3,122	33%	0
Warehouse	Cooling Chillers	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	704	5	$3,122	33%	0
Warehouse	Cooling Chillers	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,408	5	$5,067	6%	0
Warehouse	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	17	20	$477	76%	0
Warehouse	Cooling Chillers	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	17	20	$477	76%	0
Warehouse	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	7.87	20	$60	62%	15
Warehouse	Cooling Chillers	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	7.87	20	$60	62%	1
Warehouse	Cooling Chillers	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.00	18	$0.23	1%	0
Warehouse	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.02	30	$10	75%	0
Warehouse	Cooling Chillers	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.01	30	$10	75%	0
Warehouse	Cooling Chillers	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.24	13	$0.38	9%	17
Warehouse	Cooling Chillers	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.13	20	$2	0%	0
Warehouse	Cooling Chillers	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Warehouse	Cooling Chillers	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.03	25	$1	33%	0
Warehouse	Cooling Chillers	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.04	7	$0.30	76%	479
Warehouse	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.07	25	$3	53%	0
Warehouse	Cooling Chillers	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.07	25	$3	60%	0
Warehouse	Cooling Chillers	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.07	25	$27	10%	0
Warehouse	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.04	25	$2	12%	0
Warehouse	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.04	25	$2	14%	0
Warehouse	Cooling Chillers	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.23	25	$42	12%	0
Warehouse	Cooling DX	Advanced Control Technology	Advanced Control Technologies for Packaged Air-Conditioning Units (Retrofit)	Standard Controls	Per 5 Tons of Cooling	Existing	184	15	$4,920	15%	0
Warehouse	Cooling DX	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.03	7	$1	90%	0
Warehouse	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.04	15	$0.68	93%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Cooling DX	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.02	15	$0.68	93%	0
Warehouse	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,558	5	$2,929	33%	910
Warehouse	Cooling DX	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,024	5	$3,122	33%	0
Warehouse	Cooling DX	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	2,337	5	$5,067	6%	0
Warehouse	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	24	20	$477	76%	0
Warehouse	Cooling DX	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	24	20	$477	76%	0
Warehouse	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	11	20	$60	62%	105
Warehouse	Cooling DX	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	11	20	$60	62%	7
Warehouse	Cooling DX	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Warehouse	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	75%	0
Warehouse	Cooling DX	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.02	30	$10	75%	0
Warehouse	Cooling DX	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.40	13	$0.38	9%	143
Warehouse	Cooling DX	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.22	20	$2	15%	329
Warehouse	Cooling DX	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Warehouse	Cooling DX	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	13%	0
Warehouse	Cooling DX	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	33%	0
Warehouse	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	Existing	70	9	$88	7%	24
Warehouse	Cooling DX	Package Terminal - Air Conditioner	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Package Terminal AC	New	70	9	$88	7%	2
Warehouse	Cooling DX	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.30	90%	7,496
Warehouse	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	Cooling DX	Rooftop DX Unit - Below Standard	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Below Standard 9.5 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.01	15	$0.04	100%	0
Warehouse	Cooling DX	Rooftop DX Unit - CEE Tier 1	CEE Tier 1 11.5 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.01	15	$0.04	100%	0
Warehouse	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.03	15	$0.07	100%	1,912
Warehouse	Cooling DX	Rooftop DX Unit - CEE Tier 2	CEE Tier 2 12.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.02	15	$0.07	100%	143
Warehouse	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	Cooling DX	Rooftop DX Unit - Standard	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Federal Standard 11.0 EER, Air-Cooled = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	Cooling DX	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	233	15	$138	93%	1,506

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Cooling DX	Tune-up - Air Conditioner	Air Conditioner Maintenance (Tune-up)	Unmaintained Air Conditioner	Per Ton	Existing	21	3	$48	48%	0
Warehouse	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.10	25	$3	53%	0
Warehouse	Cooling DX	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.10	25	$3	60%	0
Warehouse	Cooling DX	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.10	25	$27	10%	0
Warehouse	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.06	25	$2	12%	0
Warehouse	Cooling DX	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.06	25	$2	14%	0
Warehouse	Cooling DX	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.32	25	$42	12%	0
Warehouse	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	111	9	$406	32%	88
Warehouse	Cooling DX	Window Air Conditioner	CEE TIER 1 = 11.3 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	111	9	$406	32%	8
Warehouse	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	142	9	$771	33%	0
Warehouse	Cooling DX	Window Air Conditioner	CEE TIER 2 = 11.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	142	9	$771	33%	0
Warehouse	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	Existing	77	9	$41	26%	102
Warehouse	Cooling DX	Window Air Conditioner	ENERGY STAR = 10.8 EER; 8,000-13,999 Btu	Federal Standard 9.8 EER; 8,000-13,999 Btu	Per Window AC	New	77	9	$41	26%	7
Warehouse	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Warehouse	Ext Lighting	Exterior Lighting - Standard	Standard Exterior Lighting	Standard Exterior Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Warehouse	Ext Lighting	Lighting - LED Lighting Package	Exterior LED Lighting Package	Standard Lighting	Per Lighting Package	Existing	461	13	$316	66%	461
Warehouse	Ext Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	198	5	-0.9446	62%	116
Warehouse	Ext Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	565	13	$66	67%	2,138
Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	448
Warehouse	Fax	Fax - ENERGY STAR	ENERGY STAR Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	37
Warehouse	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Warehouse	Fax	Fax - Standard	Standard Fax	Standard Fax	Per Building SqFt	New	0.00	6	$0.00	100%	0
Warehouse	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Warehouse	Flat Screen Monitors	Monitor - ENERGY STAR Flat Screen	ENERGY STAR Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Warehouse	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	Existing	0.00	4	$0.00	100%	0
Warehouse	Flat Screen Monitors	Monitor - Standard Flat Screen	Standard Flat Screen Monitor	Standard Flat Screen Monitor	Per Building SqFt	New	0.00	4	$0.00	100%	0
Warehouse	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - 2014 Federal Standard	2014 Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - Below Standard	Below Standard Freezer	Below Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - ENERGY STAR	ENERGY STAR Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Warehouse	Freezers	Freezer - Standard	Standard Freezer	Standard Freezer	Per Building SqFt	New	0.00	12	$0.00	100%	0
Warehouse	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	Existing	1,699	15	$200	54%	4,357
Warehouse	HVAC Aux	ECM Motor	Central Air Conditioner ECM Fan	Standard Motor	Per ECM	New	1,074	15	$200	79%	279
Warehouse	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	Existing	1,699	15	$200	4%	298
Warehouse	HVAC Aux	ECM Motor	Electric Furnace ECM Fan	Standard Motor	Per ECM	New	1,074	15	$200	5%	19
Warehouse	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	Existing	1,699	15	$200	56%	4,474

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	HVAC Aux	ECM Motor	Gas Furnace ECM Fan (CEE Air Handling Ratio < 0.02)	Standard Motor	Per ECM	New	1,074	15	$200	81%	286
Warehouse	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	HVAC Aux	HVAC Auxillary - Standard Equipment	Standard HVAC Auxillary	Standard HVAC Auxillary	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	75	15	$274	67%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	75	15	$274	67%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	2,066	15	$2,036	0%	2
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	518	15	$2,036	9%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	518	15	$678	9%	51
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	1,143	15	$678	1%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	5,959	15	$4,197	0%	1
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	2,066	15	$4,197	0%	0
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	Existing	1,143	15	$1,375	1%	6
Warehouse	HVAC Aux	Motor - Enhanced (Ultra-PE)	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	NEMA Qualifying Standard Motor	Per Motor	New	5,959	15	$1,375	0%	0
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	Existing	5,200	15	$1,151	67%	16,527
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 1-15 HP	Constant Speed Motor	Per Building	New	3,288	15	$1,151	67%	723
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	Existing	5,200	15	$540	1%	150
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 125-200 HP	Constant Speed Motor	Per Building	New	3,288	15	$540	1%	7
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	Existing	5,200	15	$667	4%	1,064
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 20-40 HP	Constant Speed Motor	Per Building	New	3,288	15	$667	4%	47
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	Existing	5,200	15	$410	0%	56
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 250-500 HP	Constant Speed Motor	Per Building	New	3,288	15	$410	0%	2
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	Existing	5,200	15	$821	1%	337
Warehouse	HVAC Aux	Variable Frequency Drive	Variable Speed Drive Control, 50-100 HP	Constant Speed Motor	Per Building	New	3,288	15	$821	1%	15
Warehouse	Heat Pump	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.32	7	$1	90%	0
Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	Existing	0.04	15	$0.68	93%	0
Warehouse	Heat Pump	Cool Roofs	ENERGY STAR Cool Roof - Reflect Material (Reflectivity = 0.55)	Standard Roof	Per Roof Area SqFt	New	0.02	15	$0.68	93%	0
Warehouse	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	9,720	5	$5,859	33%	0
Warehouse	Heat Pump	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	9,133	5	$5,859	33%	0
Warehouse	Heat Pump	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	14,580	5	$4,709	6%	223
Warehouse	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	296	20	$477	76%	221
Warehouse	Heat Pump	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	296	20	$477	76%	14
Warehouse	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	131	20	$60	62%	63

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Heat Pump	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	131	20	$60	62%	4
Warehouse	Heat Pump	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.07	18	$0.23	38%	0
Warehouse	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	75%	0
Warehouse	Heat Pump	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.02	30	$10	75%	0
Warehouse	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	Heat Pump	Heat Pump - Below Standard	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Below Standard Air Source Heat Pump 9.0 EER and 2.8 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.38	15	$11	5%	0
Warehouse	Heat Pump	Heat Pump - ENERGY STAR	ENERGY STAR Ground Source Heat Pump 16.2 EER and 3.6 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.34	15	$7	5%	0
Warehouse	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.08	15	$0.10	100%	287
Warehouse	Heat Pump	Heat Pump - High Efficiency	High Efficiency Air Source Heat Pump 11.1 EER and 3.3 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.07	15	$0.10	100%	38
Warehouse	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.57	15	$0.55	5%	184
Warehouse	Heat Pump	Heat Pump - Premium Efficiency	Premium Efficiency Water Source Heat Pump 12.0 EER and 4.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.55	15	$0.63	5%	23
Warehouse	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	Heat Pump	Heat Pump - Standard	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Federal Standard Air Source Heat Pump 10.6 EER and 3.2 COP, = 135 and < 240 kBtuh	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	Existing	513	15	$540	33%	2,994
Warehouse	Heat Pump	Heat Pump - Variable Refrigerant Flow System	Variable Refrigerant Flow System (VRF) - Heat Pump	Packaged VAV With Electric Reheat	Per Ton	New	482	15	$540	81%	530
Warehouse	Heat Pump	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	5.37	13	$0.38	9%	231
Warehouse	Heat Pump	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	1.40	20	$2	15%	129
Warehouse	Heat Pump	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.29	25	$1	29%	0
Warehouse	Heat Pump	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.19	25	$1	13%	0
Warehouse	Heat Pump	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.58	25	$1	33%	0
Warehouse	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	Existing	70	15	$150	10%	0
Warehouse	Heat Pump	Package Terminal - Heat Pump	High Efficiency Package Terminal Air Conditioner	Federal Standard Equipment	Per Ton	New	70	15	$150	10%	0
Warehouse	Heat Pump	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.42	7	$0.30	90%	2,939
Warehouse	Heat Pump	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	1,458	15	$138	93%	1,119
Warehouse	Heat Pump	Tune-up - Air Source Heat Pump	Air Source Heat Pump Maintenance (Tune-up)	Unmaintained Air Source Heat Pump	Per Ton	Existing	135	3	$48	48%	0
Warehouse	Heat Pump	Tune-up - Ground Source Heat Pump	Ground Source Heat Pump Maintenance (Tune-up)	Unmaintained Ground Source Heat Pump	Per Ton	Existing	135	3	$48	48%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	1.22	25	$3	53%	0
Warehouse	Heat Pump	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	1.22	25	$3	60%	0
Warehouse	Heat Pump	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	1.27	25	$27	10%	0
Warehouse	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.78	25	$2	12%	0
Warehouse	Heat Pump	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.78	25	$2	14%	0
Warehouse	Heat Pump	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	3.89	25	$42	12%	0
Warehouse	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	Existing	60	9	$107	68%	0
Warehouse	Lighting	Bi-Level Control, Stairwell Lighting	Bi-Level Stairwell Occupancy Sensor Control, 50% Lighting Power During Unoccupied Time	Continuous Full Power Lighting in Stairways	Per Stairwell Lighting Control	New	40	9	$107	68%	0
Warehouse	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	98	10	$119	85%	590
Warehouse	Lighting	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	98	10	$119	85%	45
Warehouse	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	2.12	9	$1	34%	35,475
Warehouse	Lighting	Daylighting Controls	Continuous Dimming, Fluorescent Fixtures (Day-Lighting)	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	1.42	13	$1	0%	0
Warehouse	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	Existing	0.87	9	$0.83	34%	8,981
Warehouse	Lighting	Daylighting Controls	Dual Level Switches, Fluorescent Fixtures	No Dimming Controls	Per Applicable SQFT of Dimmable Perimeter Area of Building	New	0.58	13	$0.83	0%	0
Warehouse	Lighting	Exit Sign - LED	LED Exit Signs	CFL Exit Sign	Per Exit Sign	Existing	175	11	$68	60%	6,783
Warehouse	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	Existing	35	13	$30	93%	2,109
Warehouse	Lighting	Exit Sign - Photoluminescent	Photoluminescent Exit Sign	LED Exit Sign	Per Exit Sign	New	35	13	$30	93%	146
Warehouse	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	Existing	0.56	11	$2	78%	0
Warehouse	Lighting	LED Strip Lighting	LED Strip Lighting (Non-Refrigerated)	Fluorescent	Per Linear Foot of Lighting	New	0.56	11	$2	78%	0
Warehouse	Lighting	LightLouver Daylighting System	LightLouver Daylighting System	No Daylight System	Per Linear Feet of Window	Existing	49	9	$65	40%	0
Warehouse	Lighting	Lighting - CFL Lamp Package	ENERGY STAR CFL	EISA Incandescent	Per Building	Existing	11,367	2	$69	68%	11,543
Warehouse	Lighting	Lighting - Clock/Timer	Lighting Clock/Timer Commercial grade	No Time Clock	Per Lighting Control	Existing	976	9	$205	42%	16,516
Warehouse	Lighting	Lighting - Fluorescent High Performance Package	Fluorescent HP Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	6,134	13	$10,680	90%	4,088
Warehouse	Lighting	Lighting - Fluorescent Reduced Wattage Package	Fluorescent RW Lamps and Ballasts Packages	Standard Lighting	Per Lighting Package	Existing	12,269	13	$8,974	76%	53,060
Warehouse	Lighting	Lighting - High Bay Fluorescent High Output Package	High Bay Fluorescent HO Packages	Standard HID Lighting	Per Lighting Package	Existing	26,397	15	$3,512	73%	40,436
Warehouse	Lighting	Lighting - High Bay LED Package	High Bay LED Package	Standard HID Lighting	Per Lighting Package	Existing	17,343	20	$66,033	94%	0
Warehouse	Lighting	Lighting - High Intensity Discharge Package	High Efficiency Metal Halide Lighting Packages	Standard HID Lighting	Per Lighting Package	Existing	10,709	15	$3,473	67%	0
Warehouse	Lighting	Lighting - Induction Lighting Package	Induction Lighting Package	Standard HID Lighting	Per Lighting Package	Existing	29,591	20	$4,871	62%	103,979
Warehouse	Lighting	Lighting - LED Lamp Package	ENERGY STAR LED	EISA Incandescent	Per Lighting Package	Existing	13,694	11	$3,242	73%	57,269
Warehouse	Lighting	Lighting - LPD Package	LPD Reduction Package 15%	LPD Code	Per Lighting Package	New	14,105	15	$102	68%	1,041
Warehouse	Lighting	Lighting - LPD Package	LPD Reduction Package 25%	LPD Code	Per Lighting Package	New	23,508	15	$2,298	71%	6,596

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Lighting	Lighting - Specialty Lamp Package	CFL and LED Specialty Lamp Package	Standard Incandescent	Per Lighting Package	Existing	208	3	$13	81%	960
Warehouse	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	Existing	0.00	14	$0.00	100%	0
Warehouse	Lighting	Lighting - Standard	Standard Lighting	Standard Lighting	Per Building SqFt	New	0.00	14	$0.00	100%	0
Warehouse	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	Existing	598	14	$225	31%	36,604
Warehouse	Lighting	Occupancy Sensor - High-Bay	Fixture-Mounted (Control > 150 Watts)	No Sensor	Per Lighting Control	New	401	14	$225	31%	1,698
Warehouse	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	Existing	27	14	$225	43%	0
Warehouse	Lighting	Occupancy Sensor - Wall or Ceiling	Wall or Ceiling-Mounted (Control > 400 Watts)	No Sensor	Per Lighting Control	New	18	14	$225	43%	0
Warehouse	Other	Compressed Air Optimization	Compressed Air - Leak Audit, New Compressors, Improved Controls	No Leak Audit And No New Compressor And No New Controls	Per Compressor HP	Existing	281	10	$50	2%	0
Warehouse	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Warehouse	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	Existing	399	30	$851	50%	0
Warehouse	Other	Transformers	Transformers, Three-Phase Low-Voltage Dry-Type CEE Tier 1	Standard Efficiency Transformer NEMA TP-1-2002	Per Transformer	New	399	30	$851	50%	0
Warehouse	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	Existing	200	6	$218	68%	0
Warehouse	Other Plug Load	All-In-One Office Equipment	All-In-One ENERGY STAR Office Equipment	Non-ENERGY STAR Features	Per All-in-One Device	New	200	6	$218	68%	0
Warehouse	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$119	85%	0
Warehouse	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans with Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$119	85%	0
Warehouse	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	Existing	4.33	10	$1	85%	42
Warehouse	Other Plug Load	Ceiling Fans	ENERGY STAR Ceiling Fans without Light Kit	Standard Ceiling Fan	Per Ceiling Fan	New	4.33	10	$1	85%	3
Warehouse	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Other Plug Load	Plug Load - Standard Equipment	Standard Plug Load	Standard Plug Load	Per Building SqFt	New	0.00	10	$0.00	100%	0
Warehouse	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	Existing	79	25	$2,782	5%	0
Warehouse	Other Plug Load	Snow Melt System Control	Snow Melt System Control	Manual Control	Per Snow Melt Control	New	84	25	$2,782	0%	0
Warehouse	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	Existing	42	10	$5	56%	137
Warehouse	Other Plug Load	Water Coolers	ENERGY STAR Water Cooler	Non-ENERGY STAR Water Cooler	Per Water Cooler	New	45	10	$5	56%	10
Warehouse	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Warehouse	Photo Copiers	Photo Copier - ENERGY STAR	ENERGY STAR Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Warehouse	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Warehouse	Photo Copiers	Photo Copiers - Standard	Standard Photo Copier	Standard Photo Copier	Per Building SqFt	New	0.00	6	$0.00	100%	0
Warehouse	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	1,369
Warehouse	Printers	Printers - ENERGY STAR	ENERGY STAR Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	113
Warehouse	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Warehouse	Printers	Printers - Standard	Standard Printers	Standard Printers	Per Building SqFt	New	0.00	6	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.01	100%	0

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Refrigerators	Refrigerator - 2014 Federal Standard	2014 Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.01	100%	0
Warehouse	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - Below Standard	Below Standard Refrigerator	Below Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.02	100%	0
Warehouse	Refrigerators	Refrigerator - CEE Tier 1	CEE Tier 1 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.02	100%	0
Warehouse	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - CEE Tier 2	CEE Tier 2 Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - ENERGY STAR	ENERGY STAR Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Refrigerators	Refrigerator - Federal Standard	Standard Refrigerator	Standard Refrigerator	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	567
Warehouse	Servers	Server - ENERGY STAR	ENERGY STAR Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	57
Warehouse	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	Existing	0.00	9	$0.00	100%	0
Warehouse	Servers	Server - Standard	Standard Server	Standard Server	Per Building SqFt	New	0.00	9	$0.00	100%	0
Warehouse	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	27,633	5	$2,629	33%	1,915
Warehouse	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	28,269	5	$2,929	33%	140
Warehouse	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	41,449	5	$4,709	6%	518
Warehouse	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	488	20	$477	76%	209
Warehouse	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	488	20	$477	76%	17
Warehouse	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	217	20	$60	62%	54
Warehouse	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	217	20	$60	62%	3
Warehouse	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.22	18	$0.23	38%	386
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.74	30	$10	75%	0
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.76	30	$10	75%	0
Warehouse	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	16	13	$0.38	9%	375
Warehouse	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	4.00	20	$2	15%	348
Warehouse	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.47	25	$1	29%	0
Warehouse	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.31	25	$1	13%	0
Warehouse	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.97	25	$1	33%	0
Warehouse	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Space Heat - Standard	Standard Space Heat	Standard Space Heat	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	4,144	15	$138	93%	1,652

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	2.01	25	$3	53%	0
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	2.01	25	$3	60%	0
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	2.09	25	$27	10%	0
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	1.28	25	$2	12%	0
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	1.28	25	$2	14%	0
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	6.42	25	$42	12%	0
Warehouse	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	Existing	1,394	3	$238	25%	874
Warehouse	Vending Machines	Vending Machine - Controller	Refrigerated Vending Machine Controller	No Controls	Per Vending Machine	New	1,394	3	$238	25%	52
Warehouse	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.01	10	$0.00	100%	2,175
Warehouse	Vending Machines	Vending Machine - ENERGY STAR	ENERGY STAR Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.01	10	$0.00	100%	226
Warehouse	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Vending Machines	Vending Machine - Standard	Standard Vending Machine	Standard Vending Machine	Per Building SqFt	New	0.00	10	$0.00	100%	0
Warehouse	Water Heat	Desuperheaters - Air Conditioner	Add-on Desuperheaters to Air Conditioner	No Desuperheater	Per Desuperheater	Existing	151	10	$600	63%	0
Warehouse	Water Heat	Desuperheaters - Air Source Heat Pump	Add-on Desuperheaters to Air Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	948	10	$600	2%	31
Warehouse	Water Heat	Desuperheaters - Ground Source Heat Pump	Add-on Desuperheaters to Ground Source Heat Pump	No Desuperheater	Per Desuperheater	Existing	948	10	$600	0%	1
Warehouse	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	155	11	$1,067	10%	0
Warehouse	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	155	11	$1,067	10%	0
Warehouse	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	60	11	$272	8%	0
Warehouse	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	60	11	$272	8%	0
Warehouse	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	948	40	$833	60%	1,423
Warehouse	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	948	40	$666	83%	107
Warehouse	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	49	10	$4	67%	346
Warehouse	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	29	10	$196	90%	0
Warehouse	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	29	10	$196	90%	0
Warehouse	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	5.92	13	$2	56%	67
Warehouse	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	189	7	$62	5%	21
Warehouse	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	644	4	$102	35%	499

Table A.3.3. Commercial Electric Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (kWh)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (MWh)
Warehouse	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.06	13	$0.02	75%	2,990
Warehouse	Water Heat	Water Heating - ENERGY STAR	ENERGY STAR Heat Pump Water Heater EF = 2.0	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.06	13	$0.02	75%	372
Warehouse	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	49
Warehouse	Water Heat	Water Heating - Storage 2015 Standard	2015 Standard Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	6
Warehouse	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heating - Storage Below Standard	Below Standard Water Heater EF = 0.86	Below Standard Water Heater EF = 0.86	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heating - Storage Standard	Standard Water Heater EF = 0.92	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	Existing	0.00	13	$0.00	0%	0
Warehouse	Water Heat	Water Heating - Tankless	Tankless Water Heater EF = 0.95	Standard Water Heater EF = 0.92	Per Building SqFt	New	0.00	13	$0.00	0%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Convenience	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	9%	0
Convenience	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	9%	0
Convenience	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	152	12	$400	75%	0
Convenience	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	152	12	$400	75%	0
Convenience	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	69	10	$2,696	4%	0
Convenience	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	71	10	$2,696	4%	0
Convenience	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Convenience	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Convenience	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	252	12	$1,057	25%	0
Convenience	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	252	12	$1,057	25%	0
Convenience	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	74	12	$1,165	19%	0
Convenience	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	74	12	$1,165	19%	0
Convenience	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	533	12	$2,075	11%	0
Convenience	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	533	12	$2,075	11%	0
Convenience	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Convenience	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Convenience	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Convenience	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Convenience	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Convenience	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	1
Convenience	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Convenience	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Convenience	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	88	10	$5,450	64%	0
Convenience	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	71	10	$5,450	64%	0
Convenience	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.16	100%	0
Convenience	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.16	100%	0
Convenience	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.25	100%	0
Convenience	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.25	100%	0
Convenience	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.09	20	$0.35	100%	0
Convenience	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.35	100%	0
Convenience	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.10	20	$0.45	100%	7
Convenience	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.08	20	$0.45	100%	0
Convenience	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Convenience	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Convenience	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Convenience	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Convenience	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.05	30	$10	74%	0
Convenience	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Convenience	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.51	13	$0.38	51%	11
Convenience	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	2,000	13	$502	3%	0
Convenience	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	2,000	13	$502	3%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Convenience	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.28	20	$2	15%	0
Convenience	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Convenience	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Convenience	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Convenience	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Convenience	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Convenience	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.08	7	$0.29	90%	43
Convenience	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	58	15	$138	76%	0
Convenience	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.48	3	$0.75	48%	0
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	47%	0
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	52%	0
Convenience	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	9%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	20%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	23%	0
Convenience	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	20%	0
Convenience	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	5%	0
Convenience	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	5%	0
Convenience	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	4%	0
Convenience	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	4%	0
Convenience	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	142	14	$442	0%	0
Convenience	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	142	14	$442	0%	0
Convenience	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	97	14	$307	0%	0
Convenience	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	97	14	$307	0%	0
Convenience	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	111	40	$833	60%	9

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Convenience	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	111	40	$666	83%	0
Convenience	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	17	10	$4	63%	0
Convenience	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	8%	0
Convenience	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	8%	0
Convenience	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	5%	0
Convenience	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	6.97	10	$196	90%	0
Convenience	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	6.95	10	$196	90%	0
Convenience	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.03	100%	0
Convenience	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.03	100%	0
Convenience	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Convenience	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Convenience	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Convenience	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.29	100%	0
Convenience	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.29	100%	0
Convenience	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	0.69	13	$2	52%	0
Convenience	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Convenience	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	22	7	$62	5%	0
Convenience	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.12	100%	10
Convenience	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.12	100%	0
Convenience	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	75	4	$102	35%	1
Education	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	14%	0
Education	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	14%	0
Education	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	152	12	$400	35%	22
Education	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	152	12	$400	35%	0
Education	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	738	10	$2,696	4%	9
Education	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	760	10	$2,696	4%	0
Education	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Education	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Education	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	252	12	$1,057	25%	0
Education	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	252	12	$1,057	25%	0
Education	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	74	12	$1,165	49%	0
Education	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	74	12	$1,165	49%	0
Education	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	533	12	$2,075	26%	41
Education	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	533	12	$2,075	26%	1
Education	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.07	10%	0
Education	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.07	10%	0
Education	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.07	100%	0
Education	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.07	100%	0
Education	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Education	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.08	100%	0
Education	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.01	20	$0.08	100%	0
Education	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.22	100%	0
Education	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.22	100%	0
Education	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.45	100%	0
Education	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.45	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Education	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.07	20	$0.63	100%	0
Education	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.07	20	$0.63	100%	0
Education	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.08	20	$0.72	100%	1,607
Education	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.07	20	$0.72	100%	71
Education	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	31	20	$86	75%	0
Education	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Education	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.09	20	$4	49%	0
Education	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.09	20	$4	49%	0
Education	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.37	20	$15	15%	0
Education	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	6.56	20	$15	55%	0
Education	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	974	10	$2,060	64%	88
Education	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	935	10	$2,060	77%	35
Education	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.06	7	$1	90%	0
Education	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.06	7	$1	90%	0
Education	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	74	15	$450	60%	4,550
Education	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	79	15	$450	60%	773
Education	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,279	5	$8,259	75%	0
Education	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,227	5	$8,259	75%	0
Education	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,279	5	$14,606	43%	0
Education	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Education	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Education	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	32
Education	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Education	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	877	10	$5,450	64%	0
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	936	10	$5,450	64%	0
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	841	10	$5,450	64%	2
Education	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	876	10	$5,450	64%	2
Education	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.11	100%	0
Education	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.06	20	$0.11	100%	0
Education	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.18	100%	0
Education	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.18	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Education	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.09	20	$0.24	100%	0
Education	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.08	20	$0.24	100%	0
Education	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.10	20	$0.32	100%	101
Education	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.09	20	$0.32	100%	5
Education	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Education	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Education	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.05	30	$10	74%	0
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Education	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Education	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.37	13	$0.38	9%	0
Education	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.40	13	$0.38	9%	8
Education	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	660	13	$502	3%	0
Education	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	660	13	$502	3%	0
Education	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.28	20	$2	15%	0
Education	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Education	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Education	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Education	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	232	15	$885	0%	0
Education	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	223	15	$857	0%	0
Education	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Education	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Education	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	4,306
Education	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.08	7	$0.29	90%	731
Education	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	146	15	$138	35%	0
Education	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	156	15	$138	35%	0
Education	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	0.64	3	$0.75	48%	26
Education	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.68	3	$0.75	48%	4
Education	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.06	15	$3	62%	0
Education	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	103	12	$318	21%	0
Education	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	53%	0
Education	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	59%	0
Education	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	10%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	12%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	14%	0
Education	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	12%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Education	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	104	10	$5,944	10%	0
Education	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	104	10	$5,944	10%	0
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	86	11	$789	33%	0
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	86	11	$789	33%	0
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	62	11	$391	31%	36
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	62	11	$391	31%	1
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	69	11	$565	29%	26
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	69	11	$565	29%	1
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	53	11	$134	28%	29
Education	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	53	11	$134	28%	0
Education	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	62%	0
Education	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	62%	0
Education	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	52%	0
Education	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	52%	0
Education	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	103	14	$442	28%	31
Education	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	103	14	$442	28%	0
Education	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	70	14	$307	33%	23
Education	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	70	14	$307	33%	0
Education	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	96	40	$833	60%	550
Education	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	95	40	$666	83%	11

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Education	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	9	10	$4	63%	0
Education	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	840	15	$3,200	0%	0
Education	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	840	15	$3,228	0%	0
Education	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	27	10	$8	38%	0
Education	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	26	10	$8	38%	0
Education	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	60	10	$31	15%	0
Education	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	38%	0
Education	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	38%	0
Education	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	25%	0
Education	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	2.70	10	$196	71%	0
Education	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	2.69	10	$196	71%	0
Education	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Education	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Education	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Education	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.03	100%	0
Education	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.03	100%	0
Education	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	1.54	13	$2	52%	0
Education	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Education	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	19	7	$62	5%	0
Education	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.01	100%	613
Education	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.01	100%	17
Education	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	65	4	$102	15%	29
Grocery	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	27%	4
Grocery	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	27%	0
Grocery	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	305	12	$400	75%	0
Grocery	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	305	12	$400	75%	0
Grocery	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	4,750	10	$2,696	4%	3
Grocery	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	4,886	10	$2,696	4%	0
Grocery	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Grocery	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Grocery	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	504	12	$1,057	25%	2
Grocery	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	504	12	$1,057	25%	0
Grocery	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	148	12	$1,165	34%	0
Grocery	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	148	12	$1,165	34%	0
Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,066	12	$2,075	19%	3
Grocery	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,066	12	$2,075	19%	0
Grocery	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Grocery	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.10	100%	0
Grocery	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.01	20	$0.10	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Grocery	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.03	20	$0.27	100%	0
Grocery	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.27	100%	0
Grocery	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.55	100%	0
Grocery	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.04	20	$0.55	100%	0
Grocery	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.07	20	$0.77	100%	0
Grocery	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.06	20	$0.77	100%	0
Grocery	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.08	20	$0.89	100%	0
Grocery	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.07	20	$0.89	100%	0
Grocery	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Grocery	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	29	20	$86	41%	0
Grocery	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Grocery	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Grocery	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.08	20	$4	49%	0
Grocery	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.07	20	$4	49%	0
Grocery	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.33	20	$15	15%	0
Grocery	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	4.43	20	$15	55%	0
Grocery	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	658	10	$2,060	64%	0
Grocery	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	544	10	$2,060	77%	0
Grocery	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Grocery	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Grocery	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	864	5	$5,556	34%	0
Grocery	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	714	5	$5,556	34%	0
Grocery	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	864	5	$9,587	55%	0
Grocery	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Grocery	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Grocery	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	11
Grocery	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Grocery	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	16
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	590	10	$5,450	64%	0
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	592	10	$5,450	64%	0
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	479	10	$5,450	64%	0
Grocery	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	489	10	$5,450	64%	0
Grocery	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.14	100%	0
Grocery	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.14	100%	0
Grocery	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.22	100%	0
Grocery	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.22	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Grocery	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.09	20	$0.30	100%	0
Grocery	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.30	100%	0
Grocery	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.10	20	$0.39	100%	169
Grocery	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.08	20	$0.39	100%	7
Grocery	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Grocery	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Grocery	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Grocery	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.05	30	$10	74%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.05	30	$10	74%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Grocery	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Grocery	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.66	13	$0.38	9%	45
Grocery	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.66	13	$0.38	9%	0
Grocery	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	2,000	13	$502	3%	40
Grocery	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	2,000	13	$502	3%	1
Grocery	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.28	20	$2	15%	44
Grocery	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Grocery	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Grocery	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Grocery	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	205	15	$790	0%	0
Grocery	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	169	15	$675	0%	0
Grocery	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Grocery	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Grocery	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.08	7	$0.29	90%	1,034
Grocery	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.08	7	$0.29	90%	0
Grocery	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	196	15	$138	76%	17
Grocery	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	197	15	$138	76%	0
Grocery	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	0.57	3	$0.75	48%	0
Grocery	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.56	3	$0.75	48%	8
Grocery	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	91	12	$318	21%	0
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	31%	0
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	35%	0
Grocery	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	6%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	41%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	46%	0
Grocery	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	40%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Grocery	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	43%	0
Grocery	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	43%	0
Grocery	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	36%	0
Grocery	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	36%	0
Grocery	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	142	14	$442	12%	4
Grocery	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	142	14	$442	12%	0
Grocery	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	97	14	$307	14%	4
Grocery	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	97	14	$307	14%	0
Grocery	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	149	40	$833	60%	134
Grocery	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	148	40	$666	83%	3
Grocery	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	19	10	$4	63%	0
Grocery	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	856	15	$3,295	0%	0
Grocery	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	856	15	$3,410	0%	0
Grocery	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	51%	0
Grocery	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	51%	0
Grocery	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	33%	0
Grocery	Water Heat	Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End Use	No Heat Recovery	Per sqft	Existing	0.04	16	$0.91	50%	0
Grocery	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	7.77	10	$196	90%	0
Grocery	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	7.75	10	$196	90%	0
Grocery	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Grocery	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.05	100%	0
Grocery	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.05	100%	0
Grocery	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	2.59	13	$2	52%	0
Grocery	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Grocery	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Grocery	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	29	7	$62	5%	0
Grocery	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.02	100%	148
Grocery	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.02	100%	5
Grocery	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	101	4	$102	50%	23
Health	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	14%	0
Health	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	14%	0
Health	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	305	12	$400	50%	0
Health	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	305	12	$400	50%	0
Health	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	1,632	10	$2,696	4%	0
Health	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	1,682	10	$2,696	4%	0
Health	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Health	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Health	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	504	12	$1,057	25%	0
Health	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	504	12	$1,057	25%	0
Health	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	148	12	$1,165	34%	0
Health	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	148	12	$1,165	34%	0
Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,066	12	$2,075	19%	0
Health	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,066	12	$2,075	19%	0
Health	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.93	10%	0
Health	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.93	10%	0
Health	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.93	100%	0
Health	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.93	100%	0
Health	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Health	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Health	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.04	100%	0
Health	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.04	100%	0
Health	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.13	100%	0
Health	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.13	100%	0
Health	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.27	100%	0
Health	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.04	20	$0.27	100%	0
Health	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.06	20	$0.38	100%	0
Health	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.38	100%	0
Health	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.07	20	$0.42	100%	372
Health	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.06	20	$0.42	100%	10
Health	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Health	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	15	20	$86	61%	0
Health	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Health	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.15	20	$4	49%	0
Health	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.12	20	$4	49%	0
Health	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.60	20	$15	15%	0
Health	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	5.76	20	$15	55%	105
Health	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	1,713	10	$2,060	64%	400
Health	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	1,432	10	$2,060	77%	5
Health	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Health	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Health	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,124	5	$13,562	42%	0
Health	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	939	5	$13,562	42%	0
Health	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,124	5	$24,455	55%	0
Health	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Health	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Health	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	9
Health	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Health	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	5
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	770	10	$5,450	64%	0
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	844	10	$5,450	64%	105
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	644	10	$5,450	64%	0
Health	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	695	10	$5,450	64%	0
Health	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.06	100%	0
Health	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.06	100%	0
Health	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.10	100%	0
Health	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.10	100%	0
Health	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.14	100%	0
Health	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.14	100%	0
Health	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.09	20	$0.18	100%	150
Health	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.08	20	$0.18	100%	4
Health	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Health	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Health	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.05	30	$10	74%	0
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Health	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Health	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.44	13	$0.38	9%	0
Health	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.48	13	$0.38	9%	41
Health	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,400	13	$502	3%	1
Health	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,400	13	$502	3%	0
Health	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.27	20	$2	15%	15
Health	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Health	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Health	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Health	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	370	15	$313	0%	0
Health	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	309	15	$265	0%	0
Health	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Health	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Health	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	833
Health	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.08	7	$0.29	90%	930
Health	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	128	15	$138	76%	0
Health	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	140	15	$138	76%	5
Health	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	1.02	3	$0.75	48%	7
Health	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	1.12	3	$0.75	48%	7
Health	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.06	15	$3	65%	0
Health	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	164	12	$318	21%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	53%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	59%	0
Health	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	10%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	12%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	14%	0
Health	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	12%	0
Health	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	224	10	$5,944	14%	0
Health	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	224	10	$5,944	14%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	86	11	$789	33%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	86	11	$789	33%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	62	11	$391	31%	15
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	62	11	$391	31%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	69	11	$565	29%	10
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	69	11	$565	29%	0
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	53	11	$134	28%	10

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Health	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	53	11	$134	28%	0
Health	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	81%	0
Health	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	81%	0
Health	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	68%	0
Health	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	68%	0
Health	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	239	14	$442	8%	7
Health	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	239	14	$442	8%	0
Health	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	163	14	$307	9%	6
Health	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	163	14	$307	9%	0
Health	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	309	40	$833	60%	485
Health	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	308	40	$666	83%	8
Health	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	11	10	$4	63%	0
Health	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	4,455	15	$3,772	0%	0
Health	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	4,455	15	$3,820	0%	0
Health	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	16	10	$8	21%	0
Health	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	16	10	$8	21%	0
Health	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	36	10	$31	9%	55
Health	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	13%	0
Health	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	13%	0
Health	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	8%	0
Health	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	3.31	10	$196	86%	0
Health	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	3.30	10	$196	86%	0
Health	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.00	100%	0
Health	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.00	100%	0
Health	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Health	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Health	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Health	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Health	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.07	13	$0.07	100%	0
Health	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.07	13	$0.07	100%	0
Health	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	4.64	13	$2	52%	0
Health	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Health	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	61	7	$62	5%	0
Health	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.07	13	$0.02	100%	542
Health	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.07	13	$0.02	100%	13
Health	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	210	4	$102	75%	36
Large Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Office	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.03	100%	0
Large Office	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.03	100%	0
Large Office	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.08	100%	0
Large Office	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.08	100%	0
Large Office	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.04	20	$0.18	100%	0
Large Office	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.03	20	$0.18	100%	0
Large Office	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.25	100%	0
Large Office	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.25	100%	0
Large Office	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.06	20	$0.29	100%	568
Large Office	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.29	100%	20
Large Office	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	45	20	$86	74%	0
Large Office	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Office	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.18	20	$4	49%	0
Large Office	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.15	20	$4	49%	0
Large Office	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.71	20	$15	15%	0
Large Office	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	16	20	$15	55%	0
Large Office	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	2,480	10	$2,060	64%	187
Large Office	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	2,175	10	$2,060	77%	9
Large Office	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Large Office	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Large Office	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	58	15	$450	43%	1,113
Large Office	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	62	15	$450	43%	1,453
Large Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	3,255	5	$24,507	51%	0
Large Office	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	2,854	5	$24,507	51%	0
Large Office	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	3,255	5	$44,782	51%	0
Large Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Large Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	9
Large Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Large Office	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Large Office	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.04	100%	0
Large Office	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.04	100%	0
Large Office	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.07	100%	0
Large Office	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.07	100%	0
Large Office	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.10	100%	0
Large Office	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.10	100%	0
Large Office	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.13	100%	275
Large Office	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.13	100%	11
Large Office	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Office	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Office	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Large Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Large Office	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.50	13	$0.38	9%	0
Large Office	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.54	13	$0.38	9%	83
Large Office	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,040	13	$502	3%	5
Large Office	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,040	13	$502	3%	0
Large Office	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.22	20	$2	15%	7
Large Office	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Large Office	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Large Office	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Large Office	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	438	15	$1,205	0%	0
Large Office	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	384	15	$1,096	0%	0
Large Office	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Office	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Office	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	1,445
Large Office	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	1,887
Large Office	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	148	15	$138	79%	0
Large Office	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	160	15	$138	79%	0
Large Office	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	1.21	3	$0.75	48%	13
Large Office	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	1.31	3	$0.75	48%	16
Large Office	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.05	15	$3	62%	0
Large Office	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	195	12	$318	21%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	62%	0
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	69%	0
Large Office	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	11%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	1%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	1%	0
Large Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	1%	0
Large Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	86%	0
Large Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	86%	0
Large Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	72%	0
Large Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	72%	0
Large Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	1,516	40	$833	60%	634
Large Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	1,513	40	$666	83%	11
Large Office	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	23	10	$4	63%	0
Large Office	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	1,048	15	$2,880	0%	0
Large Office	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	1,048	15	$2,989	0%	0
Large Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	9	10	$196	81%	0
Large Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	9	10	$196	81%	0
Large Office	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Office	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.03	100%	0
Large Office	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.03	100%	0
Large Office	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	18	13	$2	52%	0
Large Office	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Office	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	303	7	$62	5%	0
Large Office	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.01	100%	711
Large Office	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.01	100%	18
Large Office	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	1,031	4	$102	35%	78

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Large Retail	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.08	100%	0
Large Retail	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.08	100%	0
Large Retail	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.23	100%	0
Large Retail	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.01	20	$0.23	100%	7
Large Retail	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.04	20	$0.47	100%	0
Large Retail	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.00	20	$0.47	100%	0
Large Retail	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.66	100%	361
Large Retail	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.01	20	$0.66	100%	0
Large Retail	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.75	100%	127
Large Retail	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.75	100%	0
Large Retail	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	35	20	$86	75%	0
Large Retail	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.06	20	$4	49%	0
Large Retail	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.06	20	$4	49%	0
Large Retail	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.26	20	$15	15%	0
Large Retail	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	6.25	20	$15	55%	216
Large Retail	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	928	10	$2,060	64%	756
Large Retail	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	856	10	$2,060	77%	15
Large Retail	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Large Retail	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Large Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,219	5	$9,117	75%	0
Large Retail	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,123	5	$9,117	75%	0
Large Retail	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,219	5	$16,201	85%	0
Large Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Large Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Large Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	38
Large Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	1
Large Retail	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	57
Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	835	10	$5,450	64%	0
Large Retail	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	770	10	$5,450	64%	0
Large Retail	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.11	100%	0
Large Retail	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.11	100%	0
Large Retail	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.18	100%	0
Large Retail	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.18	100%	0
Large Retail	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.25	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Retail	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.25	100%	0
Large Retail	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.33	100%	617
Large Retail	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.33	100%	28
Large Retail	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Large Retail	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Large Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Large Retail	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.48	13	$0.38	9%	0
Large Retail	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.50	13	$0.38	9%	166
Large Retail	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,200	13	$502	3%	15
Large Retail	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,200	13	$502	3%	0
Large Retail	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.20	20	$2	15%	160
Large Retail	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Large Retail	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Large Retail	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Large Retail	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	164	15	$1,100	0%	0
Large Retail	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	152	15	$1,036	0%	0
Large Retail	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Large Retail	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Large Retail	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.05	7	$0.29	90%	1,601
Large Retail	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	3,772
Large Retail	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	278	15	$138	88%	0
Large Retail	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	293	15	$138	88%	74
Large Retail	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	0.45	3	$0.75	48%	9
Large Retail	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.48	3	$0.75	48%	28
Large Retail	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.04	15	$3	65%	0
Large Retail	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	73	12	$318	21%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	59%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	66%	0
Large Retail	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	11%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	4%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	5%	0
Large Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	4%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	14%	0
Large Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	14%	0
Large Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	12%	0
Large Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	12%	0
Large Retail	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	146	14	$442	1%	1
Large Retail	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	146	14	$442	1%	0
Large Retail	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	100	14	$307	1%	1
Large Retail	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	100	14	$307	1%	0
Large Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	793	40	$833	60%	1,227
Large Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	792	40	$666	83%	26
Large Retail	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	41	10	$4	63%	0
Large Retail	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	447	15	$2,985	0%	0
Large Retail	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	447	15	$3,049	0%	0
Large Retail	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	51%	0
Large Retail	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	51%	0
Large Retail	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	33%	0
Large Retail	Water Heat	Refrigeration with Heat Recovery	Heat Recovery from Refrigeration System. Applied to Water Heating Electric End Use	No Heat Recovery	Per sqft	Existing	0.04	16	$0.91	50%	0
Large Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	16	10	$196	81%	0
Large Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	16	10	$196	81%	0
Large Retail	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Large Retail	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.04	100%	0
Large Retail	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.04	100%	0
Large Retail	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	9	13	$2	52%	0
Large Retail	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Large Retail	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Large Retail	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	158	7	$62	5%	0
Large Retail	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.01	100%	1,368
Large Retail	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.01	100%	42
Large Retail	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	540	4	$102	50%	215
Lodging	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	27%	1
Lodging	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	27%	0
Lodging	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	305	12	$400	49%	0
Lodging	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	305	12	$400	49%	0
Lodging	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	2,460	10	$2,696	4%	1
Lodging	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	2,535	10	$2,696	4%	0
Lodging	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Lodging	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Lodging	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	504	12	$1,057	32%	1
Lodging	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	504	12	$1,057	32%	0
Lodging	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	148	12	$1,165	34%	0
Lodging	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	148	12	$1,165	34%	0
Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,066	12	$2,075	11%	1
Lodging	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,066	12	$2,075	11%	0
Lodging	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.82	10%	0
Lodging	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.82	10%	0
Lodging	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.82	100%	0
Lodging	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.82	100%	0
Lodging	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Lodging	Pool Heat	Pool Heater - Standard Equipment	Standard Pool Heater Equipment	Standard Pool Heater Equipment	Per Building SqFt	Existing	0.00	5	$0.00	100%	0
Lodging	Pool Heat	Pool Heater - Standard Equipment	Standard Pool Heater Equipment	Standard Pool Heater Equipment	Per Building SqFt	New	0.00	5	$0.00	100%	0
Lodging	Pool Heat	Spa Covers	R-14	No cover	Per Spa Area	Existing	13	6	$14	33%	0
Lodging	Pool Heat	Spa Covers	R-14	No cover	Per Spa Area	New	13	6	$14	33%	0
Lodging	Pool Heat	Swimming Pool Covers	Transparent	No Cover	Per Pool Area	Existing	5.20	5	$1	33%	33
Lodging	Pool Heat	Swimming Pool Covers	Transparent	No Cover	Per Pool Area	New	5.20	5	$1	33%	1
Lodging	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.05	100%	0
Lodging	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.01	20	$0.05	100%	0
Lodging	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.13	100%	0
Lodging	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.13	100%	0
Lodging	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.27	100%	0
Lodging	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.27	100%	0
Lodging	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.06	20	$0.38	100%	0
Lodging	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.06	20	$0.38	100%	0
Lodging	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.07	20	$0.44	100%	143
Lodging	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.07	20	$0.44	100%	6
Lodging	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Lodging	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	89	20	$96	75%	0
Lodging	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Lodging	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Lodging	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.15	20	$4	49%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Lodging	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.14	20	$4	49%	0
Lodging	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.59	20	$15	15%	0
Lodging	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	6.55	20	$15	55%	0
Lodging	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	1,946	10	$2,060	64%	0
Lodging	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	1,854	10	$2,060	77%	3
Lodging	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Lodging	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.06	7	$1	90%	0
Lodging	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	71	15	$450	16%	97
Lodging	Space Heat	Demand Controlled Ventilation	Demand Controlled Ventilation - DCV (Occupancy Sensors / CO2 Sensors)	Constant Ventilation	Per Sensor	Existing	72	15	$450	16%	51
Lodging	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	1,277	5	$14,651	75%	0
Lodging	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	1,216	5	$14,651	75%	0
Lodging	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	1,277	5	$26,479	85%	0
Lodging	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Lodging	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Lodging	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	2
Lodging	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Lodging	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	876	10	$5,450	64%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	893	10	$5,450	64%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	834	10	$5,450	64%	0
Lodging	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	890	10	$5,450	64%	0
Lodging	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.01	20	$0.06	100%	0
Lodging	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.01	20	$0.06	100%	0
Lodging	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.04	20	$0.10	100%	0
Lodging	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.04	20	$0.10	100%	0
Lodging	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.14	100%	0
Lodging	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.14	100%	0
Lodging	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.19	100%	54
Lodging	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.19	100%	3
Lodging	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Lodging	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Lodging	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Lodging	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Lodging	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Lodging	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.32	13	$0.38	9%	0
Lodging	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.33	13	$0.38	9%	0
Lodging	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	3,504	13	$502	3%	2
Lodging	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	3,504	13	$502	3%	0
Lodging	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.25	20	$2	15%	0
Lodging	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Lodging	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Lodging	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Lodging	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	368	15	$130	0%	0
Lodging	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	350	15	$124	0%	0
Lodging	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Lodging	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Lodging	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	337
Lodging	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	175
Lodging	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	97	15	$138	0%	0
Lodging	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	99	15	$138	0%	0
Lodging	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	1.02	3	$0.75	48%	3
Lodging	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	1.04	3	$0.75	48%	1
Lodging	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	163	12	$318	21%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	53%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	59%	0
Lodging	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	10%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	12%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	14%	0
Lodging	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	12%	0
Lodging	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	315	10	$5,944	33%	0
Lodging	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	314	10	$5,944	33%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	86	11	$789	56%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	86	11	$789	56%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	62	11	$391	53%	20

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	62	11	$391	53%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	69	11	$565	50%	23
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	69	11	$565	50%	0
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	53	11	$134	47%	3
Lodging	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	53	11	$134	47%	0
Lodging	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	62%	0
Lodging	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	62%	0
Lodging	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	52%	0
Lodging	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	52%	0
Lodging	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	299	14	$442	20%	8
Lodging	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	299	14	$442	20%	0
Lodging	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	204	14	$307	24%	7
Lodging	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	204	14	$307	24%	0
Lodging	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	372	40	$833	60%	240
Lodging	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	371	40	$666	83%	6
Lodging	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	8.14	10	$4	63%	0
Lodging	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	11,190	15	$3,955	0%	0
Lodging	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	11,190	15	$3,961	0%	0
Lodging	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	14	10	$8	84%	0
Lodging	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	14	10	$8	84%	0
Lodging	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	32	10	$31	34%	147
Lodging	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	38%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Lodging	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	38%	0
Lodging	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	25%	0
Lodging	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	3.25	10	$196	81%	0
Lodging	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	3.25	10	$196	81%	0
Lodging	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Lodging	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.09	13	$0.08	100%	0
Lodging	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.09	13	$0.08	100%	0
Lodging	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	6.26	13	$2	52%	0
Lodging	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Lodging	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	74	7	$62	5%	0
Lodging	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.09	13	$0.03	100%	276
Lodging	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.09	13	$0.03	100%	9
Lodging	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	253	4	$102	35%	-54
Other Commercial	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	14%	0
Other Commercial	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	14%	0
Other Commercial	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	152	12	$400	75%	4
Other Commercial	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	152	12	$400	75%	0
Other Commercial	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	202	10	$2,696	4%	0
Other Commercial	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	208	10	$2,696	4%	0
Other Commercial	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Other Commercial	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Other Commercial	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	252	12	$1,057	18%	2
Other Commercial	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	252	12	$1,057	18%	0
Other Commercial	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	74	12	$1,165	15%	0
Other Commercial	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	74	12	$1,165	15%	0
Other Commercial	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	533	12	$2,075	11%	3
Other Commercial	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	533	12	$2,075	11%	0
Other Commercial	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.30	10%	0
Other Commercial	Dryer	Dryer - High Efficiency	High Efficiency Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.30	10%	0
Other Commercial	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	Existing	0.00	12	$0.30	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Other Commercial	Dryer	Dryer - Standard	Standard Dryer	Standard Dryer	Per Building SqFt	New	0.00	12	$0.30	100%	0
Other Commercial	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Other Commercial	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.08	100%	0
Other Commercial	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.08	100%	0
Other Commercial	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.02	20	$0.23	100%	0
Other Commercial	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.02	20	$0.23	100%	0
Other Commercial	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.04	20	$0.47	100%	0
Other Commercial	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.04	20	$0.47	100%	0
Other Commercial	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.06	20	$0.66	100%	0
Other Commercial	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.66	100%	0
Other Commercial	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.07	20	$0.75	100%	0
Other Commercial	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.06	20	$0.75	100%	0
Other Commercial	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	7.50	20	$86	41%	0
Other Commercial	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.08	20	$4	49%	0
Other Commercial	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.07	20	$4	49%	0
Other Commercial	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.31	20	$15	15%	0
Other Commercial	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	1.46	20	$15	55%	0
Other Commercial	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	435	10	$2,060	64%	0
Other Commercial	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	401	10	$2,060	77%	0
Other Commercial	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Other Commercial	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Other Commercial	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	285	5	$4,375	20%	0
Other Commercial	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	263	5	$4,375	20%	0
Other Commercial	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	285	5	$7,393	85%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Other Commercial	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Other Commercial	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Other Commercial	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	144
Other Commercial	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	2
Other Commercial	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	55
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	195	10	$5,450	64%	0
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	206	10	$5,450	64%	0
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	179	10	$5,450	64%	0
Other Commercial	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	180	10	$5,450	64%	0
Other Commercial	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.11	100%	0
Other Commercial	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.11	100%	0
Other Commercial	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.18	100%	0
Other Commercial	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.18	100%	0
Other Commercial	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.25	100%	0
Other Commercial	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.25	100%	0
Other Commercial	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.33	100%	1,114
Other Commercial	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.33	100%	40
Other Commercial	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Other Commercial	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Other Commercial	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.04	30	$10	74%	0
Other Commercial	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.31	13	$0.38	9%	0
Other Commercial	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.33	13	$0.38	9%	310

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Other Commercial	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,542	13	$502	3%	57
Other Commercial	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,542	13	$502	3%	1
Other Commercial	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.24	20	$2	15%	196
Other Commercial	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Other Commercial	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Other Commercial	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Other Commercial	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	195	15	$390	0%	0
Other Commercial	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	180	15	$362	0%	0
Other Commercial	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Other Commercial	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Other Commercial	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	0
Other Commercial	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	7,068
Other Commercial	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	130	15	$138	76%	0
Other Commercial	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	137	15	$138	76%	61
Other Commercial	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	0.54	3	$0.75	48%	0
Other Commercial	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.57	3	$0.75	48%	52
Other Commercial	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.05	15	$3	65%	1,708
Other Commercial	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	87	12	$318	21%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	31%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	35%	0
Other Commercial	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	6%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	41%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	46%	0
Other Commercial	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	40%	0
Other Commercial	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	Existing	49	10	$5,944	2%	0
Other Commercial	Water Heat	Clothes Washer	Commercial Ozonating Clothes Washer	Standard Commercial Clothes Washer	Per Clothes Washer	New	49	10	$5,944	2%	0
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	86	11	$789	14%	0
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	86	11	$789	14%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	62	11	$391	13%	883
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	62	11	$391	13%	11
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	69	11	$565	13%	622
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	69	11	$565	13%	11
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	53	11	$134	12%	710
Other Commercial	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	53	11	$134	12%	9
Other Commercial	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	10%	0
Other Commercial	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	10%	0
Other Commercial	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	8%	0
Other Commercial	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	8%	0
Other Commercial	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	192	14	$442	0%	6
Other Commercial	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	192	14	$442	0%	0
Other Commercial	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	131	14	$307	0%	5
Other Commercial	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	131	14	$307	0%	0
Other Commercial	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	410	40	$833	60%	2,245
Other Commercial	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	409	40	$666	83%	41
Other Commercial	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	12	10	$4	63%	0
Other Commercial	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	1,853	15	$3,695	0%	0
Other Commercial	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	1,853	15	$3,723	0%	0
Other Commercial	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	Existing	25	10	$8	13%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Other Commercial	Water Heat	Low-Flow Showerheads	2.0 GPM	2.5 GPM Showerhead (Federal Code)	Per Showerhead	New	25	10	$8	13%	1
Other Commercial	Water Heat	Low-Flow Showerheads	2.5 GPM Showerhead (Federal Code)	Existing Showerhead (4.5 GPM)	Per Showerhead	Existing	57	10	$31	5%	0
Other Commercial	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	8%	0
Other Commercial	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	8%	0
Other Commercial	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	5%	0
Other Commercial	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	5.13	10	$196	90%	0
Other Commercial	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	5.12	10	$196	90%	0
Other Commercial	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.01	100%	0
Other Commercial	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.01	100%	0
Other Commercial	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.05	13	$0.13	100%	0
Other Commercial	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.05	13	$0.13	100%	0
Other Commercial	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	2.56	13	$2	52%	0
Other Commercial	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Other Commercial	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	82	7	$62	5%	0
Other Commercial	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.06	13	$0.05	100%	2,234
Other Commercial	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.06	13	$0.05	100%	56
Other Commercial	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	279	4	$102	35%	275
Restaurant	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	Existing	657	10	$200	41%	0
Restaurant	Cooking	Broiler	Cooking Broiler 34% Efficient	15% Efficient	Per Broiler	New	657	10	$200	41%	0
Restaurant	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	Existing	305	12	$400	75%	9
Restaurant	Cooking	Convection Oven	ENERGY STAR Convection Oven	Standard Oven	Per Convection Oven	New	305	12	$400	75%	0
Restaurant	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	Existing	3,356	10	$2,696	13%	143
Restaurant	Cooking	Conveyor Oven	High-Efficiency Model (23% Efficient)	15% Efficient	Per Conveyor Oven	New	3,462	10	$2,696	13%	3
Restaurant	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	Existing	0.00	12	$0.00	100%	0
Restaurant	Cooking	Cooking - Standard Equipment	Standard Cooking Equipment	Standard Cooking Equipment	Per Building SqFt	New	0.00	12	$0.00	100%	0
Restaurant	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	Existing	504	12	$1,057	32%	106
Restaurant	Cooking	Fryer	ENERGY STAR Fryer	Standard	Per Fryer	New	504	12	$1,057	32%	2
Restaurant	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	Existing	148	12	$1,165	56%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Restaurant	Cooking	Griddle	High-Efficiency Griddle (40% Efficient)	Standard Griddle (32% Efficient)	Per Griddle	New	148	12	$1,165	56%	0
Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	Existing	1,066	12	$2,075	26%	187
Restaurant	Cooking	Steam Cooker	ENERGY STAR Steam Cooker	Standard	Per Steam Cooker	New	1,066	12	$2,075	26%	4
Restaurant	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Restaurant	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Restaurant	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Restaurant	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Restaurant	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Restaurant	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	4
Restaurant	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Restaurant	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	Existing	99	10	$5,450	64%	0
Restaurant	Space Heat	Exhaust Hood Makeup Air	Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air	Hood Pulls Conditioned Air (No Make-up Air)	Per Building	New	66	10	$5,450	64%	0
Restaurant	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.12	100%	0
Restaurant	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.04	20	$0.12	100%	0
Restaurant	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.19	100%	0
Restaurant	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.04	20	$0.19	100%	0
Restaurant	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.08	20	$0.27	100%	0
Restaurant	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.27	100%	0
Restaurant	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.09	20	$0.36	100%	36
Restaurant	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.36	100%	1
Restaurant	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Restaurant	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Restaurant	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Restaurant	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Restaurant	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Restaurant	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Restaurant	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.38	13	$0.38	51%	56
Restaurant	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,600	13	$502	3%	0
Restaurant	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,600	13	$502	3%	0
Restaurant	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.25	20	$2	15%	2
Restaurant	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Restaurant	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Restaurant	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Restaurant	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Restaurant	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Restaurant	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.07	7	$0.29	90%	218

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Restaurant	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	66	15	$138	76%	0
Restaurant	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.56	3	$0.75	48%	2
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	6%	0
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	7%	0
Restaurant	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	1%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	74%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	82%	0
Restaurant	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	72%	0
Restaurant	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	29%	0
Restaurant	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	29%	0
Restaurant	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	24%	0
Restaurant	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	24%	0
Restaurant	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	576	14	$442	52%	294
Restaurant	Water Heat	Dishwasher	High Temp Commercial High Efficiency Dishwasher (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	576	14	$442	52%	5
Restaurant	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	Existing	393	14	$307	62%	115
Restaurant	Water Heat	Dishwasher	Low-Temp Commercial Dishwasher (Includes Extra Chemical Cost) - (ENERGY STAR)	Standard High Temp Commercial Dishwasher	Per Dishwasher	New	393	14	$307	62%	2
Restaurant	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	187	40	$833	60%	283
Restaurant	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	187	40	$666	83%	7
Restaurant	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	14	10	$4	63%	0
Restaurant	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	Existing	18	5	$39	80%	0
Restaurant	Water Heat	Low-Flow Spray Heads	1.0 GPM	1.6 GPM (Code)	Per Spray Head	New	18	5	$39	80%	0
Restaurant	Water Heat	Low-Flow Spray Heads	1.6 GPM (Code)	Existing Spray Head (2.5 GPM)	Per Spray Head	Existing	27	5	$30	52%	0
Restaurant	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	17	10	$196	71%	0
Restaurant	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	17	10	$196	71%	0
Restaurant	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.08	13	$0.03	100%	0
Restaurant	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.08	13	$0.03	100%	0
Restaurant	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.00	100%	0
Restaurant	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.00	100%	0
Restaurant	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Restaurant	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.17	13	$0.31	100%	0
Restaurant	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.17	13	$0.31	100%	0
Restaurant	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	2.93	13	$2	52%	0
Restaurant	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Restaurant	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	37	7	$62	5%	0
Restaurant	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.18	13	$0.13	100%	321
Restaurant	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.18	13	$0.13	100%	11
Restaurant	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	127	4	$102	80%	79
Small Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Office	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Office	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Small Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Small Office	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Small Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	24
Small Office	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Small Office	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Small Office	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.11	100%	0
Small Office	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.11	100%	0
Small Office	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.18	100%	0
Small Office	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.18	100%	0
Small Office	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.24	100%	0
Small Office	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.24	100%	0
Small Office	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.32	100%	169
Small Office	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.32	100%	7
Small Office	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Office	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Office	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Small Office	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.04	30	$10	74%	0
Small Office	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Small Office	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.30	13	$0.38	51%	263
Small Office	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,040	13	$502	3%	19
Small Office	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,040	13	$502	3%	0
Small Office	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.22	20	$2	15%	9
Small Office	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Small Office	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Small Office	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Small Office	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Small Office	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Office	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	1,029
Small Office	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	71	15	$138	79%	0
Small Office	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.54	3	$0.75	48%	8
Small Office	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.05	15	$3	62%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	9%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	10%	0
Small Office	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	2%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	70%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	78%	0
Small Office	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	68%	0
Small Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	29%	0
Small Office	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	29%	0
Small Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	24%	0
Small Office	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	24%	0
Small Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	133	40	$833	60%	239
Small Office	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	133	40	$666	83%	5
Small Office	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	20	10	$4	63%	0
Small Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	8.36	10	$196	81%	0
Small Office	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	8.34	10	$196	81%	0
Small Office	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.01	100%	0
Small Office	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.01	100%	0
Small Office	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Small Office	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.18	100%	0
Small Office	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.18	100%	0
Small Office	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	0.83	13	$2	52%	0
Small Office	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Office	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	26	7	$62	5%	0
Small Office	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.07	100%	268

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Small Office	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.07	100%	8
Small Office	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	91	4	$102	35%	29
Small Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Retail	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Small Retail	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.04	7	$1	90%	0
Small Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Small Retail	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Small Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	20
Small Retail	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	0
Small Retail	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Small Retail	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.14	100%	0
Small Retail	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.14	100%	0
Small Retail	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.23	100%	0
Small Retail	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.23	100%	0
Small Retail	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.32	100%	0
Small Retail	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.32	100%	0
Small Retail	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.42	100%	133
Small Retail	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.42	100%	6
Small Retail	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Small Retail	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Retail	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Small Retail	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Small Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Small Retail	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Small Retail	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.35	13	$0.38	51%	159
Small Retail	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,200	13	$502	3%	4
Small Retail	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,200	13	$502	3%	0
Small Retail	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.20	20	$2	15%	4
Small Retail	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Small Retail	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Small Retail	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Small Retail	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Small Retail	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Small Retail	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	832
Small Retail	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	72	15	$138	88%	0
Small Retail	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.38	3	$0.75	48%	0
Small Retail	Space Heat	Variable Air-Volume Systems	Install Variable Air-Volume System	Constant Volume System	Per Sqft	Existing	0.04	15	$3	65%	176
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	9%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	10%	0
Small Retail	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	2%	0
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	70%	0
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	78%	0
Small Retail	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	68%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer Enhanced Efficiency MEF = 3.10 and WF = 3.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	86	11	$789	5%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	62	11	$391	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 2 MEF = 2.2 and WF = 4.5	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	62	11	$391	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	69	11	$565	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer CEE Tier 3 MEF = 2.4 and WF = 4.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	69	11	$565	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	Existing	53	11	$134	4%	0
Small Retail	Water Heat	Clothes Washer	Residential Grade, Clothes Washer ENERGY STAR MEF = 2.0 and WF = 6.0	Standard Clothes Washer MEF = 1.26 and WF = 9.5 (Federal Standard)	Per Clothes Washer	New	53	11	$134	4%	0
Small Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	5%	0
Small Retail	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	5%	0
Small Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	4%	0
Small Retail	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	4%	0
Small Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	196	40	$833	60%	187
Small Retail	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	195	40	$666	83%	4
Small Retail	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	30	10	$4	63%	0
Small Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	12	10	$196	81%	0
Small Retail	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	12	10	$196	81%	0
Small Retail	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.02	13	$0.01	100%	0
Small Retail	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.02	13	$0.01	100%	0
Small Retail	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Small Retail	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Small Retail	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Small Retail	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.16	100%	0
Small Retail	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.16	100%	0
Small Retail	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	1.22	13	$2	52%	0
Small Retail	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Small Retail	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	39	7	$62	5%	0
Small Retail	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.04	13	$0.07	100%	210
Small Retail	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.04	13	$0.07	100%	6
Small Retail	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	133	4	$102	35%	23
Warehouse	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Other	Other - Standard	Standard Other Equipment	Standard Other Equipment	Per Building SqFt	New	0.00	10	$0.00	100%	0
Warehouse	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.06	100%	0
Warehouse	Space Heat	Boiler - 2013 Federal Standard	2013 Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.06	100%	0
Warehouse	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	Existing	0.01	20	$0.16	100%	0
Warehouse	Space Heat	Boiler - 85% AFUE	Boiler - 85% AFUE	Standard Boiler	Per Building SqFt	New	0.01	20	$0.16	100%	0
Warehouse	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	Existing	0.03	20	$0.33	100%	47
Warehouse	Space Heat	Boiler - 90% AFUE	Boiler - 90% AFUE	Standard Boiler	Per Building SqFt	New	0.03	20	$0.33	100%	0
Warehouse	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	Existing	0.04	20	$0.48	100%	0
Warehouse	Space Heat	Boiler - 94% AFUE	Boiler - 94% AFUE	Standard Boiler	Per Building SqFt	New	0.04	20	$0.48	100%	0
Warehouse	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	Existing	0.05	20	$0.54	100%	252
Warehouse	Space Heat	Boiler - 96% AFUE	Boiler - 96% AFUE	Standard Boiler	Per Building SqFt	New	0.05	20	$0.54	100%	12
Warehouse	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Space Heat	Boiler - Below Standard	Below Standard Boiler	Below Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Boiler - Economizer	Economizer	No Economizer	Per Boiler HP	Existing	14	20	$86	75%	0
Warehouse	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Boiler - Federal Standard	Standard Boiler	Standard Boiler	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.08	20	$4	49%	0
Warehouse	Space Heat	Boiler - Pipe Insulation	Above Code (3" of Insulation)	Code (2" of Insulation)	Per Linear Foot of Boiler Pipe	New	0.07	20	$4	49%	0
Warehouse	Space Heat	Boiler - Pipe Insulation	Code (2" of Insulation)	Existing Insulation (1" of Insulation)	Per Linear Foot of Boiler Pipe	Existing	0.31	20	$15	15%	0
Warehouse	Space Heat	Boiler - Turbulators	Boiler Turbulator	No Turbulator	Per Tube	Existing	3.93	20	$15	55%	94
Warehouse	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	Existing	585	10	$2,060	64%	329
Warehouse	Space Heat	Boiler Reset Controls	Boiler Reset Controls	No Boiler Reset Controls	Per Control	New	561	10	$2,060	77%	6
Warehouse	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.03	7	$1	90%	0
Warehouse	Space Heat	Commissioning	Commissioning/QI - New Installation	No Commissioning	Per SqFt	New	0.05	7	$1	90%	0
Warehouse	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	Existing	767	5	$3,122	75%	0
Warehouse	Space Heat	Direct Digital Control System - Optimization	DDC Optimization	Standard DDC	Per Building	New	737	5	$3,122	75%	0
Warehouse	Space Heat	Direct Digital Control System-Installation	DDC Retrofit - EMS Upgrade	Pneumatic	Per Building	Existing	767	5	$5,067	85%	0
Warehouse	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	Existing	20	20	$477	75%	0
Warehouse	Space Heat	Doors	U-Factor = 0.10	Standard Door (U-Factor = 0.55)	Per Door	New	20	20	$477	75%	0
Warehouse	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	Existing	9	20	$60	61%	71
Warehouse	Space Heat	Doors	U-Factor = 0.35	Standard Door (U-Factor = 0.55)	Per Door	New	9	20	$60	61%	1

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Warehouse	Space Heat	Duct Repair And Sealing	Reduction In Duct Losses to 5%	No Repair or Sealing, 15% duct losses	Per Building SqFt	Existing	0.01	18	$0.23	38%	0
Warehouse	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.05	20	$0.08	100%	0
Warehouse	Space Heat	Furnace - 2013 Standard	2013 Standard Furnace	Standard Furnace	Per Building SqFt	New	0.05	20	$0.08	100%	0
Warehouse	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.13	100%	0
Warehouse	Space Heat	Furnace - 92% AFUE	Furnace - 92% AFUE	Standard Furnace	Per Building SqFt	New	0.05	20	$0.13	100%	0
Warehouse	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	Existing	0.06	20	$0.18	100%	0
Warehouse	Space Heat	Furnace - 94% AFUE	Furnace - 94% AFUE	Standard Furnace	Per Building SqFt	New	0.06	20	$0.18	100%	0
Warehouse	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	Existing	0.07	20	$0.24	100%	785
Warehouse	Space Heat	Furnace - 96% AFUE	Furnace - 96% AFUE	Standard Furnace	Per Building SqFt	New	0.07	20	$0.24	100%	32
Warehouse	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	Existing	0.00	10	$0.00	100%	0
Warehouse	Space Heat	Furnace - Below Standard	Below Standard Furnace	Below Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	Existing	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Furnace - Standard	Standard Furnace	Standard Furnace	Per Building SqFt	New	0.00	20	$0.00	100%	0
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	Existing	0.03	30	$10	74%	0
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Warehouse	Space Heat	Green Roof	Ecoroof, Vegetated Roof System	Standard Roof	Per Roof Area SqFt	New	0.03	30	$10	74%	0
Warehouse	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.71	13	$0.38	9%	0
Warehouse	Space Heat	Infiltration Control	Weather-Stripping	Standard Practice	Per Window SqFt	Existing	0.89	13	$0.38	9%	211
Warehouse	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	Existing	1,320	13	$502	3%	4
Warehouse	Space Heat	Infrared Heater	Infrared Heater - Gas Radiant Heating	Standard Unit Heater	Per 1000 kBTU Unit Heater	New	1,320	13	$502	3%	0
Warehouse	Space Heat	Insulation - Duct	New Duct Insulation (R-8) (Unconditioned Spaces)	No Insulation	Per Surface Area of Duct	Existing	0.21	20	$2	15%	210
Warehouse	Space Heat	Insulation - Floor	R-30	Average Existing Insulation (R-10)	Per Floor Area SqFt	Existing	0.02	25	$1	29%	0
Warehouse	Space Heat	Insulation - Roof	R-20ci	Average Existing Insulation (R-10)	Per Roof Area SqFt	Existing	0.01	25	$1	12%	0
Warehouse	Space Heat	Insulation - Wall	R-13+R-7.5ci	Average Existing Insulation (R-10)	Per Wall Area SqFt	Existing	0.04	25	$1	32%	0
Warehouse	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	197	15	$1,689	0%	0
Warehouse	Space Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	189	15	$1,649	0%	0
Warehouse	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	Existing	0.00	15	$0.00	100%	0
Warehouse	Space Heat	Other Space Heat - Standard Equipment	Standard Equipment Other Space Heat	Standard Equipment Other Space Heat	Per Building SqFt	New	0.00	15	$0.00	100%	0
Warehouse	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.05	7	$0.29	90%	328
Warehouse	Space Heat	Retro-Commissioning	Retro-Commissioning	No Retro-Commissioning	Per SqFt	Existing	0.06	7	$0.29	90%	4,774
Warehouse	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	175	15	$138	92%	0
Warehouse	Space Heat	Thermostat Programmable	Setback Thermostat 5-1-1, 5-2 or 7-day	Manual Thermostat	Per Thermostat	Existing	220	15	$138	92%	97
Warehouse	Space Heat	Tune-up - Boiler Maintenance	Boiler Maintenance (Tune-up)	Unmaintained Boiler	Per kBTU	Existing	0.54	3	$0.75	48%	64
Warehouse	Space Heat	Tune-up - Furnace Maintenance	Furnace Maintenance (Tune-up)	Unmaintained Furnace	Per kBTU	Existing	0.68	3	$0.75	48%	42
Warehouse	Space Heat	Vent Damper	Automatic Air Flue Damper	No Damper	Per 200 kBtuh Boiler	Existing	87	12	$318	21%	0
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	Existing	0.08	25	$3	53%	0
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.45	U-Value = 0.55 (Code Metal Framing)	Per Window SqFt	New	0.08	25	$3	59%	0
Warehouse	Space Heat	Window - Metal Framing	U-Value = 0.55 (Code Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.08	25	$27	10%	0

Table A.3.4. Commercial Gas Measure Details

Segment	End Use	Measure Name	Measure Description	Baseline Description	Unit Description	Construction Vintage	Savings per Unit (Therm)	Measure Life	Incrmental Cost per Unit	Measure Applicability	2023 Economic Potential (Thousand Therms)
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	Existing	0.05	25	$2	12%	0
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.30	U-Value = 0.35 (Code Non-Metal Framing)	Per Window SqFt	New	0.05	25	$2	14%	0
Warehouse	Space Heat	Window - Non-Metal Framing	U-Value = 0.35 (Code Non-Metal Framing)	Existing Windows U = 0.67	Per Window SqFt	Existing	0.27	25	$42	12%	0
Warehouse	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	4.26	11	$1,067	10%	0
Warehouse	Water Heat	Dishwasher	Dishwasher Enhanced Efficiency (EF 1.00) 200 kWh/yr and 4.00 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	4.26	11	$1,067	10%	0
Warehouse	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	Existing	1.88	11	$272	8%	0
Warehouse	Water Heat	Dishwasher	ENERGY STAR 295 kWh/yr and 4.25 Gallons/Cycle	Federal Standard 355 kWh/yr and 6.5 Gallons/Cycle = 307 kWh/yr and = 5.0 Gallons/Cycle for July 1, 2011 - Dec 31, 2011	Per Dishwasher	New	1.88	11	$272	8%	0
Warehouse	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	Existing	798	40	$833	60%	769
Warehouse	Water Heat	Drainwater Heat Recovery	Install Power-Pipe or GFX System	No GFX or Power-Pipe System	Per 40 Gal Water Heater	New	796	40	$666	83%	15
Warehouse	Water Heat	Faucet Aerator	0.5 GPM	Existing Aerator (3.0 GPM)	Per Aerator	Existing	41	10	$4	63%	0
Warehouse	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	Existing	279	15	$2,396	0%	0
Warehouse	Water Heat	Integrated Space Heating and Water Heating	Integrated System	Separate Boiler and Water Heater	Per 200 kBtuh Boiler	New	279	15	$2,436	0%	0
Warehouse	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	Existing	24	10	$196	90%	0
Warehouse	Water Heat	Ultrasonic Faucet Control	Install Ultrasonic Faucet Control	No Faucet Control	Per Faucet	New	24	10	$196	90%	0
Warehouse	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	Existing	0.01	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - 0.67 EF	Water Heater - 0.67 EF	Standard Water Heater	Per Building SqFt	New	0.01	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - 2015 Standard	2015 Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	Existing	0.00	6	$0.00	100%	0
Warehouse	Water Heat	Water Heater - Below Standard	Below Standard Water Heater	Below Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.03	100%	0
Warehouse	Water Heat	Water Heater - Condensing 0.80 EF	Water Heater - Condensing 0.80 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.03	100%	0
Warehouse	Water Heat	Water Heater - Pipe Insulation	Hot Water Pipe Insulation (R-4)	No Pipe Insulation	Per Linear Foot	Existing	4.98	13	$2	52%	0
Warehouse	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	Existing	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - Standard	Standard Water Heater	Standard Water Heater	Per Building SqFt	New	0.00	13	$0.00	100%	0
Warehouse	Water Heat	Water Heater - Tank Blanket/Insulation	Install Insulation (R-11)	No Tank Insulation	Per Water Heater	Existing	159	7	$62	5%	0
Warehouse	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	Existing	0.03	13	$0.01	100%	862
Warehouse	Water Heat	Water Heater - Tankless 0.82 EF	Water Heater - Tankless 0.82 EF	Standard Water Heater	Per Building SqFt	New	0.03	13	$0.01	100%	24
Warehouse	Water Heat	Water Heater - Thermostat Setback	Install Programmable Thermostat (120 Degrees)	No Thermostat Setback (130 Degrees)	Per Water Heater	Existing	542	4	$102	35%	94

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Agriculture	Fans	Agricultural Exhaust Fans (Rate 21 CFM/Watt+)	Per Unit	Existing	5%	20	$0.25	1,043
Agriculture	Fans	Circulating Fans	Per Unit	Existing	5%	10	$0.12	1,069
Agriculture	Fans	High Volume Low Speed Fans	Per Unit	Existing	47%	25	$1	5,756
Agriculture	Fans	High-Efficiency Ventilation System	Per Unit	Existing	6%	10	$1	0
Agriculture	HVAC	Energy-Efficient Dehumidifier	Per Unit	Existing	2%	15	$0.85	416
Agriculture	HVAC	Heat Reclaimer	Per Unit	Existing	42%	15	$0.13	305
Agriculture	HVAC	Heat Recovery Ventilators	Per Unit	Existing	4%	10	$0.35	875
Agriculture	HVAC	Infrared Film for Greenhouses	Per Unit	Existing	11%	4	$0.20	13
Agriculture	HVAC	Programmable Ventilation Controller	Per Unit	Existing	0%	10	$0.11	21
Agriculture	HVAC	Scroll Compressor	Per Unit	Existing	8%	15	$0.80	53
Agriculture	Motors Other	Automatic Milker Takeoff	Per Unit	Existing	3%	15	$0.60	36
Agriculture	Motors Other	VFDs on Small Milking Machines	Per Unit	Existing	3%	15	$0.66	39
Agriculture	Motors Other	Variable Speed Drives for Dairy Vacuum Pumps	Per Unit	Existing	37%	15	$0.13	446
Agriculture	Other	Block Heater Timer	Per Unit	Existing	3%	10	$0.03	197
Agriculture	Other	Grain bin aeration control systems	Per Unit	Existing	2%	20	$0.13	106
Agriculture	Other	Grain bin aeration control systems	Per Unit	Existing	2%	20	$0.13	69
Agriculture	Other	Greenhouse Heat Curtain	Per Unit	Existing	17%	5	$0.04	15
Agriculture	Other	High Efficiency Stock tank	Per Unit	Existing	4%	10	$0.33	261
Agriculture	Other	Livestock Waterers	Per Unit	Existing	11%	10	$0.26	803
Agriculture	Process Heat	Crate Heating Pads	Per Unit	Existing	18%	15	$0.14	1,706
Agriculture	Process Heat	Grain dryers	Per Unit	Existing	24%	20	$6	0
Agriculture	Process Heat	Heat Lamp Setback (Microzone)	Per Unit	Existing	0%	15	$0.17	42
Agriculture	Process Heat	Heat Lamp/Heating Pad Controller	Per Unit	Existing	2%	15	$0.10	171
Agriculture	Process Heat	Heat Lamps	Per Unit	Existing	3%	10	$0.01	333
Agriculture	Process Refrig and Cooling	Milk Precooler - Dairy Plate Cooler	Per Unit	Existing	3%	15	$0.52	8
Agriculture	Pumps	Low Pressure Irrigation	Per Unit	Existing	50%	10	$0.78	30
Chemical Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Chemical Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	151
Chemical Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	305
Chemical Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	302
Chemical Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	738
Chemical Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	11,537
Chemical Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Chemical Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	52
Chemical Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	2,210
Chemical Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	242
Chemical Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	1,630
Chemical Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	778
Chemical Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	1,500
Chemical Mfg	HVAC	Clean Room: Change Filter Strategy	Per Unit	Existing	40%	1	$0.00	3,970
Chemical Mfg	HVAC	Clean Room: Chiller Optimize	Per Unit	Existing	15%	10	$0.08	3,928
Chemical Mfg	HVAC	Clean Room: Clean Room HVAC	Per Unit	Existing	9%	20	$0.16	2,541
Chemical Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Chemical Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Chemical Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Chemical Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	1,298
Chemical Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	454
Chemical Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	26
Chemical Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	3,603
Chemical Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Chemical Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Chemical Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	13,574

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Chemical Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Chemical Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	2,123
Chemical Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Chemical Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	374
Chemical Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	755
Chemical Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	693
Chemical Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,671
Chemical Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	6,162
Chemical Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Chemical Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	3,493
Chemical Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	116
Chemical Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	1,878
Chemical Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	547
Chemical Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	3,291
Chemical Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Chemical Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	55
Chemical Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	20,230
Chemical Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	23,479
Chemical Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	3,670
Chemical Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	18,827
Chemical Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	7,672
Chemical Mfg	Process Refrig and Cooling	Defrost Control System	Per Unit	Existing	7%	15	$0.08	4,056
Chemical Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	2,358
Chemical Mfg	Process Refrig and Cooling	Evaporator Fan Controller	Per Unit	Existing	5%	16	$0.08	2,897
Chemical Mfg	Process Refrig and Cooling	Freezer-Cooler Replacement Gaskets	Per Unit	Existing	4%	4	$0.08	153
Chemical Mfg	Process Refrig and Cooling	Insulation for Bare Suction Lines	Per Unit	Existing	1%	10	$0.96	0
Chemical Mfg	Process Refrig and Cooling	Mechanical Subcoolers	Per Unit	Existing	0%	15	$0.35	327
Chemical Mfg	Process Refrig and Cooling	Strip Curtains for Walk-Ins	Per Unit	Existing	4%	4	$0.18	350
Chemical Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	413
Chemical Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	5,441
Chemical Mfg	Process Refrig and Cooling	Variable Speed Compressor Systems	Per Unit	Existing	10%	15	$0.22	5,848
Chemical Mfg	Process Refrig and Cooling	Walk-in PSC to ECM	Per Unit	Existing	5%	10	$0.48	58
Chemical Mfg	Process Refrig and Cooling	Walk-in Shaded Pole to ECM	Per Unit	Existing	7%	10	$0.48	52
Chemical Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Chemical Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	347
Chemical Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	714
Chemical Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	708
Chemical Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,672
Chemical Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	26,073
Chemical Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Chemical Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	117
Chemical Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	3,979
Chemical Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	923
Electrical Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Electrical Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	10
Electrical Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	12
Electrical Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	12
Electrical Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	30
Electrical Equipment Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	458
Electrical Equipment Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Electrical Equipment Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	1
Electrical Equipment Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	88

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Electrical Equipment Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	10
Electrical Equipment Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	65
Electrical Equipment Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	113
Electrical Equipment Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	220
Electrical Equipment Mfg	HVAC	Clean Room: Change Filter Strategy	Per Unit	Existing	40%	1	$0.00	579
Electrical Equipment Mfg	HVAC	Clean Room: Chiller Optimize	Per Unit	Existing	15%	10	$0.08	576
Electrical Equipment Mfg	HVAC	Clean Room: Clean Room HVAC	Per Unit	Existing	9%	20	$0.16	368
Electrical Equipment Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Electrical Equipment Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Electrical Equipment Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Electrical Equipment Mfg	HVAC	Solidstate Chiller	Per Unit	Existing	90%	10	$0.50	2,238
Electrical Equipment Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	189
Electrical Equipment Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	88
Electrical Equipment Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	8
Electrical Equipment Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	701
Electrical Equipment Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Electrical Equipment Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Electrical Equipment Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	2,640
Electrical Equipment Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Electrical Equipment Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	413
Electrical Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Electrical Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	25
Electrical Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	30
Electrical Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	28
Electrical Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	67
Electrical Equipment Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	248
Electrical Equipment Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Electrical Equipment Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	140
Electrical Equipment Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	3
Electrical Equipment Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	75
Electrical Equipment Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	22
Electrical Equipment Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	132
Electrical Equipment Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Electrical Equipment Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	5
Electrical Equipment Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	734
Electrical Equipment Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	949
Electrical Equipment Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	134
Electrical Equipment Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	689
Electrical Equipment Mfg	Process Other	Elec Chip Fab: Eliminate Exhaust	Per Unit	Existing	5%	10	$0.18	128
Electrical Equipment Mfg	Process Other	Elec Chip Fab: Exhaust Injector	Per Unit	Existing	100%	10	$0.45	1,075
Electrical Equipment Mfg	Process Other	Elec Chip Fab: Reduce Gas Pressure	Per Unit	Existing	10%	10	$0.00	0
Electrical Equipment Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	228
Electrical Equipment Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	71
Electrical Equipment Mfg	Process Refrig and Cooling	Floating Head Pressure Controller	Per Unit	Existing	9%	15	$0.07	209
Electrical Equipment Mfg	Process Refrig and Cooling	Floating Suction Pressure Controller	Per Unit	Existing	1%	15	$0.07	32
Electrical Equipment Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	16
Electrical Equipment Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	152
Electrical Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Electrical Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	22
Electrical Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	27
Electrical Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	27
Electrical Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	64

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Electrical Equipment Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	1,037
Electrical Equipment Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Electrical Equipment Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	3
Electrical Equipment Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	152
Electrical Equipment Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	37
Fabricated Metal Products	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Fabricated Metal Products	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	64
Fabricated Metal Products	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	84
Fabricated Metal Products	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	74
Fabricated Metal Products	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	181
Fabricated Metal Products	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Fabricated Metal Products	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	13
Fabricated Metal Products	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	542
Fabricated Metal Products	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	58
Fabricated Metal Products	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	400
Fabricated Metal Products	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	339
Fabricated Metal Products	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	660
Fabricated Metal Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Fabricated Metal Products	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Fabricated Metal Products	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Fabricated Metal Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	569
Fabricated Metal Products	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	280
Fabricated Metal Products	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	24
Fabricated Metal Products	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	2,217
Fabricated Metal Products	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Fabricated Metal Products	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Fabricated Metal Products	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	8,352
Fabricated Metal Products	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Fabricated Metal Products	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,306
Fabricated Metal Products	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Fabricated Metal Products	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	180
Fabricated Metal Products	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	236
Fabricated Metal Products	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	211
Fabricated Metal Products	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	510
Fabricated Metal Products	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Fabricated Metal Products	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,057
Fabricated Metal Products	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	36
Fabricated Metal Products	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	568
Fabricated Metal Products	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	165
Fabricated Metal Products	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	1,024
Fabricated Metal Products	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Fabricated Metal Products	Other	Transformers	Per Unit	Existing	2%	30	$0.09	17
Fabricated Metal Products	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	2,195
Fabricated Metal Products	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	401
Fabricated Metal Products	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	2,057
Fabricated Metal Products	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	1,071
Fabricated Metal Products	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	330
Fabricated Metal Products	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	58
Fabricated Metal Products	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	720
Fabricated Metal Products	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Fabricated Metal Products	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	115
Fabricated Metal Products	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	154

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Fabricated Metal Products	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	136
Fabricated Metal Products	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	322
Fabricated Metal Products	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Fabricated Metal Products	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	23
Fabricated Metal Products	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	867
Fabricated Metal Products	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	188
Food Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Food Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	386
Food Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	363
Food Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	360
Food Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	880
Food Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	13,414
Food Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Food Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	82
Food Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	2,635
Food Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	293
Food Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	1,944
Food Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	2,800
Food Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	5,397
Food Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Food Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Food Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Food Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	4,672
Food Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	2,149
Food Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	259
Food Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	17,036
Food Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Food Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Food Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	64,179
Food Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Food Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	10,036
Food Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Food Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	2,140
Food Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	2,012
Food Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	1,847
Food Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	4,455
Food Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	16,422
Food Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Food Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	9,311
Food Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	427
Food Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	5,008
Food Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	1,458
Food Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	9,105
Food Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Food Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	231
Food Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	9,484
Food Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	12,258
Food Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,733
Food Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	8,904
Food Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	45,936
Food Mfg	Process Refrig and Cooling	Defrost Control System	Per Unit	Existing	7%	15	$0.08	57,682
Food Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	14,176

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Food Mfg	Process Refrig and Cooling	Evaporator Fan Controller	Per Unit	Existing	5%	16	$0.08	44,573
Food Mfg	Process Refrig and Cooling	Floating Head Pressure Controller	Per Unit	Existing	9%	15	$0.07	85,076
Food Mfg	Process Refrig and Cooling	Floating Suction Pressure Controller	Per Unit	Existing	1%	15	$0.07	12,781
Food Mfg	Process Refrig and Cooling	Freezer-Cooler Replacement Gaskets	Per Unit	Existing	4%	4	$0.08	3,117
Food Mfg	Process Refrig and Cooling	Insulation for Bare Suction Lines	Per Unit	Existing	1%	10	$0.96	0
Food Mfg	Process Refrig and Cooling	Mechanical Subcoolers	Per Unit	Existing	0%	15	$0.35	1,105
Food Mfg	Process Refrig and Cooling	Strip Curtains for Walk-Ins	Per Unit	Existing	4%	4	$0.18	7,098
Food Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	2,789
Food Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	34,281
Food Mfg	Process Refrig and Cooling	Variable Speed Compressor Systems	Per Unit	Existing	10%	15	$0.22	81,379
Food Mfg	Process Refrig and Cooling	Walk-in PSC to ECM	Per Unit	Existing	5%	10	$0.48	1,177
Food Mfg	Process Refrig and Cooling	Walk-in Shaded Pole to ECM	Per Unit	Existing	7%	10	$0.48	3,263
Food Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Food Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	843
Food Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	807
Food Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	801
Food Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,890
Food Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	30,384
Food Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Food Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	186
Food Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	4,497
Food Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	1,103
Furniture Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Furniture Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	5
Furniture Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	21
Furniture Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	19
Furniture Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	46
Furniture Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Furniture Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	2
Furniture Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	137
Furniture Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	15
Furniture Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	101
Furniture Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	138
Furniture Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	266
Furniture Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Furniture Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Furniture Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Furniture Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	230
Furniture Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	128
Furniture Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	3
Furniture Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	1,015
Furniture Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Furniture Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Furniture Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	3,822
Furniture Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Furniture Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	598
Furniture Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Furniture Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	14
Furniture Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	57
Furniture Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	51
Furniture Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	123
Furniture Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Furniture Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	269
Furniture Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	6
Furniture Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	145
Furniture Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	42
Furniture Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	260
Furniture Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Furniture Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	8
Furniture Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	574
Furniture Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	104
Furniture Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	536
Furniture Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	23
Furniture Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	7
Furniture Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	11
Furniture Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	15
Furniture Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Furniture Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	9
Furniture Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	39
Furniture Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	35
Furniture Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	82
Furniture Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Furniture Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	4
Furniture Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	210
Furniture Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	48
Industrial Machinery	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Industrial Machinery	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	90
Industrial Machinery	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	283
Industrial Machinery	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	280
Industrial Machinery	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	686
Industrial Machinery	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	10,272
Industrial Machinery	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Industrial Machinery	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	69
Industrial Machinery	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	2,053
Industrial Machinery	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	224
Industrial Machinery	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	1,515
Industrial Machinery	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	3,060
Industrial Machinery	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	6,053
Industrial Machinery	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Industrial Machinery	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Industrial Machinery	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Industrial Machinery	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	5,194
Industrial Machinery	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	1,764
Industrial Machinery	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	63
Industrial Machinery	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	13,989
Industrial Machinery	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Industrial Machinery	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Industrial Machinery	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	52,699
Industrial Machinery	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Industrial Machinery	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	8,241
Industrial Machinery	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Industrial Machinery	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	274
Industrial Machinery	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	864
Industrial Machinery	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	794

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Industrial Machinery	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,916
Industrial Machinery	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	7,055
Industrial Machinery	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Industrial Machinery	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	4,004
Industrial Machinery	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	195
Industrial Machinery	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	2,153
Industrial Machinery	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	626
Industrial Machinery	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	3,881
Industrial Machinery	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Industrial Machinery	Other	Transformers	Per Unit	Existing	2%	30	$0.09	83
Industrial Machinery	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	8,315
Industrial Machinery	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	10,520
Industrial Machinery	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,517
Industrial Machinery	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	7,794
Industrial Machinery	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	4,333
Industrial Machinery	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	1,326
Industrial Machinery	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	200
Industrial Machinery	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	2,928
Industrial Machinery	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Industrial Machinery	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	163
Industrial Machinery	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	524
Industrial Machinery	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	520
Industrial Machinery	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,228
Industrial Machinery	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	19,272
Industrial Machinery	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Industrial Machinery	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	129
Industrial Machinery	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	2,922
Industrial Machinery	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	711
Instruments	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Instruments	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	91
Instruments	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	56
Instruments	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	50
Instruments	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	122
Instruments	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Instruments	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	6
Instruments	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	365
Instruments	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	40
Instruments	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	269
Instruments	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	1,054
Instruments	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	2,031
Instruments	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Instruments	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Instruments	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Instruments	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	1,758
Instruments	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	381
Instruments	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	69
Instruments	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	3,018
Instruments	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Instruments	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Instruments	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	11,370
Instruments	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Instruments	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,778

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Instruments	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Instruments	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	178
Instruments	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	111
Instruments	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	99
Instruments	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	239
Instruments	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Instruments	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	495
Instruments	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	11
Instruments	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	266
Instruments	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	77
Instruments	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	480
Instruments	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Instruments	Other	Transformers	Per Unit	Existing	2%	30	$0.09	47
Instruments	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	298
Instruments	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	54
Instruments	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	279
Instruments	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	685
Instruments	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	217
Instruments	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	114
Instruments	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	453
Instruments	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Instruments	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	144
Instruments	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	91
Instruments	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	80
Instruments	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	190
Instruments	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Instruments	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	9
Instruments	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	512
Instruments	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	111
Mining	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Mining	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	222
Mining	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	446
Mining	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	409
Mining	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	988
Mining	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	3,639
Mining	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Mining	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	2,064
Mining	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	47
Mining	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	1,110
Mining	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	323
Mining	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	1,963
Mining	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Mining	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	3
Mining	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	6
Mining	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	5
Mining	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	12
Mining	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Mining	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	1
Mining	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	33
Mining	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	7
Miscellaneous Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Miscellaneous Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	10

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Miscellaneous Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	26
Miscellaneous Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	25
Miscellaneous Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	62
Miscellaneous Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	931
Miscellaneous Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Miscellaneous Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	3
Miscellaneous Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	186
Miscellaneous Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	20
Miscellaneous Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	137
Miscellaneous Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	383
Miscellaneous Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	739
Miscellaneous Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Miscellaneous Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Miscellaneous Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Miscellaneous Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	640
Miscellaneous Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	227
Miscellaneous Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	10
Miscellaneous Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	1,801
Miscellaneous Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Miscellaneous Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Miscellaneous Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	6,786
Miscellaneous Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Miscellaneous Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,061
Miscellaneous Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Miscellaneous Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	43
Miscellaneous Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	111
Miscellaneous Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	102
Miscellaneous Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	246
Miscellaneous Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	914
Miscellaneous Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Miscellaneous Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	513
Miscellaneous Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	12
Miscellaneous Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	276
Miscellaneous Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	80
Miscellaneous Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	498
Miscellaneous Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Miscellaneous Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	15
Miscellaneous Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	611
Miscellaneous Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	773
Miscellaneous Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	111
Miscellaneous Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	572
Miscellaneous Mfg	Process Other	Cleaners: Professional Wet Cleaning	Per Unit	Existing	29%	15	$7	0
Miscellaneous Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	439
Miscellaneous Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	45
Miscellaneous Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	24
Miscellaneous Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	97
Miscellaneous Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Miscellaneous Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	6
Miscellaneous Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	15
Miscellaneous Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	15
Miscellaneous Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	35
Miscellaneous Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	549

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Miscellaneous Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Miscellaneous Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	2
Miscellaneous Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	83
Miscellaneous Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	20
Nonmetallic Mineral Products	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Nonmetallic Mineral Products	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	152
Nonmetallic Mineral Products	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	204
Nonmetallic Mineral Products	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	202
Nonmetallic Mineral Products	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	496
Nonmetallic Mineral Products	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	7,432
Nonmetallic Mineral Products	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Nonmetallic Mineral Products	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	23
Nonmetallic Mineral Products	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	1,485
Nonmetallic Mineral Products	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	162
Nonmetallic Mineral Products	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	1,096
Nonmetallic Mineral Products	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	515
Nonmetallic Mineral Products	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	992
Nonmetallic Mineral Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Nonmetallic Mineral Products	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Nonmetallic Mineral Products	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Nonmetallic Mineral Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	859
Nonmetallic Mineral Products	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	369
Nonmetallic Mineral Products	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	31
Nonmetallic Mineral Products	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	2,924
Nonmetallic Mineral Products	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Nonmetallic Mineral Products	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Nonmetallic Mineral Products	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	11,015
Nonmetallic Mineral Products	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Nonmetallic Mineral Products	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,723
Nonmetallic Mineral Products	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Nonmetallic Mineral Products	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	466
Nonmetallic Mineral Products	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	625
Nonmetallic Mineral Products	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	574
Nonmetallic Mineral Products	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,386
Nonmetallic Mineral Products	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	5,104
Nonmetallic Mineral Products	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Nonmetallic Mineral Products	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	2,895
Nonmetallic Mineral Products	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	66
Nonmetallic Mineral Products	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	1,557
Nonmetallic Mineral Products	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	453
Nonmetallic Mineral Products	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	2,807
Nonmetallic Mineral Products	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Nonmetallic Mineral Products	Other	Transformers	Per Unit	Existing	2%	30	$0.09	40
Nonmetallic Mineral Products	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	6,013
Nonmetallic Mineral Products	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	7,608
Nonmetallic Mineral Products	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,097
Nonmetallic Mineral Products	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	5,636
Nonmetallic Mineral Products	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	1,369
Nonmetallic Mineral Products	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	774
Nonmetallic Mineral Products	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	135
Nonmetallic Mineral Products	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	1,658
Nonmetallic Mineral Products	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Nonmetallic Mineral Products	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	277
Nonmetallic Mineral Products	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	379
Nonmetallic Mineral Products	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	376
Nonmetallic Mineral Products	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	888
Nonmetallic Mineral Products	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	13,942
Nonmetallic Mineral Products	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Nonmetallic Mineral Products	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	44
Nonmetallic Mineral Products	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	2,114
Nonmetallic Mineral Products	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	514
Paper Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Paper Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	468
Paper Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	390
Paper Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	386
Paper Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	977
Paper Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	14,126
Paper Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Paper Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	94
Paper Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	6,957
Paper Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	309
Paper Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	2,157
Paper Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	383
Paper Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	758
Paper Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Paper Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Paper Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Paper Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	651
Paper Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	309
Paper Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	42
Paper Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	2,446
Paper Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Paper Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Paper Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	9,216
Paper Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Paper Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,441
Paper Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Paper Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	1,022
Paper Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	882
Paper Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	789
Paper Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,905
Paper Mfg	Motors Other	Material Handling	Per Unit	Existing	13%	10	$0.64	6,222
Paper Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Paper Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	3,981
Paper Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	192
Paper Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	2,140
Paper Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	623
Paper Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	3,841
Paper Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Paper Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	30
Paper Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	2,363
Paper Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	3,009
Paper Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	431
Paper Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	2,216

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Paper Mfg	Process Other	Efficient Agitator	Per Unit	Existing	50%	10	$0.08	715
Paper Mfg	Process Other	Effluent Treatment System	Per Unit	Existing	15%	10	$0.07	145
Paper Mfg	Process Other	Mech Pulp: Premium Process	Per Unit	Existing	0%	5	$0.11	4
Paper Mfg	Process Other	Mech Pulp: Refiner Plate Improvement	Per Unit	Existing	0%	1	$0.03	15
Paper Mfg	Process Other	Mech Pulp: Refiner Replacement	Per Unit	Existing	10%	12	$0.58	237
Paper Mfg	Process Other	Paper: Efficient Pulp Screen	Per Unit	Existing	15%	10	$0.18	202
Paper Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	2,117
Paper Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	362
Paper Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	114
Paper Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	781
Paper Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Paper Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	791
Paper Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	673
Paper Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	668
Paper Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,578
Paper Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	23,937
Paper Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Paper Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	160
Paper Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	3,751
Paper Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	887
Plastics Rubber Products	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Plastics Rubber Products	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	193
Plastics Rubber Products	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	218
Plastics Rubber Products	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	192
Plastics Rubber Products	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	471
Plastics Rubber Products	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Plastics Rubber Products	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	22
Plastics Rubber Products	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	1,409
Plastics Rubber Products	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	154
Plastics Rubber Products	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	1,040
Plastics Rubber Products	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	920
Plastics Rubber Products	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	1,773
Plastics Rubber Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Plastics Rubber Products	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Plastics Rubber Products	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Plastics Rubber Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	1,535
Plastics Rubber Products	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	643
Plastics Rubber Products	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	64
Plastics Rubber Products	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	5,095
Plastics Rubber Products	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Plastics Rubber Products	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Plastics Rubber Products	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	19,195
Plastics Rubber Products	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Plastics Rubber Products	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	3,002
Plastics Rubber Products	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Plastics Rubber Products	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	544
Plastics Rubber Products	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	614
Plastics Rubber Products	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	549
Plastics Rubber Products	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,325
Plastics Rubber Products	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Plastics Rubber Products	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	2,747
Plastics Rubber Products	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	63

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Plastics Rubber Products	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	1,500
Plastics Rubber Products	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	430
Plastics Rubber Products	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	2,663
Plastics Rubber Products	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Plastics Rubber Products	Other	Transformers	Per Unit	Existing	2%	30	$0.09	52
Plastics Rubber Products	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	5,705
Plastics Rubber Products	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,035
Plastics Rubber Products	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	5,348
Plastics Rubber Products	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	4,925
Plastics Rubber Products	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	1,518
Plastics Rubber Products	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	265
Plastics Rubber Products	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	3,314
Plastics Rubber Products	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Plastics Rubber Products	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	349
Plastics Rubber Products	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	401
Plastics Rubber Products	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	354
Plastics Rubber Products	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	836
Plastics Rubber Products	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Plastics Rubber Products	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	42
Plastics Rubber Products	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	2,254
Plastics Rubber Products	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	488
Primary Metal Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Primary Metal Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	265
Primary Metal Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	622
Primary Metal Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	616
Primary Metal Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	1,508
Primary Metal Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	23,514
Primary Metal Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Primary Metal Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	134
Primary Metal Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	4,516
Primary Metal Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	494
Primary Metal Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	3,331
Primary Metal Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	1,490
Primary Metal Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	2,891
Primary Metal Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Primary Metal Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Primary Metal Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Primary Metal Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	2,497
Primary Metal Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	1,282
Primary Metal Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	62
Primary Metal Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	10,161
Primary Metal Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Primary Metal Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Primary Metal Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	38,279
Primary Metal Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Primary Metal Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	5,986
Primary Metal Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Primary Metal Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	1,177
Primary Metal Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	2,764
Primary Metal Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	2,538
Primary Metal Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	6,125
Primary Metal Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	22,575

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Primary Metal Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Primary Metal Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	12,799
Primary Metal Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	538
Primary Metal Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	6,883
Primary Metal Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	2,004
Primary Metal Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	12,069
Primary Metal Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Primary Metal Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	86
Primary Metal Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	14,974
Primary Metal Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	19,571
Primary Metal Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	2,738
Primary Metal Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	14,071
Primary Metal Mfg	Process Heat	New Arc Furnace	Per Unit	Existing	45%	10	$0.09	65,664
Primary Metal Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	441
Primary Metal Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	633
Primary Metal Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	110
Primary Metal Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	1,337
Primary Metal Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Primary Metal Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	150
Primary Metal Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	360
Primary Metal Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	357
Primary Metal Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	843
Primary Metal Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	13,839
Primary Metal Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Primary Metal Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	79
Primary Metal Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	2,006
Primary Metal Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	491
Printing Related Support	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Printing Related Support	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	49
Printing Related Support	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	118
Printing Related Support	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	104
Printing Related Support	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	254
Printing Related Support	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Printing Related Support	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	12
Printing Related Support	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	761
Printing Related Support	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	83
Printing Related Support	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	562
Printing Related Support	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	841
Printing Related Support	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	1,620
Printing Related Support	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Printing Related Support	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Printing Related Support	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Printing Related Support	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	1,402
Printing Related Support	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	475
Printing Related Support	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	22
Printing Related Support	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	3,762
Printing Related Support	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Printing Related Support	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Printing Related Support	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	14,174
Printing Related Support	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Printing Related Support	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	2,217
Printing Related Support	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Printing Related Support	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	138
Printing Related Support	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	329
Printing Related Support	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	294
Printing Related Support	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	710
Printing Related Support	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Printing Related Support	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	1,484
Printing Related Support	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	34
Printing Related Support	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	799
Printing Related Support	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	232
Printing Related Support	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	1,439
Printing Related Support	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Printing Related Support	Other	Transformers	Per Unit	Existing	2%	30	$0.09	45
Printing Related Support	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	3,083
Printing Related Support	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	563
Printing Related Support	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	2,890
Printing Related Support	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	1,112
Printing Related Support	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	140
Printing Related Support	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	293
Printing Related Support	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Printing Related Support	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	90
Printing Related Support	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	218
Printing Related Support	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	193
Printing Related Support	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	455
Printing Related Support	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Printing Related Support	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	22
Printing Related Support	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	1,218
Printing Related Support	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	264
Street Lighting	Lighting	LED Traffic Light - Amber (20 Watts)	Per Unit	Existing	0%	8	$6	0
Street Lighting	Lighting	LED Traffic Light - Don't Walk 12"	Per Unit	Existing	29%	8	$0.10	27,828
Street Lighting	Lighting	LED Traffic Light - Don't Walk 8"	Per Unit	Existing	13%	8	$0.23	8,114
Street Lighting	Lighting	LED Traffic Light - Green 10" or 12"	Per Unit	Existing	12%	8	$0.22	8,420
Street Lighting	Lighting	LED Traffic Light - Green 8"	Per Unit	Existing	5%	8	$0.51	0
Street Lighting	Lighting	LED Traffic Light - Green Arrow	Per Unit	Existing	2%	8	$1	0
Street Lighting	Lighting	LED Traffic Light - Red 10" or 12"	Per Unit	Existing	16%	8	$0.08	17,640
Street Lighting	Lighting	LED Traffic Light - Red 8"	Per Unit	Existing	7%	8	$0.17	5,488
Street Lighting	Lighting	LED Traffic Light - Red Arrow (7 Watts)	Per Unit	Existing	7%	8	$0.18	5,110
Street Lighting	Lighting	Streetlight - HPS 100W to LED 62W	Per Unit	Existing	9%	8	$1	0
Street Lighting	Lighting	Streetlight - HPS 150W to LED 113W	Per Unit	Existing	7%	8	$1	0
Street Lighting	Lighting	Streetlight - HPS 200W to LED 120W	Per Unit	Existing	9%	8	$0.68	0
Street Lighting	Lighting	Streetlight - HPS 250W to LED 150W	Per Unit	Existing	8%	8	$0.61	0
Street Lighting	Lighting	Streetlight - HPS 400W to LED 225W	Per Unit	Existing	9%	8	$0.36	1,635
Street Lighting	Lighting	Streetlight - HPS 70W to LED 42W	Per Unit	Existing	9%	8	$1	0
Transportation Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Transportation Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	15
Transportation Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	32
Transportation Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	32
Transportation Equipment Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	78
Transportation Equipment Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	1,161
Transportation Equipment Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Transportation Equipment Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	8
Transportation Equipment Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	232
Transportation Equipment Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	25

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Transportation Equipment Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	171
Transportation Equipment Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	423
Transportation Equipment Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	814
Transportation Equipment Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Transportation Equipment Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Transportation Equipment Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Transportation Equipment Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	705
Transportation Equipment Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	282
Transportation Equipment Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	15
Transportation Equipment Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	2,234
Transportation Equipment Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Transportation Equipment Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Transportation Equipment Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	8,417
Transportation Equipment Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Transportation Equipment Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	1,316
Transportation Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Transportation Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	36
Transportation Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	77
Transportation Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	71
Transportation Equipment Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	171
Transportation Equipment Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	628
Transportation Equipment Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Transportation Equipment Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	357
Transportation Equipment Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	17
Transportation Equipment Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	192
Transportation Equipment Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	56
Transportation Equipment Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	346
Transportation Equipment Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Transportation Equipment Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	19
Transportation Equipment Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	1,896
Transportation Equipment Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	2,399
Transportation Equipment Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	346
Transportation Equipment Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	1,777
Transportation Equipment Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	529
Transportation Equipment Mfg	Process Refrig and Cooling	Desuperheaters	Per Unit	Existing	3%	14	$0.60	166
Transportation Equipment Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	52
Transportation Equipment Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	352
Transportation Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Transportation Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	33
Transportation Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	71
Transportation Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	71
Transportation Equipment Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	168
Transportation Equipment Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	2,628
Transportation Equipment Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Transportation Equipment Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	18
Transportation Equipment Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	398
Transportation Equipment Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	97
Wood Product Mfg	Fans	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Wood Product Mfg	Fans	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	20
Wood Product Mfg	Fans	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	51
Wood Product Mfg	Fans	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	50
Wood Product Mfg	Fans	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	123

Table A.3.5. Industrial Electric Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year KWh Saved	2023 Economic Potential (MWh)
Wood Product Mfg	Fans	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	1,842
Wood Product Mfg	Fans	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Wood Product Mfg	Fans	Motor Rewind	Per Unit	Existing	1%	10	$0.30	12
Wood Product Mfg	Fans	Premium Fan	Per Unit	Existing	20%	10	$0.18	369
Wood Product Mfg	Fans	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	40
Wood Product Mfg	Fans	Variable Speed Drive Control	Per Unit	Existing	14%	10	$0.18	272
Wood Product Mfg	HVAC	Chiller Air Cooled	Per Unit	Existing	4%	20	$0.19	73
Wood Product Mfg	HVAC	Chiller Water-Cooled	Per Unit	Existing	9%	20	$0.19	143
Wood Product Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$4	0
Wood Product Mfg	HVAC	Heat Pump - Ground Source	Per Unit	Existing	32%	15	$11	0
Wood Product Mfg	HVAC	Package Terminal	Per Unit	Existing	0%	9	$1	0
Wood Product Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.36	123
Wood Product Mfg	Lighting	Exit Sign - LED	Per Unit	Existing	2%	11	$0.42	90
Wood Product Mfg	Lighting	Exit Sign - Photoluminescent	Per Unit	Existing	0%	13	$0.85	4
Wood Product Mfg	Lighting	Lighting - CFL Packages	Per Unit	Existing	8%	2	$0.00	713
Wood Product Mfg	Lighting	Lighting - Fluorescent High Performance Packages	Per Unit	Existing	4%	7	$2	0
Wood Product Mfg	Lighting	Lighting - Fluorescent Reduced Wattage Packages	Per Unit	Existing	9%	5	$0.90	0
Wood Product Mfg	Lighting	Lighting - High Bay Fluorescent High Output Packages	Per Unit	Existing	49%	6	$0.09	2,686
Wood Product Mfg	Lighting	Lighting - High Intensity Discharge Packages	Per Unit	Existing	10%	5	$0.46	0
Wood Product Mfg	Lighting	Lighting - LED Lamp Packages	Per Unit	Existing	10%	11	$0.22	420
Wood Product Mfg	Motors Other	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Wood Product Mfg	Motors Other	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	53
Wood Product Mfg	Motors Other	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	133
Wood Product Mfg	Motors Other	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	122
Wood Product Mfg	Motors Other	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	295
Wood Product Mfg	Motors Other	Material Handling	Per Unit	Existing	5%	10	$0.46	1,092
Wood Product Mfg	Motors Other	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Wood Product Mfg	Motors Other	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	617
Wood Product Mfg	Motors Other	Motor Rewind	Per Unit	Existing	1%	10	$0.30	28
Wood Product Mfg	Motors Other	Replace Pneumatic Conveyor	Per Unit	Existing	29%	10	$0.01	7,270
Wood Product Mfg	Motors Other	Switch from Belt drive to Direct Drive	Per Unit	Existing	8%	12	$0.21	332
Wood Product Mfg	Motors Other	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	96
Wood Product Mfg	Motors Other	Variable Speed Drive Control	Per Unit	Existing	13%	10	$0.20	596
Wood Product Mfg	Other	Power Quality-Improving Appliances	Per Unit	Existing	0%	20	$2	0
Wood Product Mfg	Other	Transformers	Per Unit	Existing	2%	30	$0.09	10
Wood Product Mfg	Process AirComp	Air Compressor Optimization	Per Unit	Existing	21%	10	$0.09	1,539
Wood Product Mfg	Process AirComp	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	1,876
Wood Product Mfg	Process AirComp	Motor Management Plan	Per Unit	Existing	3%	10	$0.07	280
Wood Product Mfg	Process AirComp	VFD Controlled Compressor	Per Unit	Existing	22%	15	$0.49	1,438
Wood Product Mfg	Process Refrig and Cooling	Chiller - Water Piping Loop with VSD Control	Per Unit	Existing	9%	15	$0.27	149
Wood Product Mfg	Process Refrig and Cooling	Synchronous Belts	Per Unit	Existing	1%	10	$0.21	25
Wood Product Mfg	Process Refrig and Cooling	VFD on Cooling Tower Fans	Per Unit	Existing	6%	15	$0.08	165
Wood Product Mfg	Pumps	Enhanced (Ultra-PE) Motor 1-15 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	0
Wood Product Mfg	Pumps	Enhanced (Ultra-PE) Motor 125-200 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$1	35
Wood Product Mfg	Pumps	Enhanced (Ultra-PE) Motor 20-40 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.79	90
Wood Product Mfg	Pumps	Enhanced (Ultra-PE) Motor 250-500 HP, 1200-3600 RPM	Per Unit	Existing	0%	15	$0.30	89
Wood Product Mfg	Pumps	Enhanced (Ultra-PE) Motor 50-100 HP, 1200-3600 RPM	Per Unit	Existing	1%	15	$0.19	211
Wood Product Mfg	Pumps	Integrated Plant Energy Management	Per Unit	Existing	50%	11	$0.19	3,458
Wood Product Mfg	Pumps	Motor Early Retirement	Per Unit	Existing	3%	10	$4	0
Wood Product Mfg	Pumps	Motor Rewind	Per Unit	Existing	1%	10	$0.30	22
Wood Product Mfg	Pumps	Pump System Optimization	Per Unit	Existing	12%	12	$0.25	501
Wood Product Mfg	Pumps	Variable Speed Drive Control	Per Unit	Existing	4%	10	$0.21	128

Table A.3.6. Industrial Gas Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Agriculture	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Agriculture	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	14
Agriculture	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	8
Agriculture	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	1
Agriculture	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	3
Agriculture	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	17
Agriculture	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	118
Agriculture	Indirect Boiler	Efficient Burners	Per Unit	Existing	22%	15	$0.17	220
Agriculture	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	75
Agriculture	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	38
Agriculture	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	28
Agriculture	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	25
Agriculture	Process Heat	Efficient Drying	Per Unit	Existing	15%	20	$4	163
Agriculture	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	11
Agriculture	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	300
Agriculture	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Agriculture	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Chemical Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Chemical Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	8
Chemical Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	5
Chemical Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	1
Chemical Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	6
Chemical Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	31
Chemical Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	212
Chemical Mfg	Indirect Boiler	Efficient Burners	Per Unit	Existing	22%	15	$0.17	396
Chemical Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	135
Chemical Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	68
Chemical Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	51
Chemical Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	46
Chemical Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	22
Chemical Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	259
Chemical Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Chemical Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Chemical Mfg	Process Heat	Thermal Oxidizer Upgrades	Per Unit	Existing	43%	15	$2	460
Electrical Equipment Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Electrical Equipment Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	1
Electrical Equipment Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	0
Electrical Equipment Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Electrical Equipment Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Electrical Equipment Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Electrical Equipment Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	0
Electrical Equipment Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	0
Electrical Equipment Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Electrical Equipment Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Electrical Equipment Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Electrical Equipment Mfg	Process Heat	Efficient Process Furnaces	Per Unit	Existing	7%	25	$1	0
Electrical Equipment Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Electrical Equipment Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	1
Electrical Equipment Mfg	Process Heat	Optimized Furnace Operations	Per Unit	Existing	6%	15	$0.41	0
Electrical Equipment Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Electrical Equipment Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0

Table A.3.6. Industrial Gas Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Fabricated Metal Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Fabricated Metal Products	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	2
Fabricated Metal Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	1
Fabricated Metal Products	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Fabricated Metal Products	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Fabricated Metal Products	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Fabricated Metal Products	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	2
Fabricated Metal Products	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1
Fabricated Metal Products	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	1
Fabricated Metal Products	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Fabricated Metal Products	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Fabricated Metal Products	Process Heat	Efficient Process Furnaces	Per Unit	Existing	7%	25	$1	3
Fabricated Metal Products	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	1
Fabricated Metal Products	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	13
Fabricated Metal Products	Process Heat	Optimized Furnace Operations	Per Unit	Existing	6%	16	$0.41	3
Fabricated Metal Products	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Fabricated Metal Products	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Food Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Food Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	25
Food Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	15
Food Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	2
Food Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	6
Food Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	31
Food Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	211
Food Mfg	Indirect Boiler	Efficient Burners	Per Unit	Existing	22%	15	$0.17	393
Food Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	134
Food Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	68
Food Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	51
Food Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	45
Food Mfg	Process Heat	Efficient Drying	Per Unit	Existing	15%	20	$4	293
Food Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	20
Food Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	537
Food Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Food Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Furniture Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Furniture Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	1
Furniture Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	0
Furniture Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Furniture Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Furniture Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Furniture Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	0
Furniture Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	0
Furniture Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Furniture Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Furniture Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Furniture Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Furniture Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	1
Furniture Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Furniture Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Industrial Machinery	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Industrial Machinery	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	25

Table A.3.6. Industrial Gas Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Industrial Machinery	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	15
Industrial Machinery	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	2
Industrial Machinery	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Industrial Machinery	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	2
Industrial Machinery	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	12
Industrial Machinery	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	8
Industrial Machinery	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	4
Industrial Machinery	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	3
Industrial Machinery	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	3
Industrial Machinery	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	2
Industrial Machinery	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	24
Industrial Machinery	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Industrial Machinery	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Instruments	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Instruments	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	0
Instruments	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	0
Instruments	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Instruments	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Instruments	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Instruments	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	0
Instruments	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	0
Instruments	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Instruments	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Instruments	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Instruments	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Instruments	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	0
Instruments	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Instruments	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Miscellaneous Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Miscellaneous Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	3
Miscellaneous Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	2
Miscellaneous Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Miscellaneous Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Miscellaneous Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Miscellaneous Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	1
Miscellaneous Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	0
Miscellaneous Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Miscellaneous Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Miscellaneous Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Miscellaneous Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Miscellaneous Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	2
Miscellaneous Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Miscellaneous Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Nonmetallic Mineral Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Nonmetallic Mineral Products	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	2
Nonmetallic Mineral Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	1
Nonmetallic Mineral Products	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Nonmetallic Mineral Products	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Nonmetallic Mineral Products	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Nonmetallic Mineral Products	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	2
Nonmetallic Mineral Products	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1

Table A.3.6. Industrial Gas Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Nonmetallic Mineral Products	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	1
Nonmetallic Mineral Products	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Nonmetallic Mineral Products	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Nonmetallic Mineral Products	Process Heat	Efficient Process Furnaces	Per Unit	Existing	7%	25	$1	52
Nonmetallic Mineral Products	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	4
Nonmetallic Mineral Products	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	71
Nonmetallic Mineral Products	Process Heat	Optimized Furnace Operations	Per Unit	Existing	6%	17	$0.41	48
Nonmetallic Mineral Products	Process Heat	Oxyfuel	Per Unit	Existing	15%	21	$1	154
Nonmetallic Mineral Products	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Nonmetallic Mineral Products	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Paper Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Paper Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	1
Paper Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	0
Paper Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Paper Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Paper Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	1
Paper Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	9
Paper Mfg	Indirect Boiler	Efficient Burners	Per Unit	Existing	22%	15	$0.17	11
Paper Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	6
Paper Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	3
Paper Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	2
Paper Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	2
Paper Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	1
Paper Mfg	Process Heat	High Efficiency Pulping	Per Unit	Existing	16%	20	$0.01	9
Paper Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	19
Paper Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Paper Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Plastics Rubber Products	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Plastics Rubber Products	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	2
Plastics Rubber Products	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	1
Plastics Rubber Products	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Plastics Rubber Products	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Plastics Rubber Products	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Plastics Rubber Products	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	3
Plastics Rubber Products	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	2
Plastics Rubber Products	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	1
Plastics Rubber Products	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	1
Plastics Rubber Products	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	1
Plastics Rubber Products	Process Heat	Efficient Process Furnaces	Per Unit	Existing	7%	25	$1	1
Plastics Rubber Products	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Plastics Rubber Products	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	7
Plastics Rubber Products	Process Heat	Optimized Furnace Operations	Per Unit	Existing	6%	18	$0.41	1
Plastics Rubber Products	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Plastics Rubber Products	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Primary Metal Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Primary Metal Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	1
Primary Metal Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	1
Primary Metal Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Primary Metal Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Primary Metal Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Primary Metal Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	1

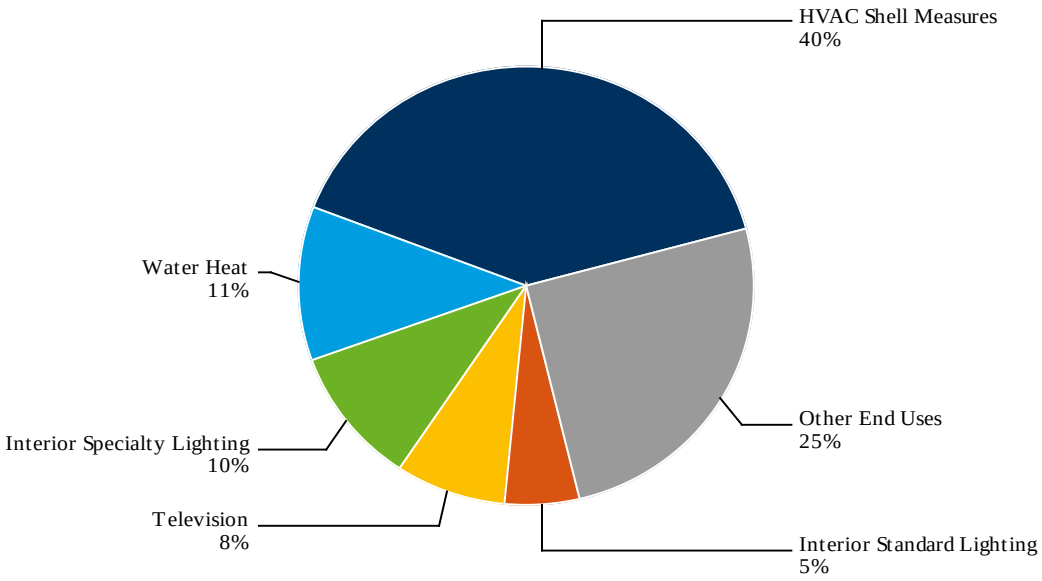
Table A.3.6. Industrial Gas Measure Details

Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Primary Metal Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1
Primary Metal Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Primary Metal Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Primary Metal Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Primary Metal Mfg	Process Heat	Efficient Process Furnaces	Per Unit	Existing	7%	25	$1	17
Primary Metal Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	1
Primary Metal Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	49
Primary Metal Mfg	Process Heat	Optimized Furnace Operations	Per Unit	Existing	6%	19	$0.41	17
Primary Metal Mfg	Process Heat	Oxyfuel	Per Unit	Existing	15%	22	$1	7
Primary Metal Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Primary Metal Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Printing Related Support	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Printing Related Support	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	2
Printing Related Support	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	1
Printing Related Support	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Printing Related Support	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Printing Related Support	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Printing Related Support	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	1
Printing Related Support	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1
Printing Related Support	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0
Printing Related Support	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Printing Related Support	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Printing Related Support	Process Heat	Efficient Drying	Per Unit	Existing	15%	20	$4	9
Printing Related Support	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	1
Printing Related Support	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	14
Printing Related Support	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Printing Related Support	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Transportation Equipment Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Transportation Equipment Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	5
Transportation Equipment Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	3
Transportation Equipment Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Transportation Equipment Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Transportation Equipment Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Transportation Equipment Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	2
Transportation Equipment Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1
Transportation Equipment Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	1
Transportation Equipment Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Transportation Equipment Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Transportation Equipment Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	1
Transportation Equipment Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	8
Transportation Equipment Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Transportation Equipment Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0
Wood Product Mfg	HVAC	Duct Repair And Sealing	Per Unit	Existing	3%	18	$20	0
Wood Product Mfg	HVAC	Efficient Furnace	Per Unit	Existing	17%	20	$2	0
Wood Product Mfg	HVAC	Thermostat Programmable	Per Unit	Existing	3%	15	$0.62	0
Wood Product Mfg	HVAC	Waste Heat Recovery	Per Unit	Existing	5%	15	$2	0
Wood Product Mfg	Indirect Boiler	Blowdown Steam Heat Recovery	Per Unit	Existing	1%	15	$2	0
Wood Product Mfg	Indirect Boiler	Economizer	Per Unit	Existing	6%	20	$6	0
Wood Product Mfg	Indirect Boiler	Efficient Boiler	Per Unit	Existing	12%	20	$1	1
Wood Product Mfg	Indirect Boiler	Improved Boiler Insulation	Per Unit	Existing	8%	15	$6	1
Wood Product Mfg	Indirect Boiler	Improved Boiler Load Control	Per Unit	Existing	4%	15	$1	0

Table A.3.6. Industrial Gas Measure Details

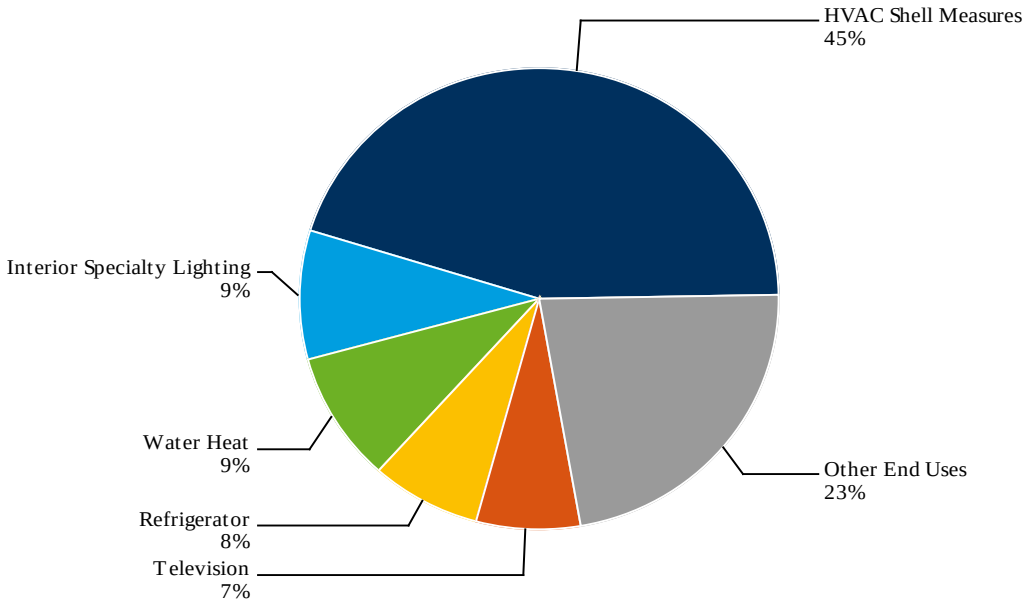
Segment	End Use	Measure Name	Unit Description	Construction Vintage	Percent Savings	Measure Life	Cost per Base Year Therm Saved	2023 Economic Potential (Thousand Therms)
Wood Product Mfg	Indirect Boiler	Improved Boiler Process Control	Per Unit	Existing	3%	15	$1	0
Wood Product Mfg	Indirect Boiler	Upgrade Burner Efficiency	Per Unit	Existing	8%	20	$1	0
Wood Product Mfg	Process Heat	Efficient Drying	Per Unit	Existing	15%	20	$4	7
Wood Product Mfg	Process Heat	Heat Recovery / Economizer	Per Unit	Existing	3%	15	$2	0
Wood Product Mfg	Process Heat	Improved Controls	Per Unit	Existing	30%	15	$0.48	3
Wood Product Mfg	Process Heat	Steam Trap Maintenance	Per Unit	Existing	13%	2	$4	0
Wood Product Mfg	Process Heat	Steam Trap Replacement	Per Unit	Existing	15%	2	$5	0

Figure A.4.1.1 Electric Technical Potential: Residential by End Use



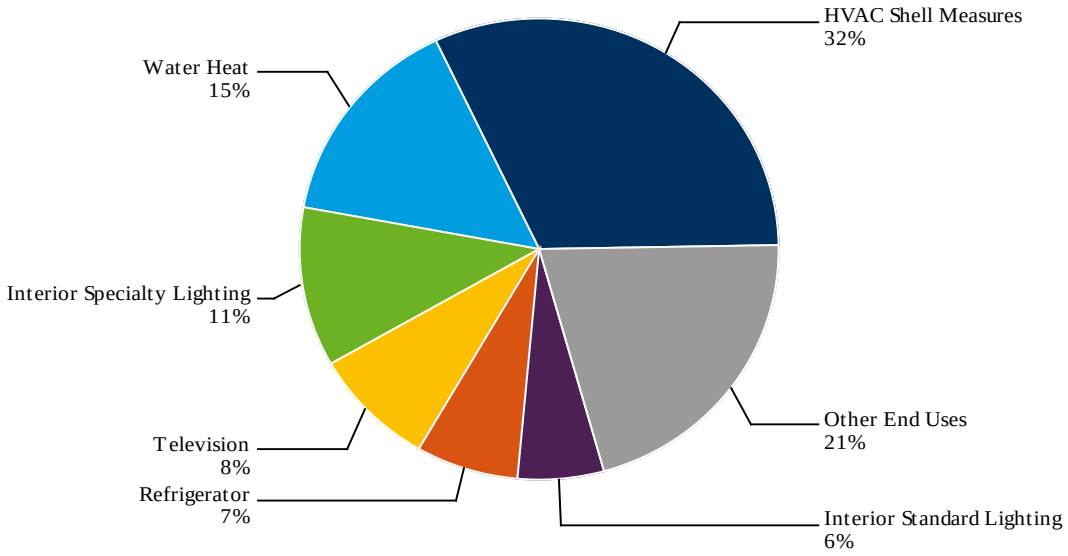
Note: 'Other End Uses' includes:
Refrigerator: 4%, Central Cooling: 4%, Set Top Box: 3%, Other Plug Load: 3%, Freezer: 2%, Computer: 2%
Dryer: 2%, Exterior Lighting: 1%, Cooking Oven: 1%, Dehumidifier: 1%, Printer: 1%, DVD: 1%
Monitor: 0%, Home Audio System: 0%, Pool Pump: 0%, Heat Pump: 0%, Copier: 0%, Room Cooling: 0%

Figure A.4.1.2 Electric Technical Potential: Residential Low Income Multi Family by End Use



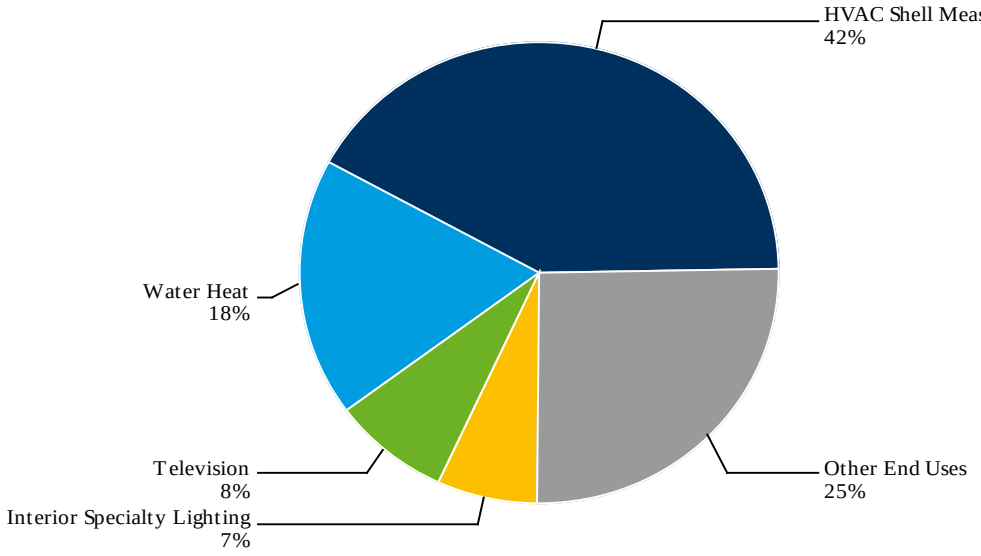
Note: 'Other End Uses' includes:
Interior Standard Lighting: 5%, Other Plug Load: 4%, Set Top Box: 3%, Central Cooling: 3%, Cooking Oven: 1%, Computer: 1%
Exterior Lighting: 1%, Freezer: 1%, Dehumidifier: 1%, Dryer: 1%, Printer: 1%, DVD: 0%

Figure A.4.1.3 Electric Technical Potential: Residential Low Income Single Family by End Use



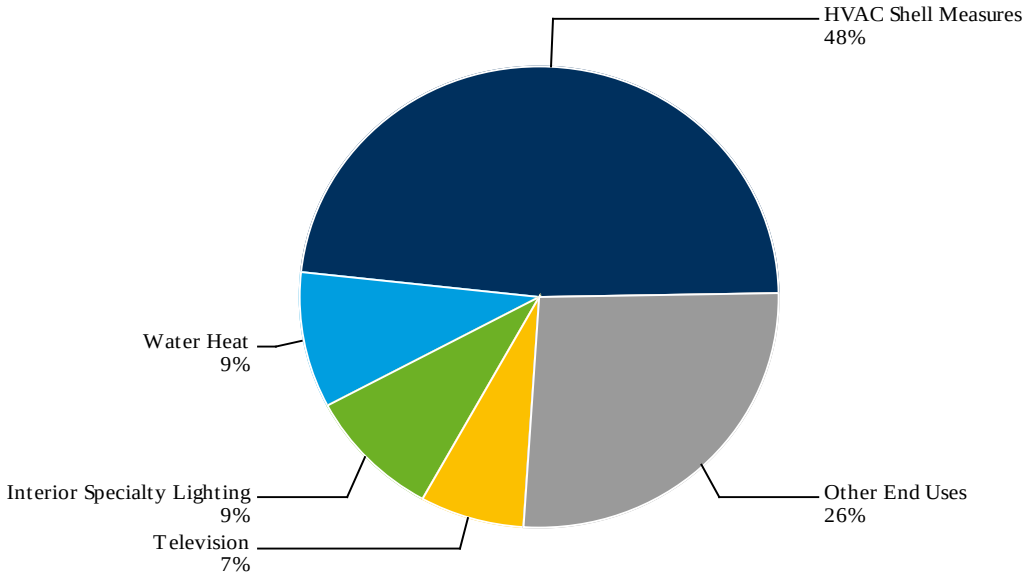
Note: 'Other End Uses' includes:
Set Top Box: 3%, Other Plug Load: 3%, Freezer: 3%, Central Cooling: 2%, Computer: 2%, Dryer: 2%
Exterior Lighting: 1%, Dehumidifier: 1%, Cooking Oven: 1%, DVD: 1%, Printer: 1%, Monitor: 0%

Figure A.4.1.4 Electric Technical Potential: Residential Manufactured by End Use



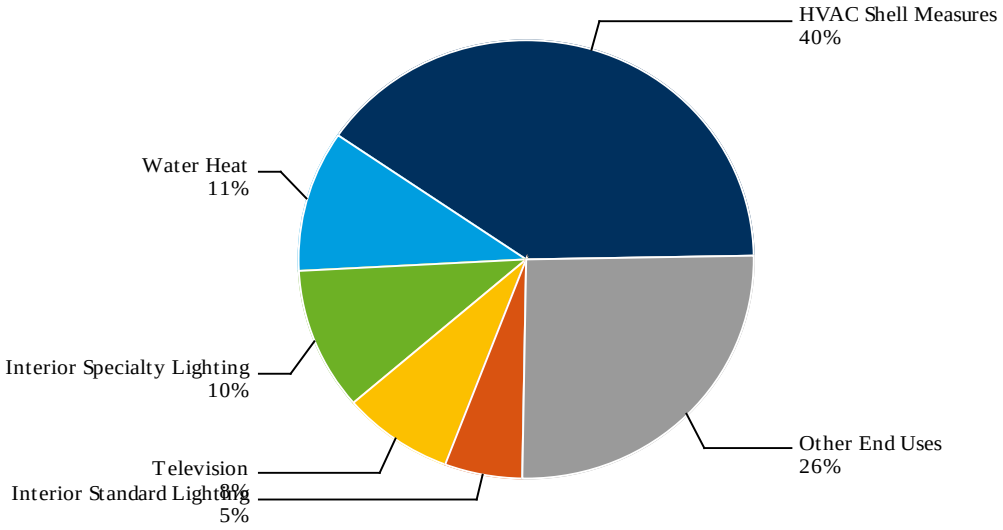
Note: 'Other End Uses' includes:
Set Top Box: 4%, Refrigerator: 4%, Interior Standard Lighting: 4%, Central Cooling: 3%, Other Plug Load: 3%, Dryer: 2%
Computer: 1%, Freezer: 1%, Exterior Lighting: 1%, Dehumidifier: 1%, DVD: 1%, Printer: 0%

Figure A.4.1.5 Electric Technical Potential: Residential Multi Family by End Use



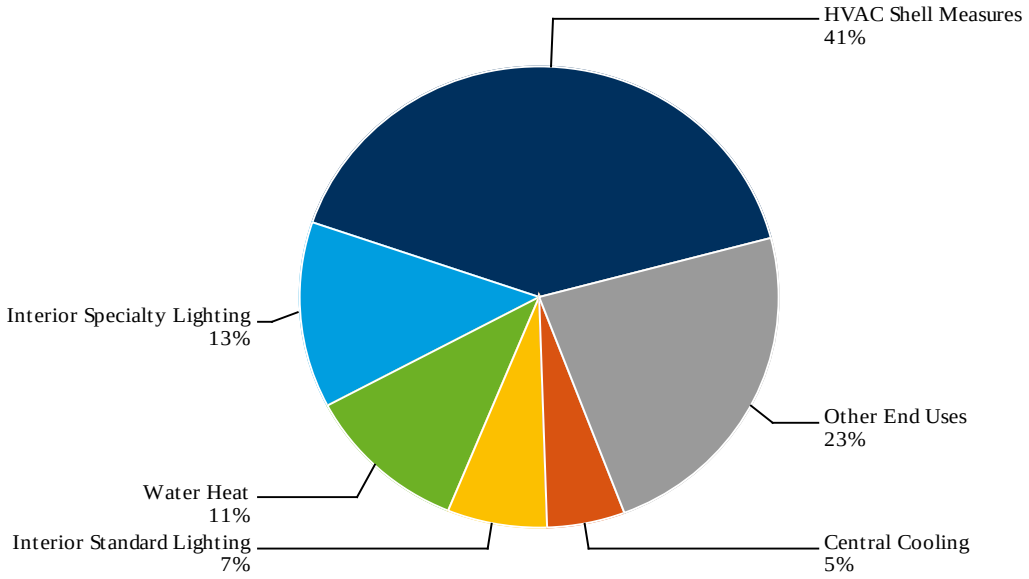
Note: 'Other End Uses' includes:
Interior Standard Lighting: 5%, Refrigerator: 4%, Other Plug Load: 4%, Set Top Box: 3%, Central Cooling: 3%, Cooking Oven: 1%
Computer: 1%, Exterior Lighting: 1%, Dehumidifier: 1%, Dryer: 1%, Printer: 1%, DVD: 0%

Figure A.4.1.6 Electric Technical Potential: Residential Single Family by End Use



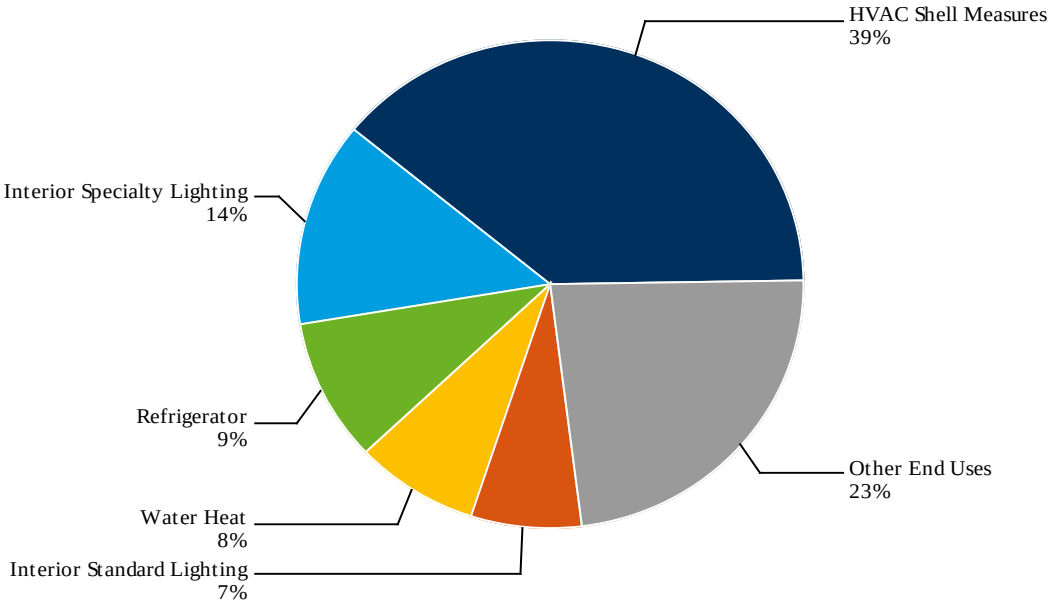
Note: 'Other End Uses' includes:
Central Cooling: 4%, Refrigerator: 4%, Set Top Box: 3%, Other Plug Load: 3%, Freezer: 2%, Computer: 2%
Dryer: 2%, Exterior Lighting: 1%, Cooking Oven: 1%, Dehumidifier: 1%, DVD: 1%, Printer: 1%
Monitor: 0%, Home Audio System: 0%, Pool Pump: 0%, Heat Pump: 0%, Copier: 0%, Room Cooling: 0%

Figure A.4.1.7 Electric Economic Potential: Residential by End Use



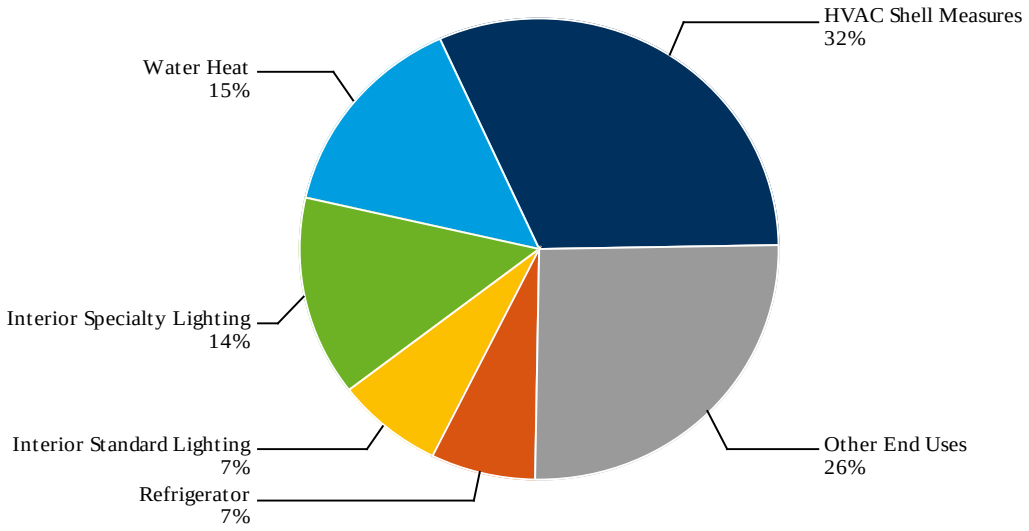
Note: 'Other End Uses' includes:
Television: 4%, Set Top Box: 4%, Refrigerator: 3%, Other Plug Load: 3%, Freezer: 2%, Computer: 2%
Exterior Lighting: 1%, Dehumidifier: 1%, Dryer: 1%, DVD: 1%, Pool Pump: 0%, Printer: 0%

Figure A.4.1.8 Electric Economic Potential: Residential Low Income Multi Family by End Use



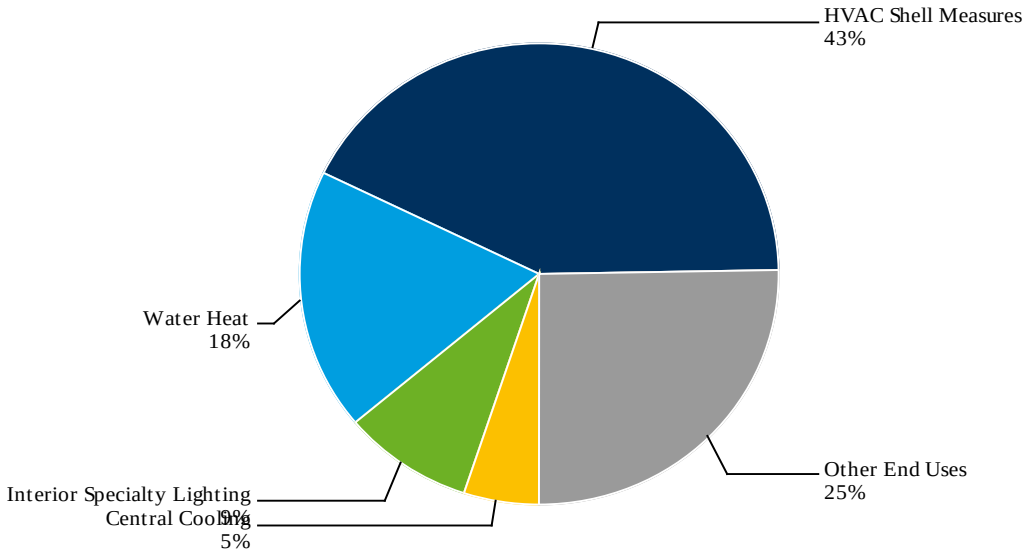
Note: 'Other End Uses' includes:
Television: 4%, Set Top Box: 4%, Other Plug Load: 4%, Central Cooling: 4%, Computer: 2%, Freezer: 1%

Figure A.4.1.9 Electric Economic Potential: Residential Low Income Single Family by End Use



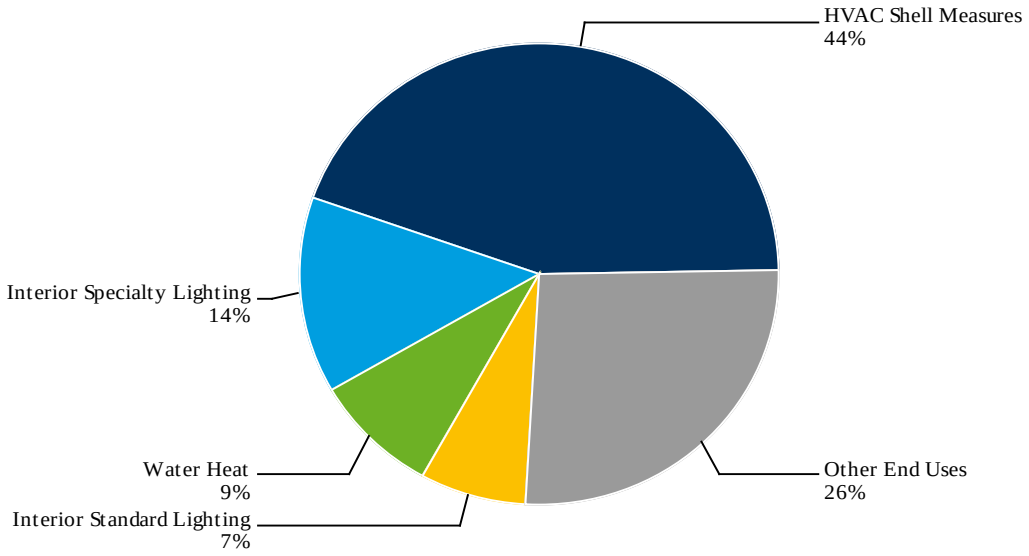
Note: 'Other End Uses' includes:
Television: 4%, Set Top Box: 4%, Central Cooling: 4%, Freezer: 3%, Other Plug Load: 3%, Computer: 3%
Exterior Lighting: 1%, Dehumidifier: 1%, Dryer: 1%, DVD: 1%, Printer: 0%, Room Cooling: 0%

Figure A.4.1.10 Electric Economic Potential: Residential Manufactured by End Use



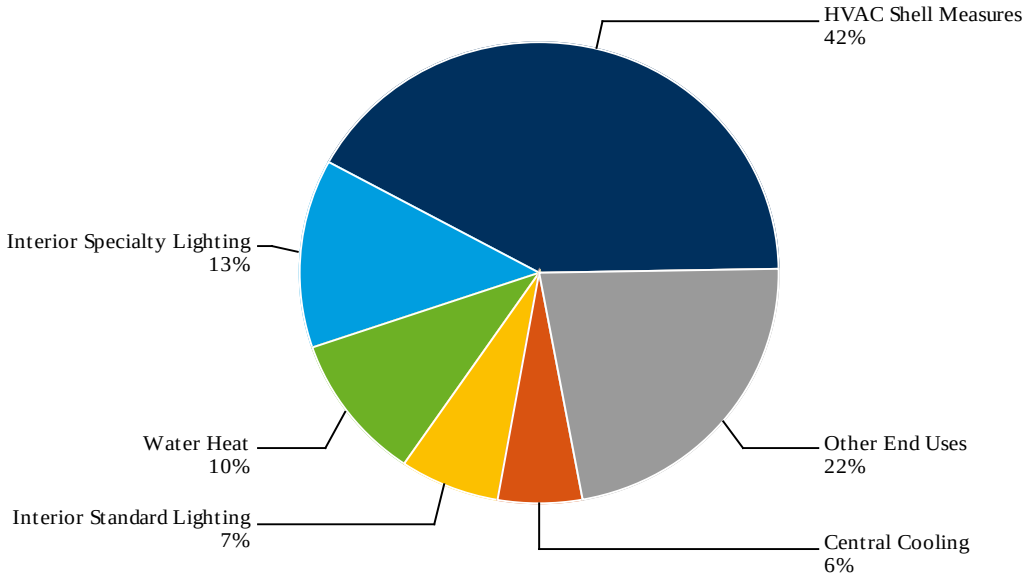
Note: 'Other End Uses' includes:
Set Top Box: 5%, Interior Standard Lighting: 5%, Television: 4%, Refrigerator: 3%, Other Plug Load: 2%, Computer: 2%
Freezer: 2%, Exterior Lighting: 1%, Dehumidifier: 1%, DVD: 1%, Printer: 0%, Room Cooling: 0%

Figure A.4.1.11 Electric Economic Potential: Residential Multi Family by End Use



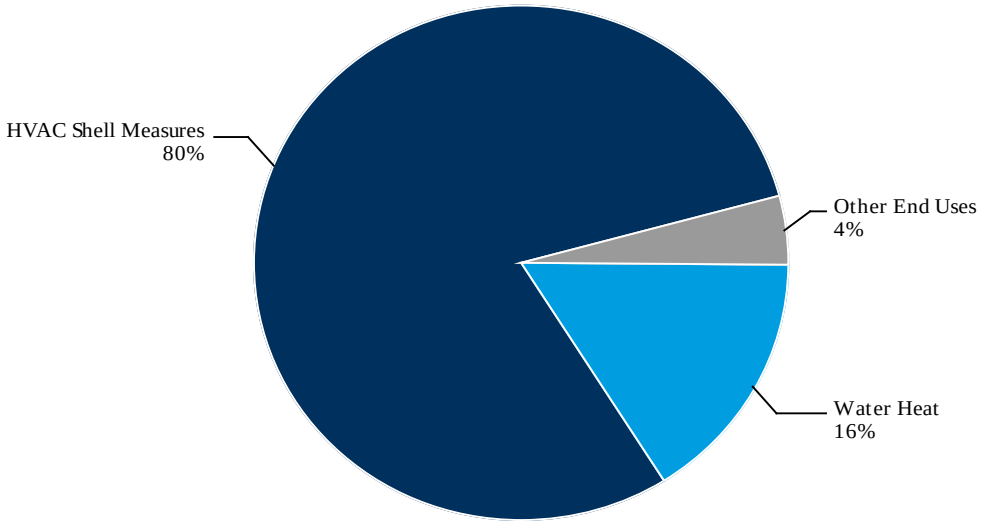
Note: 'Other End Uses' includes:
Television: 4%, Set Top Box: 4%, Other Plug Load: 4%, Central Cooling: 4%, Refrigerator: 4%, Computer: 2%
Exterior Lighting: 1%, Dehumidifier: 1%, Freezer: 1%, DVD: 1%, Printer: 0%, Room Cooling: 0%

Figure A.4.1.12 Electric Economic Potential: Residential Single Family by End Use



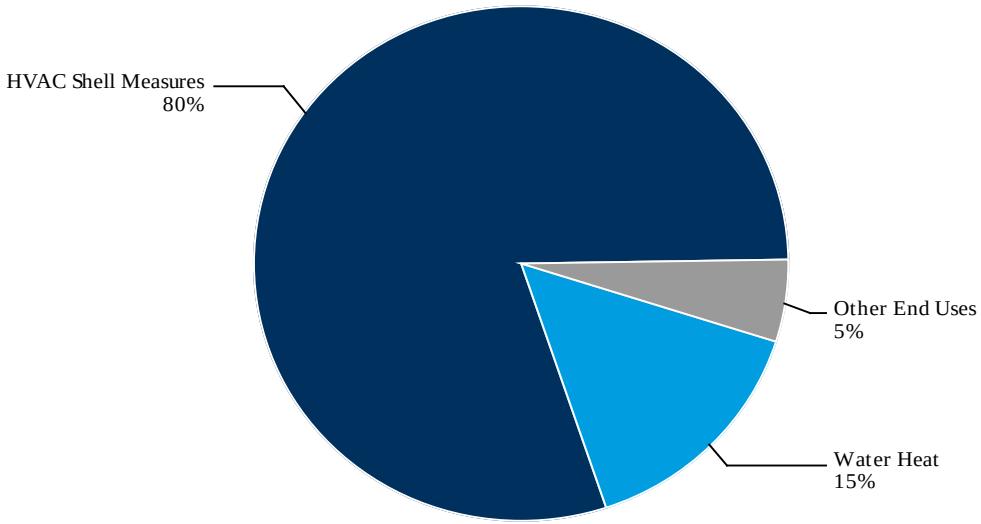
Note: 'Other End Uses' includes:
Television: 4%, Set Top Box: 4%, Freezer: 3%, Other Plug Load: 2%, Computer: 2%, Refrigerator: 2%
Exterior Lighting: 1%, Dryer: 1%, Dehumidifier: 1%, DVD: 1%, Pool Pump: 1%, Printer: 0%

Figure A.4.2.1 Gas Technical Potential: Residential by End Use



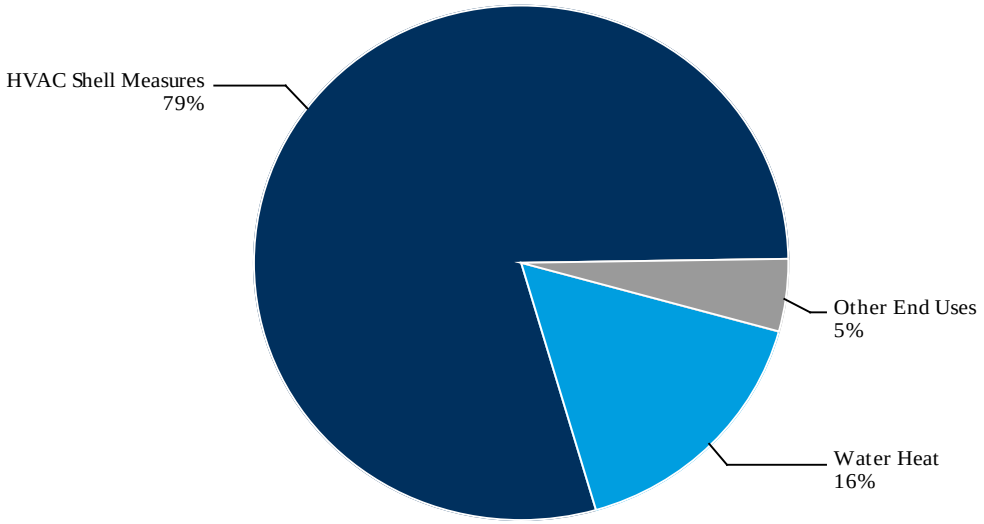
Note: 'Other End Uses' includes:

Figure A.4.2.2 Gas Technical Potential: Residential Low Income Multi Family by End Use



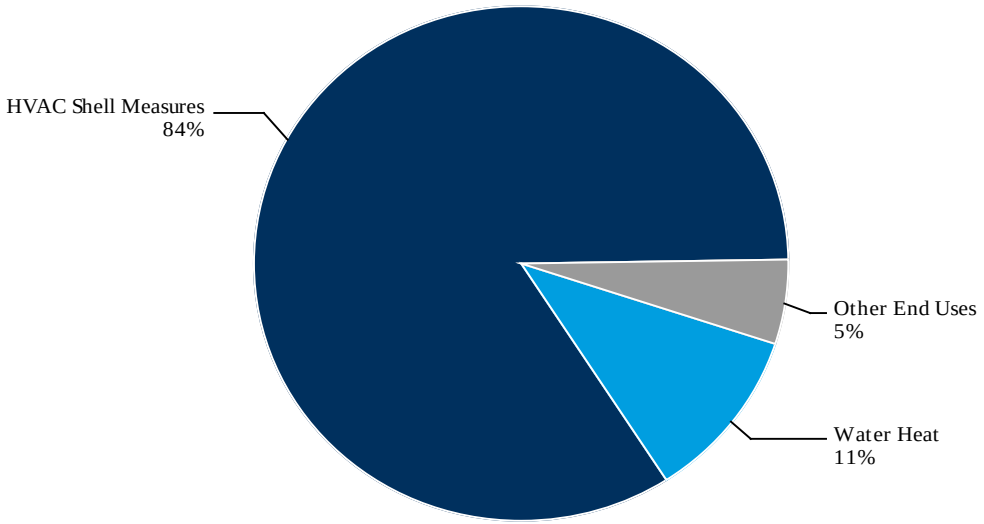
Note: 'Other End Uses' includes:

Figure A.4.2.3 Gas Technical Potential: Residential Low Income Single Family by End Use



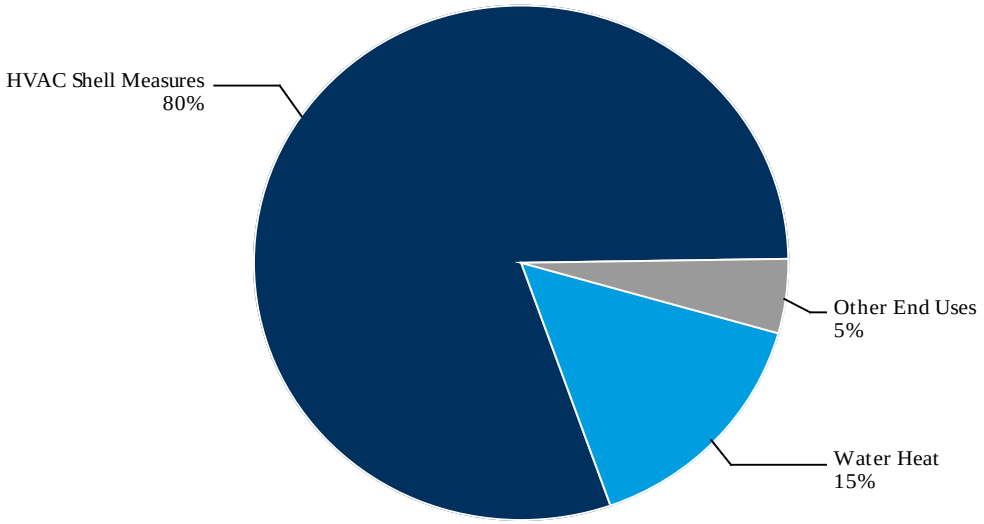
Note: 'Other End Uses' includes:

Figure A.4.2.4 Gas Technical Potential: Residential Manufactured by End Use



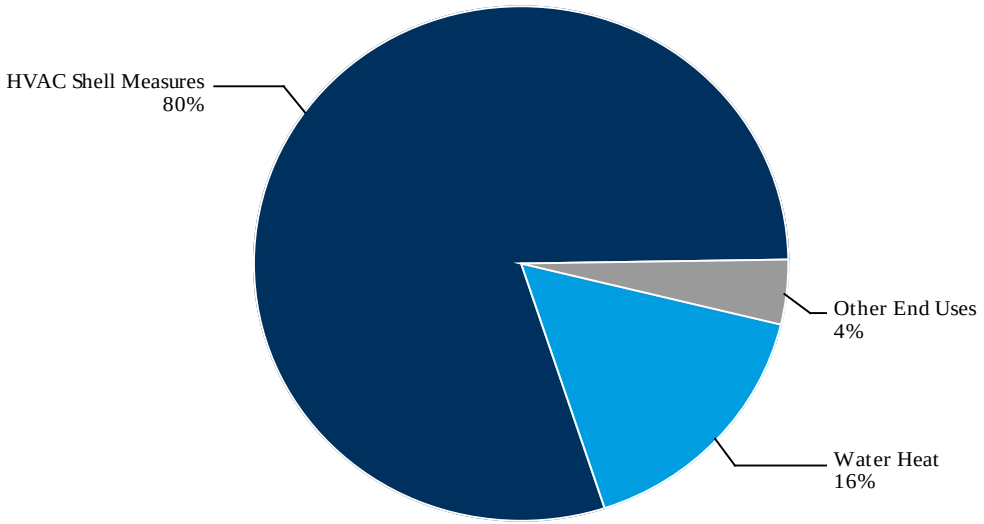
Note: 'Other End Uses' includes:

Figure A.4.2.5 Gas Technical Potential: Residential Multi Family by End Use



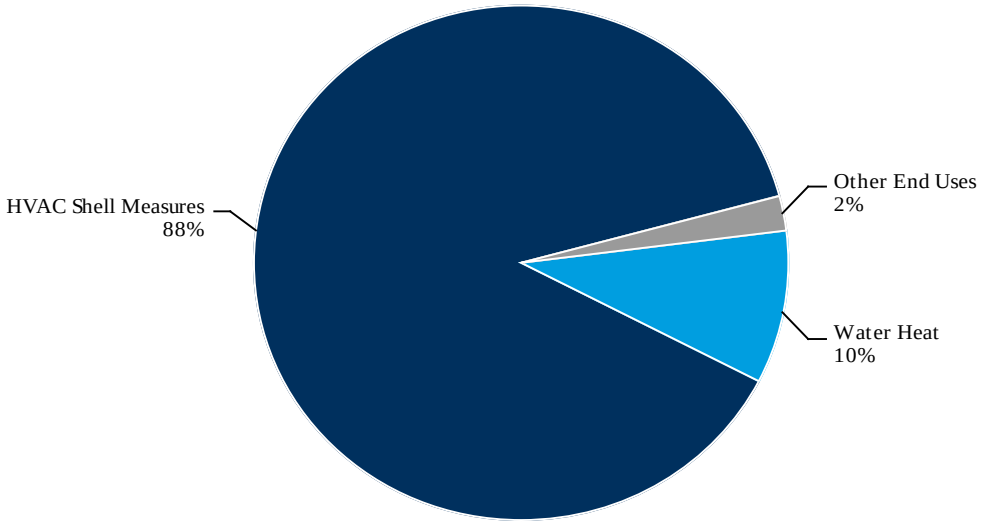
Note: 'Other End Uses' includes:

Figure A.4.2.6 Gas Technical Potential: Residential Single Family by End Use



Note: 'Other End Uses' includes:

Figure A.4.2.7 Gas Economic Potential: Residential by End Use



Note: 'Other End Uses' includes:

Figure A.4.2.8 Gas Economic Potential: Residential Low Income Multi Family by End Use

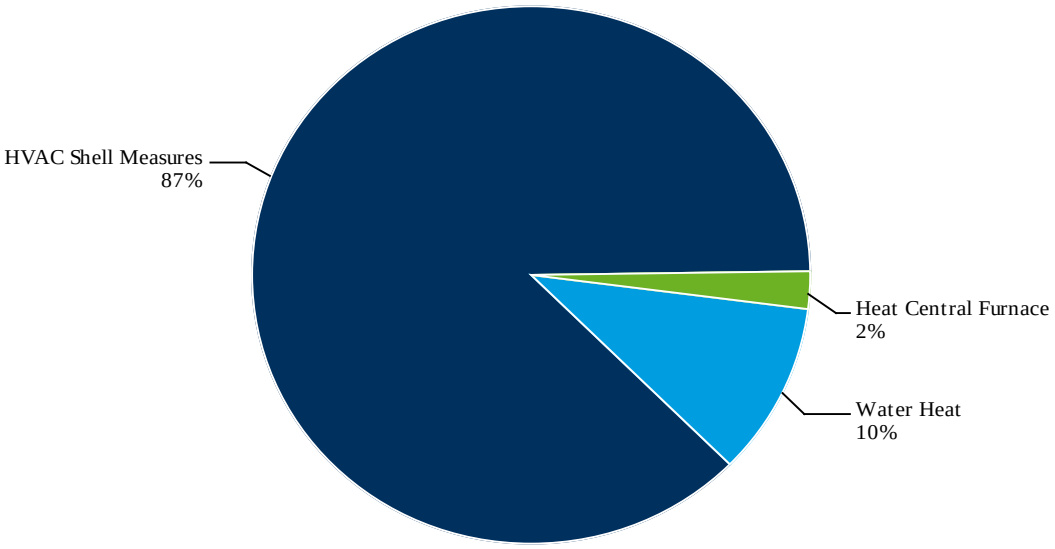


Figure A.4.2.9 Gas Economic Potential: Residential Low Income Single Family by End Use

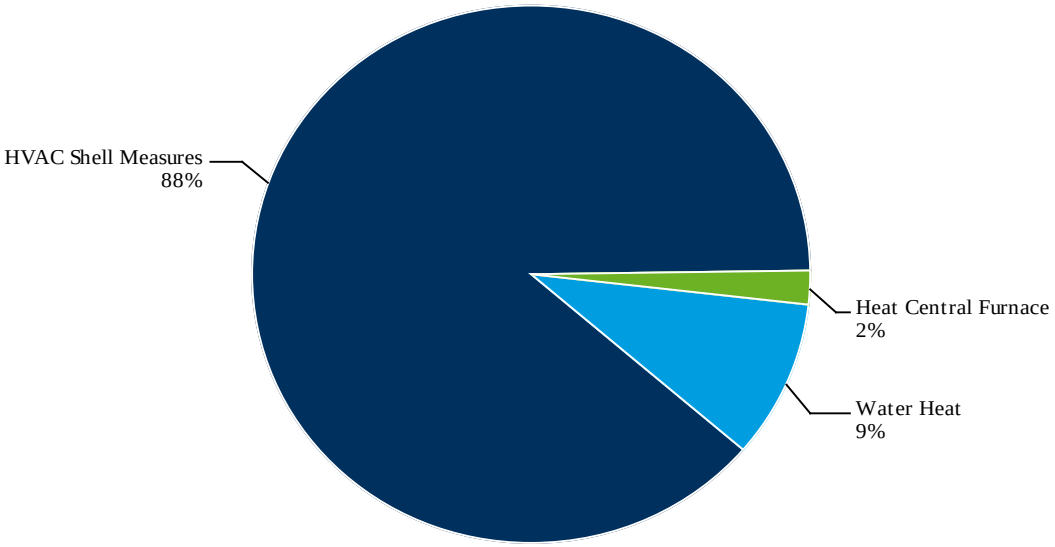
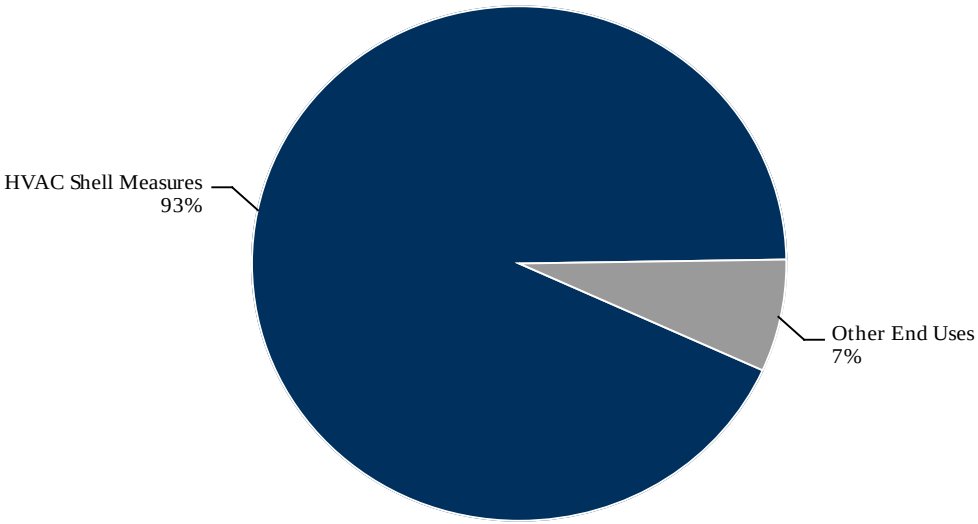


Figure A.4.2.10 Gas Economic Potential: Residential Manufactured by End Use



Note: 'Other End Uses' includes:

Figure A.4.2.11 Gas Economic Potential: Residential Multi Family by End Use

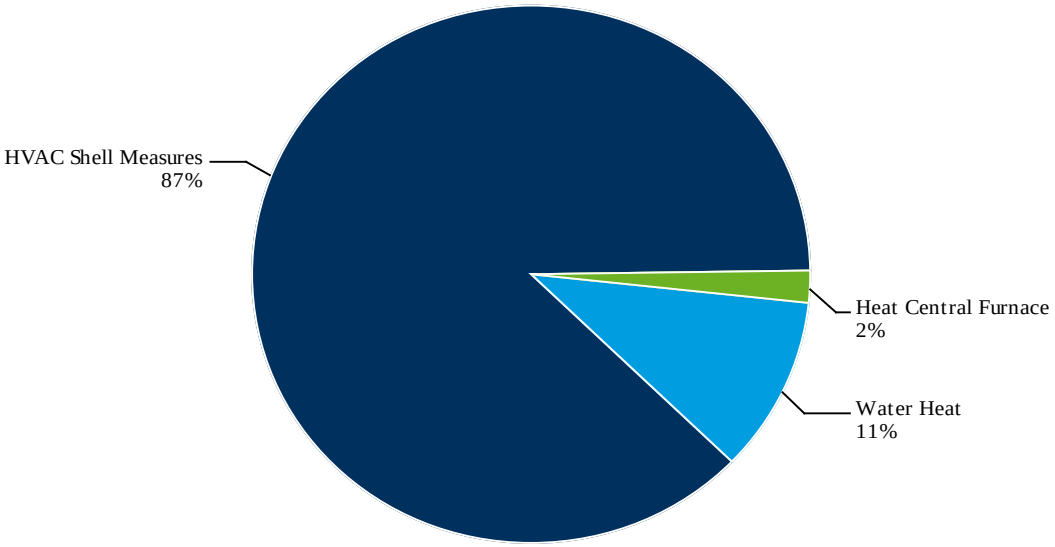
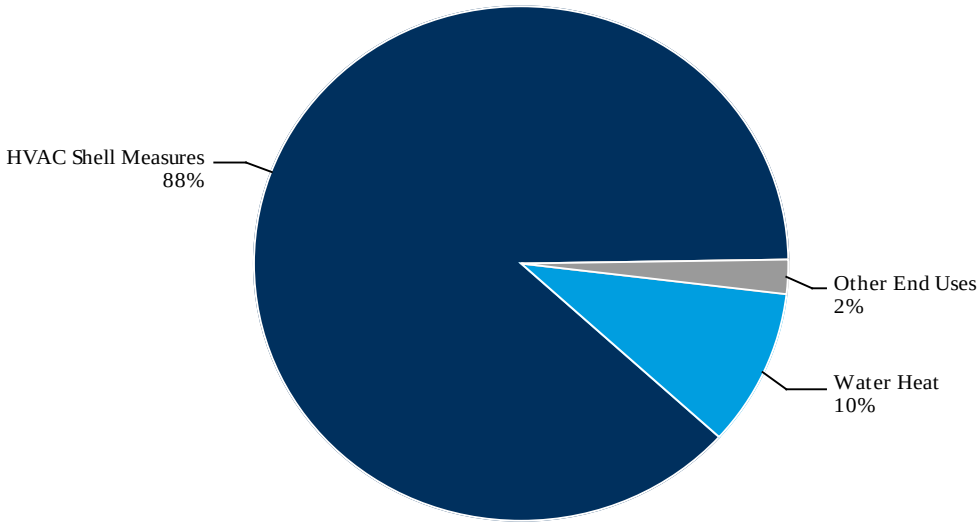
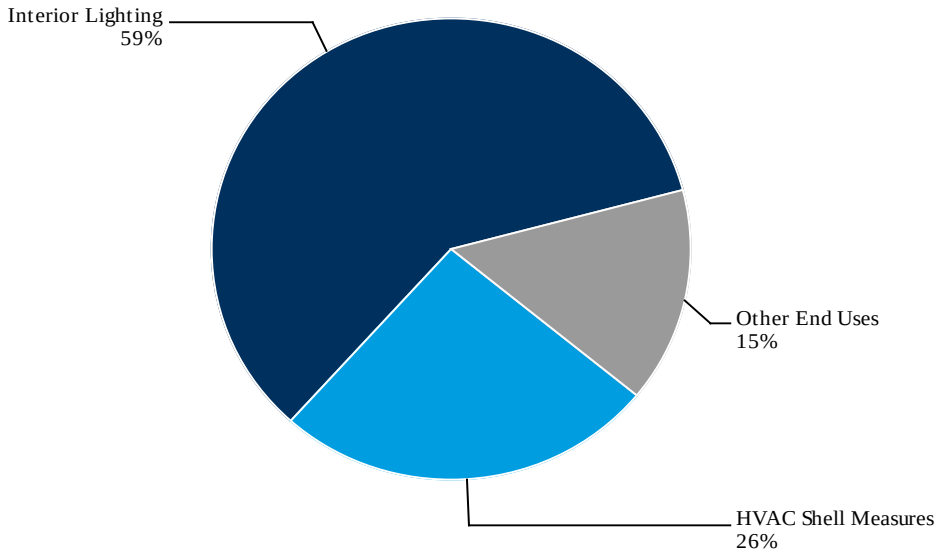


Figure A.4.2.12 Gas Economic Potential: Residential Single Family by End Use



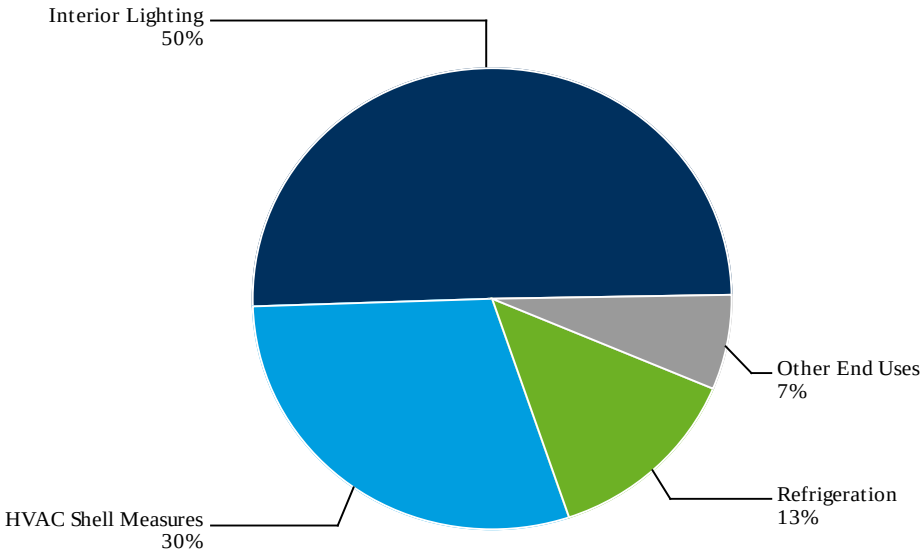
Note: 'Other End Uses' includes:

Figure A.4.3.1 Electric Technical Potential: Commercial by End Use



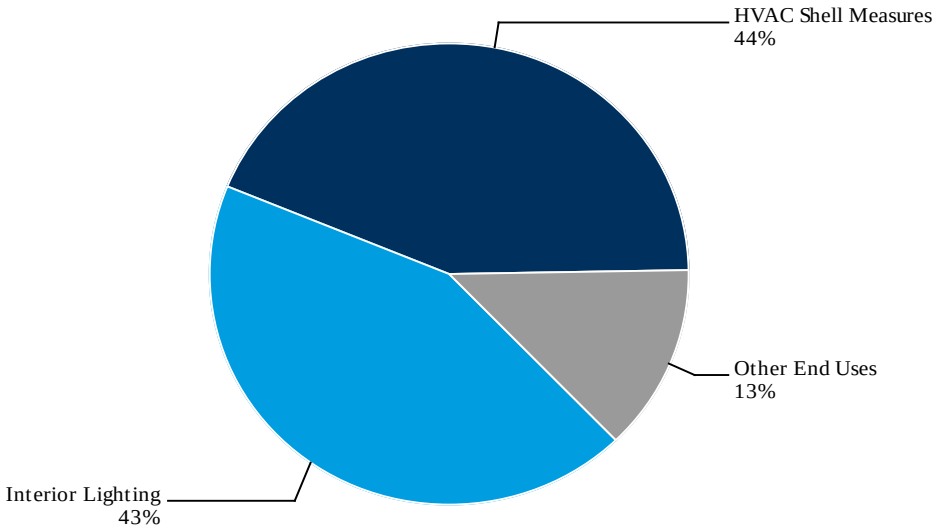
Note: 'Other End Uses' includes:
Refrigeration: 5%, Water Heat: 3%, Computers: 2%, Cooling: 1%, Refrigerators: 1%, Vending Machine: 1%
Other Plug Load: 1%, Printers: 0%, Exterior Lighting: 0%, Heat Pump: 0%, Servers: 0%, Cooking: 0%

Figure A.4.3.2 Electric Technical Potential: Commercial Convenience by End Use



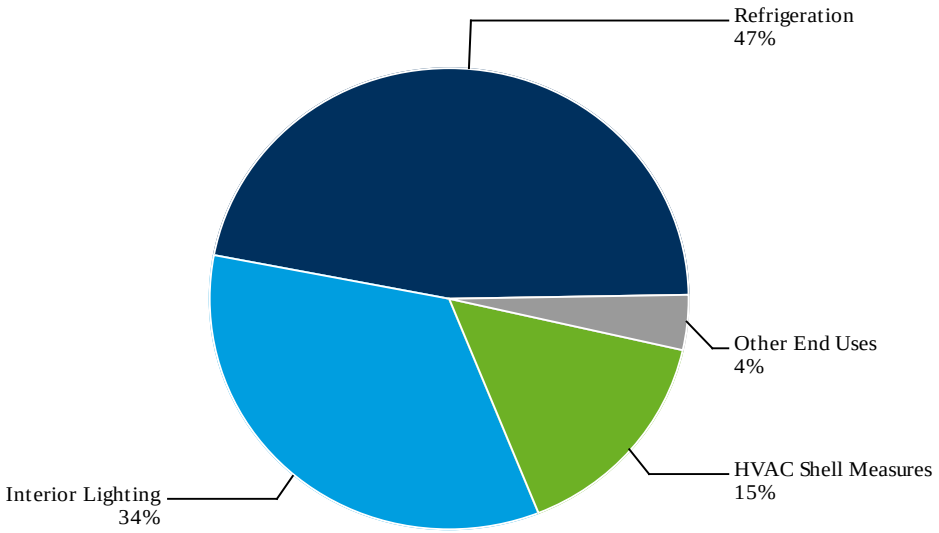
Note: 'Other End Uses' includes:
Vending Machine: 2%, Water Heat: 1%, Cooling: 1%, Other Plug Load: 1%, Other: 0%, Heat Pump: 0%
Computers: 0%, Photo Copiers: 0%, Fax: 0%, Printers: 0%, Flat Screen Monitors: 0%, Cooking: 0%

Figure A.4.3.3 Electric Technical Potential: Commercial Education by End Use



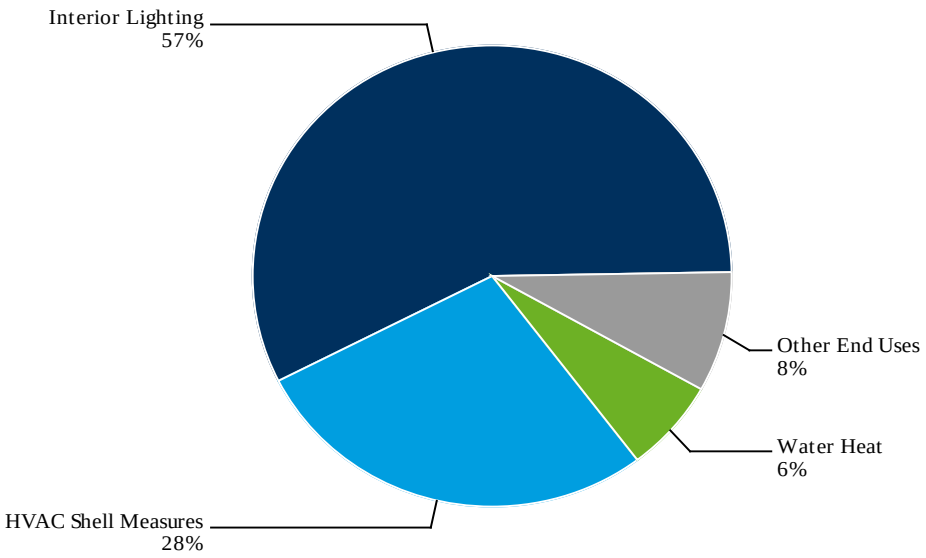
Note: 'Other End Uses' includes:
Computers: 5%, Refrigeration: 2%, Water Heat: 2%, Cooling: 1%, Vending Machine: 1%, Printers: 0%
Other Plug Load: 0%, Heat Pump: 0%, Refrigerators: 0%, Other: 0%, Cooking: 0%, Exterior Lighting: 0%

Figure A.4.3.4 Electric Technical Potential: Commercial Grocery by End Use



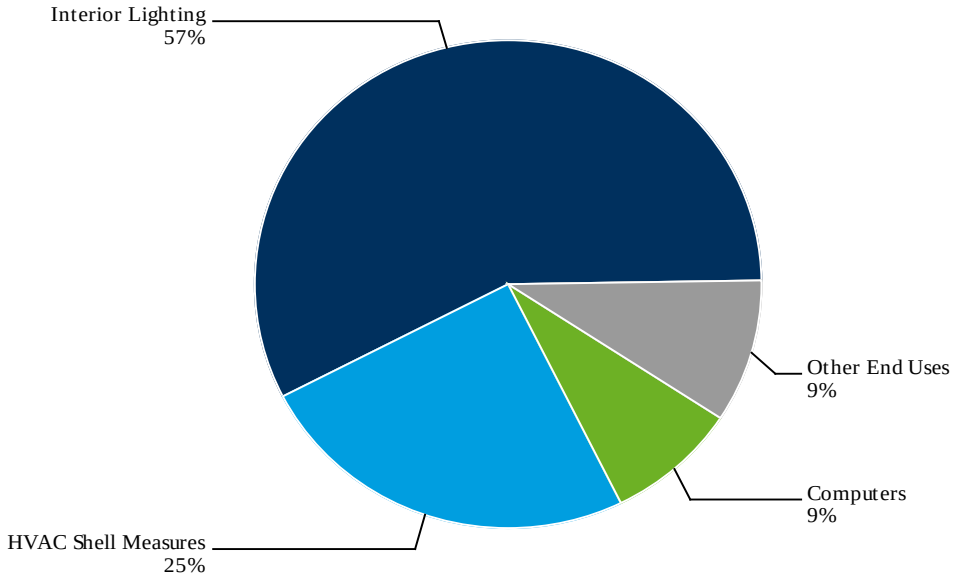
Note: 'Other End Uses' includes:
Water Heat: 1%, Cooling: 1%, Vending Machine: 0%, Computers: 0%, Other Plug Load: 0%
Heat Pump: 0%, Printers: 0%, Servers: 0%, Refrigerators: 0%, Other: 0%, Photo Copiers: 0%

Figure A.4.3.5 Electric Technical Potential: Commercial Health by End Use



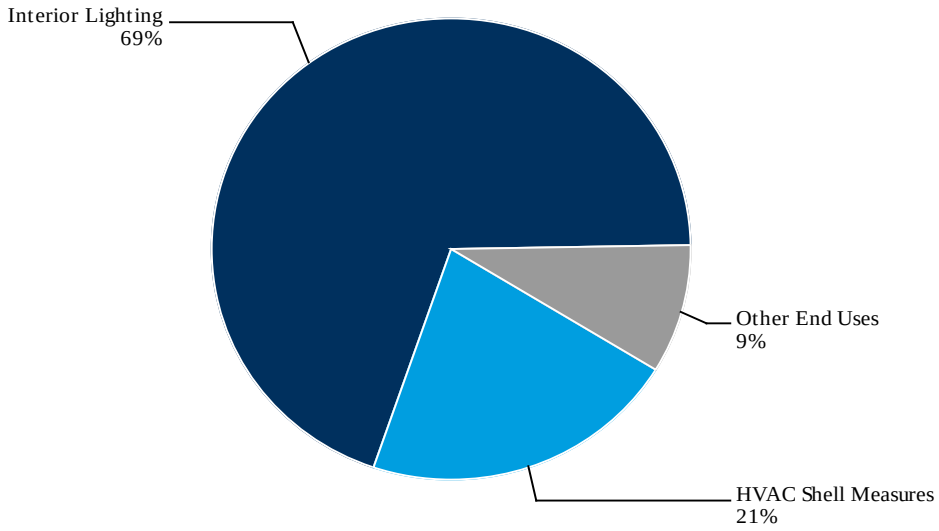
Note: 'Other End Uses' includes:
Computers: 2%, Refrigeration: 2%, Cooling: 1%, Refrigerators: 1%, Vending Machine: 0%, Other Plug Load: 0%
Printers: 0%, Cooking: 0%, Heat Pump: 0%, Other: 0%, Servers: 0%, Photo Copiers: 0%

Figure A.4.3.6 Electric Technical Potential: Commercial Large Office by End Use



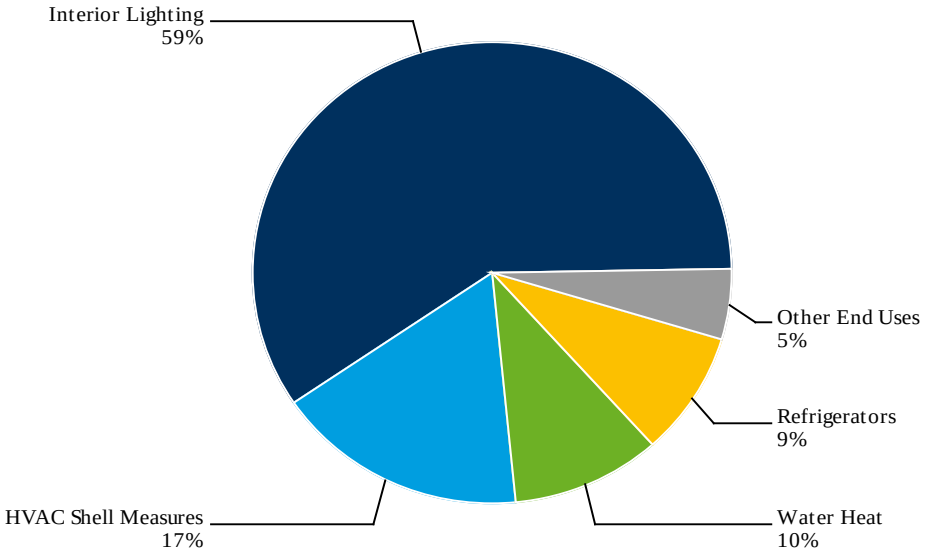
Note: 'Other End Uses' includes:
Refrigerators: 2%, Cooling: 2%, Water Heat: 1%, Printers: 1%, Other Plug Load: 1%, Servers: 1%

Figure A.4.3.7 Electric Technical Potential: Commercial Large Retail by End Use



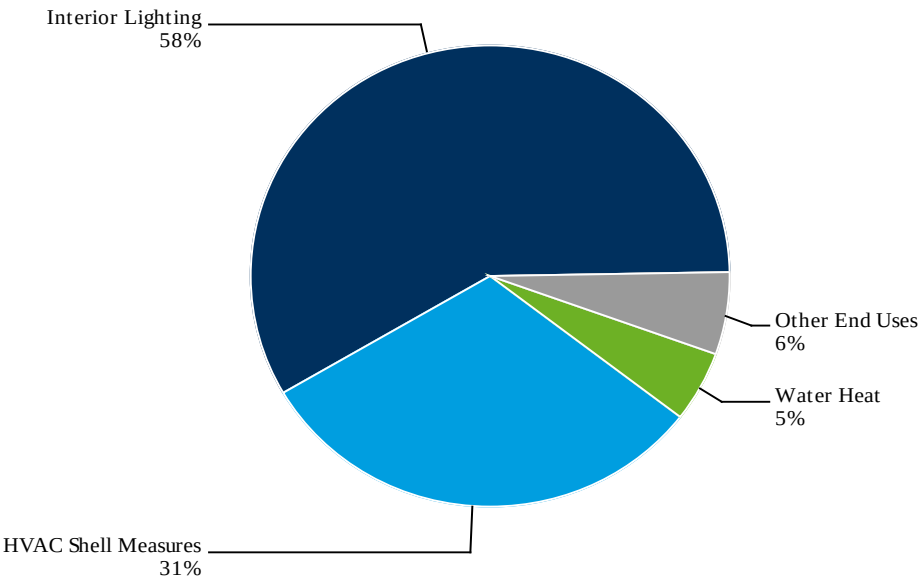
Note: 'Other End Uses' includes:
Refrigeration: 3%, Water Heat: 1%, Cooling: 1%, Computers: 1%, Vending Machine: 1%, Refrigerators: 1%
Other Plug Load: 0%, Exterior Lighting: 0%, Printers: 0%, Photo Copiers: 0%, Other: 0%, Fax: 0%

Figure A.4.3.8 Electric Technical Potential: Commercial Lodging by End Use



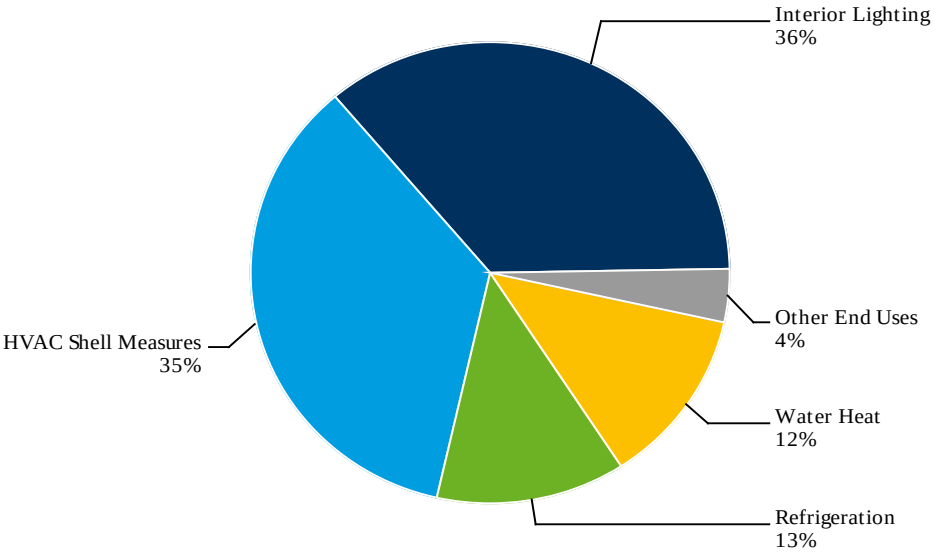
Note: 'Other End Uses' includes:
Refrigeration: 2%, Vending Machine: 1%, Cooling: 1%, Computers: 0%, Cooking: 0%, Heat Pump: 0%
Other Plug Load: 0%, Printers: 0%, Photo Copiers: 0%, Fax: 0%, Exterior Lighting: 0%, Servers: 0%

Figure A.4.3.9 Electric Technical Potential: Commercial Other Commercial by End Use



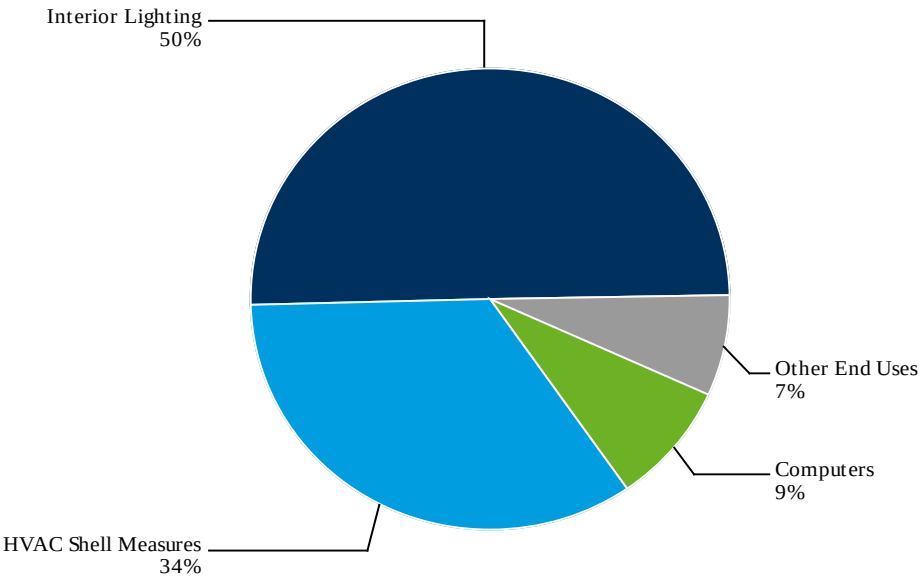
Note: 'Other End Uses' includes:
Cooling: 1%, Computers: 1%, Refrigeration: 1%, Vending Machine: 1%, Other Plug Load: 0%, Heat Pump: 0%
Exterior Lighting: 0%, Printers: 0%, Servers: 0%, Photo Copiers: 0%, Refrigerators: 0%, Fax: 0%

Figure A.4.3.10 Electric Technical Potential: Commercial Restaurant by End Use



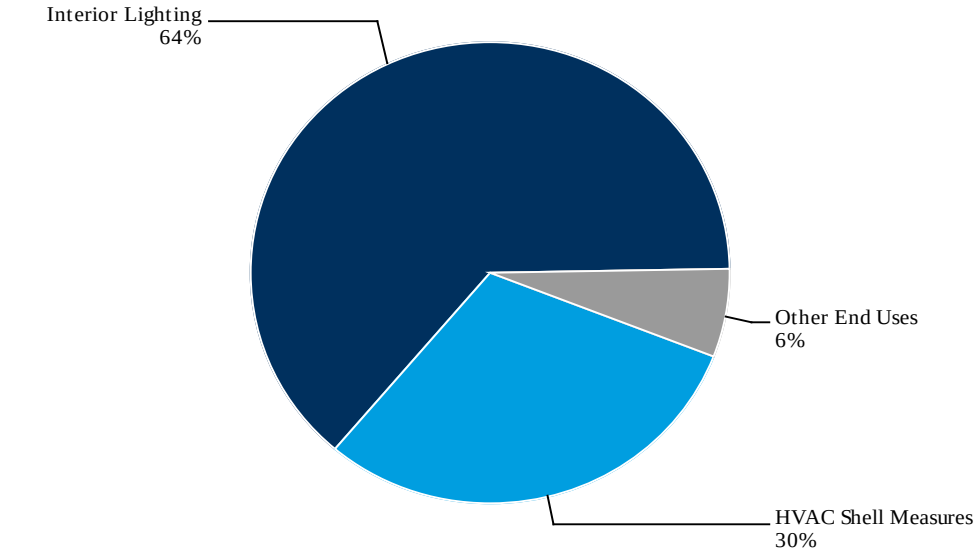
Note: 'Other End Uses' includes:
Cooling: 1%, Cooking: 0%, Vending Machine: 0%, Other Plug Load: 0%, Heat Pump: 0%, Computers: 0%
Photo Copiers: 0%, Refrigerators: 0%, Fax: 0%, Printers: 0%, Servers: 0%, Flat Screen Monitors: 0%

Figure A.4.3.11 Electric Technical Potential: Commercial Small Office by End Use



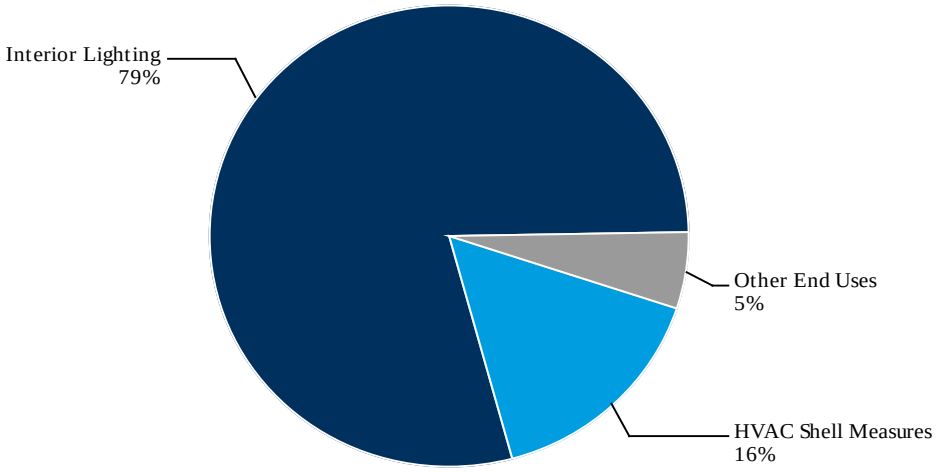
Note: 'Other End Uses' includes:
Cooling: 1%, Printers: 1%, Water Heat: 1%, Other Plug Load: 1%, Servers: 1%, Vending Machine: 1%
Heat Pump: 0%, Other: 0%, Photo Copiers: 0%, Refrigerators: 0%, Fax: 0%, Exterior Lighting: 0%

Figure A.4.3.12 Electric Technical Potential: Commercial Small Retail by End Use



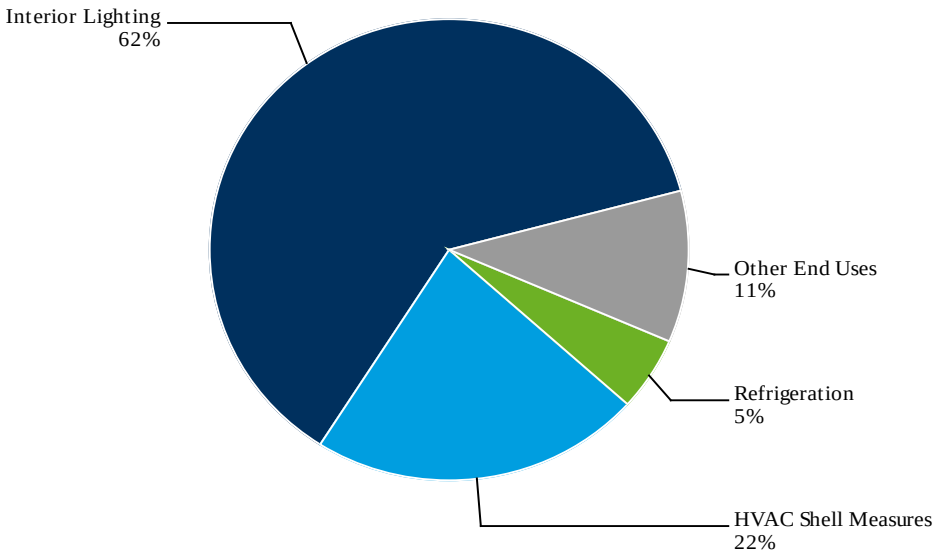
Note: 'Other End Uses' includes:
Cooling: 1%, Water Heat: 1%, Computers: 1%, Vending Machine: 1%, Other Plug Load: 1%, Printers: 0%
Heat Pump: 0%, Photo Copiers: 0%, Exterior Lighting: 0%, Fax: 0%, Servers: 0%, Refrigerators: 0%

Figure A.4.3.13 Electric Technical Potential: Commercial Warehouse by End Use



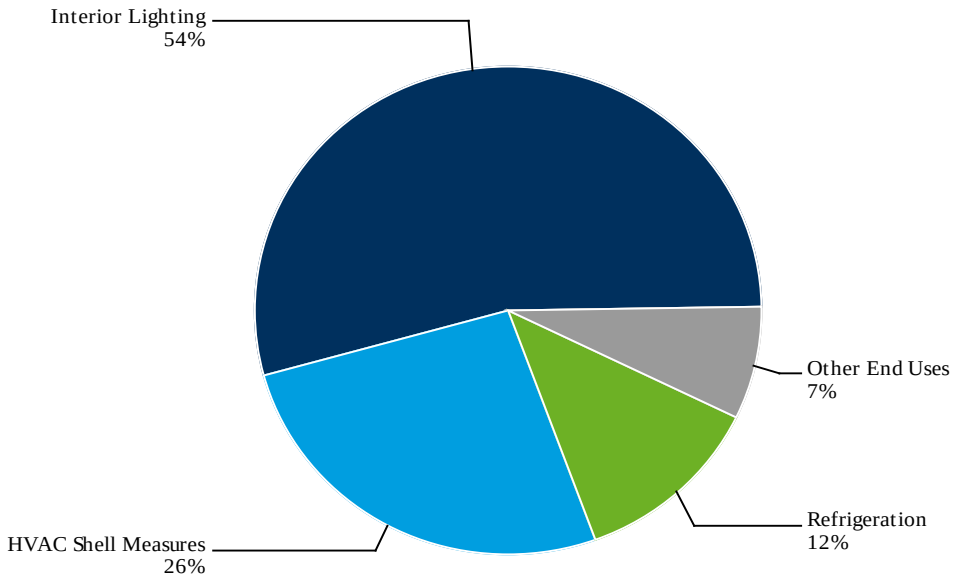
Note: 'Other End Uses' includes:
Computers: 2%, Water Heat: 1%, Vending Machine: 1%, Exterior Lighting: 1%, Other Plug Load: 0%, Cooling: 0%
Printers: 0%, Heat Pump: 0%, Photo Copiers: 0%, Servers: 0%, Fax: 0%, Refrigerators: 0%

Figure A.4.3.14 Electric Economic Potential: Commercial by End Use



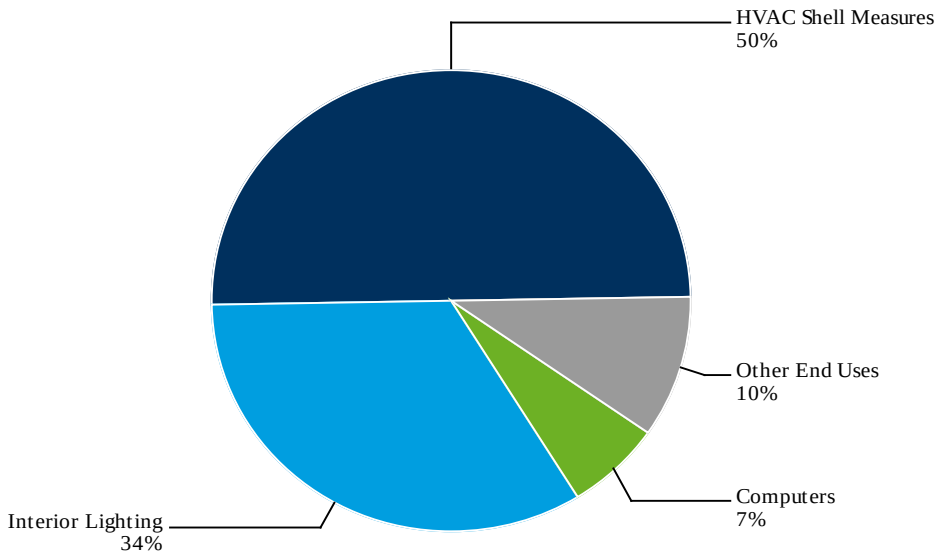
Note: 'Other End Uses' includes:
Water Heat: 4%, Computers: 3%, Cooling: 1%, Vending Machine: 1%, Printers: 0%, Heat Pump: 0%
Exterior Lighting: 0%, Servers: 0%, Fax: 0%, Other Plug Load: 0%, Other: 0%, Cooking: 0%

Figure A.4.3.15 Electric Economic Potential: Commercial Convenience by End Use



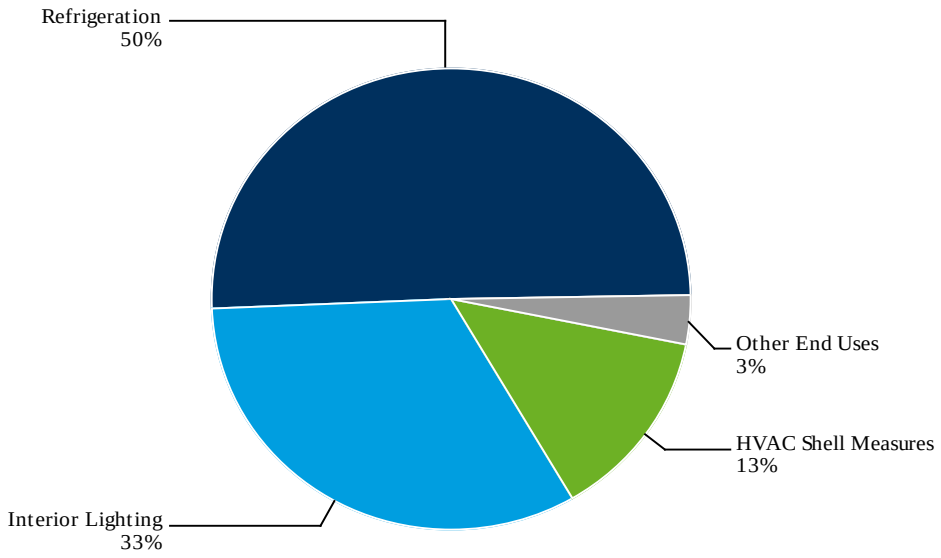
Note: 'Other End Uses' includes:
Vending Machine: 3%, Water Heat: 2%, Cooling: 1%, Heat Pump: 0%, Other: 0%, Computers: 0%

Figure A.4.3.16 Electric Economic Potential: Commercial Education by End Use



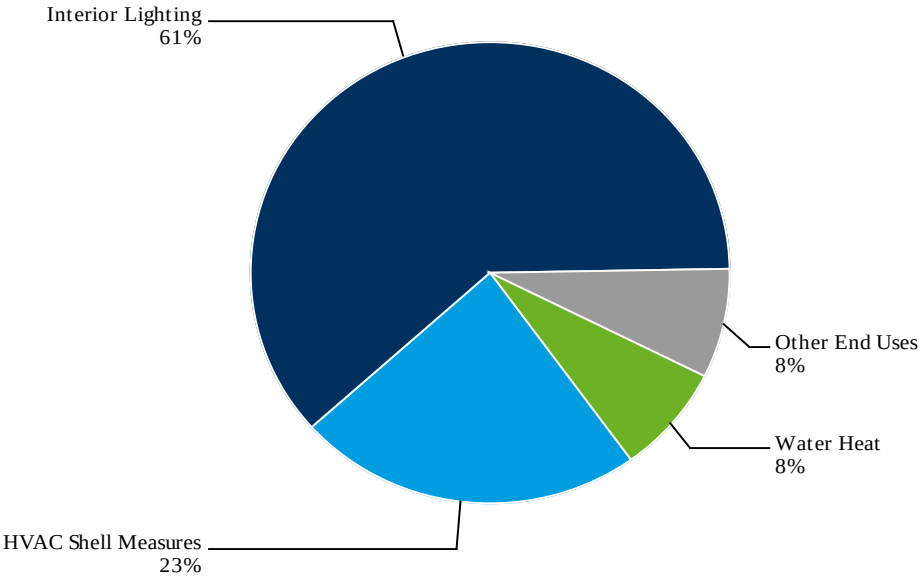
Note: 'Other End Uses' includes:
Water Heat: 3%, Refrigeration: 2%, Cooling: 2%, Vending Machine: 1%, Printers: 1%, Heat Pump: 1%
Other: 0%, Exterior Lighting: 0%, Servers: 0%, Fax: 0%, Other Plug Load: 0%, Dryer: 0%

Figure A.4.3.17 Electric Economic Potential: Commercial Grocery by End Use



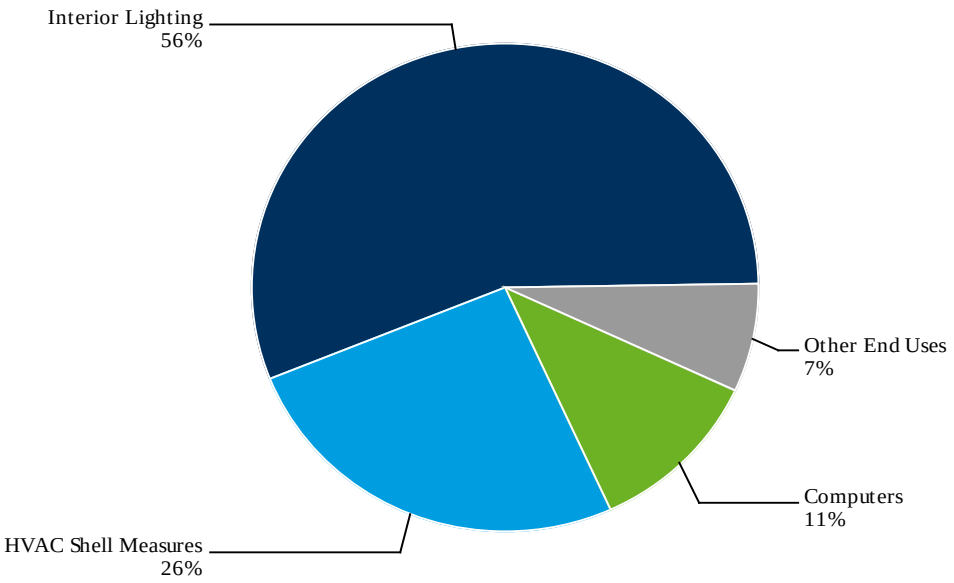
Note: 'Other End Uses' includes:
Water Heat: 1%, Cooling: 1%, Cooking: 0%, Vending Machine: 0%, Computers: 0%, Heat Pump: 0%
Printers: 0%, Servers: 0%, Other: 0%, Fax: 0%, Exterior Lighting: 0%, Other Plug Load: 0%

Figure A.4.3.18 Electric Economic Potential: Commercial Health by End Use



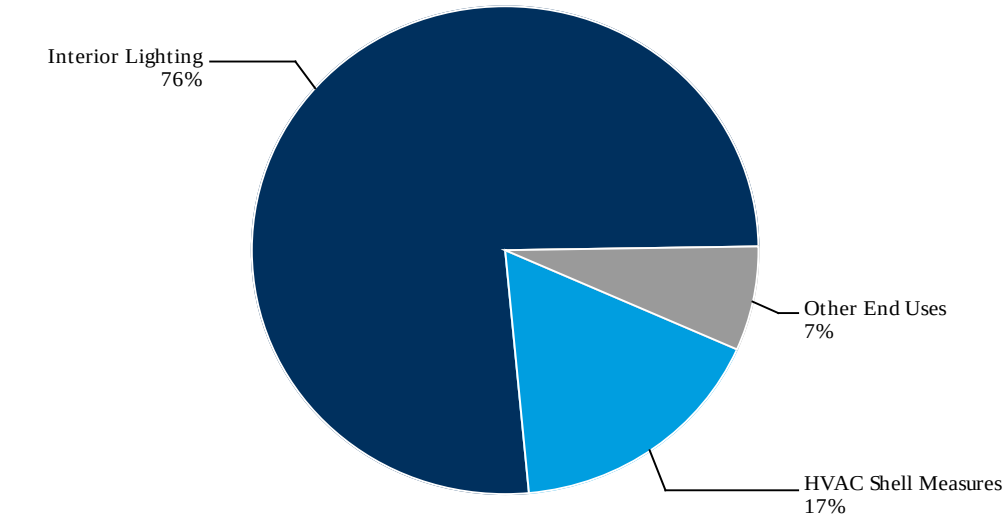
Note: 'Other End Uses' includes:
Computers: 3%, Cooling: 2%, Refrigeration: 1%, Vending Machine: 1%, Printers: 0%, Heat Pump: 0%
Other: 0%, Other Plug Load: 0%, Servers: 0%, Cooking: 0%, Fax: 0%, Dryer: 0%

Figure A.4.3.19 Electric Economic Potential: Commercial Large Office by End Use



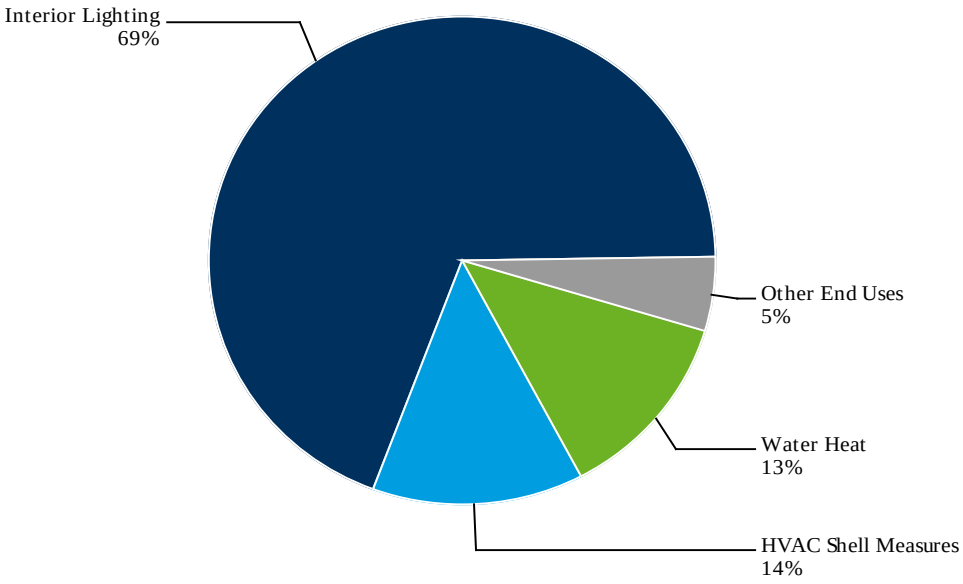
Note: 'Other End Uses' includes:
Water Heat: 2%, Cooling: 2%, Printers: 2%, Servers: 1%, Vending Machine: 1%, Other Plug Load: 0%

Figure A.4.3.20 Electric Economic Potential: Commercial Large Retail by End Use



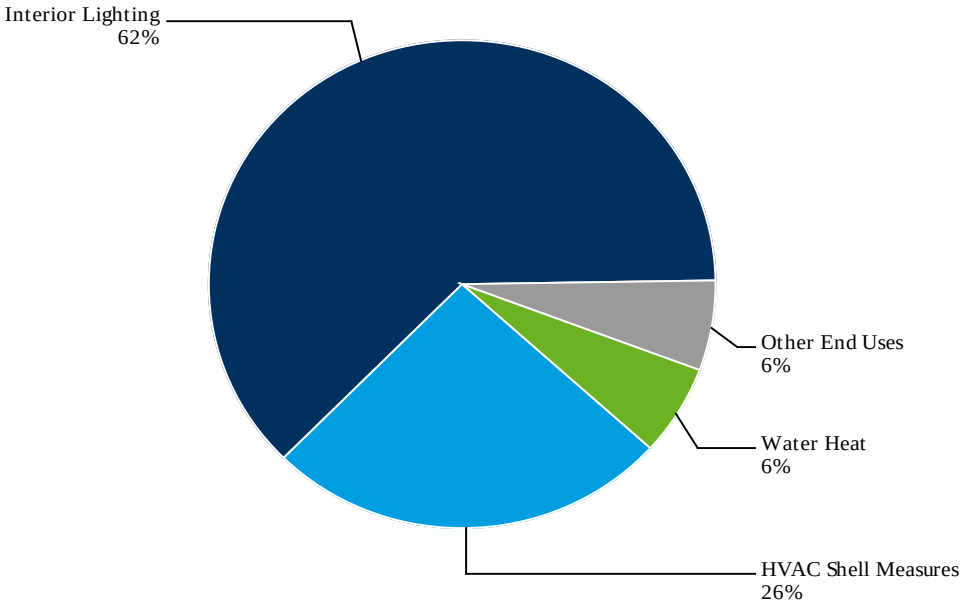
Note: 'Other End Uses' includes:
Refrigeration: 2%, Water Heat: 1%, Computers: 1%, Cooling: 1%, Vending Machine: 1%, Exterior Lighting: 0%

Figure A.4.3.21 Electric Economic Potential: Commercial Lodging by End Use



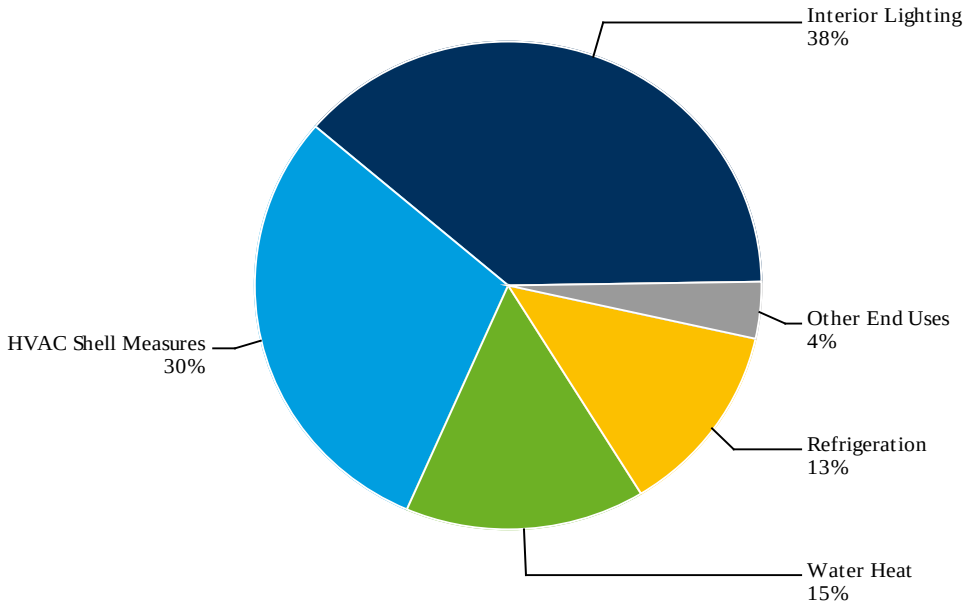
Note: 'Other End Uses' includes:
Refrigeration: 2%, Vending Machine: 1%, Cooling: 1%, Computers: 1%, Heat Pump: 0%, Printers: 0%

Figure A.4.3.22 Electric Economic Potential: Commercial Other Commercial by End Use



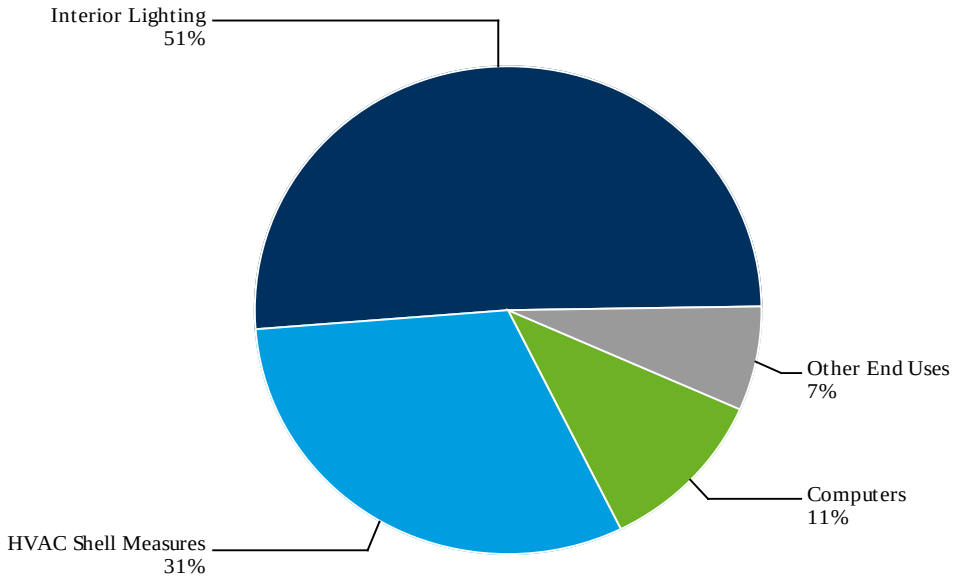
Note: 'Other End Uses' includes:
Cooling: 2%, Computers: 1%, Refrigeration: 1%, Vending Machine: 1%, Heat Pump: 0%, Exterior Lighting: 0%

Figure A.4.3.23 Electric Economic Potential: Commercial Restaurant by End Use



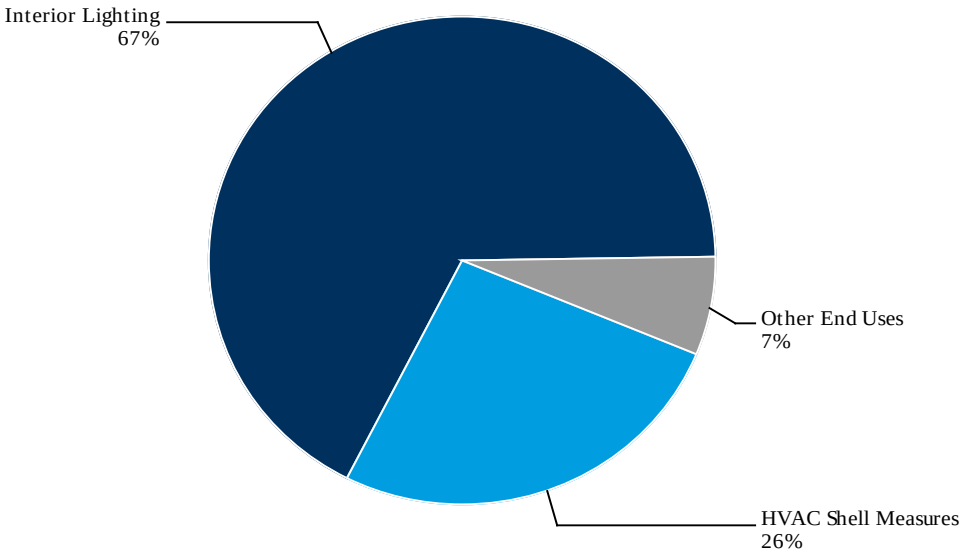
Note: 'Other End Uses' includes:
Cooling: 2%, Vending Machine: 0%, Heat Pump: 0%, Computers: 0%, Cooking: 0%, Fax: 0%

Figure A.4.3.24 Electric Economic Potential: Commercial Small Office by End Use



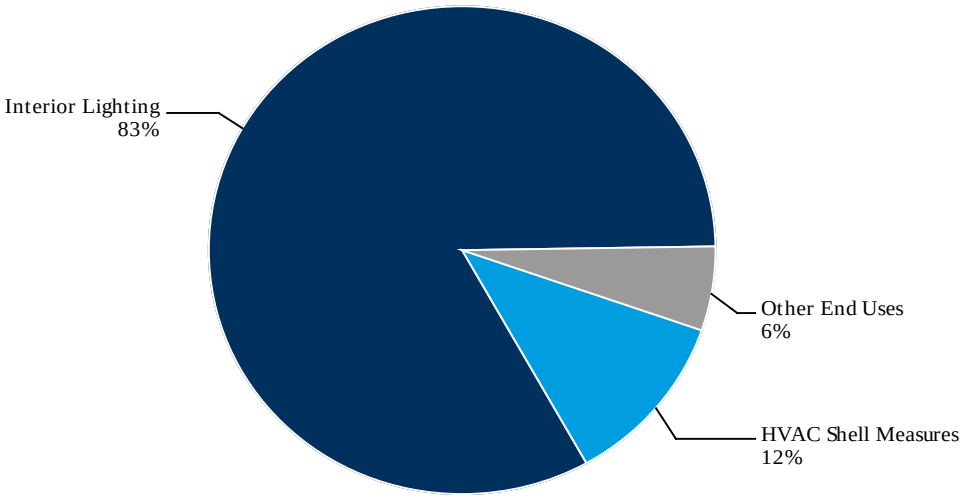
Note: 'Other End Uses' includes:
Cooling: 2%, Printers: 2%, Water Heat: 1%, Servers: 1%, Vending Machine: 1%, Heat Pump: 0%

Figure A.4.3.25 Electric Economic Potential: Commercial Small Retail by End Use



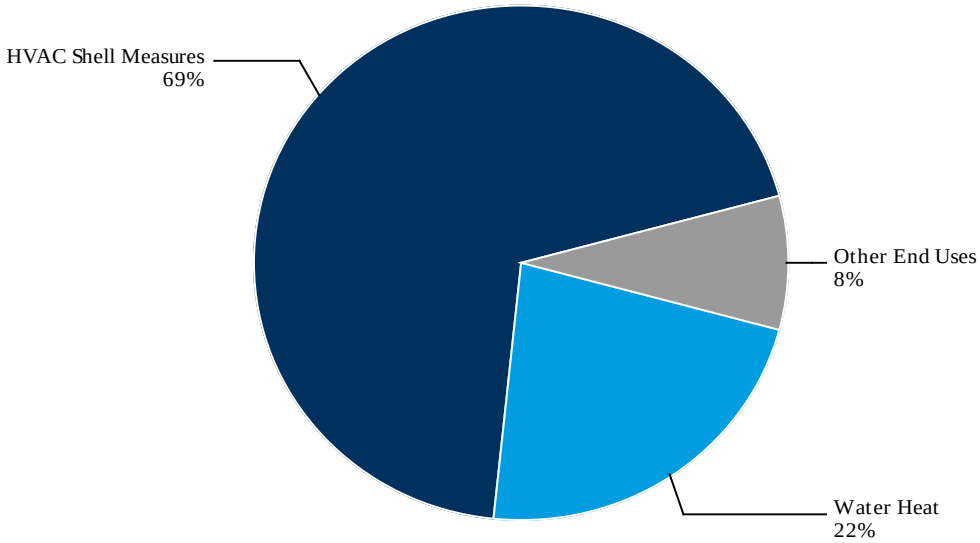
Note: 'Other End Uses' includes:
Cooling: 2%, Computers: 1%, Water Heat: 1%, Vending Machine: 1%, Printers: 0%, Heat Pump: 0%

Figure A.4.3.26 Electric Economic Potential: Commercial Warehouse by End Use



Note: 'Other End Uses' includes:
Computers: 2%, Water Heat: 1%, Vending Machine: 1%, Exterior Lighting: 1%, Cooling: 1%, Printers: 0%

Figure A.4.4.1 Gas Technical Potential: Commercial by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.2 Gas Technical Potential: Commercial Convenience by End Use

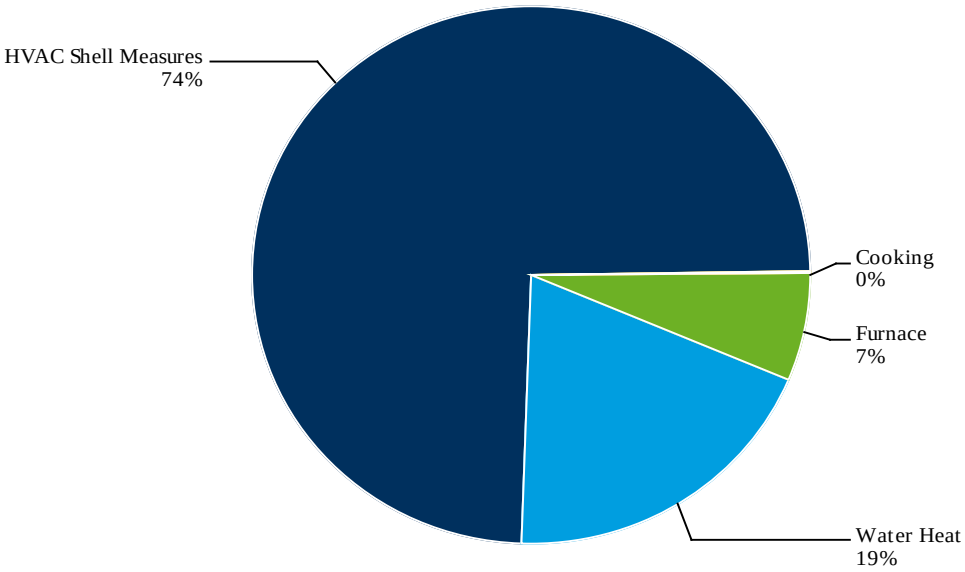
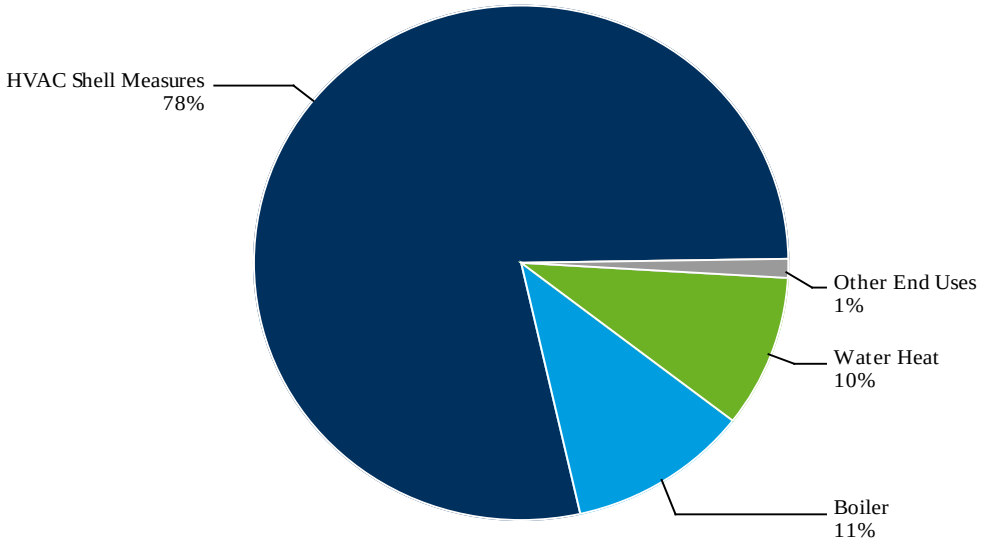


Figure A.4.4.3 Gas Technical Potential: Commercial Education by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.4 Gas Technical Potential: Commercial Grocery by End Use

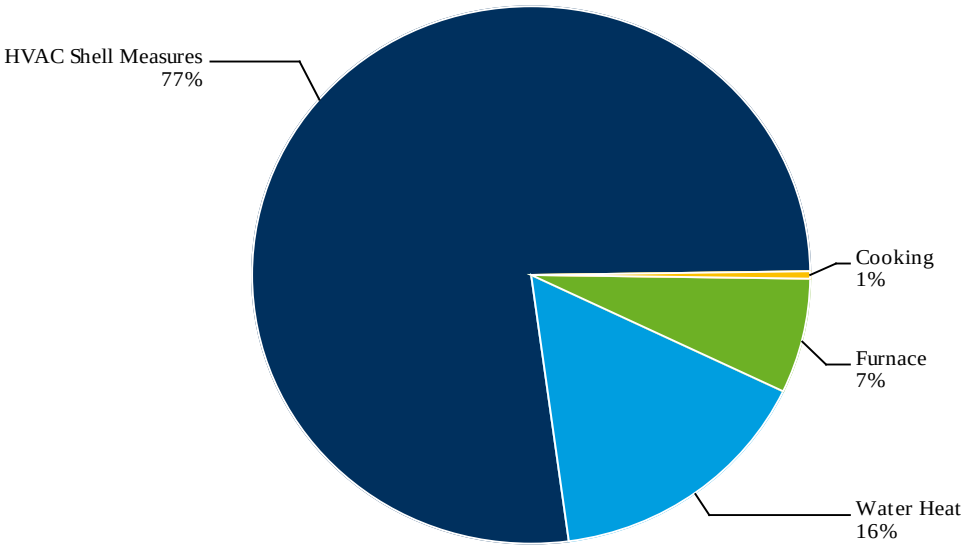


Figure A.4.4.5 Gas Technical Potential: Commercial Health by End Use

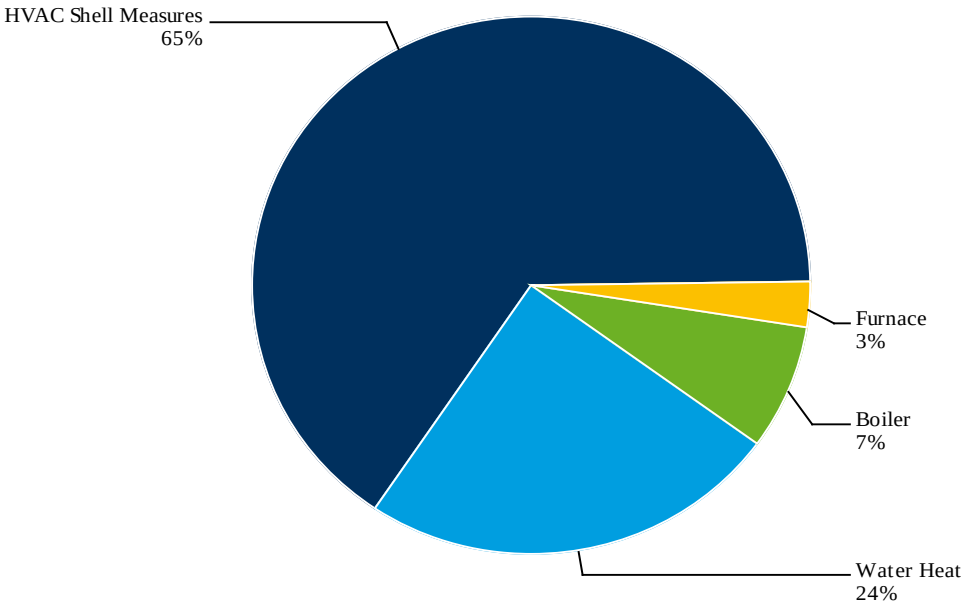


Figure A.4.4.6 Gas Technical Potential: Commercial Large Office by End Use

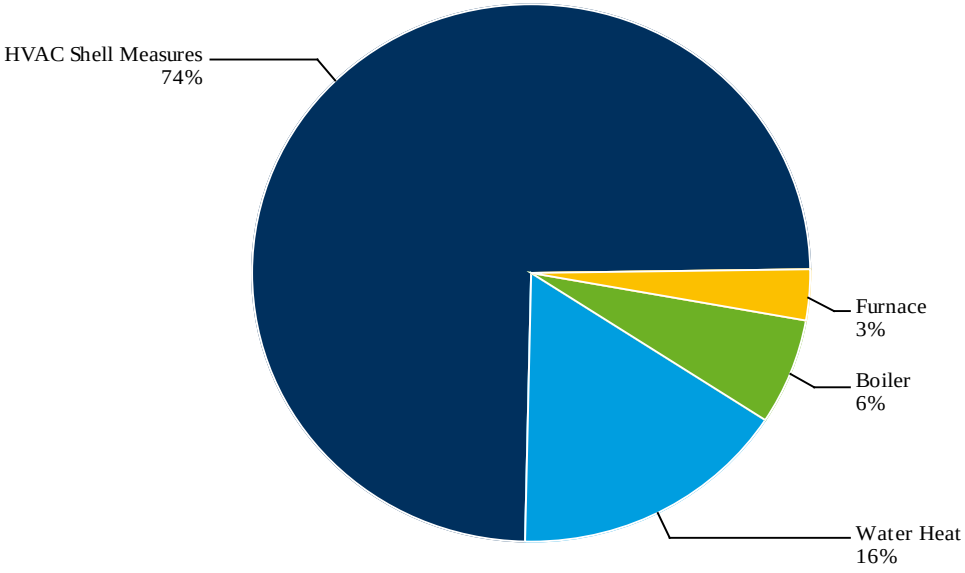
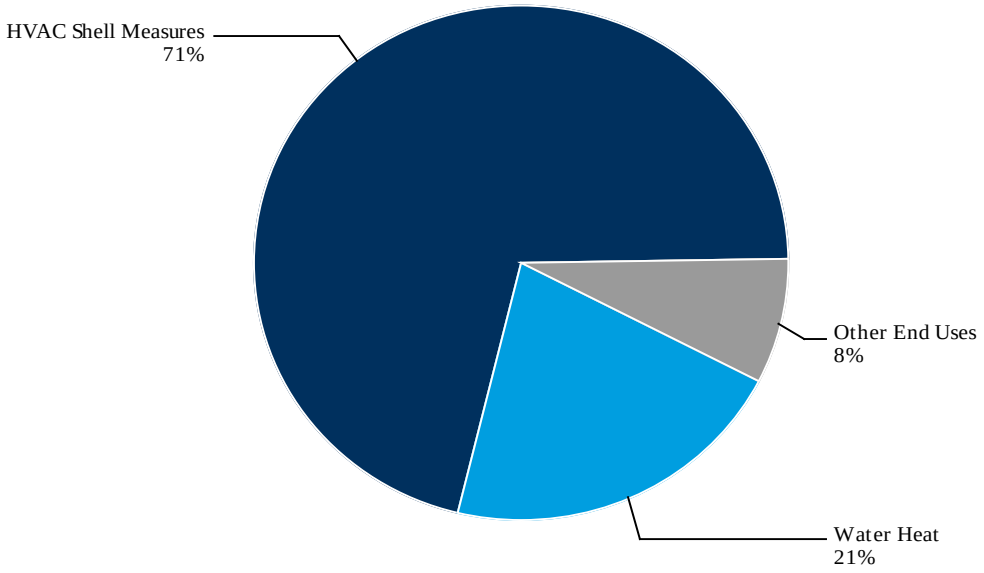
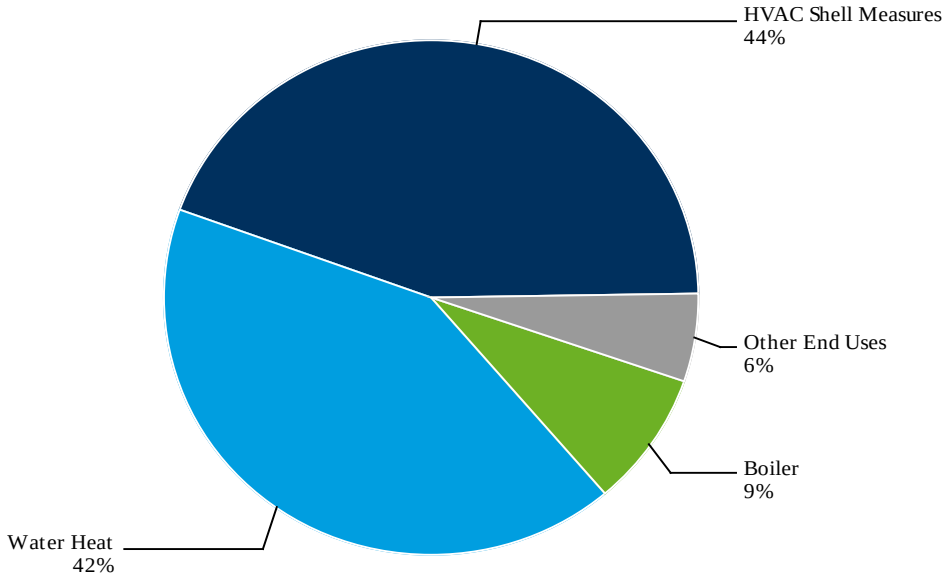


Figure A.4.4.7 Gas Technical Potential: Commercial Large Retail by End Use



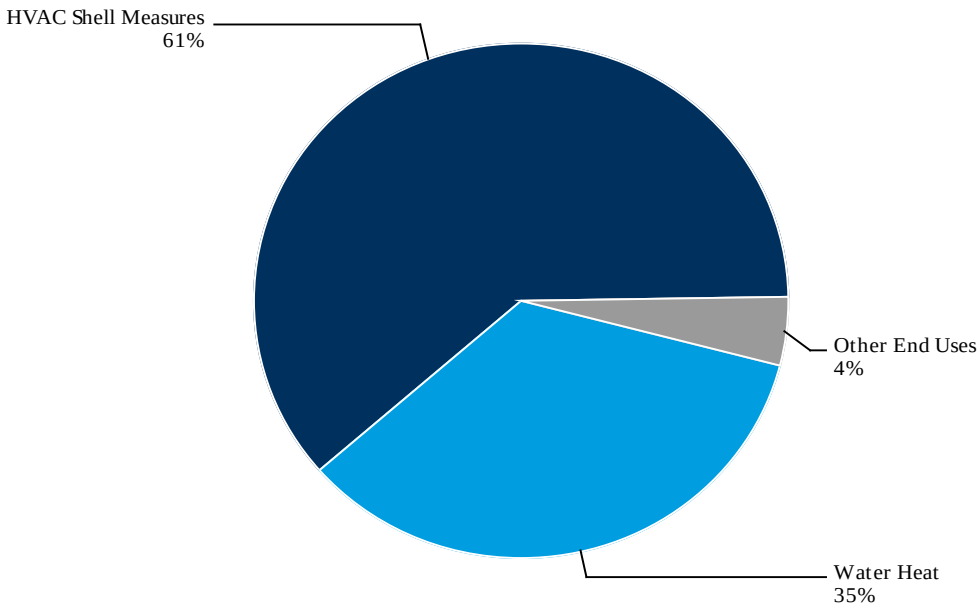
Note: 'Other End Uses' includes:

Figure A.4.4.8 Gas Technical Potential: Commercial Lodging by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.9 Gas Technical Potential: Commercial Other Commercial by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.10 Gas Technical Potential: Commercial Restaurant by End Use

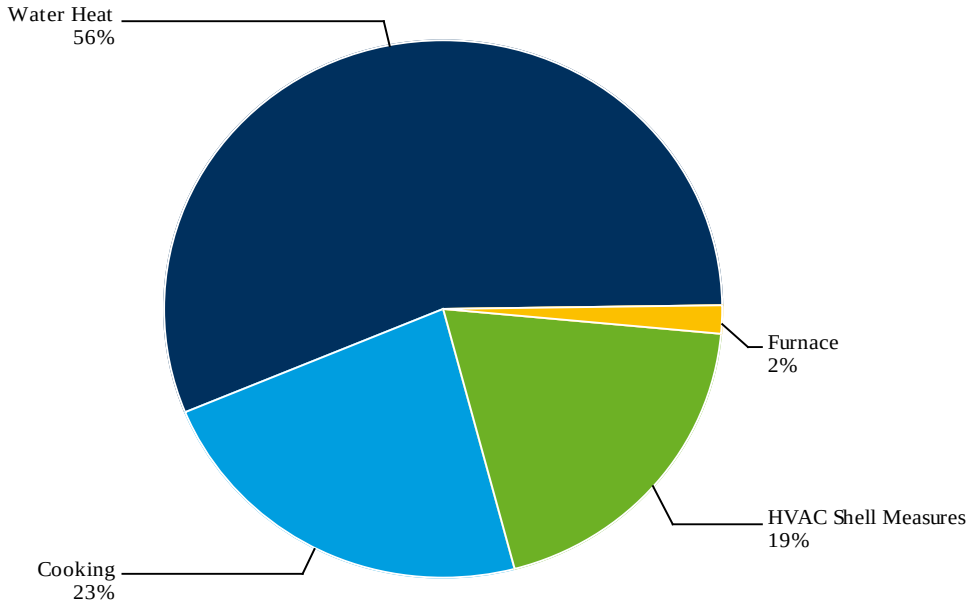


Figure A.4.4.11 Gas Technical Potential: Commercial Small Office by End Use

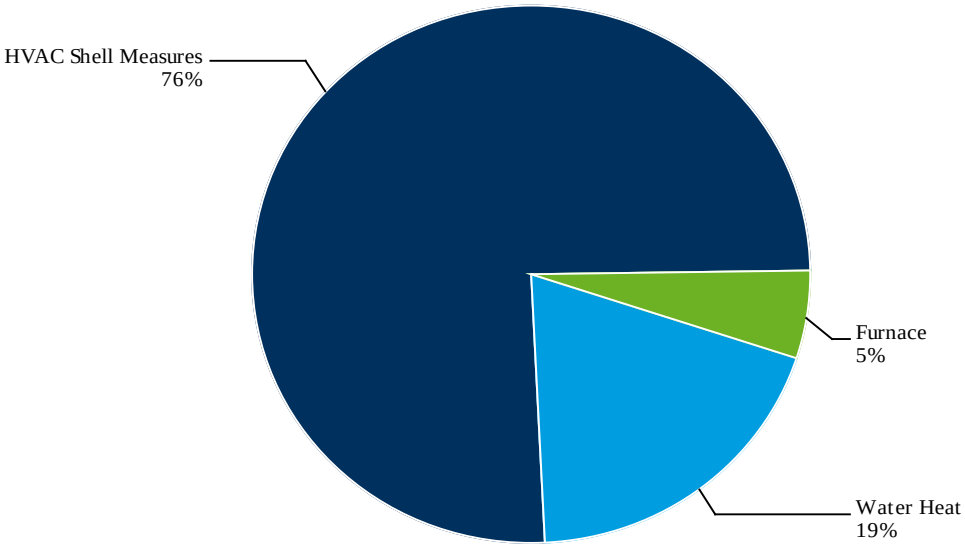


Figure A.4.4.12 Gas Technical Potential: Commercial Small Retail by End Use

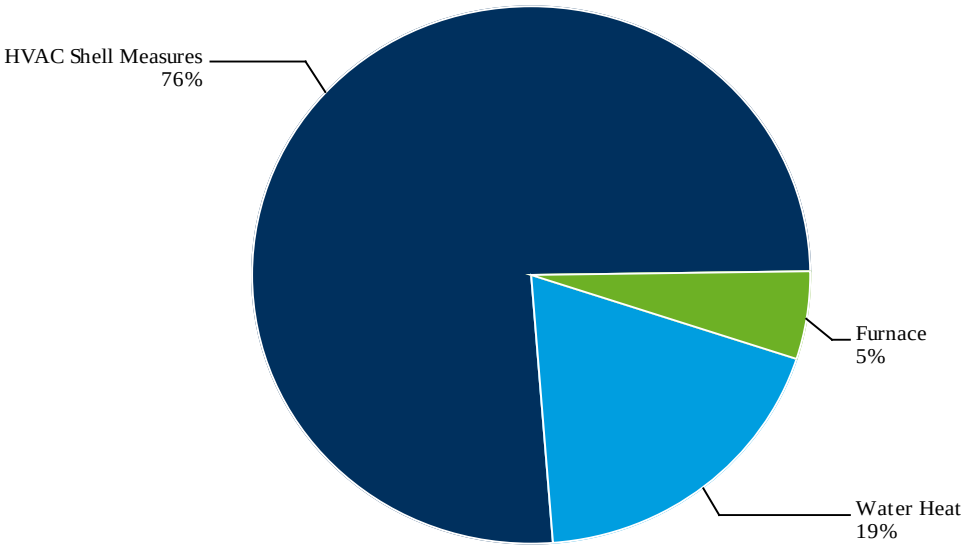


Figure A.4.4.13 Gas Technical Potential: Commercial Warehouse by End Use

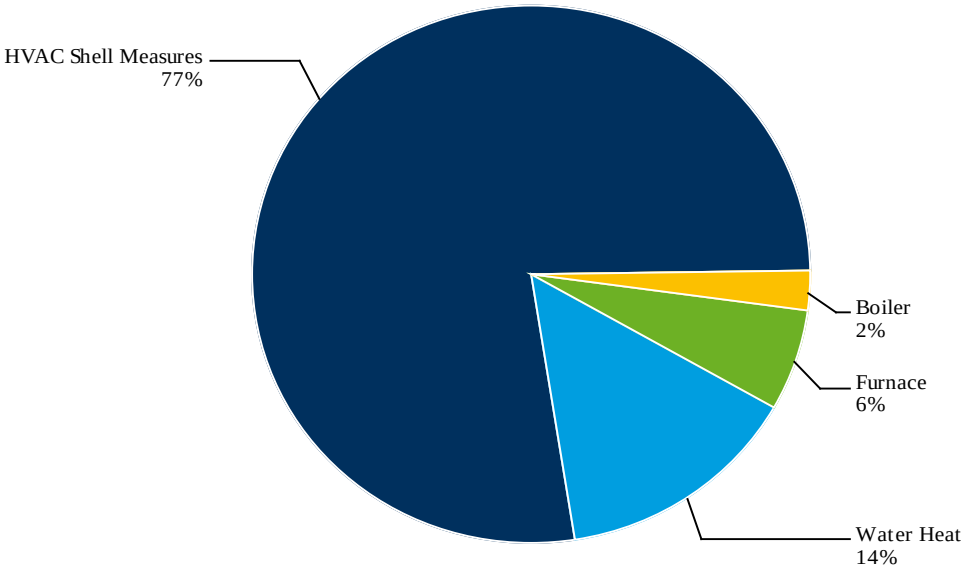
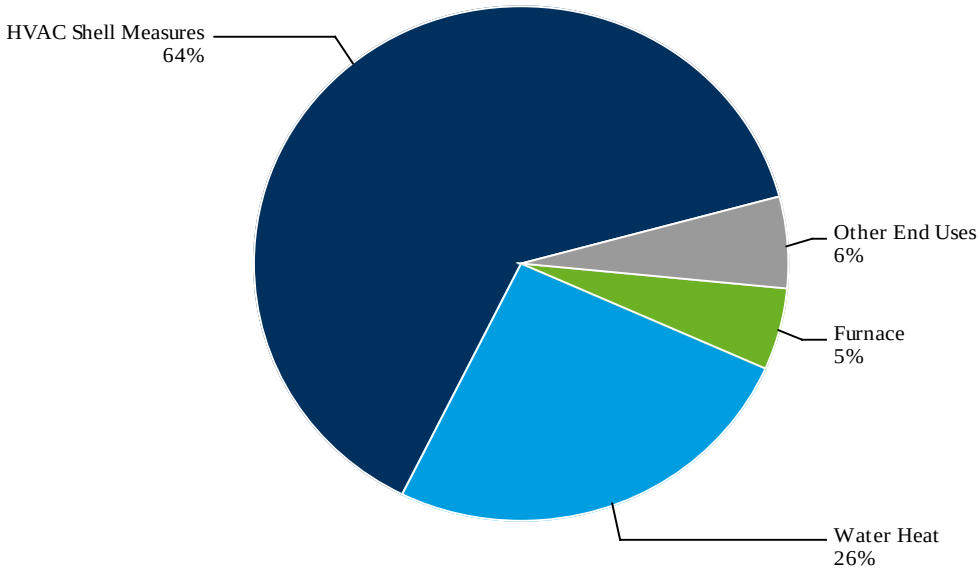


Figure A.4.4.14 Gas Economic Potential: Commercial by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.15 Gas Economic Potential: Commercial Convenience by End Use

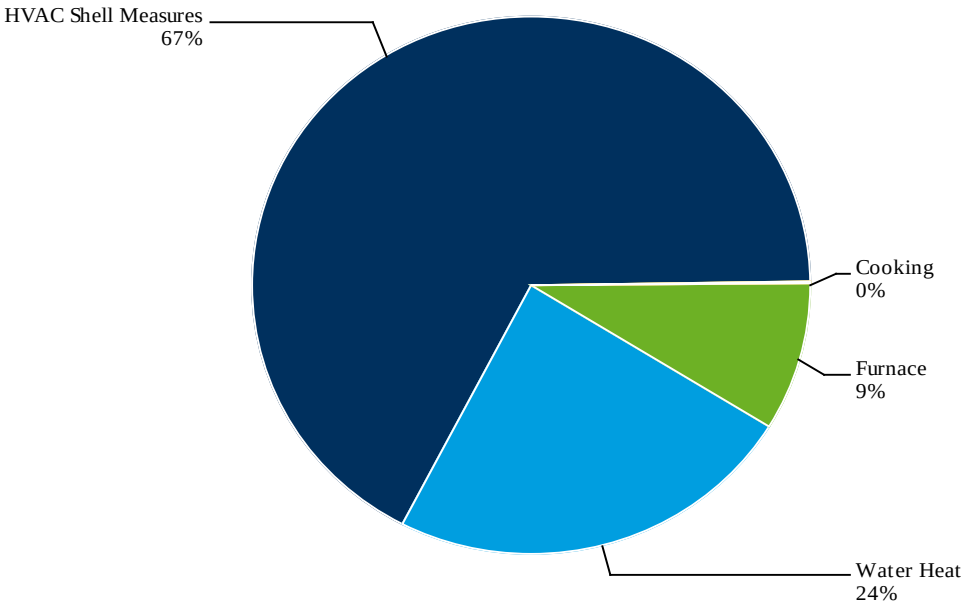
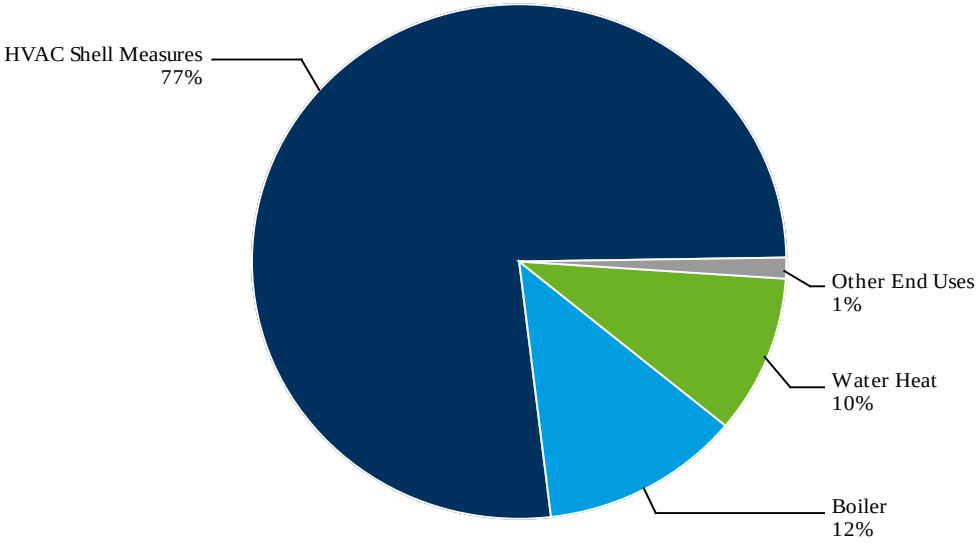


Figure A.4.4.16 Gas Economic Potential: Commercial Education by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.17 Gas Economic Potential: Commercial Grocery by End Use

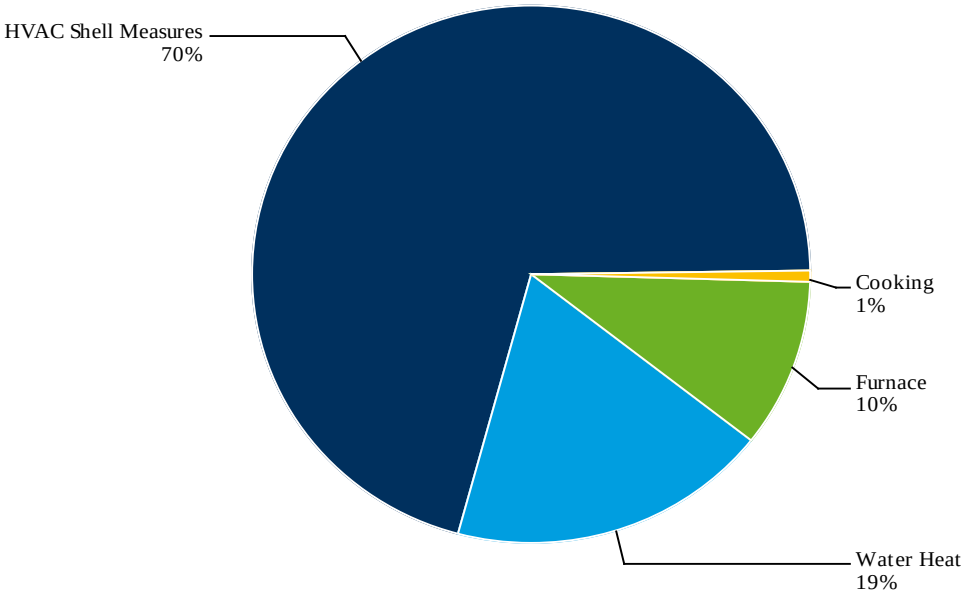


Figure A.4.4.18 Gas Economic Potential: Commercial Health by End Use

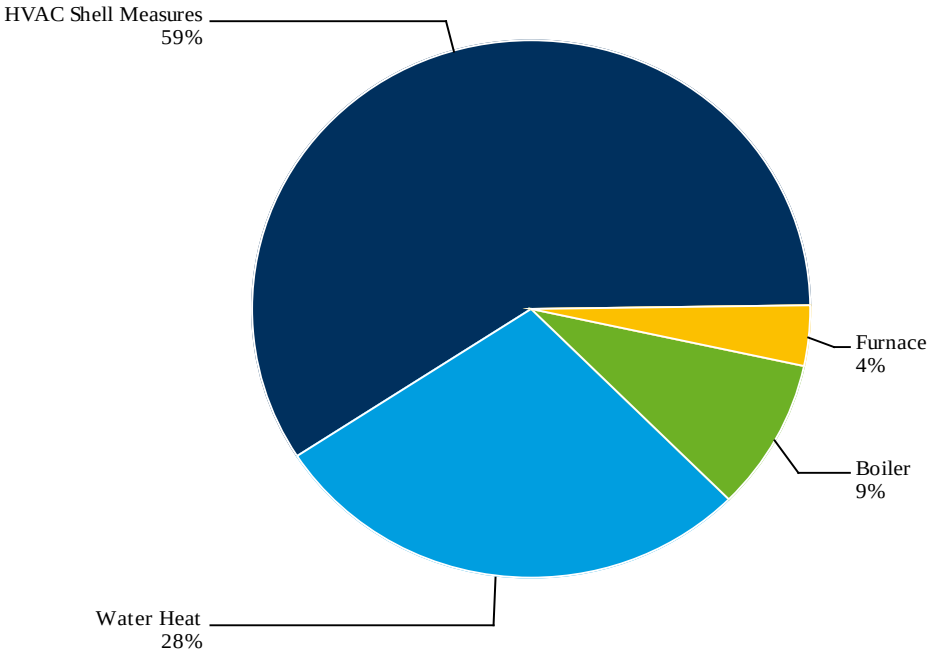


Figure A.4.4.19 Gas Economic Potential: Commercial Large Office by End Use

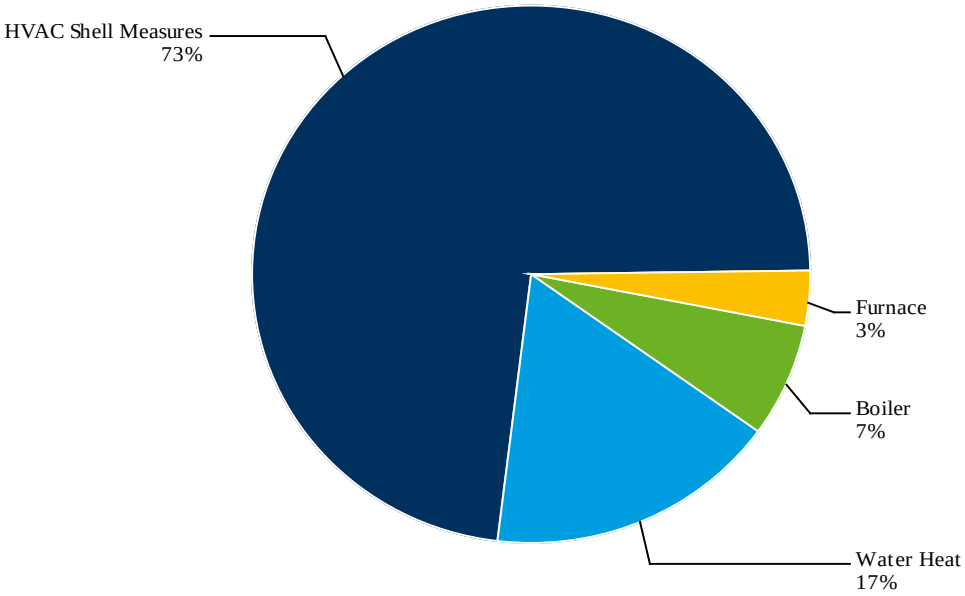


Figure A.4.4.20 Gas Economic Potential: Commercial Large Retail by End Use

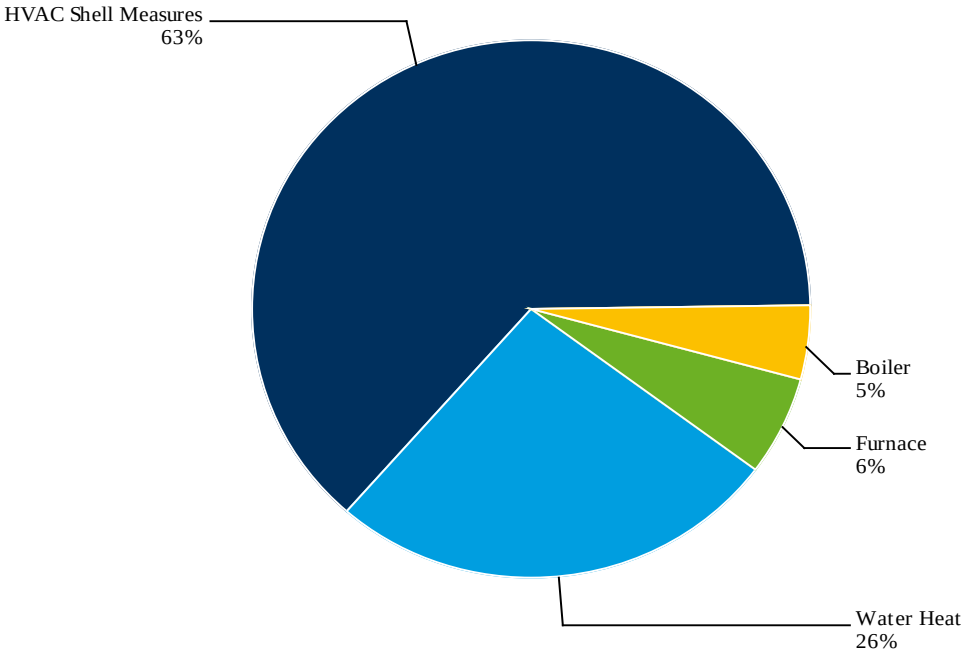
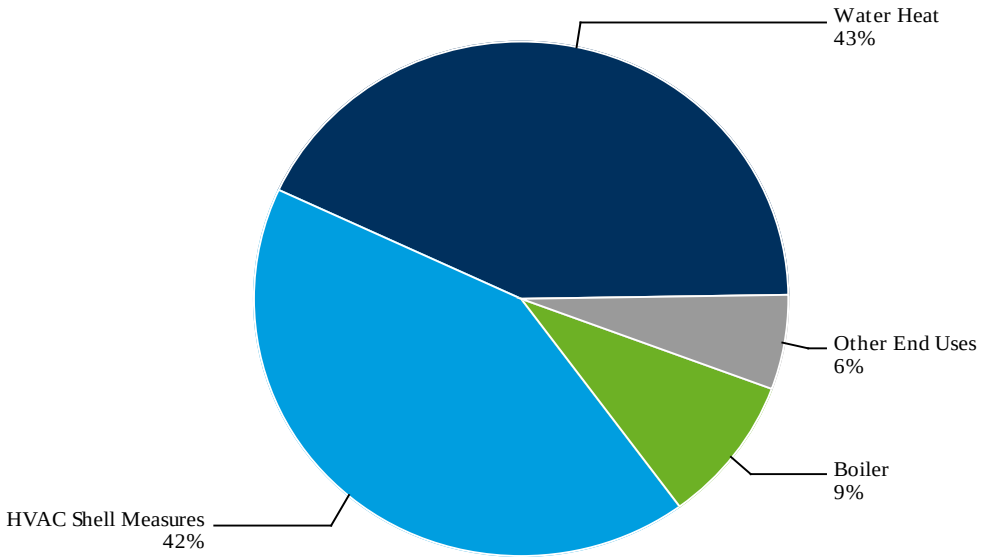


Figure A.4.4.21 Gas Economic Potential: Commercial Lodging by End Use



Note: 'Other End Uses' includes:

Figure A.4.4.22 Gas Economic Potential: Commercial Other Commercial by End Use

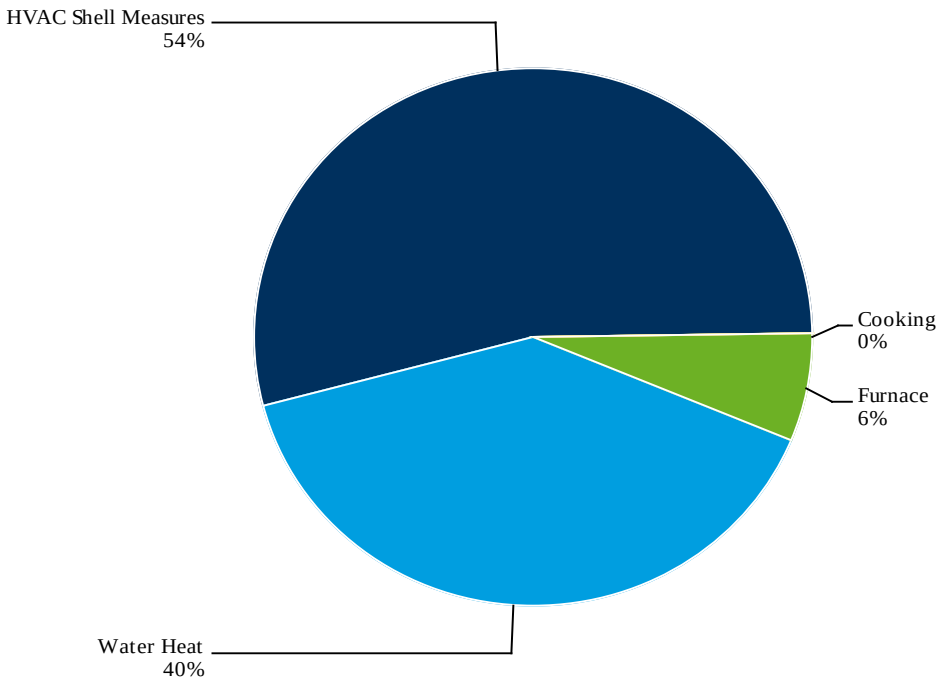


Figure A.4.4.23 Gas Economic Potential: Commercial Restaurant by End Use

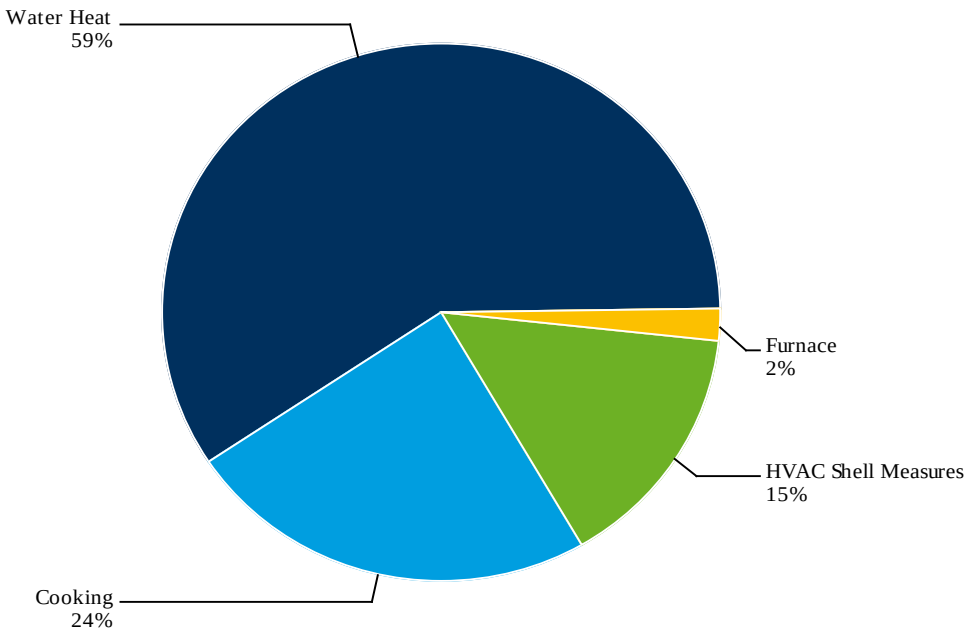


Figure A.4.4.24 Gas Economic Potential: Commercial Small Office by End Use

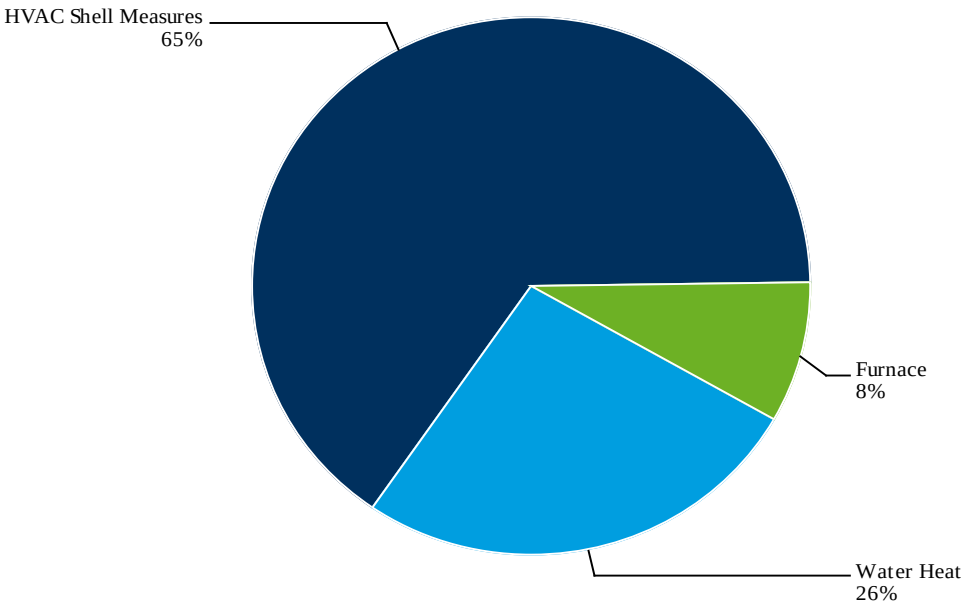


Figure A.4.4.25 Gas Economic Potential: Commercial Small Retail by End Use

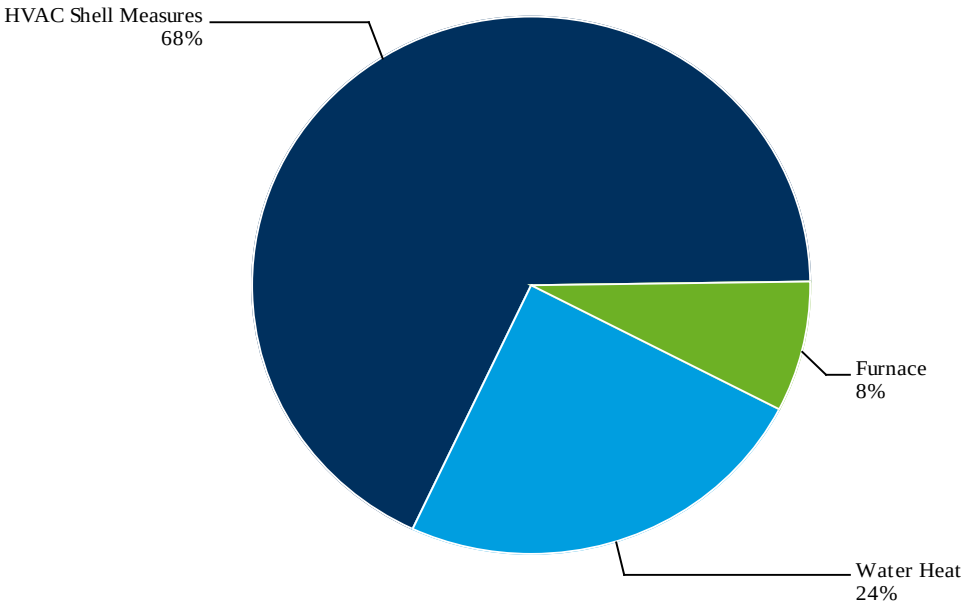


Figure A.4.4.26 Gas Economic Potential: Commercial Warehouse by End Use

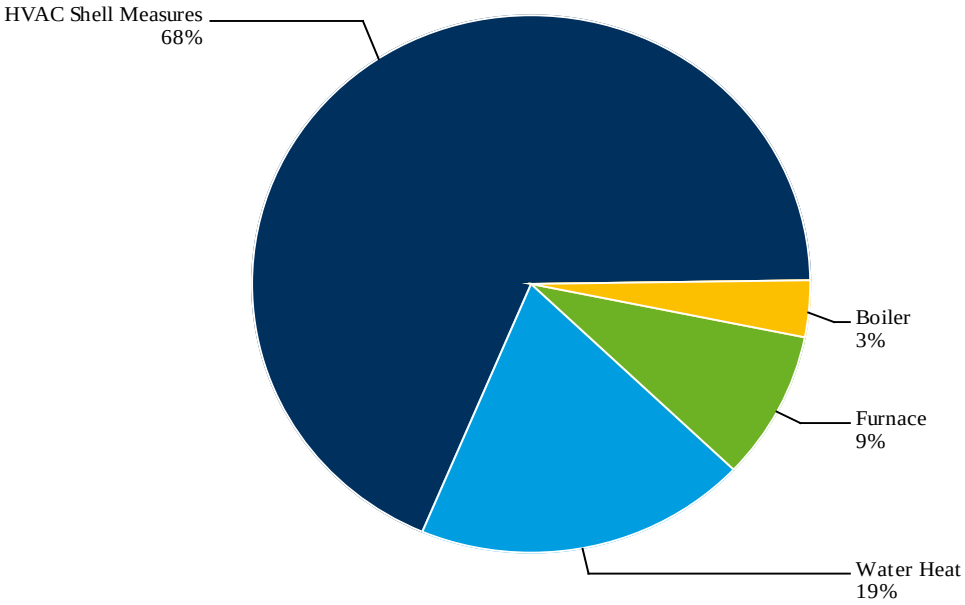
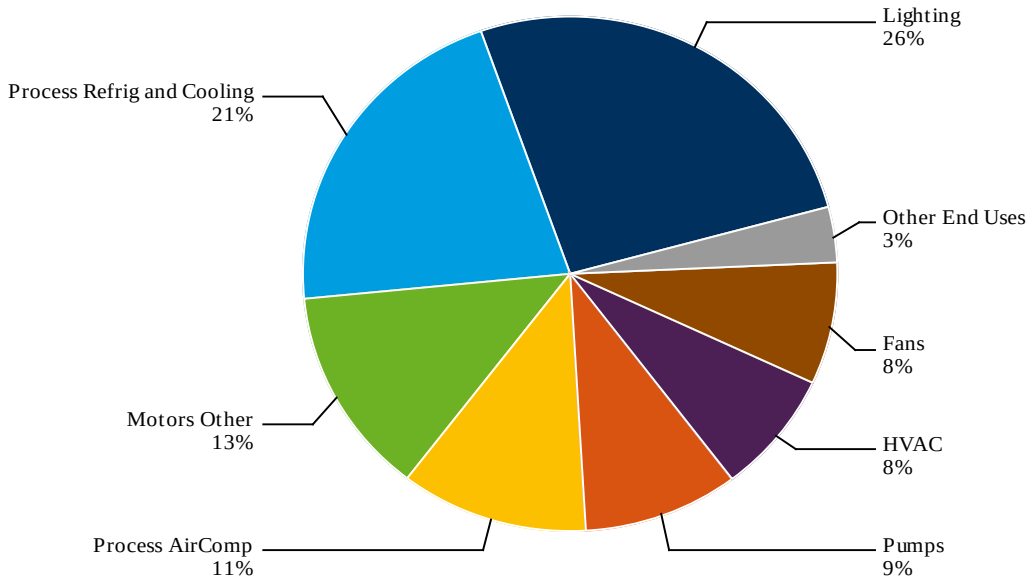
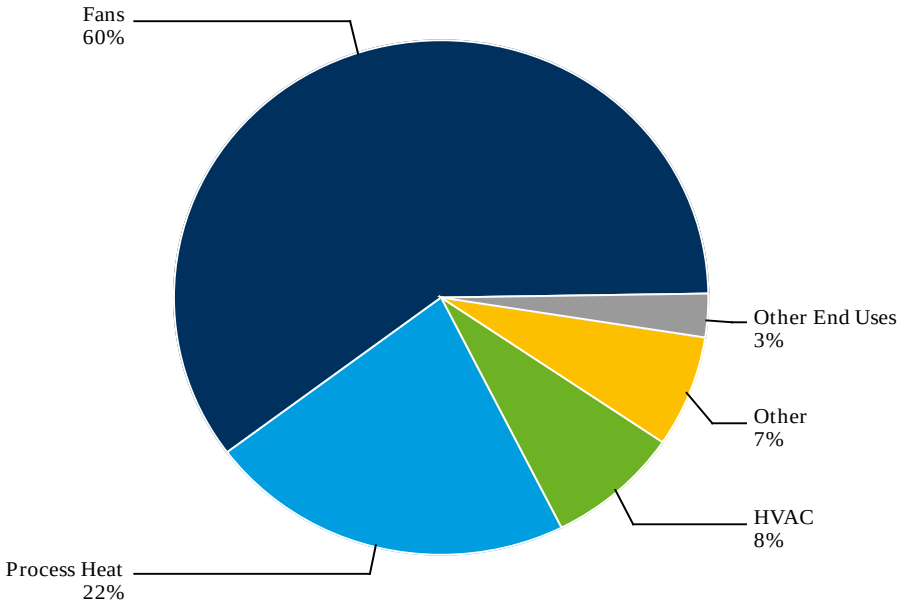


Figure A.4.5.1 Electric Technical Potential: Industrial by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.2 Electric Technical Potential: Industrial Agriculture by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.3 Electric Technical Potential: Industrial Chemical Mfg by End Use

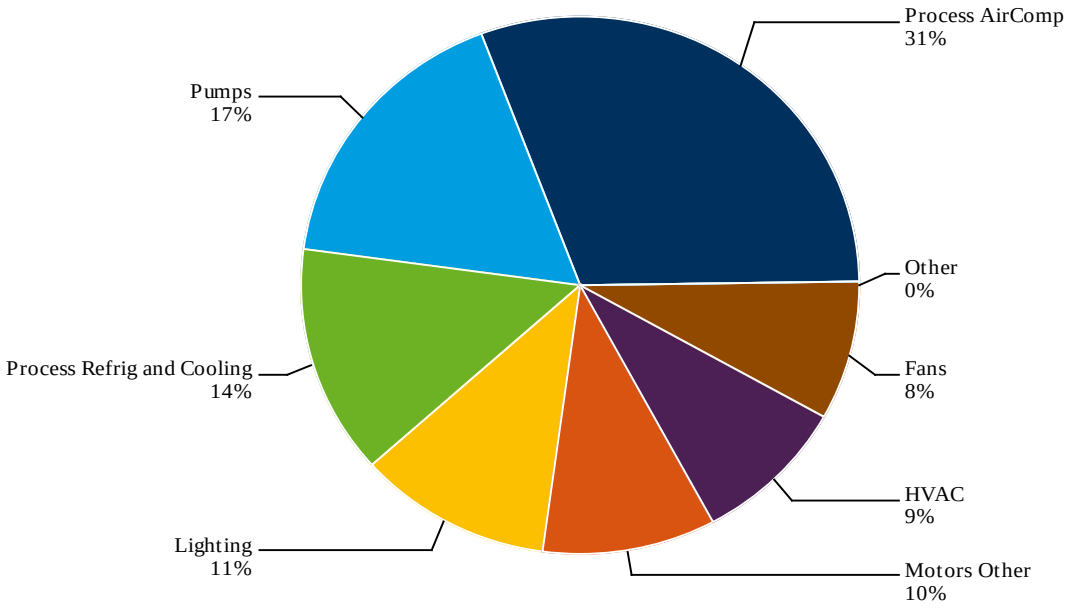
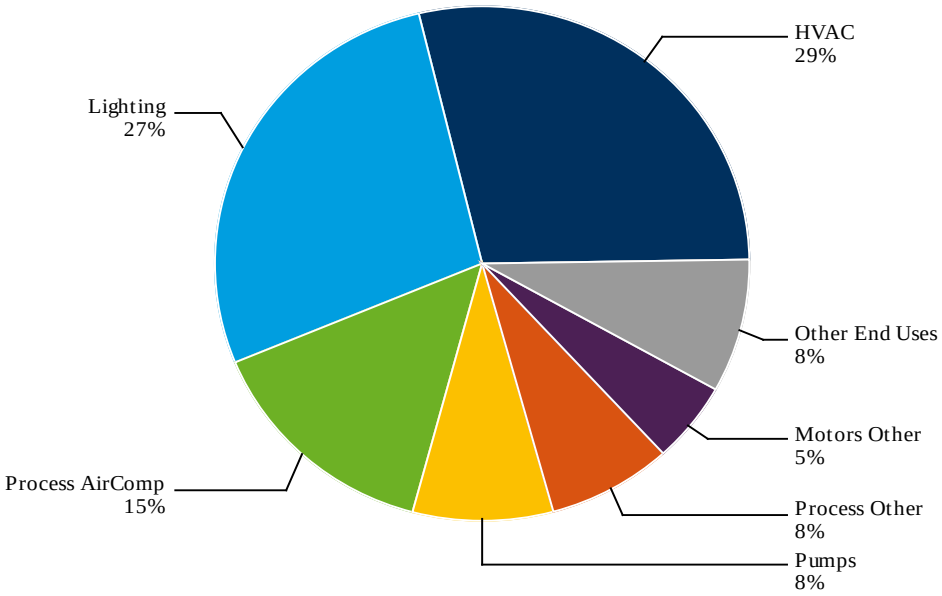
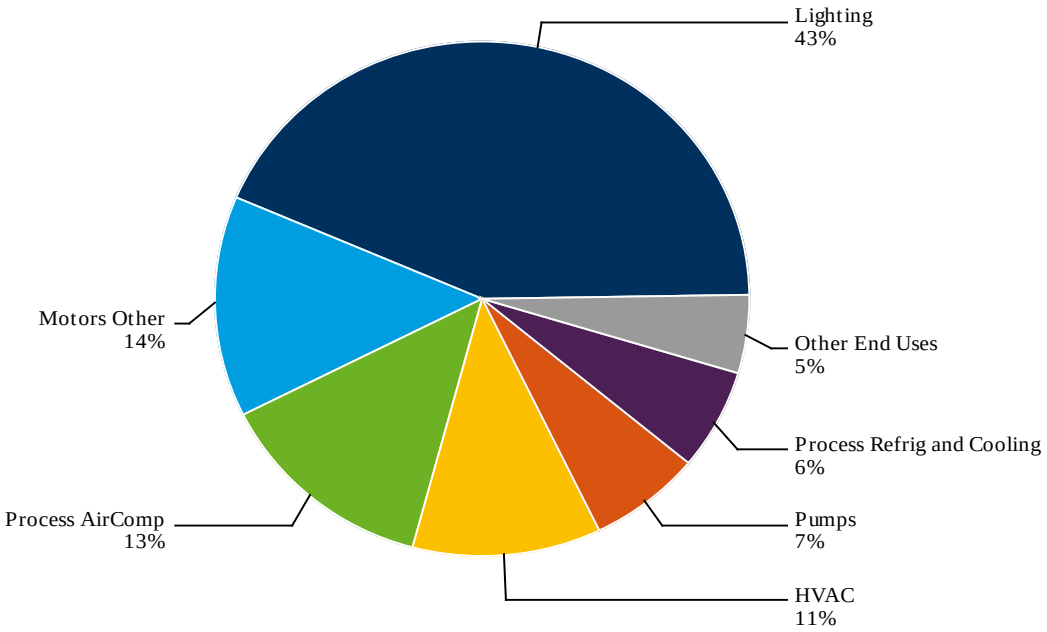


Figure A.4.5.4 Electric Technical Potential: Industrial Electrical Equipment Mfg by End Use



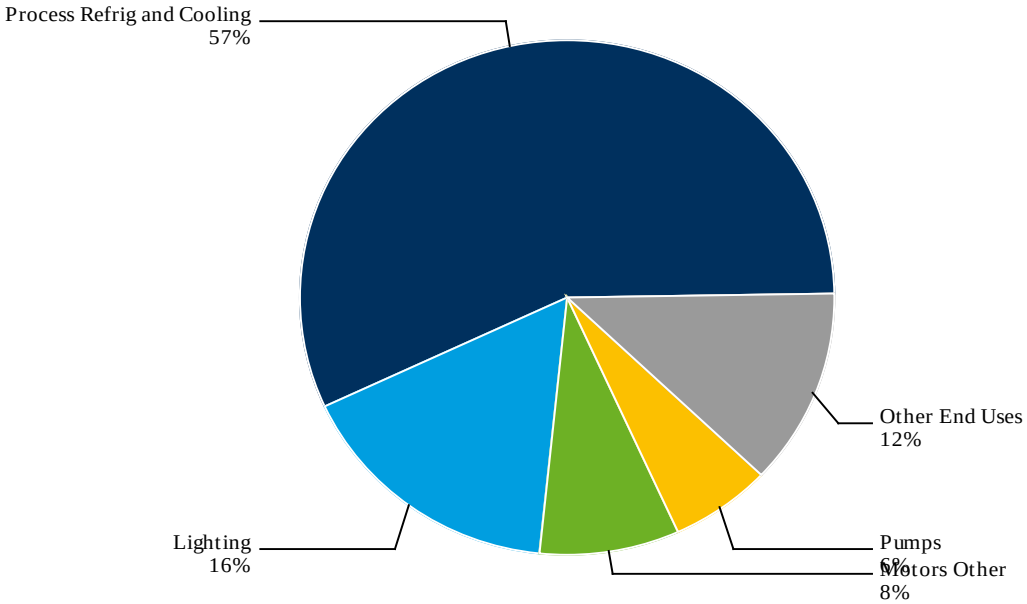
Note: 'Other End Uses' includes:

Figure A.4.5.5 Electric Technical Potential: Industrial Fabricated Metal Products by End Use



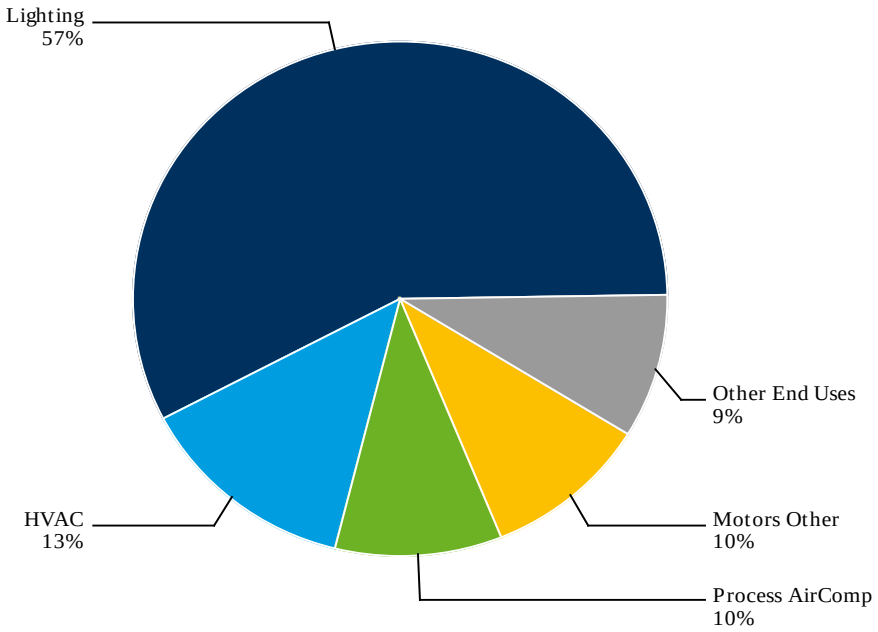
Note: 'Other End Uses' includes:

Figure A.4.5.6 Electric Technical Potential: Industrial Food Mfg by End Use



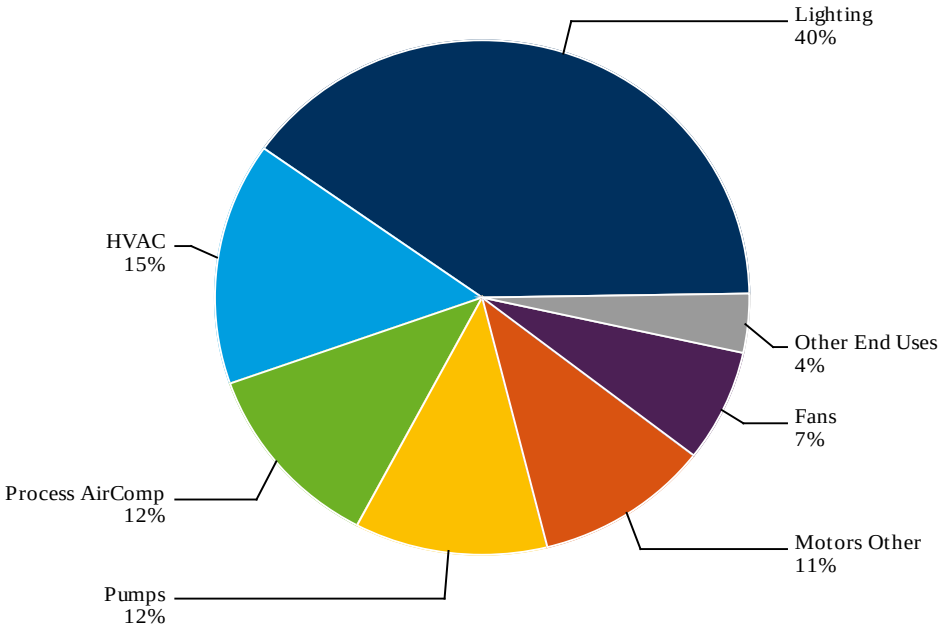
Note: 'Other End Uses' includes:

Figure A.4.5.7 Electric Technical Potential: Industrial Furniture Mfg by End Use



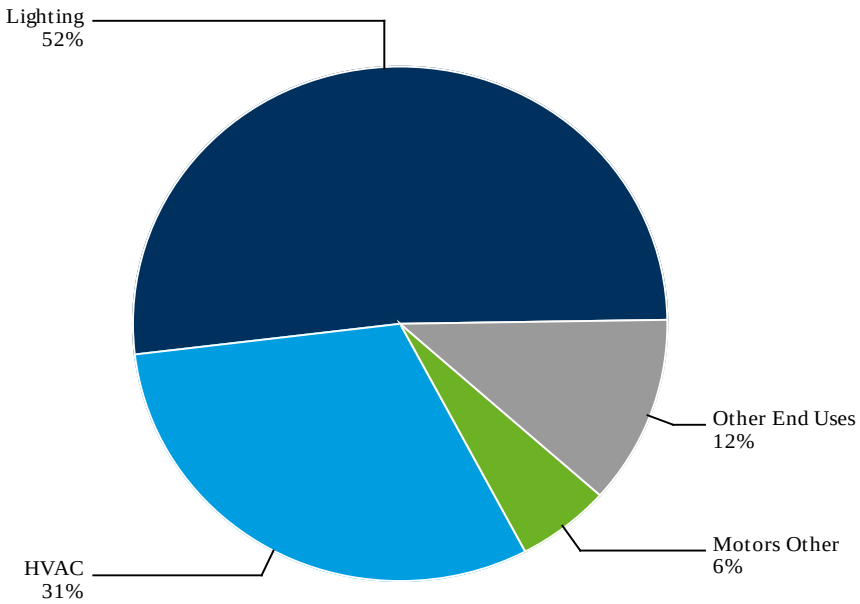
Note: 'Other End Uses' includes:

Figure A.4.5.8 Electric Technical Potential: Industrial Industrial Machinery by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.9 Electric Technical Potential: Industrial Instruments by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.10 Electric Technical Potential: Industrial Mining by End Use

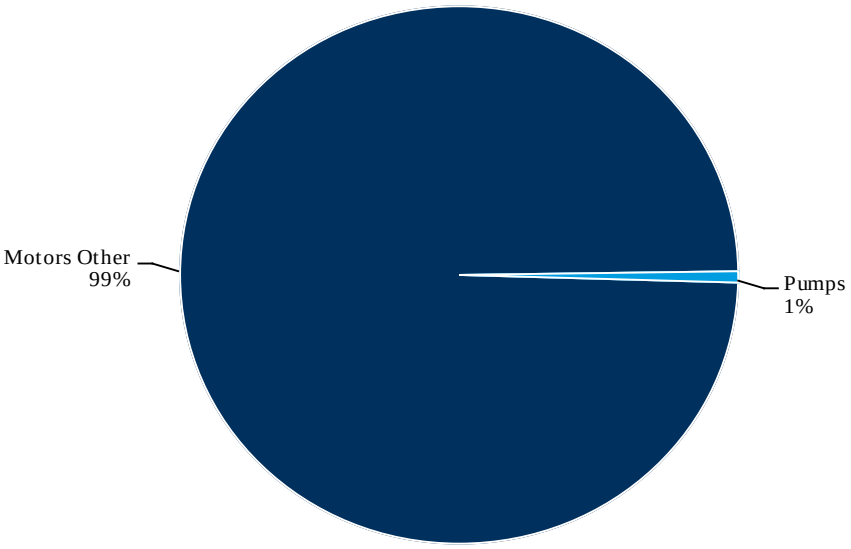
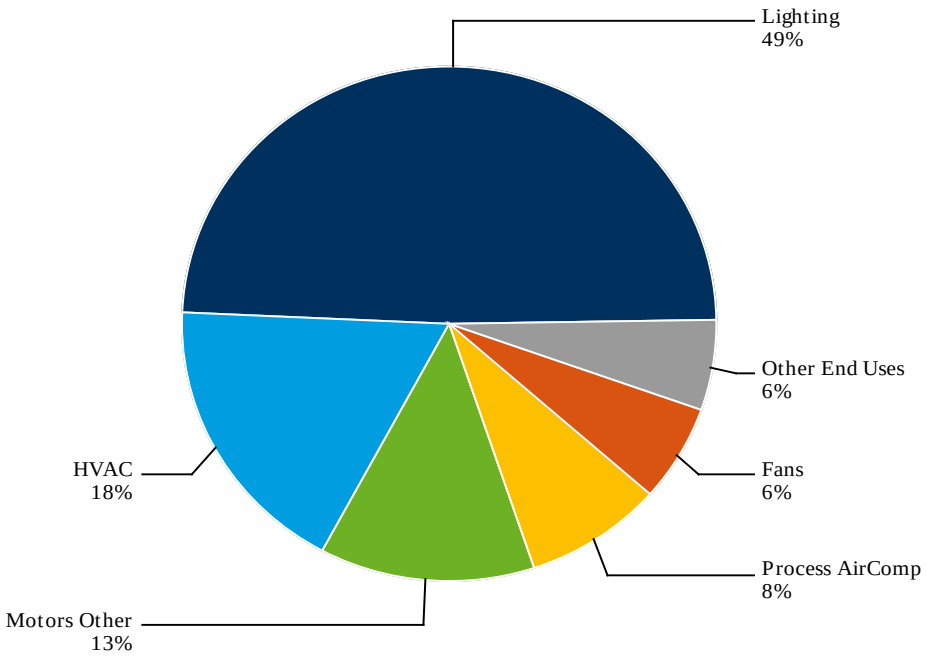
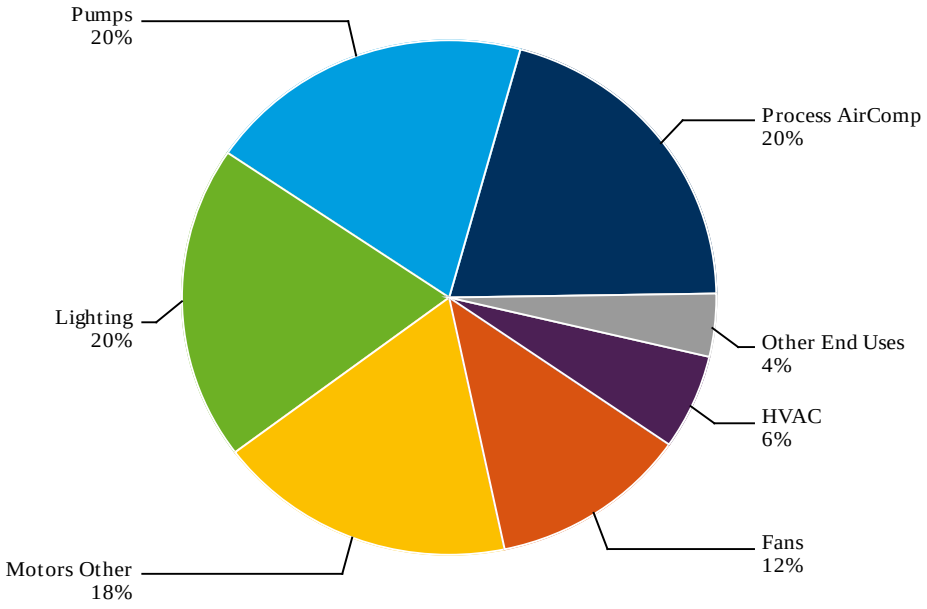


Figure A.4.5.11 Electric Technical Potential: Industrial Miscellaneous Mfg by End Use



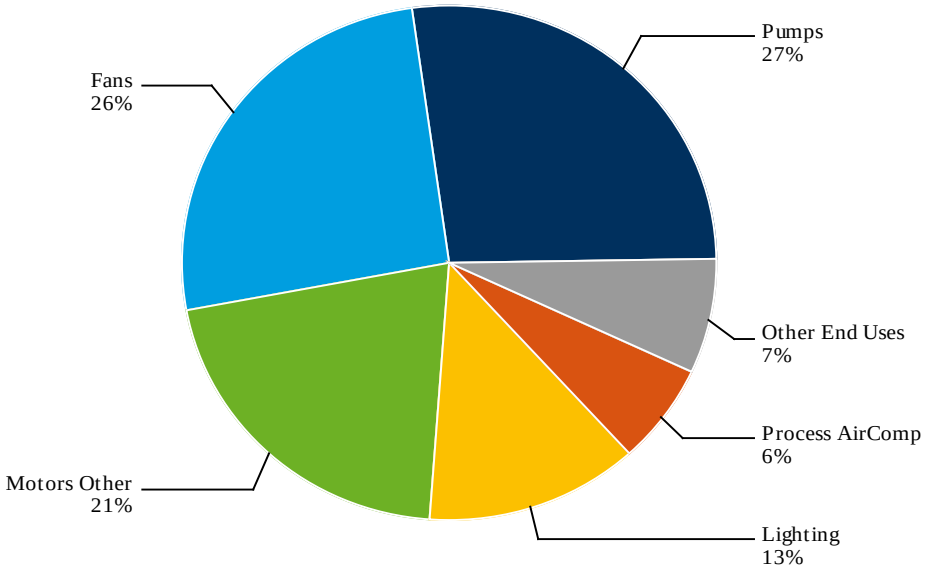
Note: 'Other End Uses' includes:

Figure A.4.5.12 Electric Technical Potential: Industrial Nonmetallic Mineral Products by End Use



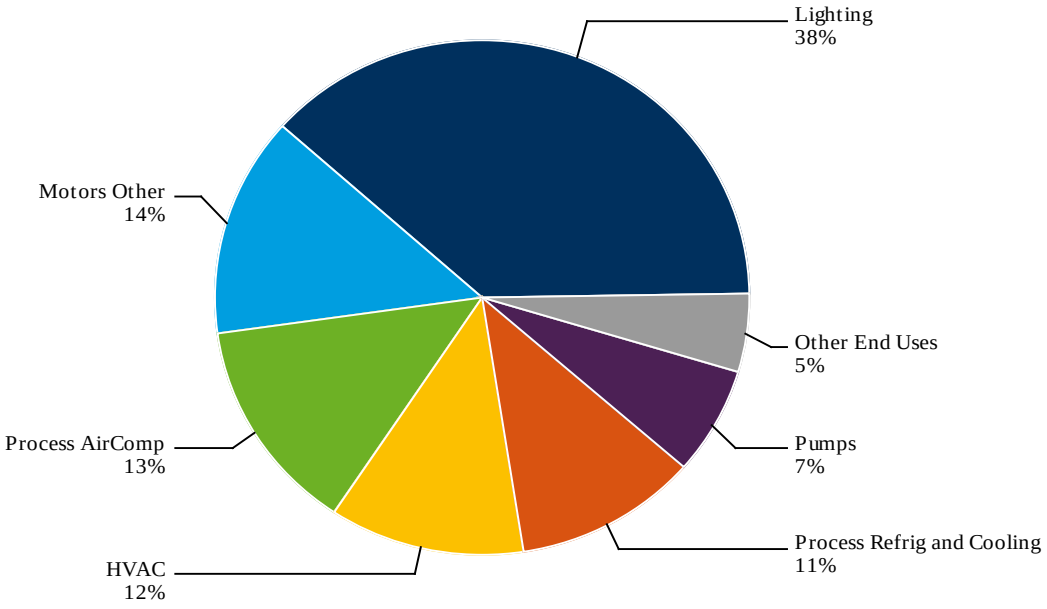
Note: 'Other End Uses' includes:

Figure A.4.5.13 Electric Technical Potential: Industrial Paper Mfg by End Use



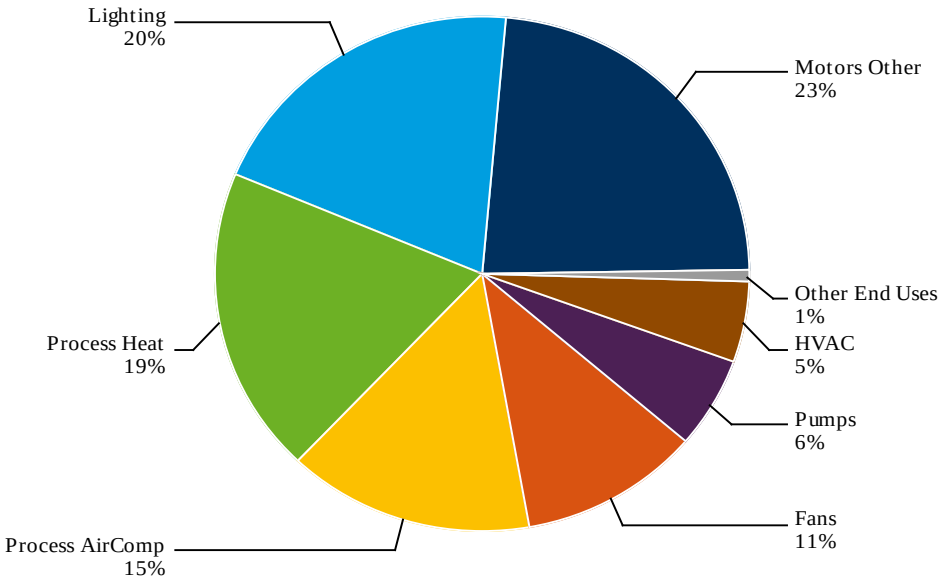
Note: 'Other End Uses' includes:

Figure A.4.5.14 Electric Technical Potential: Industrial Plastics Rubber Products by End Use



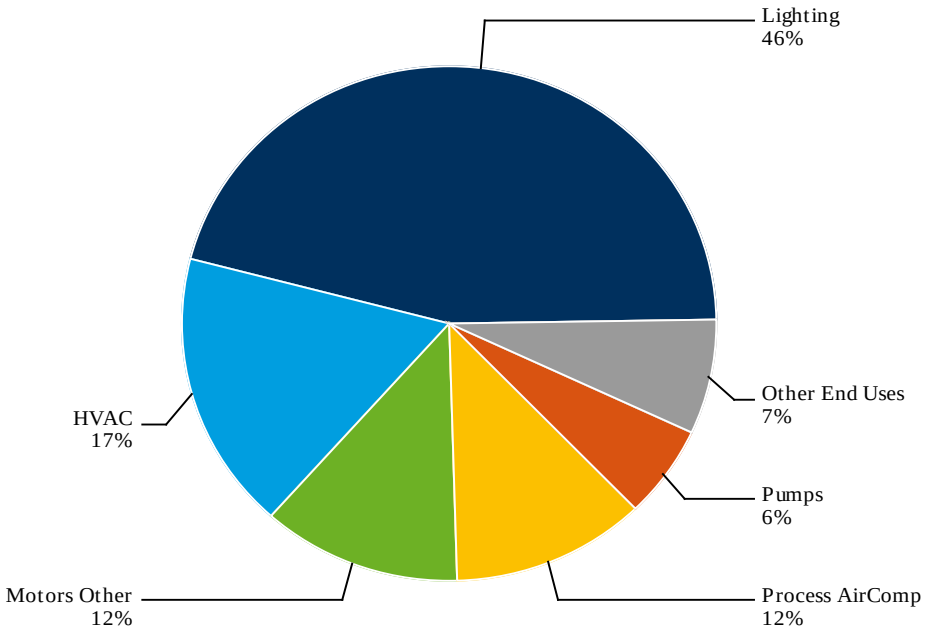
Note: 'Other End Uses' includes:

Figure A.4.5.15 Electric Technical Potential: Industrial Primary Metal Mfg by End Use



Note: 'Other End Uses' includes:

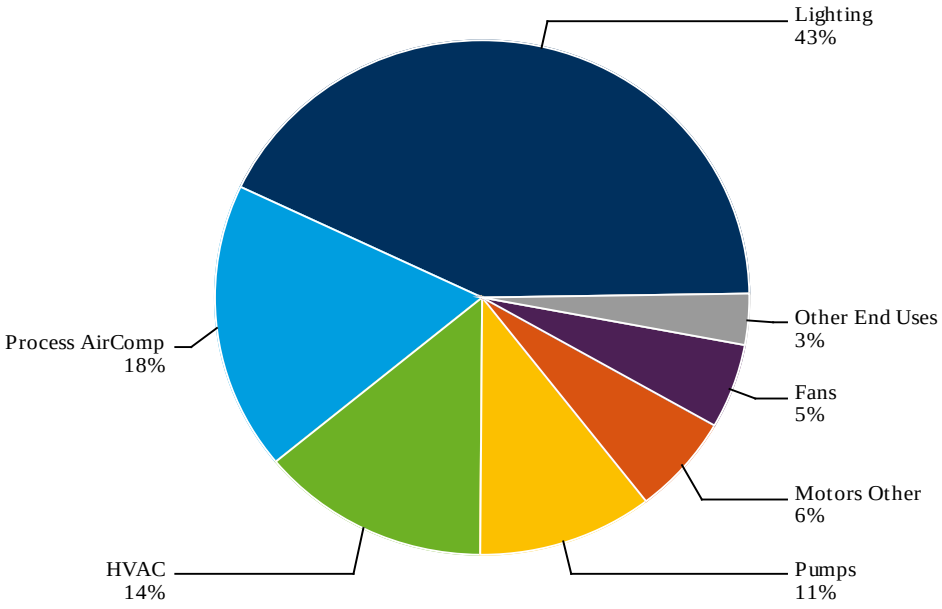
Figure A.4.5.16 Electric Technical Potential: Industrial Printing Related Support by End Use



Note: 'Other End Uses' includes:

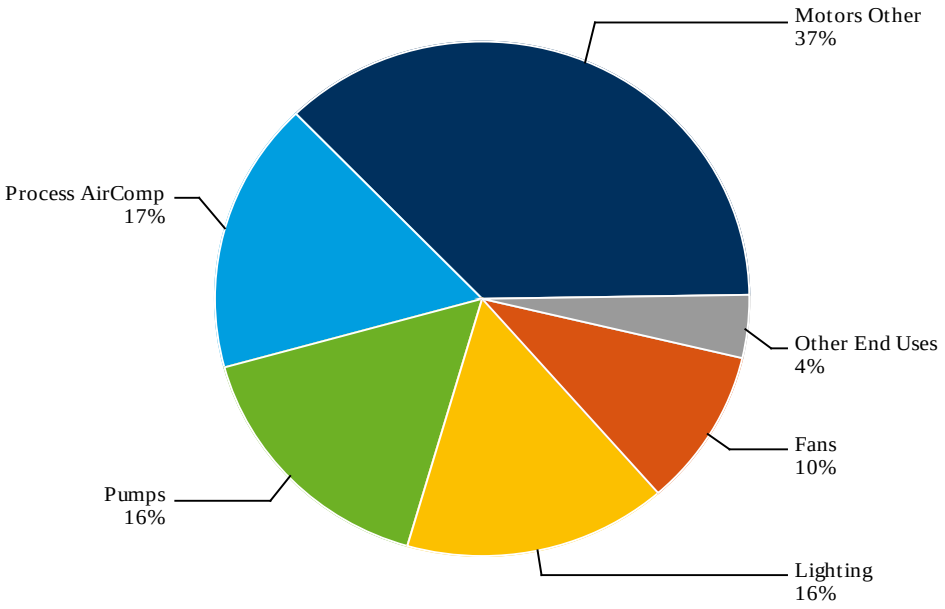
Figure A.4.5.17 Electric Technical Potential: Industrial Street Lighting by End Use

Figure A.4.5.18 Electric Technical Potential: Industrial Transportation Equipment Mfg by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.19 Electric Technical Potential: Industrial Wood Product Mfg by End Use



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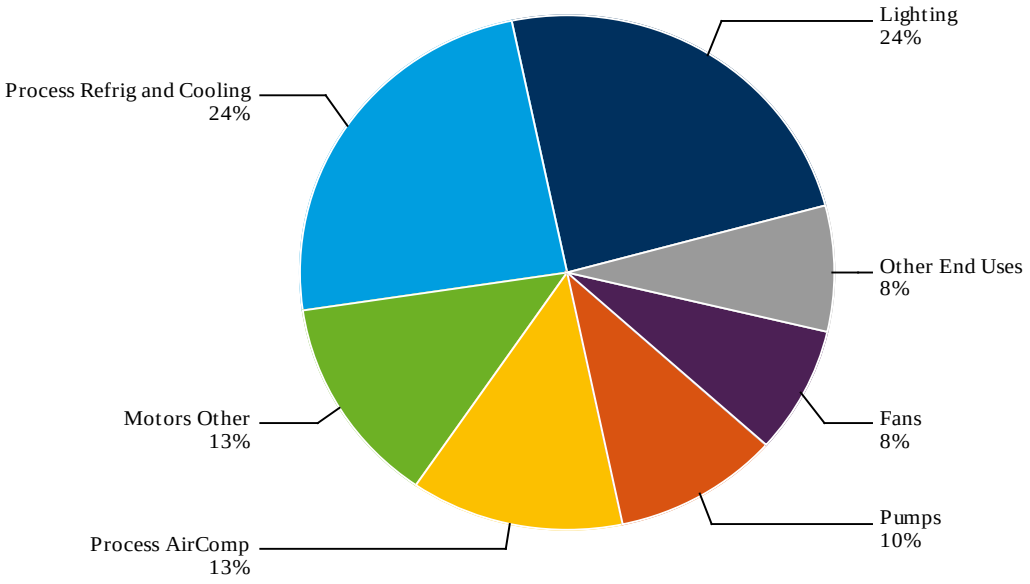

Note: 'Other End Uses' includes:

Figure A.4.5.21 Electric Economic Potential: Industrial Agriculture by End Use

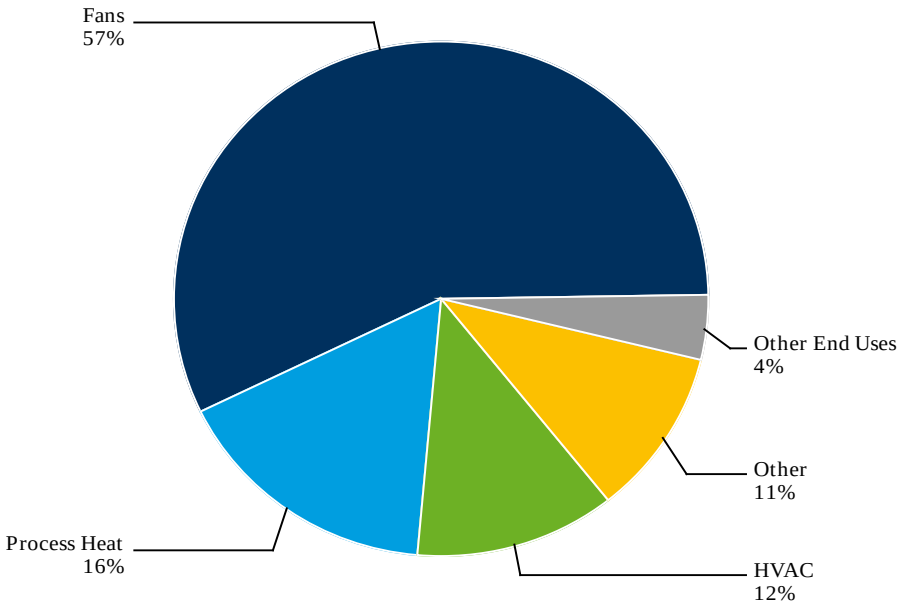

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Figure A.4.5.22 Electric Economic Potential: Industrial Chemical Mfg by End Use

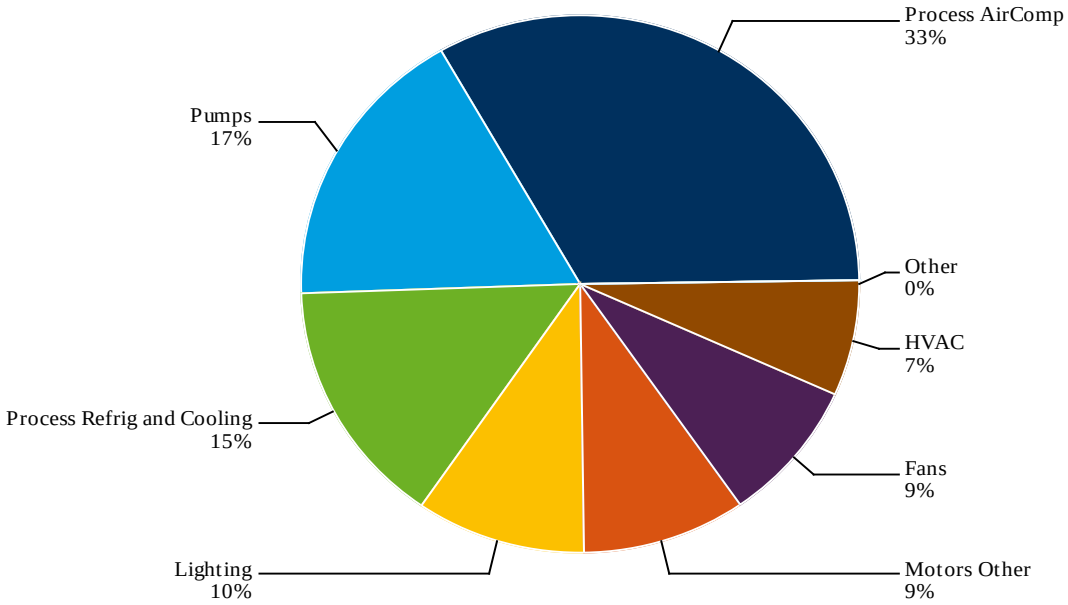

Figure A.4.5.23 Electric Economic Potential: Industrial Electrical Equipment Mfg by End Use

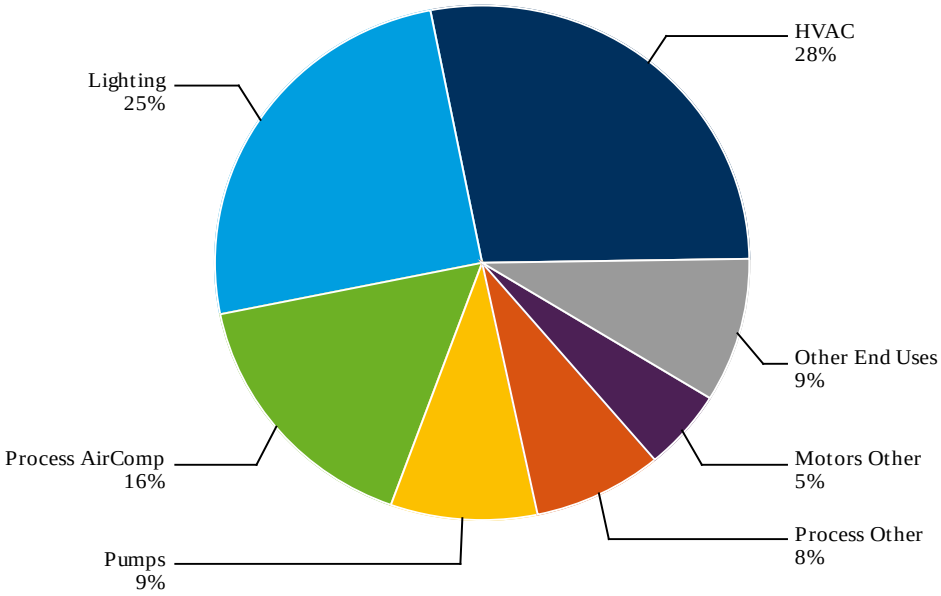

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Figure A.4.5.24 Electric Economic Potential: Industrial Fabricated Metal Products by End Use

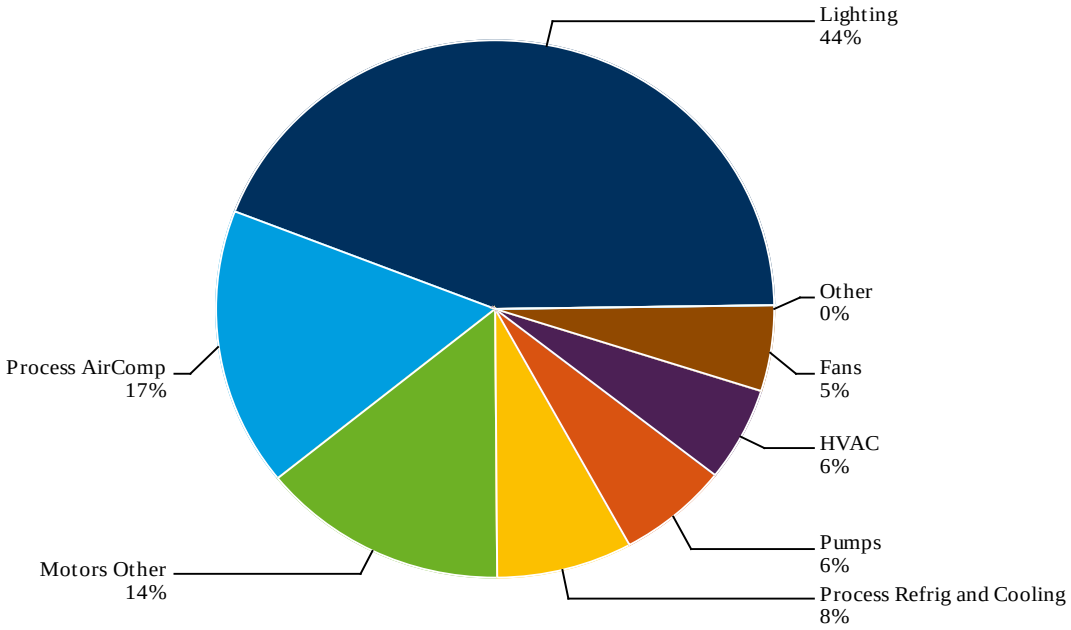

Figure A.4.5.25 Electric Economic Potential: Industrial Food Mfg by End Use

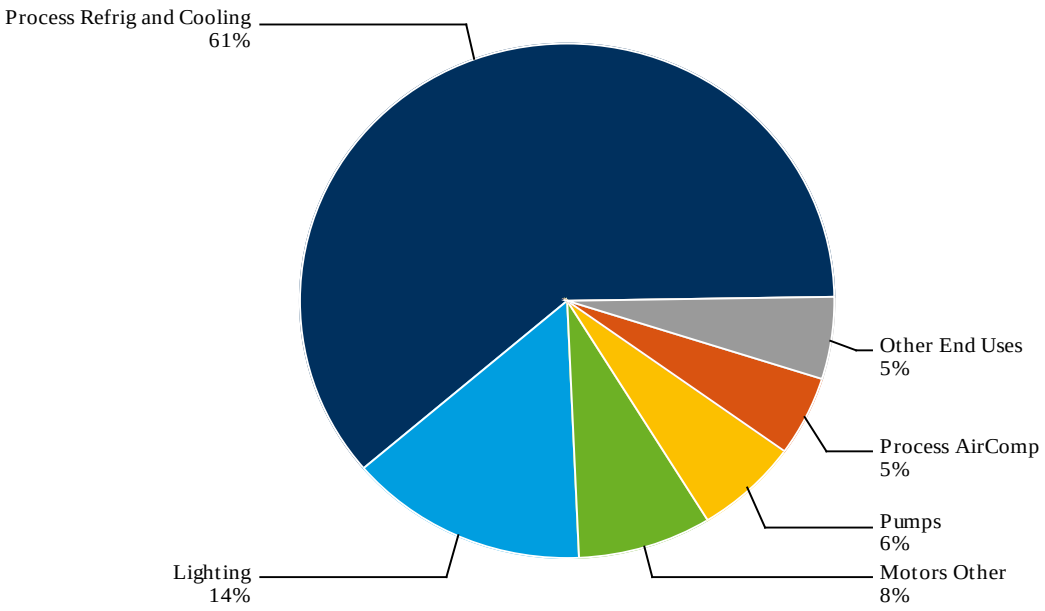

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Figure A.4.5.26 Electric Economic Potential: Industrial Furniture Mfg by End Use

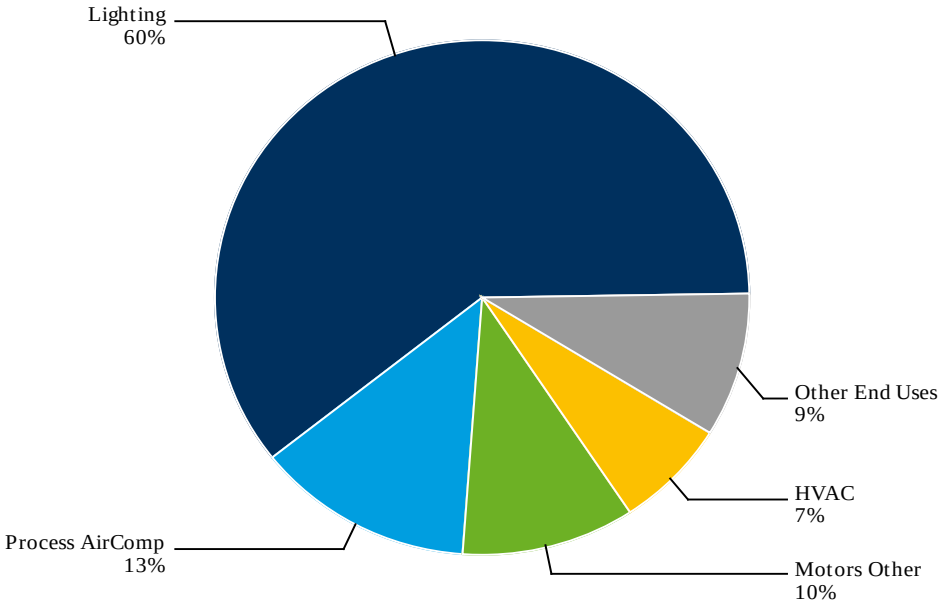

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Figure A.4.5.27 Electric Economic Potential: Industrial Industrial Machinery by End Use

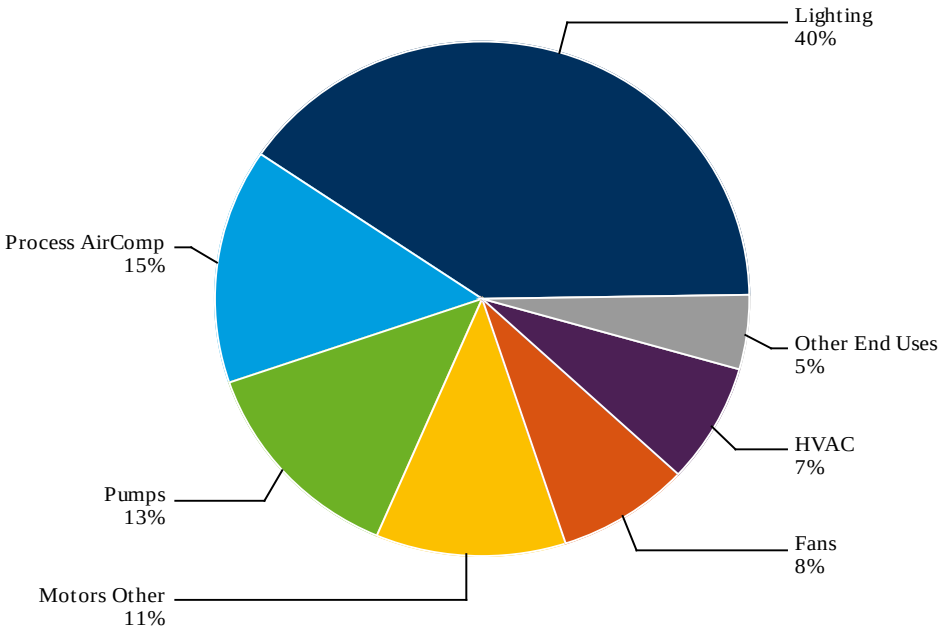

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Figure A.4.5.28 Electric Economic Potential: Industrial Instruments by End Use

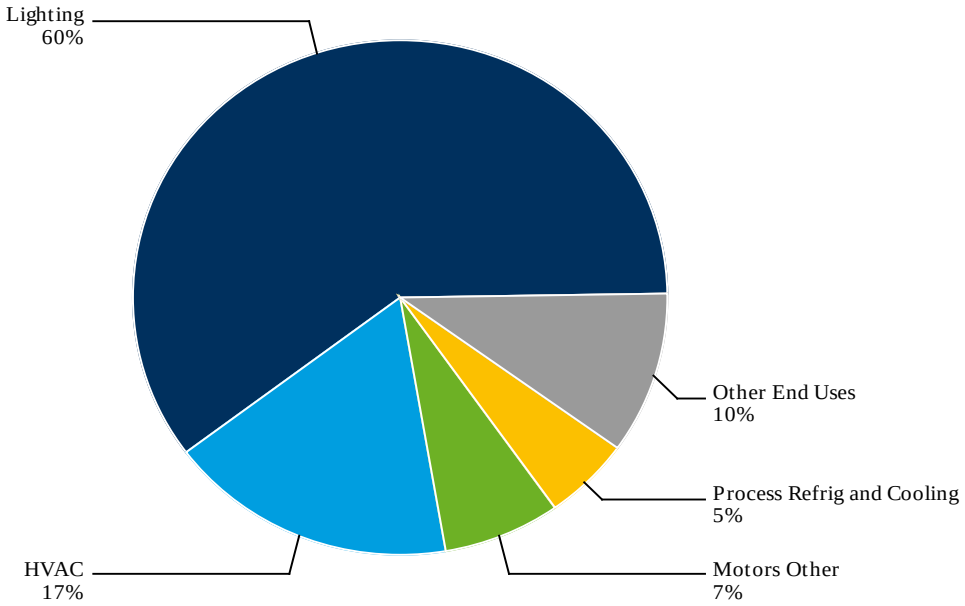

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Figure A.4.5.29 Electric Economic Potential: Industrial Mining by End Use

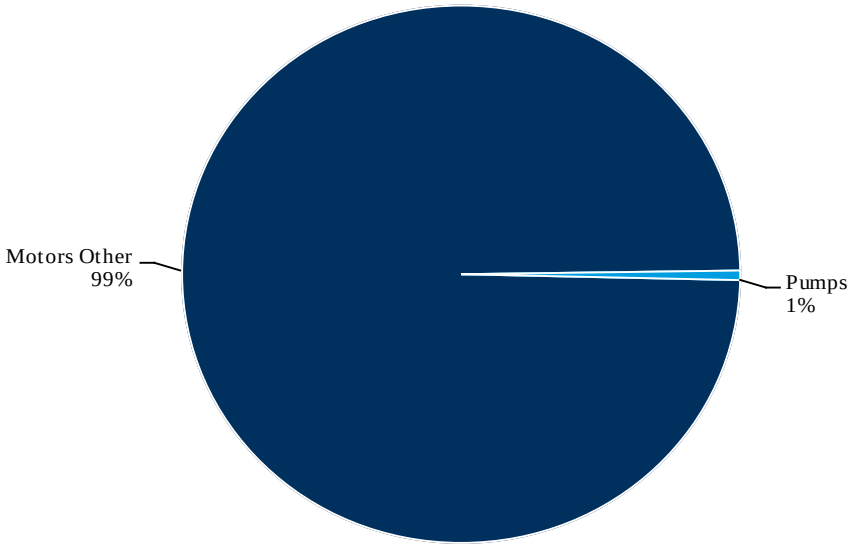

Figure A.4.5.30 Electric Economic Potential: Industrial Miscellaneous Mfg by End Use

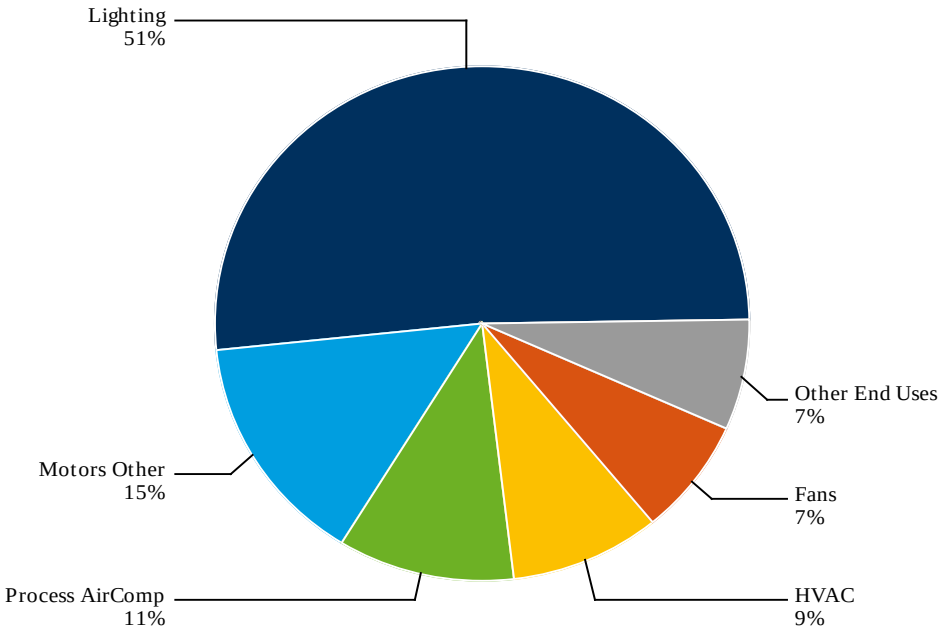

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Figure A.4.5.31 Electric Economic Potential: Industrial Nonmetallic Mineral Products by End Use

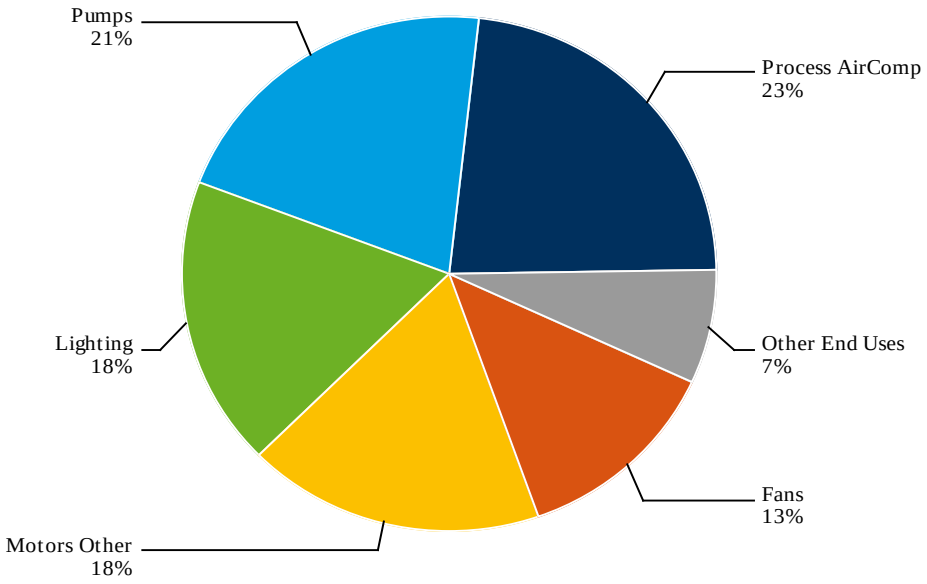

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Figure A.4.5.32 Electric Economic Potential: Industrial Paper Mfg by End Use

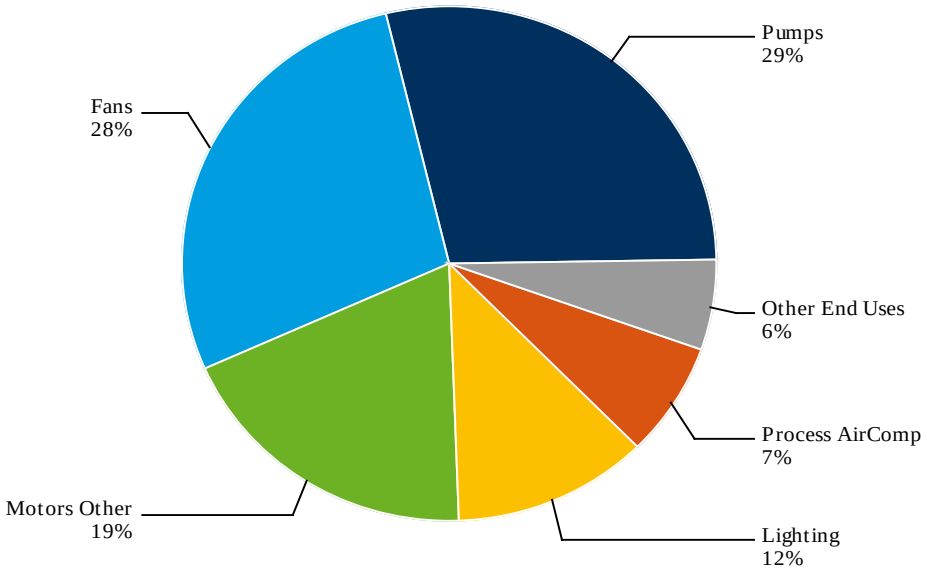

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Figure A.4.5.33 Electric Economic Potential: Industrial Plastics Rubber Products by End Use

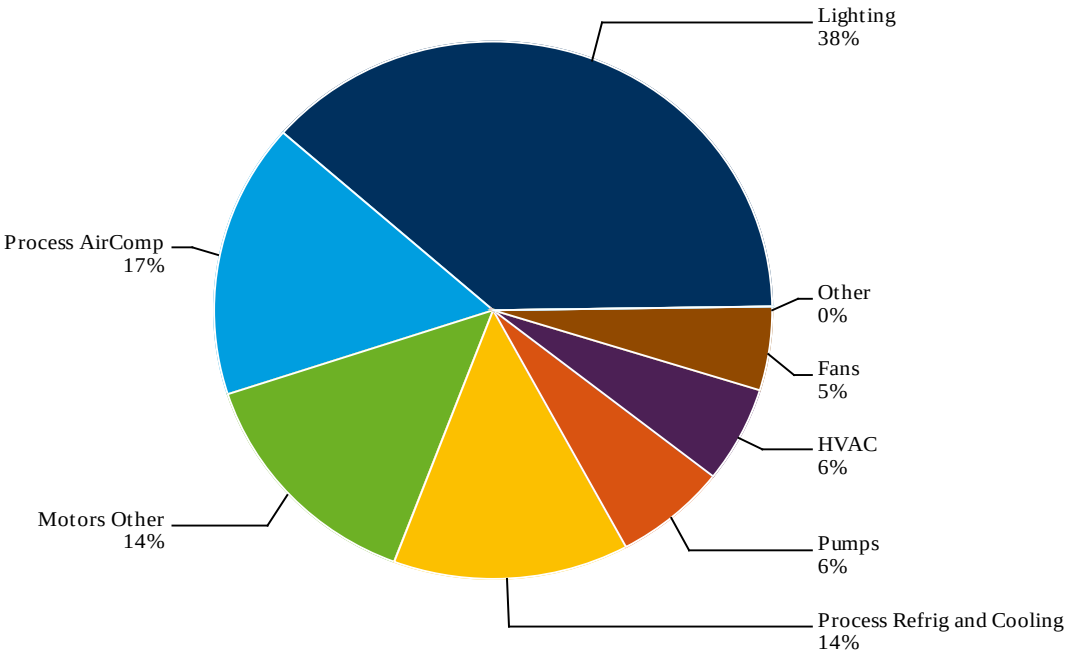

Figure A.4.5.34 Electric Economic Potential: Industrial Primary Metal Mfg by End Use

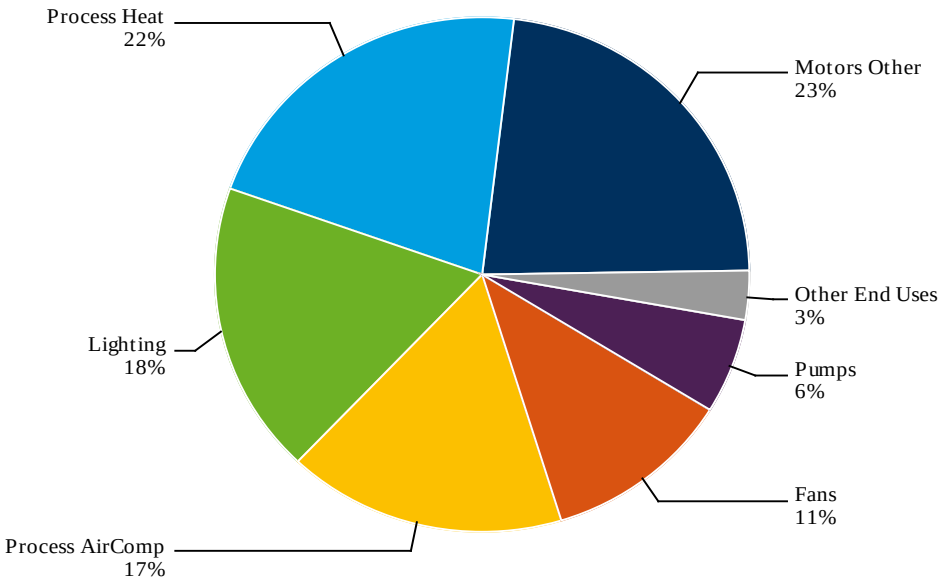

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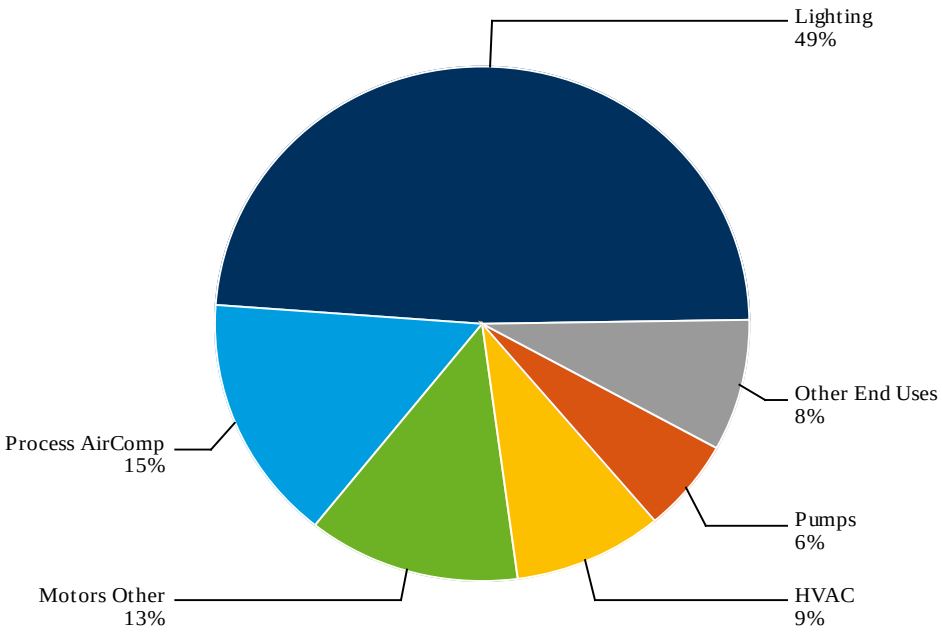
Figure A.4.5.35 Electric Economic Potential: Industrial Printing Related Support by End Use



Note: 'Other End Uses' includes:

Figure A.4.5.36 Electric Economic Potential: Industrial Street Lighting by End Use

Figure A.4.5.37 Electric Economic Potential: Industrial Transportation Equipment Mfg by End Use

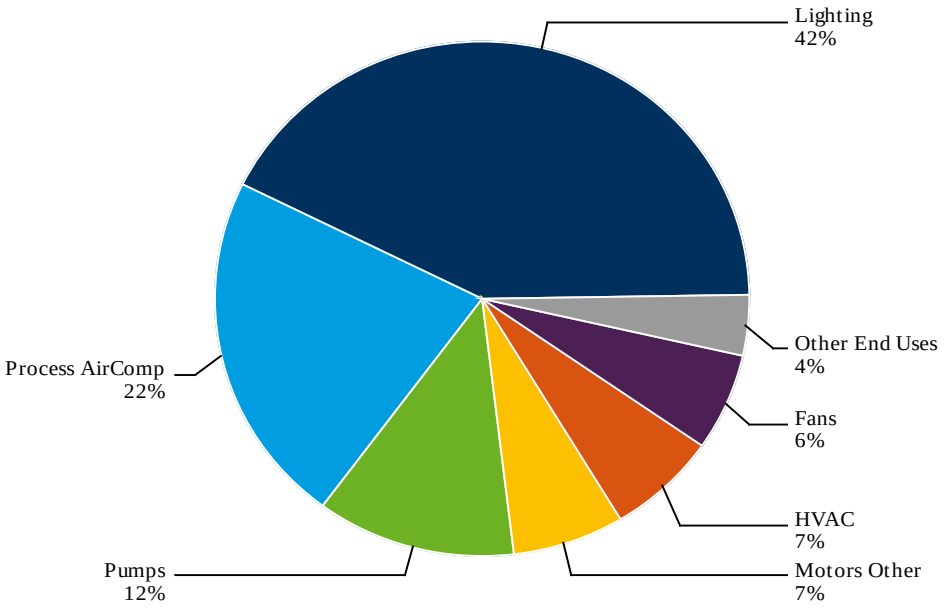


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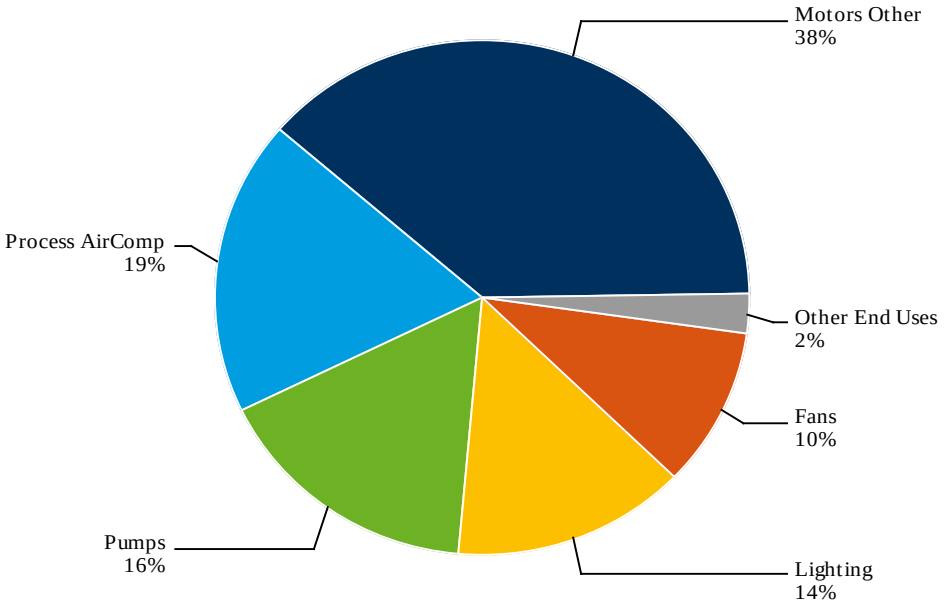
Figure A.4.5.38 Electric Economic Potential: Industrial Wood Product Mfg by End Use



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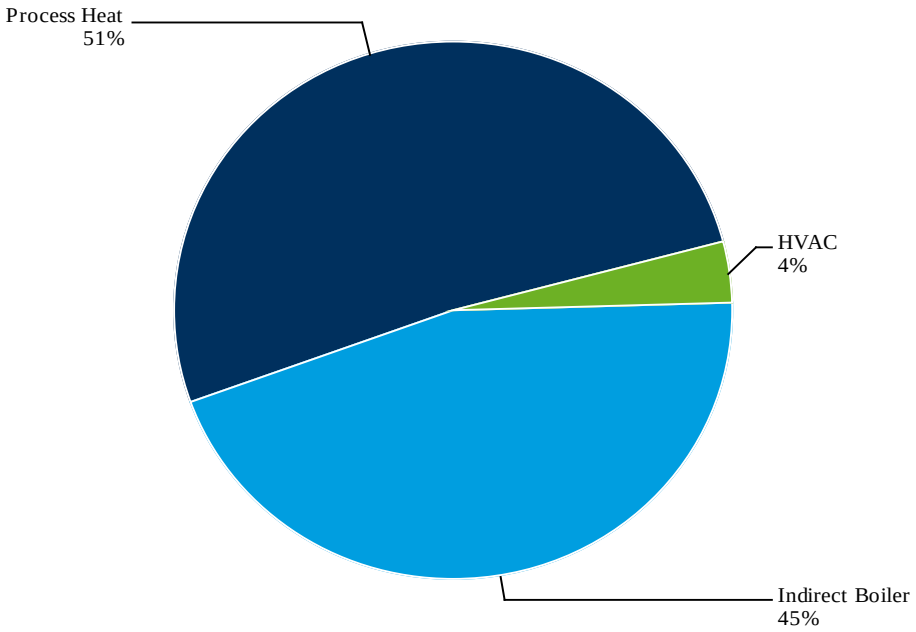


Figure A.4.6.2 Gas Technical Potential: Industrial Agriculture by End Use

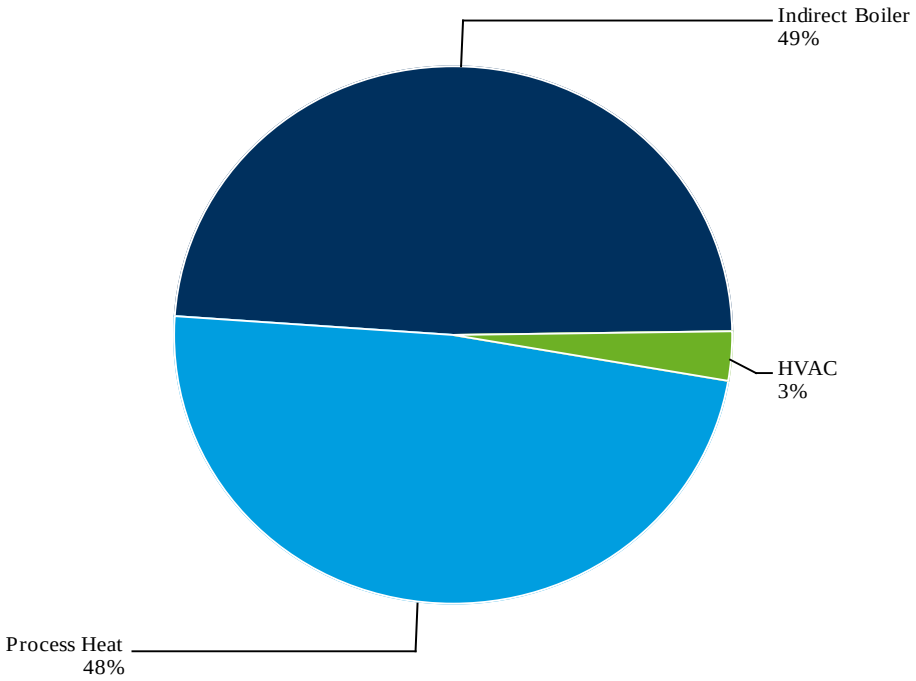


Figure A.4.6.3 Gas Technical Potential: Industrial Chemical Mfg by End Use

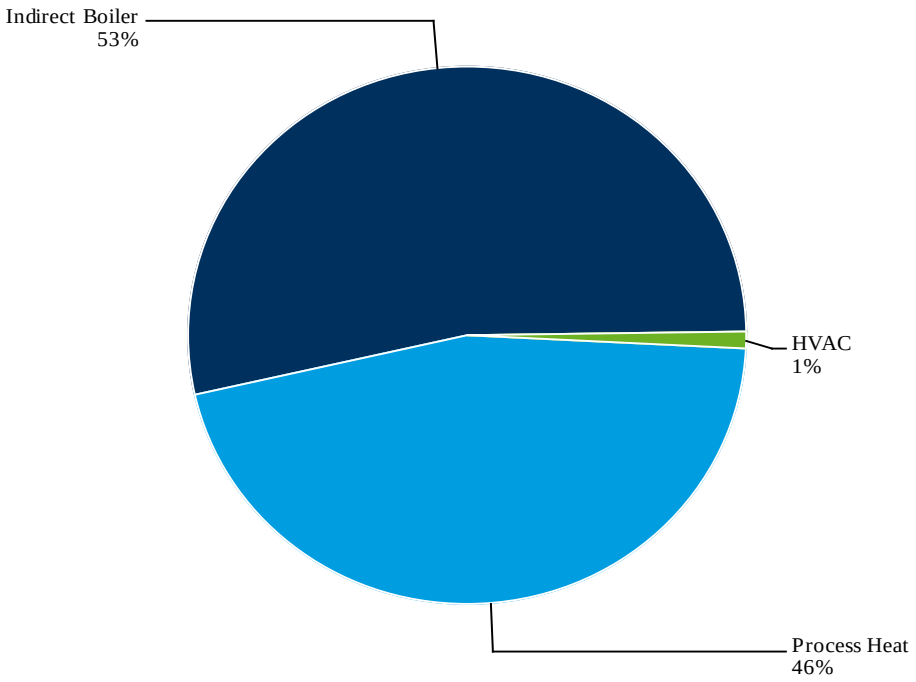


Figure A.4.6.4 Gas Technical Potential: Industrial Electrical Equipment Mfg by End Use

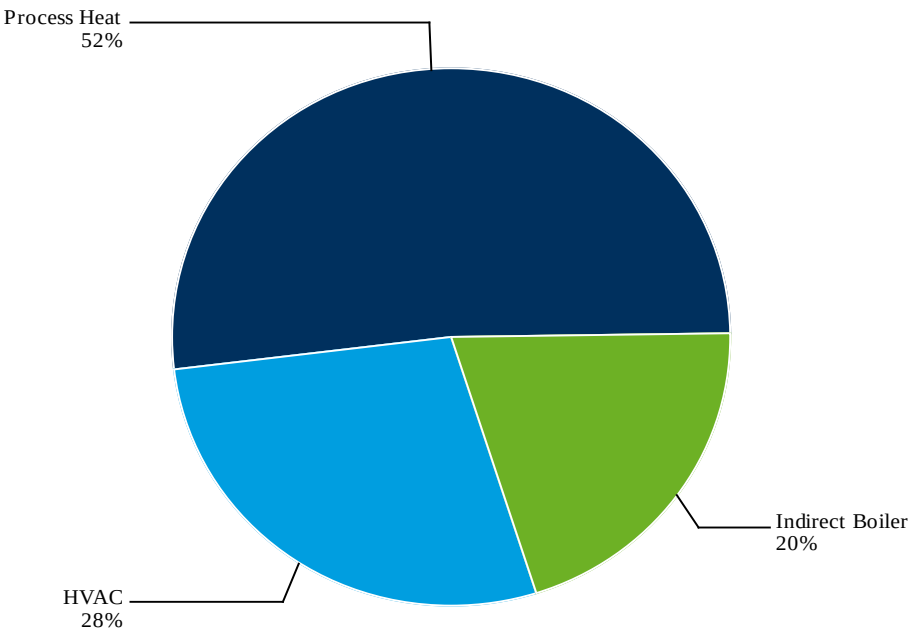


Figure A.4.6.5 Gas Technical Potential: Industrial Fabricated Metal Products by End Use

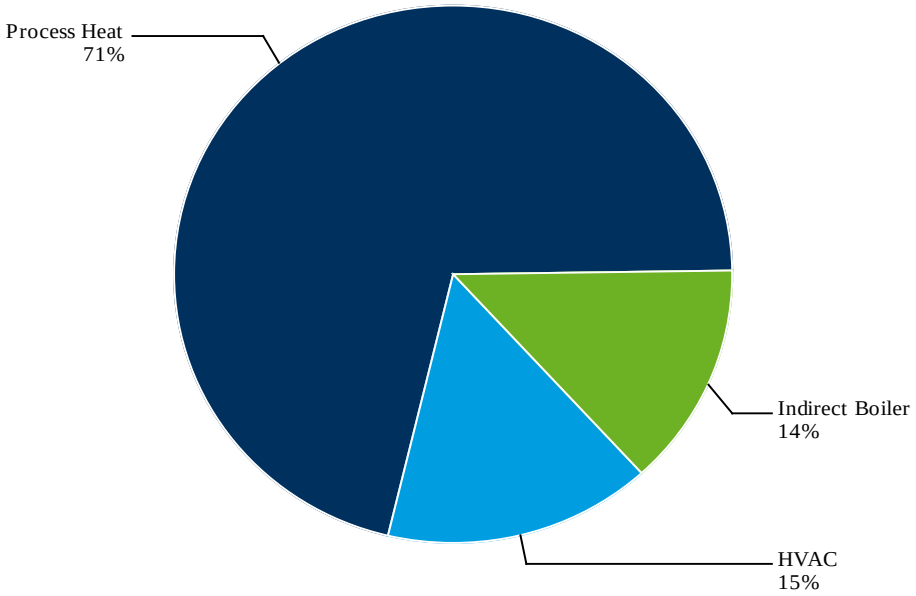


Figure A.4.6.6 Gas Technical Potential: Industrial Food Mfg by End Use

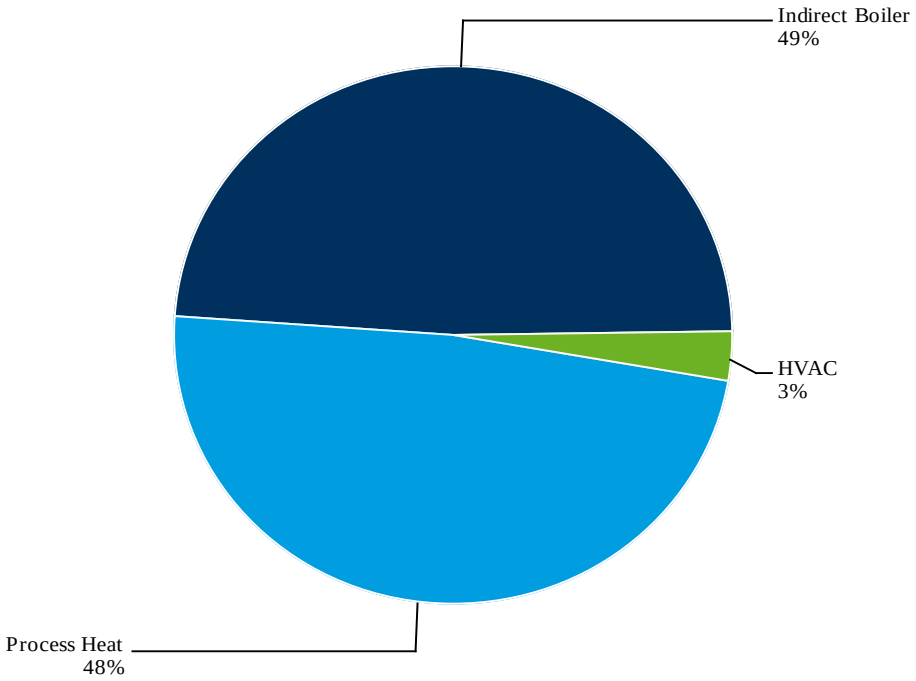


Figure A.4.6.7 Gas Technical Potential: Industrial Furniture Mfg by End Use

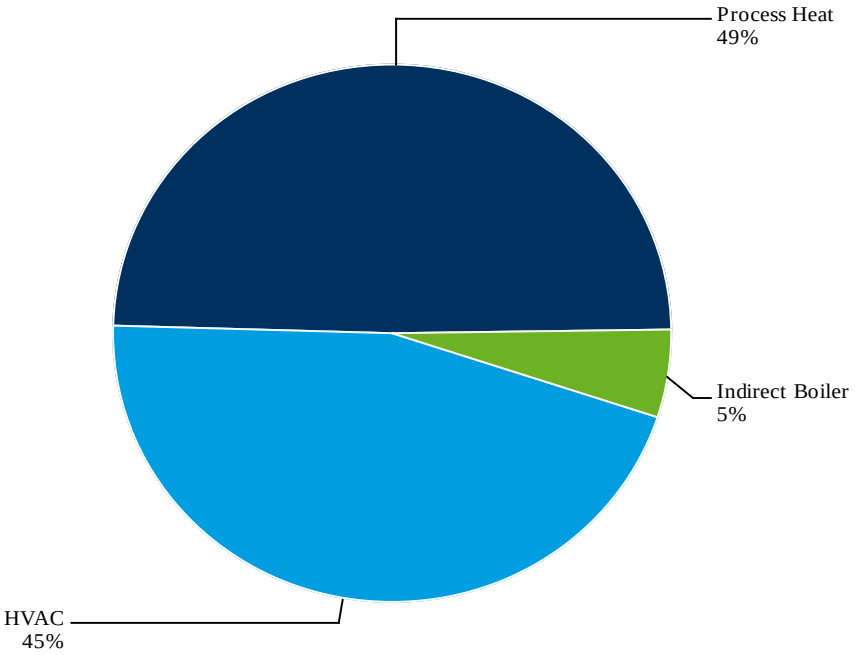


Figure A.4.6.8 Gas Technical Potential: Industrial Industrial Machinery by End Use

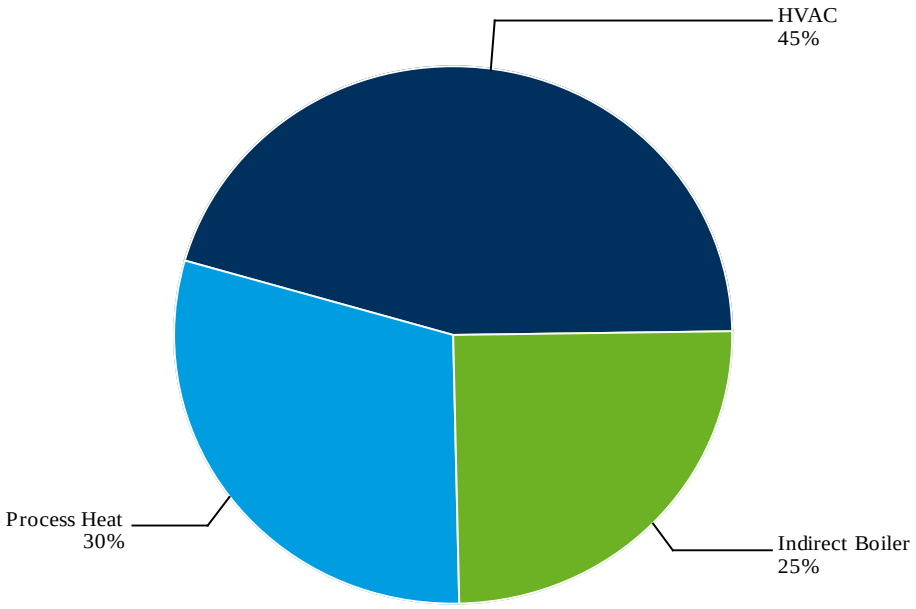


Figure A.4.6.9 Gas Technical Potential: Industrial Instruments by End Use

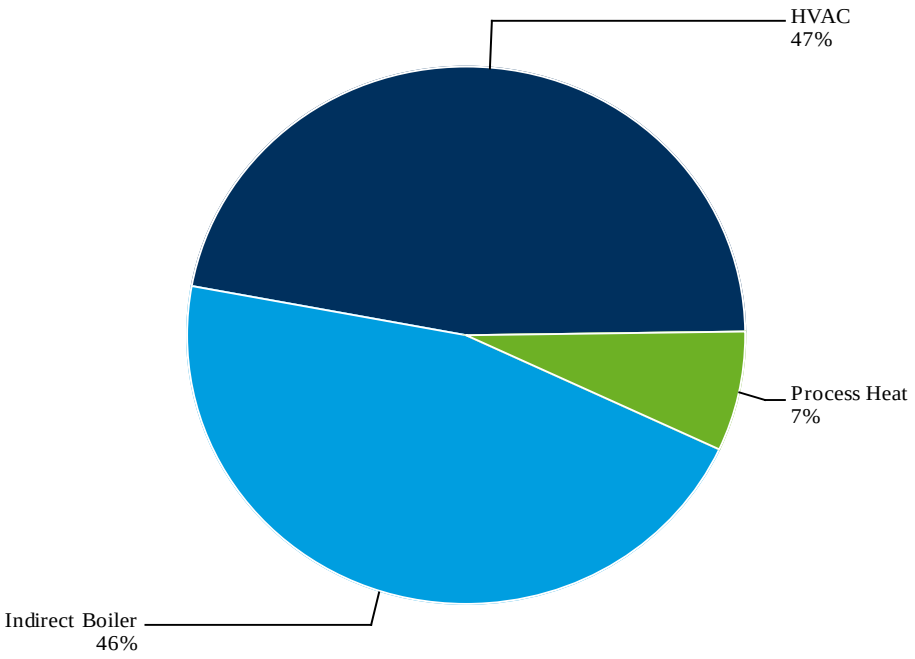


Figure A.4.6.11 Gas Technical Potential: Industrial Miscellaneous Mfg by End Use

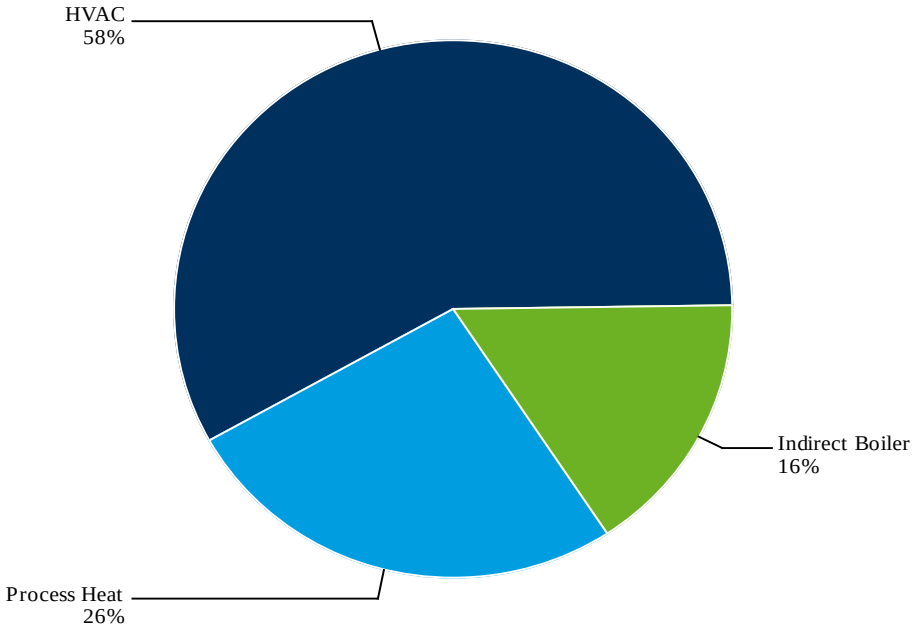
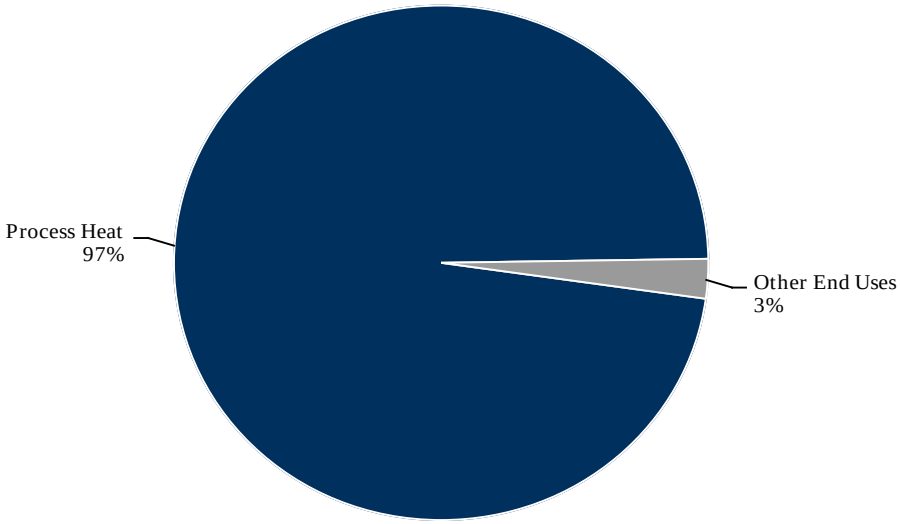


Figure A.4.6.12 Gas Technical Potential: Industrial Nonmetallic Mineral Products by End Use



Note: 'Other End Uses' includes:

Figure A.4.6.13 Gas Technical Potential: Industrial Paper Mfg by End Use

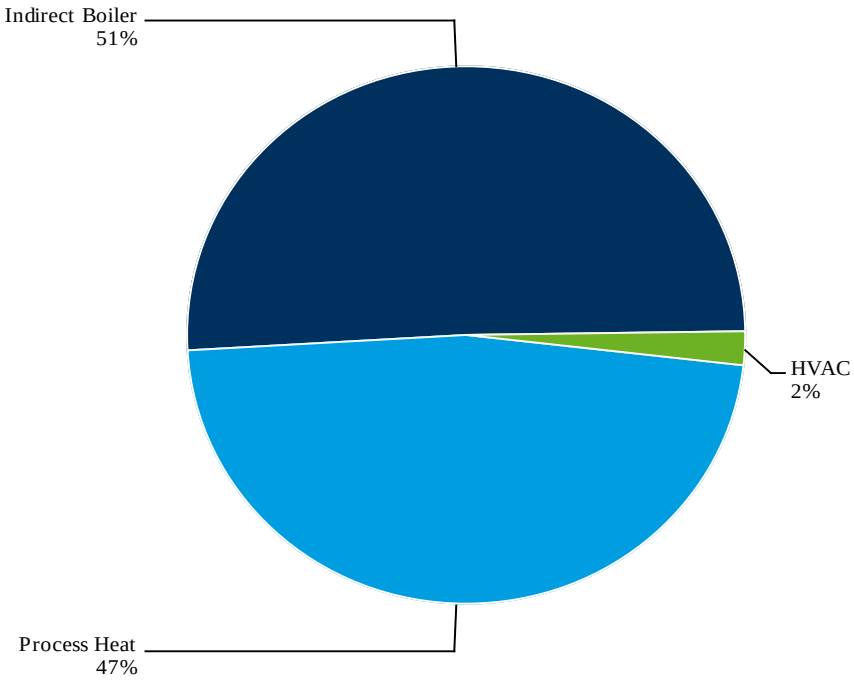


Figure A.4.6.14 Gas Technical Potential: Industrial Plastics Rubber Products by End Use

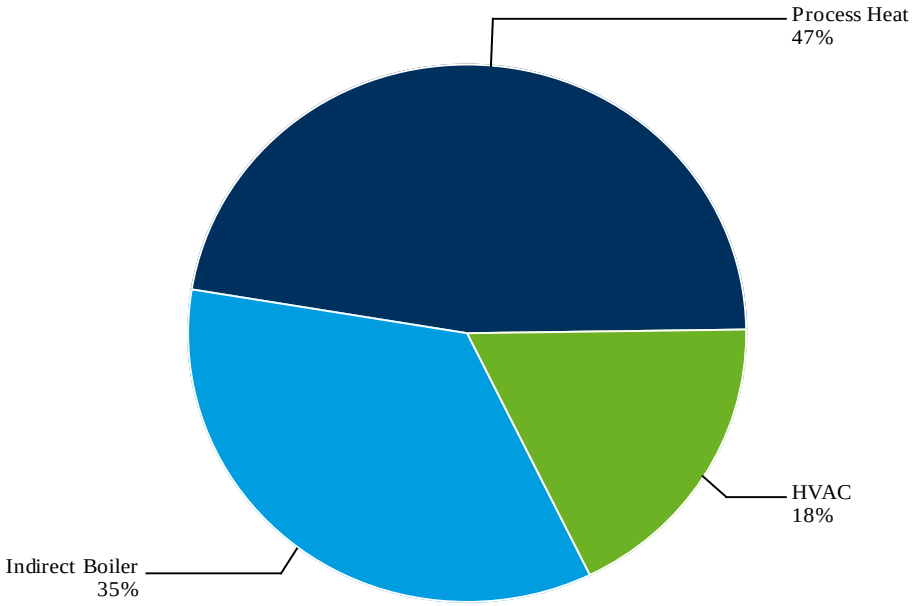
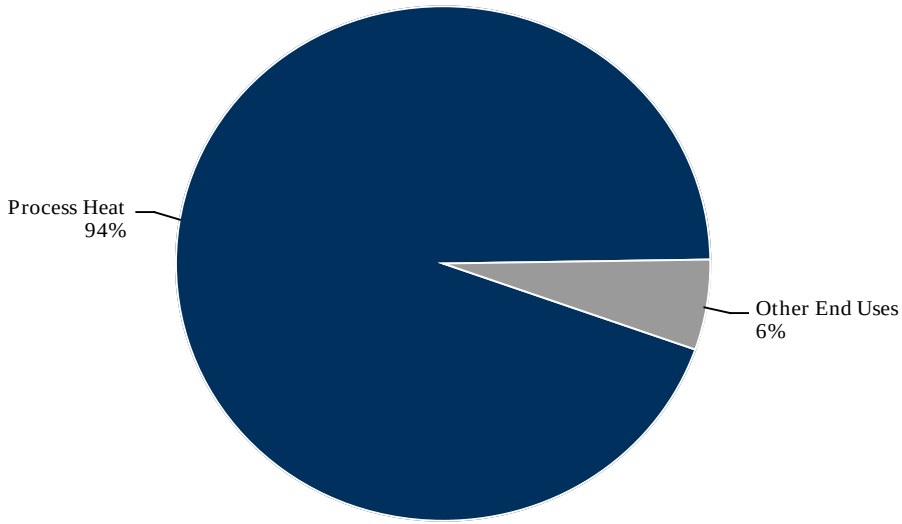


Figure A.4.6.15 Gas Technical Potential: Industrial Primary Metal Mfg by End Use



Note: 'Other End Uses' includes:

Figure A.4.6.16 Gas Technical Potential: Industrial Printing Related Support by End Use

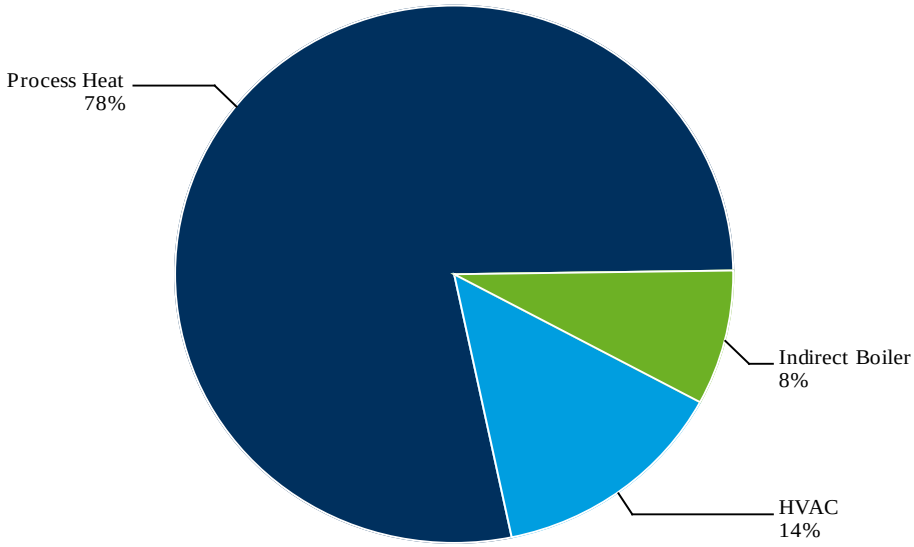


Figure A.4.6.17 Gas Technical Potential: Industrial Transportation Equipment Mfg by End Use

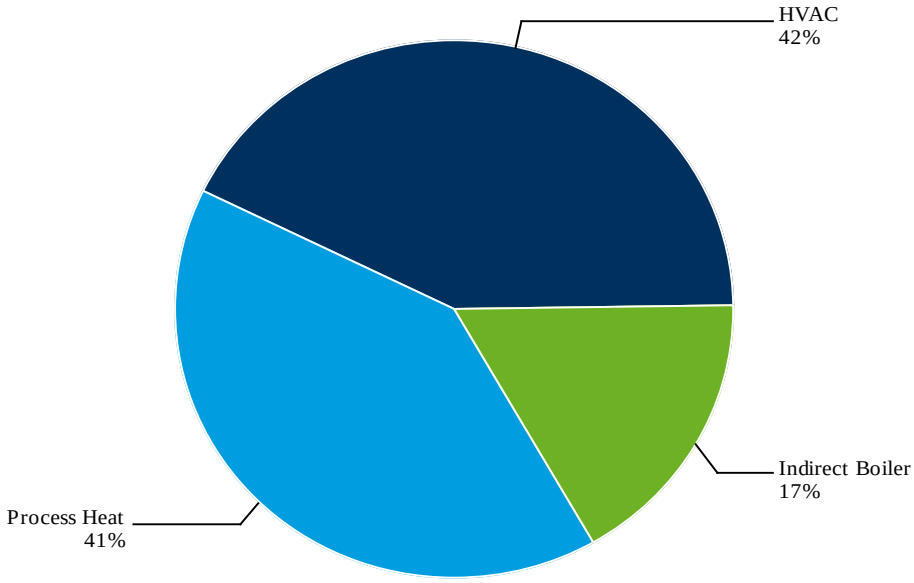


Figure A.4.6.18 Gas Technical Potential: Industrial Wood Product Mfg by End Use

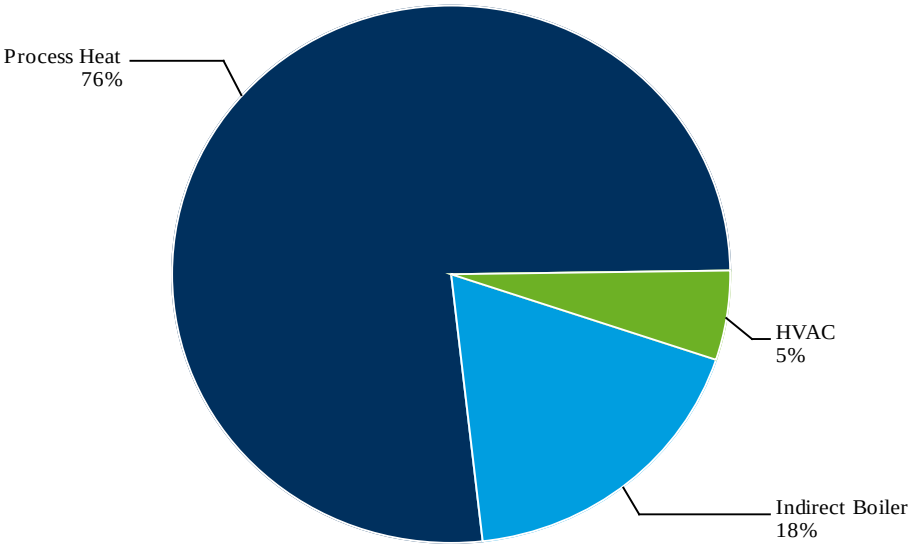


Figure A.4.6.19 Gas Economic Potential: Industrial by End Use

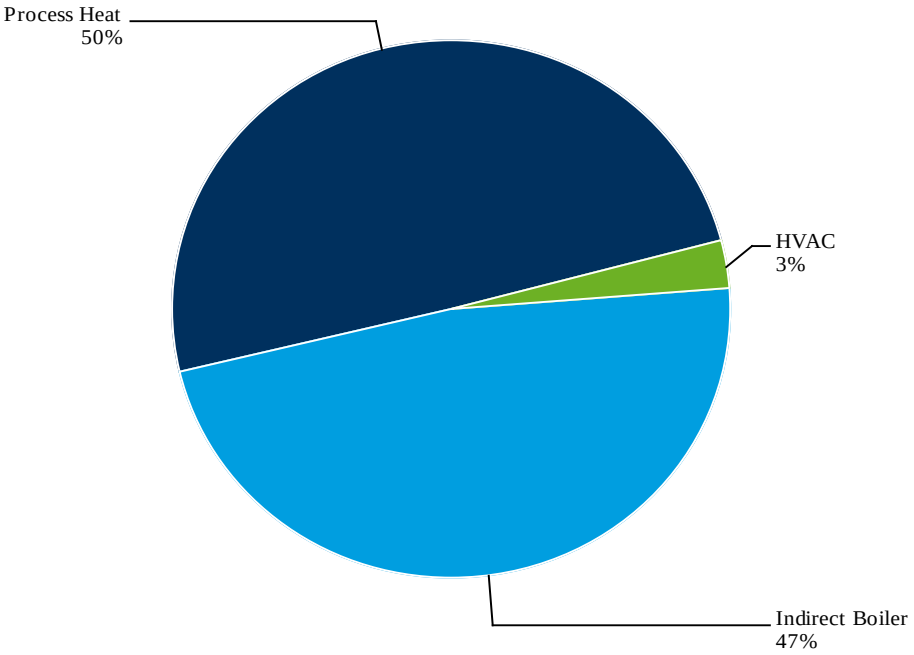


Figure A.4.6.20 Gas Economic Potential: Industrial Agriculture by End Use

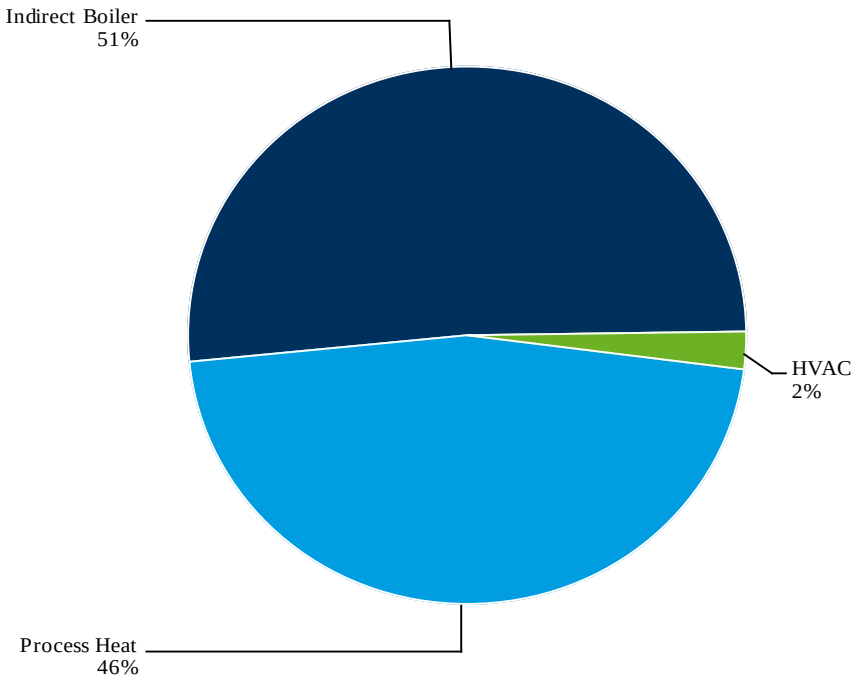


Figure A.4.6.21 Gas Economic Potential: Industrial Chemical Mfg by End Use

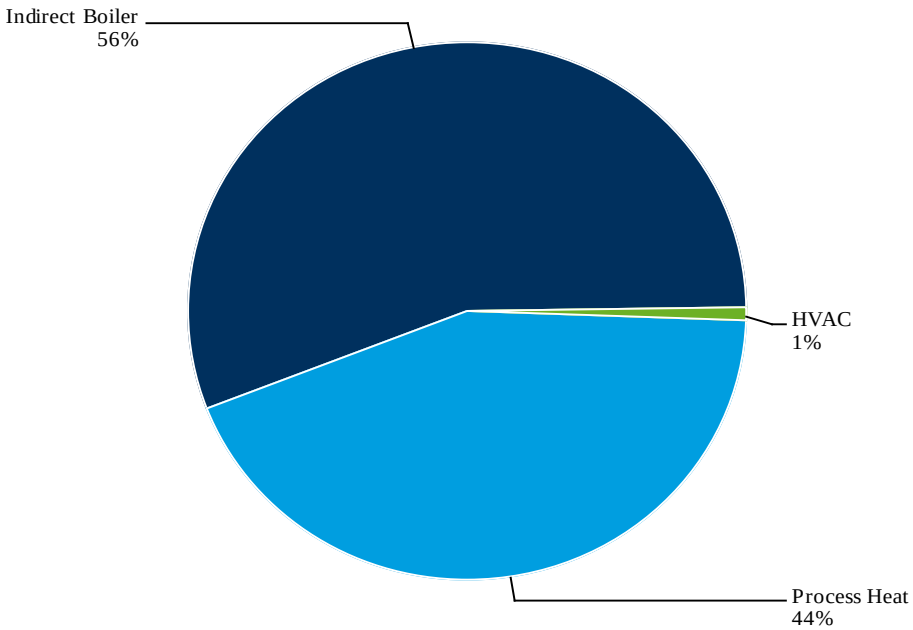


Figure A.4.6.22 Gas Economic Potential: Industrial Electrical Equipment Mfg by End Use

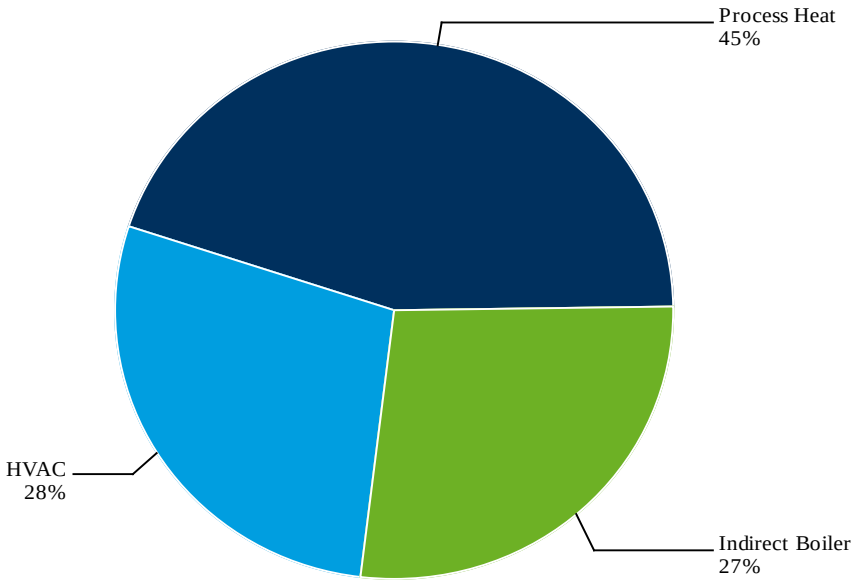


Figure A.4.6.23 Gas Economic Potential: Industrial Fabricated Metal Products by End Use

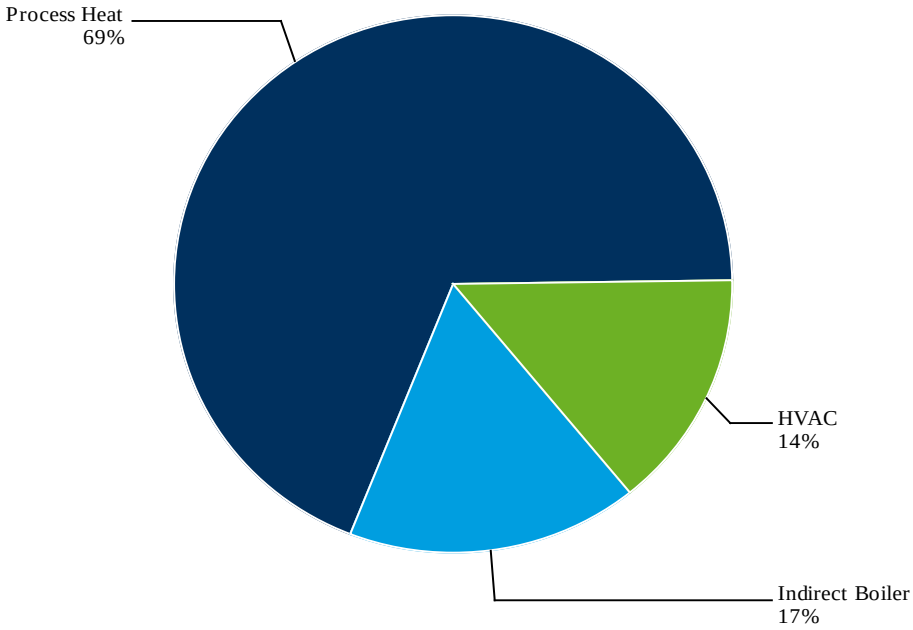


Figure A.4.6.24 Gas Economic Potential: Industrial Food Mfg by End Use

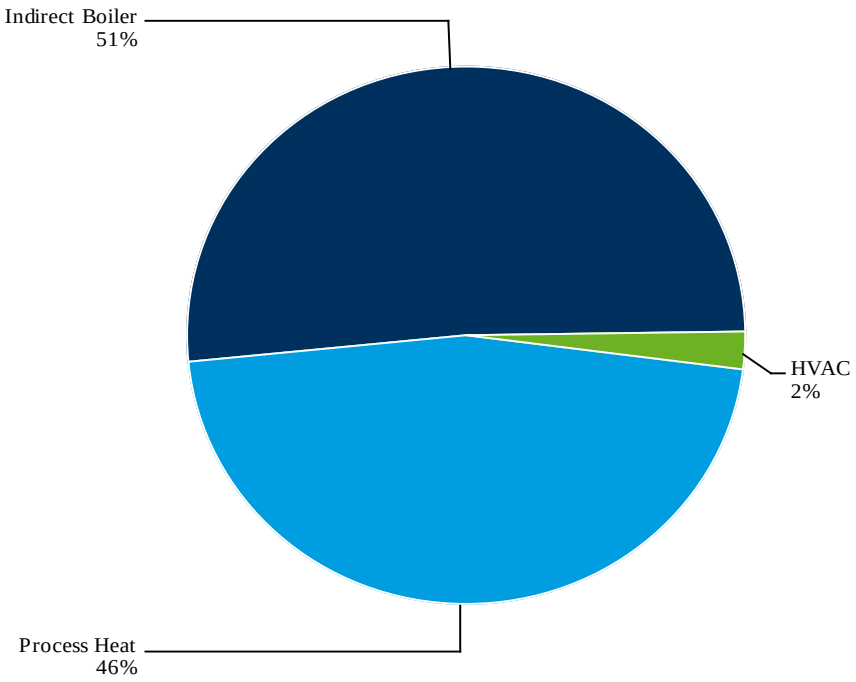


Figure A.4.6.25 Gas Economic Potential: Industrial Furniture Mfg by End Use

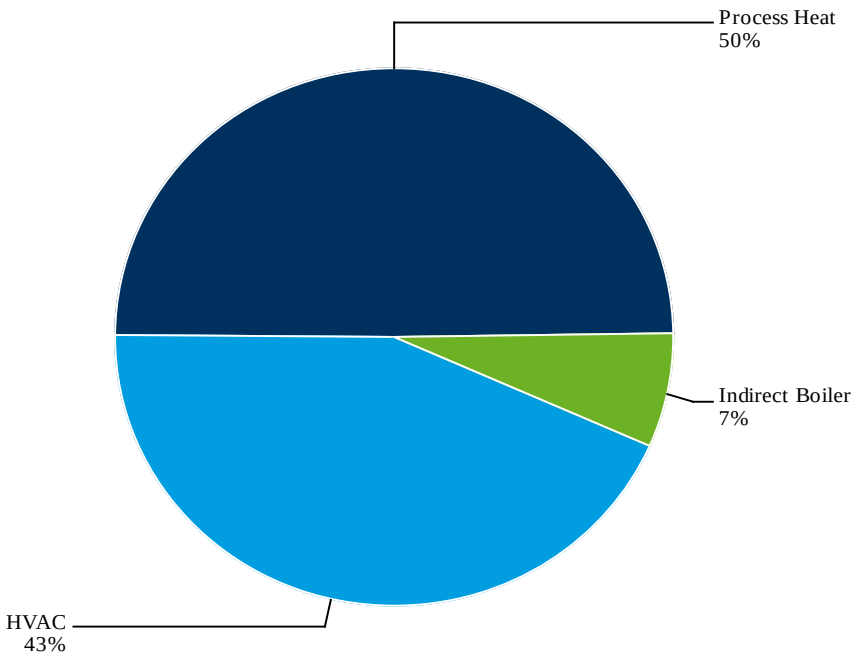


Figure A.4.6.26 Gas Economic Potential: Industrial Industrial Machinery by End Use

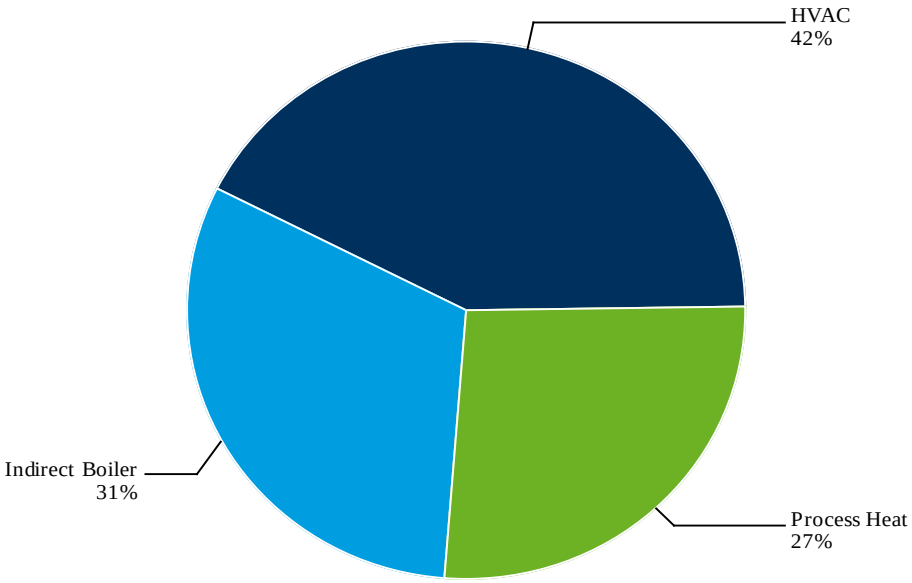


Figure A.4.6.27 Gas Economic Potential: Industrial Instruments by End Use

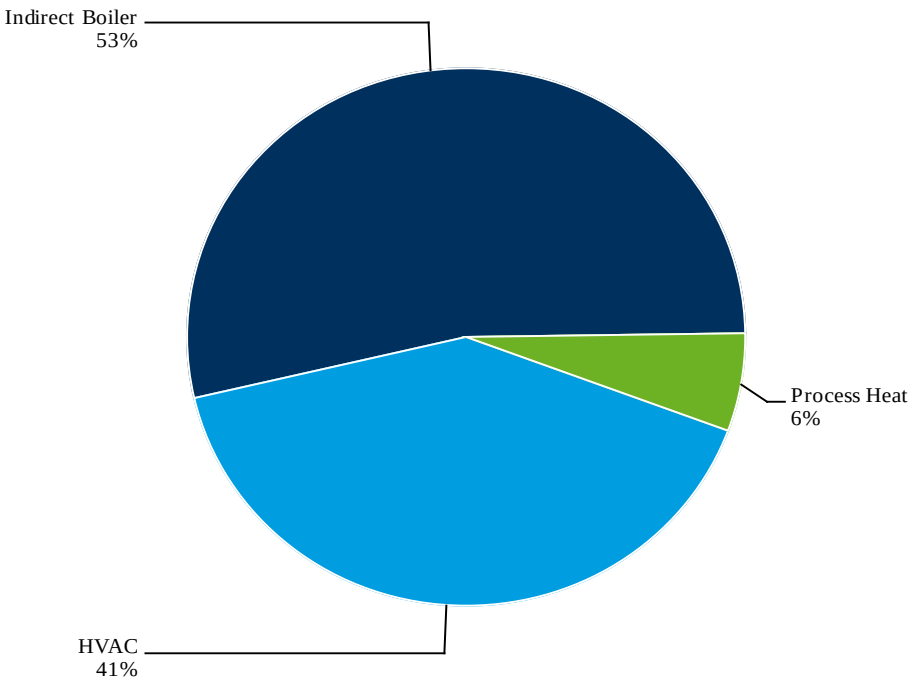


Figure A.4.6.29 Gas Economic Potential: Industrial Miscellaneous Mfg by End Use

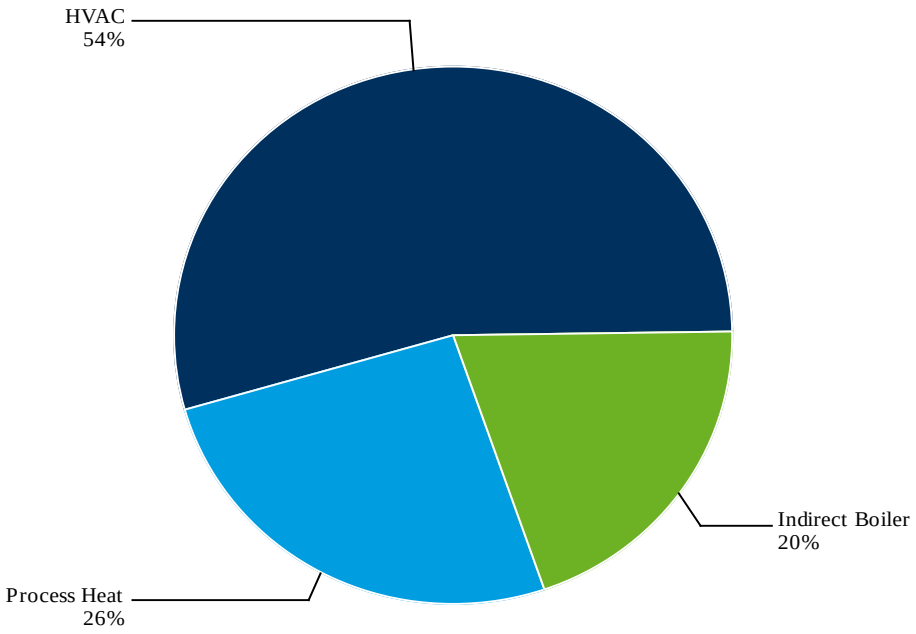
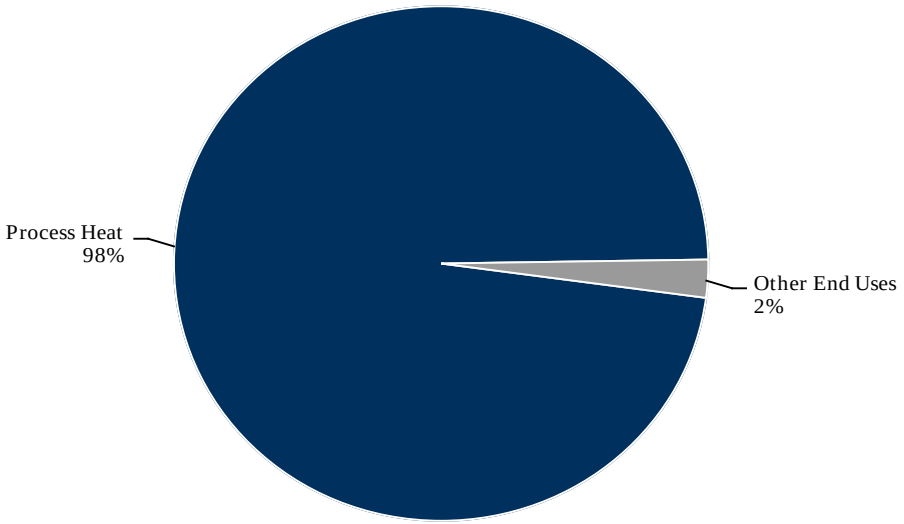


Figure A.4.6.30 Gas Economic Potential: Industrial Nonmetallic Mineral Products by End Use



Note: 'Other End Uses' includes:

Figure A.4.6.31 Gas Economic Potential: Industrial Paper Mfg by End Use

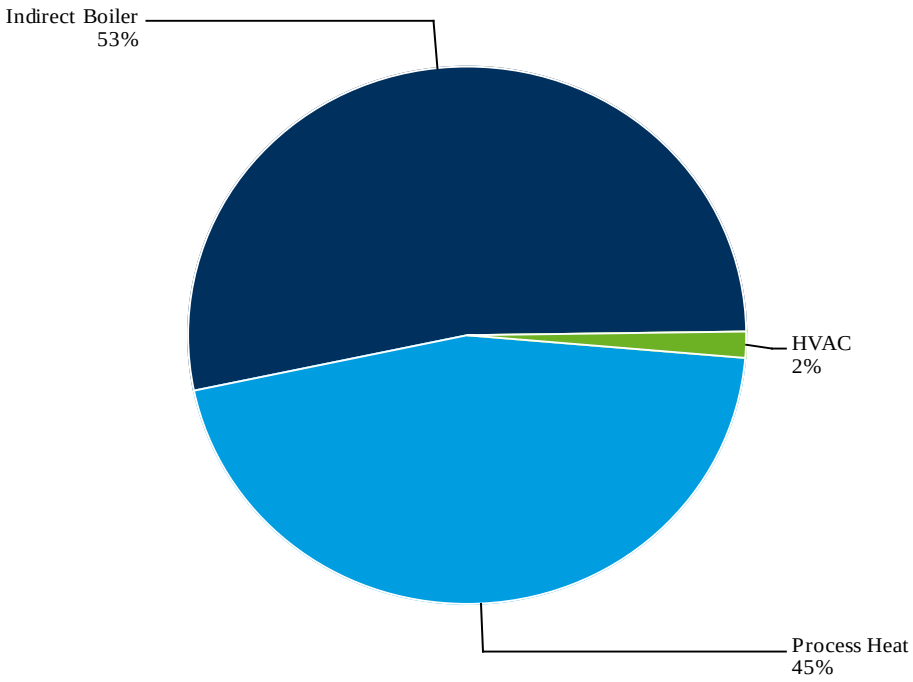


Figure A.4.6.32 Gas Economic Potential: Industrial Plastics Rubber Products by End Use

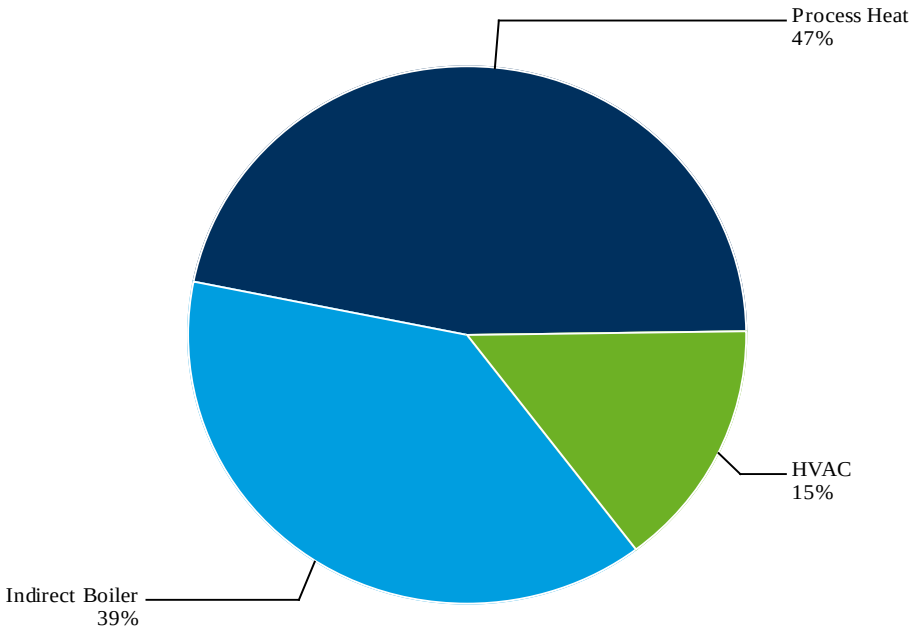
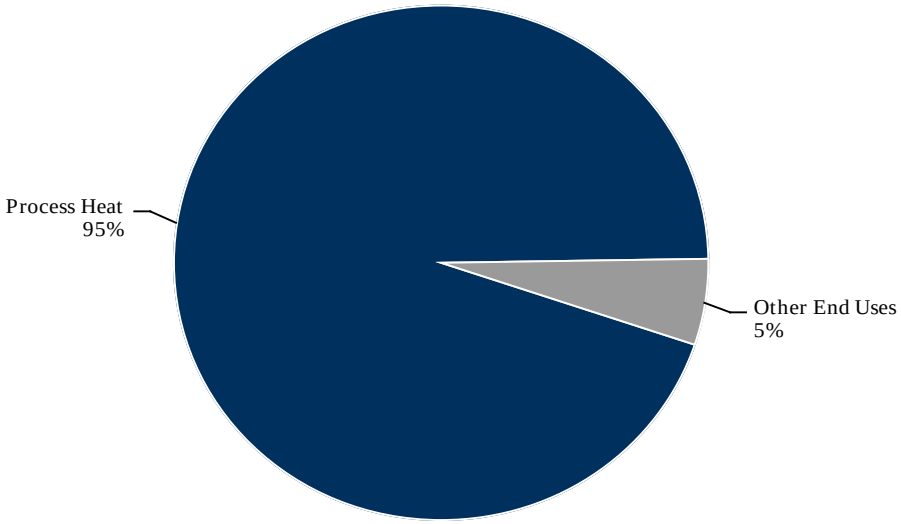


Figure A.4.6.33 Gas Economic Potential: Industrial Primary Metal Mfg by End Use



Note: 'Other End Uses' includes:

Figure A.4.6.34 Gas Economic Potential: Industrial Printing Related Support by End Use

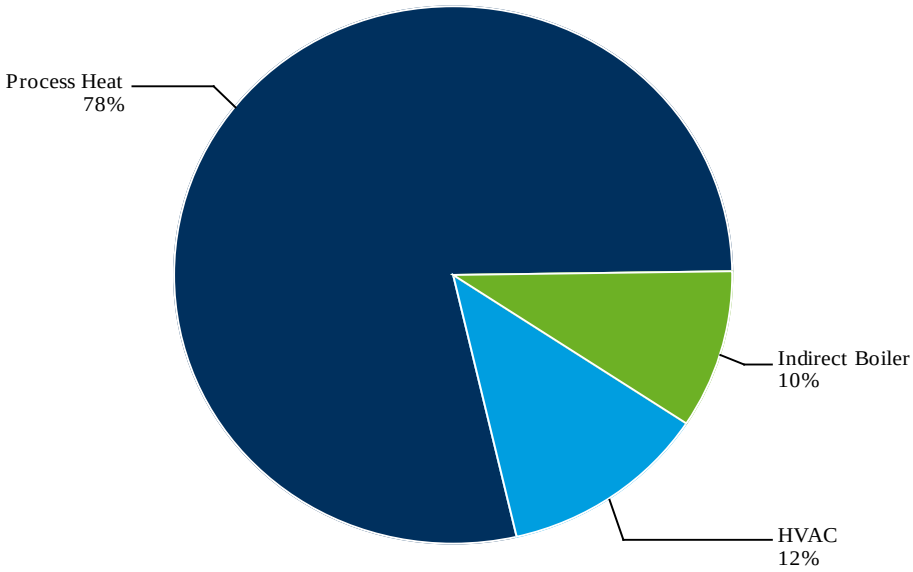


Figure A.4.6.35 Gas Economic Potential: Industrial Transportation Equipment Mfg by End Use

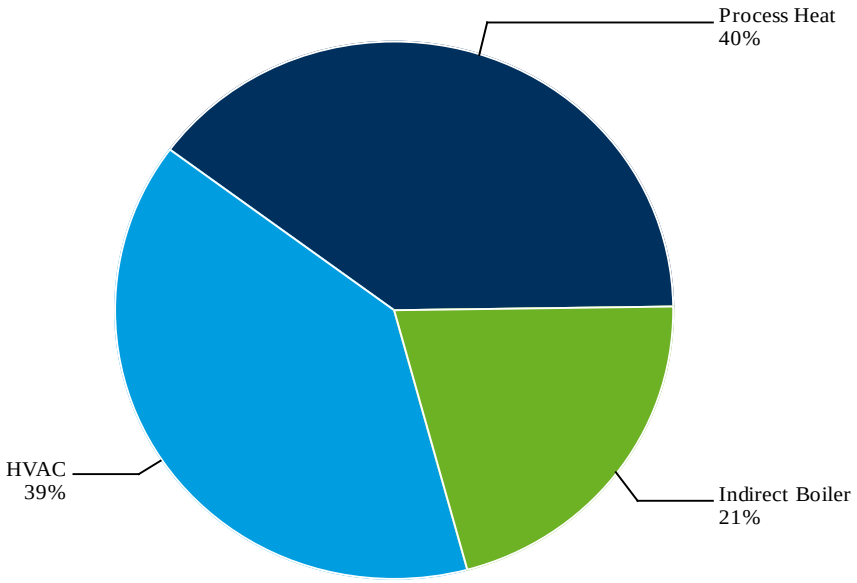
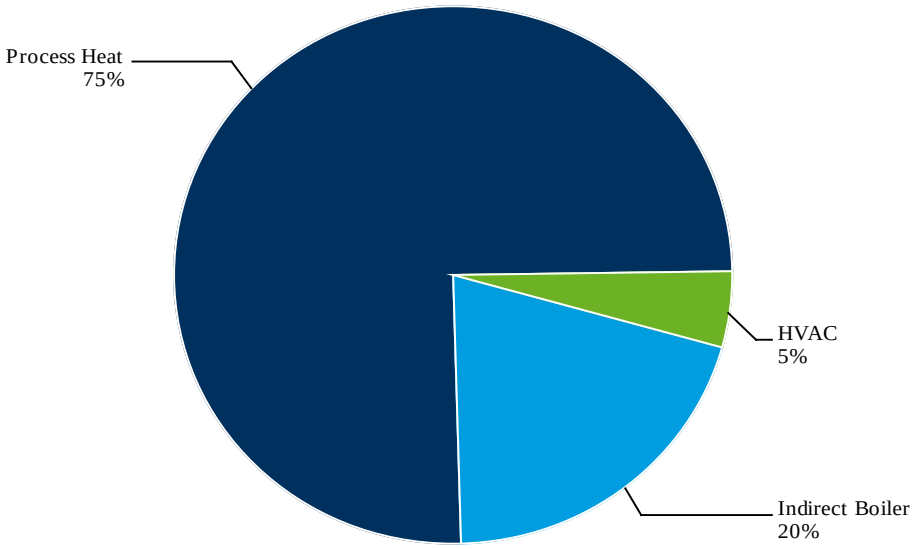


Figure A.4.6.36 Gas Economic Potential: Industrial Wood Product Mfg by End End Use



APPENDIX A.5: MARKET POTENTIAL

HVAC

Active Chilled Beam Cooling with Dedicated Outdoor Air System[1]: Conventional variable air volume (VAV) systems for large commercial buildings use a large fraction of their energy just to distribute energy in the air; pumping air is much less efficient than pumping water. One alternative is the "chilled beam" system, in which small amounts of outdoor air are entrained into a larger supply of recirculated air, and passed across a radiant-convective "chilled-beam" fixture. One benefit is that the chiller energy is delivered efficiently to the zone by being carried in water. Also, to prevent condensation, much warmer water is used, which helps reduce energy consumption. These systems can be quieter, and can allow smaller floor-to-floor heights, due to lack of ducts, which reduces construction cost.

Commercial Energy Recovery Ventilation Systems[2]: Energy recovery ventilation (ERV) systems exchange heat (often both sensible heat and water vapor) between the outgoing exhaust air and the ventilation air being brought in. In contrast, heat recovery devices transfer only the sensible heat between the supply and exhaust airstreams by making use of the temperature difference between the two airstreams. Under appropriate conditions, this allows for a reduced capacity of the HVAC system and saves energy. Exhaust energy recovery technologies include energy recovery loops, heat pipes, plate exchangers, and rotating wheel air to air heat exchangers.

Optimized Residential Duct Work[3]: Installing ductwork in conditioned spaces (i.e., within the insulated building envelope) substantially eliminates air and energy losses to the outside. This can allow smaller heating and cooling systems to be used resulting in first cost savings. Interior ducts are also subjected to less severe conditions, which may prolong the life of sealants used to reduce leakage. An optimized duct system has appropriately sized ducts, short runs, the smoothest interior surfaces possible, and the fewest, most gradual direction and size changes possible. Besides reducing energy loss, reducing the air leakage in the ductwork can also mean that smaller capacity furnaces, air conditioners and blower fans can be installed to meet air conditioning requirements, reducing initial equipment costs.

Lighting

Lighting – LED Linear Replacement: Solid State Lighting (SSL) or LED linear replacement of 4 foot T-8 fluorescent fixtures reduces the power density, which results in overall energy savings.

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[1] H. Sachs, W. Lin, and A. Lowenberger; ACEEE Emergining Energy -Savings HVAC Technologies and Practices for the Buildings Sector (2009). Report # A092.

[2] Ibid

[3] Ibid

Water Heat

Add-on Heat Pump Water Heater[4]: Storage tank electric water heaters rely on electric resistance heaters to heat water to a setpoint temperature. A heat pump water heater utilizes a refrigeration engine that moves heat from the ambient environment to heat water in a storage tank. An add-on heat pump water heater system is attached to the cold water line of an existing storage water heater and uses the refrigeration cycle and heat exchangers to preheat the cold water inlet. For electric water heaters, the electric resistance heaters are used as back-up heating if the heat pump is unable to meet the water heater temperature setpoint.

Condensing Tankless Water Heater[5:] Tankless gas water heaters promise greater efficiency, 0.82 EF, when compared to typical storage gas water heater and an endless supply of hot water – up to the limits of their firing rate. Similarly, condensing tankless units are more sophisticated than standard tankless units and use two separate heat exchangers (usually one copper and one stainless steel) to extract more usable heat from flue gases, increasing rated efficiencies to about 0.92 EF. This condensing tankless water heater increased efficiency results in energy savings over both storage and tankless gas water heaters.

Multifamily Building Best Practices[6]: Multifamily buildings are generally characterized by central tank water heaters or boilers with a recirculation loop. In many cases, less than one third of the site energy is actually delivered to the fixtures. Proper operation and maintenance and improved controls can improve multifamily water heating performance by 15% to 30%. For new installations, choosing high efficiency equipment, placing the water heater as near as possible to demand locations, and properly insulating the recirculation loop can dramatically reduce losses.

Single-Family On-Demand Recirculation Pumps[7:] Typical hot water recirculation loops reduce water waste greatly, but poor pipe insulation guarantees energy waste that costs much more than the value of the water saved. A hot water, user-activated, recirculation pump is activated when hot water is desired and turns off as soon as hot water reaches the fixture. The user-activated recirculation pump greatly reduces the heat losses associated with typical recirculation loop systems, which results in energy savings. When compared to a home without a recirculation loop, a user-activated recirculation loop can deliver hot water in about one-fifth of the time, which helps lower water and energy losses.

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[4] H. Sachs, J. Talbot, and N. Kaufman; Emerging Hot Water Technologies and Practices for Energy Efficiency as of 2011. Report # A112.

[5] Ibid

[6] Ibid

[7] Ibid

The data on natural gas utility spending and savings, shown as Figure 15 of Volume 1, are presented in the table below.

Table 1. Gas Utility Spending and Savings

Utility/ Administrator	Short Name	State	2010 Sales & Revenue		2010 Energy-Efficiency Performance				Normalized 2010 Performance			
			Sales (BBtu)	Revenue ($millions)	Savings (BBtu)	Incentive Spending ($ millions)	Non-Incentive Spending ($ millions)	Total Spending ($ millions)	Incentive Spending as % of Revenue	Non-Incentive Spending as % of Revenue	Total Incentive Spending as % of Revenue	Savings as % of Sales
Pacific Gas & Electric	PG&E	CA	525,304	$4,560	3,126	$30.8	$35.3	$66.0	0.7%	0.8%	1.4%	0.6%
Puget Sound Energy	PSE	WA	102,683	$1,170	503	$13.8	$5.8	$19.6	1.2%	0.5%	1.7%	0.5%
Avista	Avista-WA	WA	15,971	$141	143	$4.4	$1.0	$5.4	3.1%	0.7%	3.8%	0.9%
Cascade Natural Gas	Cascade	WA	19,828	$231	44	$1.4	$2.2	$3.5	0.6%	0.9%	1.5%	0.2%
Avista	Avista-ID	ID	6,922	$63	47	$1.4	$0.5	$2.0	2.2%	0.9%	3.1%	0.7%
Questar	Questar-UT	UT	102,382	$784	1,323	$27.1	$8.5	$35.6	3.5%	1.1%	4.5%	1.3%
Xcel Energy	Xcel-CO	CO	231,748	$1,523	555	$8.7	$8.2	$16.9	0.6%	0.5%	1.1%	0.2%
Xcel Energy	Xcel-MN	MN	74,995	$559	697	$4.6	$6.7	$11.3	0.8%	1.2%	2.0%	0.9%
Yankee Gas Services	YGS	CT	48,631	$599	108	$3.7	$1.0	$4.7	0.6%	0.2%	0.8%	0.2%
Connecticut Natural Gas	CNG	CT	29,155	$288	74	$3.1	$0.8	$3.9	1.1%	0.3%	1.4%	0.3%
Southern Connecticut N.G.	SoCT	CT	28,396	$357	85	$3.1	$0.3	$3.3	0.9%	0.1%	0.9%	0.3%
National Grid	NGrid-MA	MA	126,182	$1,865	691	$25.1	$9.1	$34.2	1.3%	0.5%	1.8%	0.5%
NStar	NStar-MA	MA	45,955	$478	268	$8.6	$4.0	$12.6	1.8%	0.8%	2.6%	0.6%
Focus on Energy	WFOE	WI	326,700	$2,820	2,248	$15.8	$7.5	$23.3	0.6%	0.3%	0.8%	0.7%
Iowa Statewide Total	Iowa	IA	106,084	$930	990	$31.6	$8.6	$40.1	3.4%	0.9%	4.3%	0.9%

Appendix B. Supplemental Material: Demand Response

Table B.1 provides the calculated participation rates underlying Figure 16 in Volume I.

Table B.1. Summary of Residential DLC Program Saturation

Utility - State	Calculated 2010 Participation Rate
Indiana Michigan Power Company - IN	0.01%
Entergy Louisiana, Inc. - LA	0.05%
Central Illinois Pub Serv Co, - IL	0.08%
Avista Corporation, dba Avista Utilities - ID	0.17%
Puget Sound Energy, Inc. - WA	0.29%
Progress Energy Carolinas - SC	0.36%
Alabama Power Company - AL	0.51%
Ohio Edison Co. - OH	0.90%
Progress Energy Carolinas - NC	1.13%
Cleveland Electric Illuminating Co - OH	1.13%
XCEL d/b/a Southwestern Public Service Co - TX	1.20%
Wisconsin Public Service Corporation - MI	2.19%
Commonwealth Edison Company - IL	3.11%
KCP&L Greater Missouri Operation Company - MO	3.16%
Wisconsin Power and Light Company - WI	4.55%
Pacific Gas and Electric Company - CA	5.80%
San Diego Gas & Electric Company - CA	6.22%
Duke Energy Corporation - OH	6.95%
Kansas City Power & Light Company - MO	7.97%
Public Service Company of New Mexico - NM	8.04%
Atlantic City Electric Company - NJ	8.22%
Kansas City Power & Light Company - KS	9.24%
Tampa Electric Company - FL	9.71%
Duke Energy Corporation - KY	10.20%
Indianapolis Power & Light Company - IN	10.31%
Public Service Electric & Gas Company - NJ	10.43%
Duke Energy Corporation - IN	10.73%
Idaho Power Company - OR	10.97%
Duke Energy Corporation - NC	11.03%
XCEL d/b/a Northern States Power Co - Wisconsin - WI	11.30%
Wisconsin Public Service Corporation - WI	11.54%

Utility - State	Calculated 2010 Participation Rate
Jersey Central Power & Light Co - NJ	11.61%
Nevada Power Company - NV	11.71%
Idaho Power Company - ID	13.92%
Duke Energy Corporation - SC	14.05%
Delmarva Power & Light Company - MD	15.85%
MidAmerican Energy Company - IA	17.90%
XCEL d/b/a Northern States Power Co - Minnesota - ND	18.09%
Interstate Power and Light Company - IA	19.00%
Southern California Edison - CA	20.18%
Florida Power & Light, Co. - FL	23.37%
Hawaiian Electric - HI	24.18%
Delmarva Power & Light Company - DE	24.58%
XCEL d/b/a Public Service Co of Colorado - CO	24.75%
PacifiCorp - UT	25.60%
The Detroit Edison Company - MI	29.12%
Progress Energy Florida - FL	32.33%
XCEL d/b/a Northern States Power Co - Minnesota - SD	33.96%
Southern Indiana Gas & Electric Co. - IN	36.17%
Central Vermont Public Service Corporation - VT	42.61%
XCEL d/b/a Northern States Power Co - Minnesota - MN	45.44%
Baltimore Gas and Electric Company - MD	54.70%

Table B.2 provides the calculated participation rates underlying Figure 17 in Volume I.

Table B.2. Summary of Utility Interruptible Program Participation

Utility - State	Calculated 2010 Participation Rate
Kansas City Power & Light Company	0.66%
Southwestern Electric Power Company	0.83%
Public Service Company of Oklahoma	1.20%
Empire Direct Electric Company	1.27%
Kansas City Power & Light Company	1.28%
Public Service Co of NH	1.29%
Duke Energy Corporation	1.75%
Progress Energy Carolinas	1.86%
Progress Energy Carolinas	1.92%
Duke Energy Corporation	1.98%
Connecticut Light and Power Co	2.17%
Southern California Edison	2.31%
Georgia Power	2.34%
Kansas City Power & Light Company	2.75%
Duke Energy Corporation	3.48%
South Carolina Electric & Gas Company	3.63%
Sierra Pacific Power Company	3.71%
Duke Energy Corporation	4.48%
Metropolitan Edison Co	4.73%
El Paso Electric Company	4.79%
Entergy Texas, Inc.	5.30%
Entergy Arkansas, Inc.	5.52%
Mississippi Power Company	6.09%
Tampa Electric Company	6.52%
MidAmerican Energy Company	7.60%
Consolidated Edison Company of New York	8.75%
Wisconsin Power and Light Company	9.64%
Indiana Michigan Power Company	14.15%
Alliant	14.20%
Ohio Power Company	15.75%
Alabama Power Company	15.94%
Hawaiian Electric	25.81%

Table B.3 provides the results of research into Residential DLC snapback effects in other jurisdictions.

Table B.3. Summary of Residential DLC Snapback Research

Study	Average Peak Demand Reduction (kW)	Average Snapback Load Increase (kW)	Snapback as % of Demand Reduction
Bonneville Power Administration			
DLC w/ AC &WH	0.70	=>0.70	100%
DLC w/ WH	0.26	=>0.26	100%
Progress Energy Carolinas			
AC DLC (Asheville-typical) total event kWh	1.81	0.9	50%
AC DLC (Asheville-extreme) total event kWh	2.22	1.1	50%
AC DLC (Raleigh-typical) total event kWh	2.69	1.3	48%
AC DLC (Raleigh-extreme) total event kWh	3.43	1.61	47%
AC DLC (Wilmington-typical) total event kWh	2.38	1.19	50%
AC DLC (Wilmington-extreme) total event kWh	2.96	1.44	49%
Water Heating DLC	0.80	0.57	71%
Pacific Gas & Electric			
AC DLC	0.86	0.46	53%

Appendix C. Supplemental Material: Assessment of NTG

Table C.1 provides the 32 jurisdictions reviewed, whether the jurisdiction has an Energy Efficiency Resource Standard in place, and whether spillover and/or freeridership are considered.

Table C.1. Treatment of Freeridership and Spillover by Jurisdiction

Jurisdiction		Spillover		Freeridership
	EERS	Participant	Nonparticipant	
Arizona	Yes	No	No	No
Arkansas	Yes	Yes	Yes	Yes
California	Yes	Yes	No	Yes
Colorado	Yes	No	No	Yes
Connecticut	Yes	Yes	Yes	Yes
Delaware	No	No	No	No
District of Columbia	No	No	No	No
Florida	Yes	Yes	Yes	Yes
Hawaii	Yes	No	No	Yes
Idaho	No	No	No	No
Indiana	Yes	No	No	Yes
Iowa	Yes	No	No	No
Maine	Yes	No	No	Yes
Maryland	Yes	No	No	No
Massachusetts	Yes	Yes	Yes	Yes
Michigan	Yes	No	No	No
Minnesota	Yes	No	No	Yes
Nevada	Yes	No	No	Yes
New Hampshire	No	Yes	Yes	No
New Jersey	No	No	No	No
New Mexico	Yes	No	No	No
New York	Yes	Yes	Yes	Yes
North Carolina	Yes	No	No	No
Ohio	Yes	No	No	No
Oregon	Yes	Yes	Yes	Yes
Pennsylvania	Yes	No	No	No
Rhode Island	Yes	Yes	No	No
Texas	Yes	No	No	No
Utah	No	Yes	Yes	Yes
Vermont	Yes	Yes	Yes	Yes
Washington	Yes	Yes	Yes	Yes
Wisconsin	Yes	No	No	Yes