AMEREN ILLINOIS ENERGY EFFICIENCY MARKET POTENTIAL ASSESSMENT

Report Number 1404

Volume 1: Executive Summary

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road
Suite 450
Walnut Creek, CA 94596
925.482.2000
www.enernoc.com

Prepared for:
Ameren Corporation

Presented on:
July 8, 2013

This report was prepared by

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Blvd., Suite 450
Walnut Creek, CA 94596

I. Rohmund, Project Director
B. Kester, Project Manager

Subcontractors
YouGov|Definitive Insights
Washington University in St. Louis

In cooperation with
Applied Energy Group

EXECUTIVE SUMMARY

Ameren Illinois (AIC) selected EnerNOC to conduct this Energy Efficiency Market Potential Study to assess the various categories of electric and natural gas energy efficiency potential in the residential, commercial, and industrial sectors of the Ameren Illinois service territory. The key objectives of the study were to:

- Satisfy the legislative requirement to provide an electric potential study with the IPA incremental savings filing that is no less than 3 years old (last one completed in 2010). Ameren Illinois chose to include natural gas as well.
- Provide support for the development of an integrated gas and electric Cycle 3 (2014-2017) Plan.
- Conduct comprehensive market research to better represent customers in the AIC service territory.
- Quantify wasted energy due to customer behavior.
- Develop EE potential estimates for 2017-2024 for benchmarking and future analyses.

The study assesses various tiers of energy efficiency potential including technical, economic, achievable, and naturally occurring potential. The study developed updated baseline estimates with the latest information on federal, state, and local codes and standards for improving energy efficiency. The study consisted of three primary components: market research, a full energy efficiency potential analysis, including program design and estimation of supply curves, and quantification of wasted energy due to customer behavior.

As part of the study, the EnerNOC team conducted primary market research to collect data for the Ameren Illinois service territory, including: electric and natural gas end-use data, end-use saturation data, and customer psychographics, demographics, and firmographics. This information enables Ameren Illinois to understand how their customers make decisions related to their energy use and energy efficiency investment decisions.

Ameren Illinois will use the results of this study in its Demand Side Management (DSM) planning process to optimally implement energy efficiency related savings programs.

Report Organization

This report is presented in six volumes as outlined below. This document is **Volume 1: Executive Summary**.

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Energy Efficiency Potential Analysis
- Volume 4, Program Analysis
- Volume 5, Supply Curves
- Volume 6, EE Potential Analysis Appendices

Definitions

Before launching into the discussion of results, a few key terms are defined:

- **Technical potential** is a theoretical construct that assumes all feasible measures are adopted by customers, regardless of cost or customer preferences.
- **Economic potential** is also a theoretical construct that assumes all ***cost-effective*** measures are adopted by customers, regardless of customer preferences. This is a subset of technical potential.
- **Maximum achievable potential (MAP)** takes into account expected program participation, based on customer preferences resulting from ideal implementation conditions. MAP establishes a maximum target for the EE savings that a utility can hope to achieve through its EE programs and involves incentives that represent a substantial portion of the incremental cost combined with high administrative and marketing costs. It is commonly-accepted in the industry that MAP is considered the hypothetical upper-boundary of achievable savings potential simply because it presumes conditions that are ideal and not typically observed in real-world experience. This is a subset of economic potential.
- **Realistic achievable potential (RAP)** represents what is considered to be realistic estimates of EE potential based on realistic parameters associated with EE program implementation (i.e., limited budgets, customer acceptance barriers, etc.). This is also a subset of economic potential.
- **Baseline projection** is a reference end-use forecast developed specifically for this study. This estimates what would happen in the absence of any DSM programs, and includes naturally occurring energy efficiency and savings from equipment standards and building codes that were active and on the books for future enactment as of January 31, 2013. It is the metric against which savings are measured. The approach used to develop this projection is an end-use forecast approach and it is fundamentally different than the statistically-adjusted end-use approach used by Ameren to develop its official load forecasts. However, as much as possible, the forecast assumptions are the same and the resulting forecasts are close.
- **Net savings** represents the energy efficiency potential savings potential that is after naturally occurring energy efficiency has been taken into consideration. Unless specified, all savings listed in this report represent net savings, as opposed to gross savings.
- **Incremental savings** refers to the amount of potential savings that can be achieved in that one particular year. **Cumulative savings** refers to the sum of the incremental savings. Unless specified, all savings listed in the report are cumulative savings.

Overall Conclusions

This study has enlightened Ameren Illinois about its customer base and the potential for electric and natural gas energy savings that are possible through energy-efficiency (EE) programs. The key highlights are as follows:

- With a thorough review of 699 possible efficiency measures[1], the estimated program potential is somewhat higher than past program achievements.
- In general, however, attaining the maximum achievable program potential in the Cycle 3 plan will not meet the Illinois state savings targets and will cost significantly more than the spending caps, for both electric and natural gas programs.

[1] A list of all the measures and the corresponding costs, savings, and lifetimes can be found in in Volume 6: Appendices.

- The study identifies that a majority of savings are to be had in the commercial and industrial sectors as opposed to the residential sector. This represents a significant change from previous studies and reflects the recent wave of Federal appliance standards

High-level details on savings and costs are provided in the Key Findings sections below.

Key Findings for Electricity

The key findings of the potential analysis are presented first in terms of measure-level results, where program delivery and implementation concerns have not been considered. Subsequently, program-level savings are developed by considering appropriate program delivery mechanisms and measure bundling strategies based on real-world implementation and evaluation experience.

Measure-level Energy Efficiency Potential

Key findings related to measure-level electric potentials are summarized as follows:

- **Realistic achievable potential.** In 2014 realistic achievable savings are 483 GWh which is 1.3% of the baseline projection. By 2016 cumulative realistic achievable savings grow to 1,093 GWh which represents 3.0% of the baseline projection.
- **Maximum achievable potential**. In 2014 savings for this case are 630 GWh or 1.8% of the baseline and by 2016 cumulative savings reach 1,432 GWh or 4.0% of the baseline projection.
- **Economic potential** reflects the savings when all cost-effective measures are taken. The savings for this case in 2014 are 1,149 GWh or 3.2% of the baseline projection and by 2016 the cumulative savings reach 2,650, about 7.4% of the baseline.
- **Technical potential**, which reflects the adoption of all energy efficiency measures regardless of cost-effectiveness, is a theoretical upper bound on savings. Savings in 2014 for the technical case are 1,584 GWh or 4.4% of the baseline and by 2016 these savings reach a cumulative number of 3,516 GWh or about 9.8% of the baseline.

Table 1 and Figure 1 summarize the electric energy-efficiency savings for the different levels of potential relative to the baseline projection.

Table 1 Summary of Cumulative, Net, Measure-Level Electric Energy Efficiency Potential

	2014	2015	2016
Baseline Projection (GWh)	35,865	35,810	35,999
Cumulative Savings (GWh)			
Realistic Achievable Potential	483	803	1,093
Maximum Achievable Potential	630	1,051	1,432
Economic Potential	1,149	1,958	2,650
Technical Potential	1,584	2,604	3,516
Energy Savings (% of Baseline)			
Realistic Achievable Potential	1.3%	2.2%	3.0%
Maximum Achievable Potential	1.8%	2.9%	4.0%
Economic Potential	3.2%	5.5%	7.4%
Technical Potential	4.4%	7.3%	9.8%

Figure 1 Summary of Cumulative, Net, Measure-Level Electric Energy Savings

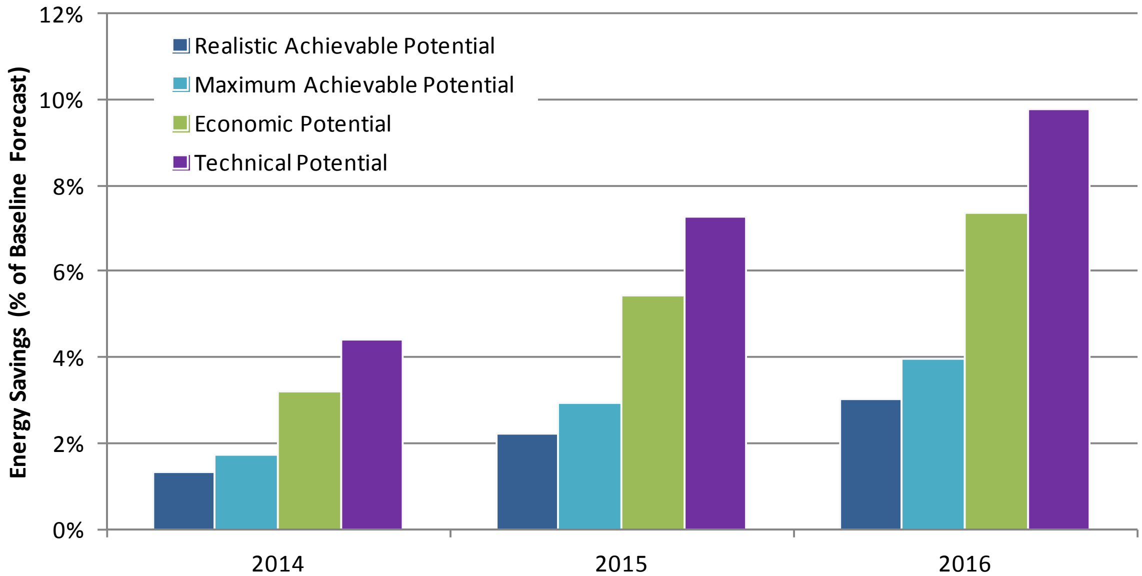
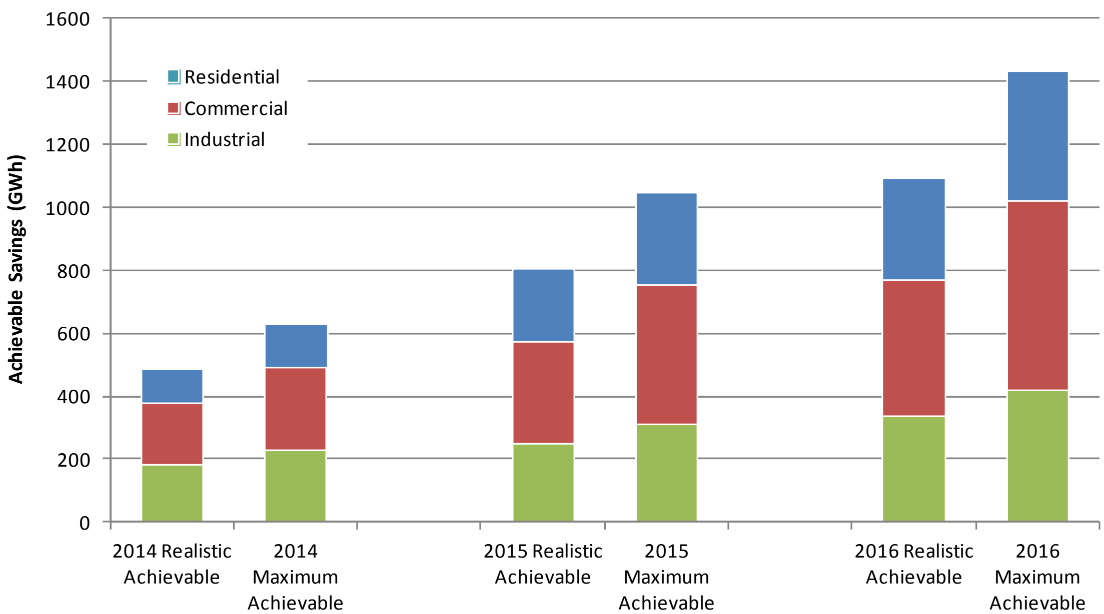


Figure 2 summarizes the range of electric achievable potential by sector. The commercial sector accounts for the largest portion of the savings, followed by residential and industrial.

Figure 2 Cumulative, Net, Measure-Level Potential by Sector (GWh)



Program-level Potential

The program-level results here consider program delivery strategies, real-world limitations, and the associated administrative costs and economics. (Please note that measure-level savings are provided above in cumulative terms, but are translated here to incremental or annual terms to align better with the language and expectations of program implementation and annual targets.)

In order to more accurately assign realistic program costs, measure-level results were synthesized to group measures into programs that can realistically be delivered to Ameren Illinois customers. The key steps and differences between the measure-level analysis and program-level analysis are:

- Installation Smoothing: Measure installations from the program-level analysis were "smoothed" to account for even implementation across three program years.
  - For example, the measure-level analysis estimates the installation of 1,000 units in 2014, 800 units in 2015, and 600 units in 2016 of Measure X. In order to provide consistency for implementers and align with the ramp rate of legislative targets, the program-level analysis would estimate 800 installations of Measure X in 2014, 2015, and 2016.
- Measure Removal/Reduction: Specific measures or measure types were from the program-level analysis due to either the realistic potential installations being too high to implement over the three program years or the measures cannot be delivered through traditional Ameren Illinois programs. There were two main segments where electric measure were removed/reduced:
  - Residential Consumer Electronics: Past program experience and evaluation has shown the consumer electronics market is extremely difficult to reach and has had limited participation in past programs.
  - Business Energy Management Systems: The measure-level model predicts installations of Energy Management Systems for most commercial and industrial buildings in the Ameren Illinois service territory. The levels of installations were reduced to more realistic implementation levels and to control program costs (Energy Management Systems have very high costs with relatively low energy savings).

Key findings related to program-level electric potentials are summarized as follows:

- **Program Low achievable potential.** In 2014 program low achievable savings are 341 GWh which is 0.9% of the baseline projection at a cost of $86.1 million. By 2016 cumulative realistic achievable savings grow to 992 GWh which represents 2.8% of the baseline projection at a cumulative cost of $263.9 million.
- **Program High achievable potential**. In 2014 savings for this case are 449 GWh or 1.3% of the baseline at a cost of $177.7 million. By 2016 cumulative savings reach 1,308 GWh or 3.6% of the baseline projection at a cumulative cost of $542.8.

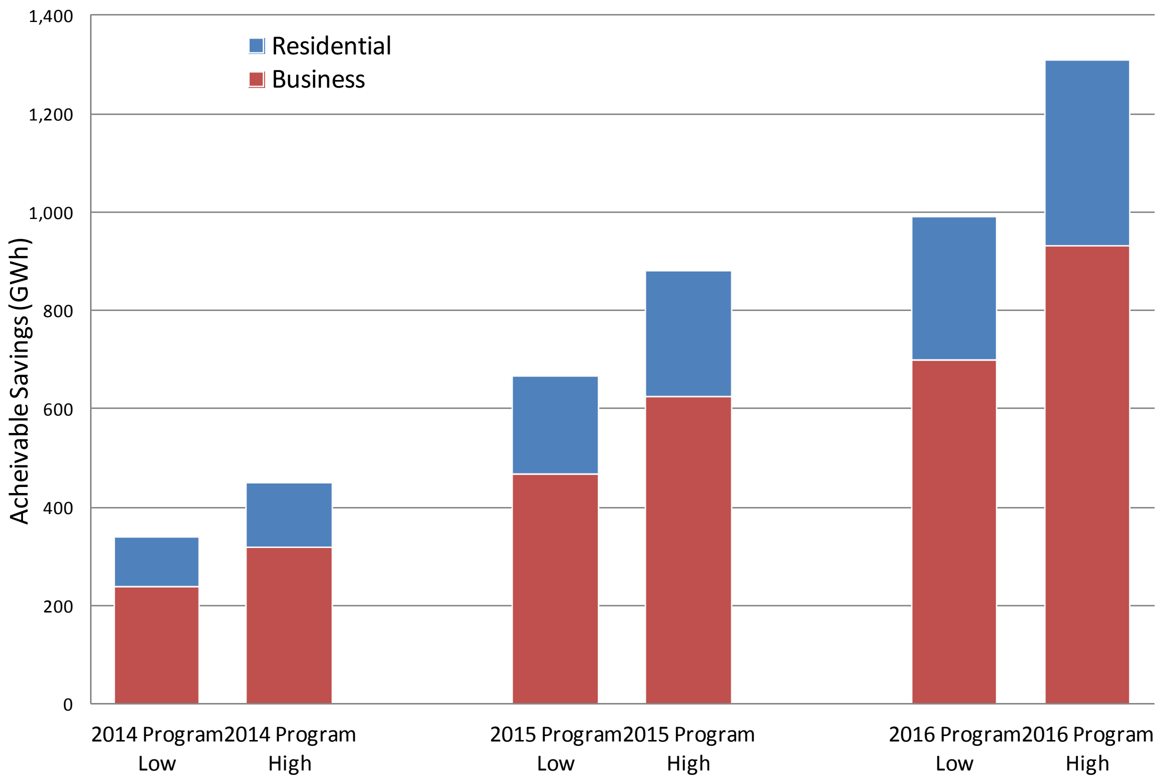
Table 2summarizes the electric energy-efficiency program savings for the different levels of potential relative to the baseline projection.

Table 2 Summary of Cumulative, Net, Program-Level Electric Energy Efficiency Potential

	2014	2015	2016
Baseline Projection (GWh)	35,861	35,792	35,973
Annual Savings (GWh)			
Program Low Potential	341	667	992
Program High Potential	449	880	1,308
Energy Savings (% of Baseline)			
Program Low Potential	0.9%	1.9%	2.8%
Program High Potential	1.3%	2.5%	3.6%
Energy Costs (Million $)			
Program Low Potential	$86.1	$171.2	$263.9
Program High Potential	$177.7	$353.0	$542.8

Figure 3 summarizes the range of electric program-level achievable potential by sector. Sectors were adjusted to Residential and Business (which includes both Commercial and Industrial) to align with Ameren Illinois program sectors. The business sector accounts for the largest portion of the savings, followed by residential.

Figure 3 Cumulative, Net, Program-Level Potential by Sector (GWh)



Supply Curves

The program analysis provided guidelines for creating various portfolio scenarios by interpolating between Program RAP and Program MAP, optimizing to consider a number of other scenarios relevant to planning considerations. These include attainment of the Illinois state goals, spending exactly at the rate caps, and 0.5% increments of spending until the estimated limit of MAP is reached.

Figure 4 shows the resulting Net Incremental MWh savings per year for the various portfolios, along with a line indicating the level of load reduction necessary to meet the Illinois state targets in any year. Figure 5 shows the total program costs to achieve these electricity savings.

Figure 4 ***Summary of Achievable Electricity Savings (Net, Incremental MWh)***

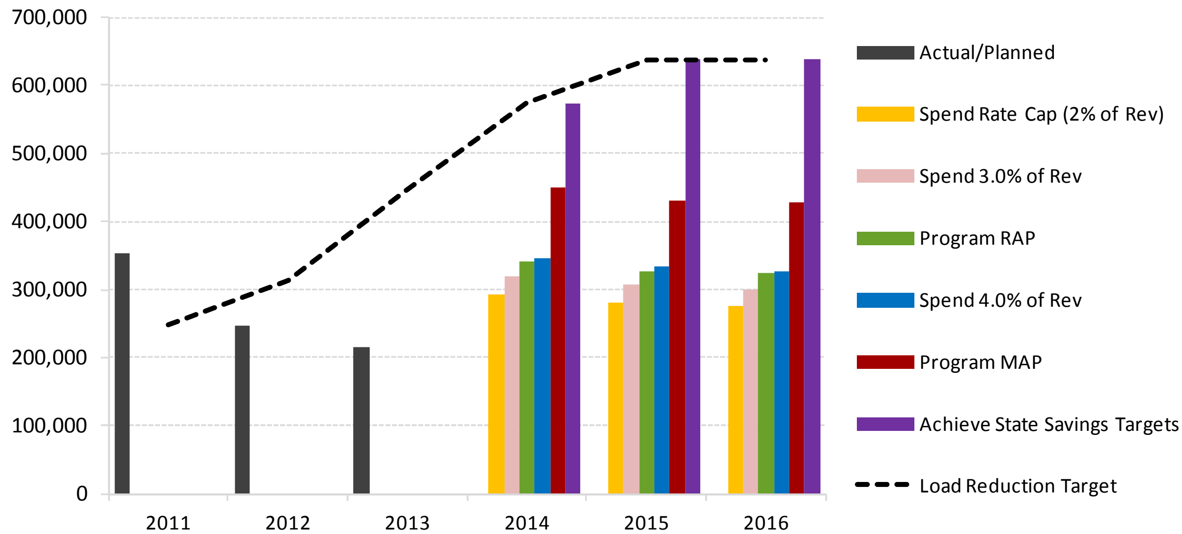


Figure 5 ***Costs to Achieve Electricity Savings ($000)***

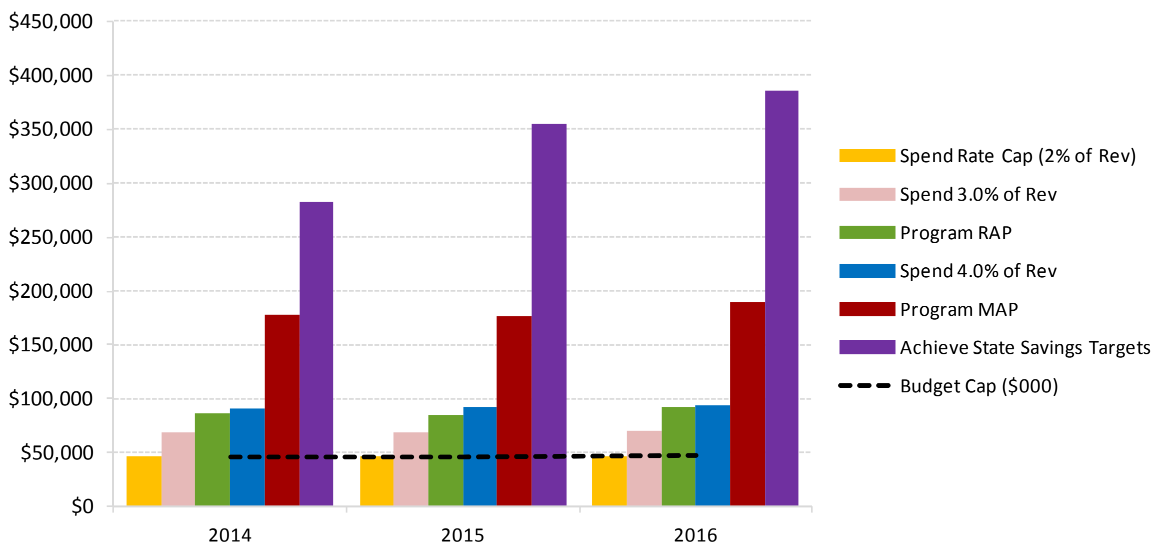


Figure 6 through Figure 8 show the supply curves for electric EE programs at various implementation levels for the program years 2014-2016. Each horizontal line is a discrete program with a bundle of measures and an explicit delivery mechanism and cost structure. Several program levels are shown, as well as the supply curve for achieving the state target.

- Overall, the analysis shows a significant majority of the EE program savings fall under $0.40/kWh, where kWh are given in incremental or first-year terms.
- The portfolio representing spending at the rate cap level of 2% of revenue is significantly lower than the Program Low level from the EE potential analysis.

Overall, any portfolio between the Rate Cap and the Program RAP portfolio will offer the best opportunity for Ameren Illinois to achieve a cost-effective portfolio with levels of electric savings greater than the current Cycle 2 portfolio, while also having less risk and uncertainty than the Program MAP portfolio. As can be seen from the supply curves, the Program RAP would be very similar to the portfolio that spends 4.0% of Revenue in the three program years. This gives a barometer of the spending level required to achieve the savings in the Program RAP scenario.

Figure 6 Electric Energy Efficiency Program Supply Curves—Potential in 2014

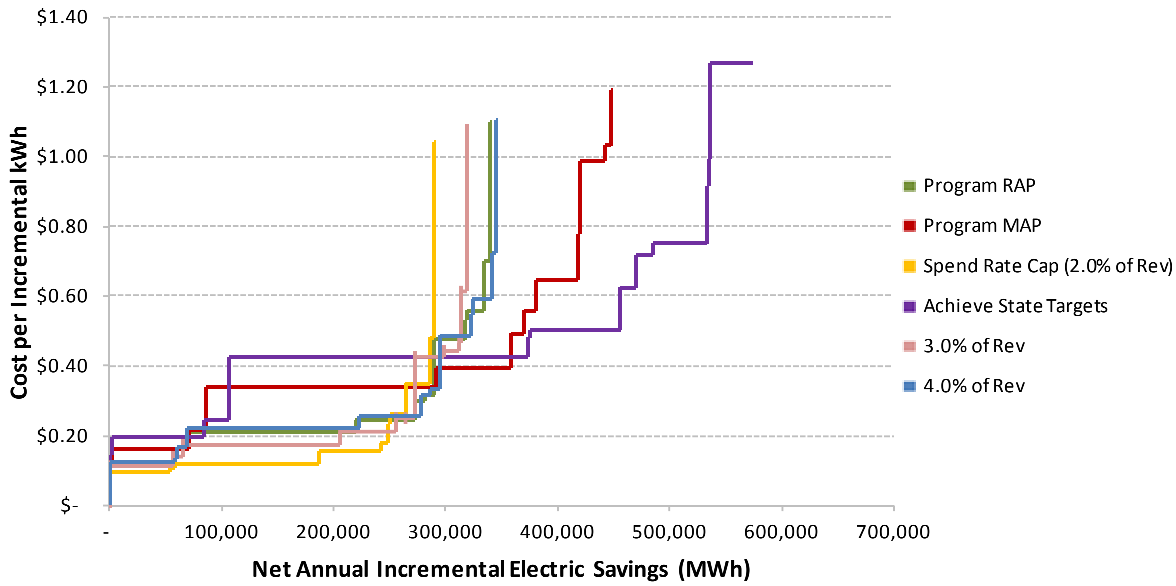


Figure 7 Electric Energy Efficiency Program Supply Curves—Potential in 2015

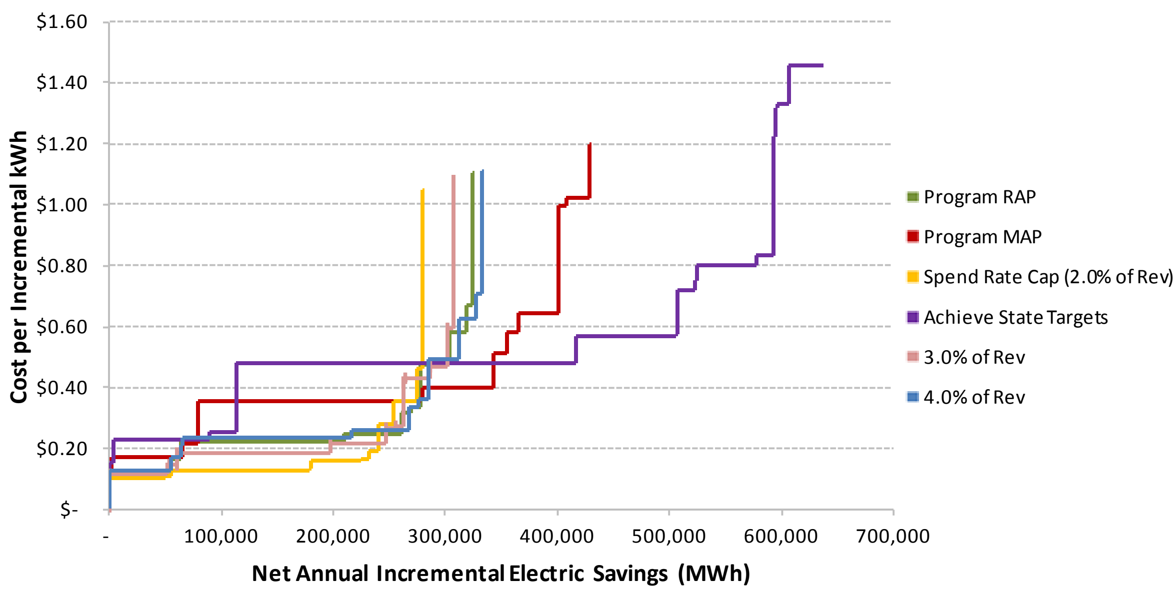
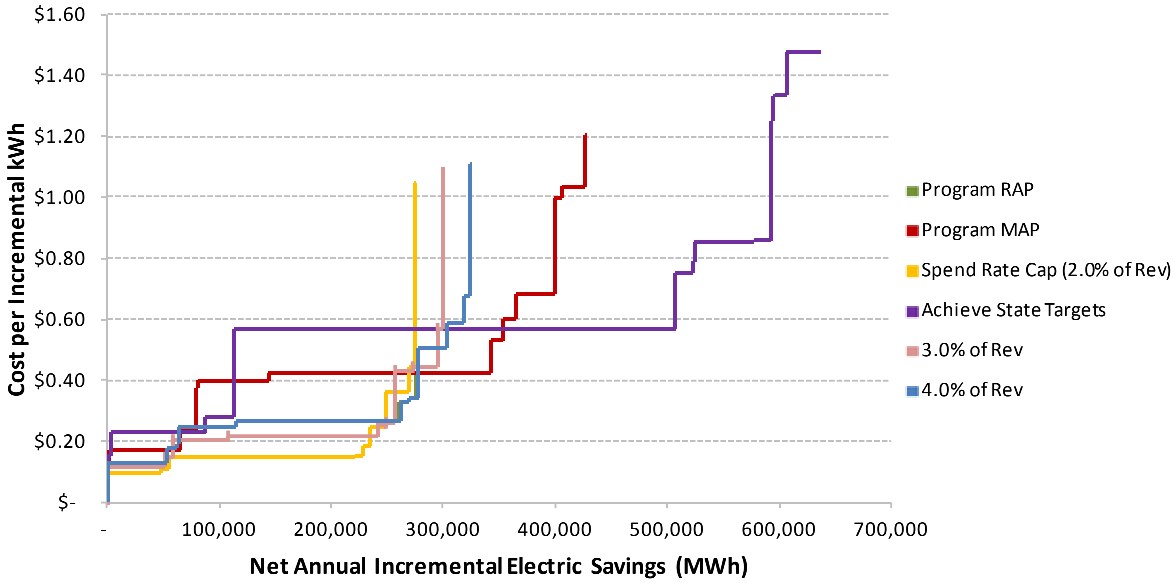


Figure 8 Electric Energy Efficiency Program Supply Curves—Potential in 2016



Key Findings for Natural Gas

Like the electricity findings above, the key findings of the natural gas potential analysis are presented first in terms of measure-level results, where program delivery and implementation concerns have not been considered. Subsequently, the results are refined to the program level by considering appropriate program delivery mechanisms and measure bundling strategies based on real-world implementation and evaluation experience.

Measure-level Energy Efficiency Potential

Key findings related to measure-level natural gas potentials are summarized below.

- **Realistic achievable potential**. In 2014 realistic achievable savings are 6.1 million therms which is 0.5% of the baseline projection. By 2016, cumulative realistic achievable savings grow to 14.1 million therms which represent 1.3% of the baseline projection.
- **Maximum achievable potential**. In 2014 savings for this case are 9.0 million therms or 0.8% of the baseline and by 2016 cumulative savings reach 20.8 million therms or 1.9% of the baseline projection.
- **Economic potential**. The savings for this case in 2014 are 17.4 million therms or 1.6% of the baseline projection and by 2016 the cumulative savings reach 39.6 million therms, about 3.6% of the baseline.
- **Technical potential**. Savings in 2014 for the technical case are 29.1 million therms, 2.6% of the baseline and by 2016 these cumulative savings reach 65.3 million therms, about 5.9% of the baseline.

Table 3 and Figure 9 summarize the natural gas energy-efficiency savings for the different levels of potential relative to the baseline projection.

Table 3 ***Summary of Cumulative, Net, Measure-Level Natural Gas Energy Efficiency Potential***

	2014	2015	2016
Baseline Energy Forecasts (million therms)	**1,102**	**1,109**	**1,109**
Cumulative Energy Savings (million therms)			
Realistic Achievable Potential	6.1	9.5	14.1
Maximum Achievable Potential	9.0	14.1	20.8
Economic Potential	17.4	27.0	39.6
Technical Potential	29.1	45.2	65.3
Energy Savings (% of Baseline)			
Realistic Achievable Potential	0.5%	0.9%	1.3%
Maximum Achievable Potential	0.8%	1.3%	1.9%
Economic Potential	1.6%	2.4%	3.6%
Technical Potential	2.6%	4.1%	5.9%

Figure 9 ***Summary of Cumulative, Net, Measure-Level Natural Gas Energy Savings***

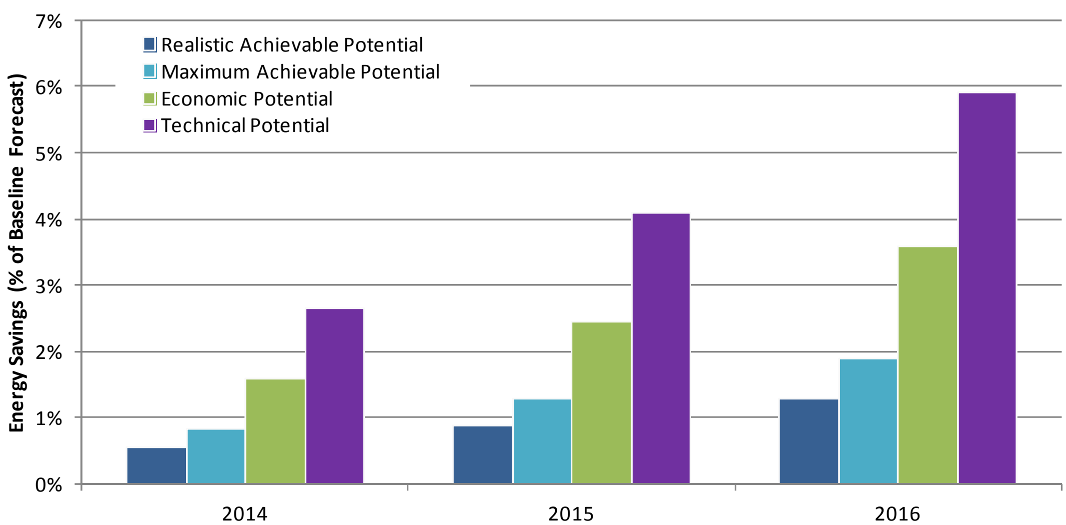
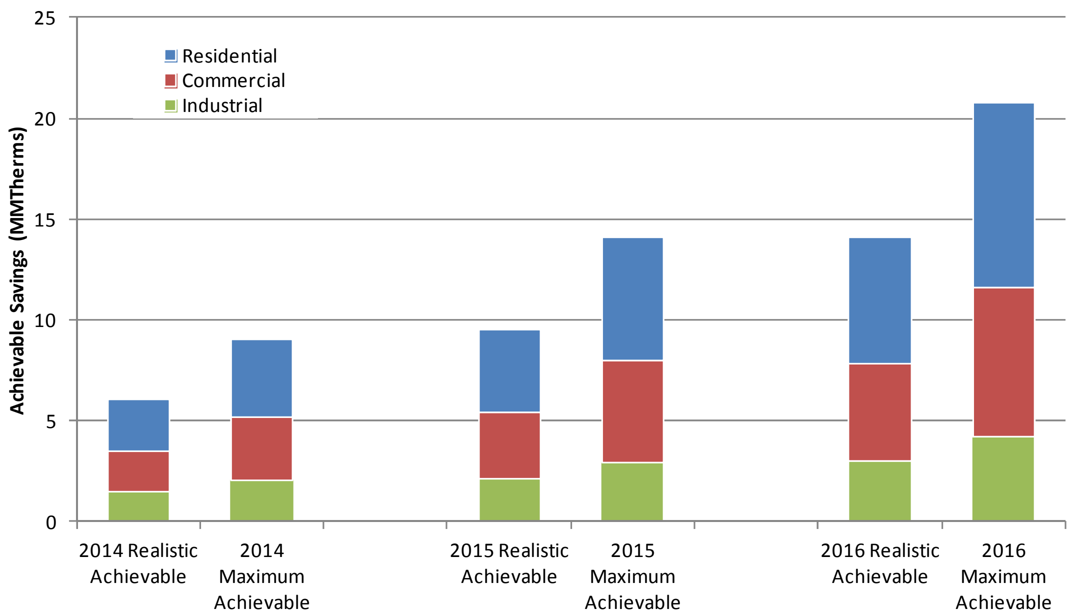


Figure 10 presents the range of natural gas achievable potential by sector. Unlike the electric analysis, the residential sector accounts for the largest portion of the natural gas savings, followed by the commercial and then the industrial sectors.

Figure 10 Cumulative, Net, Measure-Level Natural Gas Potential by Sector (million therms)



Program-level Potential

As with the electricity analysis, the program-level results here consider program delivery strategies, real-world limitations, and the associated administrative costs and economics. Please note that measure-level savings are provided above in cumulative terms, but are translated here to incremental or annual terms to align better with the language and expectations of program implementation and annual targets.

In order to more accurately assign realistic program costs, measure-level results were synthesized to group measures into programs that can realistically be delivered to Ameren Illinois customers. The key steps and differences between the measure-level analysis and program-level analysis are discussed above. Key findings related to program-level natural gas potentials are summarized as follows:

- **Program Low achievable potential.** In 2014 program low achievable savings are 4.2 million therms which is 0.4% of the baseline projection at a cost of $13.3 million. By 2016 cumulative program low achievable savings grow to 12.5 million therms or 1.1% of the baseline projection at a cumulative cost of $40.7 million.
- **Program High achievable potential**. In 2014 savings for this case are 6.3 million therms or 0.6% of the baseline at a cost of $28.9 million. By 2016 cumulative savings reach 18.7 million therms or 1.7% of the baseline projection at a cumulative cost of $89.0 million.

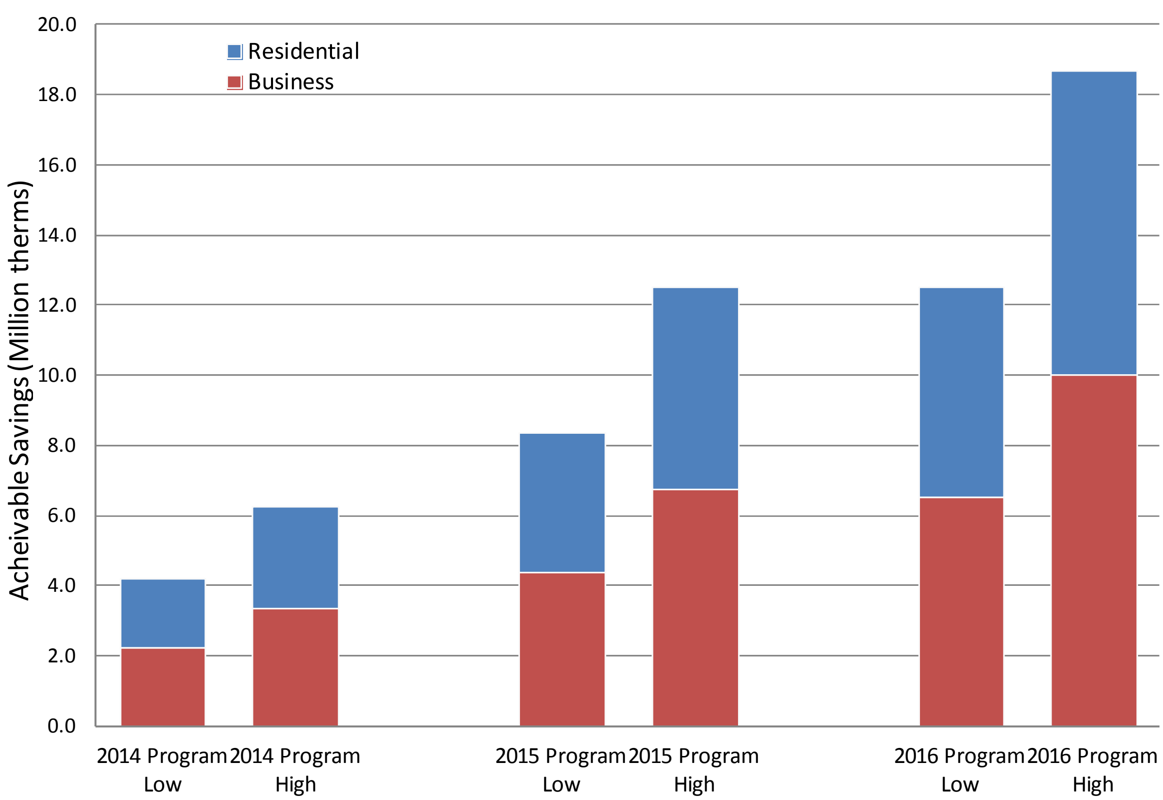
Table 4 summarizes the electric energy-efficiency savings for the different levels of potential relative to the baseline projection.

Table 4 Summary of Cumulative, Net, Program-Level Electric Energy Efficiency Potential

	2014	2015	2016
Baseline Energy Forecasts (million therms)	**1,102**	**1,109**	**1,109**
Annual Savings (million therms)			
Program Low Potential	4.2	8.3	12.5
Program High Potential	6.3	12.5	18.7
Energy Savings (% of Baseline)			
Program Low Potential	0.4%	0.8%	1.1%
Program High Potential	0.6%	1.1%	1.7%
Energy Costs (Million $)			
Program Low Potential	$13.3	$26.6	$40.7
Program High Potential	$28.9	$58.1	$89.0

Figure 11 summarizes the range of natural gas program-level achievable potential by sector. Sectors were adjusted to Residential and Business (which includes both Commercial and Industrial) to align with Ameren Illinois program sectors. The business sector accounts for the largest portion of the savings, followed by residential.

Figure 11 Cumulative, Net, Program-Level Potential by Sector (million therms)



Supply Curves

For the natural gas portfolios, the resulting Net Incremental therm savings per year are shown in Figure 12. The respective costs to achieve the savings are shown in Figure 13.

Figure 12 Summary of Achievable Natural Gas Savings (Net, Incremental 1000 Therms)

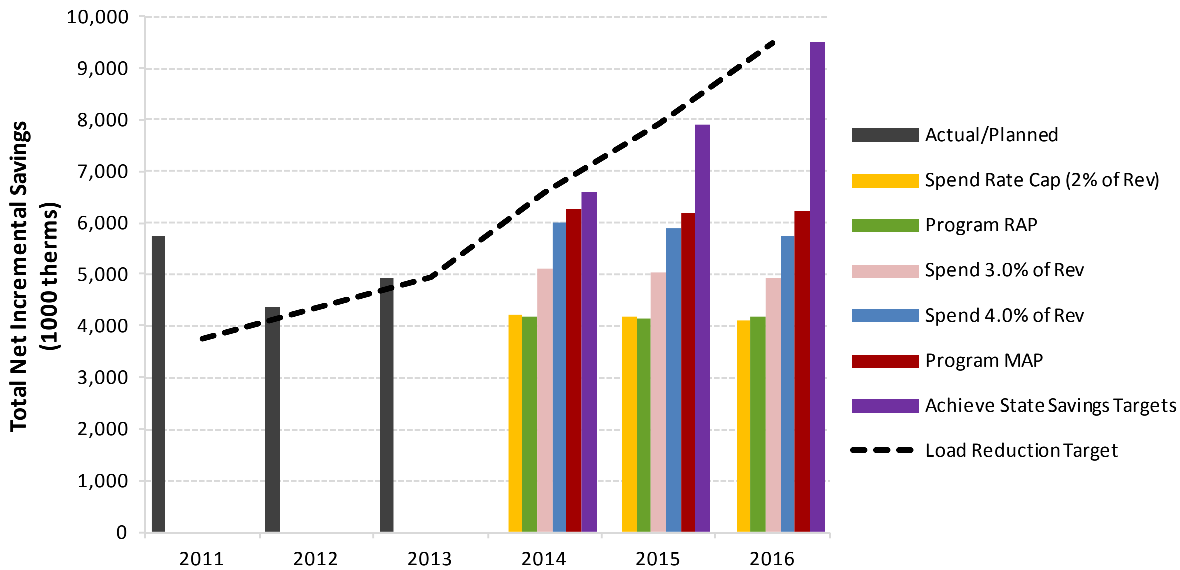
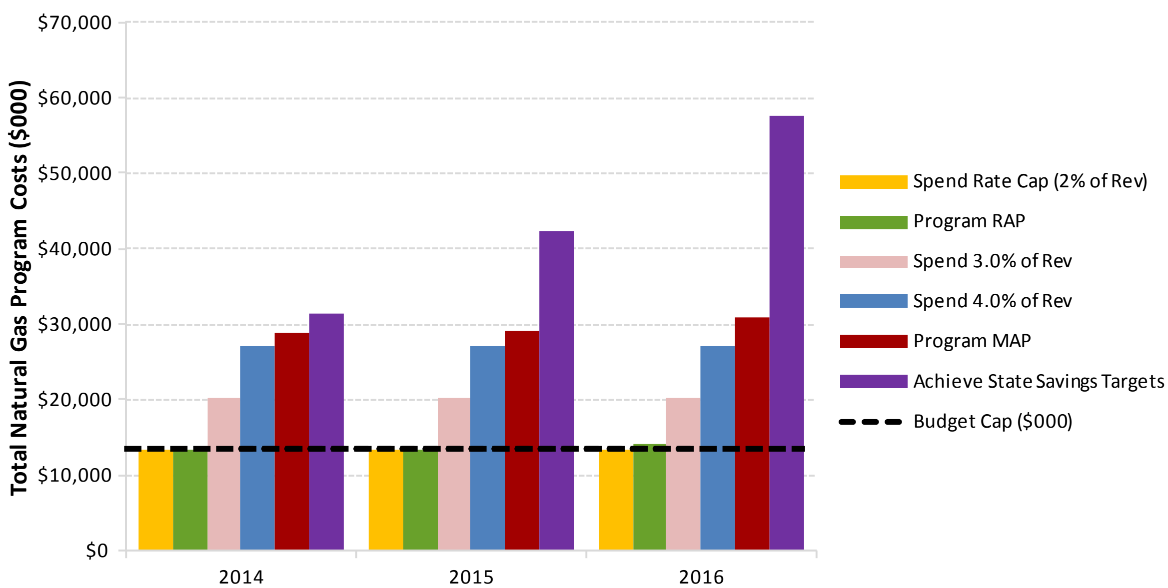


Figure 13 Costs to Achieve Natural Gas Savings ($000)



The supply curves for the various natural gas EE portfolios are presented below in Figure 14 through Figure 16 for the program years 2014-2016.

- A majority of the EE program savings for natural gas are under and around the $5.00/therm level, where therms are given in incremental or first-year terms.
- The portfolio representing spending at the rate cap level of 2% of revenue is closer to the Program RAP scenario for natural gas than it was in the electric analysis.

- There are a few very high cost programs that skew the end of the supply curve with a nearly vertical spike, including: Residential ENERGY STAR Homes, Residential Moderate Income, and Retro Commissioning.

Overall, the Program RAP portfolio offers the most cost-effective natural gas portfolio for Ameren Illinois, maintaining spending levels close to the "Spend Rate Cap" portfolio and providing slightly lower $/therm cost.

Figure 14 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2014

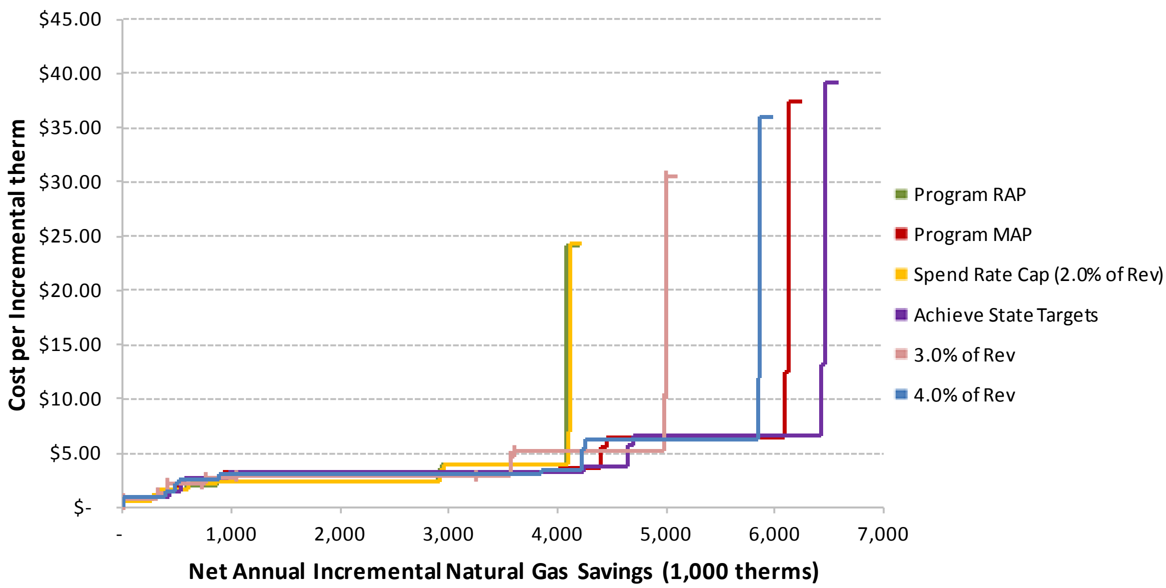


Figure 15 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2015

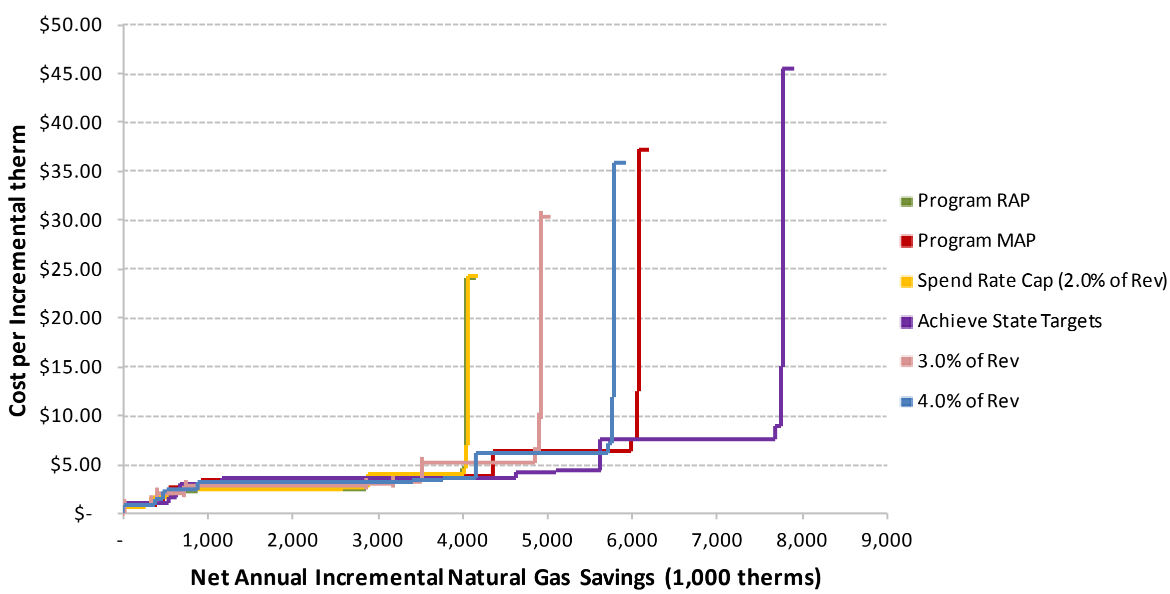
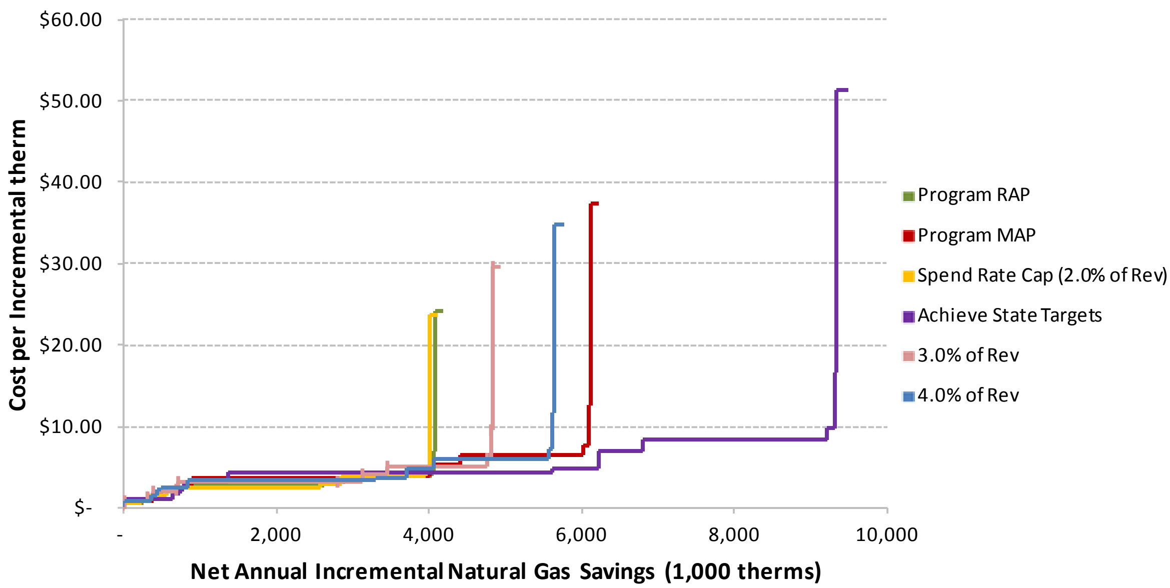


Figure 16 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2016



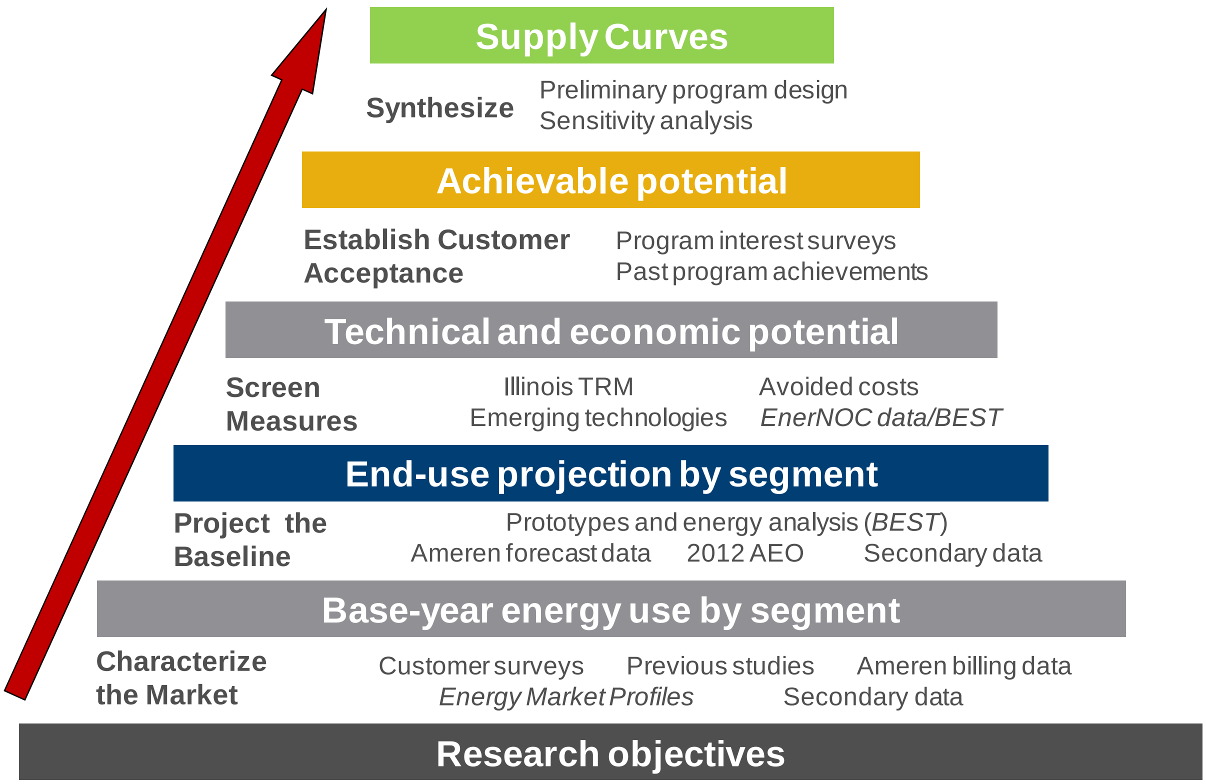
Study Approach

This study followed industry best practices in assessment of EE market potential. An overview of the analysis approach is illustrated in Figure 17 below. Key features of this approach include the following:

1. Conduct primary market research that includes comprehensive saturation and program-interest surveys with residential, commercial and industrial customers. Volume 2 describes the market research in detail.
2. Perform a market characterization to describe sector-level electricity and natural gas use for the residential, commercial and industrial sectors for a recent “base year” (2011). We further segmented by housing type, building type and industry.
3. Utilize a wide variety of data sources to estimate how customers in the region currently use electricity and natural gas. We developed energy market profiles for each segment that describe appliance/equipment saturation and use for new and existing buildings.
4. Develop a baseline end-use projection by sector, segment, end use and technology for electricity and natural gas for a 10-year time horizon. This projection accounts for building codes and appliance standards that are “on the books.”
5. Identify and analyze energy efficiency measures appropriate for the Ameren Illinois service area, including measures currently covered by programs offered by Ameren and other entities as well as emerging technologies.
6. Estimate three levels of measure-level energy-efficiency potential, *Technical*, *Economic*, and *Achievable*. We used EnerNOC’s analytical model, LoadMAP, to develop the baseline projection and the estimates of EE potential. We delivered LoadMAP to Ameren so staff can continue to use it on their own for additional analyses. Steps 2 through 6 are documented in Volume 3. Detailed appendices are provided in Volume 6.
7. Transfer measure-level results to Applied Energy Group who used this information to develop program designs (documented in Volume 4).
8. Use program-level results from Step 7 to develop supply curves (see Volume 5).

Additional information and results are provided below.

Figure 17 Analysis Approach for Ameren Illinois Market Potential Study



Throughout the project, the Ameren and EnerNOC project teams engaged with Ameren Illinois' stakeholders (the SAG) in meetings and by webinar to review each major step in the study.

Market Research

The market research component collected electricity and natural gas end-use data, end-use saturation data, customer demographics, and psychographic information that provides insight on how Ameren Illinois customers make decisions related to electric and natural gas usage and energy-efficiency investment decisions.

Comprehensive primary market research about Ameren Illinois customers was conducted for this project. This research provides a solid foundation for the analyses performed in this study and it also provides a wealth of information for future analyses across many departments at Ameren. The market research included:

- Residential customers – online saturation surveys with 726 customers
- Residential customers – online program interest surveys with 749 customers
- Small and medium C&I customers – online saturation surveys with 691 customers
- Large C&I customers – 101 site visits distributed strategically among campuses/locations of Ameren Illinois' largest customers
- C&I customers – online program interest surveys with 610 customers

Volume 2 of the report series presents the detailed results of the primary market research.

Energy-use Surveys

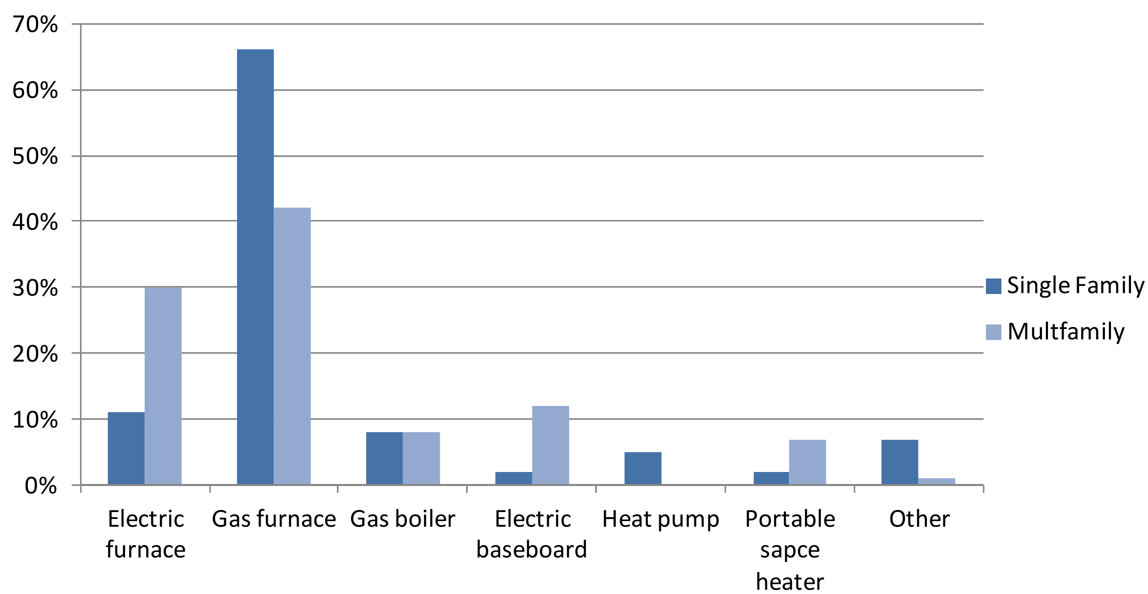
Energy-use (or saturation) surveys were conducted across all customer classes. Topics included:

- Characteristics of households/homes and businesses/buildings and their occupants
- Heating, cooling and water heating equipment
- Lighting, refrigeration and food service equipment
- Office equipment, electronics and miscellaneous plug loads
- Motors and process uses
- Energy-efficiency measures taken and planned

Figure 18 and Figure 19 present two examples of results from the residential saturation survey.

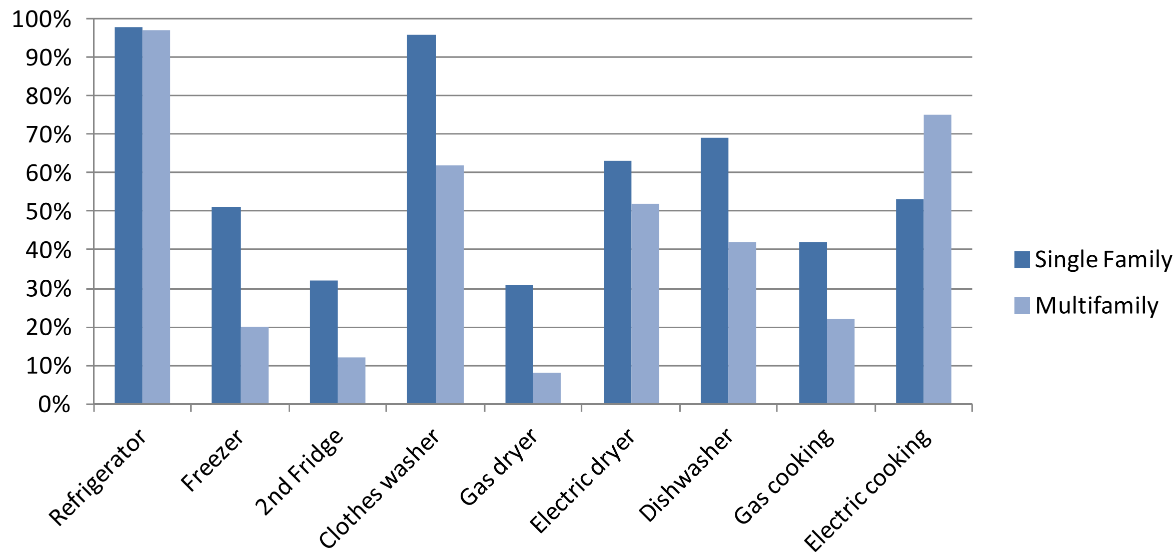
In the residential sector, the majority of respondents in single-family homes have a gas furnace (66%) and eleven percent (11%) have an electric furnace (Figure 18). Most respondents in multi-family homes have either a gas or an electric furnace. Several respondents reported using supplemental heating such as portable space heaters and fireplaces as their main type of space heating; 9% of single-family and 8% of multi-family homes use these other types of space heating.

Figure 18 Type of Space Heating



Almost all respondents living in single-family homes have a refrigerator (Figure 19). In addition, more than half have a stand-alone freezer and 32% have a second refrigerator. In the previous study the saturation of a second refrigerator was 29%. While the difference is not statistically significant, we had expected the percentage to decrease based on the success of the program the past three years. We speculate that the ARRA rebate encouraged more customers to purchase new refrigerators and therefore customers that had already recycled a second refrigerator or never had one in the first place moved the existing refrigerator to the garage after purchasing a new one through the ARRA rebate. Sixty-nine percent of respondents in single-family homes have a dishwasher and 53% use electric for cooking. Ninety-six percent of respondents in single-family homes also have a clothes washer, and 94% have a clothes dryer. Sixty-three percent of respondents have an electric dryer; while 31% have a gas unit.

Figure 19 Appliance Saturation



Program-interest Research

A hallmark of this study is the research of customer attitudes and behaviors toward energy efficiency measures and programs. The objectives of this research were to:

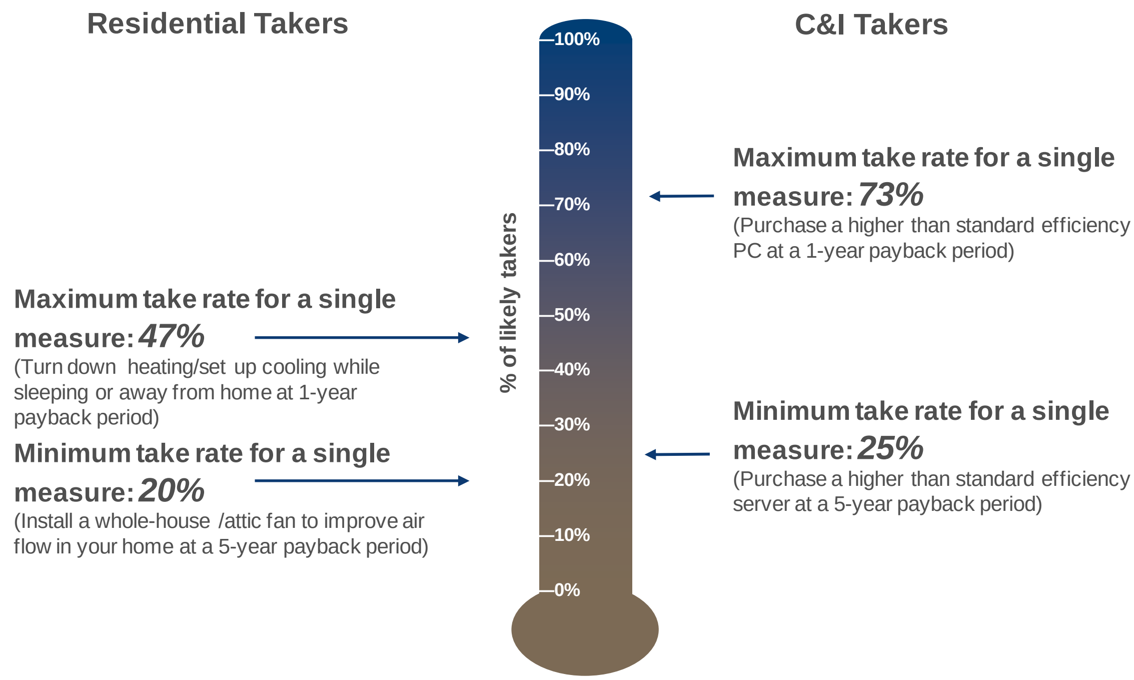
1. Help Ameren estimate achievable potential
   - o How likely are customers within each sector to participate in various energy efficiency programs Ameren Illinois is considering offering?
   - o Which energy efficiency measures offer the highest likely participation rates?
   - o How does likelihood to participate differ by payback period for the customer?
2. Help Ameren Illinois understand unique customer segments to support customer marketing and outreach

Other relevant questions embedded in this phase of the research to help Ameren Illinois better understand achievable potential include:

- What overall demographic and psychographic characteristics correspond to a higher likelihood to participate in energy efficiency programs?
- What attitudinal or market segments can be derived within the residential sector, and how do these segments differ in terms of their impact on the likelihood to participate, as well as on customer demographic and psychographic characteristics?
- Which of these segments represent the best opportunities for Ameren Illinois to focus their marketing on?
- What messaging strategies would likely be useful to help foster participation among these high opportunity segments?

Key results from the program interest research included “take rates” for various program concepts. Take rates represent the likelihood that customers will participate in specific programs and they reflect a snapshot of current behavior and circumstances. They have been adjusted for response bias using industry standard techniques to reflect what customers *actually* do rather than what they *say* they will do. Figure 20 illustrates the range of take rates for the residential and business sectors.

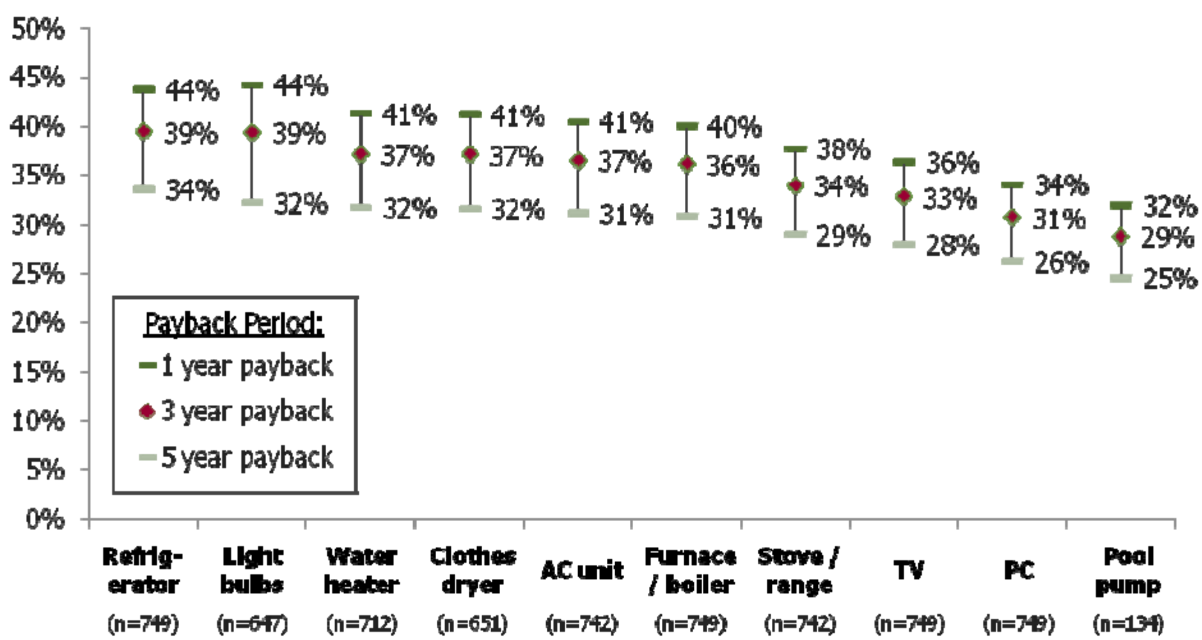
Figure 20 Range of Take Rates



Residential Sector Program Interest Research Results

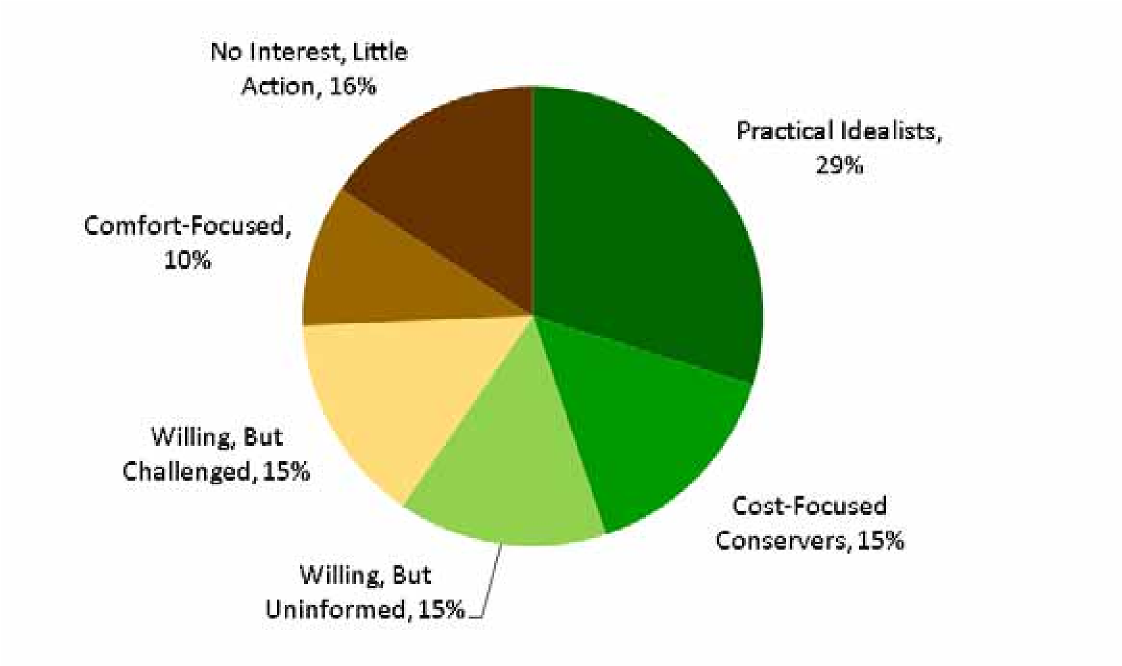
Figure 21 presents likely take rates for specific appliances or equipment measures in the residential sector. This is a subset of the take rates for the residential sector; additional rates were developed for a second category of non-equipment measures such as insulation or low-flow showerheads.

Figure 21 Likely Residential Take Rates for Purchasing High-efficiency Equipment



In addition to estimating take rates, the study also developed an attitudinal segmentation model that disaggregated residential customers into groups that differ in terms of whether, and why, they might be interested in pursuing energy efficiency options. The goal of the segmentation analysis was to define groups of customers that were different in ways that would allow Ameren Illinois to prioritize customer targets for EE program marketing, and to develop targeted messages for each of those segments. Using a variety of attitudinal and behavioral inputs, six residential customer segments that seemed to best represent the differences in this population on these issues were identified. The segments and relative sizes are outlined in Figure 22 and described in detail in Volume 2.

Figure 22 Residential Attitudinal Segment Distribution



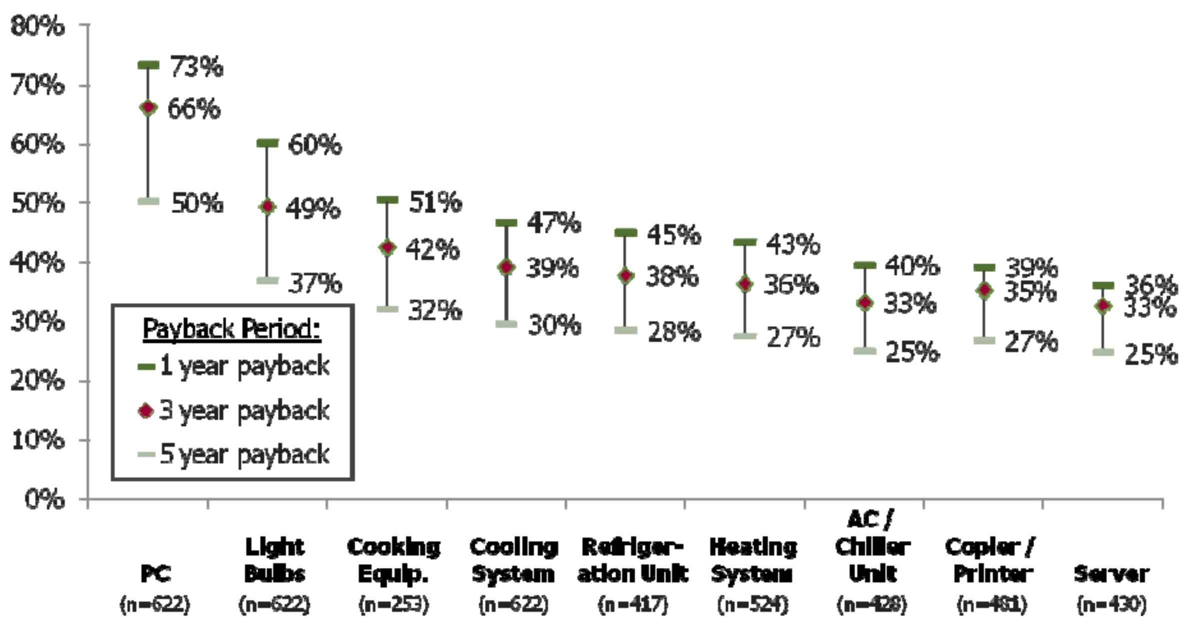
- **Practical Idealists (30%)** are concerned with conserving energy, both from a cost-focus and an environmental perspective (they are the "greenest" segment). They are tech and feature oriented when considering appliances, but they also say they research options and compare prices. Higher education and income, and with the largest homes (though with only average total annual kWh usage), but tend to say their economic situation is worse than it was a year ago. Tend to be high on familiarity, and experience, with EE / conservation measures to date, and are very likely to say that they would adopt new EE / conservation measures.
- **Cost-Focused Conservers (15%)** are informed about, and interested in, conservation / EE measures, but for cost reasons rather than environmental reasons. This group believes in the value of EE as a way to save money, and has taken many prior EE actions. They do not trust Ameren Illinois very highly, however, and do not see it as the job of the company to encourage customers to save energy or money. They would prefer the company reduce rates than spend money on EE or green options. They have higher than average education and income levels, and the second largest homes on average, and the second highest average kWh. They have the second highest program take rate.
- **Willing, But Uninformed (15%).** This group is positive in its assessment of Ameren Illinois, and green in their environmental perspectives (though this is not a daily, top-of-mind issue). They are relatively less experienced with EE / conservation measures to-date, however, and unsure of what they could be doing in this area, or if any of their actions would actually lead them to save money. They prefer simple, functional appliances that are on sale, and which they can purchase locally, rather than online. They have average sized homes and average annual kWh usage, as well as have lower than average income and education levels. They are moderate on take rates across programs, but are the lowest on familiarity / experience with EE conservation measures currently.

- **Willing, But Challenged (15%)**. This group has relatively high opinions of Ameren Illinois and believes that the company should be pursuing EE options for its customers, while also supporting green initiatives. They are relatively low on EE / conservation information currently, however, and have implemented fewer such measures than others to-date. Appliance cost is critical to them and it appears that they do not think that they can afford to purchase higher quality / higher EE appliances. They live in the smallest homes, and have lower than average income and education levels, as well as the lowest annual kWh usage. They are moderate to low in their interest in participating in new EE / conservation options.
- **Comfort Focused (10%)**. This group is quite positive in its overall assessment of Ameren Illinois, but does not see the company as a leader in energy efficiency, nor do they think the company should be a leader in this area (i.e., in encouraging customers to be more efficient), or in green energy. Rather, the company should just focus on keeping costs low. Comfort is important to them, and they just want to be left alone to use energy as they please. They are concerned about appliance cost, but worry more about functionality (particularly as this relates to comfort) than about environmental / energy saving considerations. They tend to live in average sized homes, but have the highest annual kWh levels, along with higher than average incomes and educations. They are moderate on both familiarity with EE programs / options to-date, and their likelihood to participate in new programs.
- **Low Interest, Little Action (16%)**. This group has very little interest in conservation or EE. This group actively dislikes Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They do not want the company to encourage customers to save energy, nor do they want it to pursue green options. They do want the company to keep costs low as its sole focus. They have smaller than average homes, but average kWh levels, and are more likely to live in multi-family structures and to have somewhat lower levels of education and income. They are the lowest on likelihood to adopt new EE programs and one of the lowest on existing familiarity / experience with EE / conservation options.

Business Sector Program Interest Research Results

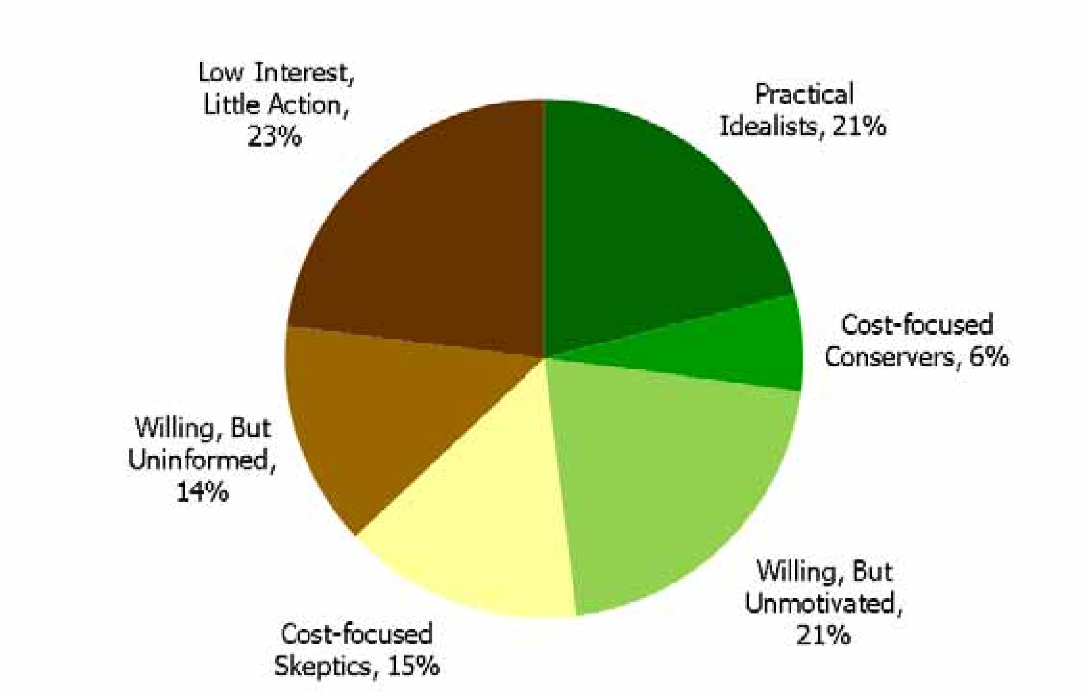
Figure 23 presents likely take rates for high-efficiency equipment in the business sector, a subset of measures considered in the program interest surveys. For the estimation of achievable potential, the take rates at the one-year payback period were used.

Figure 23 Likely C&I Take Rates for Purchasing High-efficiency Equipment



As with the residential sector, the team developed a segmentation model that disaggregated business customers into groups that differ in terms of whether, and why, they might be interested in pursuing energy efficiency options. This segmentation will allow Ameren Illinois to prioritize customer targets for EE program marketing, and to develop targeted messages for each of those segments The segments and relative sizes are outlined in Figure 24 and described in detail in Volume 2.

Figure 24 Business Attitudinal Segment Distribution



- **Practical Idealists (21%)** are concerned with conserving energy, both from a cost-focus and an environmental perspective. They are feature focused when considering equipment, but they also say they research options and compare prices. They have the highest opinion of Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They tend to be high on familiarity with EE / conservation measures to date, and are most likely to say that they would adopt new EE / conservation measures in the future.
- **Cost-Focused Conservers (6%)** are informed about, and interested in, conservation / EE measures, but for cost reasons rather than environmental reasons. This group believes in the value of EE as a way to save money, and has taken many prior EE actions. They trust Ameren Illinois and believe the company should keep costs low for their customers while also pursuing green options. They have the highest average kWh, higher than average building size and number of employees, and the second highest program take rate.
- **Willing, But Unmotivated (21%)**. This group believes in conserving energy, for both environmental and cost reasons, and has the highest familiarity with EE / conservation measures. Despite this, they aren't as active as you might expect in conserving energy, which could be due to the fact that they already have lower than average kWh. They are, however, likely to say they would adopt new EE programs in the future.
- **Cost-Focused Skeptics (15%)**. Skeptical about global warming and the need for EE, this group is only focused on saving energy if it will in turn save them money. They have a positive opinion of Ameren Illinois, but believe their priority should be keeping costs low for their customers rather than focusing on conservation. While unfamiliar with EE measures, they have higher than average kWh and would be somewhat likely to adopt new EE / conservation measures in the future if they thought it would save them money.

- **Willing, But Uninformed (14%)**. This group is relatively less experienced with EE / conservation measures to-date, and unsure of what they could be doing in this area, but they believe that conservation is important and that Ameren Illinois should be focused on pursuing green options in addition to keeping energy costs low. They have an average building size and number of employees, as well as have lower than average kWh. They are low on take rates across programs, and are the lowest on familiarity / experience with EE conservation measures currently.
- **Low Interest, Little Action (23%)**. This group has very little interest in conservation or EE. This group actively dislikes Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They do not want the company to encourage customers to save energy, nor do they want it to pursue green options. They do want the company to keep costs low as its sole focus. They operate in smaller than average size buildings, and have smaller than average company size (more than half have less than 10 employees). They are the lowest on likelihood to adopt new EE programs and second lowest on existing familiarity.

Market Characterization and Energy-Use Profiles

The primary market research was a key source of information for the development of energy market profiles, base-year electricity use by end use and the baseline projection. For this study, 2011 was defined as the base-year because it was the most recent year for which complete billing data were available when the study began.

Total electricity use for the residential, commercial and industrial sectors for Illinois in 2011 was 36,571 GWh and 569 (million therms) of natural gas.

Residential Sector

In 2011, there were 1.25 million households in Ameren's service area. They used 11.6 GWh of electricity and 569 million therms of natural gas. For the analysis, this energy consumption was allocated to six residential segments based on the Ameren Illinois customer database and the saturation survey data. Since the Ameren Illinois electric and natural gas service territories overlap in some areas, but not all; the resulting customer segments are characterized by which fuels they receive from Ameren Illinois: electricity only, natural gas only, or both electricity and natural gas. These three segments are further subdivided into single family and multi-family homes.

Figure 25 shows the distribution of electricity and natural gas energy consumption by end use for all homes. Figure 26 shows the electricity and natural gas intensities (annual use per household) for these segments.

Figure 25 Residential Electricity and Natural Gas Use by End Use (2011), All Homes

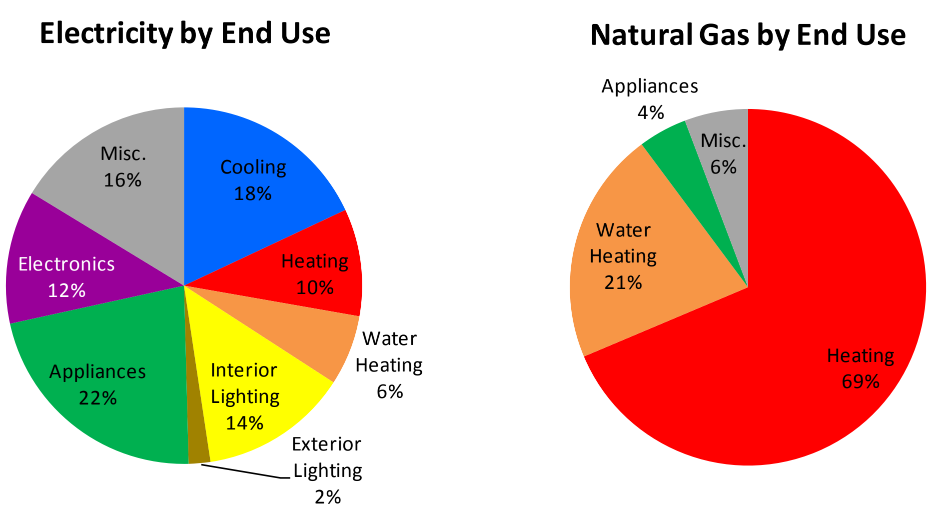
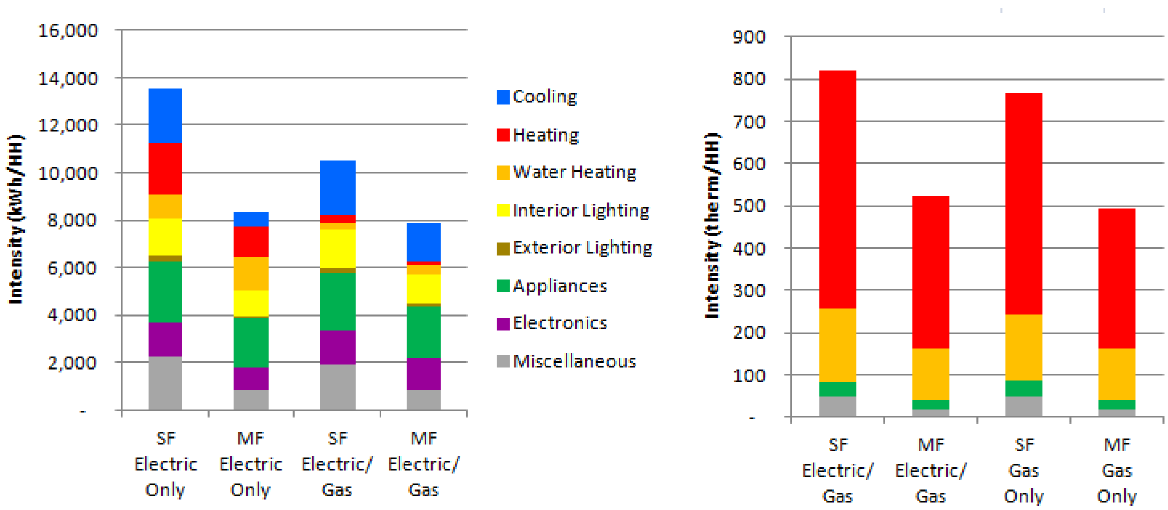


Figure 26 Residential Electricity and Natural Gas Use per Household by Housing Type



Commercial

The total amount of electricity consumed by Ameren Illinois commercial customers in 2011 was 12,414 GWh and the total natural gas energy consumed was 207 (million therms).

Figure 27 shows the distribution of electricity and natural gas energy consumption by end use for all commercial buildings served by Ameren Illinois. Electric usage is dominated by lighting, with interior and exterior varieties accounting for over one third of consumption. Natural gas usage is dominated by space heating (58%) and water heating (24%), with a small amount in food preparation and miscellaneous.

Figure 28 presents the electricity intensity in kWh per square foot by end use and building type. As is true across the entire commercial sector, lighting is a major end use in each building type, as is cooling. Figure 29 present the natural gas intensity in therms per square foot by end use and building type. Space heating is a significant end use across all building types but food preparation dominates in restaurants.

Figure 27 Commercial Electricity and Natural Gas Use by End Use (2011), All Buildings

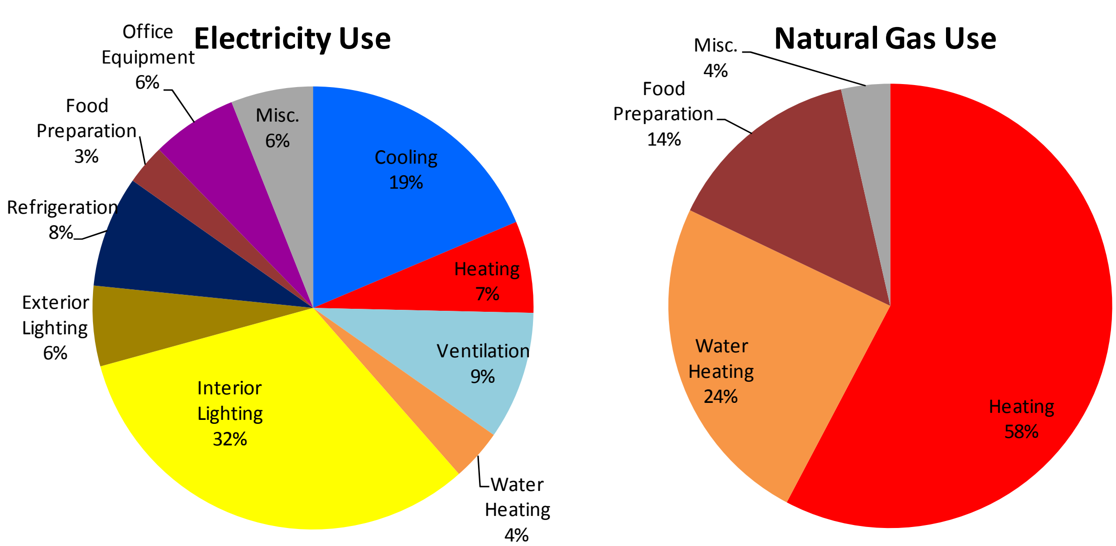


Figure 28 Commercial Electricity Intensity (kWh/sq ft, 2011)

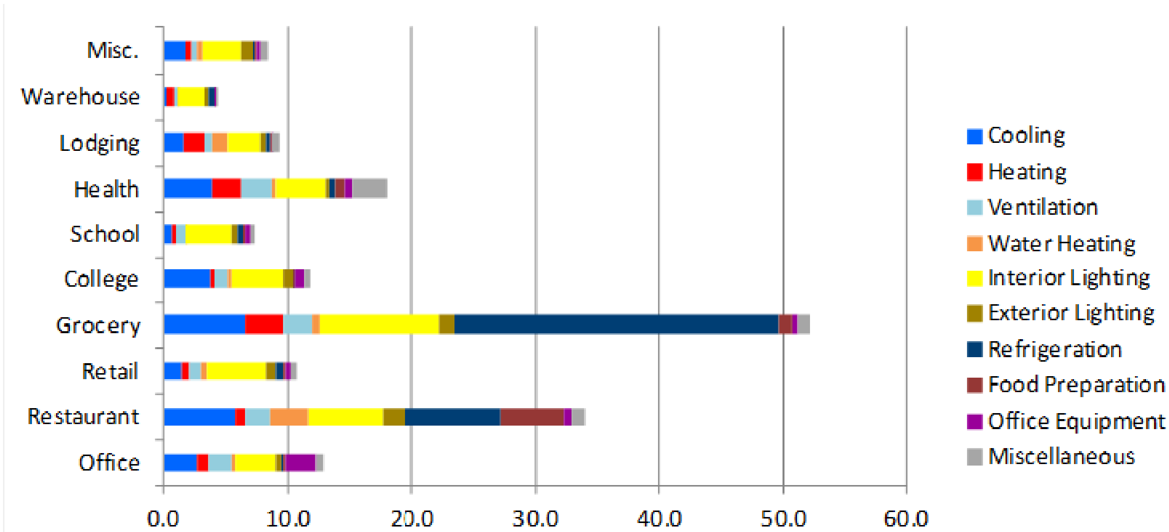
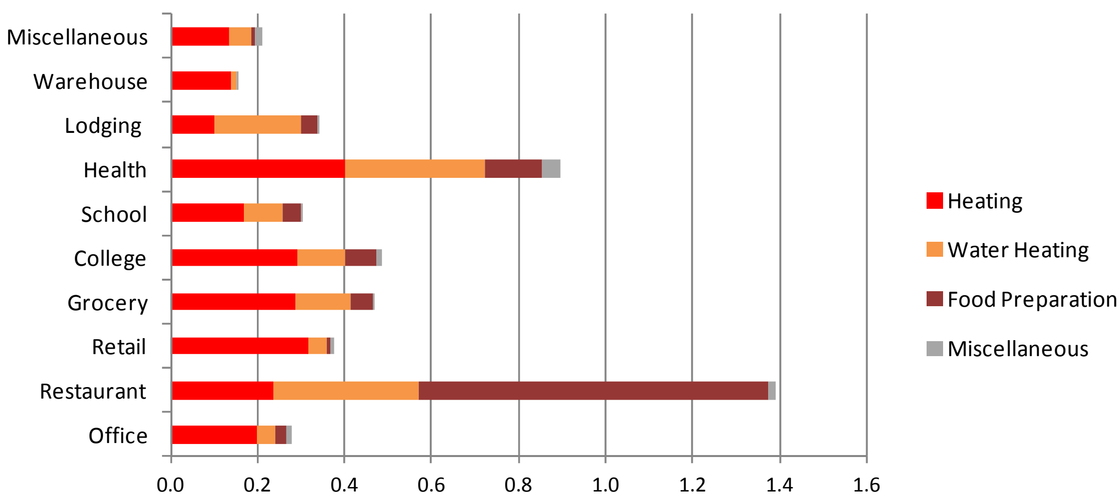


Figure 29 Commercial Natural Gas Intensity (therms/sq ft, 2011)



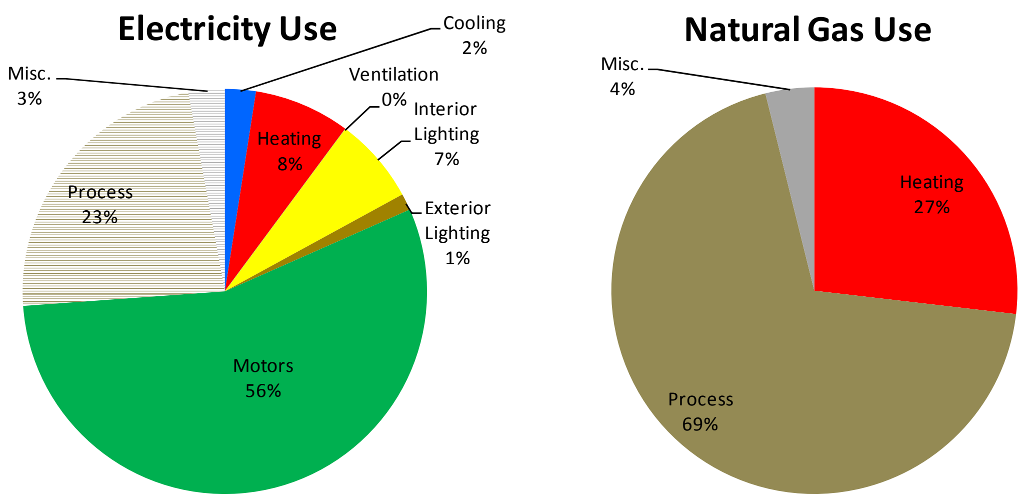
Industrial

The total electric energy consumed by industrial customers in Ameren service territory in 2011 was 12,580 GWh and the total natural gas energy consumed was 330 (million therms)[2]. Figure 30 shows the distribution of electricity and natural gas energy consumption by end use for all industrial customers. Motors are clearly the largest overall electric end use for the industrial sector, accounting for 56% of energy use. Note that this end use includes a wide range of industrial equipment, such as air compressors, refrigeration compressors, pumps, conveyor motors, and fans. The process end use accounts for 23% of electricity use, which includes refrigeration, and electro-chemical processes. Heating is the next highest, followed by interior lighting, miscellaneous, and cooling.

Natural gas usage is dominated by the process end use at 69%, primarily coming from process heating. Space heating (27%) and miscellaneous (4%) comprise the remainder of the sector's natural gas usage.

[2] This does not include the natural gas use for Self-Direct Customers.

Figure 30 Industrial Electricity and Natural Gas Use by End Use (2011), All Industries



Total energy use was allocated to four key industries: petroleum, metals, food products and machinery. The remaining industries were grouped together in the “other industrial” category. Figure 31 presents the electric consumption by end-use and industry type. The petroleum industry is the largest user of electricity and motors are the dominant end use across all segments.

Figure 32 presents the natural gas consumption by end-use and industry type. The metals industry is largest in terms of natural gas use.

Figure 31 Industrial Electricity Use by End Use and Segment (GWh, 2011)

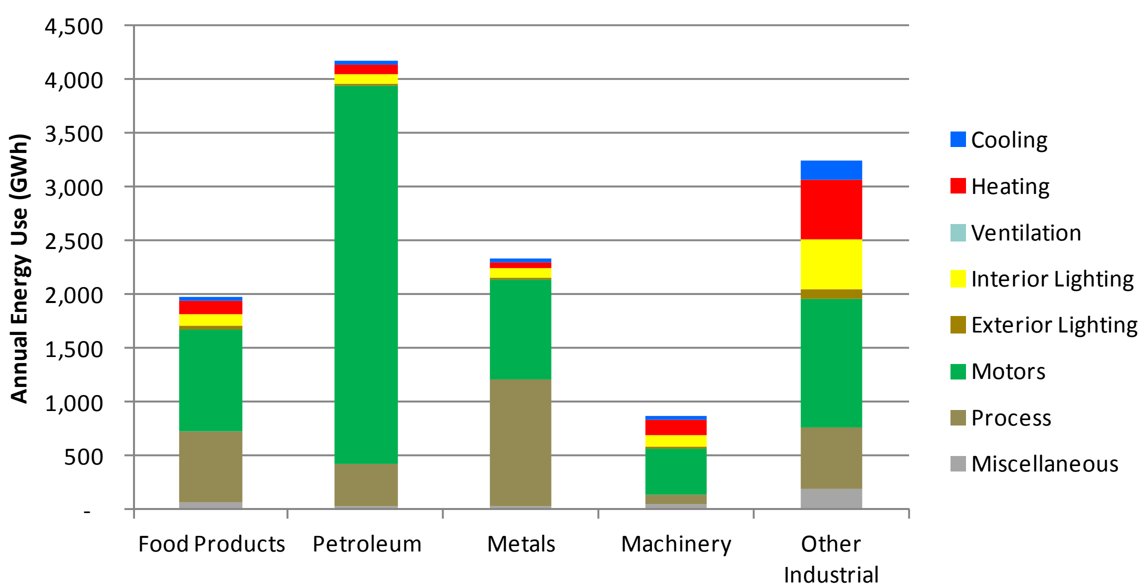
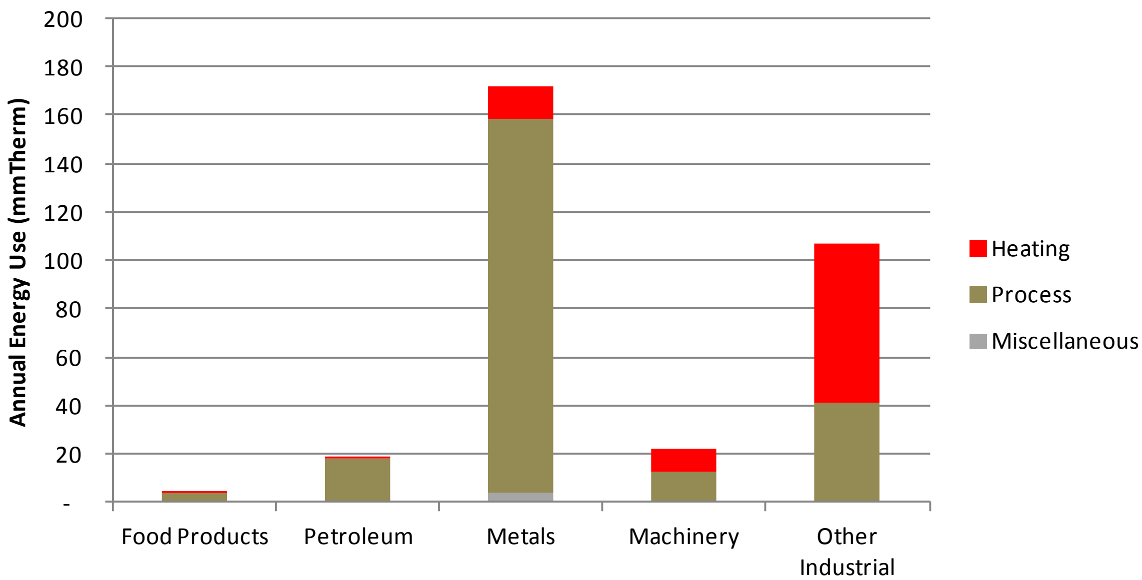


Figure 32 ***Industrial Natural Gas Use by End Use and Segment (Actual million therms, 2011)***



Baseline Projection

The baseline projection is an end-use load forecast that incorporates a forecast of customer growth, changes in electricity and natural gas prices and trends in fuel shares. It also includes expected impact of appliance/equipment standards and building codes. For this study, we developed two baseline projections: one without naturally occurring efficiency and a second with naturally occurring efficiency. The baseline projections represent what the consumption is likely to be in the future in absence of new efficiency programs and it serves as the metric against which energy efficiency potentials are measured. In the following, we present the baseline forecast with naturally occurring efficiency.

Residential

Figure 33 presents the baseline projection for electricity at the end-use level for the residential sector as a whole. Residential use decreases from 11,577 GWh in 2011 to 10,712 GWh in 2016, a decrease of 4.2%, or an average reduction of 1.4% during the program years. This projection reflects the most recent wave of federal appliance efficiency standards, including the EISA lighting standard. The naturally occurring efficiency savings come primarily from interior lighting and exterior lighting, as customers adopt CFL light bulbs instead of the minimum standard.

Figure 34 presents the residential sector baseline projections for natural gas at the end use level.

Figure 33 Residential Electricity Baseline with Naturally Occurring Efficiency

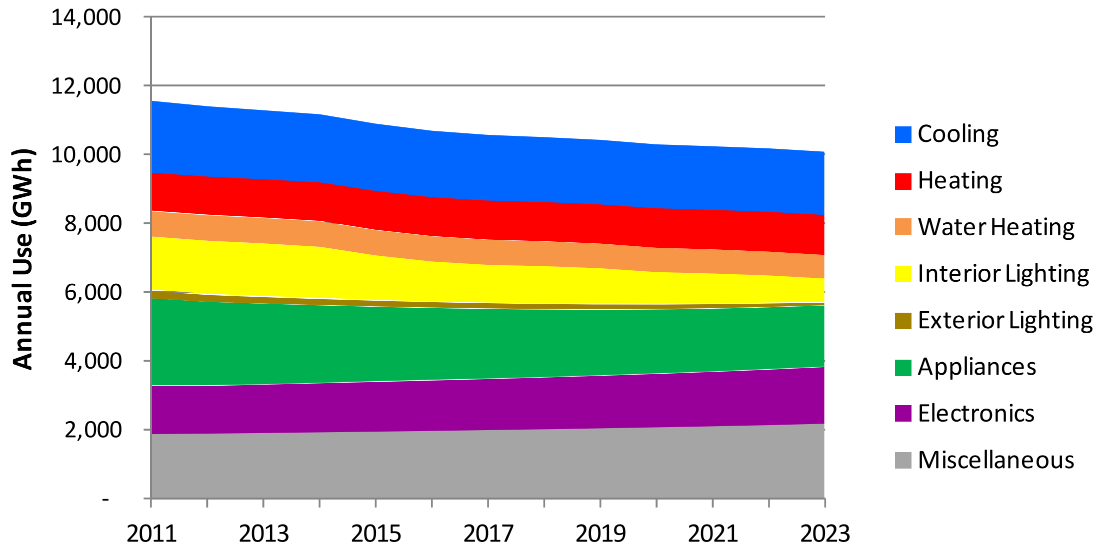
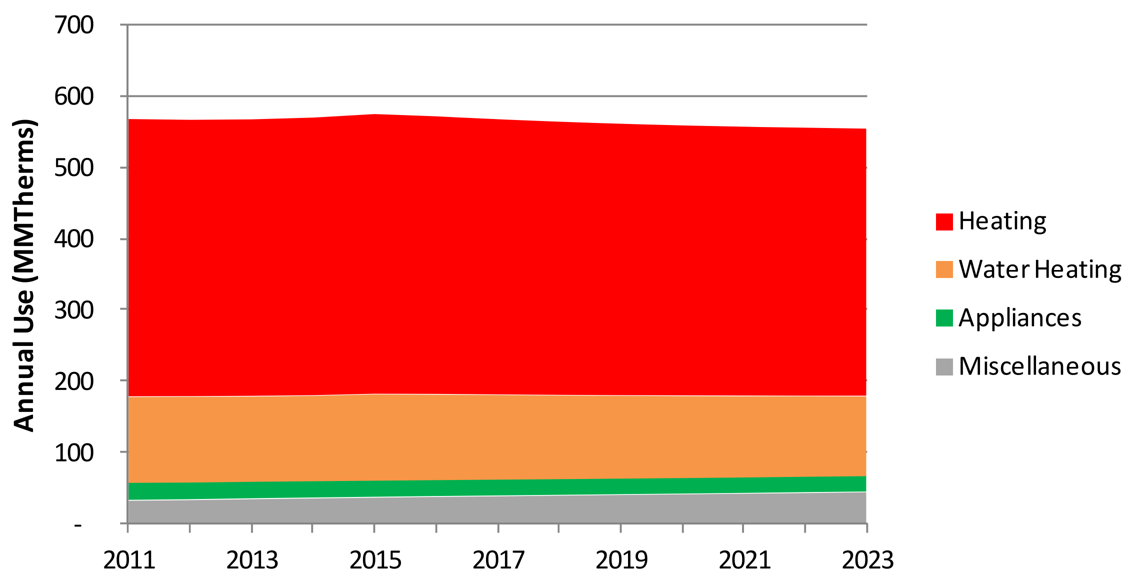


Figure 34 Residential Natural Gas Baseline with Naturally Occurring Efficiency



Commercial

Figure 35 presents the electricity baseline projection at the end-use level for the commercial sector as a whole. Electricity use shows a decline of 2% overall during the program years. Commercial usage starts at 12,414 GWh in 2011, and decreases to 11,332 GWh in 2016. This is a result of the EISA standard and customers adopting the higher efficiency lighting options that are currently available.

The natural gas baseline projection is shown in Figure 36. Natural gas use is projected to increase by only 1.8% between 2011 and 2016.

Figure 35 Commercial Electricity Baseline with Naturally Occurring Efficiency

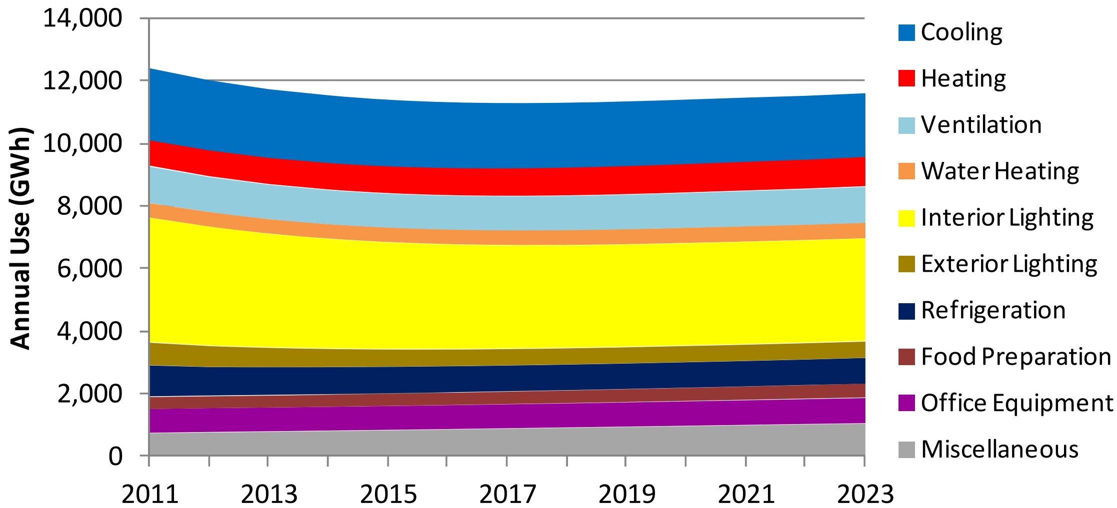
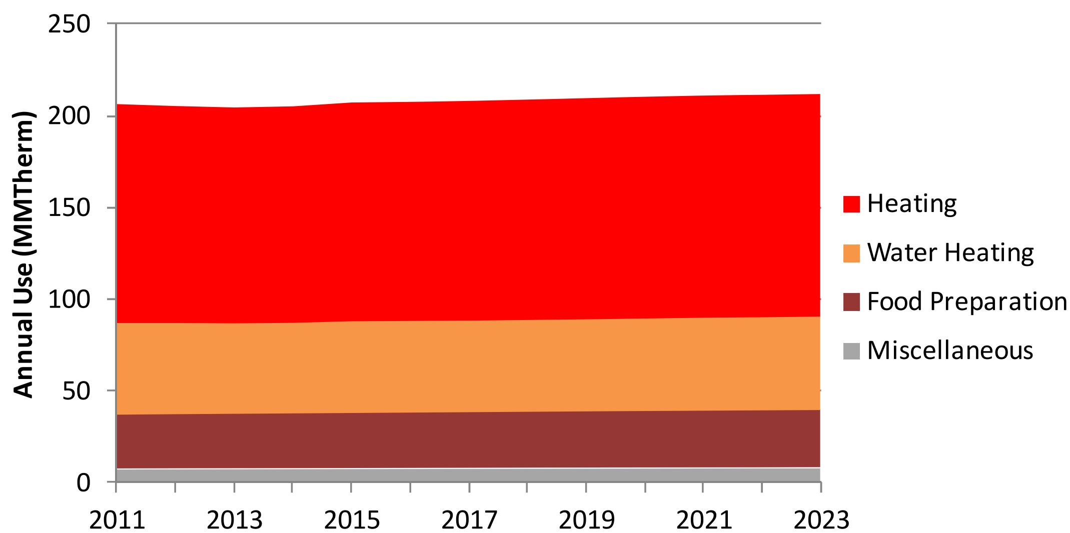


Figure 36 Commercial Natural Gas Baseline with Naturally Occurring Efficiency



Industrial

Figure 37 presents the industrial sector electricity baseline projection. Growth in this sector is projected to be fairly robust. Figure 38 shows a different story for the industrial natural gas baseline projection, which remains essentially flat from 2011 to 2016.

Figure 37 Industrial Electricity Baseline Projection with Naturally Occurring

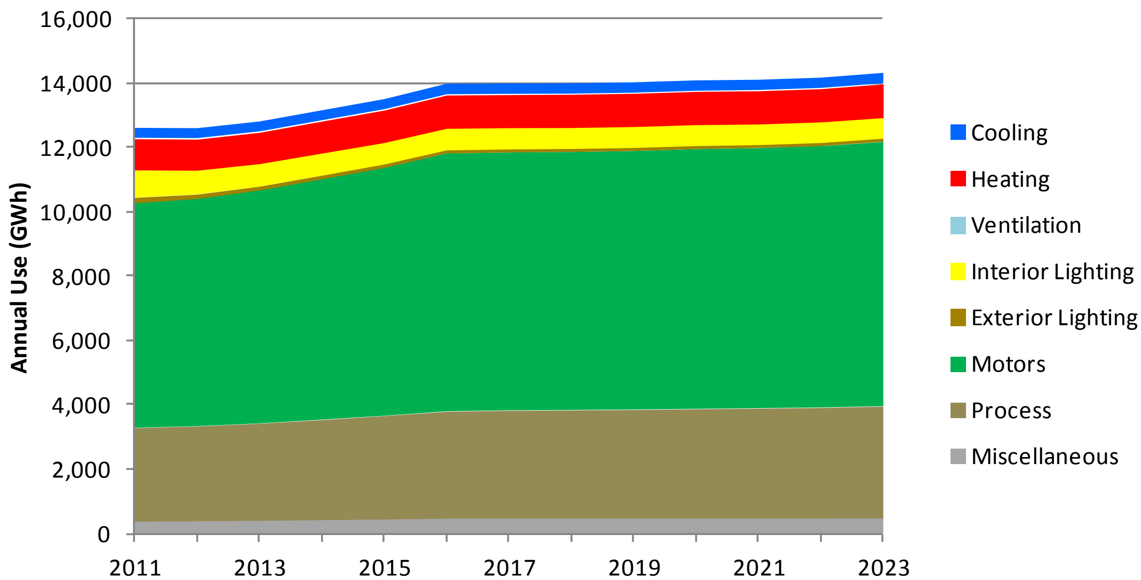
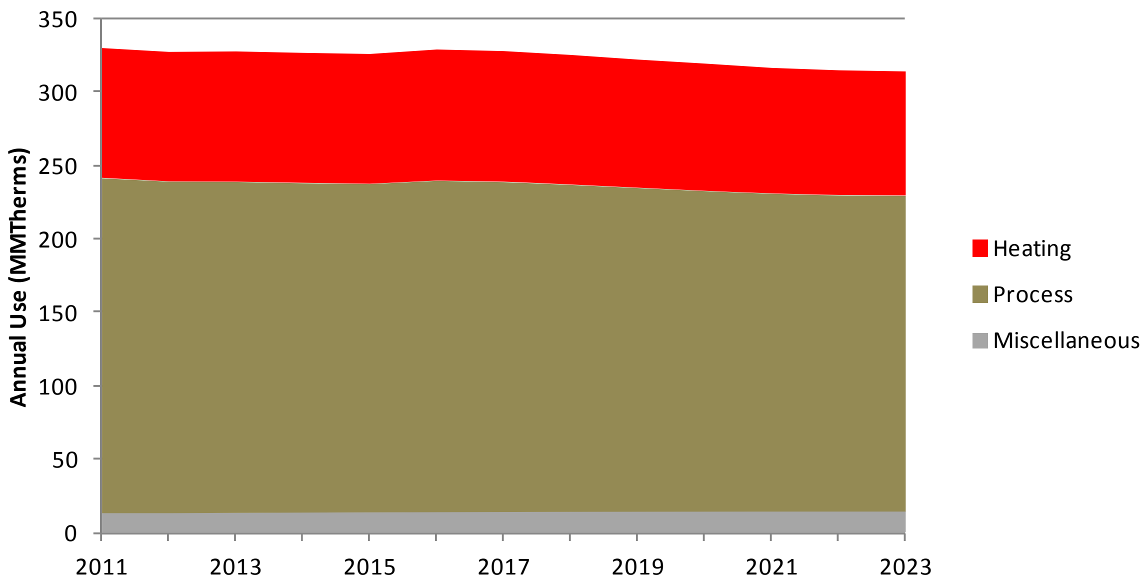


Figure 38 Industrial Natural Gas Baseline with Naturally Occurring Efficiency



Combining the three sectors, overall electricity and natural gas use are projected to be flat over the next program cycle (see Table 5 and Table 6).

Table 5 Electricity Baseline Projection Summary (GWh)

Sector	2011	2014	2015	2016	2023	% Change	Avg. Growth Rate
Residential	11,577	11,188	10,915	10,712	10,104	-7.5%	-1.6%
Commercial	12,414	11,547	11,415	11,332	11,613	-8.7%	-1.8%
Industrial	12,580	13,130	13,480	13,955	14,295	10.9%	2.1%
Total	**36,571**	**35,865**	**35,810**	**35,999**	**36,012**	**-1.6%**	**-0.3%**

Table 6 ***Natural Gas Baseline Projection Summary (million therms)***

Sector	2011	2014	2015	2016	2023	% Change	Average Growth Rate
Residential	569	570	575	572	555	0.7%	0.1%
Commercial	207	205	207	208	212	0.6%	0.1%
Industrial	330	326	326	329	314	-0.3%	-0.1%
Total	**1,105**	**1,102**	**1,109**	**1,109**	**1,081**	**0.4%**	**0.1%**

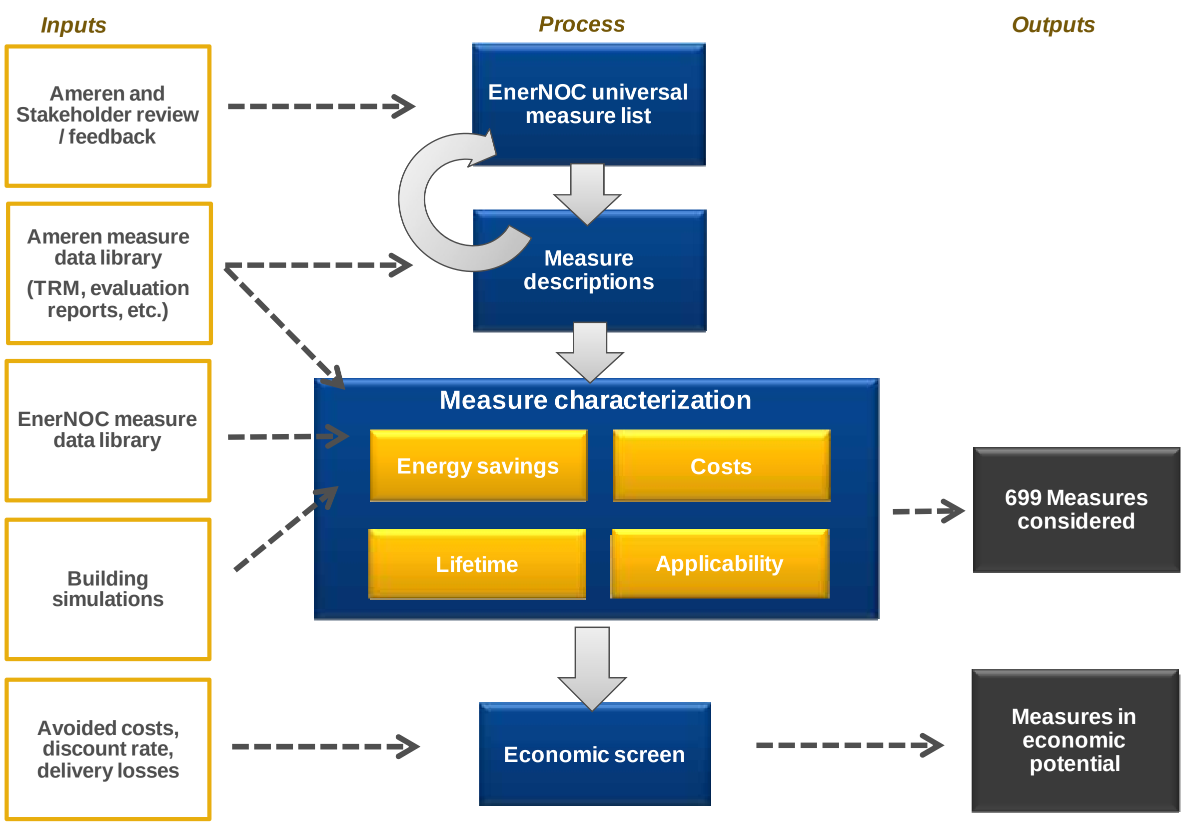
Potential Savings from Energy Efficiency Measures

Once the baseline projections were developed, analysis of energy-efficiency potential proceeded. This activity began with the identification and screening of energy-efficiency measures and continued with estimation of potential as described below.

EE Measure Database

The process for developing and characterizing energy-efficiency measures is depicted in Figure 39. The first step of the energy efficiency measure analysis is to identify the list of all relevant energy efficiency measures that should be considered for the Ameren Illinois potential assessment. The project team assembled this list of measures and it was vetted by stakeholders. Sources for the measure assumptions were primarily drawn from the Illinois TRM. Additional sources included Ameren Illinois past program experience, EnerNOC's building simulation tool (BEST), EnerNOC's measure database (DEEM), California's measure database (DEER), measure workbooks from the Northwest Power and Conservation Council, other secondary sources, and data from EnerNOC's previous studies and program work. Full measure characterization for each sector and segment can be found in Volume 6.

Figure 39 ***EE Measure Development Process***



Measure-Level Energy Efficiency Potential

Electricity efficiency potential is summarized above in Figure 1 and recapped as follows:

- **Realistic Achievable Potential for Electricity.** In 2014, net realistic achievable savings are 483 GWh which is 1.3% of the baseline projection. By 2016, cumulative net realistic achievable savings grow to 1,093 GWh which represents 3.0% of the baseline projection.
- **Maximum Achievable Potential for Electricity**. In 2014, savings for this case are 630 GWh or 1.8% of the baseline and by 2016 cumulative net savings reach 1,432 GWh or 4.0% of the baseline projection.

Natural gas efficiency potential is summarized above in Figure 2. Achievable potential is summarized below.

- **Realistic Achievable Potential for Natural Gas**. In 2014, net realistic achievable savings are 6.1 (million therms) which is 0.5% of the baseline projection. By 2016, cumulative net realistic achievable savings grow to 14.1 (million therms) which represent 1.3% of the baseline.
- **Maximum Achievable Potential for Natural Gas**. In 2014 net savings for this case are 9.0 million therms or 0.8% of the baseline and by 2016 cumulative net savings reach 20.8 (million therms) or 1.9% of the baseline projection.

Below, we present results of the measure-level potential analysis for each sector.

Residential Measure Potential

Electricity potential for the residential sector is shown in Table 7.

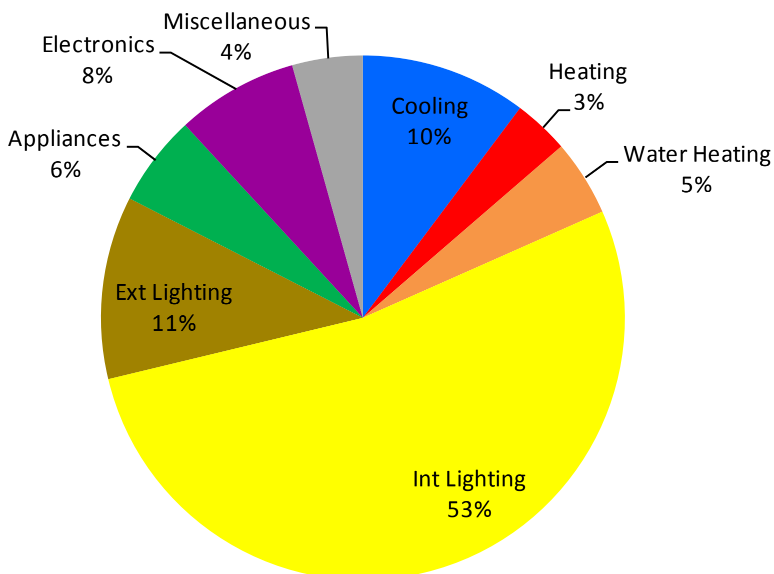
Table 7 Electricity Energy Efficiency Potential for the Residential Sector

	2014	2015	2016
Baseline Projection (GWh)	11,188	10,915	10,712
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	103	233	322
Maximum Achievable Potential	135	296	409
Economic Potential	317	721	996
Technical Potential	520	1,069	1,478
Energy Savings (% of Baseline)			
Realistic Achievable Potential	0.9%	2.1%	3.0%
Maximum Achievable Potential	1.2%	2.7%	3.8%
Economic Potential	2.8%	6.6%	9.3%
Technical Potential	4.7%	9.8%	13.8%

Figure 40 focuses on the net realistic achievable potential in program year 2016. Lighting equipment replacement accounts for the highest portion of the savings in the near term as a result of the efficiency gap between CFL lamps and advanced incandescent lamps, even those that will meet the EISA 2007 standard. Although Ameren Illinois has achieved significant savings in lighting already, there are still significant savings available by encouraging customers to adopt CFL lighting and more efficient specialty bulbs that are not affected by the EISA standard. Electronics, cooling, and appliances also contribute significantly to the savings. Detailed measure information is available in Volume 6, Appendix B. The key measures comprising the potential are listed below:

- Lighting: mostly CFL lamps and specialty bulbs
- Electronics (reduce standby wattage, televisions, set top boxes, PCs)
- Second refrigerator/ freezer removal
- HVAC: Removal of second room AC unit, efficient air conditioners, ducting repair/sealing, insulation, home energy management system and programmable thermostats

Figure 40 Residential Electric Realistic Achievable Potential by End Use in 2016



Natural gas efficiency potential is presented in Table 8 below.

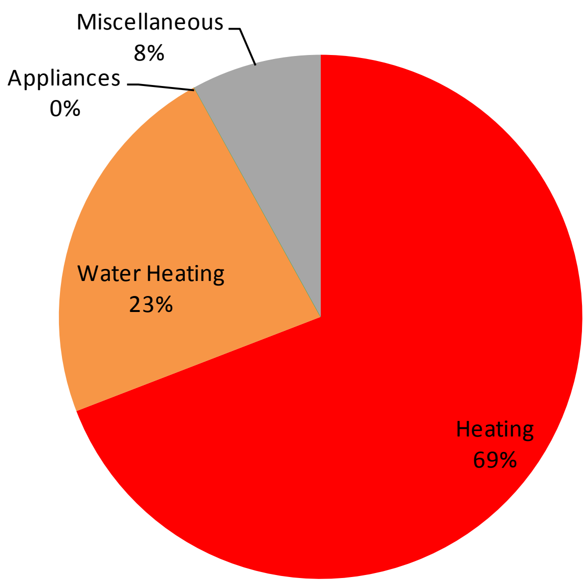
Table 8 Natural Gas Energy Efficiency Potential for the Residential Sector

	2014	2015	2016
Energy Projections (million therms)	570	575	572
Cumulative Net Energy Savings (million therms)			
Realistic Achievable Potential	2.6	4.1	6.3
Maximum Achievable Potential	3.8	6.1	9.2
Economic Potential	8.9	13.9	20.8
Technical Potential	15.1	23.9	34.8
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	0.4%	0.7%	1.1%
Maximum Achievable Potential	0.7%	1.1%	1.6%
Economic Potential	1.6%	2.4%	3.6%
Technical Potential	2.6%	4.2%	6.1%

Figure 41 focuses on the range of net realistic achievable potential in 2016. As expected, space heating and water heating savings are the largest opportunities. The key measures comprising the potential are listed below:

- Efficient furnaces & boilers, boiler hot water reset ,ducting repair/sealing, insulation, home energy management system & programmable thermostats
- Efficient water heaters, low-flow showerheads, faucet aerators, and water heater tank blankets

Figure 41 Residential Natural Gas Realistic Achievable Potential by End Use in 2016



Commercial Potential

Electricity Efficiency Potential. The baseline projection for the commercial sector only grows slightly, which reflects the sluggish near-term economy and forthcoming codes and standards. Nevertheless, the opportunity for energy-efficiency savings is still significant for the commercial sector. Table 9 presents estimates for the four types of potential for the residential sector.

Table 9 Electricity Efficiency Potential for the Commercial Sector

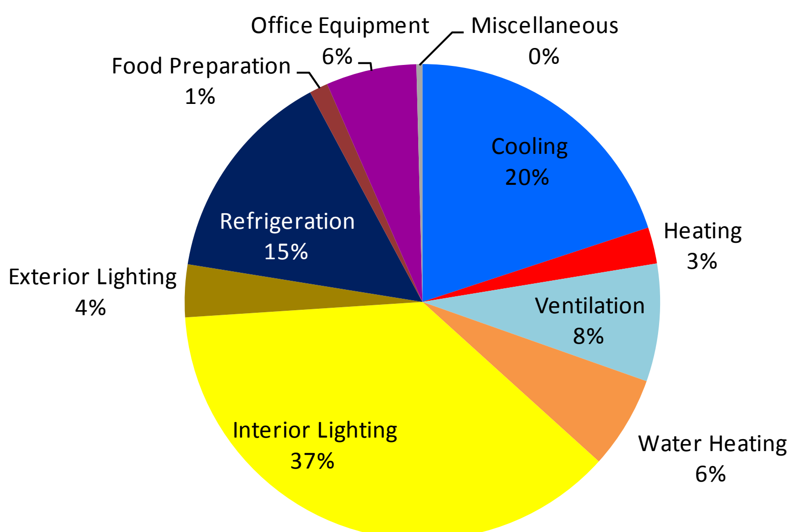
	2014	2015	2016
Baseline Projection (GWh)	11,547	11,415	11,332
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	197	319	434
Maximum Achievable Potential	269	442	604
Economic Potential	440	704	950
Technical Potential	610	915	1,211
Savings (% of Baseline)			
Realistic Achievable Potential	1.7%	2.8%	3.8%
Maximum Achievable Potential	2.3%	3.9%	5.3%
Economic Potential	3.8%	6.2%	8.4%
Technical Potential	5.3%	8.0%	10.7%

Figure 42 focuses on realistic achievable potential savings by end use. Not surprisingly, interior lighting delivers the highest achievable savings throughout the study period. In 2016, exterior lighting is second, and refrigeration is third, followed in descending order by cooling, ventilation, office equipment, and small amounts of the other end uses.

Detailed measure information is available in Volume 6, Appendix C. The key measures comprising the potential are listed below:

- Lighting – CFLs, LED lamps, linear fluorescent, daylighting controls, occupancy sensors, and HID lamps for exterior lighting
- Energy management systems & programmable thermostats
- Ventilation – variable speed control
- Refrigeration – efficient equipment, control systems, and anti-sweat door heater
- Custom measures

Figure 42 Commercial Realistic Achievable Potential Electricity Savings by End Use in 2016



Natural Gas Efficiency Potential. Table 10 presents the net savings associated with each level of potential in the commercial sector.

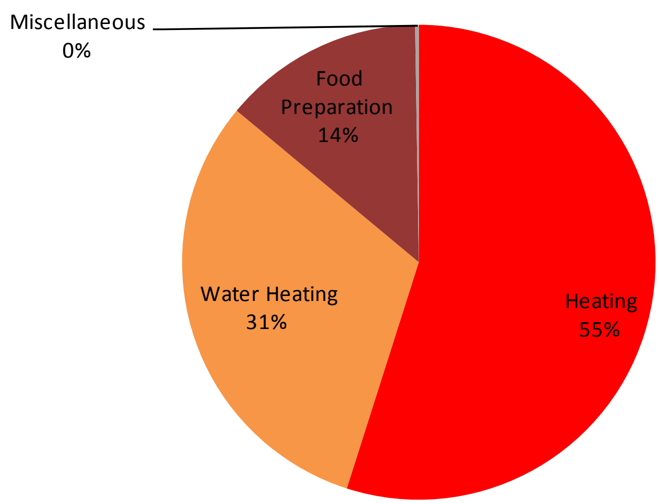
Table 10 Natural Gas Efficiency Potential for the Commercial Sector (million therms)

	2014	2015	2016
Energy Projections (million therms)	205	207	208
Cumulative Net Energy Savings (million therms)			
Realistic Achievable Potential	2.0	3.3	4.8
Maximum Achievable Potential	3.1	5.0	7.4
Economic Potential	5.0	8.1	11.8
Technical Potential	6.5	10.4	15.0
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	1.0%	1.6%	2.3%
Maximum Achievable Potential	1.5%	2.4%	3.6%
Economic Potential	2.5%	3.9%	5.7%
Technical Potential	3.2%	5.0%	7.2%

Figure 43 below shows net realistic achievable potential savings by end use. Water heating provides the largest share of the savings, with heating and food preparation each successively smaller. The key measures comprising the potential are listed below:

- Energy management systems, programmable thermostats, HVAC occupancy sensors
- Efficient boilers, boiler maintenance, steam trap repair and hot water reset
- Efficient water heaters
- Efficient food preparation equipment for the restaurant segment
- Insulation and high efficiency windows

Figure 43 Commercial Natural Gas Realistic Achievable Potential Savings by End Use in 2016



Industrial EE Measure Potential

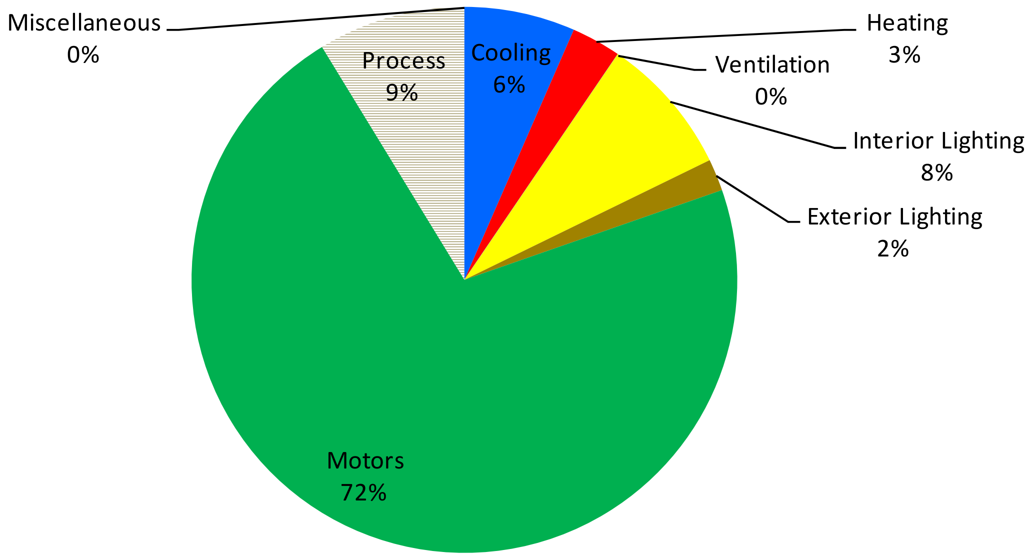
Electricity Efficiency Potential. The industrial sector in Ameren Illinois accounts for about one-third of total energy consumption, but slightly more than one-third of the potential electricity savings. Table 11 presents the net savings for the various types of potential considered in this study.

Table 11 Electric Efficiency Potential for the Industrial Sector

	2014	2015	2016
Energy Projections (GWh)	13,130	13,480	13,955
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	182	251	336
Maximum Achievable Potential	226	312	418
Economic Potential	392	533	705
Technical Potential	453	620	828
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	1.4%	1.9%	2.4%
Maximum Achievable Potential	1.7%	2.3%	3.0%
Economic Potential	3.0%	4.0%	5.0%
Technical Potential	3.5%	4.6%	5.9%

Figure 44 illustrates the cumulative realistic achievable potential savings by electric end use in 2016 for the industrial sector. The largest shares of savings opportunities are in the motors and machine drives. Potential savings for straight equipment change-outs are diminishing due to the National Electrical Manufacturer's Association (NEMA) standards, which now make premium efficiency motors the baseline efficiency level. As a result, there are not substantially more efficient upgrade options to drive incremental efficiency improvements. Many of the savings opportunities in this end use come from controls, timers, and variable speed drives, which improve system efficiencies where motors are utilized. Beyond the replacement of motors, there are significant opportunities for savings in cooling, high-bay lighting, process timers and controls, ventilation, and finally space heating.

Figure 44 Industrial Realistic Achievable Electricity Potential Savings by End Use in 2016



Natural Gas Efficiency Potential. Table 12 presents the net cumulative savings for the various types of potential considered in this study for the industrial sector.

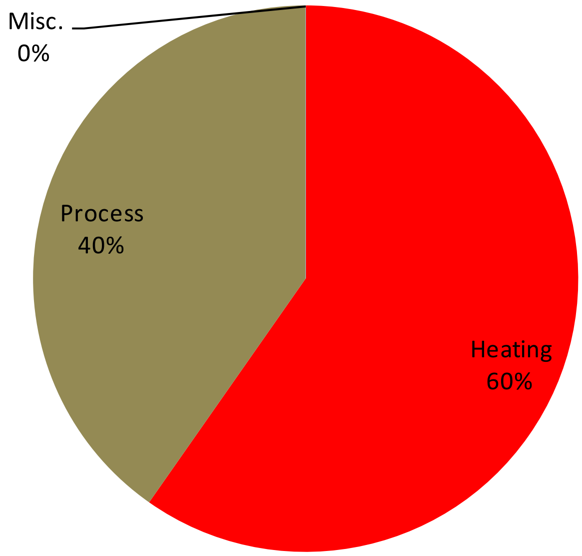
Table 12 Natural Gas Efficiency Potential for the Industrial Sector

	2014	2015	2016
Energy Projections (million therms)	326	326	329
Cumulative Net Energy Savings			
Realistic Achievable Potential	1.5	2.1	3.0
Maximum Achievable Potential	2.0	2.9	4.2
Economic Potential	3.5	4.9	6.9
Technical Potential	7.5	11.0	15.6
Energy Savings as a % of Baseline			
Realistic Achievable Potential	0.5%	0.6%	0.9%
Maximum Achievable Potential	0.6%	0.9%	1.3%
Economic Potential	1.1%	1.5%	2.1%
Technical Potential	2.3%	3.4%	4.7%

Figure 45 illustrates the net realistic achievable potential savings by natural gas end use in 2016 for the industrial sector. Space heating and process heating are the only opportunities to speak of. The key measures comprising the potential are listed below:

- Energy management systems & programmable thermostats
- Efficient boilers & furnaces
- Insulation

Figure 45 Industrial Natural Gas Realistic Achievable Potential Savings by End Use in 2016



Program Analysis

The measure-level estimates shown above for technical, economic, and achievable potential in this report were determined by screening measure for cost-effectiveness at the measure-level. This method does not take into account the program costs of delivering measures to end-use customers. The additional costs associated with the delivery of energy efficiency measures includes: Measure Incentives, Program Administration, Education and Marketing, Implementation, and Evaluation. For budgeting and cost-effectiveness purposes, the major categories are broken down into Incentives and Non-Incentives.

Utility Program Cost Assumptions. Utility program costs were developed for each program-level achievable potential scenario, with estimates of incentives and non-incentives required to achieve the related savings levels. The cost estimates were based on past program costs for Ameren Illinois, evaluations of past programs, and industry best practices.

Table 13 presents the program spending levels for each program-level achievable scenario. Also presented are Ameren Illinois' first year costs per energy saved for each scenario by fuel type. Key cost assumptions include:

- Incentives required to achieve savings ranged from 53-75% of measure incremental cost
- Non-Incentive costs required to achieve savings ranged from 23-37% of measure incremental cost
- First year electricity cost per kWh saved ranged from $0.25-0.40 per first year kWh saved
- First year natural gas cost per therm saved ranged from $3.16-4.63 per first year therm saved

Table 13 Cost Assumptions for Program Achievable Potential Scenarios

	Average Costs as Percent of Measure Cost		Average Utility cost per First-Year Unit of Energy Saved	
Achievable Scenario	**Incentive**	**Non-Incentive**	**Electricity ($/kWh)**	**Natural Gas ($/therm)**
Program Low	52%	23%	$0.25	$3.16
Program High	75%	37%	$0.40	$4.63

Costs to Achieve Program Potential. The costs associated with achieving energy efficiency potential are broken down into Incentive and Non-Incentive (Administration, Marketing, Delivery, and Evaluation) costs. The costs to achieve the electric and natural gas program-level potential are detailed in Table 14 and Table 15.

Table 14 Cost to Achieve Electric Program-Level Achievable Potential Scenarios

	2014	2015	2016
Incentive Costs			
Program Low	$59,572,278	$59,037,129	$64,800,584
Program High	$118,720,702	$117,397,971	$127,993,118
Non-Incentive Costs			
Program Low	$26,536,190	$26,077,992	$27,915,274
Program High	$58,991,921	$57,906,786	$61,777,189
Total Utility Costs			
Program Low	**$86,108,468**	**$85,115,121**	**$92,715,858**
Program High	**$177,712,622**	**$175,304,757**	**$189,770,307**

Table 15 Cost to Achieve Natural Gas Program-Level Achievable Potential Scenarios

	2014	2015	2016
Incentive Costs			
Program Low	$9,510,317	$9,576,566	$10,093,826
Program High	$19,740,073	$19,907,091	$21,227,937
Non-Incentive Costs			
Program Low	$3,771,990	$3,797,531	$3,930,407
Program High	$9,203,424	$9,274,397	$9,654,207
Total Utility Costs			
Program Low	**$13,282,307**	**$13,374,097**	**$14,024,233**
Program High	**$28,943,497**	**$29,181,488**	**$30,882,143**

About EnerNOC

EnerNOC's Utility Solutions Consulting team is part of EnerNOC's Utility Solutions, which provides a comprehensive suite of demand-side management (DSM) services to utilities and grid operators worldwide. Hundreds of utilities have leveraged our technology, our people, and our proven processes to make their energy efficiency (EE) and demand response (DR) initiatives a success. Utilities trust EnerNOC to work with them at every stage of the DSM program lifecycle – assessing market potential, designing effective programs, implementing those programs, and measuring program results.

EnerNOC's Utility Solutions deliver value to our utility clients through two separate practice areas – Implementation and Consulting.

- Our Implementation team leverages EnerNOC's deep "behind-the-meter expertise" and world-class technology platform to help utilities create and manage DR and EE programs that deliver reliable and cost-effective energy savings. We focus exclusively on the commercial and industrial (C&I) customer segments, with a track record of successful partnerships that spans more than a decade. Through a focus on high quality, measurable savings, EnerNOC has successfully delivered hundreds of thousands of MWh of energy efficiency for our utility clients, and we have thousands of MW of demand response capacity under management.
- The Consulting team provides expertise and analysis to support a broad range of utility DSM activities, including: potential assessments; end-use forecasts; integrated resource planning; EE, DR, and smart grid pilot and program design and administration; load research; technology assessments and demonstrations; evaluation, measurement and verification; and regulatory support.

The team has decades of combined experience in the utility DSM industry. The staff is comprised of professional electrical, mechanical, chemical, civil, industrial, and environmental engineers as well as economists, business planners, project managers, market researchers, load research professionals, and statisticians. Utilities view EnerNOC's experts as trusted advisors, and we work together collaboratively to make any DSM initiative a success.

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road, Suite 450
Walnut Creek, CA 94596

P: 925.482.2000
F: 925.284.3147

Ameren Illinois Energy Efficiency Market Potential Assessment

Report Number 1404

Volume 2: Market Research

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road
Suite 450
Walnut Creek, CA 94596
925.482.2000
www.enernoc.com

Prepared for:
Ameren Illinois

June 10, 2013

This report was prepared by

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Blvd., Suite 450
Walnut Creek, CA 94596

I. Rohmund, Project Director
B. Kester, Project Manager

Subcontractor
YouGov|Definitive Insights
Washington University in St. Louis

In cooperation with
Applied Energy Group

CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Background

Ameren Illinois contracted with EnerNOC to conduct an electricity and natural gas Energy Efficiency (EE) Market Potential study covering the period of performance from June 1, 2014 through May 31, 2017 to aid the development of a three-year plan for programs implemented by Ameren Illinois in Cycle 3. In addition, the analysis also included the period of performance from June 1, 2017 through May 31, 2024 to aid in benchmarking and other tasks related to future analyses. This study identifies the potential to achieve the kWh and therm annual load reduction targets within the rated caps identified in Sections 8-103 and 8-104 of the Illinois Public Utilities Act. In addition, the electric component of the study identifies the potential to achieve additional kWh savings per Section 5/16-111.5Bnew of the Act absent rate cap limitations. This comprehensive study includes primary market research, a full demand side management (DSM) potential analysis for electricity and natural gas, energy efficiency program design, supply curve development, and analysis of wasted energy.

EnerNOC teamed with YouGov|Definitive Insights and Washington University in St. Louis to perform saturation surveys and program-interest research with Ameren Illinois customers. The EnerNOC team worked in collaboration with Applied Energy Group who, under separate contract with Ameren Illinois, performed the program analysis. This report represents the combined effort of these four organizations. This volume focuses on the results of the primary market research conducted with YouGov|Definitive Insights.

Objectives

Ameren Illinois is investigating the market potential for a wide variety of Demand Side Management (DSM) options by completing a comprehensive DSM Study which consists of three primary components: **market research**, a full **DSM potential analysis,** and **quantification of wasted energy due to customer behavior**. The market research component has collected electricity and natural gas end-use data, end-use saturation data, customer demographics and psychographic information that will provide insight on how Ameren Illinois customers make decisions related to electric and natural gas usage and energy efficiency investment decisions. This report describes the outcomes of that market research effort.

Broad questions embedded in this phase of this research that will help Ameren Illinois better understand energy-efficiency potential include:

- How likely are customers to participate in various electric- or natural gas-related energy efficiency programs Ameren Illinois is considering offering?
- Which of these energy efficiency measures offer the highest likely participation rates?
- How does likelihood to participate differ by payback period for customers?
- What overall demographic/firmographic and psychographic characteristics correspond to a higher likelihood to participate in energy efficiency programs?
- What segments can be derived within each sector, and how do these segments differ in terms of their impact on the likelihood to participate, as well as on customer demographic/firmographic and psychographic characteristics?
- Which of these segments represent the best opportunities for Ameren Illinois to focus their marketing on?
- What messaging strategies would likely be useful to help foster participation among these high opportunity segments?

Report Organization

This report is presented in 6 volumes as outlined below. This document is **Volume 2: Market Research Report**.

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Energy Efficiency Potential Analysis
- Volume 4, Program Analysis
- Volume 5, Supply Curves
- Volume 6, EE Potential Analysis Appendices

RESIDENTIAL METHODOLOGY

This section covers sample design, questionnaire development and data analysis for the residential sector.

Sample Design

Ameren Illinois provided the EnerNOC team with billing data for all residential and business customers. This customer data included a variety of information for each customer, including name, address, annual kWh usage, annual therm usage, division, account number, etc. The EnerNOC team created a sample design with 48 separate sample cells – against which survey responses were targeted and monitored, and which took into account gas usage, electric usage and region / climate zone – which was implemented separately and independently for each of the two surveys (the Program Interest survey and the Saturation survey).

The EnerNOC team generated a total of approximately 42,000 randomly selected households distributed across six separate and independent sample tranches (three per survey). In total, postcard invitations were mailed to the households included in sample tranches one and two for the Program Interest survey and tranches one and two for the Saturation survey (with approximately 13,000 postcards mailed for each of the two surveys). Postcards invited respondents to go online and complete the survey. Customers were offered a $10 check for completing the survey. Although the team prepared for three tranches, the sample targets were hit with tranche 2 respondents.

In order to qualify to complete the survey, respondents had to meet the following criteria:

- Must have primary or shared responsibility for making energy-related decisions
- Must be at least 18 years old
- Must not work for a gas or electric utility company and must not have a household member that works for a gas or electric utility company
- Must be billed for electricity or natural gas directly by Ameren Illinois

A total of 749 Ameren Illinois Residential customers completed the Program Interest survey, while 726 completed the Saturation survey.

- Approximately 88% of those who attempted to complete the survey qualified based on applying the criteria above.
- The overall net response rate was approximately 8%
- Approximately 14% of those who started the surveys abandoned them before completing the survey.
- Average online survey length was about 25-30 minutes depending on the survey

Questionnaires

The **Program Interest** questionnaire was designed to cover multiple content areas, including:

1. Screening questions
2. Description of major end uses in the household
3. Attitudes toward Ameren Illinois
4. Attitudes toward using energy
5. Energy efficiency measures implemented to-date (with a focus on lighting)
6. Attitudes toward appliance purchasing
7. Interest in potential EE programs that could be offered by Ameren Illinois
8. Attitudes toward shopping
9. Demographics

The **Saturation** questionnaire was designed to cover multiple content areas, including:

1. Screening questions
2. Description of household structure (including windows)
3. Description of heating and cooling equipment
4. Description of lighting (bulbs and fixtures / interior and exterior)
5. Description of major appliances
6. Description of energy related actions
7. Awareness of EE-related energy programs
8. Demographics

Data Analysis

Estimating Take Rates

Market researchers have long recognized that customers tend to over-estimate their likelihood to participate in new programs and services within the context of a market research study:

- This means that it has been long recognized that some customers who say that they would be "certain" to participate in a given program in a survey would, in reality, not participate
- This is often referred to as the "say-do" problem; the problem that survey respondents are typically more likely to say they would do something than actually end up doing it
- The analytic challenge, as a result, is to appropriately adjust stated likelihood-to-participate ratings into more realistic estimates of likely customer response
- Different options are available for making these adjustments, and the best option depends in part on the nature of the product, service, or program being evaluated. For example, reactions to socially desirable (including "green") options need to be adjusted down more aggressively, while those for certain new technologies need to be adjusted less.
- The method used by the YGDI / EnerNOC team is based on proprietary research conducted by YGDI during 2010. This research captured stated likelihood to adopt / purchase a variety of new products / services, at one point in time, and then tracked actual product / service adoption /

purchase over 6 -12 months. As we expected, people were less likely to actually purchase products / services than they estimated they would at an earlier point in time1.

- The primary adjustment factors that were observed in that research were used here to translate “stated intent” to realistic estimates of likely behavior, and they are outlined in the table below. The adjustment factors depend on how the respondent answered each of the “likelihood to acquire” questions, AND on their level of information about, and familiarity with, EE issues
- Note that these primary adjustment factors are intended to apply to relatively infrequent purchases (no more often than once a year or so). For more regular purchases – those that occur several times a year – YGDI uses a somewhat different formula, and information about this “regular purchase adjustment” is provided later in this section.
- Essentially, the primary adjustment for irregular purchases says that among those respondents who rate a given program as a “10” (“extremely likely to participate”) AND if who are rated as “high” on EE information / familiarity, then realistically, about 41% of those people will ultimately sign up for the program. At the other end of the scale, it says that among the respondents who rate their likelihood to participate as a “1” on the scale (“extremely unlikely to participate”), only 5% of those households will ultimately sign up for the program. For purposes of this analysis, the team assumed that Ameren Illinois could potentially achieve “high” information levels for all customers, and so used those adjustment rates for all respondents.

Table 2-1 Translating Stated Intent into Take Rates for Irregular Purchases

Scale Rating	Adjustment Value for Those High on Information
1	5%
2	5%
3	6%
4	6%
5	18%
6	20%
7	31%
8	38%
9	44%
10	56%

As noted above, YGDI uses a different adjustment for products that are purchased more frequently, since customers are more familiar with their “choice set” and have typical purchases that they tend to make in a given category. Lighting is the only measure tested in this survey which falls into this “regular purchase” category, and the adjustment values outlined below were used for this option and applied them the same way that was outlined above. Note that Information level (familiarity with the category) is not used as a differentiator in adjustments for this category since – by definition – all “buyers” are more familiar with regular purchases.

[1] The research tested the purchase of a wide array of products, equipment, or services ranging from relatively expensive ($2,500+) to relatively less expensive products and services. Note that these were a wide range of products services and did not focus on testing energy efficiency products.

Table 2-2 Translating Stated Intent into Take Rates for REGULAR Purchases

Scale Rating	Adjustment Value for Regular Purchases
1	3%
2	3%
3	3%
4	8%
5	15%
6	22%
7	35%
8	40%
9	44%
10	62%

Testing Programs at Different Payback Levels

In order to provide insight about the impact that varying payback periods might have on customer response to the programs tested, the survey explored response to each program for which payback period was relevant, at 1, 3, and 5 year payback levels. The survey used a method developed by an economist by the name of von Westendorp to capture this information; this technique begins by asking respondents to assess their likelihood to adopt a program at a 3 year payback, and then (a) if they respond positively to this option, asks them to respond to a 5 year payback, or (b) if they respond negatively to this option, asks them to respond to a 1 year payback period. In order to deal with issues of survey length, the tested program measures were sorted into different categories that were similar in terms of scale of investment and type of measure. The full 1, 3, and 5 year payback assessment were then conducted for a single program within each category. The remaining programs within each category were evaluated at the 3 year payback level only. Regression analysis was then used to develop the 1 and 5 year payback values for each measure, using the slopes observed for the example program in each category.

Weighting

In order to better mirror the residential market in Ameren Illinois's service territory, data were weighted on the basis of the 48 sample cells, in order to ensure that the weighted sample mapped back to the underlying population on electric usage, gas usage, and region / zone.

Psychographic Segmentation Analysis

One of the goals of the analysis was to explore whether or not there were psychographic customer segments that could be helpful in providing an understanding of why customers responded as they did to the programs tested, and to support initial thinking about how to prioritize marketing efforts and marketing communications. Several steps were involved in developing this psychographic segmentation:

First, the team analyzed the groups of items that were included in the questionnaire which were designed to generate psychographic insights (these included Q1-5 (questions addressing opinions toward Ameren Illinois), Q6 (questions exploring how customers think about using energy in their home), Q22-Q24 (questions about appliance purchasing attitudes), and Q41 (questions about how people shop for appliances)).

Second, the team conducted analyses that were intended to identify groups of items that respondents tended to evaluate similarly. This process is called “factor analysis,” and refers to the process of finding and interpreting these groups of items that people think of as similar. The results of the factor analyses conducted in this work are described in Chapter 3, section 2: Understanding Customer Perspectives on Energy Issues in which we outline the six separate attitude bundles that appeared to best describe the way that residential customers think about energy issues.

Third, the team considered all of the attitudinal factors that were identified in step two, along with a variety of other variables to find the ones that generated the most useful segmentation model. This was partly a trial and error process, but ultimately, the variables selected to be included in the segmentation model included:

- Overall satisfaction with Ameren Illinois (Q3)
- Overall importance rating given to the question of how important they believe it is for Ameren Illinois to actively encourage its customers to participate in energy saving, and cost saving programs (Q4-1)
- Agreement / disagreement with the item “You are very concerned about the environmental effect of electric power plants” (Q6-5)
- Agreement / disagreement with the item “Conserving energy at your home will make no difference to the quality of the environment overall” (Q6-6)
- Agreement / disagreement with the item “You would do more to make your home more energy efficient, but you don’t know where to start” (Q6-7)
- Agreement / disagreement with the item “It’s worth spending more money to get the highest quality product available” (Q24-6)
- A calculated variable that was called “EE Informed Level” and was based on indicators of experience with / awareness of EE end use options to-date, and awareness and use of existing Ameren EE programs
- A calculated variable that was called “Likely Taker Level” and was based on a count of the frequency that a given respondent rated themselves as “8” or higher on the “1” to “10” likelihood to participate scale for each of the 25 EE programs tested

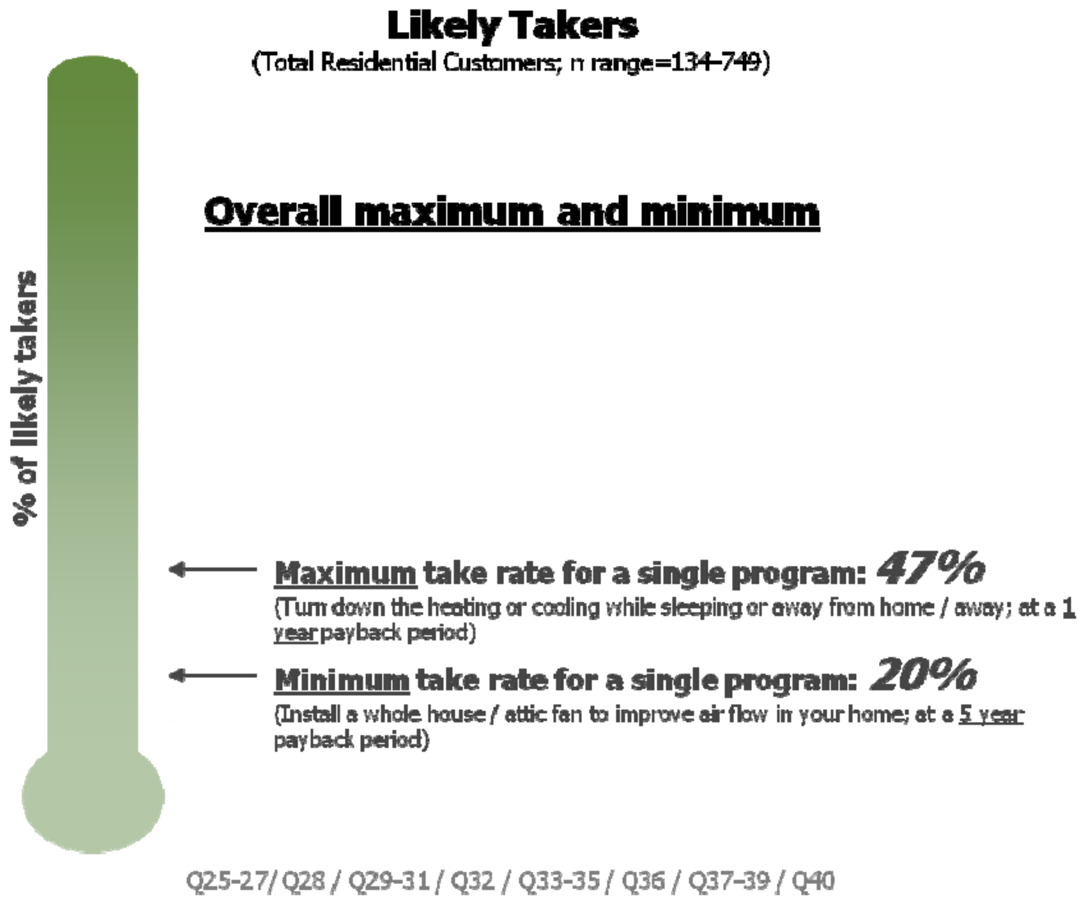
Once these inputs were identified, the team tested a wide variety of segmentation solutions, ultimately selecting a solution that optimized relative segment size, absolute segment sample size, and overall meaningfulness of segment profiles. The solution selected as most appropriate was a solution containing 6 segments with different response patterns to the final set of selected segmentation inputs.

RESIDENTIAL PROGRAM INTEREST SURVEY RESULTS

Note that the "take rates" that are reported in this chapter have been adjusted using the say / do adjustment model referenced in Chapter 2. As such, they represent the team's best estimate of the most likely proportion of customers who would actively sign up for each program, given that they were eligible to do so, and were fully aware of the program and its potential benefits for them.

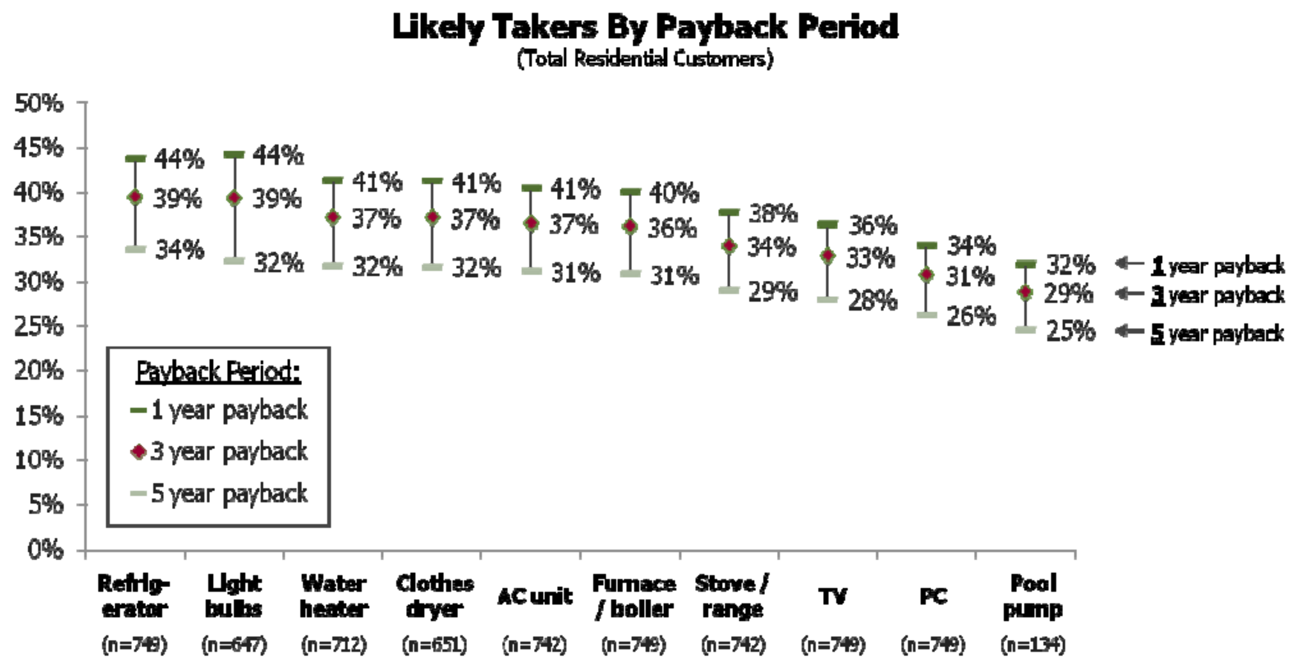
The range of take rates across the full range of programs / measures tested spans from a low of around one-fifth of all eligible customers to a high of just under one-half of all eligible customers (Figure 3-1).

Figure 3-1 Maximum and Minimum Take Rates for Residential Customers



The first full category of EE measures that were explored considered the idea of purchasing higher than standard efficiency appliances within the context of a normal replacement cycle. As shown in Figure 3-2, within the ten appliances or end uses considered, refrigerators and light bulbs were the technologies that residential customers are estimated to be the most likely to upgrade to an EE option at each payback period level (for light bulbs, this is largely due to the use of the "regular purchase" adjustment for this product category). Across the other technologies, the take rates don't differ greatly (ranging from a high of 41% to a low of 32% at a one year payback level). As expected, take rates are higher for lower payback periods.

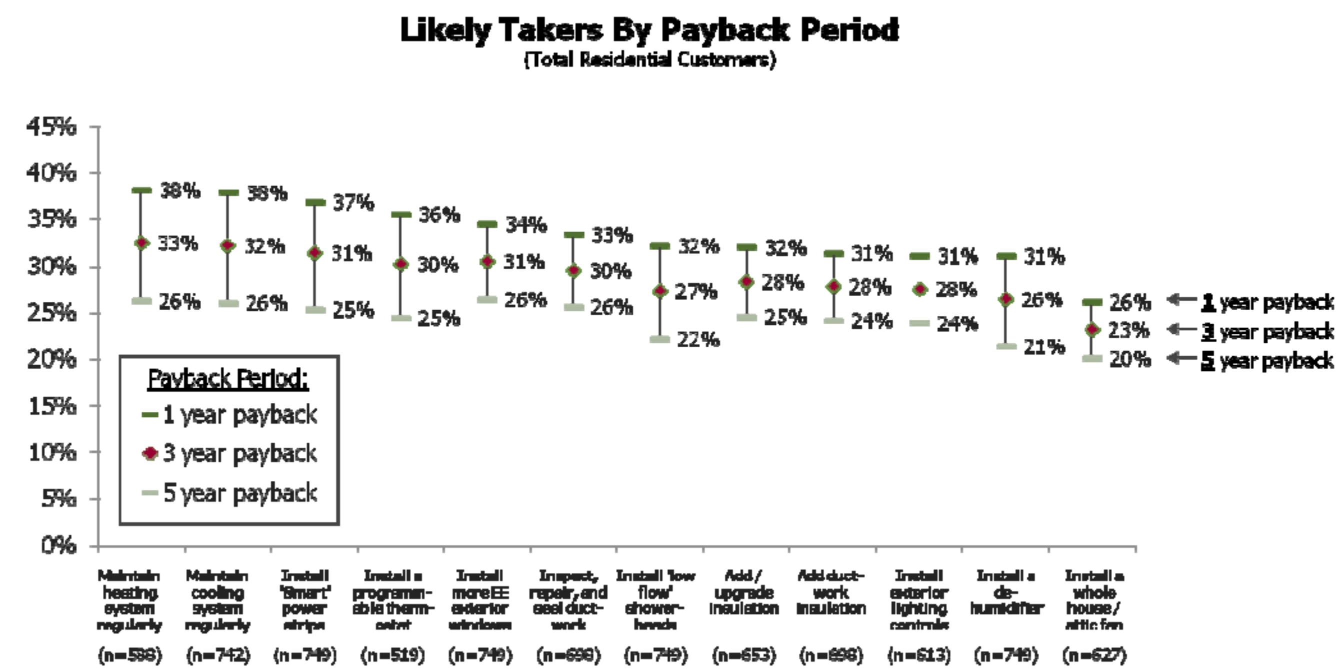
Figure 3-2 Measures for Purchasing / Installing Energy Efficient Equipment*



Q25-27/Q28/Q33/-35/Q37-39
*Note: Assumes a normal replacement cycle

Among a dozen options having to do with housing envelope upgrades, or improved maintenance, Figure 3-3 shows that residential customers indicate a slightly higher likelihood to maintain heating or cooling systems. Once again, the take rates only differ somewhat across these options (going from a high of 38% for regularly maintaining the home's heating system at a one year payback to a low of 26% at the same payback level for installing a whole house fan).

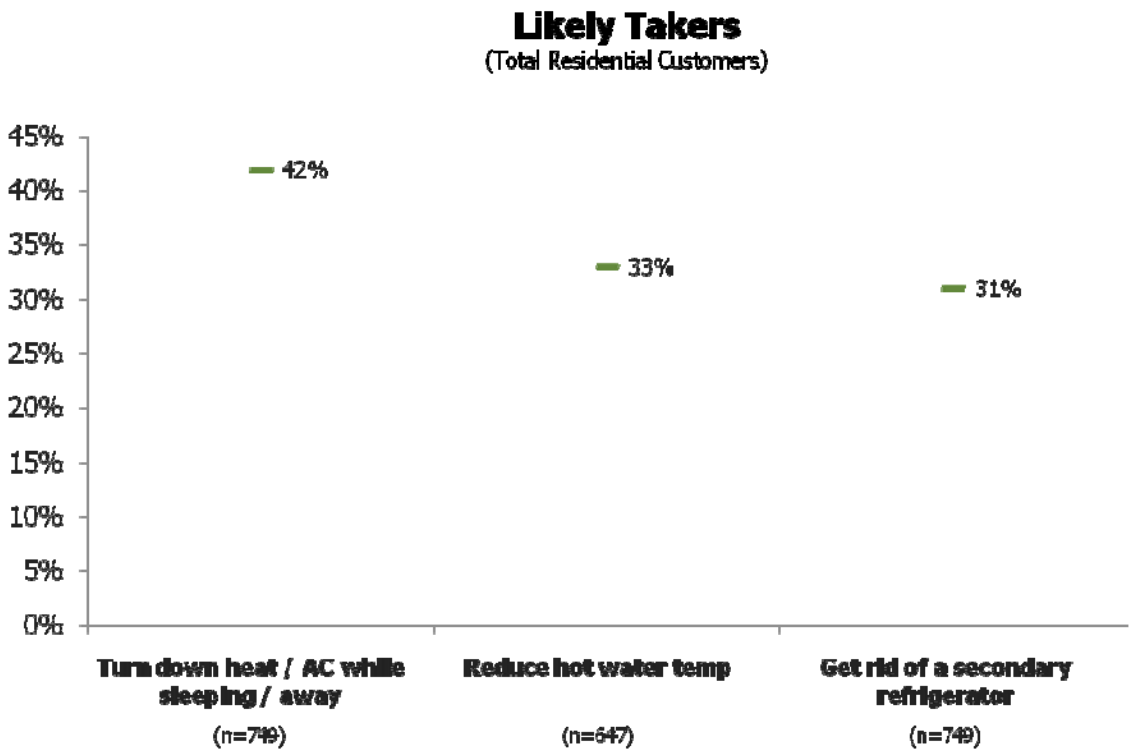
Figure 3-3 Measures for Improving Energy Efficiency of Existing Systems



Q25-27/Q28/Q33/-35/Q37-39

The last group of measures tested includes more traditional energy conservation measures that do not require any up-front investment on the part of the customer. As such, these measures are not associated with different payback periods (Figure 3-4).

Figure 3-4 Measures Not Requiring an Investment by the Customer (and not involving a payback period)



Q40

Considering all of the measures tested, as shown in Table 3-1the group of measures with the highest adoption rates is comprised almost entirely of measures associated with purchasing or installing energy efficient equipment". It is interesting to note that, because they are based on a normal replacement cycle, the measures in the "Purchasing / Installing Energy Efficient Equipment" group are among those that take the least amount of additional effort to implement, especially in comparison to the measures with the lowest take rates.

Table 3-1 Opportunities for Measures, High to Low

Measures: Highest Opportunity	Likely Takers @ 3yr Payback (or payback irrelevant for *No Upfront Investment Measures)* (n range=134-749)	Measures for:
Turn down the heating or cooling while sleeping/away from home[2]	42%	No Upfront Investment
Purchase an EE refrigerator[3]	39%	Purchasing / Installing EE Equipment
Purchase EE light bulbs[2]	39%	Purchasing / Installing EE Equipment
Purchase an EE water heater[2]	37%	Purchasing / Installing EE Equipment
Purchase an EE clothes dryer[2]	37%	Purchasing / Installing EE Equipment
Purchase an EE air conditioner[2]	37%	Purchasing / Installing EE Equipment
Purchase an EE furnace / boiler[2]	36%	Purchasing / Installing EE Equipment
Measures: Middle Opportunity	**Likely Takers @ 3yr Payback (n range=134-749)**	**Measures for:**
Purchase an EE stovetop or range[2]	34%	Purchasing / Installing EE Equipment
Purchase an EE color TV[2]	33%	Purchasing / Installing EE Equipment
Reduce water heater temperature[1]	33%	No Upfront Investment
Maintain heating system regularly	33%	Improving EE of Existing Systems
Maintain cooling system regularly	32%	Improving EE of Existing Systems
Install more EE exterior windows	31%	Improving EE of Existing Systems
Install 'Smart' power strips	31%	Purchasing / Installing EE Equipment
Get rid of a secondary refrigerator[1]	31%	No Upfront Investment
Purchase an EE personal computer[2]	31%	Purchasing / Installing EE Equipment
Inspect / repair HVAC ductwork	30%	Improving EE of Existing Systems
Install a programmable thermostat	30%	Improving EE of Existing Systems
Measures: Lowest Opportunity	**Likely Takers @ 3yr Payback (n range=134-749)**	**Measures for:**
Swimming pool pump	29%	Improving EE of Existing Systems
Add / upgrade home insulation	28%	Improving EE of Existing Systems
Add HVAC ductwork insulation	28%	Improving EE of Existing Systems
Install exterior lighting controls	28%	Improving EE of Existing Systems
Install 'low flow' showerheads	27%	Improving EE of Existing Systems
Install a dehumidifier	26%	Improving EE of Existing Systems
Install a whole house / attic fan	23%	Improving EE of Existing Systems

Some subtle differences exist in the mean take rates among various demographic groups (Figure 3-5). Groups exhibiting the higher opportunity than their counterparts include:

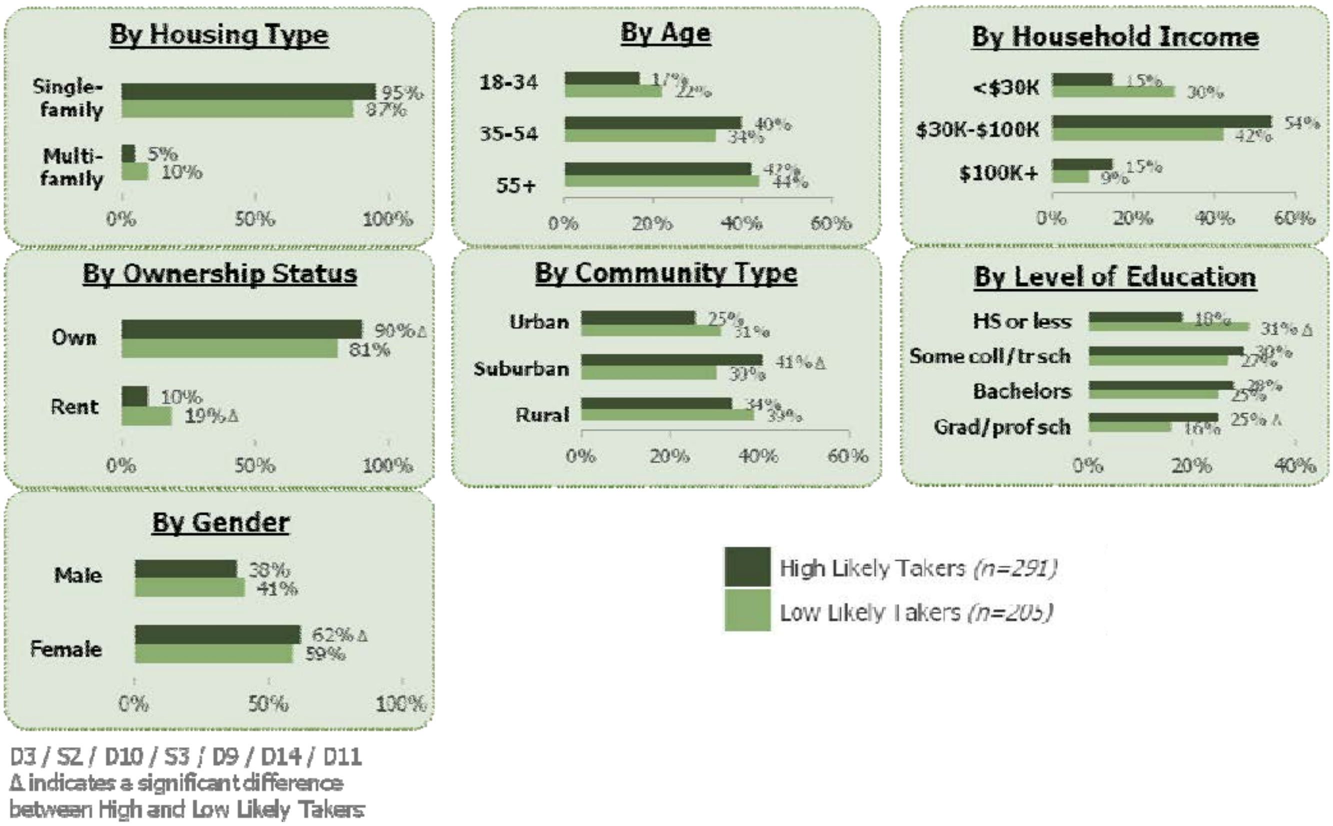
- Individuals who own their own home

---

[2] No Payback period associated with measure
[3] Assumes a normal replacement cycle

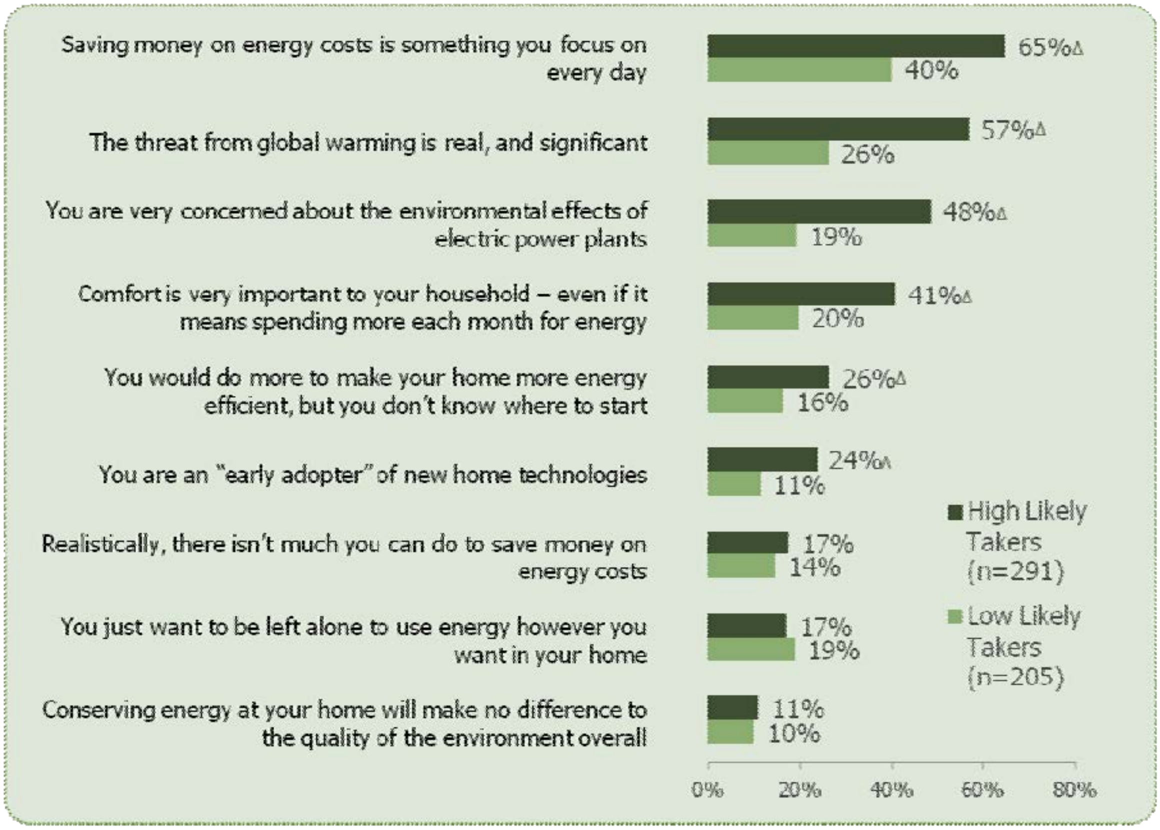
- Individuals living in suburban areas
- Households with greater than $30,000 in annual income
- Individuals having achieved some college/trade school or graduate/professional school
- Females

Figure 3-5 Likely Takers by Demographic Differences



More striking differences in the mean take rate, however, relate to attitudinal differences as shown in Figure 3-6. Unsurprisingly, customers who have highly “green” and/or highly cost-savings-focused attitudes consistently show much higher likelihoods to adopt energy efficiency measures.

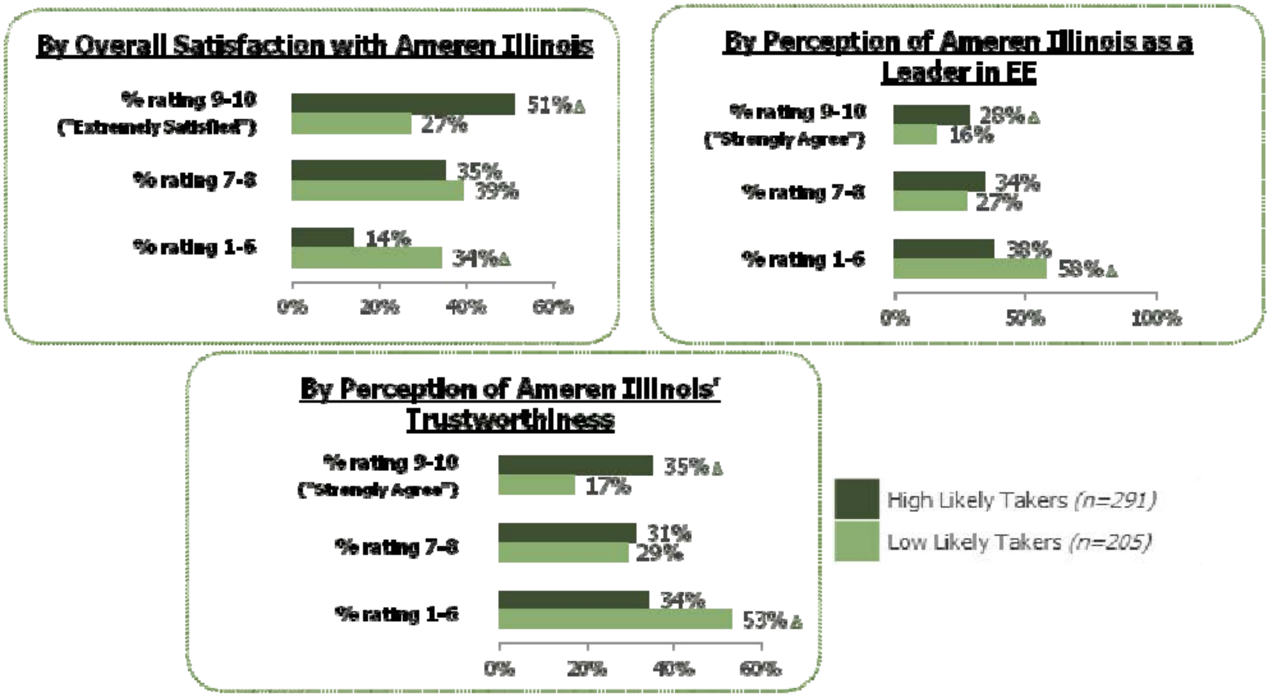
Figure 3-6 Likely Takers by General Attitudinal Differences (% Top Box, 8-10)



Q6
Δ indicates a significant difference between High and Low Likely Takers

Another key factor in likelihood to adopt energy efficiency measures appears to be the degree to which customers have favorable opinions of Ameren Illinois (Figure 3-7). Customers who have more favorable opinions about Ameren Illinois (are extremely satisfied with Ameren Illinois, perceive Ameren Illinois as a leader in energy efficiency, strongly agree that Ameren Illinois is extremely trustworthy) consistently show much higher likelihoods to adopt energy efficiency measures.

Figure 3-7 Likely Takers by Attitudinal Differences about Ameren Illinois



Q3, Q2_1, Q2_2
Δ indicates a significant difference between High and Low Likely Takers

Summary: Overall Response to EE Programs by Ameren Illinois Customers

As the preceding pages have suggested, it appears that psychographic factors (attitudes) have a larger impact on customer response to tested EE programs than do demographic differences. This means that how customers think about Ameren Illinois is likely to be much more important in predicting how they will respond to new EE programs offered by the company, than will differences in how they are situated (where they live or how large is their income).

This is important for two reasons:

- It may explain why the overall take rates for Ameren Illinois's programs are lower than they are for those observed at many other US utilities.
- It is even more important to understand the impact of customer attitudes by understanding psychographic segments.
    - These segments may identify the confluence of attitudes and concerns that map to differences in overall reaction to potential Ameren Illinois EE programs.
    - In fact, the segmentation analysis reported in the following section focuses on just these issues, focusing in particular, on the role of customer attitudes and perceptions in contributing to likely response to EE programs.

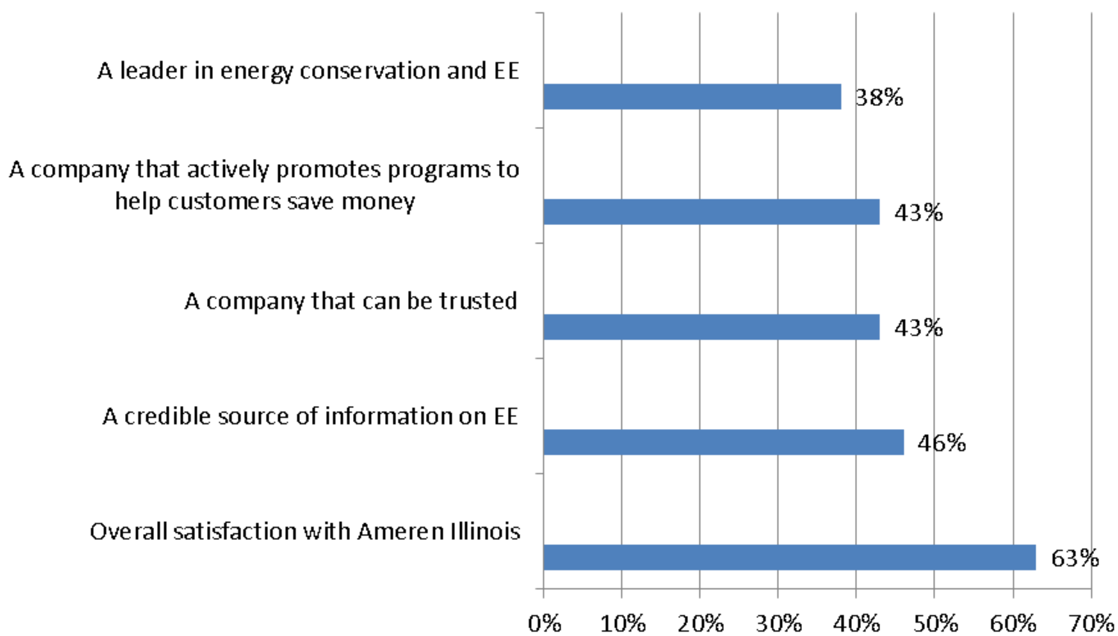
UNDERSTANDING RESIDENTIAL CUSTOMER PERSPECTIVES ON ENERGY ISSUES

Understanding Overall Customer Opinions of Ameren Illinois

In order to understand what lies beneath customer reaction to new EE options that might be offered by Ameren Illinois, it is worth exploring overall customer perspectives, both toward the company, and toward energy issues as a whole.

We begin this section by exploring overall customer perspectives toward Ameren Illinois and these findings are reported in Figure 4-1 below. In terms of their overall opinion toward the company, nearly two-thirds (63%)[4] give the company a top-three box rating (8-10 on a 10-point scale) on overall satisfaction. On the more specific attributes relating to the company's activity and credibility in promoting, and providing information about energy efficiency, fewer people (and less than half) give the company top three box ratings.

Figure 4-1 Overall Ratings of Ameren Illinois (ratings of 8-10 on 10 pt. scale)

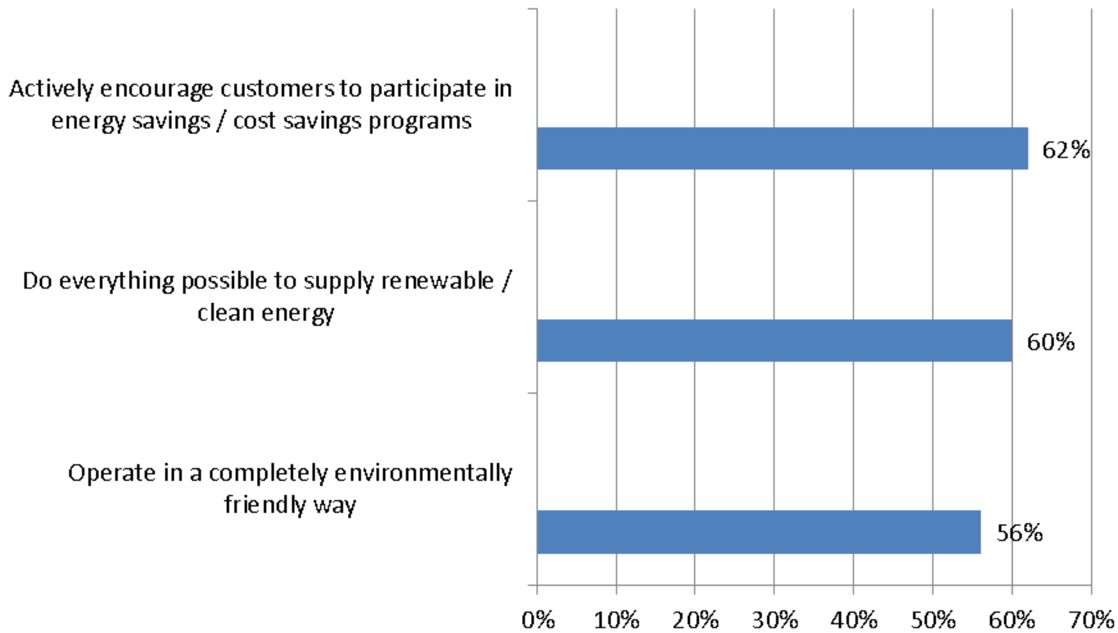


Turning to the question of whether or not Ameren Illinois **should** promote energy efficiency, and/or, greener energy options, the results suggest that a majority of customers do support this activity (Figure 4-2). A total of 60% or more believe the company should "actively encourage" customers to participate in energy / cost savings programs, while just slightly fewer (56%) say the company should operate in a "completely environmentally friendly way."

---

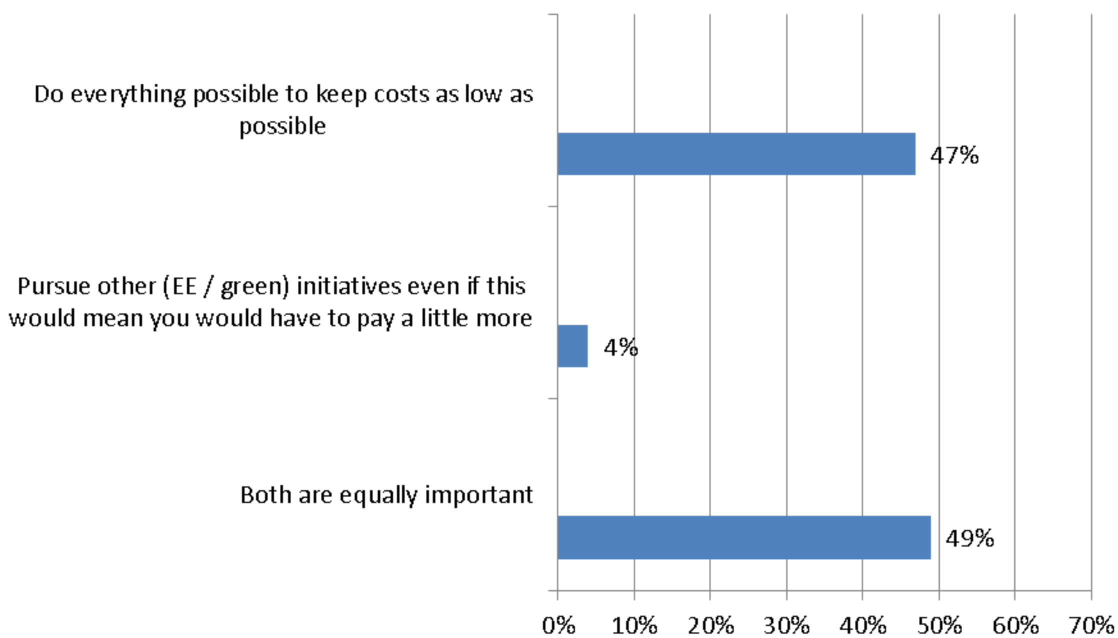
[4] Note that this compares to a 53% top-three-box rating for Ameren Missouri that we observed in similar research conducted in July 2009.

Figure 4-2 Ratings of Ameren Illinois on EE-Specific Issues (ratings of 8-10 on 10 pt. scale)



It is interesting – and important – to note, however, that while Ameren Illinois customers appear to support EE and green-focused activities by the company in the abstract, **they do not want** these activities to cost them more. As shown in Figure 4-3, when customers are asked a forced choice question, half say that the company should do everything possible to keep costs as low as possible, while only 4% say the company should pursue EE or green options if doing so would mean they would have to pay a little more. The remainder of the population wants both things at the same time (to keep costs as low as possible **and** pursue these other initiatives).

Figure 4-3 Responses to forced choice question on EE / Green vs. Cost Options



Understanding Customer Perspectives on Energy Issues

In order to provide additional context and understanding concerning why customers, are – or are not – interested in implementing a variety of EE measures, the research team explored customer thinking across a variety of background energy issues. These specific questions covered the following issues:

- How customers think about using energy in their homes (how much they think about energy costs, for example, or the relative importance of comfort vs. cost)
- What is important to them as they evaluate new appliances (initial cost vs. operating cost savings, for example)
- How they shop for new appliances

In order to understand how customers think about these issues, we conducted what is called a factor analysis of all of the attitudinal items included in these different sections of the questionnaire. What factor analysis allows us to do is to understand how customers organize their thinking about energy issues by grouping together the questionnaire items that customers evaluate similarly.

The first block of items that customers tend to rate similarly – suggesting that they see these items as addressing the same – or at least very similar issues – are questions that asked them to rate the importance of:

- The total amount of money that a product or service would cost
- Any cost savings you might see from using the product
- Any rebates or purchase discounts that might be offered
- The features and functions included with the product

This finding suggests that customers tend to aggregate together all of the cost related issues as similarly important, and further, they tend to link in feature functionality as tied to cost.

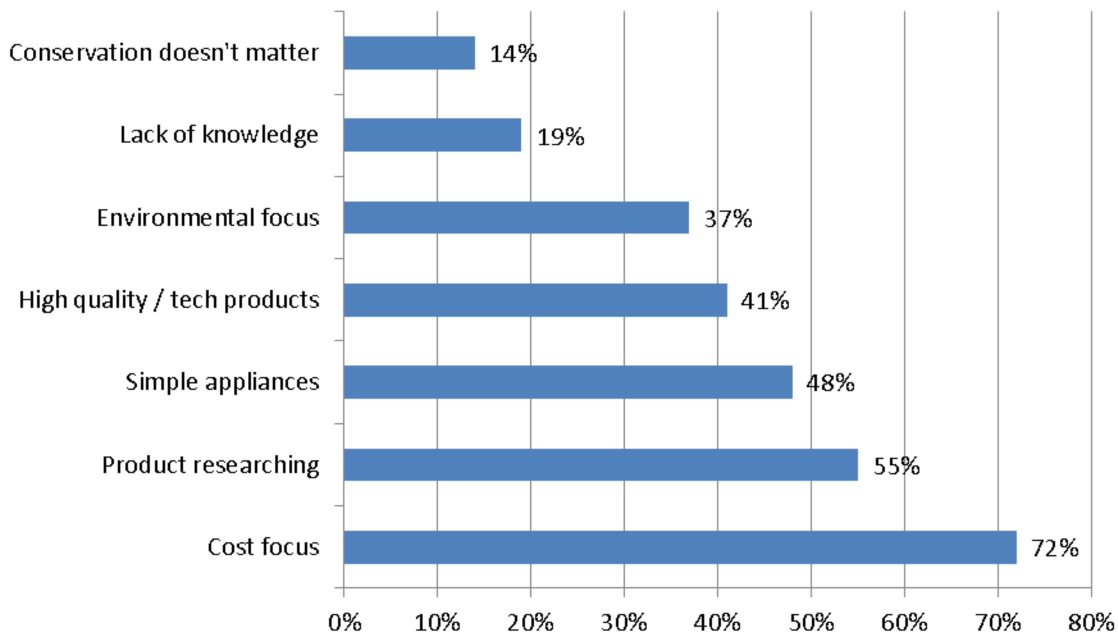
Besides this first bundle of customer perspectives on energy issues – which we might label as "cost focus," the findings suggest that there are there are five other factors – or bundles – of customer opinions on these issues. These include:

- **High quality / tech products.** The items aggregated here include expressed preferences for high quality and innovative products that help customers to save time and money. What is perhaps most interesting here is having a product labeled as EE or ENERGY STAR is viewed as fitting in with this bundle of attributes.
- **Environmental focus**. The questionnaire items that were aggregated together in this bundle of opinions included those that had to do with being concerned about the environmental effects of electric power plants; the effects of global warming, and any environmental effects from using products. Also interesting here was that being an "early adopter" of new products was connected with these "green" attitudes.
- **Product researching**. Customers also reacted similarly to items that had to do with descriptions of themselves as taking the time to research and shop carefully for products. Also included in this grouping were items that described the respondent as living in a do-it-yourself sort of household, and in a household that tended to only buy things when they were on sale.
- **Conservation doesn't matter**. Respondents did also rate similarly the questionnaire items that indicated a lack of confidence in the impact of energy efficiency / conservation: that conserving energy will make no difference to the economy, that there isn't much they can do to save money on energy costs, and that they just want to be left alone to use energy however they want in their homes.
- **Simple appliances**. Customers also rated similarly statements that focused on using appliances that are simple and functional, but also included in this grouping, the desire to purchase products in a physical store, rather than on the internet.

- **Lack of knowledge**. Finally, customers rated a questionnaire item that described the respondent as willing to do more to make their home more efficient, but not knowing where to start, by itself – not grouping it together with other items.

Saying that customers organized their responses into these bundles of items does not, of course, tell us which of these bundles of items was rated as most important or descriptive of Ameren Illinois customers as a whole. Figure 4-4 below indicates that customers most commonly rated the items in the “cost focus” bundle as most important to them, followed by the “product researching” bundle. The question bundles having to do with not valuing energy conservation or having a lack of knowledge about what to do to conserve energy were rated as least important or descriptive of them.

Figure 4-4 Average importance / agreement for top items in each attitude bundle

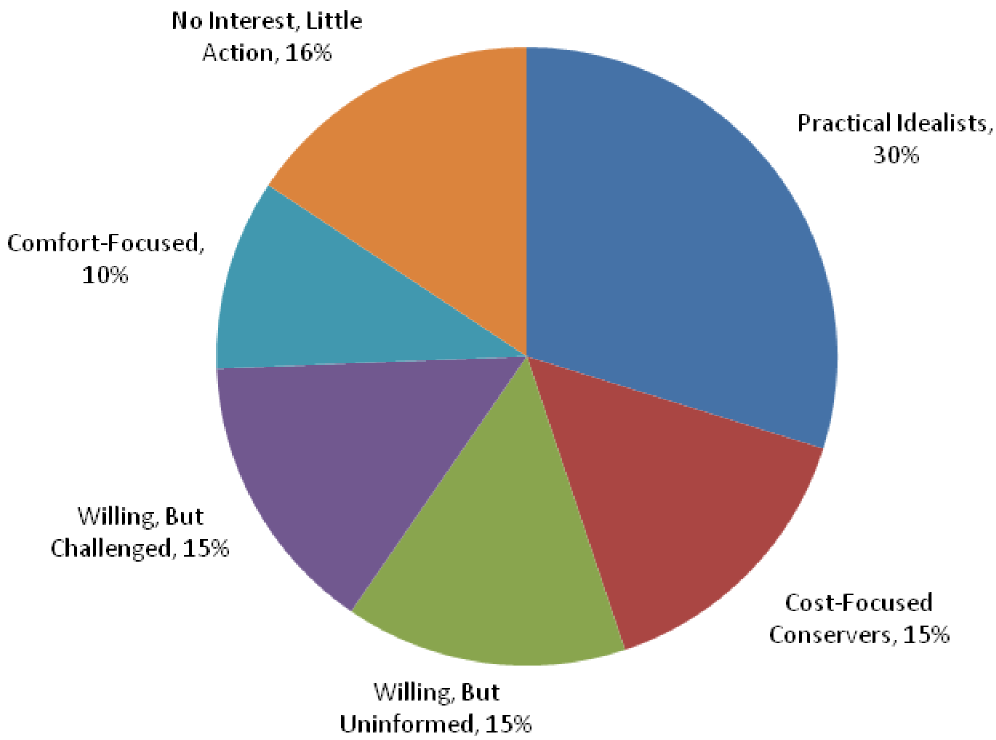


Exploring Customer Segments

So far, our analysis of customer perspectives on energy issues has only considered customers as a whole. Customers differ, however, and this section of the report explores some of the key divisions that exist within the residential customer base. Specifically, the team developed a segmentation model that disaggregated residential customers into groups that differ in terms of whether, and why, they might be interested in pursuing energy efficiency options. The goal of the segmentation analysis was to define groups of customers that were different in ways that would allow Ameren Illinois to prioritize customer targets for EE program marketing, and to develop targeted messages for each of those segments.

Using a variety of attitudinal and behavioral inputs (see the discussion earlier in this report), the team identified a set of six residential customer segments that seemed to best represent the differences in this population on these issues. The segment sizes are outlined in Figure 4-5 below.

Figure 4-5   Residential Segment Distribution



Base Segment Descriptions

Summary descriptions for each of the segments follow:

Practical Idealists (30%)

Concerned with conserving energy, both from a cost-focus and an environmental perspective (they are the "greenest" segment). They are tech and feature oriented when considering appliances, but they also say they research options and compare prices. Higher education and income, and with the largest homes (though with only average total annual kWh usage), but tend to say their economic situation is worse than it was a year ago. Tend to be high on familiarity, and experience, with EE / conservation measures to date, and are very likely to say that they would adopt new EE / conservation measures.

Cost-Focused Conservers (15%)

Informed about, and interested in, conservation / EE measures, but for cost reasons rather than environmental reasons. This group believes in the value of EE as a way to save money, and has taken many prior EE actions. They do not trust Ameren Illinois very highly, however, and do not see it as the job of the company to encourage customers to save energy or money. They would prefer the company reduce rates than spend money on EE or green options. They have higher than average education and income levels, and the second largest homes on average, and the second highest average kWh. They have the second highest program take rate.

Willing, But Uninformed (15%)

This group is positive in its assessment of Ameren Illinois, and green in their environmental perspectives (though this is not a daily, top-of-mind issue). They are relatively less experienced with EE / conservation measures to-date, however, and unsure of what they could be doing in this area, or if any of their actions would actually lead them to save money. They prefer simple, functional appliances that are on sale, and which they can purchase locally, rather than online. They have average sized homes and average annual kWh usage, as well as have lower than average income and education levels. They are moderate on take rates across programs, but are the lowest on familiarity / experience with EE conservation measures currently.

Willing, But Challenged (15%)

This group has relatively high opinions of Ameren Illinois and believes that the company should be pursuing EE options for its customers, while also supporting green initiatives. They are relatively low on EE / conservation information currently, however, and have implemented fewer such measures than others to-date. Appliance cost is critical to them and it appears that they do not think that they can afford to purchase higher quality / higher EE appliances. They live in the smallest homes, and have lower than average income and education levels, as well as the lowest annual kWh usage. They are moderate to low in their interest in participating in new EE / conservation options.

Comfort Focused (10%)

This group is quite positive in its overall assessment of Ameren Illinois, but does not see the company as a leader in energy efficiency, nor do they think the company should be a leader in this area (i.e., in encouraging customers to be more efficient), or in green energy. Rather, the company should just focus on keeping costs low. Comfort is important to them, and they just want to be left alone to use energy as they please. They are concerned about appliance cost, but worry more about functionality (particularly as this relates to comfort) than about environmental / energy saving considerations. They tend to live in average sized homes, but have the highest annual kWh levels, along with higher than average incomes and educations. They are moderate on both familiarity with EE programs / options to-date, and their likelihood to participate in new programs.

Low Interest, Little Action (16%)

This group has very little interest in conservation or EE. This group actively dislikes Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They do not want the company to encourage customers to save energy, nor do they want it to pursue green options. They do want the company to keep costs low as its sole focus. They have smaller than average homes, but average kWh levels, and are more likely to live in multi-family structures and to have somewhat lower levels of education and income. They are the lowest on likelihood to adopt new EE programs and one of the lowest on existing familiarity / experience with EE / conservation options.

Segment Marketing

Table 4-1 Segment Marketing

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Practical Idealists (30%)	Receptive to messages on both the positive environmental impact of EE / conservation, as well as cost-savings – plus satisfaction with Ameren Illinois is high, making them likely to trust their utility as a reliable source for energy efficiency suggestions.	Home size is large, but annual kWh usage is average, suggesting that this segment is probably already relatively efficient in its use of energy. Having said that, given a large number of end uses that could be impacted, there is still likely to be opportunity for additional efficiency gains. As one of the wealthier segments they also may have the income to invest more aggressively in EE	Projected take rates are the highest here of any of the other segments. Also note that high opinions of Ameren Illinois would likely make them more receptive to further education/ encouragement on the benefits of participating in new EE options.	As they are the most likely to have purchased/plan on purchasing EE appliances, there is potential ground to be gained in terms of future EE appliance rebate participation. They are already inclined to take EE actions – and they have already made some EE changes. Encouraging them to do more may just mean helping them to find the opportunity.
Cost-Focused Conservers (15%)	This segment would be the most receptive to messages focused on the cost savings they can get from EE investments. They are not overly concerned with functionality, environmental impacts, or how much it improves their lives. They just want things (including Ameren Illinois) to be cheap.	Homes tend to be larger than average and their average kWh usage is the second highest of any segment. Having said that, they are quite familiar with EE and conservation actions and programs, so while there may be opportunity for load reduction, the simple (and low cost) things have probably been done already.	They are not fans of Ameren Illinois, but are fans of saving money (they have the second highest average new program take rate). Environmental messages will not have much effect on them, nor will messages that feel like "education" (since they already think they are pretty knowledgeable).	This group will represent a difficult balance for Ameren Illinois. On the one hand, they seek out information about ways to save money on energy and should be responsive to new opportunities to do so. On the other hand, they do not want Ameren Illinois to spend "their" money on helping other customers to save money or to invest in green initiatives that do not benefit them directly.

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Willing But Uninformed (15%)	This is a challenging segment because they appear to be green, but are not deeply so. They agree with overall statements of environmental concern, but when pushed, admit that they do not typically worry about the environmental effects of their day-to-day actions. Even more importantly, they say they don't know how to conserve energy or if doing so would have any impact.	This group has average size homes and average annual kWh use, but relatively little experience with EE / conservation to-date (and a lack of confidence in the potential benefit of these activities). Given their lack of action so far, there should be substantial opportunity to improve the EE of these homes. Getting the attention of these homeowners will be the challenge.	This segment expresses moderate take rates across the new EE / load control options, though as was just noted; getting them to act on those opportunities will be a real challenge. Green messages are unlikely to be compelling, as are cost savings messages (since they will likely not believe them). This group will likely need a "do-it-for-me" approach.	Since this group tends to like and trust Ameren Illinois, they should be open and receptive to messages from the company about reasons to consider EE / conservation actions. The challenge with this group will be convincing them to "trust" that they should invest the time and energy to do so because they will actually see a benefit. Starting simple, with easily demonstrable savings would be a help.
Willing, But Challenged (15%)	This is also a challenging segment for Ameren Illinois. While they have some interest in EE, they have not done much so far, and they appear to think that they cannot afford "higher end" solutions. They are broadly favorable to the company and its efforts to help customers save energy (and to green efforts), but they do feel confident in their abilities to save on their own.	This group has the lowest annual kWh use and the smallest homes, along with lower than average levels of education and income. They are also among the groups least likely to have purchased a variety of new appliances in the last year. Beyond this, they are (along with the other "willing" group) less informed about, or experienced with EE measures to-date. All of this means that opportunities for energy savings are likely to exist, of course.	This group is also somewhat responsive to the EE measures tested, though obviously, there are huge barriers to implementation for them. On the one hand, they lack the upfront financial resources that might be necessary to implement some changes, and lack the experience with, or confidence in, EE measures that would make it easy for them to justify any expense on this front.	This group also likes and trusts Ameren Illinois, and looks to the company to help customers save money on energy. Having said that, they lack the resources to do much on their own (at least they think so). Zero upfront cost solutions would likely be an important starting point for this population.

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Comfort Focused (10%)	This segment is broadly positive toward Ameren Illinois, but does not want to hear about the company spending money on helping customers to save energy or about green initiatives. Ameren Illinois job – from their perspective – is just to keep costs low and let them use energy the way they want to.	Houses are average in size, but average annual kWh usage is highest of all the segments. They also have higher education and income, though are only average of familiarity with EE and are less likely to have participated in prior EE programs. All of this means there is probably substantial EE opportunity here, if it can be realized.	Take rates are low for this segment, and they have little or no interest in saving energy, whether for environmental benefits, or if it costs them any feature functionality or comfort. They are not opposed to saving money, but only if this does not "cost" them in other ways.	Attempting to sell this segment on the societal benefits of EE is probably a losing proposition. Getting their attention on implementing new EE (but not load control measures) will mean convincing them that they can save money without giving up anything in terms of time, effort, or comfort.
Little Interest, Little Action (16%)	This segment would likely be the most difficult to market to as they are the least likely to like Ameren Illinois, and the least concerned with environmental issues. Beyond this, they appear to simply be unconcerned with energy issues, appliances, and related issues.	Houses in this segment tend to be somewhat smaller than average, but with average kWh. In addition, lower than average incomes may limit the EE behaviors these customers adopt. Having said that, they have done relatively little to-date in terms of EE measures.	Take rates are the lowest in this group and familiarity / experience with EE is also very low. Given their lack of involvement in this category, it is not clear at all what sort of messaging would be likely to get this group's attention.	While it could be argued that EE education is needed with this group, it is unclear how to get their attention to attend to any type of education.

Residential Segments – At a Glance

Table 4-2 Segment Prioritization

	Practical Idealists	Cost-Focused Conservers	Willing, But Uninformed	Willing, But Challenged	Comfort Focused	Little Interest, Little Action
Size	30%	15%	15%	15%	10%	16%
Opportunity	**High** They have done a lot already, but are open to – and able to – do more	**Medium-High** Experienced in EE and willing to do more; if the money is right	**Medium-Low** Willing to be convinced of the advisability of EE actions, but not convinced to date	**Medium-Low** Open to the possibility of EE actions, but see themselves as very limited in their opportunity to take advantage and have not done so yet	**Low** No interest in the EE category; "leave me alone"	**Very Low** Totally uninvolved with the energy category and no interest in becoming so
Role for Ameren Illinois	**Trusted Green Partner:** They like the company and see Ameren Illinois as having an important role in both EE and promoting green initiatives	**Save Us Money:** Broadly negative toward the company; just want Ameren Illinois to focus on lowering costs (for me)	**Help Me:** They like the company and want it to help them become more energy efficient (though they are not certain this is possible).	**Help Me:** They like the company but do not think that EE is something that is relevant for them, or is something that they can afford, or figure out how to make work for them	**Leave Me Alone:** Don't like the company, don't trust it, and just want to b left alone	**Don't Bother Me:** Like the company, but not interested in energy issues generally, and see little likely value in EE actions

Table 4-3 Likely Takers given a 3 year payback period

	Practical Idealists	Cost-Focused Conservers	Willing, But Uninformed	Willing, But Challenged	Comfort Focused	Low Interest, Little Action
Size	30%	15%	15%	15%	10%	16%
Measures for purchasing/installing energy efficient equipment (Assumes a normal replacement cycle)						
Light bulb	52%	41%	38%	38%	31%	22%
Refrigerator	49%	40%	40%	35%	36%	27%
Water heater	48%	38%	37%	31%	33%	21%
Air conditioner	47%	40%	36%	32%	33%	20%
Clothes dryer	47%	39%	38%	32%	32%	21%
Furnace or boiler	46%	39%	37%	30%	32%	20%
Color TV	43%	33%	35%	27%	28%	20%
PC	41%	33%	30%	27%	23%	18%
Stovetop or range	46%	35%	33%	30%	30%	18%
Swimming pool pump	32%	28%	36%	25%	29%	15%
Measures for improving energy efficiency of existing systems						
Maintain heating system regularly	45%	37%	29%	26%	31%	18%
Maintain cooling system regularly	43%	35%	29%	26%	30%	19%
Install Smart power strips	41%	35%	33%	27%	22%	18%
Install a programmable thermostat	39%	30%	30%	33%	23%	16%
Inspect, repair, and seal HVAC ductwork VAC ductwork	40%	31%	28%	26%	23%	16%
Install exterior lighting controls	34%	31%	28%	24%	20%	19%
Install more EE exterior windows	37%	36%	31%	27%	23%	19%
Install improved home insulation	36%	33%	30%	23%	20%	17%
Install “low flow” showerheads	38%	29%	28%	23%	19%	15%
Add insulation to HVAC ductwork	37%	32%	27%	25%	22%	15%
Install a dehumidifier	34%	31%	27%	22%	21%	15%
Install a whole house/attic fan	30%	27%	24%	20%	17%	13%
Measures not requiring an investment by the customer						
Turning down the heating/cooling systems while sleeping/away	33%	29%	21%	23%	22%	16%
Reduce water heater temperature	33%	22%	17%	18%	17%	13%

Get rid of secondary refrigerator	25%	22%	16%	18%	14%	13%

RESIDENTIAL SATURATION SURVEY RESULTS

Household Demographics

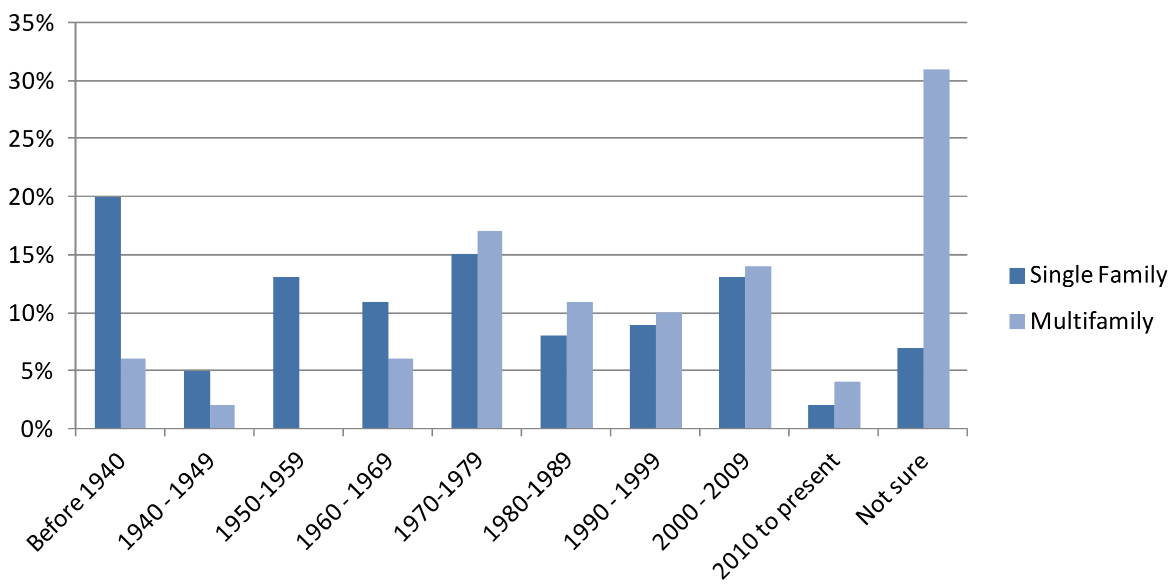
The sample was split by housing type into two segments for analysis: single-family detached homes and multi-family homes. Single-family detached homes include single-family homes and mobile or manufactured homes. The multi-family home segment includes single-family homes that are attached to one or more other homes, multi-family homes in a building with 2-4 units, and multi-family homes in a building with 5 or more units. Seventy-nine percent of respondents live in a single-family home while 21% live in a multi-family home. The average number of individuals living in a single-family home is 2.6 and the average number of individuals living in a multi-family home is 2.0.

Several household demographic questions were asked that are important to a household's energy use. Key demographics include the age of home, the size of the home, and the number of individuals who work from home or are home during the weekday.

Age and Size of Home

The approximate year the home was built was asked to determine the age of the home. The current housing stock of single family homes if fairly old with 64% built before 1980. Figure 5-1 shows twenty-five percent of single-family homes were built prior to 1950.

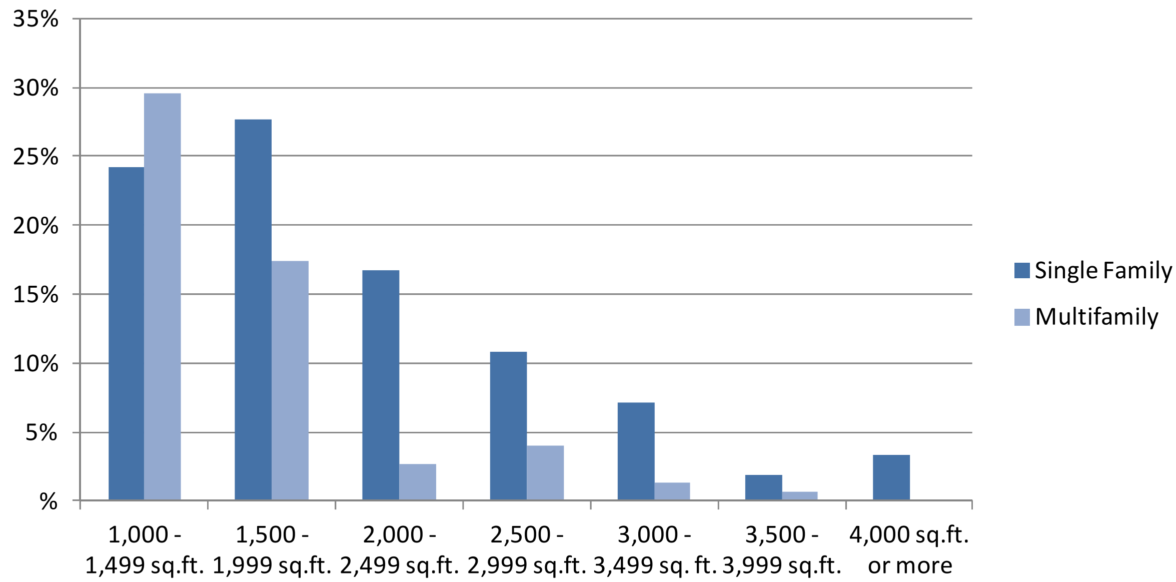
Figure 5-1 Year Home was Built



Almost a third of respondents did not know when their multi-family home was built (31%). The majority of those that were able to answer the question reported that their multi-family home was built in the last 40 years.

Home size is related to energy use. That is, larger homes use more energy than smaller homes. In the Ameren Illinois area, the majority of single-family homes are in the 1,000 to 2,499 square foot range (Figure 5-2). Twenty-three percent of single-family homes are 2,500 square feet or more and only 8% are less than 1,000 square feet. Multi-family homes are significantly smaller with the majority under 1,499 square feet (75%).

Figure 5-2 Square Footage of Home

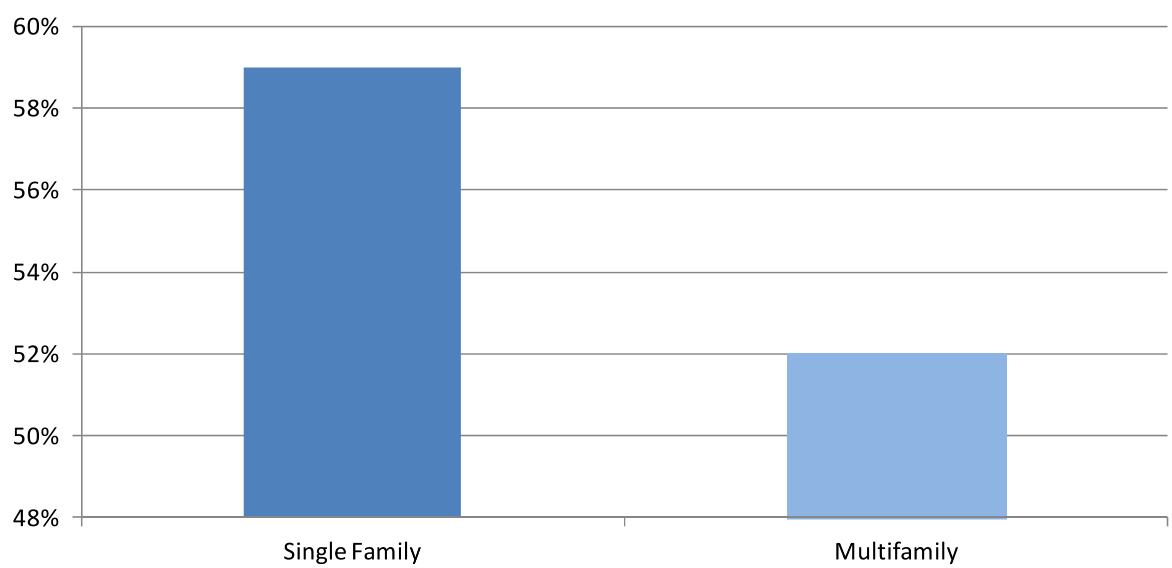


Individuals Home During the Weekday

Energy use tends to be higher in homes where one or more household members are home during the day. Similarly, in the summer, peak demand tends to be higher.

Most homes in the Ameren Illinois service territory have a member who is regularly home during the day on weekdays (Figure 5-3). Fifty-nine percent of single-family and 52% of multi-family customers say someone is home during the weekday, either because they work at home or regularly stay at home all or most weekdays (four days or more).

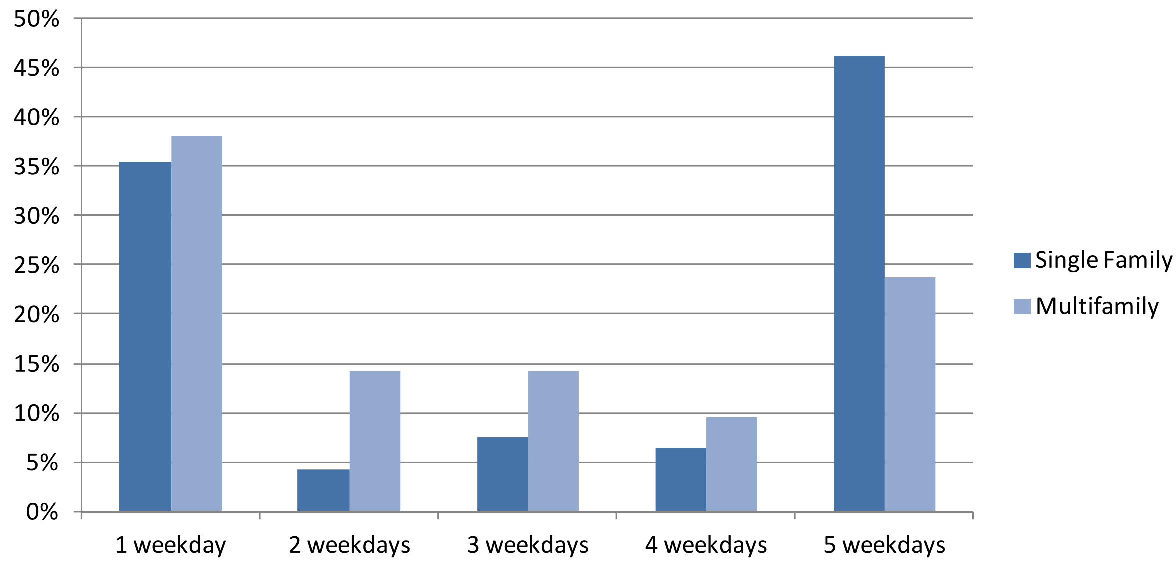
Figure 5-3 Customers with Someone Home All or Most Weekdays



Within the group presented in Figure 5-3 is a subset of respondents that are working at home. Sixteen percent of respondents in the single-family segment have a member who telecommutes or works from home at least one day during the day on weekdays. A slightly smaller percentage (13%) of those living in multi-family homes telecommutes or works from home.

A large proportion of those working from home, do so 5 days a week (Figure 5-4). Respondents living in single-family homes tend to work at home more days than those living in multi-family homes. Note that the percentage numbers shown in Figure 4-4 are the percent of those that work from home, not of the total population.

Figure 5-4 Number of Weekdays Spent Working at Home



Household Equipment and Appliances

Respondents were asked about the type of equipment and appliances they have, the type of fuel used for heating, cooling and water heating, and hours of operation for lighting and electronics.

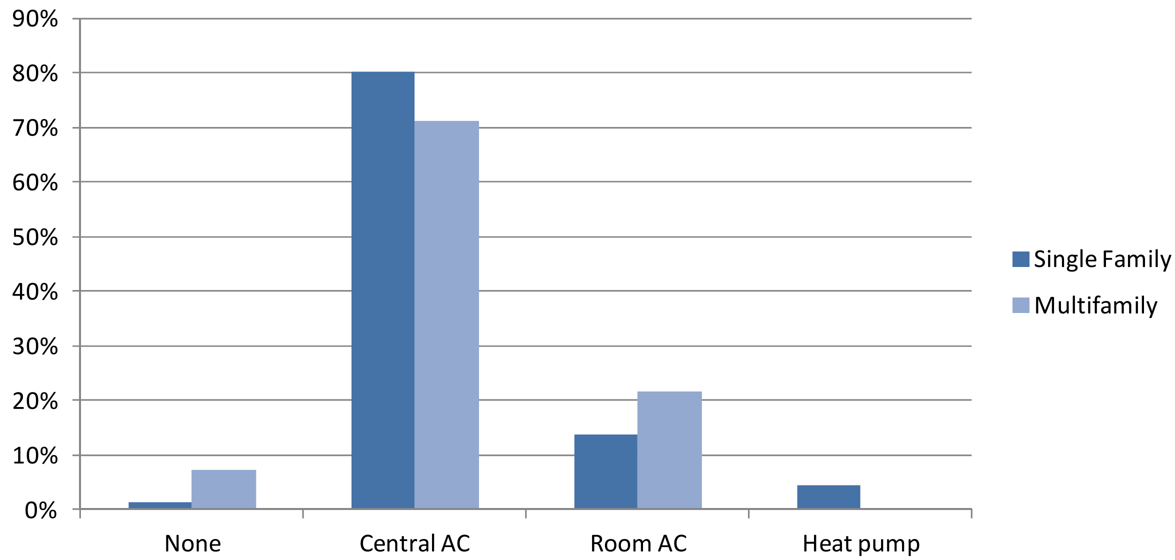
Heating, Cooling and Water Heating

Most respondents have central air conditioning both in single-family homes and multi-family homes (Figure 5-5). Eighty percent of respondents in single-family homes have central air conditioning and an additional 4% have a heat pump for cooling. Seventy-one percent of respondents in multi-family homes have central air conditioning and none have a heat pump. The remaining customers rely on room air conditioners or do not have cooling.

Almost two-thirds of primary cooling systems in single-family homes have been purchased since 2000 compared to 39% in multi-family homes. Forty-two percent of respondents in multi-family homes did not know when their primary cooling system was purchased.

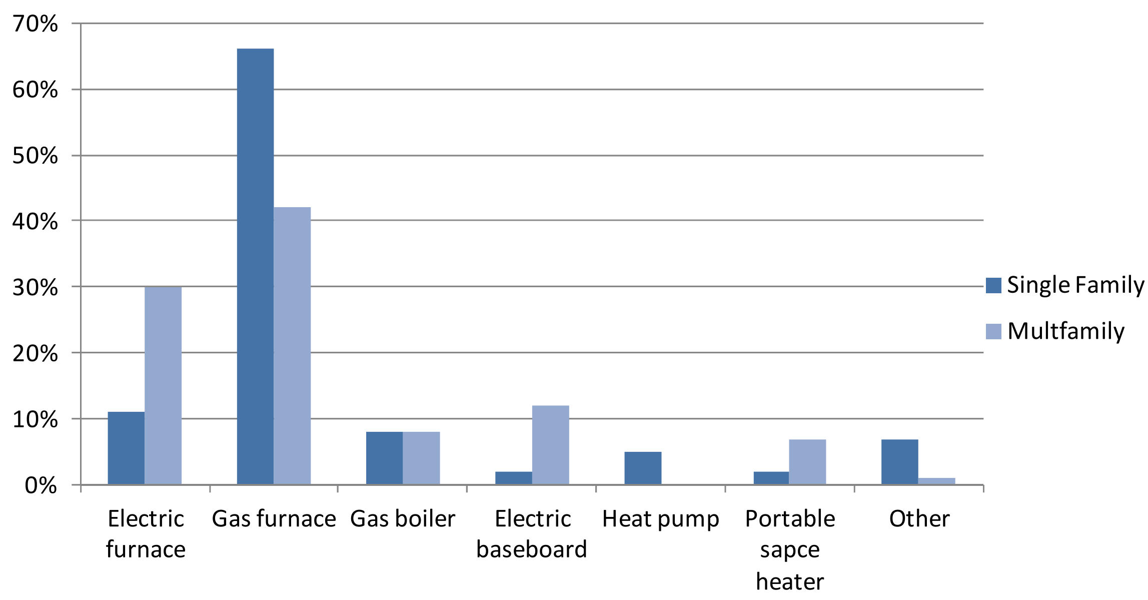
Fifty-seven percent of respondents in single-family homes have programmable thermostats, compared to only 30% in multi-family homes.

Figure 5-5 Type of Primary Cooling by Segment



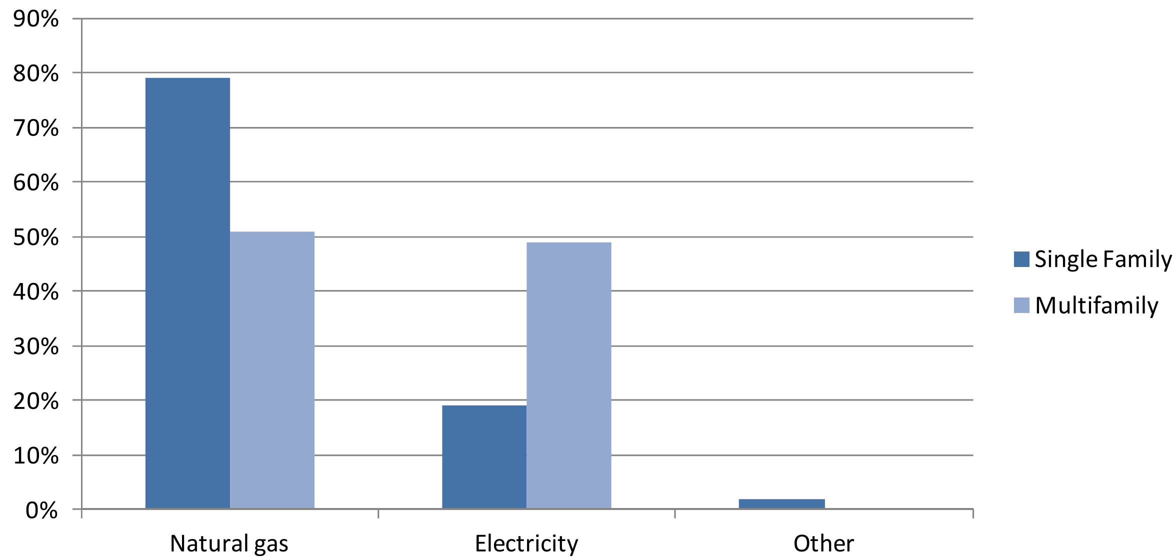
The majority of respondents in single-family homes have a gas furnace (66%) and eleven percent have an electric furnace. Most respondents in multi-family homes have either a gas or an electric furnace (Figure 5-6). Several respondents reported using supplemental heating such as portable space heaters and fireplaces as their main type of space heating; 9% of single-family and 8% of multi-family homes use these other types of space heating.

Figure 5-6 Type of Space Heating



Similar to heating, the majority of respondents in single-family homes have gas water heating, while in multi-family homes the fuel used for water heating is more evenly split between gas and electric (Figure 5-7).

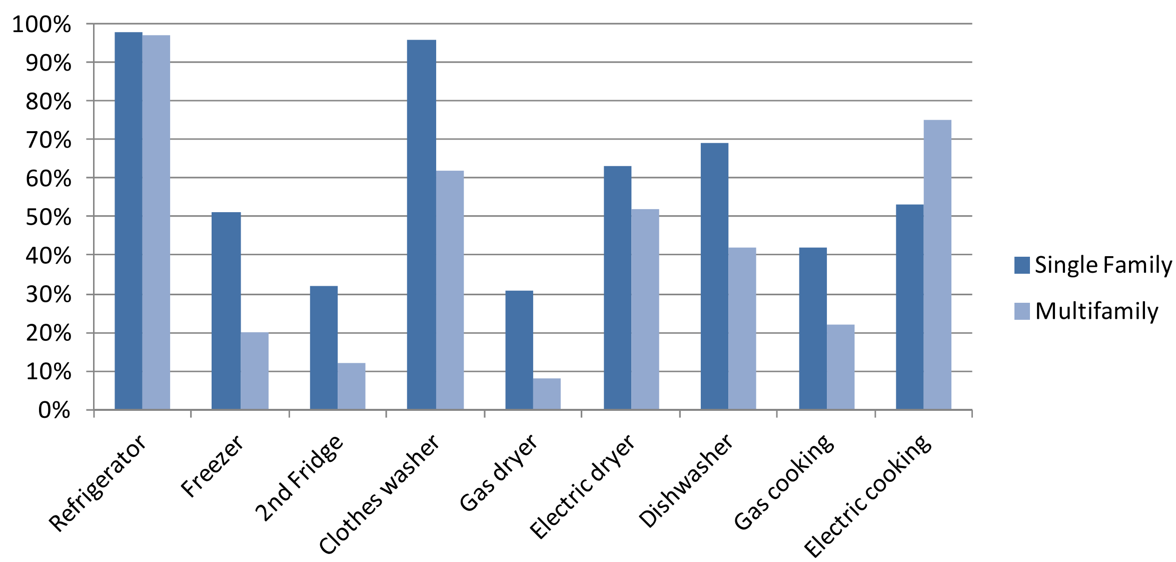
Figure 5-7 Water Heating Fuel



Appliances

Almost all respondents living in single-family homes have a refrigerator. In addition, more than half have a stand-alone freezer and 32% have a second refrigerator (Figure 5-8). Sixty-nine percent of respondents in single-family homes have a dishwasher and 53% use electricity for cooking. Ninety-six percent of respondents in single-family homes also have a clothes washer, and 94% have a clothes dryer. Sixty-three percent of respondents have an electric dryer; 31% have a gas unit.

Figure 5-8 Appliance Saturation – Single-Family Segment



With the exception of refrigerators, those living in multi-family homes have fewer appliances. Only 20% have a stand-alone freezer and 12% have a second refrigerator. Forty-two percent have a dishwasher, and 75% use electricity for cooking. Sixty-two percent have a clothes washer and 60% have either an electric or gas clothes dryer. Similar to the single-family house segment, the majority of clothes dryers are electric.

Lighting

The average number of light bulbs in a single-family home is 46, while a multi-family home has an average of 38 total light bulbs (Table 5-1). Almost half (48%) of the light bulbs in both segments are conventional incandescent bulbs. CFLs represent about one-third of the light bulbs.

Table 5-1 Average Number of Light Bulbs by Segment and Type

Segment	Incande-scent	CFL	LED	Tubular Fluore-scent	Halogen	Low Voltage	Other
Single Family	47%	32%	1%	10%	4%	4%	2%
Multi-family	50%	31%	1%	9%	3%	4%	2%
Total	48%	31%	1%	10%	3%	4%	2%

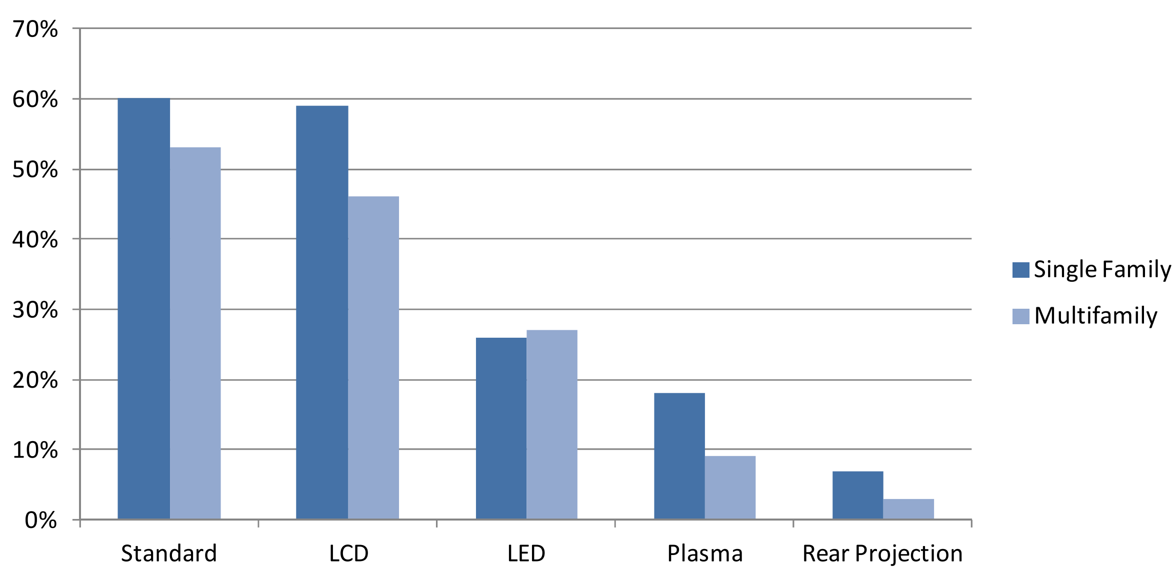
Few respondents in single-family homes use some sort of lighting controls on their interior lighting. Sixteen percent in single-family homes use lighting timers compared to 14% of those in multi-family homes. Fourteen percent in single-family homes use motion detectors compared to 4% of those in multi-family homes.

Several respondents use lighting controls for the exterior lighting in their homes. Twenty-one percent of those in single-family homes use motion detectors, compared to 9% in multi-family homes; 26% in single-family homes use dusk-to-dawn lights compared to 13% in multi-family homes; and 7% in single family homes and 3% in multifamily homes use timers.

Electronics

Respondents in single-family homes have an average of 2.9 TVs per household, while those in multi-family homes have an average of 2.1 TVs. The majority of respondents have at least one standard TV, and 59% of those in single-family homes and 46% of those in multi-family homes have at least one LCD TV (Figure 5-9). Smaller percentages have one or more LED, plasma or rear projection TV.

Figure 5-9 Type of TV by Segment



Respondents in single-family homes report that their household watches TV on average a total of 10.34 hours per day on all their TVs combined, while those in apartments watch TV 8.6 hours per day on all their TVs. Forty-seven percent of respondents in single-family homes and 42% in multi-family homes have at least one ENERGY STAR TV.

Ninety-five percent of respondents in single-family homes and 94% in multi-family homes have at least one computer. Respondents in single-family homes have an average of 2.1 computers. Respondents in multi-family homes have an average of 1.6 computers per household. Respondents in single-family homes use their computers an average of 8.0 hours per day and have them in stand-by mode an average of 15.6 hours. Multi-family homes use their computers 8.1 hours per day and have them in stand-by mode 10.7 hours. Thirty-nine percent of respondents in single-family homes and 36% in multi-family homes have an ENERGY STAR computer

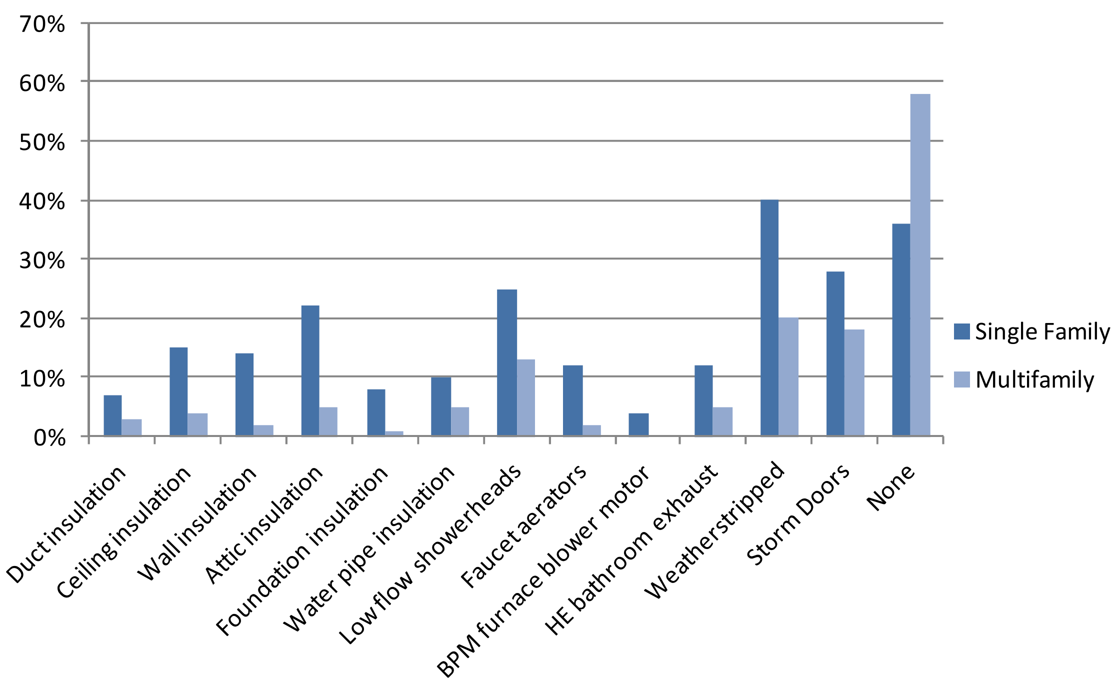
Energy Actions

Respondents were asked what recent home improvements they had made, whether they intended to make improvements in the next 6 to 12 months and what types of actions they took to improve their household's energy efficiency. They were also asked about their participation in utility-sponsored energy efficiency programs. This information was used to determine the current saturation of energy-efficiency measures and to develop the adoption rates for the forecast.

Home Improvements

The majority respondents living in single-family homes have made at least some improvements to their home (Figure 5-10). Sixty-four percent of respondents in single-family homes said they or a previous owner had made a home improvement or remodeled the home since it was built. Not surprisingly, fewer respondents living in multi-family homes had made improvements. Forty-two percent of respondents living in multi-family homes said they or a previous occupant/owner had made a home improvement or remodeled the home since it was built.

Figure 5-10 Home Improvements



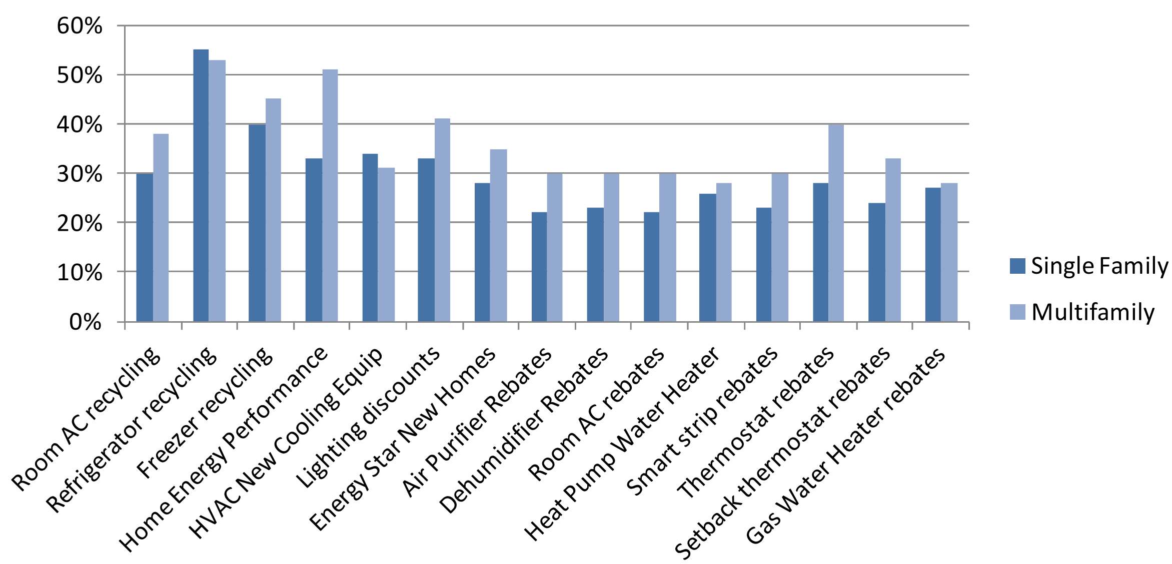
The most popular home improvements are weather-stripping/caulking windows and doors, adding storm doors and installing low flow showerheads.

Program Awareness and Participation

About a quarter of respondents in both segments stated they were aware of programs that offer conservation rebates, loans or price discount programs. Similar percentages have participated in at least one program in the last 3 years.

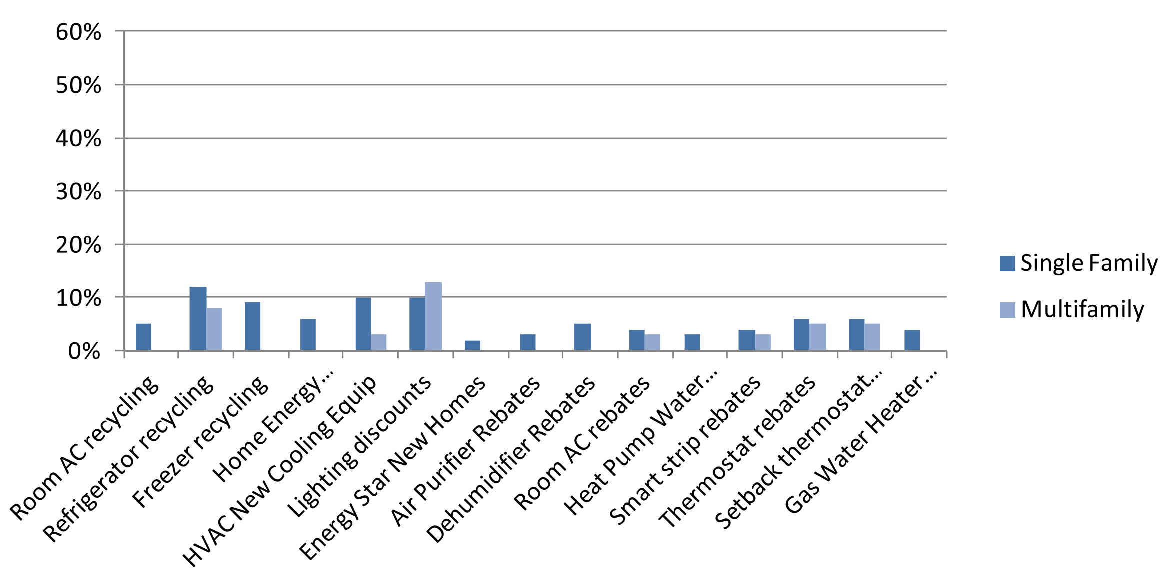
When asked specifically about Ameren Illinois programs, the refrigerator recycling programs was the program the majority of respondents were aware of in both segments (Figure 5-11). Half of multifamily respondents are also aware of the Home Energy Performance program.

Figure 5-11 Awareness of Ameren Illinois Programs



Rebate programs have the lowest levels of awareness. Overall multifamily respondents are more aware of the programs available than are single family respondents.

Figure 5-12 Participation in Ameren Illinois Programs



Few respondents have participated in Ameren Illinois' programs in the last 3 years (Figure 5-12). Twelve percent of single family respondents have participated in the refrigerator recycling program, and 13% of multifamily customers have participated in the lighting discounts program.

C&I METHODOLOGY

This section covers sample design, questionnaire development and data analysis for the commercial and industrial market research.

Sample Design

As mentioned above, Ameren Illinois provided the EnerNOC team with billing data for residential and business accounts that included a variety of information for each commercial customer, including company name, address, annual kWh usage, annual therm usage, division, account number, etc. Contact names of individuals were not provided in the list. The EnerNOC team created a sample design with 124 separate sample cells – against which survey responses were targeted and monitored, and which took into account industry, gas usage and electric usage. This grid was implemented separately and independently for each of the two surveys (the Program Interest survey and the Saturation survey). Appendix A provides additional information about the business sample design.

The EnerNOC team generated a total of 19,074 randomly selected company locations. In total, postcard invitations were mailed to all of the locations included in the list, with 9,529 cards sent for Program Interest and 9,545 sent for the Saturation survey. These postcards were allocated across the desired quota cells and invited respondents to go online and complete a survey.

- Customers were originally offered a $25 check for completing the survey, but that amount was increased to $50 approximately halfway through fielding to increase response to the survey site
- Due to the somewhat limited nature of the list, cards were mailed to all respondents at one time, and the mailing was followed by several rounds of reminder emails and phone calls

In order to qualify to complete the survey, respondents/companies had to meet the following criteria:

- The site must be a business, or a residence used for a home-operated business
- The respondent must be knowledgeable about decision-making for energy issues for the business at the specified location
- The company must be responsible for the cost of their electricity or natural gas, and Ameren must be a provider of either electricity and/or natural gas
- The location must not ONLY be an outdoor structure or facility

A total of 622 Ameren Illinois Business customers completed the Program Interest survey.

- Approximately 72% of those who attempted to complete the survey qualified based on applying the criteria above.
- The overall net response rate was approximately 10%
- Approximately 21% of those who started the surveys abandoned them before completing it
- Average online survey length was about 26 minutes

Questionnaires

The **Program Interest** questionnaire was designed to cover multiple content areas, including:

1. Screening questions
2. Customer energy needs

3. Basic energy usage
4. Attitudes toward energy usage
5. Energy efficiency measures already taken
6. Purchasing attitudes / behavior & environmental attitudes
7. Interest in potential energy efficiency measures offered by Ameren Illinois

The **Saturation** questionnaire was designed to cover multiple content areas, including:

1. Screening questions
2. Description of building type: business-use area
3. Description of building type: entire building area
4. Heating and cooling
5. Lighting
6. Office and other equipment
7. Manufacturing / processing operations
8. Energy efficiency measures

Data Analysis

Estimating Take Rates

Market researchers have long recognized that customers tend to over-estimate their likelihood to participate in new programs and services within the context of a market research study. This means that it has been long recognized that some customers who say that they would be “certain” to participate in a given program in a survey would, in reality, not participate. This is often referred to as the “say-do” problem; the problem that survey respondents are typically more likely to say they would do something than actually end up doing it. The analytic challenge, as a result, is to appropriately adjust stated likelihood-to-participate ratings into more realistic estimates of likely customer response.

Different options are available for making these adjustments, and the best option depends in part on the nature of the product, service, or program being evaluated. For example, reactions to socially desirable (including “green”) options need to be adjusted down more aggressively, while those for certain new technologies need to be adjusted less. The method used by the YGDI / EnerNOC team is based on proprietary research conducted by YGDI during 2010. This research captured stated likelihood to adopt / purchase a variety of new products / services, at one point in time, and then tracked the actual product / service adoption / purchase over 6 -12 months. As we expected, people were less likely to actually purchase the specific products / services that they estimated they would at an earlier point in time.

The primary adjustment factors that were observed in that research were used here to translate “stated intent” to realistic estimates of likely behavior, and they are outlined in the table below. The adjustment factors depend on how the respondent answered each of the “likelihood to acquire” questions. Note that these primary adjustment factors are intended to apply to relatively infrequent purchases (no more often than once a year or so). For more regular purchases – those that occur several times a year – YGDI uses a somewhat different formula, and information about this “regular purchase adjustment” is provided later in this section.

Essentially, the primary adjustment for irregular purchases says that among those respondents who rate a given program as a “10” (“extremely likely to participate”) AND if who are rated as “high” on EE information / familiarity, then realistically, about 41% of those people will ultimately sign up for the program. At the other end of the scale, it says that among the respondents who rate their likelihood to participate as a “1” on the scale (“extremely unlikely to participate”), only 5% of those businesses will ultimately sign up for the program. For purposes of this analysis, we assumed that Ameren Illinois would be able to move all businesses to a "high" level of information / familiarity with the relevant EE options.

Table 6-1 Translating Stated Intent into Take Rates for Irregular Purchases

Scale Rating	Adjustment for Those High on Information
1	3%
2	3%
3	4%
4	8%
5	30%
6	38%
7	48%
8	58%
9	61%
10	72%

As noted above, YGDI uses a different adjustment for products that are purchased more frequently, since customers are more familiar with their "choice set" and have typical purchases that they tend to make in a given category. Lighting is the only measure tested in this survey which falls into this "regular purchase" category, and the adjustment values outlined below were used for this option and applied them the same way that was outlined above. Note that Information level (familiarity with the category) is not used as a differentiator in adjustments for this category since – by definition – all "buyers" are more familiar with regular purchases.

Table 2-2 Translating Stated Intent into Take Rates for REGULAR Purchases

Scale Rating	Adjustment For Those Making Regular Purchases
1	0%
2	0%
3	0%
4	5%
5	12%
6	26%
7	44%
8	58%
9	67%
10	83%

Testing Programs at Different Payback Levels

In order to provide insight about the impact that varying payback periods might have on customer response to the programs tested, the survey explored response to each program for which payback period was relevant, at 1, 3, and 5 year payback levels. The survey used a method developed by an economist by the name of von Westendorp to capture this information; this technique begins by asking respondents to assess their likelihood to adopt a program at a 3 year payback, and then (a) if they respond positively to this option, asks them to respond to a 5 year payback, or (b) if they respond negatively to this option, asks them to respond to a 1 year payback period. In order to deal with issues of survey length, the tested program measures were sorted into different categories that were similar in terms of scale of investment and type of measure. The full 1, 3, and 5 year payback assessment were then conducted for a single program within each category. The remaining programs within each category were evaluated at the 3 year payback level only. Regression analysis was then used to develop the 1 and 5 year payback values for each measure, using the slopes observed for the example program in each category.

Weighting

In order to better mirror the business market in Ameren Illinois's service territory, data were weighted on the basis of the 124 sample cells, in order to ensure that the weighted sample mapped back to the underlying population on electric usage, gas usage, and region / zone.

Psychographic Segmentation Analysis

One of the goals of the analysis was to explore whether or not there were psychographic customer segments that could be helpful in providing an understanding of why customers responded as they did to the programs tested, and to support initial thinking about how to prioritize marketing efforts and marketing communications. Several steps were involved in developing this psychographic segmentation:

- First, the team analyzed the groups of items that were included in the questionnaire which were designed to generate psychographic insights (these included Q2 and Q4 (questions addressing opinions toward Ameren Illinois), Q14 (questions exploring how customers think about using energy in their facility), Q23 and Q25 (questions about priorities when evaluating energy-related products and services for their facility)).
- Second, the team conducted analyses that were intended to identify groups of items that respondents tended to evaluate similarly. This process is called "factor analysis," and refers to the process of finding and interpreting these groups of items that people think of as similar.
- Third, the team considered all of the attitudinal factors that were identified in step two, along with a variety of other variables to find the ones that generated the most useful segmentation model. This was partly a trial and error process, but ultimately, the variables selected to be included in the segmentation model included:
    - Whether the business owns or leases their facility (QS5)
    - Overall satisfaction with Ameren Illinois (Q3)
    - Preference for whether Ameren Illinois should focus on pursuing EE and conservation initiative, or on keeping costs low for their customers(Q5)
    - Kilowatt hours (from sample)
    - Agreement / disagreement with the item "Our organization believes that the long-term threat from global warming and climate change is real, and potentially devastating" (Q14_7)
    - Importance of the item "Features and functions included with the product / service" when selecting which pieces of equipment, electronic devices, or other energy-related products or services to purchase for their facility (Q23_6)
    - Agreement / disagreement with the item "The reality is that the most energy-efficient equipment is also almost always the best equipment on the market" (Q25_6)
    - Agreement / disagreement with the item "Since energy costs make up such a small portion of our total operating costs, energy issues just don't get a lot of attention" (Q25_11)

- A calculated variable that was called "EE Informed Level" and was based on indicators of experience with / awareness of EE end use options to-date, and awareness and use of existing Ameren EE programs
- A calculated variable that was called "Likely Taker Level" and was based on a count of the frequency that a given respondent rated themselves as "8" or higher on the "1" to "10" likelihood to participate scale for each of the 34 EE programs tested

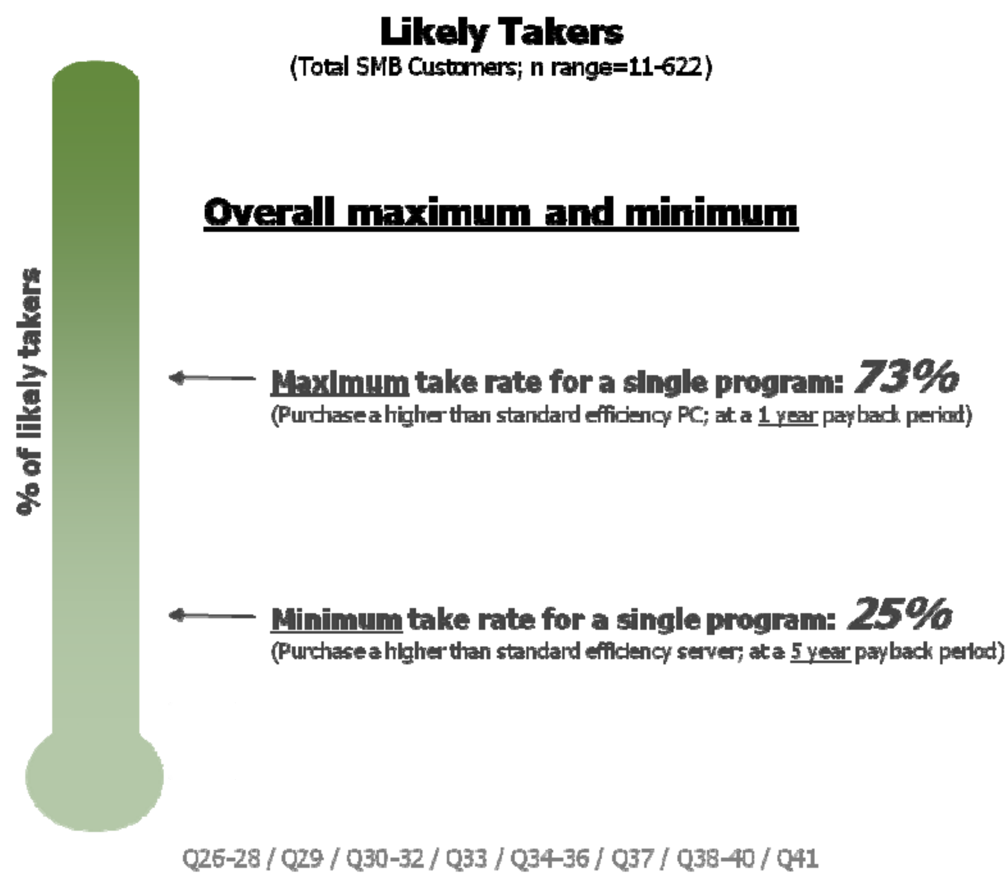
Once these inputs were identified, the team tested a wide variety of segmentation solutions, ultimately selecting a solution that optimized relative segment size, absolute segment sample size, and overall meaningfulness of segment profiles. The solution selected as most appropriate was a solution containing 6 segments with different response patterns to the final set of selected segmentation inputs.

C&I PROGRAM INTEREST SURVEY RESULTS

Note that the "take rates" that are reported in this chapter have been adjusted using the say / do adjustment model referenced in the Methodology section earlier in this report. As such, they represent the team's best estimate of the most likely proportion of customers who would actively sign up for each program, given that they were eligible to do so, and were fully aware of the program and its potential benefits for them.

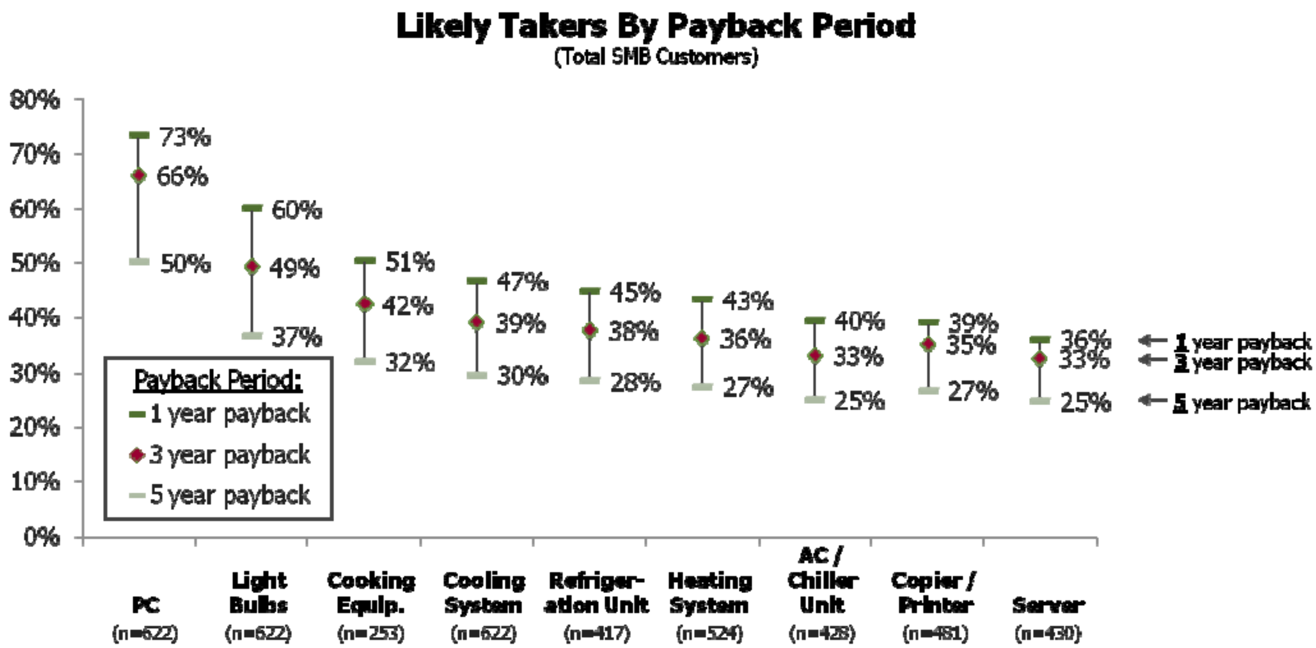
As shown in Figure 7-1, the range of take rates across the full range of programs / measures tested spans from a low of around one-tenth of all eligible customers to a high of just under 50% of all eligible customers.

Figure 7-1 Maximum and Minimum Take Rates for Business Customers



The first full category of EE measures that were explored considered the idea of purchasing higher than standard efficiency appliances within the context of a normal replacement cycle. Within the nine appliances or end uses considered, light bulbs were the technology that business customers are estimated to be the most likely to upgrade to an EE option at each payback period level (and this is largely due to the use of the "regular purchase" adjustment for this product category). Across the other technologies, the take rates are highest at each payback period level for the least expensive equipment purchases: PCs and light bulbs. While – as expected – take rates are higher for lower payback periods, these ranges are smallest for basic office equipment such as printer and servers (dipping to 25% at a 5 year payback period). Figure 7-2 shows the take rates for equipment measures.

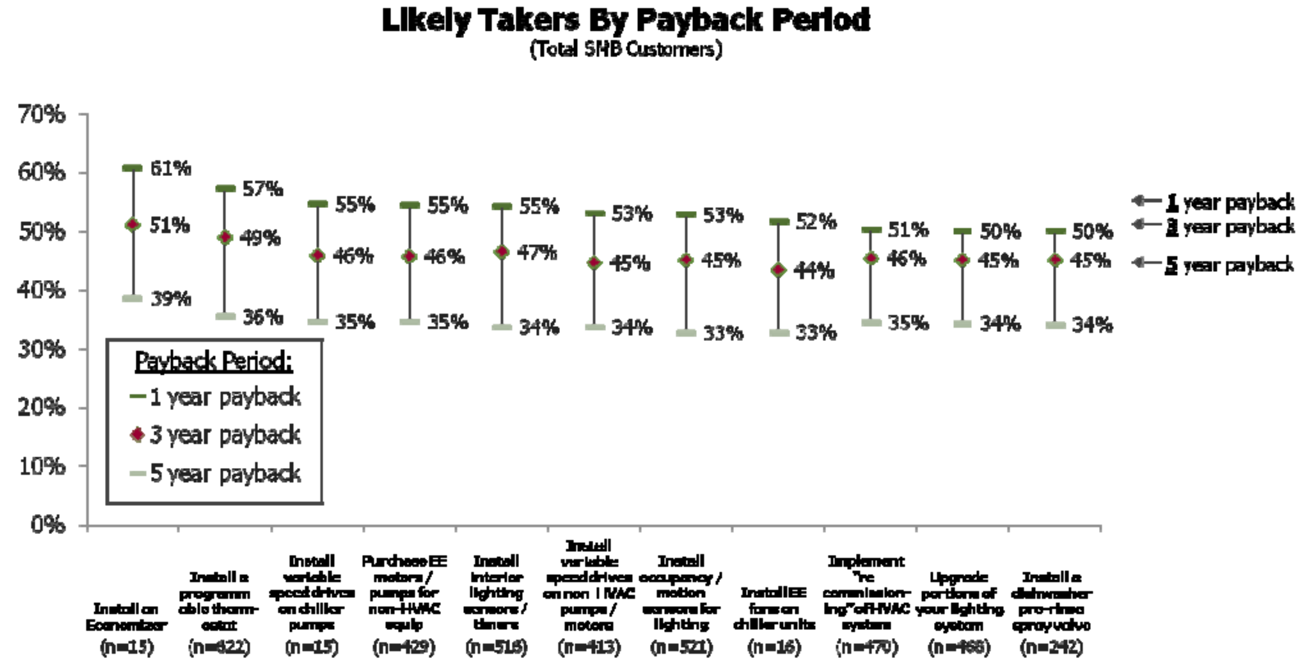
Figure 7-2 Measures for Purchasing / Installing Energy Efficient Equipment*



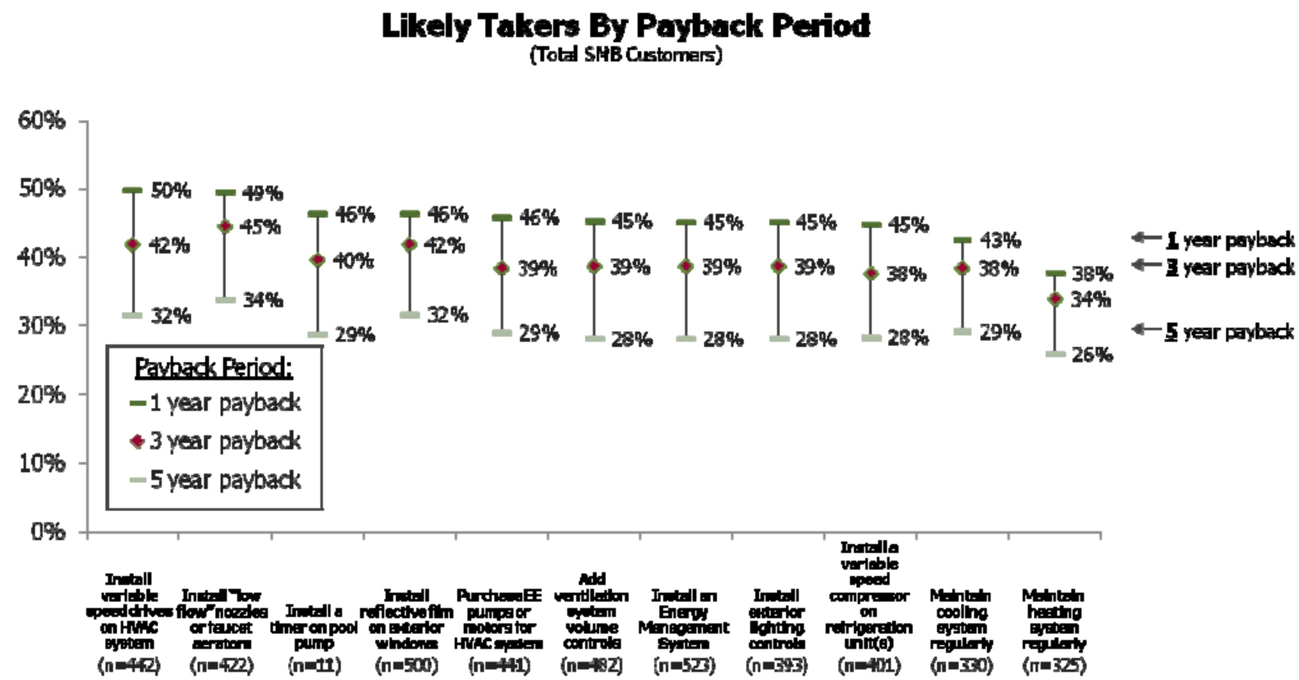
Q265-28/Q29/Q34-36/Q37
*Note: Assumes a normal replacement cycle

Among 22 options having to do with upgrading existing systems, or improved maintenance, business customers indicate a higher likelihood to install a programmable thermostat, as shown in Figure 7-3. (Though applicable to only a few, take rates are were highest for installing an Economizer). The take rates differ rather widely across these options (going from a high of 61% for installing an Economizer at a one year payback to a low of 26% for regularly maintaining the heating system at 5 year payback period).

Figure 7-3 Measures for Improving Energy Efficiency of Existing Systems



Q29/Q30/Q33/Q37



Q29/Q30/Q33/Q37

Considering all of the measures tested, as shown in Table 7-1, the group of measures with the highest adoption rates is comprised of a mix of both measures associated with purchasing or installing energy efficient equipment and measures for improving the energy efficiency of existing systems. It is interesting to note that, because they are based on a normal replacement cycle, the measures in the "Purchasing / Installing Energy Efficient Equipment" group are among those that take the least amount of additional effort to implement.

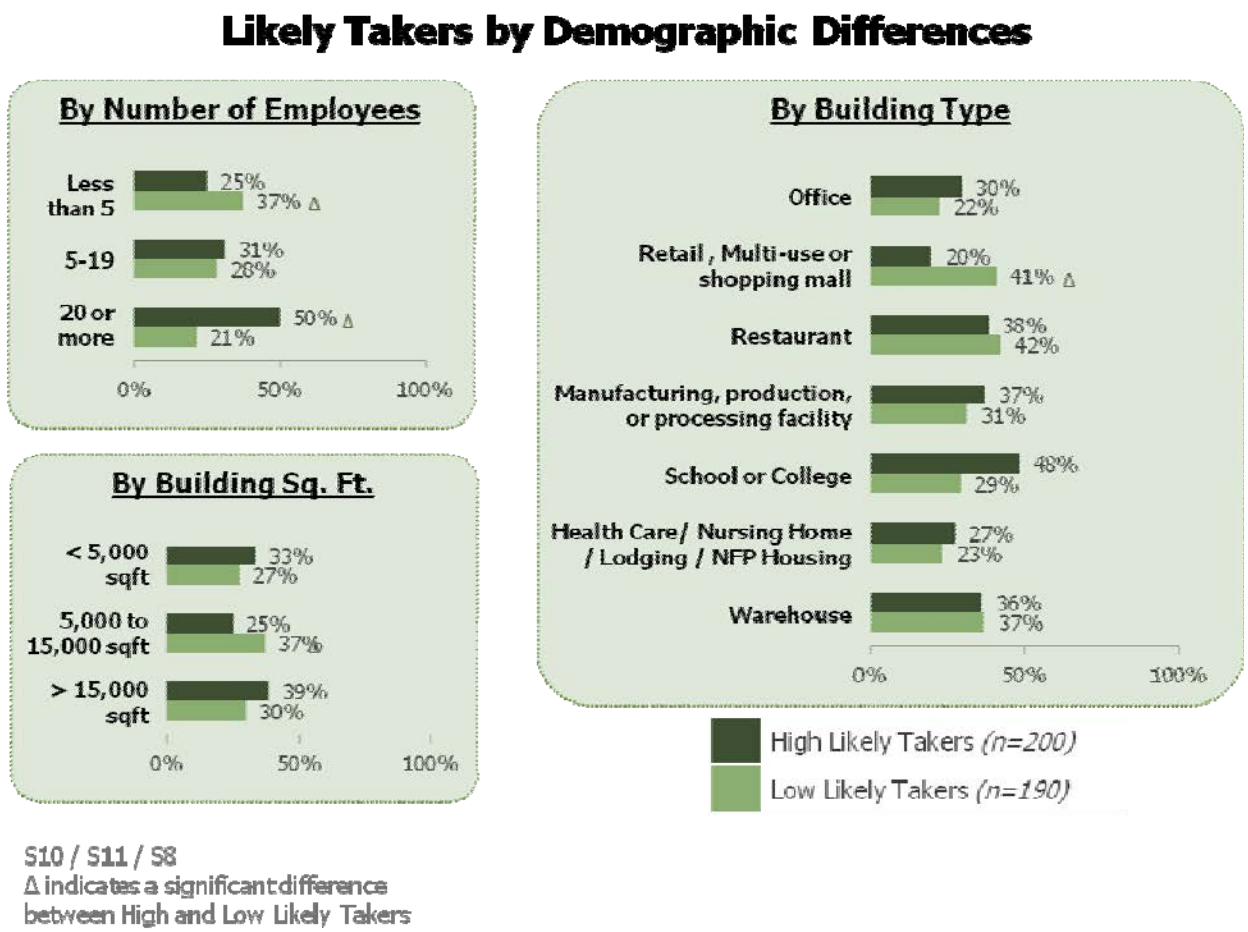
Table 7-1 Opportunities for Measures, High to Low

Measures: Highest Opportunity	Likely Takers @ 3yr Payback (or payback irrelevant for *No Upfront Investment Measures)* (n range=11-622)	Measures for:
Purchase EE PC[2]	66%	Purchasing / Installing EE Equipment
Install an Economizer	51%	Improving EE of Existing Systems
Reduce thermostat setting during the winter[1]	50%	No Upfront Investment
Purchase EE light bulbs[2]	49%	Purchasing / Installing EE Equipment
Install an advanced programmable, clock-based thermostat	49%	Improving EE of Existing Systems
Install interior lighting sensors / timers	47%	Improving EE of Existing Systems
Measures: Middle Opportunity	**Likely Takers @ 3yr Payback (n range=15-622)**	**Measures for:**
Install variable speed drives on chiller pumps	46%	Improving EE of Existing Systems
Purchase EE motors / pumps for non-HVAC equip	46%	Improving EE of Existing Systems
Implement “re-commissioning” of HVAC system	46%	Improving EE of Existing Systems
Install occupancy / motion sensors for lighting	45%	Improving EE of Existing Systems
Upgrade portions of your lighting system	45%	Improving EE of Existing Systems
Install a dishwasher pre-rinse spray valve	45%	Improving EE of Existing Systems
Install variable speed drives on non-HVAC pumps / motors	45%	Improving EE of Existing Systems
Install “low flow” nozzles or faucet aerators	45%	Improving EE of Existing Systems
Purchase EE refrigeration unit[2]	44%	Purchasing / Installing EE Equipment
Install EE fans on chiller units[2]	44%	Improving EE of Existing Systems
Reduce water heater temperature[1]	43%	No Upfront Investment
Install EE cooking equipment[2]	42%	Purchasing / Installing EE Equipment
Install variable speed drives on HVAC system	42%	Improving EE of Existing Systems
Install reflective film on exterior windows	42%	Improving EE of Existing Systems
Measures: Lowest Opportunity	**Likely Takers @ 3yr Payback (n range=134-749)**	**Measures for:**
Install a timer on pool pump	40%	Improving EE of Existing Systems
Purchase EE cooling system[2]	39%	Purchasing / Installing EE Equipment
Add ventilation system volume controls	39%	Improving EE of Existing Systems
Install an Energy Management System	39%	Improving EE of Existing Systems
Install exterior lighting controls	39%	Improving EE of Existing Systems
Purchase EE pumps or motors for HVAC system	39%	Improving EE of Existing Systems
Maintain cooling system regularly	38%	Improving EE of Existing Systems
Install a variable speed compressor on refrigeration unit(s)	38%	Improving EE of Existing Systems
Purchase EE heating system[2]	36%	Purchasing / Installing EE Equipment
Purchase EE copier / printer[2]	35%	Purchasing / Installing EE Equipment
Raise your thermostat setting in the summer[1]	34%	No Upfront Investment
Maintain heating system regularly	34%	Improving EE of Existing Systems
Purchase EE central / packaged AC or chiller[2]	33%	Purchasing / Installing EE Equipment
Purchase EE server[2]	33%	Purchasing / Installing EE Equipment

Some subtle differences exist in the mean take rates among various demographic groups, as shown in Figure 7-4. Groups exhibiting the higher opportunity than their counterparts include:

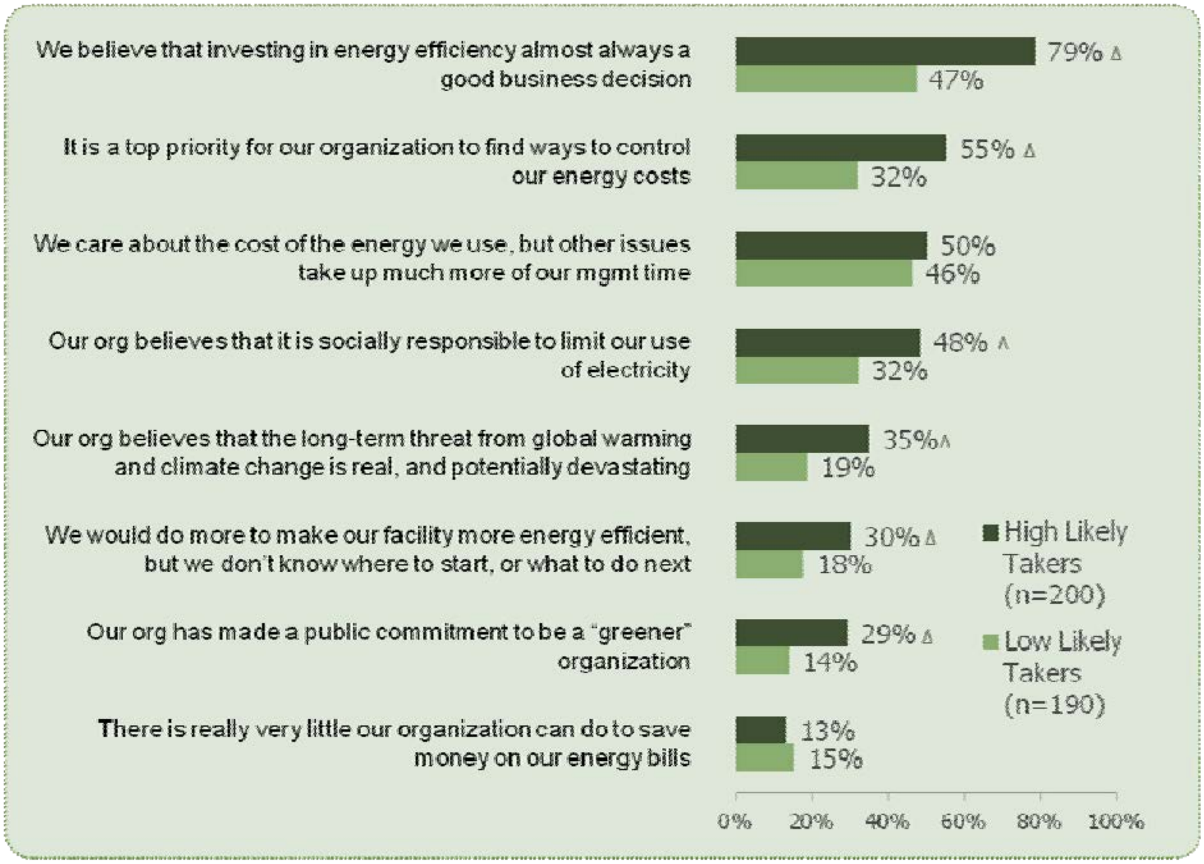
- Organizations with 20 or more employees
- Organizations with either small facilities (less than 5,000 sq. ft.) or very large facilities (greater than 15,000 sq. ft.)
- Organizations operating as/in a school or college

Figure 7-4 Likely Takers by Demographics



More striking differences in the mean take rate, however, relate to attitudinal differences as shown in Figure 7-5. Unsurprisingly, customers who have highly "green" and/or highly cost-savings-focused attitudes consistently show much higher likelihoods to adopt energy efficiency measures.

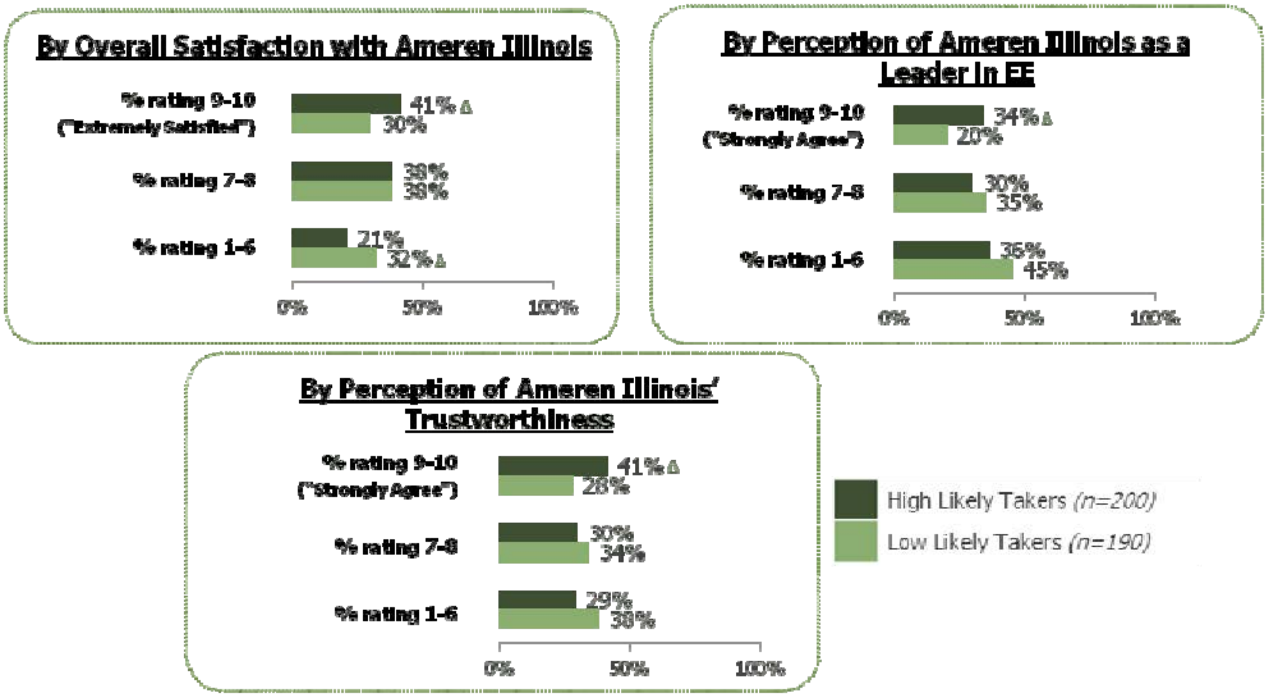
Figure 7-5 Likely Takers by General Attitudinal Differences (% Top Box, 8-10)



Q14
Δ indicates a significant difference between High and Low Likely Takers

Another key factor in likelihood to adopt energy efficiency measures appears to be the degree to which customers have favorable opinions of Ameren Illinois. As shown in Figure 7-6, customers who have more favorable opinions about Ameren Illinois (are extremely satisfied with Ameren Illinois, perceive Ameren Illinois as a leader in energy efficiency, strongly agree that Ameren Illinois is extremely trustworthy) consistently show significantly higher likelihoods to adopt energy efficiency measures.

Figure 7-6 Likely Takers by Attitudinal Differences about Ameren Illinois



Q3, Q2_1, Q2_2
Δ indicates a significant difference between High and Low Likely Takers

Summary: Overall Response to EE Programs by Ameren Illinois Customers

As the preceding pages have suggested, it appears that psychographic factors (attitudes) have a larger impact on customer response to tested EE programs than do demographic differences. This means that how customers think about Ameren Illinois is likely to be much more important in predicting how they will respond to new EE programs offered by the company, than will differences in how they operate their business (building type and size, number of employees).

This is important because it means that it is critical to understand the impact of customer attitudes by understanding psychographic segments.

- These segments may identify the confluence of attitudes and concerns that map to differences in overall reaction to potential Ameren Illinois EE programs.
- In fact, the segmentation analysis reported in the following section focuses on just these issues, focusing in particular, on the role of customer attitudes and perceptions in contributing to likely response to EE programs.

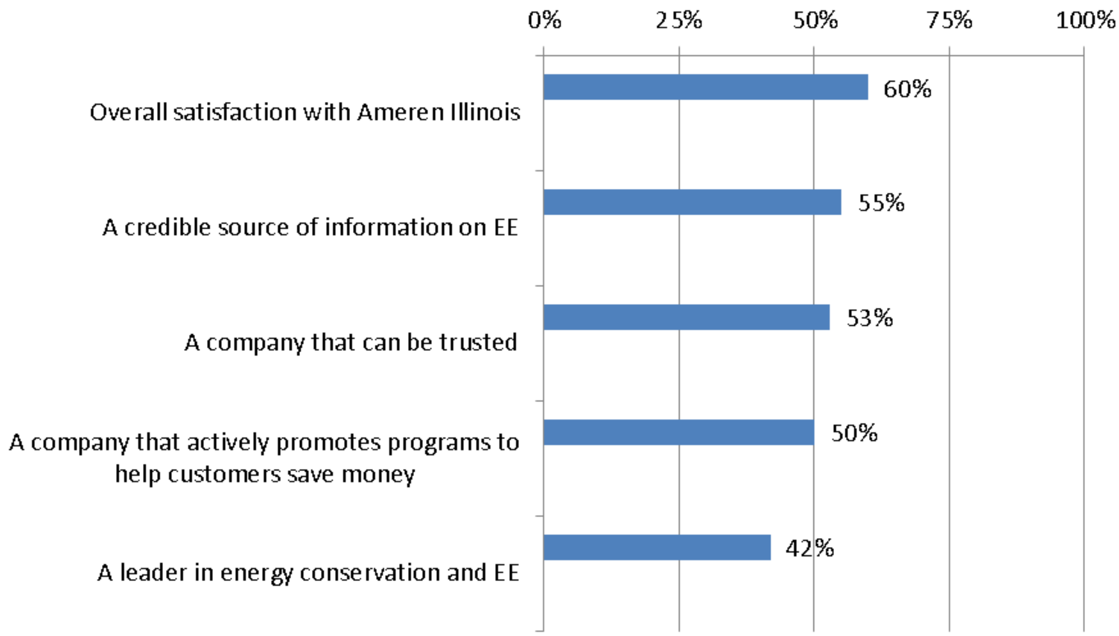
UNDERSTANDING BUSINESS CUSTOMER PERSPECTIVES ON ENERGY ISSUES

Understanding Overall Customer Opinions of Ameren Illinois

In order to understand what lies beneath customer reaction to new EE options that might be offered by Ameren Illinois, it is worth exploring overall customer perspectives, both toward the company, and toward energy issues as a whole.

We begin this section by exploring overall customer perspectives toward Ameren Illinois and these findings are reported in Figure 8-1 below. In terms of their overall opinion toward the company, nearly two-thirds (60%)[5] give the company a top-three box rating (8-10 on a 10-point scale) on overall satisfaction. On the more specific attributes relating to the company's activity and credibility in promoting and providing information about energy efficiency, slightly fewer people (about half) give the company top three box ratings.

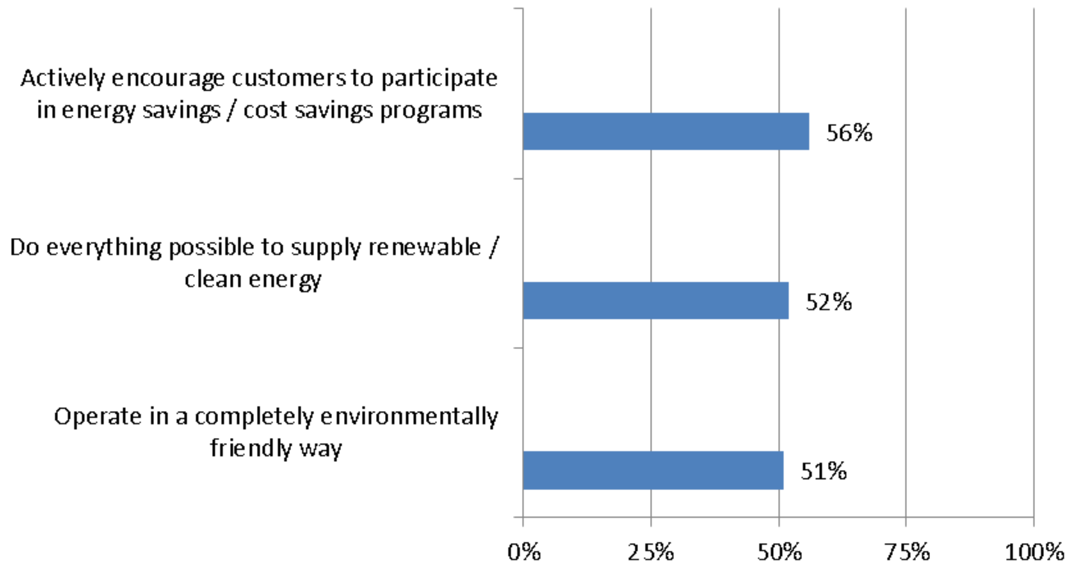
Figure 8-1 Overall Ratings of Ameren Illinois (ratings of 8-10 on 10 pt. scale)



Turning to the question of whether or not Ameren Illinois **should** promote energy efficiency, and/or, greener energy options, the results suggest that a majority of customers do support this activity. As shown in Figure 8-2, a total of 56% believe the company should "actively encourage" customers to participate in energy / cost savings programs, while just slightly fewer (51%) say the company should operate in a "completely environmentally friendly way."

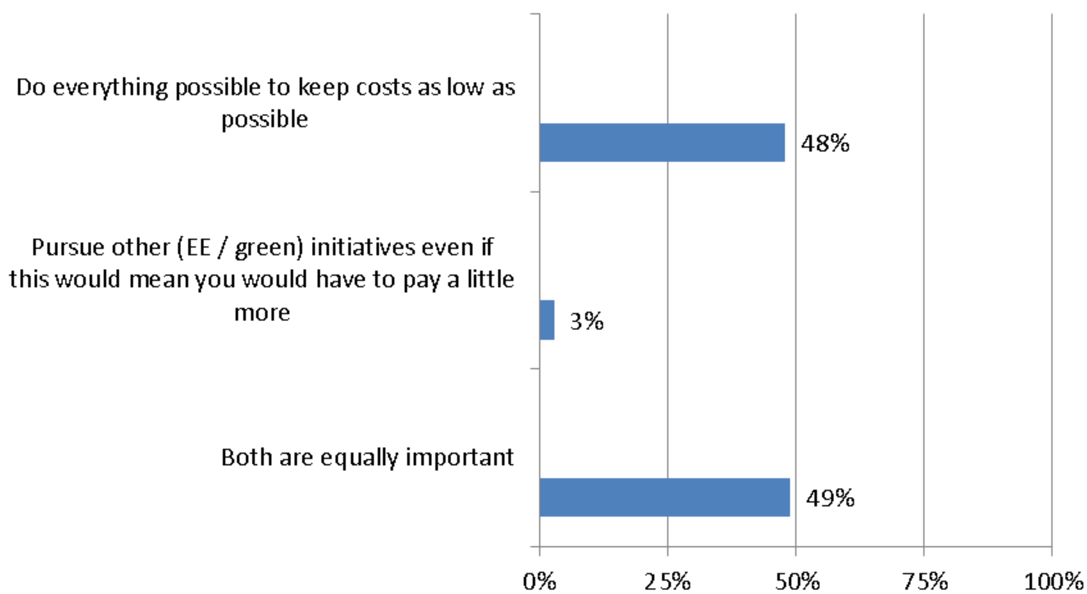
[5] Note that this compares to a 53% top-three-box rating for Ameren Missouri that we observed in similar research conducted in July 2009.

Figure 8-2 Ratings of Ameren Illinois on EE-Specific Issues (ratings of 8-10 on 10 pt. scale)



It is interesting – and important – to note, however, that while Ameren Illinois customers appear to support EE, and green-focused activities by the company in the abstract, **they do not want** these activities to cost them more. When customers are asked a forced choice question, just under half say that the company should do everything possible to keep costs as low as possible, while only 3% say the company should pursue EE or green options if doing so would mean they would have to pay a little more (Figure 8-3). The remainder of the population wants both things at the same time (to keep costs as low as possible **and** pursue these other initiatives).

Figure 8-3 Responses to forced choice question on EE / Green vs. Cost Options

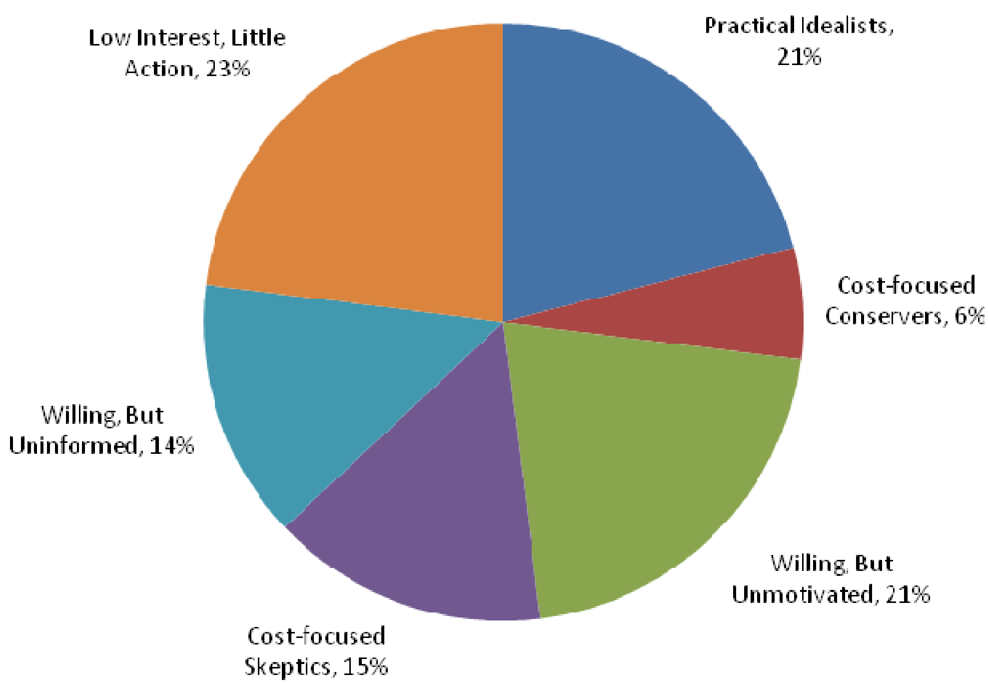


Exploring Customer Segments

So far, our analysis of customer perspectives on energy issues has only considered customers as a whole. Customers differ, however, and this section of the report explores some of the key divisions that exist within the non-residential customer base. Specifically, the team developed a segmentation model that disaggregated business customers into groups that differ in terms of whether, and why, they might be interested in pursuing energy efficiency options. The goal of the segmentation analysis was to define groups of customers that were different in ways that would allow Ameren Illinois to prioritize customer targets for EE program marketing, and to develop targeted messages for each of those segments.

Using a variety of attitudinal and behavioral inputs (see the discussion earlier in this report), the team identified a set of six business customer segments that seemed to best represent the differences in this population on these issues. The segment sizes are outlined in Figure 8-4 below.

Figure 8-4 Business Segment Distribution



Base Segment Descriptions

Summary descriptions for each of the segments follow:

Practical Idealists (21%)

Concerned with conserving energy, both from a cost-focus and an environmental perspective (they are the "greenest" segment). They are feature focused when considering equipment, but they also say they research options and compare prices. They have the highest opinion of Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They tend to be high on familiarity with EE / conservation measures to date, and are most likely to say that they would adopt new EE / conservation measures in the future.

Cost-Focused Conservers (6%)

Informed about, and interested in, conservation / EE measures, but for cost reasons rather than environmental reasons. This group believes in the value of EE as a way to save money, and has taken many prior EE actions. They trust Ameren Illinois and believe the company should keep costs low for their customers while also pursuing green options. They have the highest average kWh, higher than average building size and number of employees, and the second highest program take rate.

Willing, But Unmotivated (21%)

This group believes in conserving energy, for both environmental and cost reasons, and has the highest familiarity with EE / conservation measures. Despite this, they aren't as active as you might expect in conserving energy, which could be due to the fact that they already have lower than average kWh. They are, however, likely to say they would adopt new EE programs in the future.

Cost-Focused Skeptics (15%)

Skeptical about global warming and the need for EE, this group is only focused on saving energy if it will in turn save them money. They have a positive opinion of Ameren Illinois, but believe their priority should be keeping costs low for their customers rather than focusing on conservation. While unfamiliar with EE measures, they have higher than average kWh and would be somewhat likely to adopt new EE / conservation measures in the future if they thought it would save them money.

Willing, But Uninformed (14%)

This group is relatively less experienced with EE / conservation measures to-date, and unsure of what they could be doing in this area, but they believe that conservation is important and that Ameren Illinois should be focused on pursuing green options in addition to keeping energy costs low. They have an average building size and number of employees, as well as have lower than average kWh. They are low on take rates across programs, and are the lowest on familiarity / experience with EE conservation measures currently.

Low Interest, Little Action (23%)

This group has very little interest in conservation or EE. This group actively dislikes Ameren Illinois, particularly on the dimensions of trust and being a leader in EE. They do not want the company to encourage customers to save energy, nor do they want it to pursue green options. They do want the company to keep costs low as its sole focus. They operate in smaller than average size buildings, and have smaller than average company size (more than half have less than 10 employees). They are the lowest on likelihood to adopt new EE programs and second lowest on existing familiarity.

Segment Marketing

Table 8-1 Segment Marketing

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Practical Idealists (21%)	Receptive to messages on both the positive environmental impact of EE / conservation, as well as cost-savings – plus satisfaction with Ameren Illinois is high, making them likely to trust their utility as a reliable source for energy efficiency suggestions.	Building size is small, but annual kWh usage is average, suggesting that this segment has room to be more efficient in its use of energy.	Projected take rates are the highest here of any of the other segments. Also note that high opinions of Ameren Illinois would likely make them more receptive to further education/ encouragement on the benefits of participating in new EE options.	They are already inclined to take EE actions – and they have already made some EE changes. Encouraging them to do more may just mean helping them to find the opportunity.
Cost-Focused Conservers (6%)	This segment is positive toward Ameren Illinois, and while they think encouraging customers to participate in energy saving programs is just as important as keeping energy costs low, for their business cost cutting is top of mind. They will likely be very receptive to messages about saving energy as a way to save money.	Building and company sizes tend to be larger than average and they have the highest average kWh usage of any segment. Having said that, they are very familiar with EE and conservation actions and programs, and have the highest past participation of any segment, so while there may be opportunity for load reduction, the simple (and low cost) things have probably been done already.	They are not fans of Ameren Illinois, but are fans of saving money (they have the second highest average new program take rate). Environmental messages will not have much effect on them, nor will messages that feel like “education” (since they already think they are pretty knowledgeable).	Since this group tends to like and trust Ameren Illinois, they should be open and receptive to messages from the company about reasons to consider EE / conservation actions, particularly as a way to save money.

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Willing, But Unmotivated (21%)	This is a challenging segment because they appear to be green, but are not deeply so. They agree with overall statements of environmental concern and are the most familiar with EE/conservation of any segment, but when pushed, admit that they do not typically worry about the environmental effects of their day-to-day actions.	This group has average size buildings and larger company size, but lower than average kWh. They have taken some action to reduce their energy usage in the past, but doing so isn't top of mind.	Despite a current lack of action in EE/conservation measures, this segment is interested in participating in EE options in the future. Motivating this segment to act will be challenging, but there is potential to tap into their already high level of EE knowledge to convince them that participation would result in both cost and energy savings.	This group believes in EE and that Ameren Illinois should focus their efforts on both lowering energy costs and pursuing green initiatives. And while willing to participate in those initiatives, they will likely need messaging around how such programs would benefit them directly in order to become motivated to act.
Cost-Focused Skeptics (15%)	This is also a challenging segment for Ameren Illinois. They have the lowest participation in EE initiatives and are skeptical about the need for such measures. They are, however, favorable toward Ameren Illinois, who they believe should be focused only on decreasing energy costs for their customers.	This group has higher than average kWh and has yet to take much action to reduce their energy usage. There is definite opportunity for load reduction here, though they will need to be convinced of the cost benefit as messages around energy savings won't appeal to them.	This group is somewhat responsive to the EE measures tested, though obviously, there are barriers to implementation for them. They don't believe in the need for EE / conservation and are unfamiliar with such efforts to-date, but could be swayed by opportunities to cut costs.	This group likes and trusts Ameren Illinois, but is the most adamant that they focus solely on helping their customers save on energy costs. Increasing awareness of the need for EE/conservation, as well as promoting EE initiatives that will have a near-term cost savings would likely be an important starting points for this population.

Segment	Marketing Effort	Potential Load Impact	Receptivity to Future Conservation Programs	Going Forward
Willing But Uninformed (14%)	This segment will require a substantial education effort as they have the lowest familiarity and experience with EE / conservation to-date. But, they are moderately favorable to the company and its efforts to pursue both lower costs and green initiatives, so would likely be receptive to messaging focused on the basics of EE in the workplace.	This group has average size buildings and number of employees but lower than average kWh. Despite this, their lack of action so far indicates a substantial opportunity to improve the EE of these buildings, they are simply unsure of where to start.	This segment expresses lower take rates across the EE measures tested, but this is very likely due to a lack of awareness and understanding of the benefits of EE / conservation. Education is the key to increasing take rates among this group.	EE education should be the primary focus for engaging this segment. They are moderately favorable toward Ameren Illinois and believe that EE is important, but they lack the knowledge and experience to know where to start with their own conservation efforts.
Low Interest, Little Action (23%)	This segment would likely be the most difficult to market to as they are the least likely to like Ameren Illinois, and the least concerned with environmental issues. Beyond this, they appear to simply be unconcerned with energy and related issues.	Buildings and company sizes in this segment tend to be somewhat smaller than average, and with lower kWh. They have done relatively little to-date in terms of EE measures.	Take rates are the lowest in this group and familiarity / experience with EE is also very low. Given their lack of involvement in this category, it is not clear at all what sort of messaging would be likely to get this group's attention.	While it could be argued that EE education is needed with this group, it is unclear how to get their attention to attend to any type of education.

Business Segments – At a Glance

Table 8-2 Segment Prioritization

	Practical Idealists	Cost-Focused Conservers	Willing, But Unmotivated	Cost-Focused Skeptics	Willing, But Uninformed	Low Interest, Little Action
Size	21%	6%	21%	15%	14%	23%
Opportunity	**High** They have done a lot already, but are open to – and able to – do more	**Medium-High** Experienced in EE and willing to do more; if the money is right	**Medium-Low** Convinced of the advisability of EE actions, but unmotivated to act to date	**Medium-Low** Skeptical about the need for EE, but are interested in its cost saving benefits	**Low** Least informed and unsure of how EE could benefit them or even where to start	**Very Low** Totally uninvolved with the energy category and no interest in becoming so
Role for Ameren Illinois	**Trusted Green Partner:** They like the company and see Ameren Illinois as having an important role in both EE and promoting green initiatives	**Save Us Money:** They like the company and see Ameren Illinois as having an important role in both EE and lowering energy costs	**Help Me:** They like the company and want it to help them become more energy efficient; they just need to be swayed in that direction.	**Save Us Money:** Positive opinion of the company, but just want Ameren Illinois to focus on lowering costs (for me)	**Teach Me:** Neutral view of the company, but see Ameren Illinois as having an important role in both EE and lowering energy costs; interest in EE would likely increase with more information	**Don't Bother Me:** Dislike the company, not interested in energy issues generally, and see little likely value in EE actions

Table 8-3 Likely Takers given a 3 year payback period

	Practical Idealists	Cost-Focused Conservers	Willing, But Unmotivated	Cost-Focused Skeptics	Willing, But Uninformed	Low Interest, Little Action
Size	21%	6%	21%	15%	14%	23%
Measures for purchasing/installing energy efficient equipment (Assumes a normal replacement cycle)						
Light Bulbs	65%	56%	55%	47%	36%	38%
Heating System	59%	58%	57%	53%	42%	41%
Cooling System	58%	57%	60%	56%	46%	44%
Refrigeration Unit	56%	54%	53%	41%	39%	35%
AC / Chiller Unit	56%	60%	58%	53%	40%	39%
Copier / Printer	51%	47%	47%	36%	31%	29%
Cooking Equipment	50%	54%	40%	28%	27%	33%
PC	49%	47%	44%	41%	30%	28%
Server	47%	46%	47%	35%	31%	28%
Measures for improving energy efficiency of existing systems						
Install EE fans on chiller units	55%	64%	54%	58%	48%	36%
Install a timer on pool pump	64%	32%	60%	30%	30%	n/a
Maintain cooling system regularly	61%	51%	52%	36%	35%	35%
Maintain heating system regularly	61%	51%	53%	36%	35%	36%
Install a programmable thermostat	58%	52%	51%	49%	41%	33%
Upgrade portions of your lighting system	57%	56%	51%	40%	37%	38%
Install exterior lighting controls	57%	62%	53%	46%	39%	35%
Purchase EE pumps or motors for HVAC system	54%	53%	54%	47%	34%	36%
Add ventilation system volume controls	54%	49%	51%	42%	30%	30%
Install variable speed drives on chiller pumps	53%	64%	48%	8%	4%	36%
Install occupancy / motion sensors for lighting	53%	48%	49%	37%	25%	26%

Purchase EE motors / pumps for non-HVAC equip	53%	53%	52%	43%	36%	32%
Install interior lighting sensors / timers	52%	49%	45%	36%	29%	28%
Install variable speed drives on non-HVAC pumps / motors	52%	54%	50%	41%	33%	29%
Install variable speed drives on HVAC system	51%	54%	54%	45%	33%	36%
Install “low flow” nozzles or faucet aerators	51%	43%	41%	25%	31%	22%
Install an Energy Management System	50%	46%	44%	41%	29%	26%
Implement “re-commissioning” of HVAC system	48%	48%	45%	33%	27%	33%
Install reflective film on exterior windows	47%	38%	40%	23%	25%	31%
Install a dishwasher pre-rinse spray valve	42%	54%	27%	23%	35%	27%
Install a variable speed compressor on refrigeration unit(s)	42%	50%	49%	32%	28%	24%
Install an Economizer	34%	72%	48%	8%	4%	36%
Reduce thermostat setting during the winter	54%	49%	48%	41%	42%	39%
Reduce water heater temperature	51%	40%	49%	39%	37%	33%
Raise your thermostat setting during the summer	50%	47%	46%	40%	38%	36%

[6] No payback period associated with measure

C&I SATURATION SURVEY RESULTS

To gain an understanding of energy use for each building-type segment, information from the survey about building characteristics and end-use equipment were analyzed. This section presents the results of this analysis.

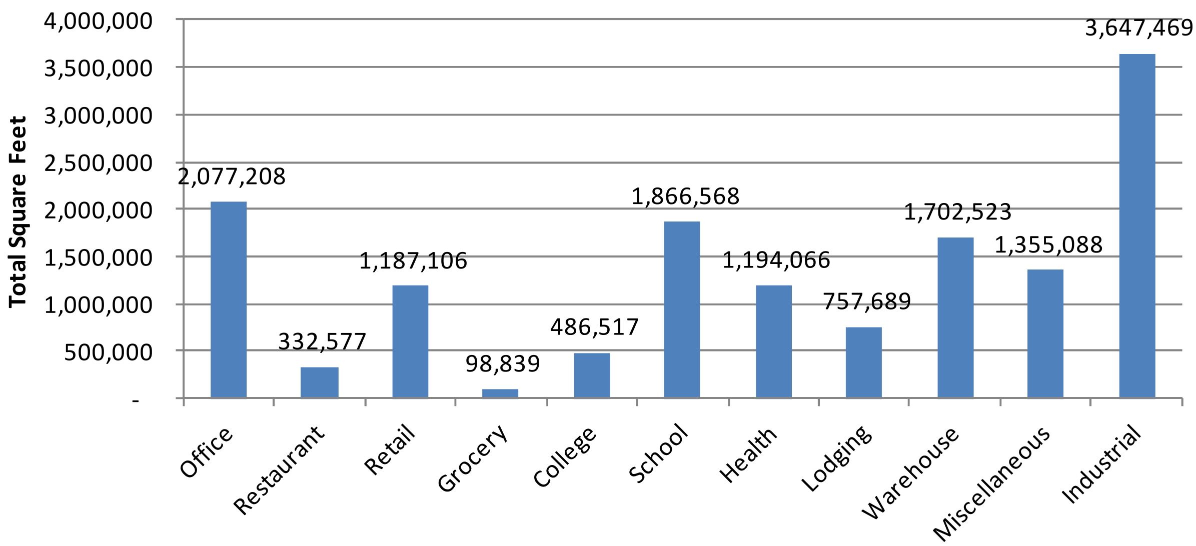
Building Characteristics

Key building characteristics include floor space, age of the building, and number of employees.

Size and Age of Segment Floor Space

Respondents were asked the approximate square footage of all the enclosed floor space in their building (Figure 9-1). The office and education segments have the most total floor space while grocery and restaurants have the least.

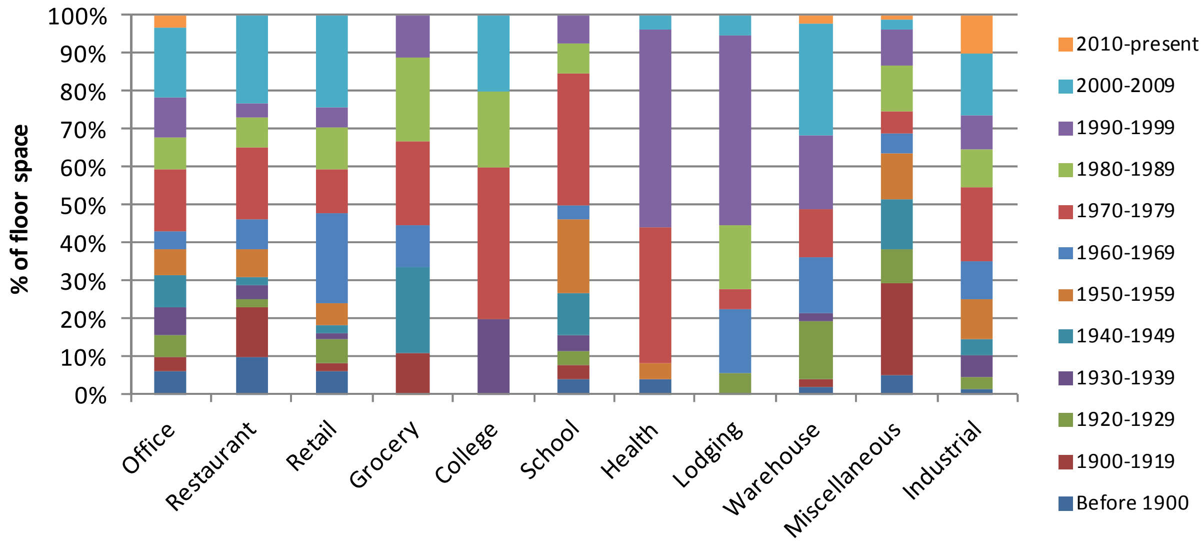
Figure 9-1 Total Square Footage by Segment



Building age is an indicator of the overall efficiency of the building. Further, buildings constructed most recently tend to be more efficient than older buildings. This is an important distinction in the end-use modeling approach taken for this study.

Respondents were asked to identify when the majority of their building or facility was built. The vast majority of floor space was built since 1960 with much of it built in the last decade (Figure 9-2). The three commercial segments with the "newest" buildings are health, warehouses and lodging with more than half built since 1990.

Figure 9-2 Age of Floorspace by Segment



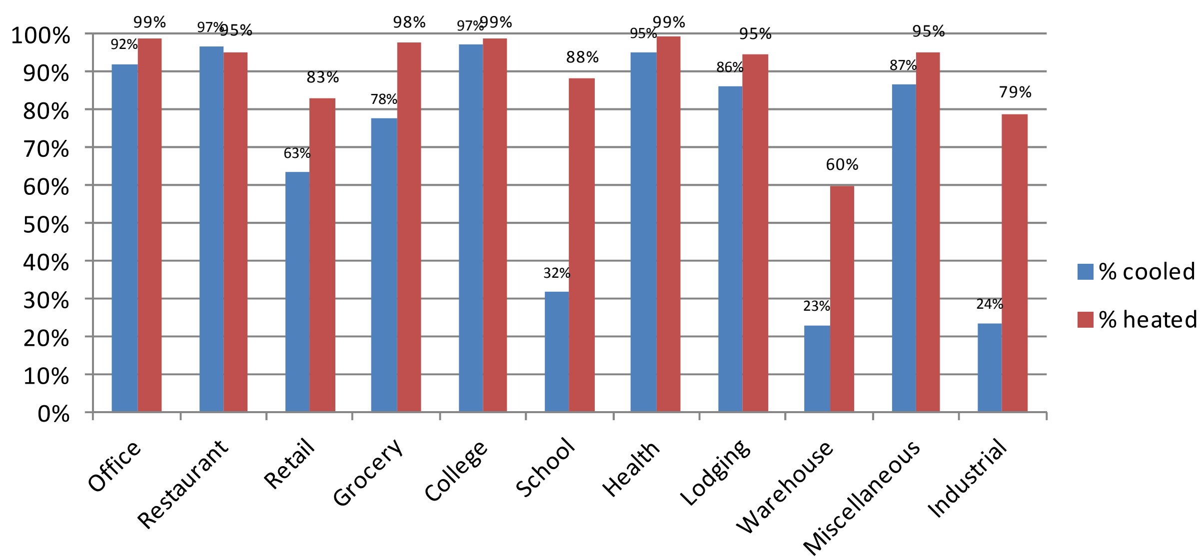
Building Equipment

Respondents were asked about the type of heating cooling and water heating equipment used in the building, the type of fuel used and the saturation of different types of lighting.

Heating and Cooling

The heating and cooling numbers presented here represent the percentage of square feet that is heated or cooled.

Figure 9-3 Percent of Floor Space Heated and Cooled by Segment



Roof top Units (RTU's) are the most popular type of primary cooling across all segments (Figure 9-4 and Table 9-1) Chillers and Split Systems are also very prevalent in all types of buildings.

Figure 9-4 Type of Primary Cooling Equipment by Segment

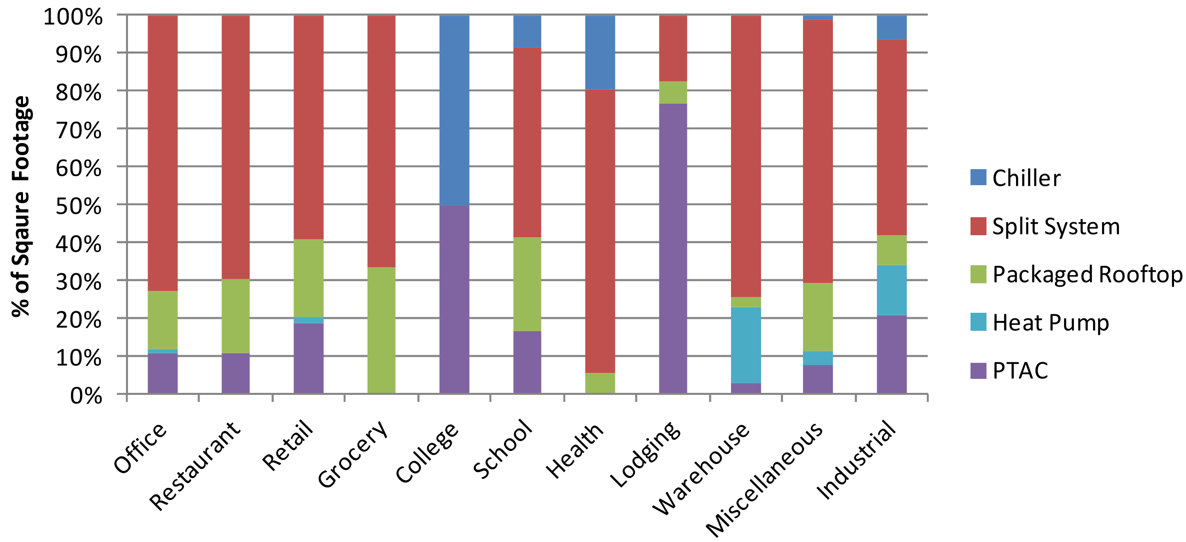


Table 9-1 Primary Cooling Equipment by Segment

Segment	Chiller	Split System	Packaged Rooftop	PTAC	Heat Pump
Office	0%	73%	15%	11%	1%
Restaurant	0%	70%	20%	11%	0%
Retail	0%	59%	20%	19%	2%
Grocery	0%	67%	33%	0%	0%
College	50%	0%	0%	50%	0%
School	8%	50%	25%	17%	0%
Health	19%	75%	6%	0%	0%
Lodging	0%	18%	6%	76%	0%
Warehouse	0%	74%	3%	3%	20%
Miscellaneous	1%	69%	18%	8%	4%
Industrial	6%	52%	8%	21%	13%

Natural gas furnaces are the main types of heating equipment used in most segments (Figure 9-5 and Table 9-3). Lodging is the only segment that uses electricity as its primary heating fuel.

Figure 9-5 Type of Primary Space Heating Equipment and Fuel

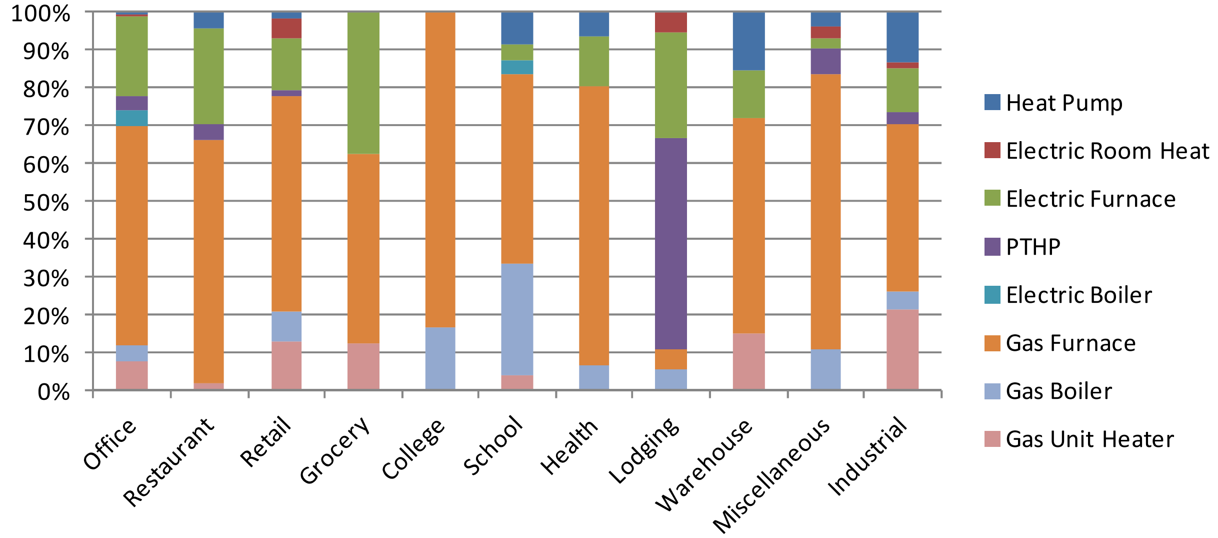


Table 9-2 Primary Space Heating Equipment by Segment

Segment	Heat Pump	Electric Room Heat	Electric Furnace	PTHP	Electric Boiler	Gas Furnace	Gas Boiler	Gas Unit Heater
Office	1%	1%	21%	3%	4%	58%	4%	8%
Restaurant	4%	0%	26%	4%	0%	64%	0%	2%
Retail	2%	5%	14%	2%	0%	57%	8%	13%
Grocery	0%	0%	38%	0%	0%	50%	0%	13%
College	0%	0%	0%	0%	0%	83%	17%	0%
School	8%	0%	4%	0%	4%	50%	29%	4%
Health	6%	0%	13%	0%	0%	74%	6%	0%
Lodging	0%	6%	28%	56%	0%	6%	6%	0%
Warehouse	15%	0%	13%	0%	0%	57%	0%	15%
Miscellaneous	4%	4%	2%	7%	0%	73%	11%	0%
Industrial	13%	2%	11%	3%	0%	44%	5%	21%

Water Heating

Natural gas is the fuel used most often to heat water in the majority of segments (Figure 9-6 and Table 9-3). But both the office segment and the lodging segment are more likely to have an electric water heater.

Figure 9-6 Type of Water Heating

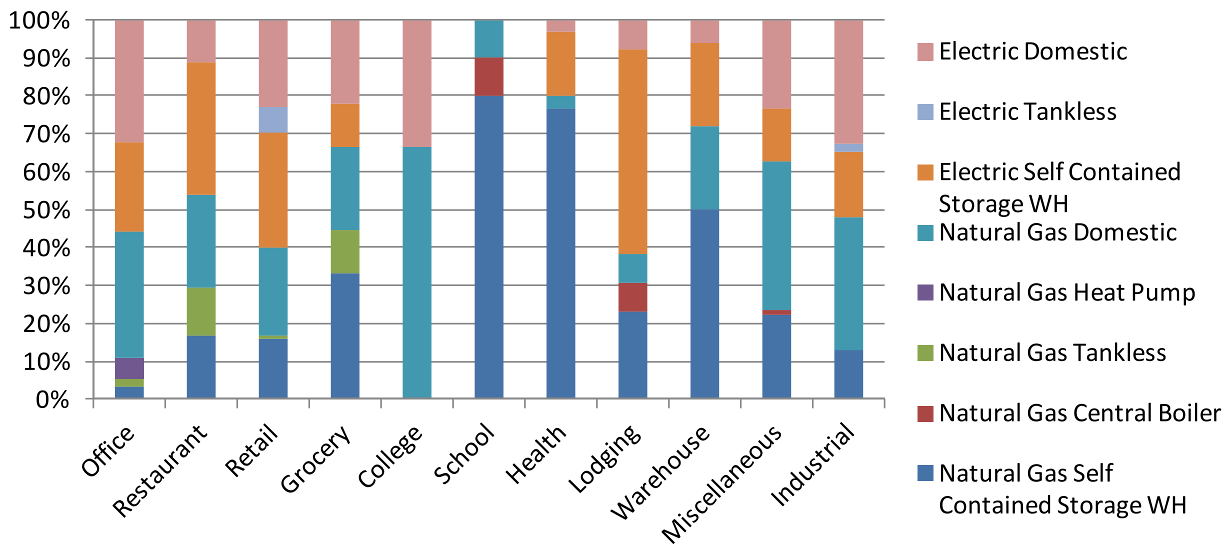


Table 9-3 Water Heating by Segment

Segment	Natural Gas Self Contained Storage WH	Natural Gas Central Boiler	Natural Gas Tankless	Natural Gas Heat Pump	Natural Gas Domestic	Electric Self Contained Storage WH	Electric Tankless	Electric Domestic
Office	3%	0%	2%	5%	33%	24%	0%	32%
Restaurant	17%	0%	13%	0%	24%	35%	0%	11%
Retail	16%	0%	1%	0%	23%	31%	6%	23%
Grocery	33%	0%	11%	0%	22%	11%	0%	22%
College	0%	0%	0%	0%	67%	0%	0%	33%
School	80%	10%	0%	0%	10%	0%	0%	0%
Health	77%	0%	0%	0%	3%	17%	0%	3%
Lodging	23%	8%	0%	0%	8%	54%	0%	8%
Warehouse	50%	0%	0%	0%	22%	22%	0%	6%
Miscellaneous	22%	1%	0%	0%	39%	14%	0%	23%
Industrial	13%	0%	0%	0%	35%	17%	2%	33%

Lighting

The survey asked respondents to count the number of lamps by various types in the facility. The most common type of lamp is fluorescent. In the LoadMAP model, fluorescent lamps are differentiated from the screw-in or specialty lamps.

Table 9-4 Average Number of Lamps by Type– All Indoor

Segment	Fluorescent	Incandescent	CFL	LED	Other
Office	35.3	3.9	20.3	2.4	5.2
Restaurant	23.2	5.0	11.6	2.1	9.5
Retail	73.5	4.0	5.7	1.5	6.0
Grocery	76.2	4.3	4.7	0.6	4.6
College	836.6	2.9	172.6	22.1	73.0
School	154.7	7.7	4.3	1.8	14.1
Health	70.5	5.5	36.4	0.6	11.9
Lodging	55.9	43.9	127.9	2.5	10.9
Warehouse	41.4	3.1	3.6	0.0	11.7
Miscellaneous	52.1	10.7	8.7	1.0	11.3
Industrial	150.2	4.7	5.8	0.9	10.2

The most prevalent type among the indoor fluorescent tubes is still the T12 lamps (Table 9-5). Lodging and office buildings are the segments with the most LED fluorescent lamps.

Table 9-5 Indoor Fluorescent Tubes by Type

Segment	T12	T8	Super T8	T5	LED	Other
Office	60%	34%	0%	0%	5%	1%
Restaurant	74%	22%	0%	2%	1%	0%
Retail	63%	31%	1%	4%	1%	0%
Grocery	38%	62%	0%	0%	0%	0%
College	17%	78%	0%	4%	1%	0%
School	56%	38%	3%	3%	0%	0%
Health	60%	24%	15%	0%	0%	0%
Lodging	81%	13%	2%	0%	4%	0%
Warehouse	65%	33%	0%	1%	0%	0%
Miscellaneous	55%	30%	7%	6%	1%	1%
Industrial	61%	31%	1%	7%	0%	0%

To calculate lighting EUIs, respondents were asked to estimate the percentage of lamps that were on during regular business hours and non-business hours by lighting type. Not surprisingly, more lights were on during business hours than non-business hours. A higher percentage of “other” lighting is on during non-business hours since the category includes lighting types that are typically used for security.

Table 9-6 Average Percent of Hours Lamps are On– All Indoor

Segment	Fluorescent		Incandescent		CFL		LED		Other	
	Biz Hrs	Non-Biz Hrs	Biz Hrs	Non-Biz Hrs	Biz Hrs	Non-Biz Hrs	Biz Hrs	Non-Biz Hrs	Biz Hrs	Non-Biz Hrs
Office	78%	3%	32%	2%	56%	13%	59%	31%	41%	39%
Restaurant	85%	7%	86%	16%	72%	40%	71%	18%	69%	42%
Retail	90%	5%	74%	1%	64%	21%	92%	19%	54%	45%
Grocery	100%	10%	75%	0%	84%	20%	100%	0%	71%	28%
College	93%	14%	100%	15%	90%	21%	97%	20%	81%	39%
School	84%	25%	45%	3%	22%	5%	76%	4%	60%	38%
Health	96%	7%	85%	11%	83%	23%	90%	76%	32%	74%
Lodging	90%	20%	88%	21%	84%	29%	62%	80%	44%	55%
Warehouse	79%	4%	61%	6%	72%	4%	75%	0%	47%	48%
Miscellaneous	63%	4%	54%	5%	38%	18%	39%	3%	54%	17%
Industrial	84%	5%	51%	5%	62%	12%	66%	47%	61%	44%

Energy Efficiency Measures

Respondents were asked what energy efficiency measures they have implemented in the last three years and what measures they had planned in the next two years. The measures were divided into five categories: lighting, HVAC, water heating, building structure and equipment upgrades. This information was used to determine the current saturation of energy-efficiency measures and to develop the adoption rates for the forecast.

Measures Implemented

HVAC upgrades are the most popular measures installed across all segments (Table 9-7). Adding insulation is also common, but varies more by segment. Less than half of all respondents in each segment implemented any of the HVAC measures shown in Table 9-7.

Table 9-7 HVAC Measures Implemented in Last 3 years

Segment	Purchase more energy efficient HVAC system	Install solar panels	Install heat recovery system	Add insula-tion to ductwork	Retro-commis-sioning of HVAC equip-ment	Install VSD on fan motors	Add econo-mizer	Add EMS
Office	19%	1%	1%	9%	4%	1%	1%	6%
Restaurant	44%	0%	2%	7%	4%	2%	2%	2%
Retail	22%	0%	0%	10%	1%	1%	0%	0%
Grocery	30%	0%	0%	11%	10%	10%	0%	0%
College	33%	0%	0%	0%	14%	14%	0%	14%
School	22%	0%	0%	8%	0%	0%	0%	4%
Health	33%	0%	3%	18%	3%	3%	3%	5%
Lodging	32%	0%	0%	5%	0%	5%	5%	5%
Warehouse	19%	0%	0%	0%	0%	13%	0%	13%
Miscellaneous	30%	0%	1%	11%	1%	6%	0%	4%

Industrial	22%	0%	1%	18%	3%	7%	3%	3%

Purchasing a more energy efficient water heating system is the most popular water heating measure, followed by reducing the water heater temperature. The grocery and lodging segments are the most likely to have implemented a water heating measure in the last 3 years, with over two-thirds implementing at least one measure.

Table 9-8 Water Heating Measures Implemented in Last 3 years

Segment	Purchase more energy efficient WH system	Insulate pipes	Reduce water temperature	Install low flow nozzles	Install faucet aerators	Other water heating measure
Office	9%	2%	6%	1%	2%	0%
Restaurant	42%	7%	25%	9%	9%	0%
Retail	15%	7%	13%	4%	7%	1%
Grocery	50%	11%	40%	0%	10%	0%
College	14%	14%	29%	14%	14%	0%
School	19%	4%	15%	4%	4%	0%
Health	32%	3%	18%	8%	8%	0%
Lodging	21%	5%	10%	42%	40%	5%
Warehouse	17%	19%	25%	0%	25%	0%
Miscellaneous	23%	9%	22%	2%	9%	6%
Industrial	16%	10%	12%	4%	3%	0%

Lighting upgrades have been implemented in 12% or more of the floor space in all the segments. Upgrading a fluorescent lighting system and switching to CFLs have been popular measures that were implemented, likely due to the awareness around the change in the lighting standard (Table 9-9). Installing occupancy or daylighting sensors is less prevalent.

Table 9-9 Lighting Measures Implemented in Last 3 years

Segment	Upgrade fluorescent lighting system	Reduce number of fluorescent fixtures	Replace with CFLs or LEDs	Replace with task lighting	Install occupancy sensors	Install daylighting sensors
Office	39%	13%	53%	1%	6%	6%
Restaurant	40%	14%	40%	21%	4%	5%
Retail	31%	11%	32%	14%	5%	1%
Grocery	60%	20%	50%	0%	0%	0%
College	43%	14%	43%	14%	14%	14%
School	33%	4%	12%	4%	11%	4%
Health	37%	34%	42%	3%	3%	3%
Lodging	63%	47%	47%	5%	11%	10%
Warehouse	27%	2%	21%	2%	29%	0%
Miscellaneous	57%	10%	44%	6%	8%	21%
Industrial	44%	12%	33%	10%	12%	10%

Overall very few building structure upgrades have been implemented in the last 3 years (Table 9-10), although lodging, restaurants and schools were the most likely to have implemented at least one building measure. The most common measure implemented was insulation of exterior doors, wall, ceilings or roofs.

Table 9-10 Building Structure Measures Implemented in Last 3 years

Segment	Replace windows with "low e" windows	Insulate exterior doors, walls ceilings or roof	Add window shades, reflective film or shading trees	Install a "cool roof"
Office	8%	3%	6%	7%
Restaurant	5%	30%	14%	9%
Retail	6%	18%	14%	4%
Grocery	0%	22%	0%	22%
College	14%	29%	17%	14%
School	15%	12%	19%	7%
Health	0%	3%	26%	3%
Lodging	21%	16%	11%	10%
Warehouse	4%	19%	21%	4%
Miscellaneous	6%	25%	19%	9%
Industrial	12%	15%	3%	10%

Overall very few equipment upgrades have been implemented in the last 3 years (Table 9-11). A couple of segments have focused on upgrading equipment: thirty-three percent of the grocery floor space has upgraded refrigeration units and the lodging segment has purchased more efficient refrigeration, office and kitchen equipment. While colleges did not make any equipment upgrades in the past three years, schools implemented each of the measures shown in Table 9-11.

Table 9-11 Equipment Upgrades Implemented in Last 3 years

Segment	Purchase more efficient refrigeration unit	Purchase high efficiency pool pump or heater	Purchase more efficient computer or office equipment	Purchase more efficiency dishwasher or kitchen equipment
Office	4%	0%	13%	4%
Restaurant	25%	0%	2%	7%
Retail	2%	0%	8%	1%
Grocery	33%	0%	10%	0%
College	0%	0%	0%	0%
School	12%	4%	19%	12%
Health	18%	3%	18%	0%
Lodging	26%	0%	11%	11%
Warehouse	2%	0%	2%	0%
Miscellaneous	6%	0%	23%	7%
Industrial	7%	0%	15%	4%

COMPARISON TO 2009 STUDY

In this section, we compare survey and market-characterization results from the current study (base year 2011) with the previous study conducted in 2009.

Residential Sector

Figure 10-1 and Figure 10-2 show the size of each of the segments as a percentage of residential sector energy use. In the 2009 study, manufactured homes were treated as a separate segment. In the 2011 study, manufactured homes are included with the single-family segment.

Figure 10-1 Electric Residential Market Segmentation by Housing Type – % of Energy Use

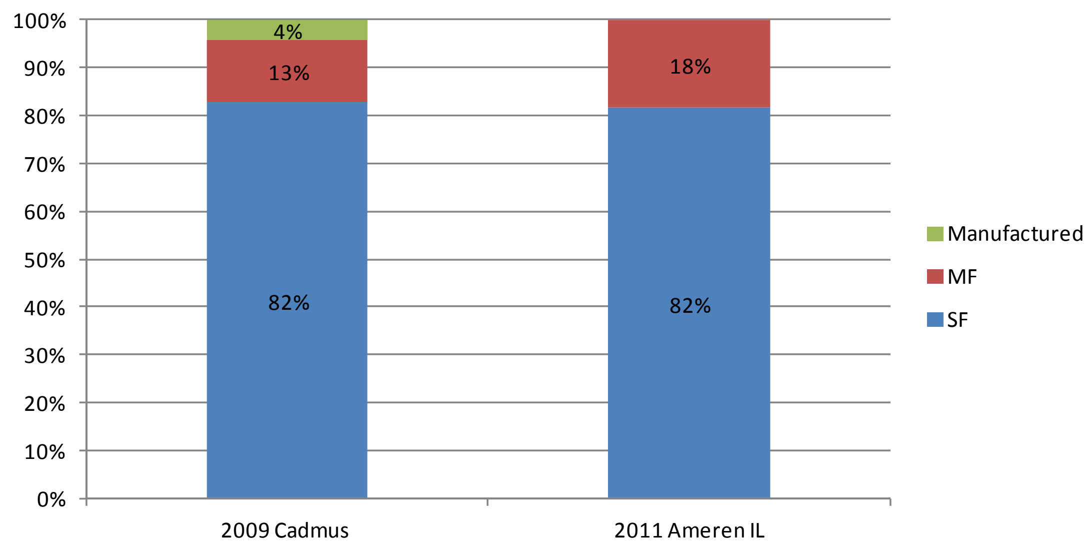


Figure 10-2 Natural Gas Residential Market Segmentation by Housing Type – % of Energy Use

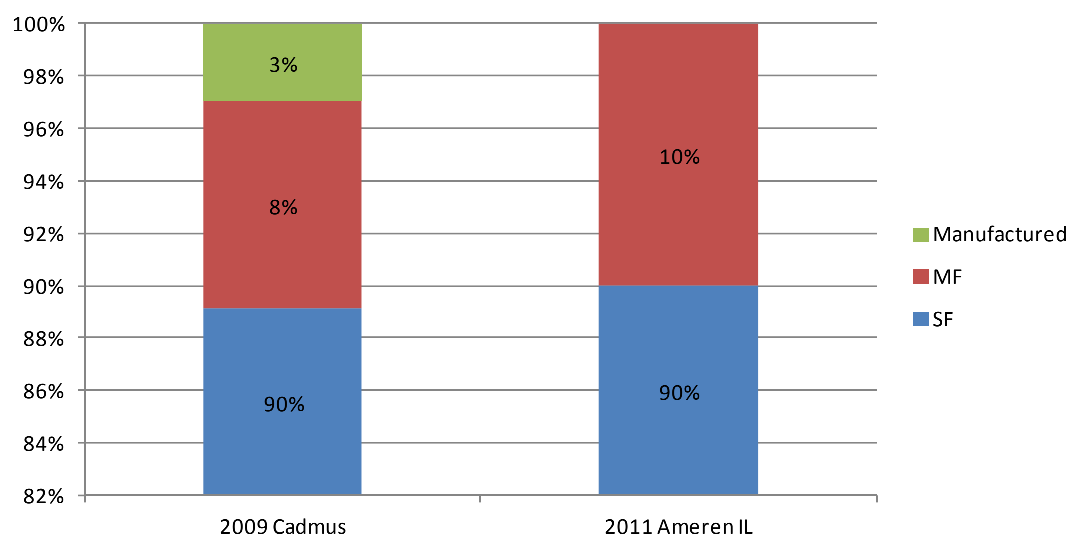
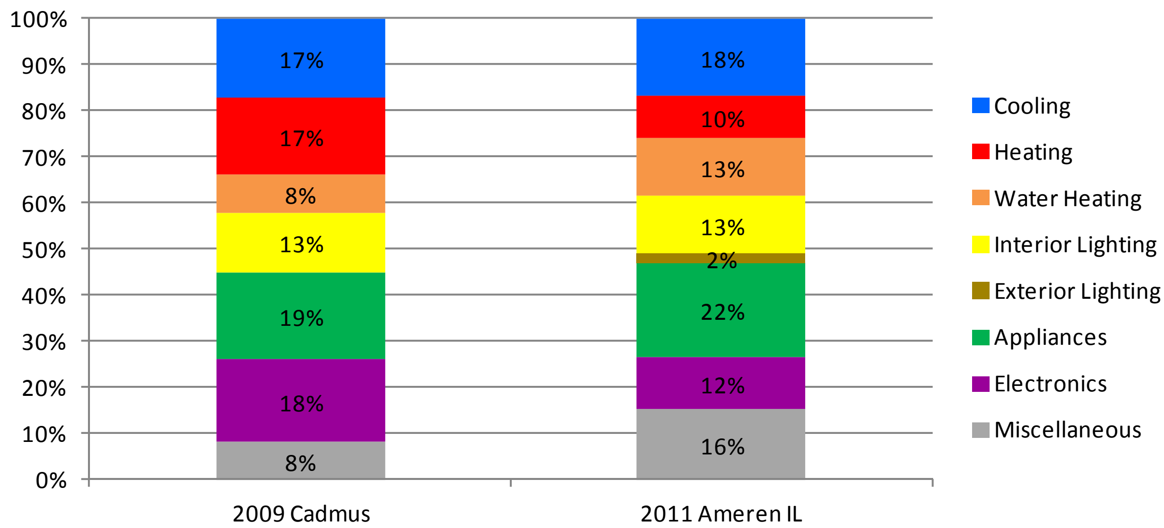


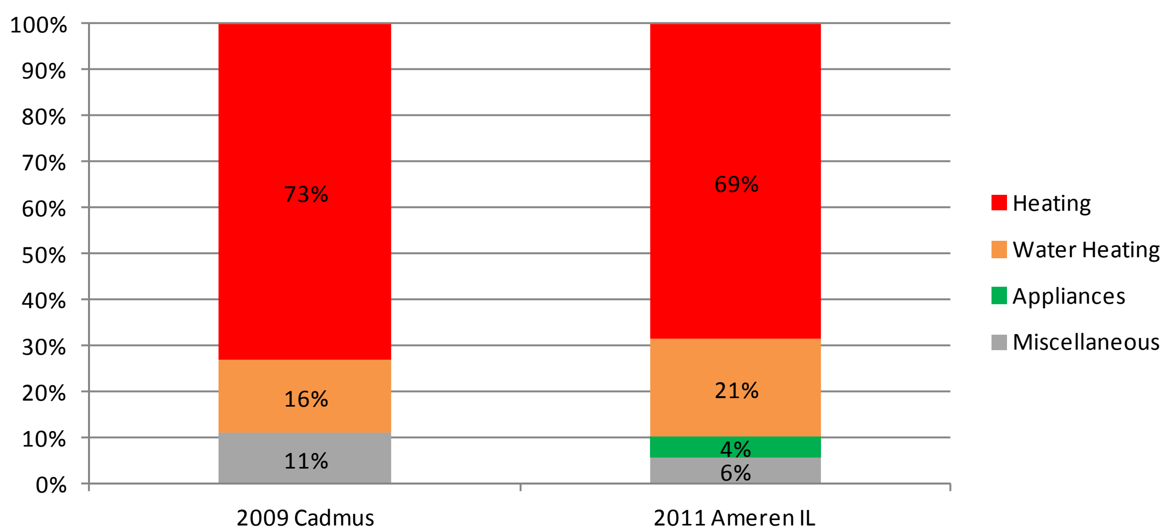
Figure 10-3 and Figure 10-4 shows the distribution of electricity and natural gas energy consumption by end use for all homes. Four main electricity end uses in the Cadmus study — appliances, electronics, cooling, and heating account for about 71% of total use. In this study, appliances, electronics, cooling, and heating account for 62% of total use. The difference in heating is likely due to a colder winter in 2009 than in 2011.

Figure 10-3 Residential Electricity Use by End Use (2011), All Homes



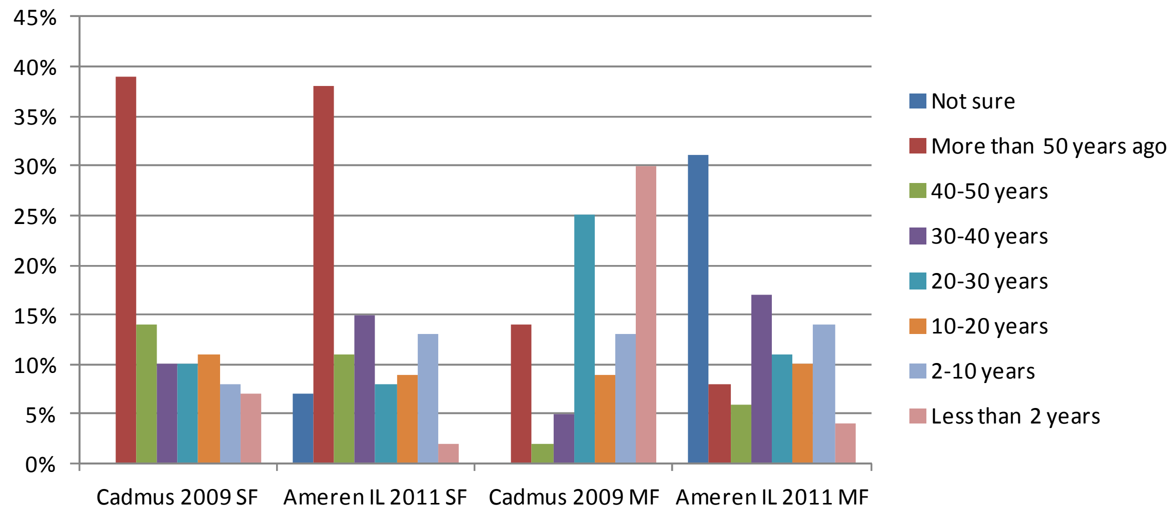
Natural gas usage is dominated by space heating with 73% of natural gas usage in the Cadmus study compared to 69% for the 2011 study. Water heating accounted for 16% of the natural gas usage in the Cadmus study compared to 21% in 2011. The two studies were similar in the usage of natural gas for cooking equipment and miscellaneous.

Figure 10-4 Residential Natural Gas Use by End Use (2011), All Homes



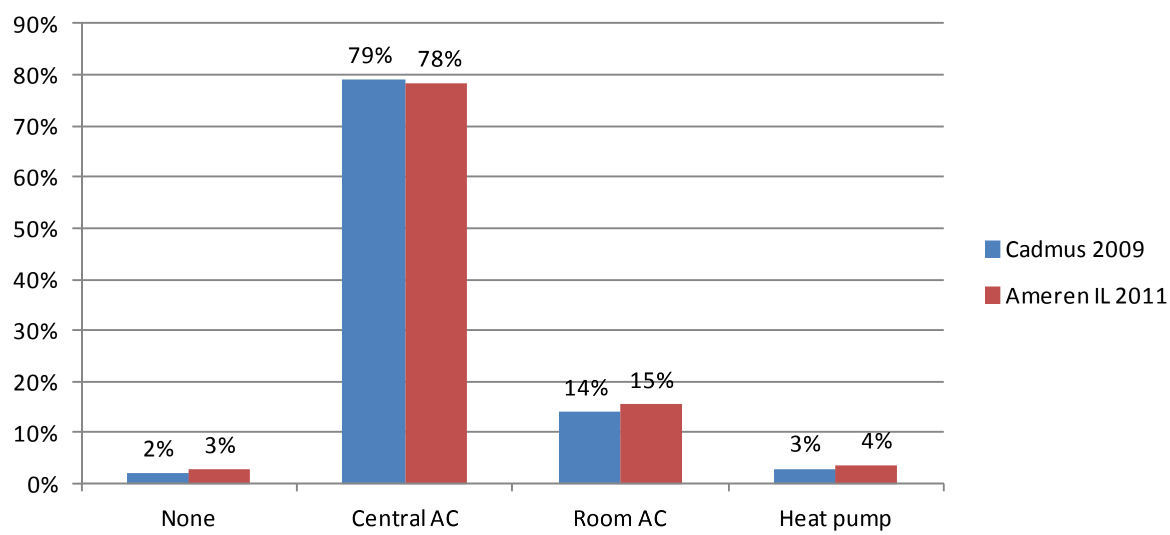
The average age of a single family home in the Ameren Illinois service territory is relatively old, with close to 40% of homes built over 50 years ago. Due to the recession, new home construction in the service territory slowed down, with less than two percent of homes built in the last two years. About one-third of multi-family respondents are not sure when their unit was built. Since the Cadmus study does not include the percentage it is difficult to make direct comparisons. However, the slowdown in new construction is noticeable when comparing homes built less than two years ago.

Figure 10-5 Age of the home



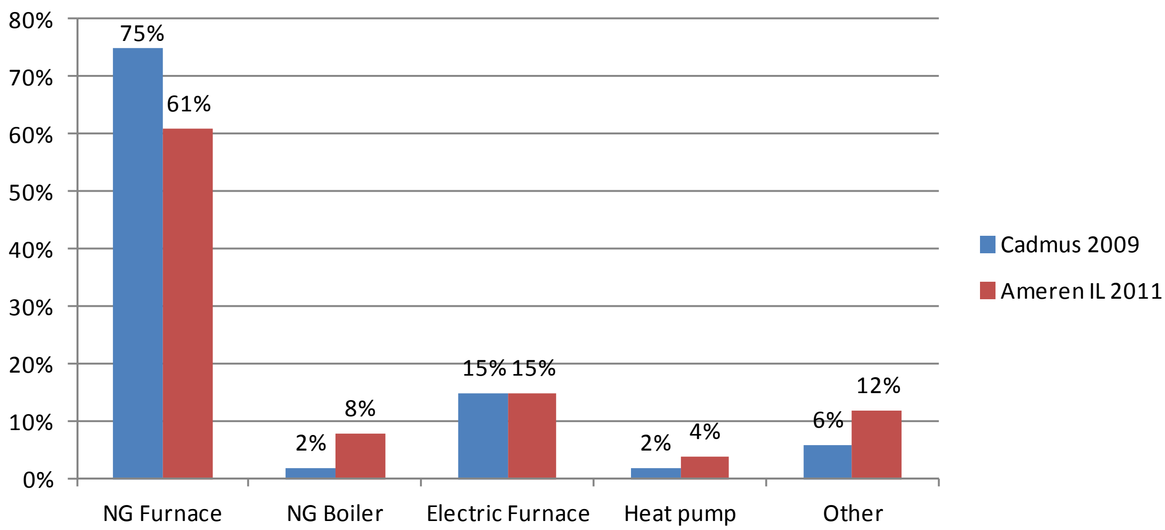
As shown in Figure 10-6, the distribution of cooling technologies has not changed significantly since 2009.

Figure 10-6 Distribution of Cooling Technologies



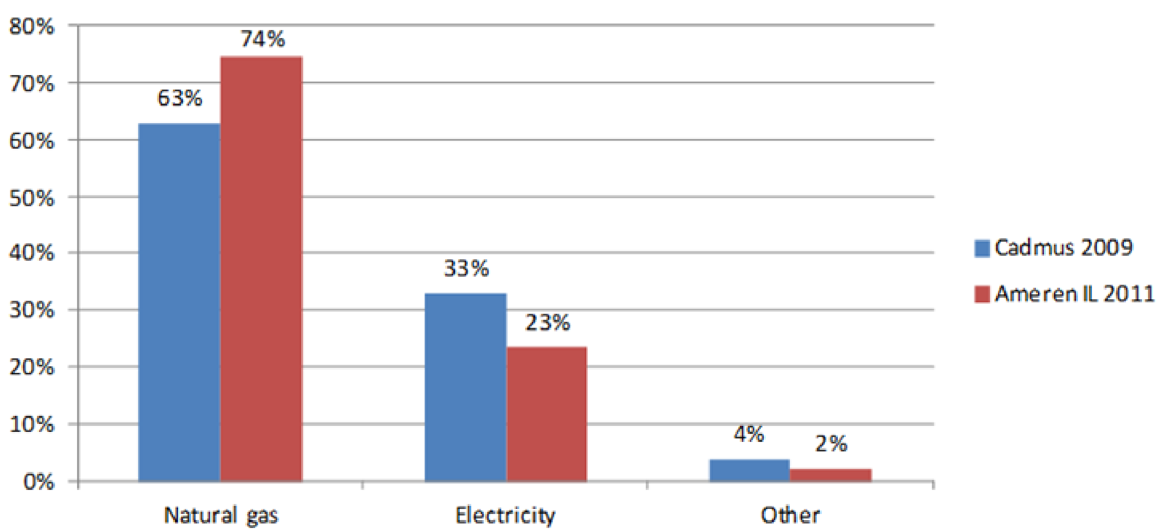
As shown in Figure 10-7 the 2011 study shows fewer natural gas furnaces. While the technologies differ, the distribution of fuel remains the same since the 2009 study.

Figure 10-7 Distribution of Heating Technologies



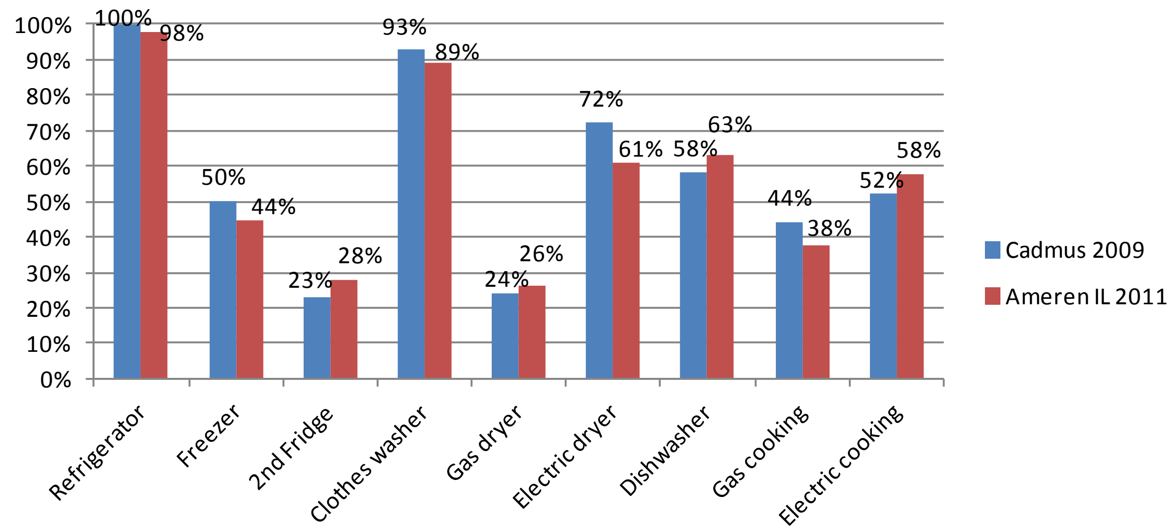
As shown in Figure 10-8, in the 2011 study, more homes use natural gas for heating water than was found in the 2009 study. The difference is likely due to the different samples and not likely due to any fuel switching.

Figure 10-8 Distribution of Water Heating Fuel



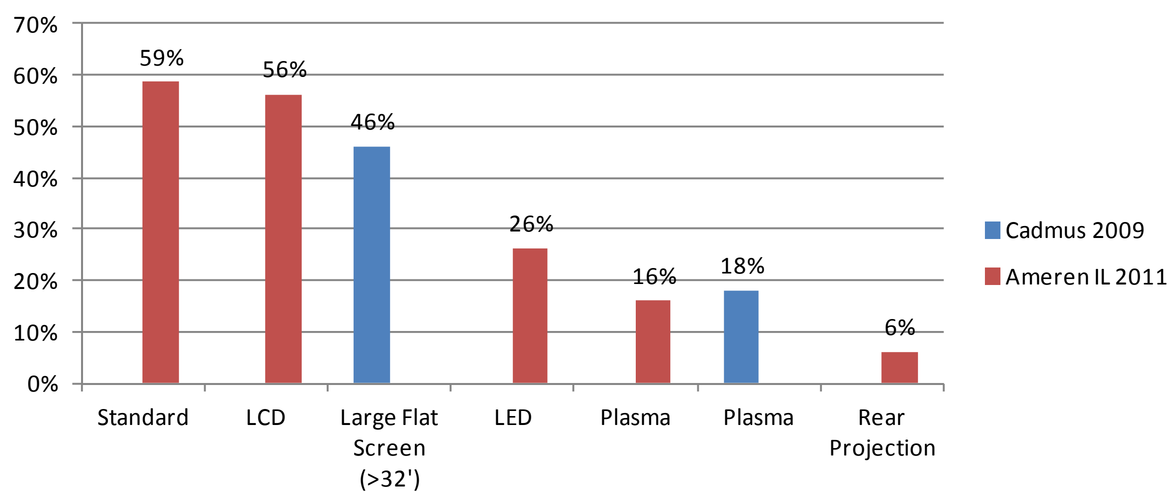
The saturation of each of the various appliances has remained fairly similar between 2009 and 2011, as shown in Figure 10-9. It is interesting that the saturation of separate freezers and second refrigerators has remained essentially flat, despite a successful appliance recycling program. For the 2011 study, we matched the respondents with a list of participants in the appliance recycling program. Approximately, 40 respondents had participated in the program since 2009. For those that participated in the program by removing a second refrigerator or freezer, about one-third still reported having one in 2011.

Figure 10-9 Saturation of Appliances and Miscellaneous



The saturation of televisions is difficult to compare since the categories between the two studies do not line up exactly. Since the newer LCD and LED televisions are typically larger than 32 inches, it seems as if the saturation of large flat screens increased since 2009. The saturation of plasma televisions is essentially flat (Figure 10-10).

Figure 10-10 Saturation of Electronics



Commercial Sector

Figure 10-11 and Figure 10-12 show the segmentation of each of the building-types as a percentage of commercial sector electricity and natural gas sales. The differences in segmentation are likely due to methodology. The respondents to the 2011 study are segmented based on self-reported building types from the survey. It is our understanding that the Cadmus study used the customer information system to identify building segments. Note that the two studies used different segmentation. Therefore if a segment shows 0% it is included in one of the other building segments.

Figure 10-11 Commercial Market Segmentation by Building Type – Percent of Electricity Use

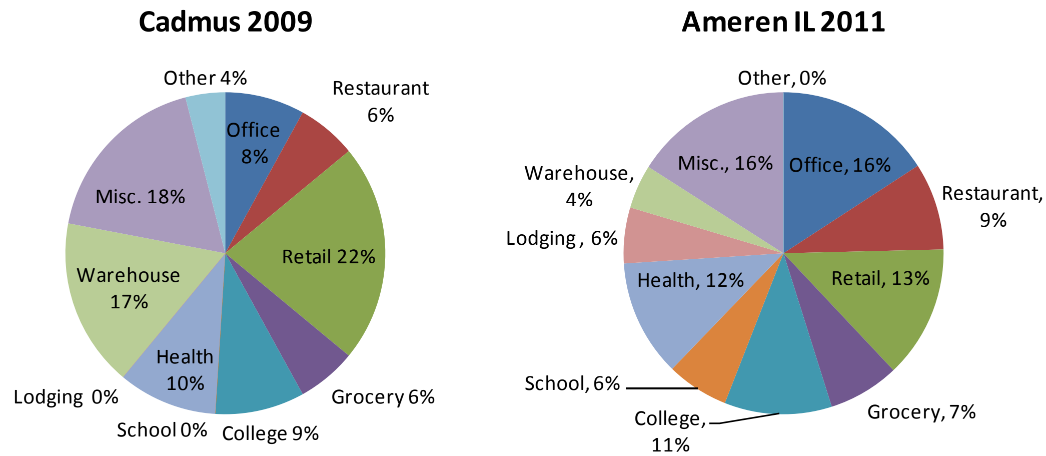


Figure 10-12 Commercial Market Segmentation by Building Type – Percent of Natural Gas Use

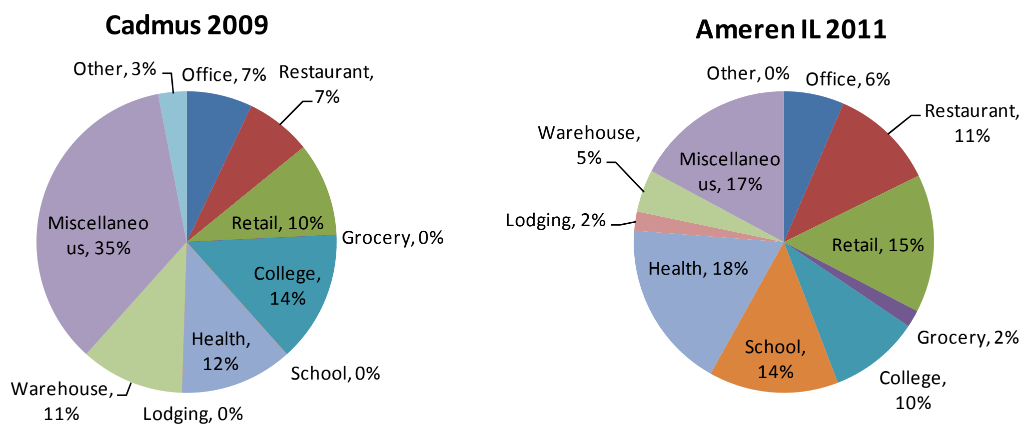


Figure 10-13 and Figure 10-14 show the distribution of electricity and natural gas energy consumption by end use for all commercial buildings from the 2009 and 2011 studies. Electricity usage is dominated by lighting, with interior and exterior varieties accounting for over one third of consumption for both studies. In the 2009 study, after lighting, plug load accounts for the next largest end use at 14%. In the 2011 study, the second largest end use is cooling. Natural gas usage is dominated by space heating (84%) in the 2009 study and (58%) in the 2011 study. Water heating is second to space heating, accounting for 9% of usage in 2009 and 24% in 2011.

Figure 10-13 Commercial Electricity Use by End Use (2011), All Buildings

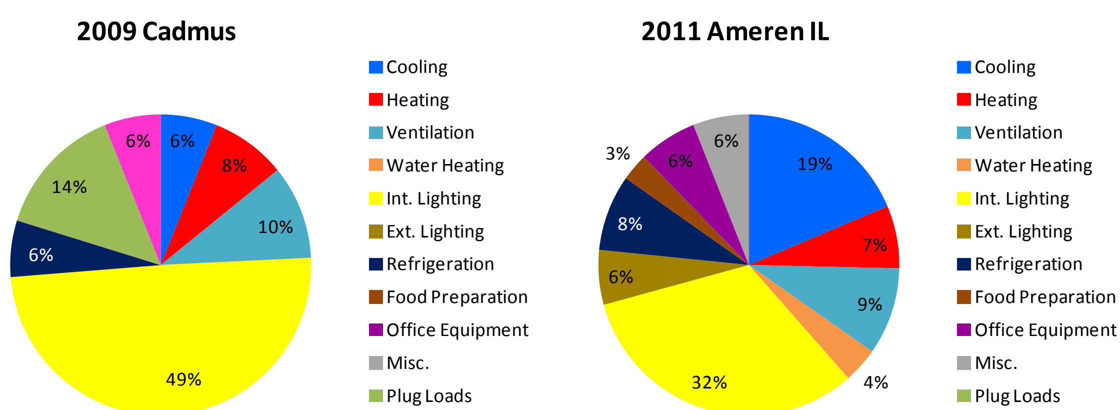
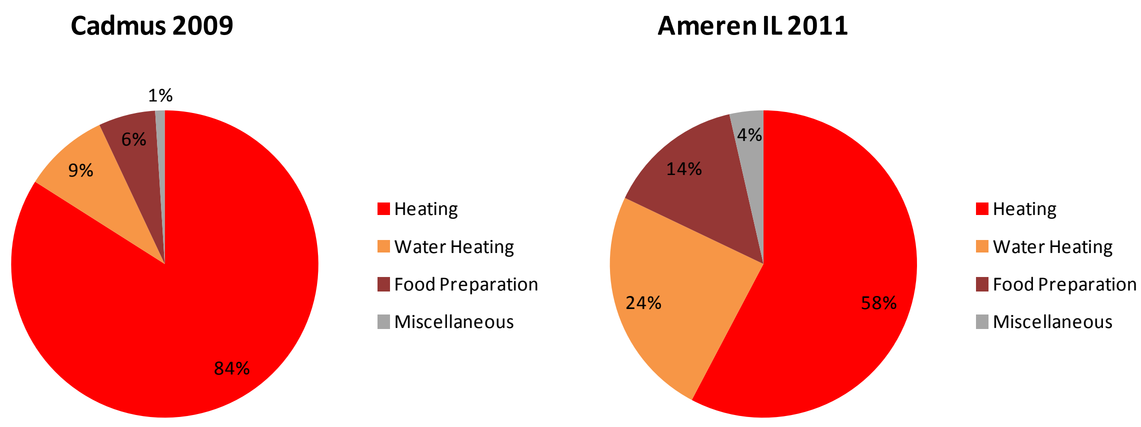
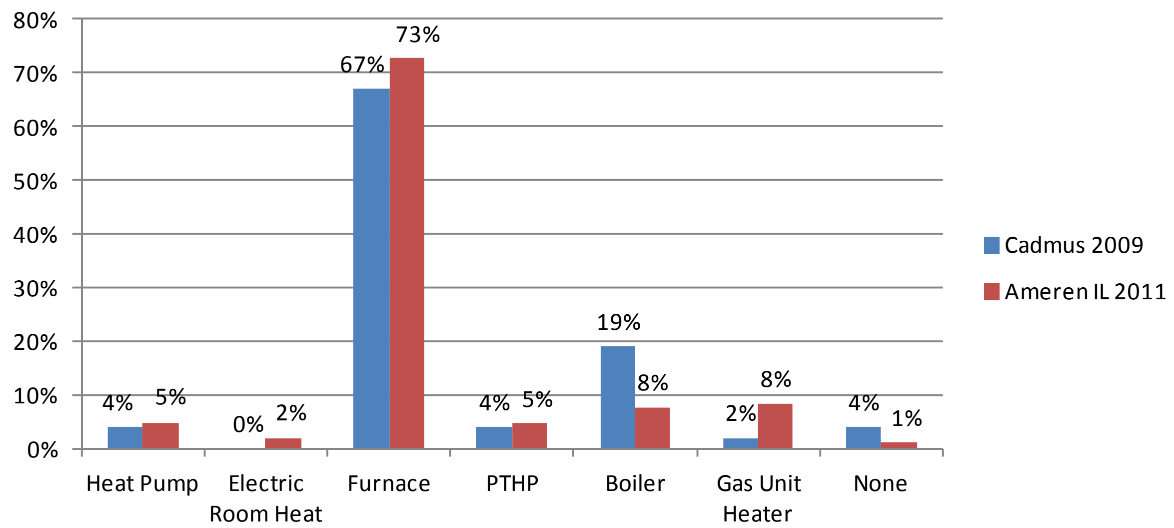


Figure 10-14 Commercial Natural Gas Use by End Use (2011), All Buildings



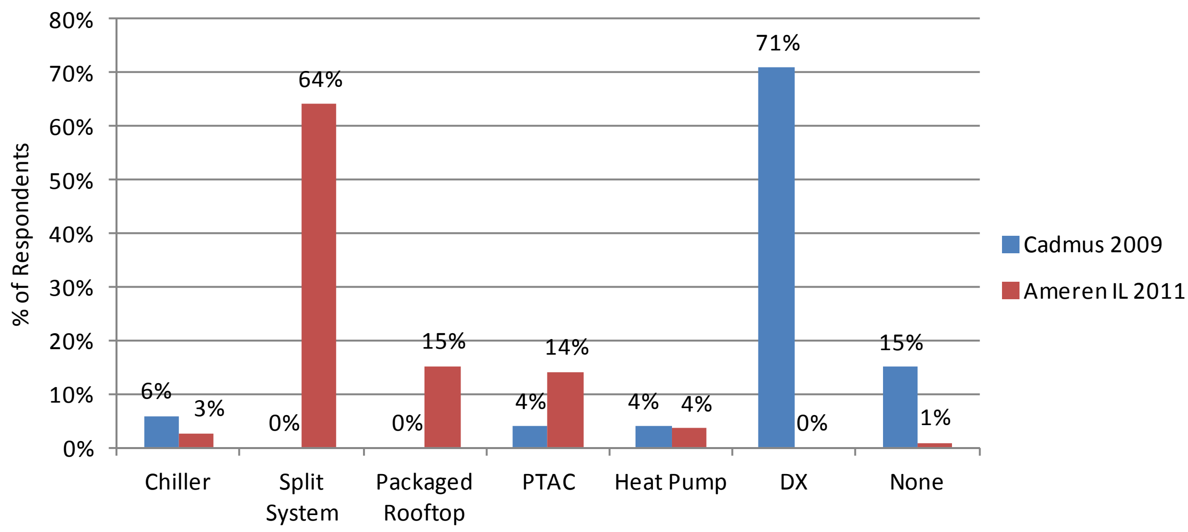
The saturation of commercial heating equipment in the commercial sector is relatively unchanged since the 2009 study, as shown in Figure 10-15. Furnaces remain the dominate space heating technology.

Figure 10-15 Types of Commercial Heating Equipment



The categories for space cooling in the commercial sector vary between the two studies, making it difficult to compare. However, the saturation of chillers and heat pumps remained about the same since 2009, as shown in Figure 10-16.

Figure 10-16 Types of Commercial Cooling Equipment



Industrial Sector

Figure 10-17 and Figure 10-18 shows the size of each of the segments as a percentage of industrial sector energy sales. The difference in segmentation likely stems from the methodology of assigning customers to segments. The 2011 study relied on self-reported responses to the survey, while it is our understanding that the 2009 study relied on Ameren's customer information system.

Figure 10-19 and Figure 10-20 show the distribution of electricity and natural gas energy consumption by end use for all industrial customers. In the 2009 study, process is the largest end use at 62%, while in the 2011 study, the motors end use is the largest overall electric end use for the industrial sector, accounting for 56% of energy use. Note that the motors end use includes a wide range of industrial equipment, such as air compressors, refrigeration compressors, pumps, conveyor motors, and fans. The difference could be accounted for in definition of the end uses. In the 2009 study, the motors end use accounts for the second most energy use at 16% while in the 2011 study, the process end use accounts for 23% of electricity use. Natural gas usage is dominated by the process end use for both the 2009 and 2011 studies with 51% and 69%, respectively. Space heating accounted for 34% of natural gas usage in the 2009 study while in the 2011 study, it accounted for 27%.

Figure 10-17 Industrial Market Segmentation – Percentage of Electricity Use

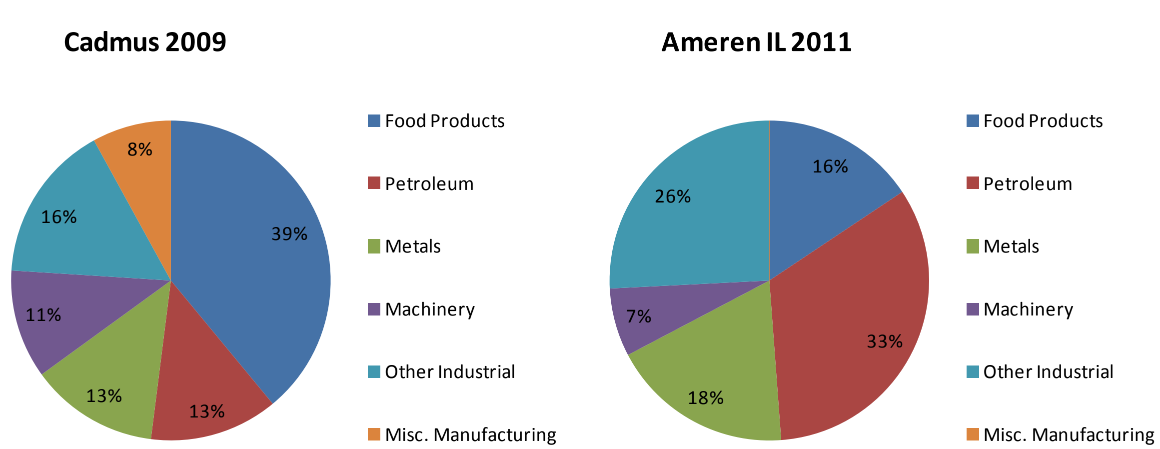


Figure 10-18 Industrial Market Segmentation – Percentage of Natural Gas Use

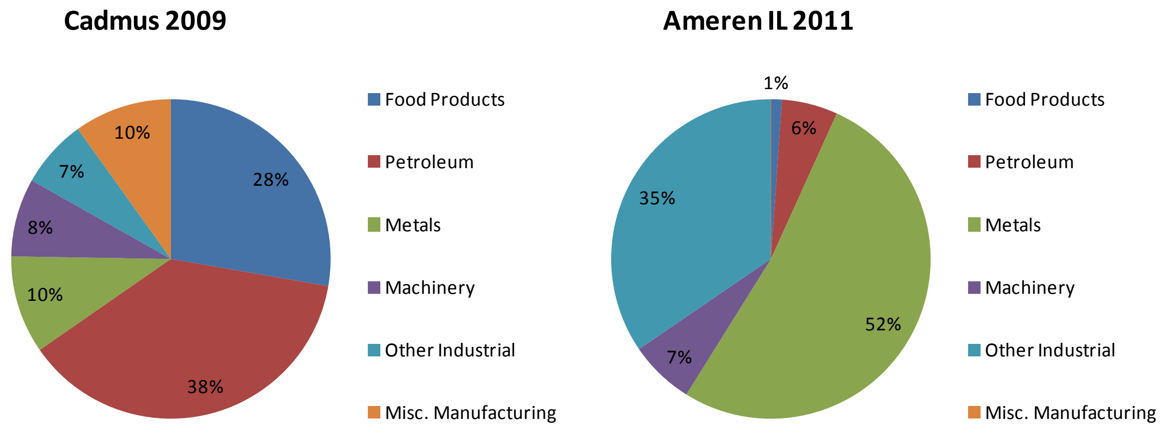


Figure 10-19 Industrial Electricity Use by End Use (2009, 2011), All Industries

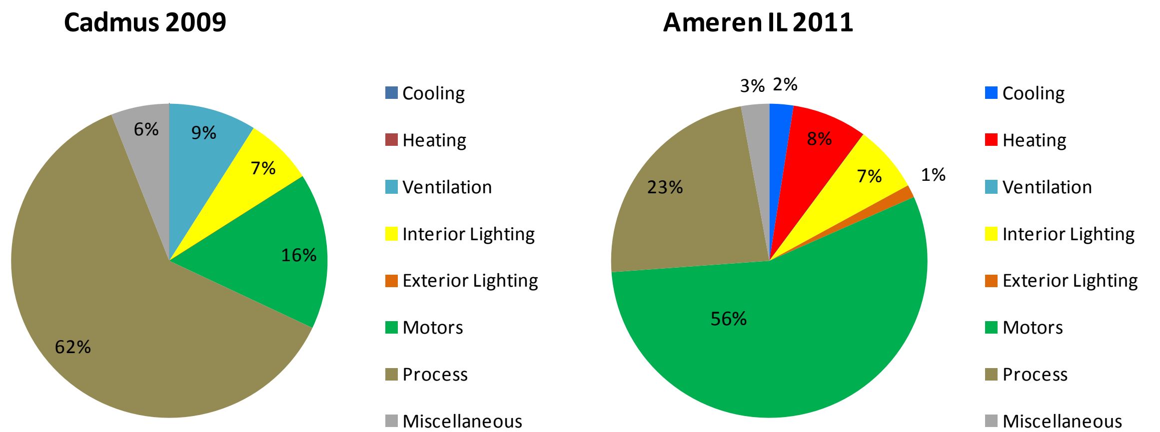
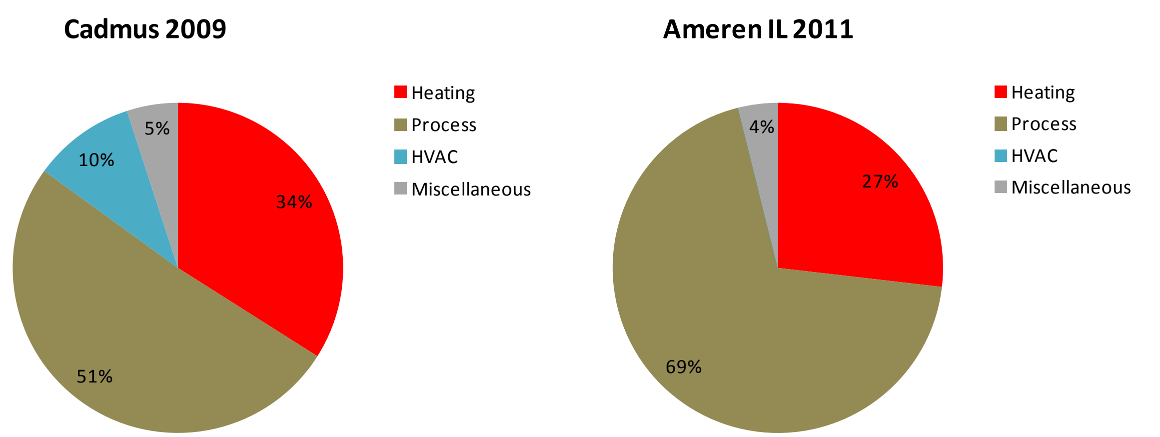


Figure 10-20 Industrial Natural Gas Use by End Use (2009, 2011), All Industries



RESIDENTIAL SAMPLE DESIGN

Sample design begins with development of the population frame. A significant amount of work goes into the frame preparation in order to target the correct population to accurately represent the Ameren Illinois service territory. The residential sample frame preparation began with an analysis of Ameren Illinois' billing accounts for the residential sector for June 1, 2010 through May 31, 2011.

Approximately 16% of the total customer population was removed from consideration for various reasons. Records with zero annual usage were removed. We also removed customers that had extremely high usage as defined by greater than 175,000 kWh or 7,000 therms. These accounts represent agricultural customers. Ameren Illinois will determine if these customers should be included in the residential sector or industrial sector. Customers that did not appear to have a full year of data were also excluded. If a customer had less than 9 electric bills or less than 4 natural gas bills, they were removed from the population. Table A-1 shows the breakdown of how many customers were removed and why.

Table A-1 Ameren Illinois Sample Frame Preparation

	Number of Electricity Records	Number of Natural Gas Records	Percent of Original Population
Not enough data	11,612	3,541	11%
Zero annual usage	2,717	3,253	4%
High usage	49	41	0%
Total Removed	**14,378**	**6,835**	**16%**

The remaining residential customer accounts were broken up into 12 usage categories based on actual annual usage from the 2010-11 Ameren Illinois billing data. By having electric, natural gas and combination (electric and natural gas) customers, the stratification is more complex. Therefore we end with 12 strata:

1. Low Electric – Electric only customers with electricity usage less than 10,000 kWh
2. Medium Electric – Electric only customers with electricity usage greater than or equal to 10,000 kWh, but less than 21,400 kWh
3. High Electric - Electric only customers with electricity usage greater than or equal to 21,400 kWh
4. Low Gas – Natural gas only customers with natural gas usage less than 600 therms
5. Medium Gas – Natural gas only customers with natural gas usage greater than or equal to 600 therms, but less than 1,100 therms
6. High Gas – Natural gas only customers with natural gas usage greater than or equal to 1,100 therms
7. Low Electric/Low Gas – Combination customers with electricity usage less than 8,600 kWh and natural gas usage less than 650 therms
8. Low Electric/High Gas – Combination customers with electricity usage less than 8,600 kWh and natural gas usage greater than or equal to 650 therms
9. Medium Electric/Low Gas – Combination customers with electricity usage greater than or equal to 8,600 kWh, but less than 16,400 kWh and natural gas usage less than 850 therms

10. Medium Electric/High Gas – Combination customers with electricity usage greater than or equal to 8,600 kWh, but less than 16,400 kWh and natural gas usage greater than or equal to 850 therms
11. High Electric/Low Gas – Combination customers with electricity usage greater than or equal to 16,400 kWh and natural gas usage less than 1,050 therms
12. High Electric/High Gas – Combination customers with electricity usage greater than or equal to 16,400 kWh and natural gas usage greater than or equal to 1,050 therms

Table A-2 shows how the residential sector is allocated across the usage categories.

Table A-2 Ameren Illinois Residential Customer Billing Analysis

Stratum	Number of Accounts	% of Total Accounts	Total MWh	% of kWh	Total Therms (000)	% of Therms
Low Electric	193,122	17%	1,119,848	9.5%		
Medium Electric	173,511	16%	2,527,665	21.5%		
High Electric	61,666	6%	1,804,717	15.3%		
Low Gas	35,476	3%			13,984	2.6%
Medium Gas	52,083	5%			42,339	7.9%
High Gas	15,699	1%			22,554	4.2%
Low Electric/ Low Gas	133,423	12%	698,061	5.9%	62,377	11.6%
Low Electric/High Gas	103,010	9%	638,261	5.4%	100,593	18.7%
Med Elec/Low Gas	147,744	13%	1,738,143	14.8%	90,787	16.8%
Med Elec/High Gas	109,925	10%	1,328,587	11.3%	125,456	23.3%
High Electric/ Low Gas	59,755	5%	1,266,780	10.8%	39,564	7.3%
High Elec/High Gas	28,243	3%	635,792	5.4%	41,377	7.7%
Total	**1,113,657**	**100%**	**11,757,852**	**100%**	**539,030**	**100%**

The breakdown among usage categories was then used to develop a sample target for each of the residential surveys with a goal of collecting 700 completed responses per residential survey. Table A-3 shows how the 700 target responses were allocated among the usage categories.

Table A-3 Ameren Illinois Residential Sample Target

Stratum	Number of Accounts	% of Total Accounts	Proposed Sample	% of Sample
Low Electric	193,122	17%	66	9%
Medium Electric	173,511	16%	69	10%
High Electric	61,666	6%	73	10%
Low Gas	35,476	3%	30	4%
Medium Gas	52,083	5%	30	4%
High Gas	15,699	1%	30	4%
Low Electric/ Low Gas	133,423	12%	66	9%
Low Electric/High Gas	103,010	9%	84	12%
Medium Electric/ Low Gas	147,744	13%	73	10%
Medium Electric/ High Gas	109,925	10%	94	13%
High Electric/ Low Gas	59,755	5%	44	6%
High Electric/ High Gas	28,243	3%	41	6%
Total	**1,113,657**	**100%**	**700**	100%

BUSINESS SAMPLE DESIGN

Sample design begins with development of the population frame. A significant amount of work goes into the frame preparation in order to target the correct sample to accurately represent the Ameren Illinois service territory. Ameren Illinois provided a database of 263,234 account records of commercial and industrial customers, which was used to construct a population frame for the sample design. Each customer record included the following categories of information:

- Account number
- Customer name
- Premise address
- Mailing address
- NAICS code
- Annual electricity use
- Natural gas use

Several steps were taken to prepare the sample. The first step was to create premises (individual customer locations) based on unique Customer Address (excluding Premise Address Suffix) and Customer Number. This step led to 165,867 establishments. The sample was further reduced by 80,963 establishments, which made up less than 1% of total energy, based on the following:

- Low annual electricity usage for Electric Only customers – less than 10,000 kWh
- Low annual natural gas usage for Natural Gas customers – less than 1,000 therms
- Low annual electricity AND low annual natural gas for Combination (Electric and Gas) customers

The final C&I population is 81,834 premises which were then mapped to 15 segments based on a mapping of SIC codes to segments. Table B-1 shows the results of this segmentation of the 81,834 premises by segment and type: electric only, natural gas only, or combination electric and natural gas establishment.

Table B-1 C&I Population for Ameren Illinois Study

	Electric Only		Combination			Gas Only	
Segment	Premises	Total GWh	Premises	Total GWh	Total Therms	Premises	Total Therms
Ag/Fish/Mining	900	401	223	69	6,404,217	91	4,738,806
Chemicals	68	702	85	426	174,284,070	21	4,457,120
Education	802	731	1,241	544	19,661,285	466	18,279,387
Food	133	1,011	168	652	78,812,684	53	103,682,045
Health	372	346	633	476	17,859,487	126	12,343,385
Lodging	190	41	384	139	3,591,409	71	1,444,308
Machinery	325	386	345	840	31,369,679	56	8,334,986
Miscellaneous	8,998	1,297	10,189	1,414	100,079,619	1,519	14,487,821
Office	10,551	1,937	9,477	1,353	45,219,744	1,375	65,686,666
Other Mfg	1,014	1,277	959	1,494	47,468,747	149	19,155,215
Petroleum	33	79	24	786	1,233,305	12	3,499,377
Primary Metals	42	1,057	48	622	21,736,514	7	1,087,385
Retail	4,826	599	9,103	1,408	32,483,044	875	7,169,365
Unknown	4,795	2,377	5,053	1,177	45,188,512	1,358	13,440,234
Warehouse	2,309	381	2,052	335	16,565,734	313	9,237,172
Total	**35,358**	**12,620**	**39,984**	**11,735**	**641,958,050**	**6,492**	**287,043,272**

Table B-2 shows the population by segment and the amount of electricity usage and natural gas usage.

Table B-2 Ameren Illinois C&I Establishments and Usage by Segment

	Electric Population		Electricity Usage		Gas Population		Gas Usage	
Stratum Name	Total Premises	% of Premises	Total kWh	% of kWh	Premises	% of Premises	Total Therms	% of Therms
Ag/Fish/Mining	1,123	1%	469	2%	314	1%	11,143,023	1%
Chemicals	153	0%	1,128	5%	106	0%	178,741,190	19%
Education	2,043	3%	1,275	5%	1,707	4%	37,940,672	4%
Food	301	0%	1,663	7%	221	0%	182,494,729	20%
Health	1,005	1%	822	3%	759	2%	30,202,872	3%
Lodging	574	1%	179	1%	455	1%	5,035,717	1%
Machinery	670	1%	1,226	5%	401	1%	39,704,665	4%
Miscellaneous	19,187	25%	2,711	11%	11,708	25%	114,567,440	12%
Office	20,028	27%	3,290	14%	10,852	23%	110,906,410	12%
Other Mfg	1,973	3%	2,771	11%	1,108	2%	66,623,962	7%
Petroleum	57	0%	865	4%	36	0%	4,732,682	1%
Primary Metals	90	0%	1,679	7%	55	0%	22,823,899	2%
Retail	13,929	18%	2,007	8%	9,978	21%	39,652,409	4%
Unknown	9,848	13%	3,554	15%	6,411	14%	58,628,746	6%
Warehouse	4,361	6%	716	3%	2,365	5%	25,802,906	3%
Total	**75,342**	**100%**	**24,355**	**100%**	**46,476**	**100%**	**929,001,322**	**100%**

**Note that the electric population plus the natural gas population exceeds the total establishment count of 81,834 because of the overlap caused by combination customers.*

The sample design step approached the C&I customer population as follows:

- The largest customers/premises were identified for individual treatment. Most of these customers will receive an onsite survey.
- The remaining small and medium C&I customers will be contacted via direct mail for the online survey.

Based on the electricity and natural gas usage within each segment, a sample target for each of the C&I surveys was developed with a goal of optimizing the precision targets. Table B-3 shows the allocation by segment.

Table B-3 Ameren Illinois C&I Establishments Sample Selection

Segment	Number of Premises	% of Premises	Proposed Sample	% of Sample	Confidence Level	Relative Error
Ag/Fish/Mining	1,214	1%	38	5%	90%	20%
Chemicals	174	0%	31	4%	90%	10%
Education	2,509	3%	67	8%	90%	20%
Food	354	0%	40	5%	90%	10%
Health	1,131	1%	85	10%	90%	10%
Lodging	645	1%	49	6%	90%	10%
Machinery	726	1%	39	5%	90%	10%
Miscellaneous	20,706	25%	47	6%	90%	25%
Office	21,403	26%	96	12%	90%	15%
Other Mfg	2,122	3%	64	8%	90%	20%
Petroleum	69	0%	25	3%	90%	10%
Primary Metals	97	0%	21	3%	90%	10%
Retail	14,804	18%	133	16%	90%	10%
Unknown	11,206	14%	45	5%	90%	25%
Warehouse	4,674	6%	52	6%	90%	25%
Total	**81,834**	**100%**	**832**	**100%**	**90%**	**4%**

RESIDENTIAL PROGRAM INTEREST SURVEY QUESTIONNAIRE

Ameren Illinois DSM Market Potential – Program Interest Questionnaire RESIDENTIAL
REVISED FINAL 7/11/2012

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must have primary or shared responsibility for making energy-related decisions
- The respondent must be at least 18 years old
- No one in the respondent's household may work for a gas or electric utility company
- The respondent household must be billed for electricity directly by Ameren Illinois

PRELOAD ALL SAMPLE FIELDS.

Hard Quotas

Total: n=700

Soft Quotas

THE MAIN QUOTA VARIABLE IS STRATUM_ID / ALL OTHER QUOTAS ARE DRIVEN BY THAT ONE.

USAGE STRATUM

N=SEE QUOTA GRID

Age (S3)

N=AS FALLS BUT WE WANT TO TRACK

Geography – READ IN FROM SAMPLE: **[REGION]**

N=SEE QUOTA GRID

FOR ENTIRE SURVEY, [ADDRESS]=THE FOLLOWING SAMPLE FIELDS:

ADDR#
ADDRDIR
ADDRSTR
ADDRSUF
ADDRSTRUC
ADDRCITY
ADDRSTATE
ADDRZIP

RESPONDENT IDENTIFICATION / VERIFICATION

Welcome. This survey is sponsored by Ameren Illinois.
[PROGRAMMER: INCLUDE AMEREN ILLINOIS LOGO]

Survey results will be collected and summarized by Definitive Insights, a market research company.

Please enter the 5-digit "Survey ID#" that appears on the survey invitation postcard you received. It should be located just above the mailing address on the front side of the postcard.

Survey ID# : ________________

[PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE]

We at Ameren Illinois and Definitive Insights value your privacy. We will use the information you provide for research purposes only and will NOT share it with third parties for marketing purposes. Information you provide will be stored in a secure database. If you have questions about our privacy practices or would like to get any other information about this study, please contact us via one of the following methods:

e-mail: AmerenHelp@definitiveinsights.com

phone: 1-888-742-4511

postal mail: Definitive Insights
ATTN: Ameren Illinois Project Director
601 SW Oak Street
Portland, Oregon 97205

INTRODUCTION

Thank you for taking the time to see if you and your household qualify to participate in a new research study about energy. The study is sponsored by Ameren Illinois, and it has a very important purpose. Ameren Illinois is delivering programs to help its customers use energy more efficiently. Your answers to this survey will help the company to improve these programs so that they work best for everyone.

Your household is one of a small number being asked to respond to the survey. To show our appreciation for your time and effort in completing the survey, you will have the option of choosing a **$10 Amazon Electronic Gift Card or a $10 check** at the end of the survey if you complete all of the questions. (You may decline to receive payment if desired.)

You will first be asked a few questions to make sure your household qualifies for participation. If you do qualify, you will then be invited to complete the full survey.

> *Note: If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.*

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

Please click “Continue” to begin.

RESPONDENT SCREENING

A1. Our records indicate that your address is:
[ADDRESS]

Is this correct?
1. Yes
2. No

[IF A1=2, TERMINATE VIA A1 AND READ A1 TERMINATE TEXT; OTHERWISE GO TO S1.]

[A1 TERMINATE TEXT:]
We truly appreciate your time and effort in responding to our survey, but our questions are related to a specific address.

If you would like information on how your home can save money on your energy bills, please visit us at www.actonenergy.com.

Thank you. Have a nice day!

S1. What is your role in making energy-related decisions about things such as: adjusting your home's thermostat, choosing to install insulation, or selecting new appliances, large electronic devices, and light bulbs for your home?

Any reference to "your home or household," here and throughout the rest of this survey, refers specifically to the residence at ***[ADDRESS]****.*

1. You are primarily responsible for some or all of these decisions
2. Someone else in your household is primarily responsible for these types of decisions **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA R1]**
3. You share responsibility for these decisions with others in your household, or with a landlord or property manager
4. Don't know **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA R1]**

[IF S1=1 OR 3, SKIP TO S2; OTHERWISE SHOW R1 AND TERMINATE WITHOUT SHOWING STANDARD TERMINATE LANGUAGE]

R1. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your household who has specific knowledge about the way your household makes decisions about energy-related issues.
We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey:
[INSERT URL THAT INCLUDES SURVEY ID#]

[PROGRAMMER NOTE: IF A RESPONDENT TERMINATES VIA R1, DELETE DATA COLLECTED AND RESET SURVEY REENTRY POSITION FOR THAT SURVEY ID# BACK TO THE BEGINNING OF THE SURVEY. RECORD THE DATA DELETED FOR THAT SURVEY ID# ELSEWHERE SO WE CAN TRACK THE NUMBER OF TIMES AND REASONS RESPONDENTS DISQUALIFY AT R1 AS WELL AS THE NUMBER OF TIMES THESE PREVIOUSLY USED SURVEY ID#'S ARE REUSED. FOR ALL RESPONDENTS THAT DO NOT TERMINATE VIA R1, DO NOT ALLOW SURVEY ID# TO BE USED AGAIN.]

S2. Do you own or rent your home?
1. Own (or in the process of buying it)
2. Rent / lease

S3. Which of the following categories represents your current age?

1. Less than 18 years old **[TERMINATE AFTER S7]**
2. 18-24
3. 25-34
4. 35-44
5. 45-54
6. 55-64
7. 65 or more years old

[IF S3=2-7, ASK S4; OTHERWISE ASK S4 AND TERMINATE AFTER S7]

S4. Do you, or does anyone else in your household work for a gas or electric utility company?

1. Yes **[TERMINATE AFTER S7]**
2. No

[IF S4=2, CONTINUE; OTHERWISE, TERMINATE AFTER S7 OR S9 – DEPENDING ON S6 RESPONSE]

S5. How is your household billed for the electricity you use?

1. My household is billed directly by Ameren Illinois **[CONTINUE TO S6, BUT DO NOT TERMINATE, REGARDLESS OF S6** RESPONSE]
2. My household is NOT billed directly by Ameren Illinois; the cost for our electricity is included in our rent, or is paid by someone else **[ASK S6 – IF S6 NOT=1, ASK S7-S9 AND TERMINATE]**
3. My household's electricity is provided by another utility; **not** Ameren Illinois **[ASK S6 – IF S6 NOT=1, TERMINATE AFTER S7]**
4. Don't know **[ASK S6, BUT TERMINATE AFTER S7, REGARDLESS OF S6 RESPONSE]**

S6. How is your household billed for the natural gas you use?

1. My household is billed directly by Ameren Illinois **[REGARDLESS OF S5 RESPONSE, GO TO S7 – DO NOT TERMINATE]**
2. My household is NOT billed directly by Ameren Illinois; the cost for our natural gas is included in our rent, or is paid by someone else **[IF S5=1, ASK S7 BUT DO NOT TERMINATE]**
3. My household's natural gas is provided by another utility; **not** Ameren Illinois **[IF S5=1, ASK S7, S8 AND S9; IF S5 NOT=1, ASK S9 AND TERMINATE]**
4. Don't know **[TERMINATE AFTER S7]**

S7. Who is billed by your gas or electric company for each of the following things used in your home?

	1. Your household	2. Someone else (e.g., landlord, property manager)	3. Not sure	4. Not used in your home
A. Heating all or some of the space in your house / unit	○	○	○	○
B. Air conditioning or cooling all or some of the space in your house / unit (including any fans, dehumidifiers, etc.)	○	○	○	○
C. Water heating	○	○	○	○
D. Lights on the <u>outside</u> of your home or building	○	○	○	○
E. Pump for a swimming pool or hot tub	○	○	○	○
F. Heater for a swimming pool or hot tub	○	○	○	○

[TERMINATE HERE IF DISQUALIFIED OR OVER-QUOTA AND GO TO TERMINATE LANGUAGE; OTHERWISE CONTINUE TO S8]

S8. **[ASK ALL:]** What is the **primary fuel type** used for each of the purposes listed below?

	Primary Fuel Type					
	1. Electricity	2. Natural gas (piped gas)	3. Propane	4. Something else [SPECIFY]	5. Not sure	6. Not applicable
1. Heating all or some of the space in your house / unit	○	○	○	○	○	○
2. Hot water heating for your home	○	○	○	○	○	○
3. Cooking	○	○	○	○	○	○
4. Clothes dryer	○	○	○	○	○	○

[IF S6=3 ASK S9; OTHERWISE GO TO S10]

S9. What company provides you with natural gas?

1. Ameren Illinois
2. Nicor
3. Some other company [**PLEASE SPECIFY**]

[IF S5 NOT=1 AND S9 NOT=1, TERMINATE; OTHERWISE CONTINUE]

S10. Which of the following systems/equipment do you use to **cool** your home, even if only once in a while, and / or for part of your home? *Select all that apply.*

1. Central air conditioner
2. One or more room air conditioners mounted in or near a window or on a wall
3. Air-source heat pump
4. Geothermal heat pump
5. Whole-house fan
6. Attic fan
7. One or more portable room air conditioners
8. One or more portable dehumidifiers
9. One or more ceiling fans
10. One or more window or room fans

990. Other **[SPECIFY]**

996. Not sure **[EXCLUSIVE]**

998. My home has no cooling systems/equipment **[EXCLUSIVE]**

[IF >1 ITEM SELECTED IN S10, DISLAY S11; OTHERWISE AUTOCODE S11=S10 AND SKIP TO S12]

S11. Which one of these cooling systems/equipment do you use to cool **all or most** of your home? **[ONLY DISPLAY ITEMS SELECTED IN S10]**

1. Central air conditioner
2. One or more room air conditioners mounted in or near a window or on a wall
3. Air-source heat pump
4. Geothermal heat pump
5. Whole-house fan
6. Attic fan
7. One or more portable room air conditioners
8. One or more portable dehumidifiers
9. One or more ceiling fans
10. One or more window or room fans

990. **[INSERT S10_990 RESPONSE]**

996. Not sure **[EXCLUSIVE]**

998. home has no cooling systems/equipment that cool all or most of my home **[EXCLUSIVE]**

S12. Which of the following systems/equipment do you use to **heat** your home, even if only once in a while, and / or for part of your home? *Select all that apply.*

1. Central warm air furnace with ducts/vents to individual rooms
2. Central boiler with hot water/steam radiators or baseboards in individual rooms
3. Electric baseboard or electric coils radiant heating
4. An air-source heat pump
5. A geothermal heat pump
6. One or more wall furnaces
7. One or more fireplaces
8. One or more wood burning stoves
9. One or more wall-mounted space heaters

10. One or more portable space heaters
990. Other **[SPECIFY]**
996. Not sure **[EXCLUSIVE]**
998. My home has no heating systems/equipment **[EXCLUSIVE]**

[IF >1 ITEM SELECTED IN S12, DISLAY S13; OTHERWISE AUTOCODE S13=S12 AND SKIP TO END OF SCREENER]

S13. Which one of these heating systems/equipment do you use to heat **all or most** of your home?
[ONLY DISPLAY ITEMS SELECTED IN S12]

1. Central warm air furnace with ducts/vents to individual rooms
2. Central boiler with hot water/steam radiators or baseboards in individual rooms
3. Electric baseboard or electric coils radiant heating
4. An air-source heat pump
5. A geothermal heat pump
6. One or more wall furnaces
7. One or more fireplaces
8. One or more wood burning stoves
9. One or more wall-mounted space heaters
10. One or more portable space heaters

990. **[INSERT S12_990 RESPONSE]**
996. Not sure **[EXCLUSIVE]**
998. My home has no heating system/equipment that heat all of most of my home **[EXCLUSIVE]**

[TERMINATE IF DISQUALIFIED; OR OVER-QUOTA AND GO TO TERMINATE LANGUAGE; OTHERWISE GO TO INVITATION LANGUAGE]

TERMINATE LANGUAGE FOR NON-QUALIFYING AFTER QS1.0 OR OVER-QUOTA RESPONDENTS

We truly appreciate your time and effort in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this point, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your home can save money on your energy bills, please visit us at www.actonenergy.com

---

Thank you. Have a nice day!

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far! You qualify for the survey. As we indicated earlier, only a limited number of individuals have been invited to participate in this survey, so we appreciate your time in filling out the survey as completely as possible.

The survey should take about 20 - 25 minutes to complete. Once you complete the survey you will be eligible to receive our $10 thank you payment. Information about how to receive this payment will be provided at the end of the survey.

Your responses are important to us, so please press “Continue” to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the personalized URL to access your survey again. The survey will automatically take you to the point where you left off.

As you complete the survey, you will **not** be able to use your browser’s “back” button. If you mistakenly press your browser’s “back” button, you will need to press the “refresh” button to continue the survey.

I – ATTITUDES

[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT]

Q1. Overall, how familiar would you say you are with Ameren Illinois as your electric, and/ or gas, utility?
[RECORD NUMBER; 1=NOT AT ALL FAMILIAR, 10=EXTREMELY FAMILIAR]

Not at all familiar								Extremely familiar	
1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Q2. Using a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree, please indicate how much your household agrees or disagrees with each of the following statements about Ameren Illinois.
Note: If you don't feel like you are very familiar with Ameren Illinois on any of the following, please just give your best guess.
Ameren Illinois is…
[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-5]	Strongly disagree								Strongly agree	
	1	2	3	4	5	6	7	8	9	10
1. …a leader in energy conservation and energy efficiency	○	○	○	○	○	○	○	○	○	○
2. …a company that can be trusted	○	○	○	○	○	○	○	○	○	○
3. …a credible information source for the community on energy efficiency	○	○	○	○	○	○	○	○	○	○
5. …a company that actively promotes programs to help its customers save money	○	○	○	○	○	○	○	○	○	○

Q3. Overall, how satisfied would you say your household is with the service provided by Ameren Illinois?
[RECORD NUMBER; 1=NOT AT ALL SATISFIED, 10=EXTREMELY SATISFIED]

Not at all satisfied								Extremely satisfied	
1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Q4. Using a 10-point scale, where '1' means it is not at all important and '10' means it is extremely important, please indicate how important it is to your household that Ameren Illinois do the following things, even if that means you would have to pay a little more in order for the company to pursue these types of initiatives.
[RECORD NUMBER; 1=NOT AT ALL IMPORTANT, 10=EXTREMELY IMPORTANT]

[ROTATE 1-4]	Not at all important								Extremely important	
	1	2	3	4	5	6	7	8	9	10
1. Actively encourage its customers to participate in energy saving and cost saving programs	○	○	○	○	○	○	○	○	○	○
2. Do everything possible to supply	○	○	○	○	○	○	○	○	○	○

renewable, clean energy										
3. Operate its business in a completely environmentally friendly manner	○	○	○	○	○	○	○	○	○	○

Q5. Considering the types of initiatives we asked about in the previous question, which would you prefer your electric utility do…? *PLEASE SELECT ONE*

1. Pursue these and other initiatives even if you would have to pay a little more
2. Do everything possible to keep energy costs as low as possible
3. Both are equally important

Q6. We'd like to understand how your household as a whole thinks about using energy at your home. Using a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree, please indicate how much you agree or disagree with each of the following statements.
[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-9]	**Strongly disagree**									**Strongly agree**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Comfort is very important to your household – even if it means spending more each month for energy	○	○	○	○	○	○	○	○	○	○
2. Saving money on energy costs is something you focus on every day	○	○	○	○	○	○	○	○	○	○
3. Realistically, there isn't much you can do to save money on energy costs	○	○	○	○	○	○	○	○	○	○
4. You just want to be left alone to use energy however you want in your home	○	○	○	○	○	○	○	○	○	○
5. You are very concerned about the environmental effects of electric power plants	○	○	○	○	○	○	○	○	○	○
6. Conserving energy at your home will make no difference to the quality of the environment overall	○	○	○	○	○	○	○	○	○	○
7. You would do more to make your home more energy efficient, but you don't know where to start	○	○	○	○	○	○	○	○	○	○
8. The threat from global warming is real, and significant	○	○	○	○	○	○	○	○	○	○
9. You are an "early adopter" of new home technologies	○	○	○	○	○	○	○	○	○	○

II – ENERGY EFFICIENCY MEASURES IMPLEMENTED

Q7. Which, if any, of the following items have been purchased for your home in the **last 12 months**? Which, if any, do you plan to purchase for your home in the **next 12 months**? *Select all that apply.*

[ROTATE 1-13]	**A. Purchased in last 12 months**	**B. Plan to purchase in next 12 months**
1. Water heater **[ASK THIS ROW IF S2=1]**	☐	☐
2. Furnace or boiler**[ASK THIS ROW IF S2=1]**	☐	☐
3. Central air conditioner **[ASK THIS ROW IF S2=1]**	☐ **[OFFER IF S10_1 IS SELECTED]**	☐
4. Room air conditioner	☐ **[OFFER IF S10_2 IS SELECTED]**	☐
5. Clothes washer or dryer	☐	☐
6. Refrigerator	☐	☐
7. Freezer	☐	☐
8. Dishwasher	☐	☐
9. TV	☐	☐
10. Computer	☐	☐
11. Pump for pool or hot tub	☐ **[ASK IF S2=1 AND S7_E NOT=4]**	☐
12. Heater for pool or hot tub	☐ **[ASK IF S2=1 AND S7_F NOT=4]**	☐
13. Heat pump	☐ **[ASK IF S2=1 OR IF ANY OF S10_3, S10_4, S12_4,S12_5 SELECTED]**	☐
14. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐	☐
15. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐	☐
16. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐	☐
17. Not sure **[EXCLUSIVE]**	☐	☐
18. **None** of the above **[EXCLUSIVE]**	☐	☐

[IF ANY Q7_1 THRU Q7_16 SELECTED, ASK Q8; OTHERWISE SKIP TO FILTER BEFORE Q9]

Q8. To the best of your recollection, were any of the items purchased for your household **in the last 12 months** ones that were specifically described as "high energy efficiency," or "highly energy efficient" appliances or devices?

High energy efficiency models are often labeled as "ENERGY STAR®" appliances or devices.

[DISPLAY ONLY ITEMS SELECTED AT Q3A]	**1. Yes**	**2. No**	**3. Not sure**
1. Water heater	○	○	○
2. Furnace or boiler	○	○	○
3. Central air conditioner	○	○	○
4. Room air conditioner	○	○	○
5. Clothes washer or dryer	○	○	○
6. Refrigerator	○	○	○
7. Freezer	○	○	○
8. Dishwasher	○	○	○
9. TV	○	○	○
10. Computer	○	○	○
11. Pump for pool or hot tub	○	○	○
12. Heater for pool or hot tub	○	○	○
13. Heat pump	○	○	○
14. **[INSERT Q7_14 OTHER SPECIFY]**	○	○	○
15. **[INSERT Q7_15 OTHER SPECIFY]**	○	○	○
16. **[INSERT Q7_16 OTHER SPECIFY]**	○	○	○

[IF ANY Q8_1 THROUGH Q8_16 SELECTED, ASK Q9; OTHERWISE SKIP TO Q10]

Q9. Of the appliances and equipment that you **plan to purchase** in the next 12 months, do you plan for any of these to be "high energy efficiency," or "highly energy efficient" models?

High energy efficiency models are often labeled as "ENERGY STAR®" appliances or devices.

[DISPLAY ONLY ITEMS SELECTED AT Q3B]	**1. Yes**	**2. No**	**3. Not sure**
1. Water heater	○	○	○
2. Furnace or boiler	○	○	○
3. Central air conditioner	○	○	○
4. Room air conditioner	○	○	○
5. Clothes washer or dryer	○	○	○
6. Refrigerator	○	○	○
7. Freezer	○	○	○
8. Dishwasher	○	○	○
9. TV	○	○	○
10. Computer	○	○	○
11. Pump for pool or hot tub	○	○	○
12. Heater for pool or hot tub	○	○	○
13. Heat pump	○	○	○
14. **[INSERT Q8_14 OTHER SPECIFY]**	○	○	○
15. **[INSERT Q8_15 OTHER SPECIFY]**	○	○	○
16. **[INSERT Q8_16 OTHER SPECIFY]**	○	○	○

Q10. Before today, have you ever heard of compact fluorescent light bulbs (CFLs)?

1. Yes
2. No
3. Not sure

[IF Q10=2-3, ASK Q11; OTHERWISE SKIP TO Q12)

Q11. Compact fluorescent light bulbs (CFLs) usually do not look like regular incandescent bulbs. The most common type of CFL is made with a glass tube bent into a spiral, resembling a soft-serve ice cream, and it fits in a regular light bulb socket (see image below). Before today, were you familiar with CFLs?

1. Yes
2. No
3. Not sure

A compact fluorescent bulb, or CFL

[IF Q10=1 OR Q11=1, ASK Q12; OTHERWISE SKIP TO Q13]

Q12. Approximately how many compact fluorescent light bulbs (CFLs) are you currently using in your home? *Your best estimate is fine.*

1. None
2. 1 to 5
3. 6 to 10
4. More than 10
5. Not sure

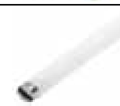
Q13. Have you purchased ***any*** lighting products within the last 6 months?

This includes any incandescent light bulbs, CFLs, halogens, fixtures and other lighting products.

1. Yes
2. No
3. Not sure

[IF Q13=1, ASK Q14; OTHERWISE SKIP TO Q16]

Q14. For your lighting purchases made in the last 6 months, please record for each type below how many were bought for your home. *Your best estimate is fine.*
If a package of bulbs contained multiple units, please count each bulb separately.

A. Light bulb type		**Bulbs purchased in the <u>last 6 months</u>**
[DISPLAY ROW IF Q10=1 OR Q11=1; OTHERWISE AUTOCODE Q14A1=0] 1. Compact fluorescent light bulbs (CFLs)		**[RECORD NUM 0-99]**
2. Incandescent light bulbs		**[RECORD NUM 0-99]**
3. LED lamps		**[RECORD NUM 0-99]**
4. Halogen light bulbs		**[RECORD NUM 0-99]**
5. Tubular fluorescent light bulbs		**[RECORD NUM 0-99]**
6. Low-voltage lamps		**[RECORD NUM 0-99]**
990. Other light bulbs **[SPECIFY]**		**[RECORD NUM 0-99]**
TOT. **Total**		**[CALCULATE TOT]**

B. Lighting fixture type		Units purchased in the last 6 months
1. Hard-wired incandescent fixtures		**[RECORD NUM 0-99]**
2. Hard-wired halogen fixtures		**[RECORD NUM 0-99]**
3. Hard-wired fluorescent fixtures		**[RECORD NUM 0-99]**
[DISPLAY ROW IF Q10=1 OR Q11=1; OTHERWISE AUTOCODE Q14B4=0] 4. Hard-wired CFL-specific fixtures		**[RECORD NUM 0-99]**
5. Plug-in incandescent fixtures		**[RECORD NUM 0-99]**
6. Plug-in halogen fixtures		**[RECORD NUM 0-99]**
7. Plug-in fluorescent fixtures		**[RECORD NUM 0-99]**
[DISPLAY ROW IF Q10=1 OR Q11=1; OTHERWISE AUTOCODE Q14B8=0] 8. Plug-in CFL-specific fixtures		**[RECORD NUM 0-99]**
9. Incandescent torchieres (floor lamps)		**[RECORD NUM 0-99]**
10. Halogen torchieres (floor lamps)		**[RECORD NUM 0-99]**
11. Fluorescent torchieres (floor lamps)		**[RECORD NUM 0-99]**
[DISPLAY ROW IF Q10=1 OR Q11=1; OTHERWISE AUTOCODE 14B12=0] 12. CFL-specific torchieres (floor lamps)		**[RECORD NUM 0-99]**
990. Other lighting fixtures **[SPECIFY]**		**[RECORD NUM 0-99]**
TOT. **Total**		**[CALCULATE TOT]**

[IF Q14ATOT>0, ASK Q15; OTHERWISE SKIP TO Q16]

Q15. For the bulbs you said you purchased within the past 6 months, please tell us how many were purchased within the **last 3 months**.

Light bulb type [ONLY DISPLAY ROWS >0 AT Q14]	**Bulbs purchased in the last 6 months**	**Number of those purchased within the past 3 months?**
1. Compact fluorescent light bulbs (CFLs)	**[Q14A1 RESPONSE]**	**[RECORD NUM 0-Q14A1]**
2. Incandescent light bulbs	**[Q14A2 RESPONSE]**	**[RECORD NUM 0-Q14A2]**
3. LED lamps	**[Q14A3 RESPONSE]**	**[RECORD NUM 0-Q14A3]**
4. Halogen light bulbs	**[Q14A3 RESPONSE]**	**[RECORD NUM 0-Q14A3]**
5. Tubular fluorescent light bulbs	**[Q14A4 RESPONSE]**	**[RECORD NUM 0-Q14A4]**
6. **[INSERT Q10A990 OTHER SPECIFY]**	**[Q14A5 RESPONSE]**	**[RECORD NUM 0-Q14A1]**
TOT. **Total**	**[Q14ATOT]**	**[CALCULATE TOT]**

[IF Q14A_1>0, ASK Q16; OTHERWISE SKIP TO Q17]

Q16. You mentioned having purchased **[Q14A1 RESPONSE]** Compact Fluorescent light bulbs CFL(s) for your home within the **last 6 months**.

[IF Q14A_1=1; DISPLAY At which one of the following did you purchase this CFL?**] [IF Q14A_1>1; DISPLAY** At which of the following types of stores did you purchase these CFLs? *Select all that apply.***]**

1. Discount store (e.g., Dollar Store or Deals)
2. Drug store / pharmacy (e.g., CVS, Walgreens)
3. Large home improvement store (e.g., Lowe's, Home Depot, Menards)
4. Smaller hardware store (e.g., Ace, True Value, Sears Hardware)
5. Mass merchandise store (e.g., Wal-Mart, Target, Kmart)
6. Online store (e.g., Amazon.com, Ebay, Lowes.com)
7. Specialty lighting or electronics store
8. Supermarket / grocery store (e.g., Schnucks, Dierbergs, Shop & Save, Aldi, Kroger)
9. Warehouse / membership club store (e.g., Costco, Sam's Club)

990.Other **[SPECIFY]**

Q17. Some utilities offer rebates, low interest loans, or price discounts to encourage people to purchase highly energy efficient products such as appliances, furnaces, heat pumps, water heaters, compact fluorescent light bulbs (CFLs), and home insulation.

To the best of your knowledge, does Ameren Illinois have any such programs that offer you a discount off the purchase price on qualified items?

1. Yes
2. No
3. Not sure

[IF Q17=1, ASK Q18; OTHERWISE SKIP TO Q19]

Q18. Has your household participated in any loans, price discounts or conservation rebate programs provided by Ameren Illinois either through a contractor or retailer, or directly by Ameren Illinois within the **last 2 years**?

1. Yes
2. No
3. Not sure

Q19. In addition to the items we've reviewed so far, which, if any, of these other energy efficiency related actions have you **[IF S2=2, "**, your landlord,**"]** or any other members of your household taken in your home in the **last 12 months**? *Select all that apply.*

[ROTATE 1-10]	**Other energy efficiency related actions taken in last 12 months**
1. Conducted a home energy audit	☐
2. Installed storm doors	☐
3. Added weather stripping, caulking, or insulation of windows or doors	☐
4. Installed enhanced insulation of ducts, ceilings, walls, attics, or foundation	☐
5. Installed enhanced water pipe insulation	☐
6. Installed low-flow shower heads or faucet aerators	☐
7. Had a furnace or heat pump tuned up to operate more efficiently	☐
8. Participated in a refrigerator/freezer recycling program	☐
9. Installed a programmable thermostat	☐
10. Installed one or more "Smart" power strips that automatically turn off devices (such as computers, printers, phone chargers) after a period of time when they are not used	☐
990. Implemented any other energy efficiency measures **[SPECIFY]**	☐
11. None of the above **[EXCLUSIVE]**	☐

Q20. Which of the following actions are you consistently taking in your home today? *Select all that apply*. *By "consistently", we mean that you do this every time, or on a regular basis.*
[ROTATE 1-7]

1. Using a power strip to turn off electronic equipment when it is not in use
2. Unplugging battery rechargers (e.g., for laptops, cell phones, MP3 players) when they are not being used
3. **[DISPLAY IF ANY S10_1, S10_3, S10_4, OR S12_1, S12_2, S12_4, S12_5 SELECTED]** Performing annual maintenance on your HVAC (heating, ventilation, or air conditioning) equipment
4. Using a water heater insulation blanket / jacket
5. Using a lower water heater temperature
6. Turning off lights when no one is in the room
7. Using a clothes dryer that has a sensor that turns the dryer off when the clothes are dry
8. Turning down heating and/or cooling equipment when away from home and/or at night

990. None of the above **[EXCLUSIVE]**

Q21. Have you noticed any energy or cost savings as a result of any actions you might have taken over the last 12 months to conserve energy?

1. Yes
2. No
3. Not sure

III – PURCHASING ATTITUDES

Now, we'd like to ask you how important various factors are when you and/or other members of your household shop for energy-related products and services for your home.

Q22. Using a 10 point scale where '1' means it is **<u>not at all important</u>** to your household and '10' means it is **<u>extremely important</u>** to your household, please indicate **how important** to your household each of the following factors is when selecting which appliances, electronic devices, or other energy-related products or services to purchase for your home.

[RECORD NUMBER; 1=NOT AT ALL IMPORTANT, 10=EXTREMELY IMPORTANT]

[ROTATE 1-7, but make sure 1-2 always appear next to each other, and make sure 1-2 rotate]	Not at all important									Extremely important
	1	2	3	4	5	6	7	8	9	10
1. Any cost savings you might see from using the product / service	○	○	○	○	○	○	○	○	○	○
2. Any positive environmental impacts that might result from using the product / service	○	○	○	○	○	○	○	○	○	○
3. Any rebates or purchase discounts that might be offered for purchasing energy efficient products / services	○	○	○	○	○	○	○	○	○	○
4. The extent to which the product / service is at the leading edge of new technology	○	○	○	○	○	○	○	○	○	○
5. Recommendations of friends and family	○	○	○	○	○	○	○	○	○	○
6. Features and functions included with the product / service	○	○	○	○	○	○	○	○	○	○
7. The total amount of money the product / service would cost	○	○	○	○	○	○	○	○	○	○

[IF Q22_1=Q22_2, ASK Q23; OTHERWISE SKIP TO Q24]

Q23. When shopping for energy-related products and services for your home, which **one** of the following factors is **<u>more</u> important** to you?

[ROTATE 1-2]	More important factor when shopping for energy-related products /services
1. Any **cost savings** you might see from reduced electricity usage	○
2. Any **positive effects on the environment** that might result	○

Q24. Using a 10 point scale where '1' means you **strongly disagree** and '10' means you **strongly agree**, please indicate how much you **agree** or **disagree** with each of the following statements.
[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-7]	**Strongly disagree**									**Strongly agree**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. You really look to appliance and other home technologies to save you time and effort	○	○	○	○	○	○	○	○	○	○
2. The most important thing about a heating system or air conditioner is how comfortable it makes your home	○	○	○	○	○	○	○	○	○	○
3. How an appliance functions is always more important than how it looks	○	○	○	○	○	○	○	○	○	○
4. You enjoy having leading-edge appliances or devices with the most innovative features	○	○	○	○	○	○	○	○	○	○
5. You prefer appliances that are plain and simple – free of high-tech options	○	○	○	○	○	○	○	○	○	○
6. It's worth spending more money to get the highest quality product available	○	○	○	○	○	○	○	○	○	○
7. It's worth spending more for an appliance or electronic device that has been rated as an energy efficient or *"ENERGY STAR®"* product	○	○	○	○	○	○	○	○	○	○

IV – INTEREST IN POTENTIAL ENERGY EFFICIENCY PROGRAMS THAT COULD BE OFFERED BY AMEREN ILLINOIS

[PROGRAMMER NOTE: REBATE/INCENTIVE PROGRAM INTRODUCTION SCREEN]

The next section of the survey asks for your reaction to a wide variety of energy efficiency programs that Ameren Illinois may be able to offer to customers like you. For each of the programs you will see, we would like to know how likely you think your household would be to participate in the program.

Q25. With many of these programs, Ameren Illinois would offer your household a rebate or other financial incentive to purchase a more energy efficient version of an item that uses energy in your home. As an example, consider the fact that you can purchase refrigerators that are "standard" efficiency or "higher than standard" efficiency. Higher efficiency refrigerators cost a little bit more, but they use less energy. Often, the energy that you can save by using a more energy efficient appliance can pay for the higher cost of that appliance within a few years.

Ameren Illinois might be able to offer a rebate or other financial incentive to households that opt to purchase a higher efficiency refrigerator or other appliance. Because these rebates would reduce the cost difference between a highly energy efficient unit and a standard unit, it would take less time to save on electricity costs to make up for the higher initial cost of the more efficient unit. And remember that you would continue to save money on electricity costs, even after the energy efficient unit "paid for itself."

[CAN SPLIT HERE ONTO TWO SCREENS]

Please assume for now that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the additional cost of a higher efficiency refrigerator within **3 years**. If you were going to acquire a new refrigerator, how likely would your household be to buy the higher than standard efficiency refrigerator (and take the rebate), rather than buying an equivalent standard efficiency refrigerator?

Please use a 10 point scale where '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this.

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

[ASK IF Q25 =7-10]

Q26. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a "higher than standard efficiency" refrigerator in **5 years**. If this were true, and you were going to acquire a new refrigerator, how likely would your household be to buy the higher than standard efficiency refrigerator (and take the rebate), rather than buying an equivalent standard efficiency refrigerator?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q25 =1-6]

Q27. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a "higher than standard efficiency" refrigerator in **1 year**. If this were true, and you were going to acquire a new refrigerator, how likely would your household be to buy the higher than standard efficiency refrigerator (and take the rebate), rather than buying an equivalent standard efficiency refrigerator?

Not At All Likely To Do This								Extremely Likely to Do This	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Q28. Now, for each of the items described below, let's assume that a rebate from Ameren Illinois would mean that you would save enough on electricity, in **3 years**, to pay for the additional cost to buy a "higher than standard efficiency" model of that item. If this were true, and you were going to acquire each of these items, how likely would your household be to buy the higher than standard efficiency model (and take the rebate), rather than buying an equivalent standard efficiency model of each item?

Please use a 10 point scale where, '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this.

[ROTATE 1-8] **3 Year Payback Period**	**Not at all likely to do this**								**Extremely likely to do this**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
[DISPLAY IF S7B=1 OR 3 AND S10=1- 8, 990,996] 1. Purchase a higher than standard efficiency **air conditioner**	○	○	○	○	○	○	○	○	○	○
IF S2=1 & S7A=1 OR 3] 2. Purchase a higher than standard efficiency **furnace or boiler**	○	○	○	○	○	○	○	○	○	○
[IF S2=1 & S7C=1 OR 3] 3. Purchase a higher than standard	○	○	○	○	○	○	○	○	○	○

efficiency **water heater**										
4. Purchase a higher than standard efficiency **TV**	○	○	○	○	○	○	○	○	○	○
5. Purchase a higher than standard efficiency **personal computer**	○	○	○	○	○	○	○	○	○	○
[IF S8_3=1-4] 6. Purchase a higher than standard efficiency **stovetop or range**	○	○	○	○	○	○	○	○	○	○
[IF S8_4=1-4] 7. Purchase a higher than standard efficiency **clothes dryer**	○	○	○	○	○	○	○	○	○	○
[S7E=1 OR 3] 8. Purchase a higher than standard efficiency s**wimming pool pump**	○	○	○	○	○	○	○	○	○	○

Q29. In addition to offering programs that would help you buy more energy efficient appliances for your home, Ameren Illinois might also be able to offer your household a rebate or other financial incentive to do other things that might make your home more energy efficient. For example, they might provide an incentive to help you <u>replace your exterior windows</u> with more energy efficient models that have greater insulating properties. Once the exterior windows are installed, the energy saved could potentially make up for the associated cost of installing the windows within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the more energy efficient exterior windows within **<u>3 years</u>**, how likely would you be to install the windows (and take the rebate)?

Please use a 10 point scale where, '1' means you think your household would be <u>not at all likely to do this</u> and '10' means your household would be <u>extremely likely to do this.</u>

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

[ASK IF Q29 =7-10]

Q30. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install more energy efficient exterior windows in **5 years**. If you were given this option, how likely would you be to replace the exterior windows in your home (and take the rebate)?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

[ASK IF Q29 =1-6]

Q31. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install more energy efficient exterior windows in **1 year**. If you were given this option, how likely would you be to replace the exterior windows in your home (and take the rebate)?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

Q32. Now, for each of the following energy efficiency improvements you could make in your home, let's assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity, in **3 years**, to pay for the additional cost to make the energy efficiency improvement. If this were true, how likely would your household be to make each improvement (and take the rebate)?

Please use a 10 point scale where, '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this.

[ROTATE SECTIONS A-B] [ROTATE ITEMS WITHIN EACH SECTION] **3 Year Payback Period**	**Not at all likely to do this**									**Extremely likely to do this**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A. Cooling / Heating System Improvements [DISPLAY THIS SECTION IF S7B=1 OR 3 AND ANY S10_1-S10_996 SELECTED]										
[DISPLAY IF S10 NE 5-6] 1. Install a whole house / attic fan to improve air flow in your home	○	○	○	○	○	○	○	○	○	○
[DISPLAY IF S12=1- 4 OR S10=1, 3 OR 4]	○	○	○	○	○	○	○	○	○	○

2. Have your cooling and / or heating system ductwork professionally inspected, repaired, and sealed										
[DISPLAY IF S12=1- 4 OR S10=1, 3 OR 4] 3. Add insulation to the ductwork that serves your cooling and/or heating or systems.	○	○	○	○	○	○	○	○	○	○
B. Exterior Building Improvements [DISPLAY THIS SECTION IF S2=1]										
4. Install additional or upgraded home insulation to ceilings, walls, or floors	○	○	○	○	○	○	○	○	○	○
[DISPLAY IF S7D=1 OR 3] 5. Install controls on your outside lights that make sure they are only on at certain times	○	○	○	○	○	○	○	○	○	○

Q33. In addition to the options described so far, Ameren Illinois might also be able to offer your household a rebate or other financial incentive to implement some lower cost measures that could still help make your home more energy efficient. For example, they might provide an incentive to help you <u>install a new – or replace an existing standard efficiency -- dehumidifier</u>, with a more energy efficient model. Installing a high efficiency dehumidifier typically reduces air conditioning costs and saves energy overall. Once the dehumidifier is installed, the energy savings could potentially make up for the cost of the unit within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the more efficient dehumidifier within <u>**3 years**</u>, how likely would you be to install or replace a dehumidifier (and take the rebate)?

Please use a 10 point scale where, '1' means you think your household would be <u>not at all likely to do this</u> and '10' means your household would be <u>extremely likely to do this.</u>

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q33 =7-10]

Q34. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install the more energy efficient dehumidifier in <u>**5 years**</u>. If you were given this option, how likely would you be to install or replace a dehumidifier in your home (and take the rebate)?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q33 =1-6]

Q35. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install or replace a more energy efficient dehumidifier in **1 year**. If you were given this option, how likely would you be to install or replace a dehumidifier in your home (and take the rebate)?

Not At All Likely To Do This									**Extremely Likely to Do This**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Q36. Now, for each of the following energy efficiency improvements you could make in your home, let's assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity, in **3 years**, to pay for the additional cost to make the energy efficiency improvement. If this were true, how likely would your household be to make each improvement (and take the rebate)?

Please use a 10 point scale where, '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this.

[ROTATE SECTIONS A-C] [ROTATE ITEMS WITHIN EACH SECTION] **3 Year Payback Period**	**Not at all likely to do this**									**Extremely likely to do this**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A. Cooling Improvements [DISPLAY THIS SECTION IF S7B=1 OR 3 AND ANY S10_1-S10_996 SELECTED]										
[DISPLAY IF S10=1- 8, 990,996] 1. Have regular maintenance performed on your cooling system by a professional service technician	○	○	○	○	○	○	○	○	○	○
B. Heating Improvements [DISPLAY THIS SECTION IF S7A=1 OR 3 AND IF S12 NE 9]										
2. Have regular maintenance performed on your heating system by a professional service technician										
[DISPLAY IF S13=1- 4 OR S10=1, 3 OR 4] 3. Install a thermostat on your heating and / or cooling system that would allow you to pre-set different heating or cooling levels for different days and different times of the day	○	○	○	○	○	○	○	○	○	○
C. Water Heating Improvements										
4. Install "low flow" showerheads that reduce the amount of hot water used	○	○	○	○	○	○	○	○	○	○
D. Other In-Home Improvements										
5. Install one or more "Smart" power strips that	○	○	○	○	○	○	○	○	○	○

automatically turn off devices (such as computers, printers, or phone chargers) after a period of time when they are not used										

Q37. So, finally in terms of new energy efficiency options that Ameren Illinois might also be able to offer your household is a rebate to install new light bulbs that are more energy efficient than traditional incandescent bulbs. Light bulbs such as compact fluorescent light bulbs (CFLs) or **LED (light emitting diode)** bulbs fit into this category. Installing these higher efficiency bulbs saves energy, and could potentially make up for the higher cost of the bulb within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the more efficient bulbs within **3 years**, how likely would you be to install one or more of the bulbs (and take the rebate)?

Please use a 10 point scale where, '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this.

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q37 =7-10]

Q38. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install the more energy efficient light bulbs in **5 years**. If you were given this option, how likely would you be to install one or more of these bulbs in your home (and take the rebate)?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q37 =1-6]

Q39. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost to install the more energy efficient light bulbs in **1 year**. If you were given this option, how likely would you be to install one or more of these bulbs in your home (and take the rebate)?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Q40. Now, please consider the following list of actions you can take to make your home more energy efficient, which don't have any up-front costs, but may require some tradeoffs in terms of a small amount of comfort or convenience.

Using a 10 point scale where, '1' means you think your household would be not at all likely to do this and '10' means your household would be extremely likely to do this, please indicate how likely you would be to take any of these energy saving actions.

[ROTATE 1-2]	**Not at all likely to do this**									**Extremely likely to do this**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Reduce the temperature of the hot water that your water heater delivers	○	○	○	○	○	○	○	○	○	○
2. Turn down the heating or cooling while sleeping or away from home	○	○	○	○	○	○	○	○	○	○
3. Get rid of a secondary refrigerator that you may only use sometimes and might be in a garage or basement	○	○	○	○	○	○	○	○	○	○

V – PURCHASING ATTITUDES / BEHAVIOR & ENVIRONMENTAL ATTITUDES

Q41. Now we'd like to understand **how your household shops for products and services for your home**. Using a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree, please indicate how much you agree or disagree with each of the following statements.

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-6]	Strongly disagree								Strongly agree	
	1	2	3	4	5	6	7	8	9	10
1. You carefully research product features and reviews to select the best product	○	○	○	○	○	○	○	○	○	○
2. You usually don't buy things unless they're on sale, or you have a coupon or discount	○	○	○	○	○	○	○	○	○	○
3. Someone in your household does a lot of do-it-yourself / home-improvement projects	○	○	○	○	○	○	○	○	○	○
4. You usually take the time to shop and explore all of your options before you make a final purchase decisions	○	○	○	○	○	○	○	○	○	○
5. You prefer to shop and make purchases in a store, rather than on the Internet	○	○	○	○	○	○	○	○	○	○
6. To be honest, the environmental impact of your day-to-day purchases is not something you spend a lot of time worrying about	○	○	○	○	○	○	○	○	○	○

VII – ADDITIONAL HOUSEHOLD CHARACTERISTICS / DEMOGRAPHICS

In order to help us classify your responses, the last few questions are on your household's characteristics.

D1. **Including yourself**, how many individuals normally live in your home?
Please do not include anyone who is just visiting, or not currently living with you due to their enrollment in college and/or military service."
[RECORD NUMBER 1-20] individuals

D2. Are there any individuals in your home that regularly stay at home all or most **weekdays**?

1. Yes
0. No

D3. Which of the following best describes your home?
1. Single-family house detached from any other houses
2. Single-family house attached to one or more houses
3. Multi-family house or building with 2-4 apartments/units
4. Multi-family house or building with 5 or more apartments/units
5. Mobile/manufactured home
990. Other **[SPECIFY]**

D4. For about how many years have you lived in your present home?
Your best estimate is fine, but please enter a whole number rather than a range of numbers.
1. Less than 1 year
2. **[RECORD NUMBER 1-100]** years

D5. Is this home your primary place of residence or is it a seasonal/vacation home that is only occupied for part of the year?
1. Primary residence
2. Seasonal / vacation home
990. Other **[SPECIFY]**

[ASK IF D5=2]

D6. How many months out of the year do you or any other members of your household typically occupy this home? *Your best estimate is fine, but please enter a whole number rather than a range of numbers.*

[RECORD NUMBER 0-12] months

D7. What is the approximate square footage of your home? Please include only heated living space in your response.
If you are not certain, please give your best estimate.
1. Less than 500 sq. ft.
2. 500 – 999
3. 1,000 – 1,499
4. 1,500 – 1,999
5. 2,000 – 2,499
6. 2,500 – 2,999
7. 3,000 – 3,499
8. 3,500 – 3,999
9. 4,000 sq. ft. or more

D8. How many bedrooms are in your home?

0. 0 / Studio/Efficiency apartment / SRO
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6 or more

D9. Which of the following best characterizes the city / town / community in which you live?

1. Urban
2. Suburban
3. Rural

D10. What is your gender?

1. Male
2. Female

D11. What is the highest level of education you have completed?

1. Less than a high school degree
2. High school degree
3. Technical/trade school program
4. Associates degree or some college
5. Bachelors degree
6. Graduate / professional degree, e.g., J.D., MBA, MD, etc.
7. Professional certification, e.g., CPA, CNP, etc.

D12. What is your current employment status?

1. Employed full-time
2. Employed part-time
3. Not currently employed
4. Retired

990. Other **[SPECIFY]**

D13. Which of the following categories includes your <u>household's</u> total annual income before taxes in 2008? Please include the income of **all** people living in your home in this figure.

1. Less than $60,000
2. $60,000 or more

D14. Which of the following categories includes your <u>household's</u> total annual income before taxes in 2008? Please include the income of **all** people living in your home in this figure.

[IF D13=1, DISPLAY OPTIONS 1-7 AND 13; IF D13=2, DISPLAY OPTIONS 8-13]

1. Less than $10,000
2. $10,000 – $14,999
3. $15,000 – $19,999
4. $20,000 – $29,999
5. $30,000 – $39,999
6. $40,000 –$49,999
7. $50,000 – $59,999
8. $60,000 – $74,999
9. $75,000 – $99,999
10. $100,000 – $124,999
11. $125,000 – $149,999
12. $150,000 or more
13. Prefer not to say

D15. When thinking about your household's current financial situation compared to what it was a year ago, would you say that **overall your current financial situation is**…?

1. Better than it was a year ago
2. The same as it was a year ago
3. Worse than it was a year ago
4. Prefer not to say

D16. When thinking about your household's current financial situation compared to what you anticipate it will be in a year from now, would you say that **overall your anticipated financial situation in a year from now will be**…?

1. Better than your current financial situation
2. The same as your current financial situation
3. Worse than your current financial situation
4. Prefer not to say

D17. Which of the following best describes your race or ethnic background?

1. White, Caucasian
2. Black, African American, Caribbean American
3. American Indian (Native American), Alaska Native
4. Asian

6. Hispanic, Latino

5. Native Hawaiian, Pacific Islander

990. Other **[SPECIFY]**

7. Prefer not to say

VIII - CONCLUSION

[INCENTIVE NAME/ADDRESS COLLECTION SCREEN]

Those are all the questions we have for you today. Thanks for your participation!

Please click ‘Continue’ to proceed to the payment screen.

C0. Please indicate which of the following you would prefer:
1. Please email me a $10 Amazon Gift Card
2. I would prefer to have a $10 check mailed to me
3. I would like to decline and not receive an incentive

[IF C0=1, ASK C1; IF C0=2, ASK C2; IF C0=3, ASK C0A]

COA. You have indicated that you do NOT want to receive your $10 payment. Is that correct?
1. Yes
2. No

[IF YES, GO TO THANK YOU SCREEN; IF NO, RE-ASK C0]

C1. So that we may mail your incentive to you, please provide your name and address below.

A. Full name
C. Mailing Address Line #1
D. Mailing Address Line #2 (optional)
E. City
F. State
G. ZIP Code

C1. So that we may email your incentive to you, please provide your email address below.

[RECORD EMAIL ADDRESS –VALIDATE FOR FORMAT]

[INCENTIVE NAME/ADDRESS VERIFICATION SCREEN]

Please review the information you provided and verify that it is complete and correct:

[DISPLAY ALL NAME AND ADDRESS OR EMAIL INFORMATION COLLECTED]

If you would like to edit any of this information, please click the “Back” button to go to the previous screen, where you can make any needed changes.

Otherwise, please click “Continue” to submit your information.

[PROGRAMMER: INCLUDE BACK BUTTON FOR THIS SCREEN DURING LIVE VERSION]

[IF CHOOSE TO RECEIVE AN INCENTIVE, DISPLAY:]
You have successfully submitted the information we need so we can send you your $10 thank you gift. Your check or gift card will be issued within 4-6 weeks to the address or email address you provided. Thank you and have a nice day!
If you would like information on how your household can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

---

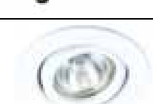
[IF CHOOSE NOT TO RECEIVE AN INCENTIVE, DISPLAY:]
Thank you for taking the time to answer our survey questions. Have a nice day!
If you would like information on how your household can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

SURVEY CLOSED MESSAGE – only display for terms or survey closed…do NOT display if respondent finishes survey.

We truly appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.
In order to achieve a representative sample for this survey, quotas with specific criteria needed to be designated. Because these quotas have now been filled, we are not accepting any more responses.
If you would like information on how your home can save money on your energy bills, please visit Ameren Illinois at
www.actonenergy.com

DEFINITIONS

[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

Word / Phrase	Definitions	
Air-source heat pump	A single system that draws in outside air to use in both heating and cooling your home	
Attic fan	A ventilation fan which regulates the heat level of a home's attic by exhausting hot air. Unlike a whole-house fan, which removes heat from the entire home, an attic fan *only* removes heat *from the attic area* of the home.	
Compact fluorescent lamp (CFL)		A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional swirly or curved shape.
Conventional bulb / Incandescent bulb		A traditional screw-in light bulb that may range from 15 – 100 watts or more
Electric baseboard or electric coil radiant heating	Devices that use electricity directly to produce heat for your home from baseboards or under-floor heating.	
ENERGY STAR®		A label for some new appliances that indicates the appliance meets the standards for high efficiency appliances
Geothermal heat pump	A single system that uses water that circulates through underground piping to provide both heating and cooling for your home	
Halogen lamp		A type of lamp, which uses filaments like a traditional incandescent bulb, but is also filled with inert gas and a small amount of halogen. Compared to traditional incandescent bulbs, halogen lamps get hotter, give off light of a brighter / whiter quality, and have a longer life span.
Hard-wired fixture		A fixture that is hard-wired or fixed to the wall in the home. Examples of hard-wired fixtures are recessed lighting, sconces, chandeliers, pendant lights, track lighting, and under-the-cabinet lighting.
LED lamp		A "light emitting diode" lamp is an electronic form of lighting that does not use filaments like traditional incandescent bulbs, but instead, uses solid state electronics.
Low Voltage lighting		Low power lights (often used under counters or in other similar situations) that use a much lower wattage than do most traditional

		incandescent lights
Plug-in fixture		A fixture that is portable or free-standing with a cord that plugs into an outlet. Examples of plug-in fixtures are table lamps, or task lighting.
CFL-specific fixture	A fixture that has a CFL-ballast located inside, which is larger and lasts longer than integrated CFLs (CFLs with a screw-in mechanism so that they can replace incandescent bulbs). CFL-specific fixtures use replaceable bulbs that have a starter in the base of the bulb.	
Tubular fluorescent lamp		Traditional fluorescent lights are generally tubes of 3 or more feet in length and are installed in special fixtures made specifically for these tubes
Wall furnace	A furnace that works "through the wall," meaning that it is a box that draws air directly from the outside and then warms it before sending the resulting warm air into a room.	
Whole-house fan	A ventilation fan mounted in the ceiling of a central part of a home that removes heat from the *entire* home. It does this by first drawing that heat from the living areas of the home into the home's attic, and then pushing the heat trapped in the attic to the outside through vents. Unlike an attic fan, which only removes heat from a home's attic, a whole-house fan removes heat from the entire home.	

APPENDIX **D**

RESIDENTIAL SATURATION SURVEY QUESTIONNAIRE

Ameren Illinois DSM Market Potential – Saturation Questionnaire RESIDENTIAL

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must have primary or shared responsibility for making energy-related decisions
- The respondent must be at least 18 years old
- The respondent must be billed for electricity or natural gas directly by Ameren Illinois

PRELOAD ALL SAMPLE FIELDS.

Hard Quotas

Total: n=700

Soft Quotas

SEE QUOTA GRID: STRATUM_ID – we will track and enforce only if we need to

Age (S2)

FOR ENTIRE SURVEY, [ADDRESS]=THE FOLLOWING SAMPLE FIELDS:

CLEAN_ADDRESS1

CLEAN_ADDRESS2

RESPONDENT IDENTIFICATION / VERIFICATION

Welcome. This survey is sponsored by Ameren Illinois.
[PROGRAMMER: INCLUDE AMEREN ILLINOIS LOGO]

Survey results will be collected and summarized by Definitive Insights, a market research company.

Please enter the 5-digit "Survey ID#" that appears on the survey invitation postcard you received. This ID# should be located just above the mailing address on the front side of your postcard.

Survey ID# : ________________

[PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE]

We at Ameren Illinois and Definitive Insights value your privacy. We will use the information you provide for research purposes only and will NOT share it with third parties for marketing purposes. Information you provide will be stored in a secure database. If you have questions about our privacy practices or would like to get any other information about this study, please contact us via one of the following methods:

e-mail:	AmerenHelp@definitiveinsights.com
phone:	**1- 855-888-9270**
postal mail:	Definitive Insights ATTN: Ameren Illinois Project Director 601 SW Oak Street Portland, Oregon 97205

INTRODUCTION

Thank you for taking the time to see if you and your household qualify to participate in a new research study about energy. The study is sponsored by Ameren Illinois, and it has a very important purpose. Ameren Illinois is delivering programs to help its customers use energy more efficiently. Your answers to this survey will help the company to improve these programs so that they work best for everyone.

Your household is one of a small number being asked to respond to the survey. To show our appreciation for your time and effort in completing the survey, **you will have the option of choosing a $10 Amazon Electronic Gift Card or a $10 check at the end of the survey if you complete all of the questions.** (You may decline to receive payment if desired.)
If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

Please click “CONTINUE” to begin.

RESPONDENT SCREENING

A1. Our records indicate that your address is:
[ADDRESS]

Is this correct?
3. Yes
4. No

[IF A1=2, TERMINATE AND READ A1 TERMINATE TEXT; OTHERWISE, GO TO S1.]

[A1 TERMINATE TEXT:]
We truly appreciate your time and effort in responding to our survey, but our questions are related to a specific address.

If you would like information on how your home can save money on your energy bills, please visit us at www.actonenergy.com.

Thank you. Have a nice day!

[DO NOT SHOW STANDARD THANK YOU SCREEN.]

S1. What is your role in making energy-related decisions about things such as: adjusting your home's thermostat, choosing to install insulation, selecting new appliances, large electronic devices, and light bulbs that are used in your home?

*Any reference to "your home," here and throughout the rest of this survey, refers specifically to the residence at **[ADDRESS]**.*

1. You are primarily responsible for some or all of these decisions
2. Someone else in your household is primarily responsible for these types of decisions **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA R1]**
3. You share responsibility for these decisions with others in your household, or with a landlord or property manager
4. Don't know **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA R1]**

[IF S1=1 OR 3, ASK S2; OTHERWISE SHOW R1 AND TERMINATE WITHOUT SHOWING STANDARD TERMINATE LANGUAGE]

[R1 TERMINATE TEXT – NOT A DECISION MAKER]
R1. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your household who has specific knowledge about the way your household makes decisions about energy-related issues.
We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey with the following ID:

Link: [URL] http://tiny.cc./ameren2

[PROGRAMMER NOTE: IF A RESPONDENT TERMINATES VIA S2, DELETE DATA COLLECTED AND RESET SURVEY REENTRY POSITION FOR THAT SURVEY ID# BACK TO THE BEGINNING OF THE SURVEY. RECORD THE DATA DELETED FOR THAT SURVEY ID# ELSEWHERE SO WE CAN TRACK THE NUMBER OF TIMES AND REASONS RESPONDENTS DISQUALIFY AT S2 AS WELL AS THE NUMBER OF TIMES THESE PREVIOUSLY USED SURVEY ID#'S ARE REUSED. FOR ALL RESPONDENTS THAT DO NOT TERMINATE VIA S5R, DO NOT ALLOW SURVEY ID# TO BE USED AGAIN.]
{NOTE: THIS WILL ALLOW A RESPONDENT WHO DOES NOT PERSONALLY QUALIFY TO FORWARD THEIR SURVEY ID# TO A CO-WORKER WHO MAY BE BETTER QUALIFIED TO ANSWER THE SURVEY.}

[NEW PROGRAMMER NOTE 7/16 –FOR ALL TERMINATES BEYOND THIS POINT, USE THE GENERAL TERMINATE TEXT ON PG 6]

S2. Which of the following categories represents your current age?

1. Less than 18 years old **[TERMINATE AFTER S7]**
2. 18-24
3. 25-34
4. 35-44
5. 45-54
6. 55-64
7. 65 or more years old

[IF S2=2-7, ASK S3; OTHERWISE ASK S3 BUT FLAG AS TERMINATE AND END SCREENER AFTER S7]
S3. Do you, or does anyone else in your household work for a gas or electric utility company?

1. Yes **[TERMINATE AFTER S7]**
2. No

[ASK ALL]
S4. Do you own or rent your home?

1. Own (or in the process of buying it)
2. Rent / lease

[PROGRAMMER NOTE: QS5 AND QS6 SHOULD BE PROGRAMMED EXACTLY LIKE S5 & S6 IN THE RES PROG INTEREST SURVEY]
S5. How is your household billed for the electricity you use?

1. My household is billed directly by Ameren Illinois **[CONTINUE TO S6]**
2. My household is NOT billed directly by Ameren Illinois; the cost for our electricity is included in our rent, or is paid by someone else **[ASK S6 – IF S6 NOT=1, ASK S7 AND TERMINATE]**
3. My household's electricity is provided by another utility; **not** Ameren Illinois **[ASK S6 – IF S6 NOT=1, TERMINATE AFTER S7]**
4. Don't know **[ASK S6, BUT TERMINATE AFTER S7, REGARDLESS OF S6 RESPONSE]**

S6. How is your household billed for the natural gas you use?

1. My household is billed directly by Ameren Illinois **[IF S5 NOT=4, CONTINUE]**
2. My household is NOT billed directly by Ameren Illinois; the cost for our natural gas is included in our rent, or is paid by someone else **[IF S5=1, ASK S7 & DO NOT TERMINATE; OTHERWISE, ASK S7 AND TERMINATE]**
3. My household's natural gas is provided by another utility; **not** Ameren Illinois **[IF S5=1, ASK S7, S8 AND S9; IF S5 NOT=1, ASK S9 AND TERMINATE]**
4. Don't know **[TERMINATE AFTER S7]**

S7. Which of the following things are included in a gas or electric bill that you pay directly, as opposed to things that might be paid for by a landlord, a property management company, or someone else? *Please select all that apply.*

<u>Things for which you pay directly</u>

1. Heating all or some of the space in your house / unit
2. Air conditioning
3. Water heating
4. Lights on the outside of your home or building
5. None of the above – I am not billed directly for any of these things in my gas or electric bill **[EXCLUSIVE]**

[IF S2=1 OR S3=2, TERMINATE HERE, BUT TERM LABEL SHOULD BE FOR THE ACTUAL TERMINATION REASON…NOT THE LAST QUESTION VIEWED)

[QUOTA CHECK – IF OVER-QUOTA, TERMINATE AND SHOW TERMINATE LANGUAGE BELOW; OTHERWISE GO TO INVITATION LANGUAGE]

GENERAL TERMINATE LANGUAGE ONLY FOR NON-QUALIFYING AFTER QS1.0 OR OVER-QUOTA RESPONDENTS

We truly appreciate your time and effort in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this point, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your home can save money on your energy bills, please visit us at www.actonenergy.com.

Thank you. Have a nice day!

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far! You qualify for the survey. As we indicated earlier, only a limited number of individuals will be able to complete this survey, so we appreciate your time in filling out the survey as completely as possible.

The survey should take about 20 minutes to complete. Once you complete the survey you will be eligible to receive our $10 Visa card thank you payment. Information about how to receive this payment will be provided at the end of the survey.

Your responses are important to us, so please press “CONTINUE” to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything.

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the personalized URL to access your survey again. The survey will automatically take you to the point where you left off.

As you complete the survey, you will **not** be able to use your browser’s “back” button. If you mistakenly press your browser’s “back” button, you will need to press the “refresh” button to continue the survey.

I – HOUSEHOLD INFORMATION

[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT]
7/25 PROGRAMMER NOTES: PLEASE USE SAME PROCESS THAT WE USED IN RES PROG INT TO PREVENT A CLICKED HYPERLINK FROM SELECTING THAT RESPONSE IF THE WORD IS A QUESTION RESPONSE OPTION; REQUIRE WHOLE NUMBERS ONLY – NO DECIMALS]]

Q1. **Including yourself**, how many individuals normally live in your home?

Do not include anyone who is just visiting, those away in the military, or children who are away at college.

[RECORD NUMBER 1-20] individuals

Q2. Which of the following best describes your home at **[ADDRESS]**?

1. Single-family house detached from any other houses
2. Single-family house attached to one or more houses
3. Multi-family house or building with 2-4 apartments/units
4. Multi-family house or building with 5 or more apartments/units
5. Mobile/manufactured home

990. Other **[SPECIFY]**

[PROGRAMMER: DISPLAY DIRECTLY BELOW Q2 ON SCREEN: Note is displayed above Q3 "PLEASE NOTE THAT ALL OF OUR REMAINING QUESTIONS REFER SPECIFICALLY TO THE RESIDENCE AT THE LOCATION CITED ABOVE."]

[IF Q2=990, ASK Q3 ; OTHERWISE SKIP TO Q4]
Q3. Rather than using one of the residence type descriptions we offered in the last question, you described your home as: "**[INSERT Q2=990 RESPONSE]**." Which of the following would you say best describes this dwelling?

Note: The term "single-family" does not necessarily mean that the individuals living in the house/building/structure must be family members. Rather, this term indicates individuals voluntarily living together in a single dwelling who share common areas and do not consider each other neighbors or tenants.

1. A **single-family fully detached house/building/structure** – a house/building/structure that is fully separated from any other house/building/structure (i.e., it has open space on all four sides of its ground-to-roof outer walls)

2. Either…
   - a **single-family semi-detached house/building/structure** – a house/building/structure that is **not** fully separated from all other houses/buildings/structures (i.e., it shares a wall with at least one other house/building/structure) and is occupied by a single party of individuals

   or…

- **a <u>multi-family</u> house/building/structure**– a single house/building/structure that incorporates several relatively self-contained housing units, each of which are occupied by separate parties of individuals

(This option includes any condominiums, town houses, row houses, duplexes, triplexes, apartment buildings, etc.)

Q4. About when was your home built?

1. Before 1940
2. 1940-1949
3. 1950-1959
4. 1960-1969
5. 1970-1979
6. 1980-1989
7. 1990-1999
8. 2000-2009
9. 2010-present
10. Not sure

Q5. For about how many years have you lived in your present home?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

1. Less than 1 year
2. **[RECORD NUMBER 1-100]** years

Q6. Is this home your primary place of residence or is it a seasonal/vacation home that is only occupied for part of the year?

1. Primary residence
2. Seasonal / vacation home

990. Other **[SPECIFY]**

[IF Q6=2, ASK Q7; OTHERWISE SKIP TO Q8]

Q7. How many months out of the year do you or any other members of your household typically occupy this home? *Your best estimate is fine, but please enter a whole number rather than a range of numbers.*

[RECORD NUMBER 0-12]

Q8. What is the approximate square footage of your home? <u>Please include only heated living space in your response.</u>

If you are not certain, please give your best estimate.

1. Less than 500 sq. ft.
2. 500 – 999
3. 1,000 – 1,499
4. 1,500 – 1,999

5. 2,000 – 2,499
6. 2,500 – 2,999
7. 3,000 – 3,499
8. 3,500 – 3,999
9. 4,000 sq. ft. or more

Q9. How many stories or levels are there in your **[IF Q2=1 OR 5 OR Q3=1, DISPLAY, "**home**"; IF Q2=2-4 OR Q3=2, DISPLAY "**apartment / unit**"]**? Please do NOT count any basements or attics in your response.

1. 1 story / level
2. 2 stories / levels
3. 3 stories / levels
4. 4 or more stories / levels

Q10. How many bedrooms are in your home, include any that might be located in the basement or attic?

0. 0 / Studio/Efficiency apartment / SRO
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6 or more

Q11. How many bathrooms are in your home?

Please consider a bathroom that does not include either a bathtub or shower as a half-bathroom.

A. Full bathrooms **[DROP DOWN WITH 0 - 4 OR MORE]**

B. Half bathrooms **[DROP DOWN WITH 0 - 4 OR MORE]**

Q12. Does your home have an attic or basement? *Select all that apply.*

[IF Q2=2-4 OR Q3=2, DISPLAY, "*Consider only an attic or basement that is reserved solely for the use of those living in your specific apartment/unit; Do not consider an attic or basement that is available to others living in other apartments/units in your building*.**"]**

1. My home has an attic
2. My home has a basement
3. My home has neither an attic nor a basement **[EXCLUSIVE]**

[IF Q12_1=1 OR Q12_2=1, ASK Q13; OTHERWISE SKIP TO Q14]

Q13. How much, if at all, is your **[DISPLAY IF Q12_1=1, "**attic**"] [DISPLAY IF Q12_1=1 AND Q12_2=1, "**or**"] [DISPLAY IF Q12_2=1, "**basement**"]** finished and/or heated during the winter months?

		Area	How much of this area is finished?	How much of this area is heated during the winter months?
1.	**[DISPLAY ROW IF Q12_1=1]**	Attic	1. All or most of it (75%+) 2. Some of it (25-74%) 3. Little or none of it (<25%)	1. All or most of it (75%+) 2. Some of it (25-74%) 3. Little or none of it (<25%)
2.	**[DISPLAY ROW IF Q12_2=1]**	Basement	1. All or most of it (75%+) 2. Some of it (25-74%) 3. Little or none of it (<25%)	1. All or most of it (75%+) 2. Some of it (25-74%) 3. Little or none of it (<25%)

Q14. Of all the windows in your home, what percentage are single pane windows, and what percentage are double pane windows or better?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

	Window Type	Percent
1.	Single pane windows *(windows with just 1 layer of glass)* 	**[RECORD NUMBER 0-100]%**
2.	Double pane windows or better *(windows with 2 or more layers of glass)* 	**[RECORD NUMBER 0-100]%**
3.	Not sure **[EXCLUSIVE]**	☐
TOT.	**Total**	**[CALCULATE TOTAL]%**

[PROGRAMMER: Q14TOT MUST EQUAL 100, OR Q14_3 MUST BE SELECTED ("NOT SURE") IN ORDER TO CONTINUE TO NEXT SCREEN]

II – HEATING AND COOLING

Now we'd like to ask you some questions about your home's heating, cooling, and water heating systems.

Q15. During the winter (December through February), how often do you use the following heating equipment in your home? **[DEFAULT ANSWER IS 'NEVER' FOR EACH OPTION]**

	Heating Equipment	**[A] Never (I don't have it or I never use it)**	**[B] On a few winter days (less than 25% of days)**	**[C] On some winter days (25-49% of days)**	**[D] On many winter days (50-74% of days)**	**[E] On most winter days (75% or more days)**
1.	Electric central warm air furnace with ducts/vents to individual rooms **[REMOVED HYPERLINK]**	○	○	○	○	○
2.	Natural gas central warm air furnace with ducts/vents to individual rooms	○	○	○	○	○
3.	Natural gas central boiler with hot water/steam radiators or baseboards in individual rooms **[REMOVED HYPERLINK]**	○	○	○	○	○
4.	Electric baseboard or electric coils radiant heating	○	○	○	○	○
5.	Air-source heat pump	○	○	○	○	○
6.	Geothermal heat pump	○	○	○	○	○
7.	Wall furnace(s)	○	○	○	○	○
8.	Fireplace(s) – wood burning	○	○	○	○	○
12.	Fireplace(s) – natural gas burning	○	○	○	○	○
9.	Wood burning stove(s)	○	○	○	○	○
10.	Wall-mounted space heater(s)	○	○	○	○	○
11.	Portable space heater(s)	○	○	○	○	○
990.	**Other (please specify)**	○	○	○	○	○

Programming note added – respondent cannot select "Never" for all options.

[IF Q4=9 (HOUSE BUILT 2010 TO PRESENT], AUTOCODE AS Q16=8 AND ASK Q17; OTHERWISE CONTINUE]

Q16. When was your heating system (**[INSERT Q15 RESPONSE]**) purchased or installed? **[Repeat for each system selected in Q15]**

[IF Q15=7-10, DISPLAY, "*If you have more than one heating unit as part of this heating system but all the units were not purchased at the same time, answer for the unit you use most often.***"]**

1. Before 1970 **[SHOW IF Q4 = 1-4, OR 11]**
2. 1970-1979 **[SHOW IF Q4 = 1-5, OR 11]**
3. 1980-1989 **[SHOW IF Q4 = 1-6, OR 11]**
4. 1990-1994 **[SHOW IF Q4 = 1-7, OR 11]**
5. 1995-1999 **[SHOW IF Q4 = 1-7, OR 11]**
6. 2000-2004 **[SHOW IF Q4 = 1-8, OR 11]**
7. 2005-2009 **[SHOW IF Q4 = 1-8, OR 11]**
8. 2010-present **[SHOW IF Q4 = 1-9, OR 11]**
9. Not sure **[SHOW ALL]**

[IF Q16=7-8 ASK Q17; OTHERWISE SKIP TO Q18]
[IF Q15=1-7 AND Q16=7-8, ASK Q17 FOR EACH MENTION; PIPE IN EACH Q15 RESPONSE GIVEN BETWEEN 1-7]
Q17. Why did you replace your **[Q15 RESPONSE 1-7]** heating system?

1. My home did not have a heating system so I added it.
2. The existing system broke and I needed to replace it.
3. I wanted to purchase a more energy efficient appliance to replace a still-working system.
4. I wanted to purchase a new unit to replace a still-working system for other reasons.
5. Other (please specify)

Q18. During the summer (June through August), how often do you use the following cooling equipment in your home? **[PROGRAMMER: THE A, B, C, ETC;. BELOW IS FOR DATA LABELING – DO NOT SHOW ON SCREEN]**

	Cooling Equipment	**A. None (I don't have it or I never use it)**	**B. On a few summer days (less than 25% of days)**	**C. On some summer days (25-49% of days)**	**D. On many summer days (50-74% of days)**	**E. On most summer days (75% or more days)**
1.	Central air conditioner	○	○	○	○	○
2.	One or more room air conditioners mounted in or near a window or on a wall	○	○	○	○	○
3.	Air source heat pump	○	○	○	○	○
4.	Geothermal heat pump	○	○	○	○	○
5.	One or more portable room air conditioners	○	○	○	○	○
6.	One or more portable dehumidifiers	○	○	○	○	○
7.	One or more ceiling, window, or room fans	○	○	○	○	○
8.	Whole-house fan	○	○	○	○	○
9.	Attic fan	○	○	○	○	○
990.	**Other (please specify)**	○	○	○	○	○

[IF Q15_5 > A. Never AND Q18_3=A. None] OR [If Q15_6 > A. Never AND Q18_4=A. None] ASK Q19; OTHERWISE SKIP TO Q22]
Q19. You indicated that you use a heat pump to heat your home in the winter, but do not use it to cool your home in the summer. For verification purposes, please select your primary heating and cooling system.

	Q19A. Heating Equipment [Show any for which Q15>A. Never]		**Q19B. Cooling Equipment [Show any for which Q18>A. None]**
1.	Electric central warm air furnace with ducts/vents to individual rooms **[REMOVED HYPERLINK]**	1.	Central air conditioner
2.	Natural gas central warm air furnace with ducts/vents to individual rooms **[REMOVED HYPERLINK]**	2.	One or more room air conditioners mounted in or near a window or on a wall
3.	Natural gas central boiler with hot water/steam radiators or baseboards in individual rooms	3.	Air source heat pumps
4.	Electric baseboard or electric coils radiant heating	4.	Geothermal heat pump
5.	Air-source heat pump	5.	One or more portable room air conditioners
6.	Geothermal heat pump	6.	One or more portable dehumidifiers
7.	Wall furnace(s)	7.	One or more ceiling, window, or room fans
8.	Fireplace(s) – wood burning	8.	Whole-house fan
12.	Fireplace(s) – natural gas burning	9.	Attic fan
9.	Wood burning stove(s)	**990.**	**Other (please specify)**

10.	Wall-mounted space heater(s)		
11.	Portable space heater(s)		
990.	**Other (please specify)**		

[IF ANY Q18=1-9,990 >A. None , ASK Q20; OTHERWISE SKIP TO Q23]
[IF Q4=9 (HOUSE BUILT 2010 TO PRESENT], AUTOCODE AS Q20=8 AND ASK Q21; OTHERWISE CONTINUE]

Q20. When was this cooling system purchased or installed? **[Repeat for each system selected in Q18]**

[IF Q18=2,5-7, DISPLAY, "*If you have more than one cooling unit as part of this cooling system but all the units were not purchased at the same time, answer for the unit you use most often.***"]**

1. Before 1970 **[SHOW IF Q4 = 1-4 OR 11]**
2. 1970-1979 **[SHOW IF Q4 = 1-5 OR 11]**
3. 1980-1989 **[SHOW IF Q4 = 1-6 OR 11]**
4. 1990-1994 **[SHOW IF Q4 = 1-7 OR 11]**
5. 1995-1999 **[SHOW IF Q4 = 1-7 OR 11]**
6. 2000-2004 **[SHOW IF Q4 = 1-8 OR 11]**
7. 2005-2009 **[SHOW IF Q4 = 1-8 OR 11]**
8. 2010-present **[SHOW IF Q4 = 1-9 OR 11]**
9. Not sure **[SHOW ALL]**

[IF Q20=7-8 ASK Q21; OTHERWISE SKIP TO Q22]
[IF Q18=1-5 >NONE AND Q20=7-8, ASK Q21 FOR EACH MENTION Q18=1-5; PIPE IN EACH Q18 RESPONSE GIVEN BETWEEN 1-5]

Q21. Why did you replace your [Q18 RESPONSE] cooling system?

1. My home did not have a cooling system so I added it.
2. The existing system broke and I needed to replace it.
3. I wanted to purchase a more energy efficient appliance to replace a still-working system.
4. I wanted to purchase a new unit to replace a still-working system for other reasons.
5. Other (please specify)

[IF (Q18=2,5,6 OR 7 Not Equal to A. NONE) , ASK Q22; OTHERWISE SKIP TO Q23]
Q22. How many of the following does your home have?

1.	**[DISPLAY IF Q18_2 NE A. None]**	Room air conditioners mounted in or near a window or on a wall	**[RECORD NUM 0-19]**
2.	**[DISPLAY IF Q18_5 NE A. None]**	Portable room air conditioners	**[RECORD NUM 0-19]**
3.	**[DISPLAY IF Q18_6 NE A. None]**	Portable dehumidifiers	**[RECORD NUM 0-19]**
4.	**[DISPLAY IF Q18_7 NE A. None]**	Window/room fans	**[RECORD NUM 0-19]**
5.	**[DISPLAY IF Q18_7 NE A. None]**	Ceiling fans	**[RECORD NUM 0-19]**

Programming note added – respondent must answer at least one choice with a numerical value of 1 or greater.

Q23. Does your home use a thermostat to control heating and/or cooling?

1.	Yes, a **programmable thermostat** (one that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week)	□
2.	Yes, a **standard/manual thermostat** (one that you have to manually adjust and that has only one setting for the internal temperature you want)	□
3.	No thermostat	□

[IF Q23=1-2, ASK Q24; OTHERWISE SKIP TO FILTER BEFORE Q25]

Q24. At what temperature do you set your thermostat during the following portions of the day?

		A. On days when you are using your **HEATING system**	B. On days when you are using your **COOLING System**
1.	Day	1. Less than 66°F 2. 66-69°F 3. 70-74°F 4. 75-79°F 5. 80°F or higher 6. Not Applicable	1. Less than 66°F 2. 66-69°F 3. 70-74°F 4. 75-79°F 5. 80°F or higher 6. Not Applicable
2.	Night	1. Less than 66°F 2. 66-69°F 3. 70-74°F 4. 75-79°F 5. 80°F or higher 6. Not Applicable	1. Less than 66°F 2. 66-69°F 3. 70-74°F 4. 75-79°F 5. 80°F or higher 6. Not Applicable

[IF S7=3, ASK Q25, OTHERWISE SKIP TO INTRO TEXT BEFORE Q29]

Q25. How many water heaters does your home have?

0. None; hot water is provided by the building to residents
1. 1
2. 2
3. 3 or more

IF Q25=1-3; ASK Q26; OTHERWISE SKIP TO TEXT BEFORE Q29]

Q26. **[IF Q25=1, DISPLAY, "**What kind of water heater is this?**" IF Q25=2-3, DISPLAY, "**What kind of water heaters are these?**"]**

[IF Q25=3, DISPLAY, "*Please answer for the two water heaters used most often.***"]**

		A. Conventional water heater with storage tank	B. Tankless (instantaneous/on demand) water heater	C. Heat pump water heater	D. Other [SPECIFY]	E. Not sure
1.	Water heater **[IF Q25>1, DISPLAY,** "Water heater #1**"]**	○	○	○	○	○
2.	**[DISPLAY ROW IF Q25>1]** Water heater #2	○	○	○	○	○

Q27. **[IF Q25=1, DISPLAY, "**What type of fuel does this water heater use? When was it installed?**"; IF Q25=2-3, DISPLAY, "**What type of fuel do these water heaters use? When were they installed?**"] [If Q26_1=conventional water heater with storage tank or If Q26_2= conventional water heater with storage tank, DISPLAY** "What size tank is your water heater?"

[IF Q25=3, DISPLAY, "*Please answer for the two water heaters used most often.***"]**

		Water Heater Type	Fuel Type	Year Installed	Tank Size [Display if Q26=1]
1.	Water heater **[IF Q25>1, DISPLAY,** "Water Heater #1**"]**	**[INSERT RESPONSE SELECTED AT Q26]**	1. Natural gas 2. Electricity 3. Fuel oil 4. Propane (bottled gas) 5. Wood 990. Other **[SPECIFY]** 998. Not sure	1. Before 1970 [SHOW IF Q4 = 1-4] 2. 1970-1979 [SHOW IF Q4 = 1-5] 3. 1980-1989 [SHOW IF Q4 = 1-6] 4. 1990-1994 [SHOW IF Q4 = 1-7] 5. 1995-1999 [SHOW IF Q4 = 1-7] 6. 2000-2004 [SHOW IF Q4 = 1-8] 7. 2005-2009 [SHOW IF Q4 = 1-8] 8. 2010-present [SHOW IF Q4 = 1-9] 998. Not sure	1. Under 55 gallons 2. 55 gallons or more 3. Not sure

2.	**[DISPLAY ROW IF Q25>1]** Water heater #2	**[INSERT RESPONSE SELECTED AT Q26]**	1. Natural gas 2. Electricity 3. Fuel oil 4. Propane (bottled gas) 5. Wood 990. Other **[SPECIFY]** 998. Not sure	1. Before 1970 [SHOW IF Q4 = 1-4] 2. 1970-1979 [SHOW IF Q4 = 1-5] 3. 1980-1989 [SHOW IF Q4 = 1-6] 4. 1990-1994 [SHOW IF Q4 = 1-7] 5. 1995-1999 [SHOW IF Q4 = 1-7] 6. 2000-2004 [SHOW IF Q4 = 1-8] 7. 2005-2009 [SHOW IF Q4 = 1-8] 8. 2010-present [SHOW IF Q4 = 1-9] 998. Not sure	1. Under 55 gallons 2. 55 gallons or more 3. Not sure

[IF Q27_1 Yr Installed=7-8 or Q27_2 Yr Installed=7-8 ASK Q28; OTHERWISE SKIP TO Q29]

Q28. Why did you replace your water heating system?

1. My home did not have a water heating system so I added it.
2. The existing system broke and I needed to replace it.
3. I wanted to purchase a more energy efficient appliance to replace a still-working system.
4. I wanted to purchase a new unit to replace a still-working system for other reasons.
5. Other (please specify)

III – LIGHTING

Thank you for your responses so far! Next we are going to ask you about your home's lighting.

Q29. About how many of the following types of light bulbs/lamps would you say you are currently using <u>inside</u> your home? *Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.* **[PROGRAMMER NOTE: DO NOT ACCEPT DECIMALS]**

Note: To make it easier for you to account for all the lighting inside your home, we've broken this down by areas that might be included in your home. If the list of areas provided does not account for all the lighted areas <u>inside</u> your home, please include the number of each type of light bulb/lamp in the "Any other areas in your home" row.

		A.	B.	C.	D.	E.	F.	G.	
	Area	**Conventional light bulbs /Incandescent lamps**	**Compact fluorescent lamps (CFLs)**	**Tubular fluorescent lamps**	**Halogen light bulbs**	**LED light bulbs**	**Low voltage lamps**	**Other types of lighting [SPECIFY]**	**Tot**
									
1.	Bedrooms **[DISPLAY ROW IF Q10>0]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
2.	Bathrooms **[DISPLAY ROW IF Q11>0]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
3.	Kitchen / dining areas	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
4.	Living area(s) (e.g., Living rooms, great rooms, family rooms)	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
5.	Hallways, entryways/ foyers, stairwells, closets/pantries	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
6.	Utility rooms, garages	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
7.	Any other areas in your home **[SPECIFY]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CA TOT**
	Total	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**Gra Tot [CA TOT**

[PROGRAMMER: GRAND TOTAL MUST BE GREATER THAN 0 FOR RESPONDENT TO MOVE TO NEXT SCREEN]

[IF Q29_C GRANDTOT>0, ASK Q30; OTHERWISE SKIP TO Q31]

Q30. What percentage of all the **<u>interior fluorescent lamps / fixtures</u>** in your home can be described as each of the following types?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

	[SET DEFAULT RESPONSE AT 0]	**% of all fluorescent lamps / fixtures used…**
1.	Standard fluorescent tubes (T12)	[RECORD NUM 0-100]%
2.	High-efficiency fluorescent tubes (T8)	[RECORD NUM 0-100]%
3.	Super high-efficiency fluorescent tubes (T5)	[RECORD NUM 0-100]%
4.	LED	[RECORD NUM 0-100]%
5.	Other	[RECORD NUM 0-100]%
TOT.	Total	[CALCULATE TOTAL]%

[IF Q29GRANDTOT>0, ASK Q31; OTHERWISE SKIP TO Q32]
[FOR Q31, SHOW ONLY THOSE RESPONSES THAT MATCH TO WHAT WAS ANSWERED IN Q29]

Q31. Approximately what is the average **number of HOURS** that each of these types of lighting (used inside your home) is on per day? *Your best estimate is fine, but please use only WHOLE numbers.*

Note: Once again, we've broken this down by areas that might be included in your home. If the list of areas provided does not account for all the lighted areas inside your home, please include the number of hours for each type of light bulb/lamp in the "Any other areas in your home" row.

[PROGRAMMER: DO NOT ACCEPT DECIMALS]

		A.	**B.**	**C.**	**D.**	**E.**	**F.**	**G.**	
	Area	**Conventional light bulbs /Incandescent lamps**	**Compact fluorescent lamps (CFLs)**	**Tubular fluorescent lamps**	**Halogen light bulbs**	**LED light bulbs**	**Low voltage lamps**	**Other types of lighting [SPECIFY]**	**Tot Hou**
									
1.	Bedrooms **[DISPLAY ROW IF Q10>0]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
2.	Bathrooms **[DISPLAY ROW IF Q11>0]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
3.	Kitchen / dining areas	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
4.	Living area(s) (e.g., Living rooms, great rooms, family rooms)	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
5.	Hallways, entryways/ foyers, stairwells, closets/pantries	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
6.	Utility rooms, garages	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CA TOT**
7.	Any other areas in	**[RECORD NUM**	**[RECORD**	**[RECORD**	**[RECORD**	**[RECORD**	**[RECORD**	**[RECORD**	**[CA**

	your home **[DISPLAY ROW IF Q29_7>0]** **[SPECIFY]**	**0-24]**	**NUM 0-24]**	**NUM 0-24]**	**NUM 0-24]**	**NUM 0-24]**	**NUM 0-24]**	**NUM 0-24]**	**TOT**
	Total	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**Gra Tot [CA TOT**

[PROGRAMMER: GRAND TOTAL MUST BE GREATER THAN 0 FOR RESPONDENT TO MOVE TO NEXT SCREEN]

Q32. Approximately how many of each of the following devices do you have to control lighting inside your home?

1. Timers: **[RECORD NUMBER 0-50]**
2. Motion detectors or occupancy sensors: **[RECORD NUMBER 0-50]**

[IF S7=4, ASK Q33; OTHERWISE SKIP TO INTRO BEFORE Q36]

Q33. About how many of ~~the~~ each of the following types of light bulbs/lamps would you say you are currently using on the outside of your home? *Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.*

	1.	**2.**	**3.**	**4.**	**5.**	
Area	**Conventional light bulbs /Incandescent lamps**	**Compact fluorescent lamps (CFLs)**	**Halogen light bulbs**	**LED lamps**	**Other [SPECIFY]**	**Total**
						
Outside your home	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CALC TOTAL]**

[IF Q33TOT>0, ASK Q34; OTHERWISE SKIP TO Q35]

Q34. Approximately, how many **HOURS** per day do you use the following lights outside your home, on average? *Your best estimate is fine.*

			Average number hours on per day
1.	**[DISPLAY ROW IF Q33_1>0]** Conventional light bulbs / Incandescent lamps		**[RECORD NUM 0-24]**
2.	**[DISPLAY ROW IF Q33_2>0]** Compact fluorescent lamps (CFLs)		**[RECORD NUM 0-24]**
3.	**[DISPLAY ROW IF Q33_3>0]** Halogen light bulbs		**[RECORD NUM 0-24]**
4.	**[DISPLAY ROW IF Q33_4>0]** LED lamps		**[RECORD NUM 0-24]**
5.	**[DISPLAY ROW IF Q33_5>0]** Other		**[RECORD NUM 0-24]**

Q35. Which of the following types of devices do you use to control lighting outside your home? *Select all that apply.*

1. Timers
2. Motion detectors
3. Dusk-to-dawn sensors
4. None of the above **[EXCLUSIVE]**

IV – MAJOR APPLIANCES

The following questions relate to some common appliances that may be used in your home.

Q36. Which of the following major appliances does your home have? *Select all that apply.*

[IF Q2=2-4 OR Q3=2, DISPLAY] "*Include only appliances that are located within your specific condo / apartment / unit. Do not include appliances that are located in common areas of your ~~apartment~~ building and available for use by the entire community of residents within your building.***"]**

1. Refrigerator and/or freezer
2. Stovetop/range and/or oven
3. Dishwasher
4. Clothes washer
5. Clothes dryer
6. None of the above **[EXCLUSIVE]**

[IF Q36_1=1, ASK Q37; OTHERWISE AUTOCODE ALL (Q37_1 thru Q37_3)=0 AND SKIP TO FILTER BEFORE Q39]
Q37. How many refrigerators, freezers, and refrigerator / freezer combos does your home have?
[PROGRAMMER: DEFAULT SHOULD BE ZERO]

	Unit Type	Number of Units
1.	Combination refrigerator / freezer units	**[RECORD NUM 0-5]**
2.	Refrigerator-only units	**[RECORD NUM 0-5]**
3.	Freezer-only units	**[RECORD NUM 0-5]**
TOT.	**Total # of units in your home:**	**[CALCULATE TOTAL]**

[IF Q37TOT>0, ASK Q38; OTHERWISE SKIP TO FILTER BEFORE Q39]
Q38. **[IF Q37TOT=1, DISPLAY, "**When was this refrigerator, freezer, or refrigerator / freezer combo purchased?**"] [IF Q37TOT>1, DISPLAY, "**When were each of these refrigerator, freezer, or refrigerator / freezer combo units purchased?**"]**

[IF Q37_1>2 OR Q37_2>2 OR Q37_3>2, DISPLAY "*When your home has more than two units in a category, please answer for the largest two units in that category.***"]**

		Unit Type [DISPLAY COLUMN IF Q37TOT>1]	Year Purchased
1.	**[DISPLAY ROW IF Q37_1>=1]**	Combination refrigerator / freezer unit **[DISPLAY IF Q37_1>1, "#1"]**	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure
2.	**[DISPLAY ROW IF Q37_3>=2]**	Combination refrigerator / freezer unit #2	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure
3.	**[DISPLAY ROW IF Q37_2>=1]**	Refrigerator-only unit **[DISPLAY IF Q37_2>1, "#1"]**	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure
4.	**[DISPLAY ROW IF Q37_2>=2]**	Refrigerator-only unit #2	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure
5.	**[DISPLAY ROW IF Q37_3>=1]**	Freezer-only unit **[DISPLAY IF Q37_3>1, "#1"]**	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure
6.	**[DISPLAY ROW IF Q37_3>=2]**	Freezer-only unit #2	1. Before 1993 2. 1993-2001 3. 2002-2007 4. 2008- present 5. Not sure

[IF Q36_2=1, ASK Q396; OTHERWISE SKIP TO FILTER BEFORE Q41]
You mentioned you have a stovetop/range and/or oven.

Q39. What type of fuel does your stovetop/range use?

1. Natural gas
2. Electricity
3. Propane (bottled gas)

990. Other **[SPECIFY]**

5. Do not have a stovetop/range – only have an oven

Q40. What type of fuel does your oven use?

1. Natural gas
2. Electricity
3. Propane (bottled gas)

990. Other **[SPECIFY]**

5. Do not have an oven – only have a stovetop/range

[IF Q36_5=1, ASK Q41; OTHERWISE SKIP TO FILTER BEFORE Q42]
Q41. What type of fuel does your clothes dryer use?

1. Natural gas
2. Electricity
3. Propane (bottled gas)
990. Other **[SPECIFY]**
5. Not sure

[IF Q36_1=1 OR Q36_3=1 OR Q36_4=1, ASK Q42; OTHERWISE SKIP TO INTRO TEXT BEFORE Q43]
Q42. Which, if any, of the following appliances in your home are ENERGY STAR appliances?
Select all that apply.

[DISPLAY IF Q37_1>2 OR Q37_2>2 OR Q37_3>2, "*When your home has more than two units in a category, please answer for the largest two units in that category.***"]**

				NOT SURE
1.	**[DISPLAY ROW IF Q37_1>=1]**	Combination refrigerator / freezer unit **[DISPLAY IF Q37_1>1, "**#1**"]**	☐	☐
2.	**[DISPLAY ROW IF Q37_3>=2]**	Combination refrigerator / freezer unit #2	☐	☐
3.	**[DISPLAY ROW IF Q37_2>=1]**	Refrigerator-only unit **[DISPLAY IF Q37_2>1, "**#1**"]**	☐	☐
4.	**[DISPLAY ROW IF Q37_2>=2]**	Refrigerator-only unit #2	☐	☐
5.	**[DISPLAY ROW IF Q37_3>=1]**	Freezer-only unit **[DISPLAY IF Q37_3>1, "**#1**"]**	☐	☐
6.	**[DISPLAY ROW IF Q37_3>=2]**	Freezer-only unit #2	☐	☐
7.	**[DISPLAY ROW IF Q33_3>=1]**	Dishwasher	☐	☐
8.	**[DISPLAY ROW IF Q33_4>=1]**	Clothes washer	☐	☐
10.		None of the above **[EXCLUSIVE]**	☐	☐

IV – ELECTRONICS

The next few questions ask about some other electronics that might be used in your home.

Q43. How many of the following types of TV sets are used in your home?
[PROGRAMMER: DO NOT ACCEPT DECIMALS]

	TV Set Type	Number of sets
1.	Standard Tube TVs	**[RECORD NUM 0-5]**
2.	LCD TVs	**[RECORD NUM 0-5]**
3.	LED TVs	**[RECORD NUM 0-5]**
4.	Plasma TVs	**[RECORD NUM 0-5]**
5.	Rear projection TVs	**[RECORD NUM 0-5]**
TOT.	**Total # of TV sets in your home:**	**[CALCULATE TOTAL]**

[IF Q43TOT>0, ASK Q44; OTHERWISE SKIP TO FILTER BEFORE Q45]
Q44. What is the size of **[IF Q40TOT=1, DISPLAY "**this TV set?**"] [IF Q40TOT>1, DISPLAY "**each of these TV sets?**"]** *Your best estimate is fine. Also note if you purchased the television since January 1, 2011.*

[IF ANY Q43_1 thru Q43_4 >3, DISPLAY, "*When you have more than 3 of any one TV type (standard tube, LCD, plasma, rear projection), answer for the largest 3 of that type*.**"]**

		TV Set Type	TV Size	Purchased since January 1, 2011?
1.	**[DISPLAY ROW IF Q43_1>0]**	Standard Tube TV **[DISPLAY IF Q43_1>1, "#1"]**	1. 35" or less 2. More than 35"	1. Yes 2. No 3. Not sure
2.	**[DISPLAY ROW IF Q43_1>1]**	Standard Tube TV #2	1. 35" or less 2. More than 35"	1. Yes 2. No 3. Not sure
3.	**[DISPLAY ROW IF Q43_1>2]**	Standard Tube TV #3	1. 35" or less 2. More than 35"	1. Yes 2. No 3. Not sure
4.	**[DISPLAY ROW IF Q43_2>0]**	LCD TV **[DISPLAY IF Q43_2>1, "#1"]**	1. Less than 40" 2. 40" to 50" 3. More than 50"	1. Yes 2. No 3. Not sure
5.	**[DISPLAY ROW IF Q43_2>1]**	LCD TV #2	1. Less than 40" 2. 40" to 50" 3. More than 50"	1. Yes 2. No 3. Not sure
6.	**[DISPLAY ROW IF Q43_2>2]**	LCD TV #3	1. Less than 40" 2. 40" to 50" 3. More than 50"	1. Yes 2. No 3. Not sure
7.	**[DISPLAY ROW IF Q43_3>0]**	LED TV **[DISPLAY IF Q43_3>1, "#1"]**	1. Less than 40" 2. 40" to 50"	1. Yes 2. No

			3. More than 50”	3. Not sure
8.	**[DISPLAY ROW IF Q43_3>1]**	LED TV #2	1. Less than 40” 2. 40” to 50” 3. More than 50”	1. Yes 2. No 3. Not sure
9.	**[DISPLAY ROW IF Q43_3>2]**	LED TV #3	1. Less than 40” 2. 40” to 50” 3. More than 50”	1. Yes 2. No 3. Not sure
10.	**[DISPLAY ROW IF Q43_4>0]**	Plasma TV **[DISPLAY IF Q43_4>1, “#1”]**	1. Less than 42” 2. 42” to 50” 3. More than 50”	1. Yes 2. No 3. Not sure
11.	**[DISPLAY ROW IF Q43_4>1]**	Plasma TV #2	1. Less than 42” 2. 42” to 50” 3. More than 50”	1. Yes 2. No 3. Not sure
12.	**[DISPLAY ROW IF Q43_4>2]**	Plasma TV #3	1. Less than 42” 2. 42” to 50” 3. More than 50”	1. Yes 2. No 3. Not sure
13.	**[DISPLAY ROW IF Q43_5>0]**	Rear projection TV **[DISPLAY IF Q43_5>1, “#1”]**	1. 56” or less 2. More than 56”	1. Yes 2. No 3. Not sure
14.	**[DISPLAY ROW IF Q43_5>1]**	Rear projection TV #2	1. 56” or less 2. More than 56”	1. Yes 2. No 3. Not sure
15.	**[DISPLAY ROW IF Q43_5>2]**	Rear projection TV #3	1. 56” or less 2. More than 56”	1. Yes 2. No 3. Not sure

[IF Q43TOT>0, ASK Q45; OTHERWISE AUTOPUNCH Q45TOT=0 AND SKIP TO Q47]

Q45. On average, how many hours per day **[IF Q43TOT=1, DISPLAY “**is this TV set turned on?**”] [IF Q43TOT>1, DISPLAY “**are each of these TV sets turned on?**”]**

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

		TV Set Type	TV Size	Number of hrs per day turned on
1.	**[DISPLAY ROW IF Q43_1>0]**	Standard Tube TV **[DISPLAY IF Q43_1>1, “#1”]**	**[INSERT RESPONSE SELECTED AT Q44_1]**	**[RECORD NUM 0-24]**
2.	**[DISPLAY ROW IF Q43_1>1]**	Standard Tube TV #2	**[INSERT RESPONSE SELECTED AT Q44_2]**	**[RECORD NUM 0-24]**
3.	**[DISPLAY ROW IF Q43_1>2]**	Standard TV #3	**[INSERT RESPONSE SELECTED AT Q44_3]**	**[RECORD NUM 0-24]**
4.	**[DISPLAY ROW IF Q43_2>0]**	LCD TV **[DISPLAY IF Q43_2>1, “#1”]**	**[INSERT RESPONSE SELECTED AT Q44_4]**	**[RECORD NUM 0-24]**
5.	**[DISPLAY ROW IF Q43_2>1]**	LCD TV #2	**[INSERT RESPONSE SELECTED AT Q44_5]**	**[RECORD NUM 0-24]**
6.	**[DISPLAY ROW IF Q43_2>2]**	LCD TV #3	**[INSERT RESPONSE SELECTED AT Q44_6]**	**[RECORD NUM 0-24]**
7.	**[DISPLAY ROW IF Q43_3>0]**	LED TV **[DISPLAY IF Q43_2>1, “#1”]**	**[INSERT RESPONSE SELECTED AT Q44_7]**	**[RECORD NUM 0-24]**
8.	**[DISPLAY ROW IF Q43_3>1]**	LED TV #2	**[INSERT RESPONSE SELECTED AT Q44_8]**	**[RECORD NUM 0-24]**

9.	[DISPLAY ROW IF Q43_3>2]	LED TV #3	[INSERT RESPONSE SELECTED AT Q44_9]	[RECORD NUM 0-24]
10.	[DISPLAY ROW IF Q43_4>0]	Plasma TV [DISPLAY IF Q43_3>1, "#1"]	[INSERT RESPONSE SELECTED AT Q44_10]	[RECORD NUM 0-24]
11.	[DISPLAY ROW IF Q43_4>1]	Plasma TV #2	[INSERT RESPONSE SELECTED AT Q44_11]	[RECORD NUM 0-24]
12.	[DISPLAY ROW IF Q43_4>2]	Plasma TV #3	[INSERT RESPONSE SELECTED AT Q44_12]	[RECORD NUM 0-24]
13.	[DISPLAY ROW IF Q43_5>0]	Rear projection TV [DISPLAY IF Q43_4>1, "#1"]	[INSERT RESPONSE SELECTED AT Q44_13]	[RECORD NUM 0-24]
14.	[DISPLAY ROW IF Q43_5>1]	Rear projection TV #2	[INSERT RESPONSE SELECTED AT Q44_14]	[RECORD NUM 0-24]
15.	[DISPLAY ROW IF Q43_5>2]	Rear projection TV #3	[INSERT RESPONSE SELECTED AT Q44_15]	[RECORD NUM 0-24]
TOT.	[DISPLAY ROW IF Q43TOT>1]	**Total # of hours per day a TV is turned on in your home:**		[CALCULATE TOTAL]

Q46. **[IF Q43TOT=1, DISPLAY "**Is this TV set an ENERGY STAR TV set?**"] [IF Q43TOT>1, DISPLAY "**Are any of these TV sets ENERGY STAR TV sets?**"]**

				ENERGY STAR?		
		TV Set Type	**TV Size**	**Yes**	**No**	**Not sure**
1.	[DISPLAY ROW IF Q43_1>0]	Standard Tube TV **[DISPLAY IF Q43_1>1, "#1"]**	[INSERT RESPONSE SELECTED AT Q44_1]	○	○	○
2.	[DISPLAY ROW IF Q43_1>1]	Standard Tube TV #2	[INSERT RESPONSE SELECTED AT Q44_2]	○	○	○
3.	[DISPLAY ROW IF Q43_1>2]	Standard TV #3	[INSERT RESPONSE SELECTED AT Q44_3]	○	○	○
4.	[DISPLAY ROW IF Q43_2>0]	LCD TV **[DISPLAY IF Q43_2>1, "#1"]**	[INSERT RESPONSE SELECTED AT Q44_4]	○	○	○
5.	[DISPLAY ROW IF Q43_2>1]	LCD TV #2	[INSERT RESPONSE SELECTED AT Q44_5]	○	○	○
6.	[DISPLAY ROW IF Q43_2>2]	LCD TV #3	[INSERT RESPONSE SELECTED AT Q44_6]	○	○	○
7.	[DISPLAY ROW IF Q43_3>0]	LED TV **[DISPLAY IF Q43_3>1, "#1"]**	[INSERT RESPONSE SELECTED AT Q44_7]	○	○	○
8.	[DISPLAY ROW IF Q43_3>1]	LED TV #2	[INSERT RESPONSE SELECTED AT Q44_8]	○	○	○
9.	[DISPLAY ROW IF Q43_3>2]	LED TV #3	[INSERT RESPONSE SELECTED AT Q44_9]	○	○	○
10.	[DISPLAY ROW IF Q43_4>0]	Plasma TV **[DISPLAY IF Q43_4>1, "#1"]**	[INSERT RESPONSE SELECTED AT Q44_10]	○	○	○
11.	[DISPLAY ROW IF Q43_4>1]	Plasma TV #2	[INSERT RESPONSE SELECTED AT Q44_11]	○	○	○
12.	[DISPLAY ROW IF Q43_4>2]	Plasma TV #3	[INSERT RESPONSE SELECTED AT Q44_12]	○	○	○
13.	[DISPLAY ROW IF	Rear projection TV **[DISPLAY**	[INSERT RESPONSE	○	○	○

	Q43_5>0]	**IF Q43_5>1, "#1"]**	**SELECTED AT Q44_13]**			
14.	**[DISPLAY ROW IF Q43_5>1]**	Rear projection TV #2	**[INSERT RESPONSE SELECTED AT Q44_14]**	○	○	○
15.	**[DISPLAY ROW IF Q43_5>2]**	Rear projection TV #3	**[INSERT RESPONSE SELECTED AT Q44_15]**	○	○	○

Q47. How many desktop and laptop computers are regularly used in your home?

	Computer Type	Number of Computers
1.	Desktops	**[RECORD NUM 0-5]**
2.	Laptops	**[RECORD NUM 0-5]**
3.	Tablets	**[RECORD NUM 0-5]**
TOT.	**Total # of computers regularly used in your home:**	**[CALCULATE TOTAL]**

[IF Q47_1>0, ASK Q48; OTHERWISE SKIP TO FILTER BEFORE Q49]

Q48. **[IF Q47_1=1, DISPLAY "**What kind of monitor does your desktop computer have?**"] [IF Q47_1>1, DISPLAY "**What kind of monitors do your desktop computers have?**"]**

[IF Q47_1>3, DISPLAY, "*When you have more than 3 desktop computers, please answer for the 3 desktop computers that are used most often*.**"]**

			Monitor Type		
			Flat panel (e.g., LCD or LED)	**Non-flat panel / standard tube**	**Not sure**
		[DISPLAY COLUMN IF Q47TOT>1]			
1.	**[DISPLAY ROW IF Q47_1>0]**	Desktop **[DISPLAY IF Q47_1>1, "#1"]**	○	○	○
2.	**[DISPLAY ROW IF Q47_1>1]**	Desktop #2	○	○	○
3.	**[DISPLAY ROW IF Q47_1>2]**	Desktop #3	○	○	○

[IF Q47TOT>0, ASK Q49; OTHERWISE AUTOPUNCH Q49ATOT=0 AND Q49BTOT=0 AND THEN SKIP TO Q50]

Q49. On average, how many hours per day **[IF Q47TOT=1, DISPLAY "**is this desktop turned on or is the laptop computer or tablet plugged in?**"] [IF Q47TOT>1, DISPLAY "**are each of these desktops turned on or are the laptop computers or tablets plugged in?**"]** *Be sure to include time in which this/these computer(s) are asleep or in stand-by mode.*

[IF ANY Q47_1 thru Q43_3 >3, DISPLAY, "*When you have more than 3 of any one computer type (desktop, laptop), answer for the 3 of that type that are used most often*.**"]**

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

			Number of hrs per day turned on and…		
		Computer Type [DISPLAY COLUMN IF Q47TOT>1]	**A. In use**	**B. NOT in use (in standby / sleep mode)**	**Total**
1.	**[DISPLAY ROW IF Q47_1>0]**	Desktop **[DISPLAY IF Q47_1>1, "#1"]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
2.	**[DISPLAY ROW IF Q47_1>1]**	Desktop #2	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
3.	**[DISPLAY ROW IF Q47_1>2]**	Desktop #3	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
4.	**[DISPLAY ROW IF Q47_2>0]**	Laptop **[DISPLAY IF Q47_2>1, "#1"]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
5.	**[DISPLAY ROW IF Q47_2>1]**	Laptop #2	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
6.	**[DISPLAY ROW IF Q47_2>2]**	Laptop #3	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
7.	**[DISPLAY ROW IF Q47_3>0]**	Tablet **[DISPLAY IF Q47_3>1, "#1"]**	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
8.	**[DISPLAY ROW IF Q47_3>1]**	Tablet #2	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
9.	**[DISPLAY ROW IF Q47_3>2]**	Tablet #3	**[RECORD NUM 0-24]**	**[RECORD NUM 0-24]**	**[CALCULATE TOTAL 0-24]**
TOT.	**[DISPLAY ROW IF Q47TOT>1]**	**Total # of hours per day a computer is turned on in your home:**	**[CALCULATE TOTAL]**	**[CALCULATE TOTAL]**	**Grand Total: [CALCULATE TOTAL]**

Q50. **[IF Q47TOT=1, DISPLAY "**Is this desktop or laptop computer an ENERGY STAR computer?**"] [IF Q47TOT>1, DISPLAY "**Are any of these desktop or laptop computers ENERGY STAR computers?**"]**

			ENERGY STAR?		
		Computer Type [DISPLAY COLUMN IF Q47TOT>1]	**Yes**	**No**	**Not sure**
1.	**[DISPLAY ROW IF Q47_1>0]**	Desktop **[DISPLAY IF Q47_1>1, "#1"]**	○	○	○
2.	**[DISPLAY ROW IF Q47_1>1]**	Desktop #2	○	○	○
3.	**[DISPLAY ROW IF Q47_1>2]**	Desktop #3	○	○	○
4.	**[DISPLAY ROW IF Q47_2>0]**	Laptop **[DISPLAY IF Q47_2>1, "#1"]**	○	○	○
5.	**[DISPLAY ROW IF Q47_2>1]**	Laptop #2	○	○	○
6.	**[DISPLAY ROW IF Q47_2>2]**	Laptop #3	○	○	○

Q51. How many of the following items are used in your home?

[PROGRAMMER: DEFAULT IS ZERO]

	[ROTATE LIST]	**Number**
1.	Cable set-top box / satellite set-top box / analog-to-digital TV converter set-top box	**[RECORD NUM 0-9]**
2.	Digital video recorder (TIVO, DVR)	**[RECORD NUM 0-9]**
3.	Stand-alone speakers and subwoofers that are part of a home theater system (not embedded in other devices like TVs or CD players)	**[RECORD NUM 0-49]**
4.	Gaming consoles (Xbox360, Wii, etc.)	**[RECORD NUM 0-9]**
5.	Medical equipment that is plugged into an electrical outlet	**[RECORD NUM 0-9]**
6.	Heated waterbeds	**[RECORD NUM 0-9]**
7.	Heated aquariums	**[RECORD NUM 0-9]**
8.	Air Purifier/Cleaner	**[RECORD NUM 0-9]**
9.	Dehumidifier	**[RECORD NUM 0-9]**

[IF Q51_8>0 or If Q51_9>0, ASK Q52, OTHERWISE SKIP TO Q53.]

Q52. **[IF Q51_8>0, DISPLAY "**Is this air purifier/air cleaner an ENERGY STAR appliance?**"] [IF Q51_9>0, DISPLAY "**Is this dehumidifier an ENERGY STAR appliance?**"]**

			ENERGY STAR?		
		Appliance	**Yes**	**No**	**Not sure**
1.	**[DISPLAY ROW IF Q51_8>0]**	Air Purifier/ Air Cleaner	○	○	○
2.	**[DISPLAY ROW IF Q51_9>0]**	Dehumidifier	○	○	○

Q53. Does your home have any of the following? *Select all that apply.*

[IF Q2=2-4 OR Q3=2, DISPLAY, Please c*onsider only those that are exclusively reserved for use by you, by others who live in your specific apartment, or by any guests to whom you choose to allow access. DO NOT consider common-access pools/spas/tubs which that can be used by any other residents within your building/community.***"]**

1. A swimming pool that includes a heater, filtration system, and/or pump
2. A spa / hot tub that includes a heater, filtration system, and/or jet pump
3. None of the above **[EXCLUSIVE]**

[IF Q53_1 OR Q53_2 SELECTED, ASK Q54; OTHERWISE SKIP TO INTRO TEXT BEFORE Q55]

Q54. You mentioned your home has **[IF Q53=1, DISPLAY, "**a pool**"] [IF Q53=1 AND 2, DISPLAY, "**and**"] [IF Q53=2, DISPLAY, "**a spa/hot tub**"]** that includes a heater, filtration system, and/or pump/jet pump. What type of fuel does **[IF Q53=1 OR 2 (BUT NOT BOTH 1 AND 2), DISPLAY, "**does this heater**"] [IF Q53=1 AND 2, DISPLAY, "**do each of the heaters**"]** use?

		Natural gas	**Electricity**	**Propane (bottled gas)**	**Other**	**Not sure**	**My home does not have this**
1.	**[DISPLAY IF Q53_1=1]** Swimming pool heater	○	○	○	○	○	○
2.	**[DISPLAY IF Q53_2=1]** Spa/hot tub heater	○	○	○	○	○	○

V – ENERGY-RELATED ACTIONS

The next few questions ask you about some actions you might have taken which may affect the amount of energy your home uses.

Q55. Which, if any, of the following home improvement / remodeling efforts have you or a previous **[IF S4=2, DISPLAY, "**or current**"]** owner made in the last 5 years? *Select all that apply.*

[IF Q2=2-4 OR Q3=2, DISPLAY, "*Please answer only for your particular apartment / unit.***"]**

1.	Enhanced insulation of ducts	☐
2.	Enhanced insulation of ceiling	☐
3.	Enhanced insulation of walls	☐
4.	Enhanced insulation of attic	☐
5.	Enhanced insulation of the foundation	☐
6.	Enhanced water pipe insulation	☐
7.	Installed low-flow showerheads	☐
8.	Installed low-flow faucet aerators	☐
9.	Installed a furnace with a brushless permanent magnet (BPM) furnace blower motor	☐
10.	Installed a high efficiency bathroom exhaust fan	☐
11.	Weather stripped/caulked windows and/or doors	☐
12.	Installed storm doors	☐
13.	None of the above **[EXCLUSIVE]**	☐

NEWQ56A. Which, if any, of the following actions are you currently taking in your home?

NEWQ56B. [ASK ONLY FOR ITEMS NOT SELECTED IN Q56A] You indicated that you are not currently doing the following. Please tell us if it would physically be possible for you to do the item. For example, if you do not have a clothes dryer, you could NOT use a dryer that has a sensor that turns the dryer off when the clothes are dry.

	[ROTATE 1-7]	**[A] Currently doing this**	**[B} Could do this**
1.	Use a "Smart strip" power strip to turn off electronic equipment when it's not in use	☐	☐
2.	Unplug battery rechargers (e.g., for laptops, cell phones, MP3 players) when they are not being used	☐	☐
3.	Perform annual maintenance on your HVAC (heating, ventilation, or air conditioning) equipment	☐	☐
4.	Use a water heater insulation blanket/jacket	☐	☐
5.	Lower the water heater temperature to 125 degrees F	☐	☐
6.	Use a clothes dryer that has a sensor that turns the dryer off when the clothes are dry	☐	☐
7.	Regularly turn out the lights when leaving a room	☐	☐
8.	None of the above **[EXCLUSIVE – DO NOT CARRY TO B SCREEN]**	☐	☐

VI – UTILITY PROGRAMS

Q57. Some utilities offer rebate, low interest loan or price discount programs to encourage people to purchase highly energy efficient products such as appliances, furnaces, heat pumps, water heaters, compact fluorescent light bulbs (CFLs), and home insulation.

To the best of your knowledge, does Ameren Illinois offer any such programs that offer customers like you a discount off the purchase price on qualified items?

1. Yes
2. No
3. Not sure

[IF Q57=1 ASK Q58, OTHERWISE SKIP TO Q59]

Q58. Are you aware of any of the following programs offered by Ameren Illinois? Has your household participated in any of the following programs in the past 3 years?

	Energy Efficiency Program [RANDOMIZE]	**A. Aware of program**	**B. Participated in the last 3 years**
1.	Appliance Recycling – Room Air Conditioner	☐	☐
2.	Appliance Recycling – Refrigerator	☐	☐
3.	Appliance Recycling – Freezer	☐	☐
4.	Home Energy Performance (HEP)	☐	☐
5.	HVAC New Cooling Equipment	☐	☐
6.	Lighting discounts online or through a retailer	☐	☐
7.	ENERGY STAR New Homes Construction	☐	☐
8.	Appliance Rebate – Air Purifier	☐	☐
9.	Appliance Rebate – Dehumidifier	☐	☐
10.	Appliance Rebate – Room Air Conditioner	☐	☐
11.	Appliance Rebate – Heat Pump Water Heater	☐	☐
12.	Appliance Rebate – Smart Strip	☐	☐
13.	Appliance Rebate – Thermostat	☐	☐
14.	Appliance Rebate – Setback Thermostat	☐	☐
15.	Appliance Rebate – High Efficiency Gas Water Heater	☐	☐
990.	Other program(s) **[SPECIFY]**	☐	☐
998.	**NONE [EXCLUSIVE]**	☐	☐

[IF 58B SELECTED, AUTOFILL 58A AS SELECTED]
[NOTE: CANNOT RANDOMIZE THIS ONE WITHOUT SPLITTING OUT INTO TWO SCREENS]

VII – ADDITIONAL HOUSEHOLD DEMOGRAPHICS

In order to help us classify your responses, the last few questions are on your household's characteristics.

Q59. Does anyone in your household regularly telecommute or work from home during the day on **weekdays**?

1. Yes
0. No

[IF Q59=1, ASK Q60; OTHERWISE SKIP TO Q61]
Q60. On average, how many **weekdays** does anyone in your household work from home each week?

1. 1 weekday
2. 2 weekdays
3. 3 weekdays
4. 4 weekdays
5. 5 weekdays

Q61. **[IF Q59=1, DISPLAY, "**Other than those that work from home or telecommute, are**"] [IF Q59=0, DISPLAY, "**Are**']** there any individuals in your home that regularly stay at home all or most **weekdays**?

1. Yes
0. No

[IF Q1>1, ASK Q62; OTHERWISE AUTOCODE Q62_5=1 AND SKIP TO Q63]
Q62. Of the **[INSERT (Q1 RESPONSE MINUS 1)]** individuals that currently live in your household besides yourself, how many are children younger than 18 years old? *Select all that apply.*

1. Birth to 2 years old **[RECORD NUMBER 0-10]**
2. 3 to 6 years old **[RECORD NUMBER 0-10]**
3. 7 to 12 years old **[RECORD NUMBER 0-10]**
4. 13 to 17 years old **[RECORD NUMBER 0-10]**
5. There are no children younger than 18 years old in my household. **[EXCLUSIVE]**

[TOTAL OF Q62_1 through Q62_4 MUST BE LESS THAN (Q1 RESPONSE MINUS 1)]

Q63. Which of the following best characterizes the city / town / community in which you live?

1. Urban
2. Suburban
3. Rural

Q64. What is your gender?

1. Male
2. Female

Q65. What is the highest level of education you have completed?

1. Less than a high school degree
2. High school degree
3. Technical/trade school program
4. Associates degree or some college
5. Bachelors degree
6. Graduate / professional degree, e.g., J.D., MBA, MD, etc.
7. Professional certification, e.g., CPA, CNP, etc.

Q66. What is your current work status?

1. Employed full-time
2. Employed part-time
3. Not currently employed
4. Retired

990. Other **[SPECIFY]**

Q67. Which of the following categories includes your household's total annual income before taxes in 2011? Please include the income of **all** people living in your home in this figure.

1. Less than $60,000
2. $60,000 or more

Q68. Which of the following categories includes your household's total annual income before taxes in 2011? Please include the income of **all** people living in your home in this figure.

[IF Q67=1, DISPLAY OPTIONS 1-7 AND 13; IF Q67=2, DISPLAY OPTIONS 8-13]

1. Less than $10,000
2. $10,000 – $14,999
3. $15,000 – $19,999
4. $20,000 – $29,999
5. $30,000 – $39,999
6. $40,000 –$49,999
7. $50,000 – $59,999
8. $60,000 – $74,999
9. $75,000 – $99,999
10. $100,000 – $124,999
11. $125,000 – $149,999
12. $150,000 or more
13. Prefer not to say

Q69. How many vehicles are used in your household?
By 'vehicles' we mean cars, trucks and SUV's.

1. One
2. Two
3. Three
4. Four or more
0. None

[If Q69=1-4, ASK Q70, OTHERWISE SKIP to Q72]

Q70. What type of vehicle do you drive?

		Conventional gasoline	Natural gas	Diesel	HEV - A hybrid using gas & an electric battery as fuel (Prius, etc.)	PHEV - Hybrid using gas and a plug-in rechargeable battery (Chevy Volt, etc.)	BEV - All electric (Tesla, Leaf, etc.)	Other
1.	**[DISPLAY IF Q69=1-4]** Car #1	○	○	○	○	○	○	○
2.	**[DISPLAY IF Q69=2-4]** Car #2	○	○	○	○	○	○	○
3.	**[DISPLAY IF Q69=3-4]** Car #3	○	○	○	○	○	○	○
4.	**[DISPLAY IF Q69=4-4]** Car #4	○	○	○	○	○	○	○

Q71. What type of car are you considering for your next purchase? *Select the one you are most likely going to purchase*.

1. Conventional gasoline
2. Diesel
3. Natural gas
4. Gas/electric hybrid, such as a Prius
5. Plug-in electric, such as a Volt
6. All electric vehicle, such as the Leaf or Tesla
7. Other (please specify)
8. Not sure / Not considering a purchase at this time

Q72. Which of the following best describes your race or ethnic background?

1. White, Caucasian
2. Black, African American, Caribbean American
3. American Indian (Native American), Alaska Native
4. Asian
6. Hispanic, Latino
5. Native Hawaiian, Pacific Islander
990. Other **[SPECIFY]**
7. Prefer not to say

VIII - CONCLUSION

[INCENTIVE NAME/ADDRESS COLLECTION SCREEN]

Those are all the questions we have for you today. Thanks for your participation!

Please click 'Continue' to proceed to the payment screen.

C0. Please indicate which of the following you would prefer:

4. Please email me a $10 Amazon Gift Card
5. I would prefer to have a $10 check mailed to me
6. I would like to decline and not receive an incentive

[IF C0=1, ASK C1; IF C0=2, ASK C2; IF C0=3, ASK C0A]

COA. You have indicated that you do NOT want to receive your $10 payment. Is that correct?

3. Yes
4. No

[IF YES, GO TO THANK YOU SCREEN; IF NO, RE-ASK C0]

C1. So that we may mail your incentive to you, please provide your name and address below.

A. Full name

C. Mailing Address Line #1

D. Mailing Address Line #2 (optional)

E. City

F. State

G. ZIP Code

C1. So that we may email your incentive to you, please provide your email address below.

[RECORD EMAIL ADDRESS –VALIDATE FOR FORMAT]

[INCENTIVE NAME/ADDRESS VERIFICATION SCREEN]

Please review the information you provided and verify that it is complete and correct:

[DISPLAY ALL NAME AND ADDRESS OR EMAIL INFORMATION COLLECTED]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "Continue" to submit your information.

[PROGRAMMER: INCLUDE BACK BUTTON FOR THIS SCREEN DURING LIVE VERSION]

[IF CHOOSE TO RECEIVE AN INCENTIVE, DISPLAY:]
You have successfully submitted the information we need so we can send you your $10 thank you gift. Your check or gift card will be issued within 4-6 weeks to the address or email address you provided. Thank you and have a nice day!
If you would like information on how your household can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

---

[IF CHOOSE NOT TO RECEIVE AN INCENTIVE, DISPLAY:]
Thank you for taking the time to answer our survey questions. Have a nice day!
If you would like information on how your household can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

SURVEY CLOSED MESSAGE

We truly appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.

In order to achieve a representative sample for this survey, quotas with specific criteria needed to be designated. Because these quotas have now been filled, we are not accepting any more responses.

If you would like information on how your home can save money on your energy bills, please visit us at http://www.actonenergy.com/.

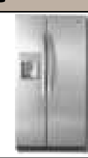
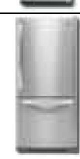
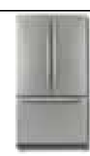
Thank you. Have a nice day!

DEFINITIONS

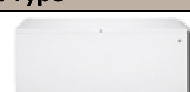
[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

<table>
<tr><th>Word / Phrase</th><th>Definitions</th></tr>
<tr><td>Air-source heat pump</td><td>A single system that draws in outside air to use in both heating and cooling your home</td></tr>
<tr><td>Attic fan</td><td>A ventilation fan which regulates the heat level of a home's attic by exhausting hot air. Unlike a whole-house fan, which removes heat from the entire home, an attic fan only removes heat from the attic area of the home.</td></tr>
<tr><td>Central boiler with hot water/steam radiators or baseboards in individual rooms</td><td>A furnace that sends either hot water or steam to individual room radiators or baseboards to heat your home</td></tr>
<tr><td>Combination refrigerator / freezer units</td><td>Units that contain both a refrigerator and a freezer.

This kind of unit comes in multiple configurations, such as:

<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Side-by-side freezer refrigerator</td><td></td><td>The freezer and refrigerator sections are adjacent to one another, allowing portions of both sections to appear at eye-level.</td></tr>
<tr><td>Top-mount freezer refrigerator</td><td></td><td>The freezer section of the unit appears at eye level, mounted above the refrigerator section.</td></tr>
<tr><td>Traditional bottom-mount freezer refrigerator</td><td></td><td>The freezer section of the unit is mounted below the refrigerator section of the unit, allowing the refrigerator section to be at eye-level. Sometimes the freezer consists of one or more pull-out freezer drawers.</td></tr>
<tr><td>French door bottom-mount freezer refrigerator</td><td></td><td>The refrigerator section of the unit has dual / twin doors. The freezer section of the unit is mounted below the refrigerator section of the unit, allowing the refrigerator section to be more at eye-level. The freezer consists of one or more pull-out freezer drawers.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Compact fluorescent lamp (CFL)</td><td>A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional shape for a light bulb</td></tr>
<tr><td>Conventional bulb / Incandescent lamp</td><td>A traditional screw-in light bulb that may range from 15 – 100 watts or more</td></tr>
<tr><td>Standard fluorescent tubes (T12)</td><td>Traditional fluorescent tube lights with standard efficiency (T12) tubes</td></tr>
<tr><td>Higher than standard efficiency fluorescent tubes (T10)</td><td>Fluorescent tube lights that provide more light output than a T12. The T10 lights have a 1 ¼ inch diameter while the T12 lights have a larger diameter of 1 ½ inches.</td></tr>
<tr><td>High-efficiency fluorescent tubes (T8)</td><td>Newer fluorescent tubes (T8s) that fit into traditional fixtures, but which represent a more efficient (lower wattage) tube</td></tr>
<tr><td>Super high-efficiency fluorescent tubes (T5)</td><td>T5 lamps are high-efficiency fluorescent tubes. T5 lamps further increase efficiency from T8 fluorescent tubes by reducing the lamp diameter to 5/8”.</td></tr>
<tr><td>Conventional water heater with storage tank</td><td>A traditional water heater that heats a tank of hot water, and keeps that tank of water hot at all times. Most tanks range from 30-80 gallons in size.</td></tr>
<tr><td>Dimming switches</td><td>Light switches that can work to dim lights, rather than simply turning them on and off</td></tr>
<tr><td>Double pane windows or better</td><td>Window systems that have two or more layers of glass with an insulating layer of air (or special gas) added between the glass layers</td></tr>
<tr><td>Dusk-to-dawn sensors</td><td>Electronic devices that use a light sensor (photocell) to automatically turn on outside lights at dusk and turn them off at dawn</td></tr>
<tr><td>Electric baseboard or electric coil radiant heating</td><td>Devices that use electricity directly to produce heat for your home from baseboards or under-floor heating.</td></tr>
<tr><td>ENERGY STAR</td><td>A label for some new appliances that indicate that the appliance meets the standards for high efficiency appliances</td></tr>
<tr><td>Freezer-only units</td><td>Units that function only as freezers (i.e., do NOT function as refrigerators).

This kind of unit comes in multiple configurations, such as:
<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Chest freezer</td><td></td><td>A freezer unit that opens from the top and often contains storage baskets.</td></tr>
<tr><td>Upright freezer</td><td></td><td>A freezer unit that opens from the front and contains shelf storage.</td></tr>
</table>
</td></tr>
<tr><td>Geothermal heat pump</td><td>A single system that uses water or fluid that circulates through underground piping to provide both heating and cooling for your home</td></tr>
<tr><td>Halogen lamp</td><td>A type of lamp which uses filaments like a traditional incandescent bulb, but is also filled with inert gas and a small amount of halogen. Compared to traditional incandescent bulbs, halogen lamps get hotter, give off light of a brighter / whiter quality, and have a longer life span.</td></tr>
</table>

<table>
<tr><td>Heat pump water heater</td><td>A system that uses a refrigeration cycle in reverse to draw heat out of the surrounding air to provide hot water in a traditional water heater storage tank</td></tr>
<tr><td>H.I.D. lamp (mercury vapor, metal halide, sodium vapor)</td><td>High power outside lights with special bulbs that are typically only used for outside lighting</td></tr>
<tr><td>LED lamp</td><td>A “light emitting diode” lamp is an electronic form of lighting that does not use filaments like traditional incandescent bulbs, but instead, uses solid state electronics.</td></tr>
<tr><td>Low voltage lighting</td><td>Low power lights (often used under counters or in other similar situations) that use a much lower wattage than do most traditional incandescent lights</td></tr>
<tr><td>Motion detectors</td><td>Electronic devices that are used to control lights in a room so that when someone is moving in a room, the lights are on, but when there is no motion in the room for several minutes, the lights are turned off</td></tr>
<tr><td>Occupancy sensors</td><td>Electronic devices that are used to control lights in a room so that when someone is present the lights are on, but where there is no one in the room for several minutes, the lights are turned off</td></tr>
<tr><td>Refrigerator-only units</td><td>Units that have only a refrigerator function (i.e., do NOT have a freezer function). They are much less common than freezer-only units.

This kind of unit, which is sometimes called a freezerless refrigerator, comes in multiple configurations, such as:

<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Chest refrigerator</td><td></td><td>An all-refrigerator unit that <u>opens from the top</u> and often contains storage baskets.</td></tr>
<tr><td>Upright refrigerator</td><td></td><td>An all-refrigerator unit that <u>opens from the front</u> and contains shelf storage.</td></tr>
</table>
</td></tr>
<tr><td>Single pane windows</td><td>Traditional windows that have only a single pane of glass, without any insulating layer of air, or anything else inserted inside the glass. Note that single pane windows may have reflective film or other additions applied to the single layer of glass.</td></tr>
<tr><td>Smart strip</td><td>Controlled Power Strips (or Smart Strips) which are multi-plug power strips with the ability to automatically disconnect specific connected loads depending upon the power draw of a “control” load, also plugged into the strip. For example, if a desktop computer is the control load, when it shuts down it might also disconnect an associated monitor, printer, and scanner, thereby reducing standby power loads. The same can be true for a television controlling a DVD, DVR, and audio system. Uncontrolled outlets are also provided on the strip that are not affected by the control device and so are always providing power to any device plugged into it.</td></tr>
<tr><td>Tankless (instantaneous/on demand) water heater</td><td>A water heater that only heats water for delivery to your home when you ask for it by using hot water. These systems do not keep a tank of water hot at all times.</td></tr>
</table>

Timers	Timers are typically used to control lights, turning them on and off at specific times of the day
Tubular fluorescent lamp	Traditional fluorescent lights are generally tubes of 3 or more feet in length and are installed in special fixtures made specifically for these tubes
Wall furnace	A furnace that works "through the wall," meaning that it is a box that draws air directly from the outside and then warms it before sending the resulting warm air into a room.
Whole-house fan	A ventilation fan mounted in the ceiling of a central part of a home that removes heat from the *entire* home. It does this by first drawing that heat from the living areas of the home into the home's attic, and then pushing the heat trapped in the attic to the outside through vents. Unlike an attic fan, which only removes heat from a home's attic, a whole-house fan removes heat from the entire home.

BUSINESS PROGRAM INTEREST SURVEY QUESTIONNAIRE

Ameren Illinois DSM Market Potential – Program Interest Questionnaire SMB
FINAL 7/26/2012

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must be knowledgeable about decision-making about energy issues for the business at the specified location
- Utility bills must be paid for that location

Hard Quotas

Total: n=700

Additional sample groups to monitor during fielding

- **MAIN QUOTA VARIABLE IS 'Usage-Segment-Stratum'**

RESPONDENT IDENTIFICATION / VERIFICATION

Welcome. This survey is sponsored by Ameren Illinois.
[PROGRAMMER: INCLUDE AMEREN ILLINOIS LOGO]

Please enter the "Survey ID#" that appears on the survey invitation postcard you received. This Survey ID# should be located just above the mailing address on the front side of your postcard.

Survey ID# : ________________

We at Ameren Illinois and Definitive Insights value your privacy. We will use the information you provide for research purposes only and will NOT share it with third parties for marketing purposes. Information you provide will be stored in a secure database. If you have questions about our privacy practices or would like to get any other information about this study, please contact us via one of the following methods:

e-mail: AmerenSurveyHelp@definitiveinsights.com

phone: 1-888-742-4511

postal mail: Definitive Insights
ATTN: Ameren Illinois Project Director
601 SW Oak Street
Portland, Oregon 97205

[PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE]

INTRODUCTION

Thank you for taking time to see if you and your business qualify to participate in a new research study about energy. The study is sponsored by Ameren Illinois, and it has a very important purpose. Ameren Illinois is delivering programs to help its customers use energy more efficiently. Your answers to this survey will help the company to improve these programs so that they work best for everyone.

Your business is one of a small number being asked to respond to the survey. To show our appreciation for your time and effort, we will send you $25 upon submitting your answers. (Note: Payment may be declined if required by your company's policies.)

You will first be asked a few questions to make sure your business qualifies for participation. If you do qualify, you will then be invited to complete the full survey.

> *Note: If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.*

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

Please click "CONTINUE" to begin.

RESPONDENT SCREENING

A1. Our records indicate that we have reached you at the following address:
[ADDRESS]

Is this correct?
5. Yes
6. No

A2. Please let us know if this address is for a business or a residence:
1. This is a business address
2. This is a residential address, but a home-operated business is located here
3. This is a residential address – it is not associated with a business

[IF A1=2 OR IF A2=3, TERMINATE AND READ A1-A2 TERMINATE TEXT; OTHERWISE, GO TO S1.]

[A1-A2 TERMINATE TEXT:]
We truly appreciate your time and effort in responding to our survey, but our questions are related to the energy-related aspects for a specific business address.

If you would like information on how you or your business can save money on your energy bills, please visit us at www.actonenergy.com.

Thank you. Have a nice day!

S1. Which of the following describes how knowledgeable you are about the way your organization makes decisions about energy-related issues?

1. You are **very knowledgeable** about **all** of the issues your organization takes into account as it makes decisions about changing out equipment, or about other energy-related issues
2. You are **knowledgeable** about **most** of the factors that your organization takes into account as it makes decisions about changing out equipment, or about other energy-related issues
3. You are **not that knowledgeable** about how and why your organization makes the decisions it does about energy related issues **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**
4. Don't know **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**

[IF S1=1-2, SKIP TO S3; OTHERWISE GO TO S2 TERMINATE TEXT]

S2. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your organization who has specific knowledge about the way your organization makes decisions about energy-related issues.

We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey with the following ID:

Link: **[http://tiny.cc/ameren3]**
ID: **[xxxxx]**

[PROGRAMMER NOTE: IF A RESPONDENT TERMINATES VIA S2, DELETE DATA COLLECTED AND RESET SURVEY REENTRY POSITION FOR THAT SURVEY ID# BACK TO THE BEGINNING OF THE SURVEY. RECORD THE DATA DELETED FOR THAT SURVEY ID# ELSEWHERE SO WE CAN TRACK THE NUMBER OF TIMES AND REASONS RESPONDENTS DISQUALIFY AT S2 AS WELL AS THE NUMBER OF TIMES THESE PREVIOUSLY USED SURVEY ID#'S ARE REUSED. FOR ALL RESPONDENTS THAT DO NOT TERMINATE VIA S2, DO NOT ALLOW SURVEY ID# TO BE USED AGAIN.]
{NOTE: THIS WILL ALLOW A RESPONDENT WHO DOES NOT PERSONALLY QUALIFY TO FORWARD THEIR SURVEY ID# TO A CO-WORKER WHO MAY BE BETTER QUALIFIED TO ANSWER THE SURVEY.} TK NOTE 7/11 – PLEASE WRITE A NEW VARIABLE TO BE RETAINED (IN THE SAMPLE FILE?) SO THAT I CAN RUN A REPORT TO KNOW HOW MANY RECORDS WERE USED BUT BY THE WRONG PERSON. NEED TO TEST

[NEW PROGRAMMER NOTE 7/16 –FOR ALL TERMINATES BEYOND THIS POINT, USE THE GENERAL TERMINATE TEXT ON PG 11]

S3. Which of the following best describes how your business is billed for electricity at **[READ IN ADDRESS FROM SAMPLE]**?

1. We are **billed directly by Ameren Illinois** for the electricity we use
2. We are **NOT billed directly by Ameren Illinois** for the electricity we use; our electric **bill is handled by another part of our company or by a third party service provider**, but ultimately, our company is responsible for the cost for our electricity
3. We are **NOT billed directly by Ameren Illinois** for the electricity we use; the cost for our electricity is **included in our rent/lease**
4. We are **served by another utility; not Ameren Illinois**
5. Don't know **[TERMINATE]**

S4. Which of the following best describes how your business is billed for natural gas at **[READ IN ADDRESS FROM SAMPLE]**?

1. We are **billed directly by Ameren Illinois** for the natural gas we use
2. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; our natural gas **bill is handled by another part of our company or by a third party service provider**, but ultimately, our company is responsible for the cost for our natural gas
3. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; the cost for our natural gas is **included in our rent/lease**
4. We are **served by another utility; not Ameren Illinois**
5. Don't know **[TERMINATE]**

[IF S3=1-2 OR S4=1-2, CONTINUE TO TRACKING VARIABLE AND S5; OTHERWISE TERMINATE]

[PROGRAMMER: DISPLAY DIRECTLY ABOVE S5 ON SCREEN:
PLEASE NOTE THAT ALL OF OUR REMAINING QUESTIONS REFER SPECIFICALLY TO THE FACILITY AT [ADDRESS]

[CREATE TRACKING VARIABLE:
(S3=1-3 AND S4=4 OR 5) = ELECTRIC ONLY
(S4=1-3 AND S3=4 OR 5) = GAS ONLY]

[PROGRAMMER: DISPLAY DIRECTLY BELOW S3 ON SCREEN: "PLEASE NOTE THAT ALL OF OUR REMAINING QUESTIONS REFER SPECIFICALLY TO THE FACILITY AT THE LOCATION CITED ABOVE"]

S5. Does your business own or lease the building space at this location?

If you both lease some space, and own some space at this location, which accounts for the majority of the space?

1. Own (or in the process of buying it)
2. Lease / rent

S6. Does your operation at this location occupy any enclosed space, or is it an outdoor structure or operation, such as a billboard, a parking lot, a communications tower, or the like?
Our location… **[SELECT ONE]**

1. Is ONLY an enclosed space
2. Is ONLY an outdoor structure or facility **[TERMINATE AFTER S7 – SHOW GENERAL TERMINATE TEXT]**
3. Includes both an enclosed space AND an outdoor structure or operation

[IF S6=2, ASK S7 AND THEN TERMINATE; IF S6=3, ASK S7 AND CONTINUE; OTHERWISE SKIP TO S8]
S7. What type of outdoor structure does your organization operate at this site?

1. Billboard
2. Communications / telecommunications tower or other facility
3. Pump
4. Parking lot
5. Traffic light or other type of outdoor lighting

990. Other **[SPECIFY]**

S8. Which of the following best describes the type of facility your organization occupies?

1. Office (finance, insurance, real estate, law, etc.)
2. Retail (department stores, services, boutiques, etc.)
3. Grocery (supermarkets, convenience store, market, etc.)
4. Restaurant (sit-down, fast food, coffee shop, etc.)
5. Warehouse
6. School (day care, pre-school, elementary, secondary)
7. College, university or trade school
8. Health Care (health practitioner office, hospital, urgent care center, etc.)
9. Nursing home / assisted living facility / residential treatment facility
10. Lodging / housing facility (hotel, motel, bed and breakfast, apartment building, etc.)
11. Not-for profit housing facility (shelter, prison, jail, etc.)
12. Entertainment / recreation facility (movie theater, bowling alley, health club/gym, library, museum, etc.)
13. Public assembly facility (convention / conference center, etc.)
14. Worship (church, temple, etc.)
15. Multi-use or shopping mall (i.e., mixed use of space for offices, restaurants, stores, service, apartments, etc.)
16. Manufacturing, production, or processing facility (including for-profit businesses and governmental facilities)

990. Other **[SPECIFY]**

S9. Which of the following best describes the activity in which your business is engaged at this location? *Please select the one option that best describes the activity.*

{NOTE TO TEAM: IF THE RESPONDENT SELECTS RESPONSE "15" ABOVE ("MIXED USE"), THEY ARE SHOWN ALL POSSIBLE OPTIONS FOR BUSINESS ACTIVITY EXCEPT HOSPITAL (80,82), WAREHOUSE (30-33), AND MANUFACTURING / PROCESSING (67-79)}

Traditional Office-Based Business [IF S8=1 OR 15 OR 990, DISPLAY CODES 1-7]	
1. Finance	○
2. Insurance	○
4. Real estate / construction	○
5. Government	○
6. Other not-for-profit	○
7. Other office **[SPECIFY]**	○
Retail [IF S8=2 OR 15 OR 990, DISPLAY CODES 8-19]	
8. Major retail store	○
9. Department store	○
10. Small retail (boutique, store in strip mall)	○
11. Convenience store	○
12. Supermarket	○
13. Market	○
14. Laundry	○
15. Dry cleaning	○
16. Copy center	○
17. Barber / salon	○
18. Gas station / auto shop	○
19. Other retail **[SPECIFY]**	○
Grocery [IF S8=3 OR 15 OR 990, DISPLAY CODES 20-23]	
20. Supermarket	○
21. Convenience store	○
22. Market	○
23. Other grocery **[SPECIFY]**	○
Restaurant / Food Service [IF S8=4 OR 15 OR 990, DISPLAY CODES 24-29]	
24. Sit-down restaurant	○
25. Casual restaurant, diner, etc.	
26. Fast food	○
27. Bakery	○
28. Coffee shop	○
29. Other restaurant/food service **[SPECIFY]**	○
Warehouse [IF S8=5 OR 990, DISPLAY CODES 30-33] **[DO NOT DISPLAY FOR S8=15 FOLLOWUP]**	
30. Refrigerated warehouse	○
31. Non-refrigerated warehouse	○
32. Combination of refrigerated and non-refrigerated space	○
33. Other warehouse **[SPECIFY]**	○
School [IF S8=6 OR 15 OR 990, DISPLAY CODES 34-37]	
34. Preschool / daycare	○
35. Elementary school	○
36. Secondary school	○
37. Other pre-college **[SPECIFY]**	○
College, University or Trade School [IF S8=7 OR 15 OR 990, DISPLAY CODES 38-41]	
38. College	○
39. University	○

40. Trade school	○
41. Other post-secondary **[SPECIFY]**	○
Health Care [IF S8=8 OR 15 OR 990, DISPLAY CODES 81-86]	
85. Medical / dental office or office for other health practitioners	○
80. General medical or surgical hospital **[DO NOT DISPLAY FOR S8=15 FOLLOWUP]**	○
81. Veterinary hospital	○
82. Other hospital **[SPECIFY] [DO NOT DISPLAY FOR S8=15 FOLLOWUP]**	○
83. Urgent care center	○
84. Other health care facility **[SPECIFY]**	○
Nursing Home / Assisted Living [IF S8=9 OR 15 OR 990, DISPLAY CODES 42-45]	
42. Nursing home	○
43. Assisted living facility	○
44. Residential treatment facility	○
45. Other care facility **[SPECIFY]**	○
Lodging / Housing [IF S8=10 OR 15 OR 990, DISPLAY CODES 46-49]	
46. Hotel	○
47. Motel	○
48. Bed & Breakfast	○
87. Apartment building / condominium association	○
49. Other lodging / housing **[SPECIFY]**	○
Not-For-Profit Housing [IF S8=11 OR 15 OR 990, DISPLAY CODES 50-52]	
50. Shelter	○
51. Prison / jail	○
52. Other not-for-profit housing **[SPECIFY]**	○
Entertainment / Recreation [IF S8=12 OR 15 OR 990, DISPLAY CODES 53-59]	
53. Health club / gym	○
54. Movie theater	○
55. Theater	○
56. Library	○
57. Museum	○
58. Bowling alley	○
59. Other entertainment / recreation **[SPECIFY]**	○
Public Assembly [IF S8=13 OR 15 OR 990, DISPLAY CODES 60-62]	
60. Conference / convention center	○
61. Community center	○
62. Other public assembly **[SPECIFY]**	○
Worship [IF S8=14 OR 15 OR 990, DISPLAY CODES 63-66]	
63. Church	○
64. Temple	○
65. Synagogue	○
86. Mosque	○
66. Other worship **[SPECIFY]**	○
Manufacturing / Production / Processing [IF S8=16 OR 990, DISPLAY CODES 67-79] **[DO NOT DISPLAY FOR S8=15 FOLLOWUP]**	
67. Agricultural production or farming	○
68. Chemical processing	○
69. Electronics / technology	○
70. Food / beverage production or processing	○
71. General / light assembly or manufacturing	○
72. Glass production or processing	○
73. Metals production or processing or fabricated metal work	○
74. Machinery / appliance / equipment manufacturing	○
75. Paper products processing, printing or manufacturing	○

76. Textiles / apparel production or processing	○
77. Water / wastewater treatment	○
78. Wood products manufacturing	○
79. Other manufacturing / processing **[SPECIFY]**	○
Something else [IF S8=15 OR 990, DISPLAY CODE 80]	
80. Something else **[SPECIFY]**	○

S10. Approximately how many employees work at this location?

1. Less than 5 employees
2. 5 – 9
3. 10 – 19
4. 20 – 49
5. 50 – 99
6. 100 – 199
7. 200 – 299
8. 300 – 399
9. 400 – 499
10. 500 – 999
11. 1,000 – 2,499
12. 2,500 – 4,999
13. 5,000 – 9,999
14. 10,000 – 24,999
15. 25,000 or more employees

S11. What is the approximate square footage of all of the **enclosed floorspace** at your business's location, including all buildings and any enclosed parking?

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

Please enter a whole number rather than a range of numbers.

1. **[RECORD NUMBER]** square feet
2. Not sure

[IF S11_1>0, ASK S12 IN ORDER TO VALIDATE S11_1 RESPONSE; OTHERWISE SKIP TO S13]

S12. You said the approximate total square footage of all of the **enclosed floorspace** at your business's location is **[INSERT S11_1 RESPONSE, USING COMMAS] square feet**.

Is this what you intended?

1. Yes
0. No, I would like to edit my response

[IF S12=1, CONTINUE TO FILTER BEFORE S13; IF S12=0 SKIP BACK TO S11]

[IF S11=2, ASK S13; OTHERWISE SKIP TO S14]

S13. We understand you aren't sure, so using the ranges listed below, please just choose the best estimate of the total square footage of all of the **enclosed floorspace** at this location, including all buildings and any enclosed parking?

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

1. Less than 1,000 sq. ft.
2. 1,000 – 4,999
3. 5,000 – 9,999
4. 10,000 – 14,999
5. 15,000 – 24,999
6. 25,000 – 49,999
7. 50,000 – 99,999
8. 100,000 – 499,999
9. 500,000 – 1 million
10. 1 million sq. ft. or more

S14. Which of the following uses of **electricity** and **natural gas** do you pay for at this location? In other words, does your electric and/or gas bill include the cost of…? *Select all that apply.*

1. Heating some or all of your space
2. Cooling some or all of your space
3. Providing hot water for your use
4. Interior lighting
5. Exterior lighting

{NOTE TO TEAM: THESE RESPONSES WILL BE USED TO SCREEN RESPONDENTS OUT OF THE RELEVANT END USE SECTIONS BELOW; I.E., IF THEY SAY THEIR ENERGY BILL DOES NOT COVER SPACE HEATING, THEY WILL BE SKIPPED OUT OF THE SPACE HEATING SECTION}

[IF NOT OVER-QUOTA, GO TO INVITATION LANGUAGE; OTHERWISE TERMINATE]

ALL TERMINATES AND OQ EXCEPT FOR TERMS AT A1 AND REFERRALS AT S2 SHOULD GET THIS TERM TEXT:

TERMINATE LANGUAGE FOR NON-QUALIFYING AFTER QS2.0 OR OVER-QUOTA RESPONDENTS

We appreciate the time and effort you have spent in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate in this research study.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this point, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your business can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

---

[ONLY ASKED IF RESPONDENT TERMINATES OR IS OVER QUOTA]

R1. Additionally, if you would like someone from the Ameren Illinois's energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. **Yes,** we would like to be contacted by someone from Ameren Illinois's energy efficiency implementation team. *Please supply the appropriate contact information below.*

   [PROGRAMMER NOTE: RESPONDENT SHOULD NOT BE FORCED TO ENTER ANY INFO IF IT'S NOT FOR THEIR PREFERRED CONTACT METHOD]

   Contact Name:______________________________

   Business Name:______________________________

   Preferred contact method(s) – *Select all that apply*:

   ☐ phone ☐ e-mail ☐ postal mail

   Daytime phone number :_______________________ **[ALLOW UP TO 20 CHARACTERS – ALLOW ALPHA CHARACTERS]**

   E-mail address:_______________________________

   Postal address:_______________________________

   ____

   ____

2. **No,** we would NOT like to be contacted

[IF R1=1, GO TO FOLLOW-UP REQUEST VERIFICATION SCREEN]

Please review the contact information you provided and verify that it is complete and correct:

IF R1=2, SHOW:
Thank you and have a nice day!

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far. You and your business have qualified to complete this survey. As we indicated earlier, only a limited number of individuals have been invited to participate in this survey, so we appreciate your time in filling out the survey as completely as possible.

The survey should take about 20 – 25 minutes to complete. Once you complete the survey you will be eligible to receive our $25 thank you payment. Information about how to receive this payment will be provided at the end of the survey.

Your responses are important to us, so please press “CONTINUE” to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything.

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the personalized URL to access your survey again. The survey will automatically take you to the point where you left off.

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

As you complete the survey, you will **not** be able to use your browser’s “back” button. If you mistakenly press your browser’s “back” button, you will need to press the “refresh” button to continue the survey.

I – CUSTOMER ENERGY NEEDS

[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT]

Now, let's turn specifically to your organization's thoughts about Ameren Illinois.

Q1. Overall, how familiar would you say your organization is with Ameren Illinois?

[RECORD NUMBER; 1=NOT AT ALL FAMILIAR, 10=EXTREMELY FAMILIAR]

Not at all familiar					Extremely familiar				
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
○	○	○	○	○	○	○	○	○	○

Q2. Using the scale below, please indicate how much your organization agrees or disagrees with each of the following statements about Ameren Illinois.

Note: If you don't feel like your organization is very familiar with Ameren Illinois on any of the following, please just give your best guess.

Ameren Illinois is…

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-4]	Strongly disagree					Strongly agree				
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. …a leader in energy conservation and green energy	○	○	○	○	○	○	○	○	○	○
2. …a company that can be trusted	○	○	○	○	○	○	○	○	○	○
3. …a credible information source on the kinds of things you can do to save energy	○	○	○	○	○	○	○	○	○	○
4. …a company that actively promotes programs to help its business customers save money	○	○	○	○	○	○	○	○	○	○

Q3. Overall, how satisfied would you say your organization is with Ameren Illinois as your electric utility?

[RECORD NUMBER; 1=NOT AT ALL SATISFIED, 10=EXTREMELY SATISFIED]

Not at all satisfied									Extremely satisfied
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
○	○	○	○	○	○	○	○	○	○

Q4. Using the scale below, please indicate how important it is to your organization that your electric utility company do the following things, even if that means that your organization would have to pay a little more in order for your utility to pursue these types of initiatives?

[RECORD NUMBER; 1=NOT AT ALL IMPORTANT, 10=EXTREMELY IMPORTANT]

[ROTATE 1-3]	Not at all important									Extremely important
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Actively encourage its customers to participate in energy saving and cost saving programs	○	○	○	○	○	○	○	○	○	○
2. Do everything possible to supply renewable, clean energy	○	○	○	○	○	○	○	○	○	○
3. Operate its business in a completely environmentally friendly manner	○	○	○	○	○	○	○	○	○	○

Q5. Considering the types of initiatives we asked about in the previous question, which would you prefer your electric utility do…? **[SELECT ONE]**

1. Pursue these and other initiatives even if your organization had to pay a little more
2. Do everything possible to keep energy costs as low as possible
3. Both are <u>equally</u> important

II – BASIC ENERGY USAGE

[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT]

Our next few questions are about the equipment you have at this facility.

Q6. Approximately what percentage of the space your business occupies, or uses, at this location is heated?

1. None
2. Less than 10%
3. 10-20%
4. 21-30%
5. 31-40%
6. 41-50%
7. 51-60%
8. 61-70%
9. 71-80%
10. 81-90%
11. More than 90%

[IF Q6=2-11, ASK Q7; OTHERWISE SKIP TO Q8]

Q7. What type of space heating system is used as a means of heating your space? *Please select one in each column.*

[PROGRAMMER: ONLY ONE TYPE CAN BE SELECTED IN EACH COLUMN]

	Heating Equipment	A. Primary	B. Secondary
1.	Natural gas warm air furnace with ducts/vents to individual rooms	☐	☐
2.	Electric warm air furnace with ducts/vents to individual rooms	☐	☐
3.	Natural gas boiler with hot water/steam radiators or baseboards in individual rooms	☐	☐
4.	Electric boiler with hot water/steam radiators or baseboards in individual rooms	☐	☐
5.	Electric baseboard or electric coils radiant heating (no supply ducts or water/steam pipes)	☐	☐
6.	Air-source heat pump	☐	☐
7.	Geothermal heat pump	☐	☐

8.	**Natural gas unit heater or wall furnace**	☐	☐
9.	**Electric unit heater or wall furnace**	☐	☐
10.	**None**	☐	☐
999.	**Not sure [EXCLUSIVE]**	☐	☐
990.	**Other (please specify)**	☐	☐

Q8. What type of cooling system is your primary means to cool your space?

By "primary", we mean the cooling system that you use for the largest amount of your space.

1. Air cooled chiller
2. Water cooled chiller
3. Central air conditioner
4. Packaged air conditioner units
5. Floor-by-floor packaged water cooled DX (Direct Expansion) units
6. Wall or window air conditioner units
7. Air-source heat pump
8. Geothermal heat pump
9. Other **[SPECIFY]**
10. Not sure

Q9. What type of water heater does your business use?

1. None
2. Hot water either purchased or provided by building to tenants
3. Self-contained or stand-alone storage water heaters/boilers
4. Central boiler
5. Tankless (instantaneous) water heater
6. Heat pump water heater
7. Heat recovery water heater
8. Other **[SPECIFY]**
9. Not sure

Q10. What size kitchen, if any, is used for food preparation in your facility, including any kitchens used for employees' personal use?

1. None
2. Small kitchenette
3. Residential-scale kitchen
4. Commercial-scale kitchen
5. Institution-scale kitchen (in larger hospitals, universities)

Q11. **[IF Q10=2-5, DISPLAY, "**How many of the following units can be found in your kitchen / food preparation / food storage and/or sales area(s)?**"] [IF Q10=1, DISPLAY, "**Even though you mentioned you don't have any kitchens, do you have any refrigerator and/or freezer units? Please indicate how many you have at your location.**"]**

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

1. Refrigerator, units	**[RECORD NUMBER 0-99]**
2. Freezer, units	**[RECORD NUMBER 0-99]**
3. Refrigerator, walk-in	**[RECORD NUMBER 0-99]**
4. Freezer, walk-in	**[RECORD NUMBER 0-99]**

[IF S8 NE 5, ASK Q12; OTHERWISE SKIP TO Q13]

Q12. Is there any warehouse or large storage space at your location?

1. No
2. Yes, unrefrigerated
3. Yes, refrigerated
4. Yes, both unrefrigerated and refrigerated

Q13. Do you have any swimming pools, hot tubs, spas, or other similar items at your location?

1. No
2. Yes, unheated
3. Yes, heated using electricity as a heat source
4. Yes, heated using natural gas as a heat source
5. Yes, heated using another heat source

III – ATTITUDES

We'd like to understand how your organization as a whole thinks about using energy at this facility.

Q14. At an organizational level, to what extent does your firm agree or disagree with each of the following statements? Please use a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree.

We are interested in your firm's attitudes, regardless of whether or not it has acted on these beliefs.

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-8]	**Strongly disagree**									**Strongly agree**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. We care about the cost of the energy we use, but realistically, other issues take up much more of our management time	○	○	○	○	○	○	○	○	○	○
2. It is a top priority for our organization to find ways to control our energy costs	○	○	○	○	○	○	○	○	○	○
3. There is really very little our organization can do to save money on our energy bills	○	○	○	○	○	○	○	○	○	○
4. Our organization believes that it is socially responsible to limit our use of electricity	○	○	○	○	○	○	○	○	○	○
5. We would do more to make our facility more energy efficient, but we don't really know where to start, or what to do next	○	○	○	○	○	○	○	○	○	○
6. Our organization has made a public commitment to be a "greener" organization	○	○	○	○	○	○	○	○	○	○
7. Our organization believes that the long-term threat from global warming and climate change is real, and potentially devastating	○	○	○	○	○	○	○	○	○	○
8. We believe that investing in energy efficiency almost always a good business decision	○	○	○	○	○	○	○	○	○	○

IV – EE MEASURES ALREADY TAKEN

Q15. Which, if any, of the following types of gas or electric appliances, equipment (e.g., HVAC equipment, motors), large electronic devices, or other significant energy-using items has your organization purchased for this facility in the **last 12 months**? *Select all that apply.*

[ROTATE 1-7]	**Purchased in last 12 months**
1. Heating equipment used to heat space in your facility	☐
2. Air conditioning equipment used to cool space in your facility	☐
3. Water heating equipment	☐
4. Refrigeration equipment	☐
5. Motors / drives	☐
6. Office equipment (computers, printers, copiers)	☐
7. Ventilation equipment	☐
8. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐
9. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐
10. Other significant energy-using item **[SPECIFY ONE ITEM]**	☐
11. Not sure **[EXCLUSIVE]**	☐
12. None of the above **[EXCLUSIVE]**	☐

[IF ANY Q15_1 THRU Q15_10 SELECTED, ASK Q16; OTHERWISE SKIP TO Q17]

Q16. To the best of your recollection, were any of the items purchased for your facility in the last 12 months ones that were specifically described as “ENERGY STAR”, “high energy efficiency” or “highly energy efficient”?

High energy efficiency models are often labeled as "ENERGY STAR®" appliances or devices.

[DISPLAY ONLY ITEMS SELECTED AT Q10] [ROTATE 1-7]	**1. Yes**	**2. No**	**3. Not sure**
1. Space heating equipment	○	○	○
2. Space cooling equipment	○	○	○
3. Water heating equipment	○	○	○
4. Refrigeration equipment	○	○	○
5. Motors / drives	○	○	○
6. Office equipment (computers, printers, copiers)	○	○	○
7. Ventilation equipment	○	○	○
8. **[INSERT Q15_8 SPECIFY]**	○	○	○
9. **[INSERT Q15_9 OTHER SPECIFY]**	○	○	○
10. **[INSERT Q15_10 OTHER SPECIFY]**	○	○	○

Q17. In the last 12 months, has your organization replaced any of the interior lighting at this facility with high efficiency lighting, including any compact fluorescent light bulbs (or CFLs), CFL-only light fixtures, or T-8 or Super T-8 lamps or fixtures?

1. Yes
2. No
3. Not sure

[IF Q17=1; ASK Q18; OTHERWISE SKIP TO Q19]

Q18. Approximately how many high efficiency bulbs and/or ballasts has your organization installed in this facility **within the last 12 months**? *Your best estimate is fine.*

	Number installed within the last 12 months
1. High efficiency bulbs / lamps	**[RECORD NUMBER 0-999]**
2. High efficiency fixtures / ballasts	**[RECORD NUMBER 0-999]**

[Q13TOT (not displayed) MUST BE >0 IN ORDER TO MOVE TO NEXT SCREEN]

Q19. Some utilities offer rebates, low interest loans, or price discounts to encourage people to purchase highly energy efficient products, including HVAC equipment, refrigeration equipment, motors, water heaters, lighting, and other items.

To the best of your knowledge, does Ameren Illinois have any such programs that offer organizations like yours a discount off the purchase price on qualified items?

1. Yes
2. No
3. Not sure

[IF Q19=1, ASK Q20; OTHERWISE SKIP TO Q21]

Q20. Has your organization participated in any loans, price discounts, or conservation rebate programs sponsored by Ameren Illinois **within the last 2 years**?

1. Yes
2. No
3. Not sure

Q21. Which of the following statements best describes your organization's approach to implementing energy efficiency actions **at this facility**? *Please select the* ***one*** *answer that best fits this facility.*

1. We don't really pay much attention to energy efficiency
2. We try and watch our energy use, and attempt to remind people about how they use lights and equipment, but we haven't actually done much in terms of changing out equipment for higher efficiency models
3. We have done some things to become more energy efficient (e.g., watch our energy use and have replaced some equipment), but I wouldn't say we have done everything we can
4. We make consistent and aggressive efforts to make our facility as energy efficient as possible

Q22. Has your organization noticed any energy or cost savings as a result of <u>any</u> of the actions your organization might have taken over the last few years to conserve energy or be more energy efficient at this facility?

1. Yes – the energy efficiency actions taken have had a **large impact** on energy or cost savings
2. Yes – the energy efficiency actions taken have had a **small or moderate impact** on energy or cost savings
3. No – the energy efficiency actions taken have had **no impact** on energy or cost savings
4. Not sure
5. Not applicable – We have not taken any actions to conserve energy or be more energy efficient at this facility over the last few years

V – PURCHASING ATTITUDES / BEHAVIOR & ENVIRONMENTAL ATTITUDES

Now, we'd like to find out about your organization's priorities when evaluating energy-related products and services for your facility.

Q23. Using the scale below, please indicate <u>how important</u> each of the following factors is to your organization when selecting which pieces of equipment, electronic devices, or other energy-related products or services to purchase for this facility.

[RECORD NUMBER; 1=NOT AT ALL IMPORTANT, 10=EXTREMELY IMPORTANT]

[ROTATE 1-7, but make sure 1-2 always appear next to each other]	**Not at all important**									**Extremely important**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Any long-term cost savings your organization might see from using the product / service	○	○	○	○	○	○	○	○	○	○
2. Any positive effects on the environment resulting from using the product / service	○	○	○	○	○	○	○	○	○	○
3. Any rebates or purchase discounts that may be offered for the products / services	○	○	○	○	○	○	○	○	○	○
4. The extent to which the product / service is at the leading edge of new technology	○	○	○	○	○	○	○	○	○	○
5. Any potential positive impact on productivity or sales potential	○	○	○	○	○	○	○	○	○	○
6. Features and functions included with the product / service	○	○	○	○	○	○	○	○	○	○
7. The total up-front cost of the product / service	○	○	○	○	○	○	○	○	○	○

[IF Q23_1=Q23_2, ASK Q24; OTHERWISE SKIP TO Q25]

Q24. When evaluating energy-related products and services for your facility, which **one** of the following factors is **<u>more</u> important** to your organization?

[ROTATE 1-2]	**More important factor when shopping for energy-related products / services**
1. Any **cost savings** your organization might see	○
2. Any **positive effects on the environment** that might result	○

Q25. Using the scale below, please indicate how much you agree or disagree with each of the statements below that have to do with how your organization selects new energy-using equipment.

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-11]	Strongly disagree									Strongly agree
	1	2	3	4	5	6	7	8	9	10
1. We manage our operations very tightly; we constantly look at how things are running and for ways to reduce costs	○	○	○	○	○	○	○	○	○	○
2. These days, we have to take a very short term view when thinking about operational investments	○	○	○	○	○	○	○	○	○	○
3. When we consider replacing energy-using equipment, we typically rely on advice from outside consultants or contractors about what would be best for our situation	○	○	○	○	○	○	○	○	○	○
4. We continue to take a long-term view of equipment costs – purchase price matters, but we take life-cycle costs into account when evaluating options	○	○	○	○	○	○	○	○	○	○
5. We are far more concerned with what new energy-using equipment can do for us – what benefits we get from using it – than we are concerned about the cost of the energy to run the equipment	○	○	○	○	○	○	○	○	○	○
6. The reality is that the most energy-efficient equipment is also almost always the best equipment on the market	○	○	○	○	○	○	○	○	○	○
7. Unless there's a bona fide reason not to, we typically install the most energy-efficient equipment possible	○	○	○	○	○	○	○	○	○	○
8. We sometimes replace equipment earlier than we absolutely have to, just because we know there are more energy efficient options available	○	○	○	○	○	○	○	○	○	○
9. We generally research product features and review all of the relevant options carefully before selecting a new piece of equipment to install	○	○	○	○	○	○	○	○	○	○
10. To be honest, the environmental impact of our day-to-day purchases is not something we spend time worrying about	○	○	○	○	○	○	○	○	○	○
11. Since energy costs make up such a small portion of our total operating costs, energy issues just don't get a lot of attention	○	○	○	○	○	○	○	○	○	○

VI – INTEREST IN POTENTIAL ENERGY EFFICIENCY MEASURES OFFERED BY AMEREN ILLINOIS

[PROGRAMMER NOTE: REBATE/INCENTIVE PROGRAM INTRODUCTION SCREEN]

Thank you for your responses so far!

The next section of the survey asks for your reaction to a wide variety of energy efficiency programs that Ameren Illinois may be able to offer to businesses like yours. For each of the programs you will see, we would like to understand how likely your business would be to participate in the program.

Q26. With many of these programs, Ameren Illinois would offer your business a rebate or other financial incentive to do something to become more energy efficient. As an example, consider the fact that you can purchase cooling systems (air conditioners, heat pumps, chillers, and the like) that are “standard” efficiency or “higher than standard” efficiency. Higher efficiency air conditioners cost more, but they use less energy. Often, the energy saved by using a more energy efficient piece of equipment can pay for the higher cost of that equipment within a few years.

Ameren Illinois might be able to offer a rebate or other financial incentive to businesses that opt to purchase a higher efficiency cooling system, or other, related appliance or piece of equipment. Because these rebates would reduce the cost difference between a highly energy efficient unit and a standard unit, it would take less time to save on electricity costs to make up for the higher initial cost of the more efficient unit. And remember that you would continue to save money on electricity costs, even after the energy efficient unit “paid for itself.”

[CAN SPLIT HERE ONTO TWO SCREENS]

Please assume for now that Ameren Illinois could provide a rebate that meant your business would save enough on electricity costs to pay for the additional cost of the more efficient cooling system within **3 years**. If you were going to acquire a new cooling system, how likely would your business be to buy the higher than standard efficiency cooling system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Please use a 10 point scale where, ‘1’ means you think your business would be <u>not at all likely to do this</u> and ‘10’ means your business would be <u>extremely likely to do this.</u>

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q26=7 TO 10]

Q27. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a “higher than standard efficiency” cooling system in **<u>5 years</u>**. If this were true, and you were going to acquire a new cooling system, how likely would your business be to buy the <u>higher than standard</u> efficiency cooling system (and take the rebate), rather than buying an equivalent <u>standard</u> efficiency cooling system?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q26 =1-6]

Q28. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a “higher than standard efficiency” cooling system in **<u>1 year</u>**. If this were true, and you were going to acquire a new cooling system, how likely would your business be to buy the higher than standard efficiency air conditioner (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

Q29. Now, for each of the items described below, let's assume that a rebate from Ameren Illinois would mean that you would save enough on electricity in **3 years** to pay for the additional cost to buy a "higher than standard efficiency" model of that item. If this were true, and you were going to acquire each of these items, how likely would your business be to buy the higher than standard efficiency model (and take the rebate), rather than buying an equivalent standard efficiency model of each item?

Please use a 10 point scale where '1' means you think your business would be not at all likely to do this and '10' means your business would be extremely likely to do this.

How likely would your business be to…?

[KEEP COOLING SECTION FIRST AND DO NOT RANDOMIZE WITHIN; FOLLOWING SECTIONS SHOULD BE RANDOMIZED, BUT NOT ITEMS WITHIN]	**Not at all likely to do this**								**Extremely likely to do this**	**Not our decision (i.e., Someone else decides)**	**Not applicable / Don't have**	**Already have / do this**
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Cooling System Equipment												
[ASK IF Q8=2-5,7] 1. Purchase a higher than standard efficiency **central / packaged air conditioner or chiller unit**	○	○	○	○	○	○	○	○	○	○	○	○	○
[ASK IF Q8=1] 2. Install higher than standard efficiency **fans on chiller units**	○	○	○	○	○	○	○	○	○	○	○	○	○
[ASK IF Q8=1] 3. Install an Economizer	○	○	○	○	○	○	○	○	○	○	○	○	○
[ASK IF Q8=1] 4. Install variable speed drives on **chiller pumps**	○	○	○	○	○	○	○	○	○	○	○	○	○
Heating System Equipment												
[ASK IF S14_1] **5.** Purchase a higher than standard efficiency **primary heating system**	○	○	○	○	○	○	○	○	○	○	○	○	○
Refrigeration Equipment												
[ASK IF ANY Q11_1 THROUGH Q11_4>0] 6. Purchase a higher than standard efficiency	○	○	○	○	○	○	○	○	○	○	○	○	○

refrigeration unit													
7. Install a **variable speed compressor** on one or more of your **refrigeration** units	○	○	○	○	○	○	○	○	○	○	○	○	○
Cooking Equipment													
[ASK IF Q10=2-5] 8. Install higher than standard efficiency **cooking equipment (Ovens, Fryers, Cooktops, Fryers, etc.)**	○	○	○	○	○	○	○	○	○	○	○	○	○
Pumps and Motors													
9. Purchase higher than standard efficiency **motors or pumps for your non-HVAC equipment**	○	○	○	○	○	○	○	○	○	○	○	○	○
8. Install **Variable Speed Drives** on one or more of your **non-HVAC pumps or motors**	○	○	○	○	○	○	○	○	○	○	○	○	○
10. Purchase higher than standard efficiency **pumps or motors that are part of your HVAC system**	○	○	○	○	○	○	○	○	○	○	○	○	○
11. Install **Variable Speed Drives** on one or more of your **pumps and motors that are part of your HVAC system**	○	○	○	○	○	○	○	○	○	○	○	○	○

Q30. In addition to offering programs that would help your business buy more energy efficient equipment, Ameren Illinois might also be able to offer your business a rebate or other financial incentives to install a variety of control systems that could optimize the operational efficiency of your *existing* equipment. For example, they might provide a rebate to help you install or upgrade an advanced programmable, clock-based thermostat on your HVAC system to provide basic automation for this system. Once this thermostat is installed, the energy saved could potentially make up for the associated cost of installing it within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the advanced programmable, clock-based thermostat within **3 years**, how likely would you be to install this device (and take the rebate)?

Please use a 10 point scale where, '1' means you think your business would be not at all likely to do this and '10' means your business would be extremely likely to do this.

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q30=7 TO 10]

Q31. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing an advanced programmable, clock-based thermostat. In this case, how likely would your business be to install the thermostat, and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q30 =1-6]

Q32. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **1 year** to pay for the cost of installing an advanced programmable, clock-based thermostat. In this case, how likely would your business be to install the thermostat and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Q33. Now, for each of the energy control system improvements below, let's assume that the impact of the rebate from Ameren Illinois was that your business would save enough on electricity in **3 years** to pay for the cost associated with each control system improvement. If this were true, how likely would your organization be to make each improvement?

Please use a 10 point scale where '1' means you think your business would not be at all likely to do this and '10' means your business would be extremely likely to do this.

How likely would your organization be to...?

[RANDOMIZE SECTIONS AND ITEMS WITHIN EACH SECTION]	Not at all likely to do this									Extremely likely to do this	Not our decision (i.e., Someone else decides)	Not applicable / Don't have	Already have / do this
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**			
Building Level													
1. Install an Energy Management System that is designed to optimize the performance of all your energy using systems													
HVAC Equipment													
2. Add controls to your ventilation system to enable variable – rather than constant – air volumes	○	○	○	○	○	○	○	○	○	○	○	○	○
Lighting Equipment													
4. Install occupancy / motion sensors to turn lights off when rooms are not in use	○	○	○	○	○	○	○	○	○	○	○	○	○
5. Install daylighting sensors or time clocks / timers to turn interior lights off at specified times when not in use	○	○	○	○	○	○	○	○	○	○	○	○	○
Swimming Pool Equipment [DISPLAY THIS SECTION IF Q13=2-5]													
6. Install a timer on the swimming pool pump to control the number of hours it operates	○	○	○	○	○	○	○	○	○	○	○	○	○
Building Exterior													
7. Install controls on your outside lights that make sure they are only on at certain times	○	○	○	○	○	○	○	○	○	○	○	○	○

Q34. In addition to the options we have discussed already, Ameren Illinois might also be able to offer your business a rebate to install a variety of lower cost equipment, or to implement a variety of services, that could optimize the operational efficiency of your equipment. For example, they might provide a rebate to help you install or upgrade higher energy efficiency personal computer. The more efficient PC could potentially make up for the higher purchase price within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the higher efficiency PC within **3 years**, how likely would you be to install this device (and take the rebate)?

Please use a 10 point scale where, '1' means you think your business would be not at all likely to do this and '10' means your business would be extremely likely to do this.

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q34=7 TO 10]

Q35. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing the more energy efficient PC. In this case, how likely would your business be to install the PC, and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[ASK IF Q34 =1-6]

Q36. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **1 year** to pay for the cost of installing the more energy efficient PC. In this case, how likely would your business be to install the PC and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Q37. Now, for each of the improvements below, let's assume that the impact of the rebate from Ameren Illinois was that your business would save enough on electricity in **3 years** to pay for the cost associated with each improvement. If this were true, how likely would your organization be to make each improvement?

Please use a 10 point scale where '1' means you think your business would not be at all likely to do this and '10' means your business would be extremely likely to do this.

How likely would your organization be to...?

[RANDOMIZE SECTIONS]	**Not at all likely to do this**									**Extremely likely to do this**	**Not our decision (i.e., Someone else decides)**	**Not applicable / Don't have**	**Already have / do this**
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**			
Office Equipment													
1. Purchase a higher than standard efficiency **copier / printer**	○	○	○	○	○	○	○	○	○	○	○	○	○
2. Purchase a higher than standard efficiency **server**	○	○	○	○	○	○	○	○	○	○	○	○	○
Water Heating Equipment [DISPLAY THIS SECTION IF Q9=2-8]													
3. Install "low flow" nozzles or faucet aerators that reduce the amount of hot water used	○	○	○	○	○	○	○	○	○	○	○	○	○
4. Install a pre-rinse spray valve on any dishwashers, which would reduce hot water use													
HVAC System [DISPLAY THIS SECTION IF Q8 NE 9]													
[ASK IF Q8=2-5,7] 5. Perform regular, professional maintenance on your cooling system in order to optimize its performance	○	○	○	○	○	○	○	○	○	○	○	○	○
[ASK IF Q8=1,3-4] 6. Perform regular, professional maintenance on your heating system in order to improve its performance	○	○	○	○	○	○	○	○	○	○	○	○	○
7. Implement a full **professional "re-commissioning"** of your HVAC system which evaluates and optimizes each element of the system's performance													
Building Exterior													
8. Install reflective film on exterior windows	○	○	○	○	○	○	○	○	○	○	○	○	○
Lighting System													
9. Upgrade portions of your lighting system including fixtures, lamps and/or ballasts	○	○	○	○	○	○	○	○	○	○	○	○	○

Q38. Finally, Ameren Illinois might also be able to offer your business a rebate to purchase and install **higher than standard efficiency light bulbs** (higher than standard efficiency light bulbs could include compact fluorescents, T-5, T-8 or Super T-8 fluorescents). The energy saved from installing these higher efficiency lamps could potentially make up for the associated cost of installing them within a few years

.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing higher efficiency light bulbs within **3 years**, how likely would you be to install one or more of these bulbs (and take the rebate)?

Please use a 10 point scale where, '1' means you think your business would be not at all likely to do this and '10' means your business would be extremely likely to do this.

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

[ASK IF Q38=7 TO 10]

Q39. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing the higher efficiency light bulbs. In this case, how likely would your business be to install the one or more of these bulbs, and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

[ASK IF Q38=1-6]

Q40. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **1 year** to pay for the cost of installing the higher efficiency light bulbs. In this case, how likely would your business be to install one or more of the bulbs, and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

Q41. Finally, we'd like to ask how likely your business is to undertake energy conservation measures such as reducing the temperature of your thermostat, hot water heaters. These actions have no up-front cost, and would reduce your electricity bill. However, they may have some tradeoffs in terms of comfort or convenience.

Please rate the likelihood that your business would take the following actions, using a 10 point scale where '1' means you think your business would be <u>not at all likely to do this</u> and '10' means your business would be <u>extremely likely to do this.</u>

[RECORD NUMBER; 1=NOT AT ALL LIKELY, 10=EXTREMELY LIKELY]

[ROTATE RESPONSES]	**Not at all likely to do this**					**Extremely likely to do this**				
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Reduce the temperature of the water that your water heater delivers	○	○	○	○	○	○	○	○	○	○
2. Reduce your thermostat setting (making it cooler) during the winter	○	○	○	○	○	○	○	○	○	○
3. Raise your thermostat setting (making it warmer) during the summer	○	○	○	○	○	○	○	○	○	○

VII - CONCLUSION

[END / COLLECT INFORMATION NECESSARY TO DISTRIBUTE INCENTIVES]
Those are all the questions we have for you today. Thank you for your participation!

C1. The $25 thank you payment you earned by completing our survey will be sent as a check. Please provide your name and address below.

A. Full name
B. Business name
C. Mailing Address Line #1
D. Mailing Address Line #2 (optional)
E. Mailing Address Line #3 (optional)
F. City
G. State
H. ZIP Code

C1I. I would prefer not to receive the $25 thank you payment.

[IF C1=I, ASK C1J; OTHERWISE, CONTINUE TO ADDRESS VERIFICATION SCREEN]

C1J. You indicated that you do NOT wish to receive the $25 thank you check. Is that correct?
1. Yes **[CONTINUE TO**
2. No **[RETURN TO C1 TO RECORD NAME AND ADDRESS]**

[IF EITHER NAME/MAILING ADDRESS ENTERED, SHOW INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN; OTHERWISE SKIP TO INCENTIVE CONFIRMATION / GOODBYE SCREEN]

[INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN]
Please review the information you provided and verify that it is complete and correct:

[DISPLAY NAME/ADDRESS/EMAIL ADDRESS COLLECTED ON PREVIOUS SCREEN]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "CONTINUE" to submit your information.
[PROGRAMMER: INCLUDE BACK BUTTON FOR THIS SCREEN DURING LIVE VERSION]

[INCENTIVE CONFIRMATION / FOLLOW-UP REQUEST SCREEN]
[IF NAME/MAILING ADDRESS ENTERED, DISPLAY, "You have successfully submitted the information we need so we can send you your $25 thank you payment. This payment will be issued to the name you provided and will be mailed within 3-4 weeks to the address you provided.**"]**

[PROGRAMMER: DISPLAY ON SAME SCREEN AS ABOVE LANGUAGE]
C2. If you would like information on how your business can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

Additionally, if you would like someone from Ameren Illinois's energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. **Yes,** we would like to be contacted by someone from Ameren Illinois's energy efficiency implementation team. *Please supply appropriate information.*

Contact Name:______________________________

Business Name:_____________________________

Preferred contact method(s) – *Select all that apply*:

☐ phone ☐ e-mail ☐ postal mail

Daytime phone number :_______________________ **[ALLOW 20 CHARACTERS]**

E-mail address:______________________________

Postal address:______________________________

____

____

2. **No,** we would NOT like to be contacted

[IF C2=1, GO TO FOLLOW-UP REQUEST VERIFICATION SCREEN; IF C2=2, SKIP TO FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]

[FOLLOW-UP REQUEST VERIFICATION SCREEN]
Please review the contact information you provided and verify that it is complete and correct:

[DISPLAY PROVIDED INFORMATION]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "Next" to submit your information.

[PROGRAMMER NOTE: INCLUDE 'BACK' BUTTON ON THIS SCREEN WHEN SURVEY IS LIVE]

[FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]
[IF C2=1, DISPLAY, "You have successfully submitted your contact information! You will be contacted by a representative from the Ameren Illinois energy efficiency implementation team within 10 business days.**"]**

If, at this time, you'd like to make any general comments or provide feedback to Ameren Illinois, please use the following text box:
[RECORD TEXT; ALLOW A HIGH MAX NUMBER OF CHARACTERS FOR LONG COMMENTS]

(Note: Any comments you submit here **will** **not** be linked to your previous survey responses or to any other identifying information when communicated to Ameren Illinois.)

Please click "Next" to submit your comment or to proceed without leaving a comment.

[GOODBYE SCREEN]
[IF STATUS=C, DISPLAY, "Thank you very much for your help with our research. It is greatly appreciated! Have a nice day!**"]**

[IF STATUS=T OR O, DISPLAY, "Thank you. Have a nice day!**"]**
[INCLUDE "Close window**" BUTTON]**

SURVEY CLOSED MESSAGE – DISPLAY ONLY IF RESPONDENT REACHES SITE AFTER WE HAVE CLOSED THE SURVEY

We appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.

If you would like information on how your business can save money on energy bills, please visit Ameren Illinois at www.actonenergy.com

---

Thank you. Have a nice day!

DEFINITIONS

[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

Term / Phrase	Definition
CFL-specific fixture	A fixture that has a CFL-ballast located inside, which is larger and lasts longer than integrated CFLs (CFLs with a screw-in mechanism so that they can replace incandescent bulbs). CFL-specific fixtures use replaceable bulbs that have a starter in the base of the bulb.
Compact fluorescent (CFL)	A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional swirly or curved shape.
Daylighting sensors	Electronic devices that are used to control lights in a room, so that when there is sufficient daylight / sunlight present, then room lights are turned off
District steam with chiller	A district steam system works by having a central steam plant that typically serves multiple clients, or in larger cities, even multiple city blocks or other areas; district steam with chiller systems use district steam to drive a local chiller system
Floor-by-floor packaged water-cooled DX units	Separate air conditioning units that serve each floor individually; these units are typically water-cooled, rather than air-cooled
Air-source heat pump	An air-source heat pump uses the difference between outdoor and indoor air temperatures to cool and heat the space.
Geo-thermal heat pump	Geothermal heat pumps are similar to ordinary heat pumps, but use the ground instead of outside air to provide heating, air conditioning and, in most cases, hot water.
Central chilled water plant (chiller)	A central chiller plant creates chilled water for distribution throughout the facility. Because of the wide variety of system types and sizes, savings and cost values for efficiency improvements represent an average over screw, reciprocating, and centrifugal technologies.
Economizer (air-side or water-side)	A heat exchanger that uses either cold outdoor air or water cooled by a wet cooling tower to meet the cooling needs of occupied spaces whenever possible.
Electric resistance	Sometimes called electric "baseboard" heat, electric resistance heaters generate hot air to warm an interior space by heating up coils that are located in each individual room or space that is heated
Energy Management System	An electronic system that can be programmed to automatically turn on / off (or to otherwise operate) HVAC, lighting, and / or other building systems according to a schedule that a building operator has established ahead of time
ENERGY STAR®	A label for some new appliances that indicates the appliance meets the standards for high efficiency appliances
Floor-by-floor packaged water-cooled DX units	Separate air conditioning units that serve each floor individually; these units are typically water-cooled, rather than air-cooled
Forced air furnace	A furnace that operates by heating air which is then forced through ductwork to different outlets throughout a building or facility
Heat recovery water heater	A water heater that uses heat "recovered" from another application

	(for example, by recovering "waste heat" from a process that heats another material) to heat water for different purposes
High-efficiency fluorescent tubes (T8)	Newer fluorescent tubes (T8s) that fit into traditional fixtures, but which represent a more efficient (lower wattage) tube
Occupancy sensors	An occupancy sensor is a motion detector that is integrated with a timing device. It senses when motion has stopped for a specified time period in order to trigger a light extinguishing signal.
Programmable thermostat	A thermostat that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week
T-5	Super high-efficiency fluorescent tubes
Tankless (instantaneous) water heater	A water heater that only heats water for delivery to your application when you ask for it by using hot water. These systems do not keep a tank of water hot at all times.
Variable air volumes	Controls air from a single supply duct and varies the airflow to each zone or room based upon the temperature in the room
Variable speed drive	A more sophisticated control that allows these units to run at many different speeds, rather than simply "on" or "off"

BUSINESS SATURATION SURVEY QUESTIONNAIRE

DEFINITIVE INSIGHTS

Ameren Illinois DSM Market Potential – Saturation Questionnaire SMALL TO MEDIUM BUSINESS

DRAFT May 30th, 2012

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must be familiar with the energy-related aspects of their business's operations at that location

- Utility bills must be paid for that location

Hard Quotas

- Total: n=xxx
- Other hard quotas TBD

Soft Quotas

- TBD

Tracking Variables

- Electric Only (S3=1-3 AND S3B=5 OR 6)
- Gas Only (S3B=1-3 AND S3=4 OR 5)

RESPONDENT IDENTIFICATION / VERIFICATION

Welcome. This survey is sponsored by Ameren Illinois.
[PROGRAMMER: INCLUDE AMEREN ILLINOIS LOGO]

Survey results will be collected and summarized by Definitive Insights, a market research company.

Please enter the "Survey ID#" that appears on the survey invitation postcard you received. This Survey ID# should be located just above the mailing address on the front side of your postcard.

Survey ID# : _______________

We at Ameren Illinois and Definitive Insights value your privacy. We will use the information you provide for research purposes only and will NOT share it with third parties for marketing purposes. Information you provide will be stored in a secure database. If you have questions about our privacy practices or would like to get any other information about this study, please contact us via one of the following methods:

e-mail: AmerenIllinoissurveyhelp@definitiveinsights.com

phone: 1-888-742-4511

postal mail: Definitive Insights
ATTN: Ameren Illinois Project Director
601 SW Oak Street
Portland, Oregon 97205

[PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE]

INTRODUCTION

Thank you for taking time to see if you and your business qualify to participate in a new research study about energy. The study is sponsored by Ameren Illinois, and it has a very important purpose. Ameren Illinois is delivering programs to help its customers use energy more efficiently. Your answers to this survey will help the company to improve these programs so that they work best for everyone.
Your business represents one of a small number of businesses that are being asked to respond to the survey. To show our appreciation for the time and effort you place into completing the survey, we will offer you a $25 Visa card upon submitting your answers. (Note: Payment may be declined if required by your company's policies.) You will first be asked a few questions to make sure your business qualifies for participation. If you do qualify, you will then be invited to complete the full survey.

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

Please click “Next” to begin.

RESPONDENT SCREENING

S1. Which of the following best describes your familiarity with the energy-related aspects of your business operations at **[READ IN ADDRESS FROM SAMPLE]**?

1. You are **very familiar** with the energy-related aspects of your operations at this location
2. You are **fairly familiar** with the energy-related aspects of your operations at this location
3. You are **not very familiar** with the energy-related aspects of your operations at this location **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**
4. Don't know **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**

[IF S1=1-2, SKIP TO S3; OTHERWISE SHOW S2 AND TERMINATE WITHOUT SHOWING STANDARD TERMINATE LANGUAGE]

S2. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your organization who is more familiar with the energy-related aspects of your business operations at this location.

We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey:

Link: **[INSERT URL THAT INCLUDES SURVEY ID#]**

[PROGRAMMER NOTE: IF A RESPONDENT TERMINATES VIA S2. DELETE DATA COLLECTED AND RESET SURVEY REENTRY POSITION FOR THAT SURVEY ID# BACK TO THE BEGINNING OF THE SURVEY. RECORD THE DATA DELETED FOR THAT SURVEY ID# ELSEWHERE SO WE CAN TRACK THE NUMBER OF TIMES AND REASONS RESPONDENTS DISQUALIFY AT S2 AS WELL AS THE NUMBER OF TIMES THESE PREVIOUSLY USED SURVEY ID#'S ARE REUSED. FOR ALL RESPONDENTS THAT DO NOT TERMINATE VIA S5R, DO NOT ALLOW SURVEY ID# TO BE USED AGAIN.]
{NOTE: THIS WILL ALLOW A RESPONDENT WHO DOES NOT PERSONALLY QUALIFY TO FORWARD THEIR SURVEY ID# TO A CO-WORKER WHO MAY BE BETTER QUALIFIED TO ANSWER THE SURVEY.}

S3. Which of the following best describes how your business is billed for electricity at **[READ IN ADDRESS FROM SAMPLE]**?

1. We are **billed directly by Ameren Illinois** for the electricity we use
2. We are **NOT billed directly by Ameren Illinois** for the electricity we use; our electric **bill is handled by another part of our company or by a third party service provider** (e.g., City and Village Tax Office, etc.), but ultimately, our company is responsible for the cost for our electricity
3 We are **NOT billed directly by Ameren Illinois** for the electricity we use; the cost for our electricity is **included in our rent/lease**
4. We are **served by another utility; not Ameren Illinois**
5. Don't know

S3b. Which of the following best describes how your business is billed for natural gas at **[READ IN ADDRESS FROM SAMPLE]**?

1. We do not use natural gas
2. We are **billed directly by Ameren Illinois** for the natural gas we use
3. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; our electric **bill is handled by another part of our company or by a third party service provider** (e.g., City and Village Tax Office), but ultimately, our company is responsible for the cost for our natural gas
4. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; the cost for our natural gas is **included in our rent/lease**

5. We are **served by another utility; not Ameren Illinois**
6. Don't know

[TERMINATE IF S3=4 or 5 AND S3B=5 or 6]

[PROGRAMMER: DISPLAY DIRECTLY BELOW S3 ON SCREEN: "PLEASE NOTE THAT ALL OF OUR REMAINING QUESTIONS REFER SPECIFICALLY TO THE FACILITY AT THE LOCATION CITED ABOVE"]

[CREATE TRACKING VARIABLE:
(S3=1-3 AND S3B=5 OR 6) = ELECTRIC ONLY
(S3B=1-3 AND S3=4 OR 5) = GAS ONLY]

[IF S3=1,2 OR S3B=1,2, ASK S4; OTHERWISE TERMINATE]
S4. Does your business own or lease the building space at this location?

If you both lease some space, and own some space at this location, which accounts for the majority of the space?

1. Own (or in the process of buying it)
2. Lease / rent

S5. Does your operation at this location occupy any enclosed space, or is it an outdoor structure or operation, such as a billboard, a parking lot, a communications tower, or the like?

1. Occupies enclosed space
2. Is an outdoor structure or facility **[TERMINATE AFTER S6]**

[IF S5=2, ASK S6 AND THEN TERMINATE; OTHERWISE SKIP TO S7]
S6. What type of outdoor structure does your organization operate at this site?

1. Billboard
2. Communications / telecommunications tower or other facility
3. Pump
4. Parking lot
5. Traffic light or other type of outdoor lighting

990. Other **[SPECIFY]**

S7. Which of the following best describes the type of facility your organization occupies?

1. Office (finance, insurance, real estate, law, etc.)
2. Retail (department stores, services, boutiques, etc.)
3. Grocery (supermarkets, convenience store, market, etc.)
4. Restaurant (sit-down, fast food, coffee shop, etc.)
5. Warehouse
6. School (day care, pre-school, elementary, secondary)
7. College, university or trade school
8. Health Care (health practitioner office, hospital, urgent care center, etc.)
9. Nursing home / assisted living facility / residential treatment facility
10. Lodging facility (hotel, motel, bed and breakfast, etc.)
11. Not-for profit housing facility (shelter, prison, jail, etc.)
12. Entertainment / recreation facility (movie theater, bowling alley, health club/gym, library, museum, etc.)
13. Public assembly facility (convention / conference center, etc.)
14. Worship (church, temple, etc.)
15. Multi-use or shopping mall (i.e., mixed use of space for offices, restaurants, stores, service, apartments, etc.)
16. Manufacturing, production, or processing facility (including for-profit businesses and governmental facilities)

990. Other **[SPECIFY]**

S8. Which of the following best describes the activity in which your business is engaged at this location? *Please select the <u>one option</u> that best describes the activity.*

{NOTE TO TEAM: IF THE RESPONDENT SELECTS RESPONSE "15" ABOVE ("MIXED USE"), THEY ARE SHOWN ALL POSSIBLE OPTIONS FOR BUSINESS ACTIVITY EXCEPT HOSPITAL, WAREHOUSE, AND MANUFACTURING / PROCESSING}

<u>Traditional Office-Based Business</u> [IF S7=1 OR 15 OR 990, DISPLAY CODES 1-7]	
1. Finance	○
2. Insurance	○
4. Real estate / construction	○
5. Government	○
6. Other not-for-profit	○
7. Other office **[SPECIFY]**	○
<u>Retail</u> [IF S7=2 OR 15 OR 990, DISPLAY CODES 8-19]	
8. Major retail store	○
9. Department store	○
10. Small retail (boutique, store in strip mall)	○
11. Convenience store	○
12. Supermarket	○
13. Market	○
14. Laundry	○
15. Dry cleaning	○
16. Copy center	○
17. Barber / salon	○
18. Gas station / auto shop	○
19. Other retail **[SPECIFY]**	○
<u>Grocery</u> [IF S7=3 OR 15 OR 990, DISPLAY CODES 20-23]	
20. Supermarket	○

21. Convenience store	○
22. Market	○
23. Other grocery **[SPECIFY]**	○
Restaurant / Food Service [IF S7=4 OR 15 OR 990, DISPLAY CODES 24-28]	
24. Sit-down restaurant	○
25. Fast food diner	○
26. Bakery	○
27. Coffee shop	○
28. Other restaurant **[SPECIFY]**	○
Warehouse [IF S7=5 OR 990, DISPLAY CODES 29-32]	
29. Refrigerated warehouse	○
30. Non-refrigerated warehouse	○
31. Combination of refrigerated and non-refrigerated space	○
32. Other warehouse **[SPECIFY]**	○
School [IF S7=6 OR 15 OR 990, DISPLAY CODES 33-36]	
33. Preschool / daycare	○
34. Elementary school	○
35. Secondary school	○
36. Other pre-college **[SPECIFY]**	○
College, University or Trade School [IF S7=7 OR 15 OR 990, DISPLAY CODES 37-40]	
37. College	○
38. University	○
39. Trade school	○
40. Other post-secondary **[SPECIFY]**	○
Health Care [IF S7=8 OR 15 OR 990, DISPLAY CODES 80-84]	
85. Medical / dental office or office for other health practitioners	○
80. General medical or surgical hospital	○
81. Veterinary hospital	○
82. Other hospital **[SPECIFY]**	○
83. Urgent care center	○
84. Other health care facility **[SPECIFY]**	○
Nursing Home / Assisted Living [IF S7=9 OR 15 OR 990, DISPLAY CODES 41-44]	
41. Nursing home	○
42. Assisted living facility	○
43. Residential treatment facility	○
44. Other care facility **[SPECIFY]**	○
Lodging [IF S7=10 OR 15 OR 990, DISPLAY CODES 41-44]	
45. Hotel	○
46. Motel	○
47. Bed & Breakfast	○
48. Other lodging **[SPECIFY]**	○
Not-For-Profit Housing [IF S7=11 OR 15 OR 990, DISPLAY CODES 45-47]	
49. Shelter	○
50. Prison / jail	○
51. Other not-for-profit housing **[SPECIFY]**	○
Entertainment / Recreation [IF S7=12 OR 15 OR 990, DISPLAY CODES 48-54]	
52. Health club / gym	○
53. Movie theater	○
54. Theater	○
55. Library	○
56. Museum	○
57. Bowling alley	○
58. Other entertainment / recreation **[SPECIFY]**	○

Public Assembly [IF S7=13 OR 15 OR 990, DISPLAY CODES 55-57]	
59. Conference / convention center	○
60. Community center	○
61. Other public assembly **[SPECIFY]**	○
Worship [IF S7=14 OR 15 OR 990, DISPLAY CODES 58-61]	
62. Church	○
63. Temple	○
64. Synagogue	○
65. Other worship **[SPECIFY]**	○
Manufacturing / Production / Processing [IF S7=16 OR 990, DISPLAY CODES 62-74]	
66. Agricultural production or farming	○
67. Chemical processing	○
68. Electronics / technology	○
69. Food / beverage production or processing	○
70. General / light assembly or manufacturing	○
71. Glass production or processing	○
72. Metals production or processing or fabricated metal work	○
73. Machinery / appliance / equipment manufacturing	○
74. Paper products processing, printing or manufacturing	○
75. Textiles / apparel production or processing	○
76. Water / wastewater treatment	○
77. Wood products manufacturing	○
78. Other manufacturing / processing **[SPECIFY]**	○
Something else [IF S7=15 OR 990, DISPLAY CODE 79]	
79. Something else **[SPECIFY]**	○

S9. Approximately how many people are employed full-time at this location?

1. Less than 5 employees
2. 5 – 9
3. 10 – 19
4. 20 – 49
5. 50 – 99
6. 100 – 199
7. 200 – 299
8. 300 – 399
9. 400 – 499
10. 500 – 999
11. 1,000 – 2,499
12. 2,500 – 4,999
13. 5,000 – 9,999
14. 10,000 – 24,999
15. 25,000 or more employees

S10. Which of the following uses of **electricity** and **natural gas** do you pay for at this location? In other words, does your electric and/or gas bill include the cost to…? *Select all that apply.*

1. Heat some or all of your space
2. Cool some or all of your space
3. Provide hot water for your use
4. Provide interior lighting
5. Provide exterior lighting

{NOTE TO TEAM: THESE RESPONSES WILL BE USED TO SCREEN RESPONDENTS OUT OF THE RELEVANT END USE SECTIONS BELOW; I.E., IF THEY SAY THEIR ENERGY BILL DOES NOT COVER SPACE HEATING, THEY WILL BE SKIPPED OUT OF THE SPACE HEATING SECTION}

S11. Which of the following are present at this location? *Select all that apply.*

1. Natural gas service
2. Propane service
3. Purchased steam or hot water
4. Fuel oil for one or more end uses
5. Electric Vehicle charging stations
6. None of the above **[EXCLUSIVE]**

[IF NOT OVER-QUOTA, GO TO INVITATION LANGUAGE; OTHERWISE TERMINATE]

TERMINATE LANGUAGE FOR NON-QUALIFYING OR OVER-QUOTA RESPONDENTS

We appreciate the time and effort you have spent in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate in this research study.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this point, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your business can save money on energy bills, please visit us at www.actonenergy.com.

Q76. Additionally, if you would like someone from Ameren Illinois energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. **Yes,** we would like to be contacted by someone from Ameren Illinois energy efficiency implementation team. *Please supply the appropriate contact information below.*

   Contact Name:____________________________

   Business Name:____________________________

   Preferred contact method(s) – *Select all that apply*:

   ☐ phone ☐ e-mail ☐ postal mail

   Daytime phone number :______________________

   E-mail address:_____________________________

   Postal address:_____________________________

   ____

   ____

2. **No,** we would NOT like to be contacted

[IF Q76=1, GO TO CONTACT INFORMATION FOR AMEREN ILLINOIS VERIFICATION SCREEN; IF Q76=2, SKIP TO GOOD-BYE SCREEN]

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far. You and your business have qualified to complete this survey. As we indicated earlier, only a limited number of individuals will be able to complete this survey, so we appreciate your time in filling out the survey as completely as possible.

The survey should take about 20 minutes to complete. Once you complete the survey you will be eligible to receive our $25 thank you payment. Information about how to receive the payment will be provided at the end of the survey.

Your responses are important to us, so please press “Next” to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything.

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the personalized URL to access your survey again. The survey will automatically take you to the point where you left off.

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

As you complete the survey, you will **not** be able to use your browser’s “back” button. If you mistakenly press your browser’s “back” button, you will need to press the “refresh” button to continue the survey.

BUILDING TYPE – BUSINESS-USE AREA

[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT.]

The first several questions are about the building areas, your company uses or occupies at **[READ IN ADDRESS FROM SAMPLE].**

Q1. Approximately when was the facility your business uses at this location constructed?

If your business is located in several buildings across a campus/complex, please estimate the average year across all buildings.

1. Before 1900
2. 1900-1919
3. 1920-1929
4. 1930-1939
5. 1940-1949
6. 1950-1959
7. 1960-1969
8. 1970-1979
9. 1980-1989
10. 1990-1999
11. 2000-2009
12. 2010-present
13. Not sure

Q2. How many years has your business occupied this facility?

1. Less than 1 year
2. 1-2 years
3. 3-4 years
4. 5-9 years
5. 10-19 years
6. 20 years or more

Q3. Has this facility been renovated or undergone tenant improvements in the last 5 years?

1. Yes
2. No
3. Not sure

[IF Q3=1, ASK Q4; OTHERWISE SKIP TO Q5]

Q4. When did these improvements take place?

1. 2007
2. 2008
3. 2009
4. 2010
5. 2011
6. 2012

Q5. Does your business operate at this location continuously all year, or is it shut down for a portion of the year?

1. Operate continuously all year long
2. Shut down for part of the year

[IF Q5=2, ASK Q6; OTHERWISE SKIP TO Q7]

Q6. During which months of the year is your operation at this location SHUT DOWN? S*elect all that apply.*

	Months when operation is SHUT DOWN
1. January	☐
2. February	☐
3. March	☐
4. April	☐
5. May	☐
6. June	☐
7. July	☐
8. August	☐
9. September	☐
10. October	☐
11. November	☐
12. December	☐

Q6A. During what percentage of each of these months is your operation at this location SHUT DOWN?

For example, if you're open for half of July, enter 50%.

Your best estimate is fine.

[DISPLAY ONLY ITEMS SELECTED AT Q6; AUTOCODE NON-SELECTED ITEMS AS 0%]	**% of month during which operation is SHUT DOWN**
1. January	**[RECORD NUMBER 1-100]**%
2. February	**[RECORD NUMBER 1-100]**%
3. March	**[RECORD NUMBER 1-100]**%
4. April	**[RECORD NUMBER 1-100]**%
5. May	**[RECORD NUMBER 1-100]**%
6. June	**[RECORD NUMBER 1-100]**%
7. July	**[RECORD NUMBER 1-100]**%
8. August	**[RECORD NUMBER 1-100]**%
9. September	**[RECORD NUMBER 1-100]**%
10. October	**[RECORD NUMBER 1-100]**%
11. November	**[RECORD NUMBER 1-100]**%
12. December	**[RECORD NUMBER 1-100]**%

[AT LEAST ONE MUST BE <100% TO MOVE TO NEXT SCREEN]

Q7. During the times of year that this building is in use, which days of the week is it OPEN? *Select all that apply.*

By "open," we are referring to times when any employees are present / working.

	Days OPEN
1. Monday	☐
2. Tuesday	☐
3. Wednesday	☐
4. Thursday	☐
5. Friday	☐
6. Saturday	☐
7. Sunday	☐
TOT. **Total number of days open per week**	**[CALCULATE TOTAL ASSUMING THAT EACH SELECTION EQUALS 1]**

[IF Q7TOT<5, ASK Q7A; OTHERWISE SKIP TO FILTER BEFORE Q8]

Q7A. You indicated that this building is **open** for **fewer than 5 days per week**. Is this what you intended?

1. Yes, this building is open for fewer than 5 days per week
2. No, this is not what I intended

[IF Q7A=2, SKIP BACK TO Q7]
[IF Q7TOT>=5 OR Q7A=1, ASK Q8; OTHERWISE SKIP BACK TO Q7]

Q8. During which hours does your facility operate on each day it is open?

[SHOW THE FOLLOWING OPTIONS IN THE DROP DOWN MENUS USED IN THE TABLE BELOW: N/A – open 24 hours; Midnight; 1 a.m.; 2 a.m.; 3 a.m.; 4 a.m.; 5 a.m.; 6 a.m.; 7 a.m.; 8 a.m.; 9 a.m.; 10 a.m.; 11 a.m.; Noon; 1 p.m.; 2 p.m.; 3 p.m.; 4 p.m.; 5 p.m.; 6 p.m.; 7 p.m.; 8 p.m.; 9 p.m.; 10 p.m.; 11 p.m.]

	A. Opening Hour	B. Closing Hour
[IF Q7_1=1] 1. Monday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_1=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
☐ **Check this box if your Tuesday – Friday hours are the same as Monday.** **[IF CHECKED, AUTOFILL TUESDAY-FRIDAY WITH THE RESPONSES FROM Q8_1A AND Q8_1B]**		
[IF Q7_2=1] 2. Tuesday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_2=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
[IF Q7_3=1] 3. Wednesday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_3=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
[IF Q7_4=1] 4. Thursday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_4=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
[IF Q7_5=1] 5. Friday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_5=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
[IF Q7_6=1] 6. Saturday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_6=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**
[IF Q7_7=1] 7. Sunday	**[DISPLAY DROP DOWN MENU]**	**[IF Q8A_7=**"N/A – open 24 hours"**, DO NOT DISPLAY DROP DOWN MENU]**

[IF THERE ARE ANY Q8 ROWS IN WHICH COLUMN A EQUALS COLUMN B, ASK Q8AA; OTHERWISE SKIP TO Q9]

Q8AA. For one or more days you are open, you selected a closing hour that is earlier than an opening hour (e.g., Opening Hour = 11a.m., Closing Hour = 2 a.m.)

To make sure this is what you intended, please answer the following questions.

	Yes	No
[DISPLAY IF Q8_1B<Q8_1A] 1. Is it correct that you are open from Monday at **[INSERT Q8_1A RESPONSE]** to **Tuesday** at **[INSERT Q8_1B RESPONSE]**?	○	○
[DISPLAY IF Q8_2B<Q8_2A] 2. Is it correct that you are open from Tuesday at **[INSERT Q8_2A RESPONSE]** to **Wednesday** at **[INSERT Q8_2B RESPONSE]**?	○	○
[DISPLAY IF Q8_3B<Q8_3A] 3. Is it correct that you are open from Wednesday at **[INSERT Q8_3A RESPONSE]** to **Thursday** at **[INSERT Q8_3B RESPONSE]**?	○	○
[DISPLAY IF Q8_4B<Q8_4A] 4. Is it correct that you are open from Thursday at **[INSERT Q8_4A RESPONSE]** to **Friday** at **[INSERT Q8_4B RESPONSE]**?	○	○
[DISPLAY IF Q8_5B<Q8_5A] 5. Is it correct that you are open from Friday at **[INSERT Q8_5A**	○	○

RESPONSE] to **<u>Saturday</u>** at **[INSERT Q8_5B RESPONSE]**?		
[DISPLAY IF Q8_6B<Q8_6A] 6. Is it correct that you are open from Saturday at **[INSERT Q8_6A RESPONSE]** to **<u>Sunday</u>** at **[INSERT Q8_6B RESPONSE]**?	○	○
[DISPLAY IF Q8_7B<Q8_7A] 7. Is it correct that you are open from Sunday at **[INSERT Q8_7A RESPONSE]** to **<u>Monday</u>** at **[INSERT Q8_7B RESPONSE]**?	○	○

[IF ANY Q8AA_1 THROUGH Q8AA_7 = "NO", SKIP BACK TO Q8]

Q9. What is the approximate total square footage that your business occupies at this location?

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

Please enter a whole number rather than a range of numbers.

1. **[RECORD NUMBER]** square feet
2. Not sure

[IF Q9_1=0+, ASK Q9A IN ORDER TO VALIDATE Q9_1 RESPONSE; OTHERWISE SKIP TO Q10]

Q9A. You said the approximate total square footage that your business occupies at this location is…

[INSERT Q9_1 RESPONSE, USING COMMAS] square feet

Is this what you intended?

1. Yes
0. No, I would like to edit my response

[IF Q9A=1, CONTINUE TO NEXT FILTER; OTHERWISE SKIP BACK TO Q9]

[IF Q9_2=1, ASK Q10; OTHERWISE SKIP TO Q11]

Q10. We understand you aren't sure, so using the ranges listed below, please just choose the best estimate of the total square footage of your business at this location.

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

1. Less than 1,000 sq. ft.
2. 1,000 – 4,999
3. 5,000 – 9,999
4. 10,000 – 14,999
5. 15,000 – 24,999
6. 25,000 – 49,999
7. 50,000 – 99,999
8. 100,000 – 499,999
9. 500,000 – 999,999
10. 1 million sq. ft. or more

Q11. What percentage of the total enclosed floorspace your business occupies in at this location can be characterized by each of the following area descriptions?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

Area description [SET DEFAULT RESPONSE AT O]	**% of total enclosed floorspace**
1. Office	**[RECORD NUM 0-100]%**
2. Data center / computer room	**[RECORD NUM 0-100]%**
3. Food preparation, food service or food sales (e.g., kitchen, cafeteria, restaurant, coffee shop, convenience store, supermarket, market, etc.)	**[RECORD NUM 0-100]%**
4. Retail (e.g., mall, department store, small retail/boutique etc.)	**[RECORD NUM 0-100]%**
5. Common areas (e.g., lobby, hallway, meeting room, auditorium, library, bathroom, workout area, worship area, etc.)	**[RECORD NUM 0-100]%**
6. Lodging (e.g., sleeping quarters, hotel room, bedroom in nursing home, etc.)	**[RECORD NUM 0-100]%**
7. Laboratory	**[RECORD NUM 0-100]%**
8. Warehouse/storage area	**[RECORD NUM 0-100]%**
9. Laundry facilities	**[RECORD NUM 0-100]%**
10. Health services (e.g., hospital, doctor's office, etc.)	**[RECORD NUM 0-100]%**
11. Manufacturing / processing / production	**[RECORD NUM 0-100]%**
990. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
991. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
992. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
TOT. **Total**	**[CALCULATE TOTAL]%**

[PROGRAMMER: Q11TOT MUST EQUAL 100 IN ORDER TO CONTINUE TO NEXT SCREEN]

I – BUILDING TYPE – ENTIRE BUILDING AREA

The following questions refer to the **total** building that your organization occupies, or uses, at this location, even if you only occupy a portion of the building.

Q12. How many floors are in the entire building? *Your best estimate is fine, but please enter a whole number rather than a range of numbers.*

If your business is located in several buildings across a campus/complex, enter the total number of floors across all the buildings.

[RECORD NUMBER 1-100] floors

Q13. What percent of the total space in the building does your organization occupy?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER 1-100]%

[IF Q13<100, ASK Q13A; OTHERWISE SKIP TO Q14]

Q13A. Approximately what percentage of the remaining space in the building is used for the following types of other business activities? *If you are not sure, please provide your best estimate.*

Please enter whole numbers that will add up to 100%

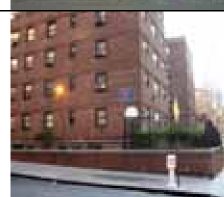
Business Activity	**Percentage of space**
1. Office space	**[RECORD NUMBER 0-100]**%
2. Restaurant(s)	**[RECORD NUMBER 0-100]**%
3. Retail	**[RECORD NUMBER 0-100]**%
4. Service	**[RECORD NUMBER 0-100]**%
5. Manufacturing	**[RECORD NUMBER 0-100]**%
6. Entertainment	**[RECORD NUMBER 0-100]**%
7. Lodging	**[RECORD NUMBER 0-100]**%
8. Health	**[RECORD NUMBER 0-100]**%
9. Education	**[RECORD NUMBER 0-100]**%
10. Warehouse	**[RECORD NUMBER 0-100]**%
11. Other **[SPECIFY]**	**[RECORD NUMBER 0-100]**%
TOT. **Total**	**[CALCULATE TOTAL]%**

[PROGRAMMER: Q13ATOT MUST EQUAL 100 IN ORDER TO CONTINUE TO NEXT SCREEN]

Q14. Approximately what percentage of the entire building exterior wall area is covered in glass and/or ”windowed”?

If your business is located in several buildings across a campus/complex, please approximate the total percentage across all buildings.

Your best estimate is fine.

% of entire building exterior wall area covered in glass and/or ”windowed”	**Example images**	
1. Less than 10%		○
2. 11-25%		○
3. 26-50%		○
4. 51-75%		○
5. More than 75%		○

Q15. Of all the windows located on the exterior walls of your building, about what percentage are single pane windows, and what percentage are double pane windows or better?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

Note: Click on hyperlinked text to view a definition of a term or phrase that pops up in a separate window. Clicking on these hyperlinked terms or phrases will NOT make you navigate away from the survey site.

Window Type	% of all exterior windows
1. Single pane windows *(windows with just 1 layer of glass)* 	**[RECORD NUMBER 0-100]**%
2. Double pane windows or better *(windows with 2 or more layers of glass)* 	**[RECORD NUMBER 0-100]**%
3. Not sure **[EXCLUSIVE]**	☐
TOT. **Total**	**[CALCULATE Q15_1 + Q15_2]**%

[PROGRAMMER: Q15TOT MUST EQUAL 100, OR Q15_3 MUST BE SELECTED ("DON'T KNOW") IN ORDER TO CONTINUE TO NEXT SCREEN]

Q16. What percentage of these windows is tinted? *Your best estimate is fine.*

If your business is located in several buildings across a campus/complex, please approximate the total percentage across all buildings.

1. Less than 10%
2. 11-25%
3. 26-50%
4. 51-75%
5. More than 75%

Q16a. Other than windows, what type of surface covers the exterior walls of the building?

If more than one type of surface covers the exterior of the building(s), please select the surface type that covers the largest portion of your exterior walls.

1. Brick
2. Concrete
3. Stucco
4. Masonry
5. Glass curtain / spandrel
6. Wood
7. Metal
8. Other **[PLEASE SPECIFY]**

Q16b. How would you characterize the insulation level of the exterior walls of the building(s)?

If the level of insulation varies within or between the buildings at your business's location, please answer for the building that has the largest amount of occupied floorspace.

1. **High** level of insulation
2. **Medium** level of insulation
3. **Low** level of insulation
4. No insulation
5. Not sure

Q17. Which of the following best describes the building roof?

If more than one description applies, please select the option that accounts for the majority of the roof(s).

1. Steep
2. Moderately slanted
3. Flat
4. Not sure

Q18. Which of the following best describes the color of the building roof?

If more than one description applies, please select the option that accounts for the majority of the roof(s).

1. Dark
2. Medium-dark
3. White or light
4. "Green roof" (partially or completely covered with vegetation and soil)
5. Not sure

HEATING AND COOLING

The next group of questions focuses on the way that your space at this location is heated and/or cooled.

[IF S10=1, ASK Q19; OTHERWISE SKIP TO FILTER BEFORE Q26]

Q19. Approximately what percentage of the space your business occupies, or uses, at this location is heated?

1. None
2. Less than 10%
3. 10-20%
4. 21-30%
5. 31-40%
6. 41-50%
7. 51-60%
8. 61-70%
9. 71-80%
10. 81-90%
11. More than 90%

[IF Q19=2-11, ASK Q21; OTHERWISE SKIP TO FILTER BEFORE Q26]

Q21. What type of space heating system is used as a means of heating your space? **[ONLY ONE TYPE CAN BE SELECTED IN EACH COLUMN]**

	Heating Equipment	Primary	Secondary
1.	**Natural gas warm air furnace with ducts/vents to individual rooms**	™	™
2.	**Electric warm air furnace with ducts/vents to individual rooms**	™	™
3.	**Natural gas boiler with hot water/steam radiators or baseboards in individual rooms**	™	™
4.	**Electric boiler with hot water/steam radiators or baseboards in individual rooms**	™	™
5.	**Electric baseboard or electric coils radiant heating (no supply ducts or water/steam pipes)**	™	™
6.	**Air-source heat pump**	™	™
7.	**Geothermal heat pump**	™	™
8.	**Natural gas unit heater or wall furnace**	™	™
9.	**Electric unit heater or wall furnace**	™	™

10.	**None**	™	™
999.	**Not sure**	™	™
990.	**Other (please specify)**	™	™

[IF Q21 PRIMARY AND Q21 SECONDARY BOTH EQUAL 11 OR 999, SKIP TO FILTER BEFORE Q26, OTHERWISE ASK Q22]

Q22. When was your primary space heating equipment installed?

Your best estimate is fine.

1. Before 1960
2. 1961-1970
3. 1971-1980
4. 1981-1990
5. 1991-1995
6. 1996-2000
7. 2001-2003
8. 2004-2006
9. 2007-2009
10. 2010-present

Q22b. Which of the following best describes how your system is maintained?

1. Regularly each month
2. Regularly each season / quarter
3. Regularly each year
4. As needed
5. Not sure

[ASK IF ANY 1-10 OR 990 AT Q21=SECONDARY, IF 11-999 AT Q21=SECONDARY, SKIP TO Q26]

Q23. What percentage of your total business space is heated with a supplemental heating system?

1. None
2. Less than 10%
3. 11-25%
4. 26-50%
5. 51-75%
6. More than 75%

Q25. When was your supplemental heating system installed? *Your best estimate is fine.*

1. Before 1990
2. 1990-1995
3. 1996-2000
4. 2001-2003
5. 2004-2006
6. 2007-2009
7. 2010- present

[IF S10=2, ASK Q26; OTHERWISE SKIP TO FILTER BEFORE Q33]

Q26. Approximately what percentage of the space your business occupies, or uses, at this location is cooled?

1. None
2. Less than 10%
3. 10-20%
4. 21-30%
5. 31-40%
6. 41-50%
7. 51-60%
8. 61-70%
9. 71-80%
10. 81-90%
11. More than 90%

[IF Q26=2-11, ASK Q27; OTHERWISE SKIP TO FILTER BEFORE Q33]

Q27. What type of cooling system is your primary means to cool your space? **[ONLY ONE TYPE CAN BE SELECTED IN EACH COLUMN]**

	Cooling Equipment	**Primary**	**Secondary**
1.	Air cooled chiller	○	○
2.	Water cooled chiller	○	○
3.	Central air conditioner	○	○
4.	Packaged rooftop air conditioner units	○	○
5.	Floor-by-floor packaged water cooled DX (Direct Expansion) units		
6.	Wall or window air conditioner units	○	○
7.	Air-source heat pump	○	○
8.	Geothermal heat pump	○	○
9.	**None**	○	○
999.	**Not sure**	○	○
990.	**Other (please specify)**	○	○

[IF Q27=1 OR 2, ASK Q28; OTHERWISE SKIP TO Q29]

Q28. What type of chiller does your facility use?

1. Centrifugal
2. Reciprocating
3. Rotary
4. Scroll
5. Screw
6. Absorption, hot water
7. Absorption, steam
8. Absorption, natural gas
9. Chiller, steam-driven turbine
10. Other **[SPECIFY]**
11. Not sure

[IF Q21_7 = Primary and Q27_7 NE Primary or Secondary] or [If Q21_8 = Primary and Q21_8 NE Primary or Secondary] ASK Q29; OTHERWISE SKIP TO Q21]

Q29. You indicated that you use a heat pump to heat your space in the winter, but do not use it to cool your space in the summer. For verification purposes, please select your primary heating and cooling system.

Q29A. Heating Equipment [Show any for which Q21=Primary or Secondary]	**Q29B. Cooling Equipment [Show any for which Q27=Primary or Secondary]**
Electric packaged unit(s)/ Roof-top unit(s)	Air cooled chiller
Electric central warm air furnace with ducts/vents to individual rooms	Water cooled chiller
Natural gas central warm air furnace with ducts/vents to individual rooms	Central air conditioner
Electric central boiler with hot water/steam radiators or baseboards in individual rooms	Packaged air conditioner units
Natural gas central boiler	Floor-by-floor packaged water cooled DX (Direct Expansion) units
Electric baseboard or electric coils radiant heating	Wall or window air conditioner units
Air-source heat pump	Air-source heat pump
Geothermal heat pump	Geothermal heat pump
Wall furnace(s)	**None**
Unit heater(s)	**Not sure**
None	**Other**
Not sure	
Other	

Q30. When was your primary cooling system installed? *Your best estimate is fine.*

1. Before 1980
2. 1980-1989
3. 1990-1994
4. 1995-2000
5. 2001-2003
6. 2004-2006
7. 2007-2009
8. 2010-present

Q30a. Which of the following best describes how your system is maintained?

1. Regularly each month
2. Regularly each season / quarter
3. Regularly each year
4. As needed
5. Not sure

[ASK IF ANY 1-8 OR 990 AT Q27=SECONDARY, IF 9-999 AT Q27=SECONDARY, SKIP TO Q33]

Q31. What percentage of your total business space is cooled with a supplemental cooling system?

1. None
2. Less than 10%
3. 11-25%
4. 26-50%

5. 51-75%
6. More than 75%

Q32. When was the supplemental cooling system installed? *Your best estimate is fine.*

1. Before 1980
2. 1980-1989
3. 1990-1994
4. 1995-2000
5. 2001-2003
6. 2004-2006
7. 2007-2009
8. 2010-present

[IF Q19=2-11 OR Q26=2-11, ASK Q33; OTHERWISE SKIP TO FILTER BEFORE Q36]

Q33. What type of temperature control is primarily used in your heating and/or cooling system(s)?

1. Manual thermostat
2. Programmable thermostat
3. Energy management system
4. Always on
5. Manual on/off
6. Time clock
7. None of the above

[IF Q26=2-11 AND Q33=1-6, ASK Q34; OTHERWISE SKIP TO FILTER BEFORE Q35]

Q34. For each of the times listed below, what is the typical cooling temperature for the thermostat in **summer (June through August)**?

Please select a range from each drop down menu.

[PROGRAMMER: PLACE DROP DOWN MENU TO INCLUDE THE FOLLOWING OPTIONS: 1=Less than 60°F; 2=60-64°F; 3=65-69°F; 4=70-74°F; 5=75-78°F; and 6=79°F or higher]

1.	Day	**[DROP DOWN MENU]**
2.	Night	**[DROP DOWN MENU]**

[IF Q19=2-11 AND Q33=1-6, ASK Q35; OTHERWISE SKIP TO FILTER BEFORE Q36]

Q35. For each of the times listed below, what is the typical heating temperature for the thermostat in **winter (December through February)**?

Please select a range from each drop down menu.

[PROGRAMMER: PLACE DROP DOWN MENU TO INCLUDE THE FOLLOWING OPTIONS: 1=Less than 60°F; 2=60-64°F; 3=65-69°F; 4=70-74°F; 5=75-78°F; and 6=79°F or higher]

1.	Day	**[DROP DOWN MENU]**
2.	Night	**[DROP DOWN MENU]**

[IF S10=3, ASK Q36; OTHERWISE SKIP TO FILTER BEFORE Q41]

The next few questions focus on any water heating used by your business.

Q36. What type of water heater does your business use? If more than one type of water heater, indicate the one that is used most often.

1. None
2. Hot water either purchased or provided by building to tenants
3. Self-contained or stand-alone storage water heater/boiler
4. Central boiler
5. Tankless (instantaneous) water heater
6. Heat pump water heater
7. Heat recovery water heater
8. Domestic-type water heater
9. Other **[SPECIFY]**
10. Not sure

[IF Q36=2-9, ASK Q37; OTHERWISE SKIP TO FILTER BEFORE Q41]

Q37. How many water heater units do you have?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER 1-100]

[IF Q36=2-4 OR 6-9, ASK Q38; OTHERWISE SKIP TO Q39]

Q38. What is the **[IF Q37>1, DISPLAY, "**average**"]** tank size of these water heater unit(s)? *Your best estimate is fine.*

1. Less than 30 gallons
2. 30-54 gallons
3. 55-69 gallons
4. 70-89 gallons
5. 90-119 gallons
6. 120-150 gallons
7. More than 150 gallons
8. Not sure

Q39. What type of fuel is used by the water heater(s)?

1. Natural gas
2. Electricity
3. Steam
4. Other **[SPECIFY]**
5. Not sure

Q40. On average, when were the water heaters installed? *Your best estimate is fine.*

1. Before 1980
2. 1980-1989
3. 1990-1994
4. 1995-2000
5. 2001-2003
6. 2004-2006
7. 2007-2009
8. 2010-present
9. Not sure

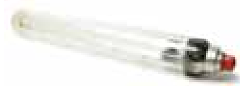
LIGHTING

[DISPLAY IF S10=4 OR 5; OTHERWISE SKIP TO "Office and Other Equipment" INTRO TEXT]
The next few questions focus on the lighting used in your business's building(s).

[IF S10=4, ASK Q41; OTHERWISE SKIP TO FILTER BEFORE Q44]
Q41. How many of each of the following types of lamps / fixtures are used in the **interior** of the building(s) at your business, considering only the areas your business occupies?

Your best estimate is fine, but please enter a whole number for each type of lamp / fixture.

Lamp/fixture type	Example Images	Number of interior lamps / fixtures
1. Fluorescent (circuline type, U-type, etc.)		[RECORD NUM 0-9999]
2. Incandescent		[RECORD NUM 0-9999]
3. Compact fluorescent		[RECORD NUM 0-9999]
4. LED		[RECORD NUM 0-9999]
5. Mercury vapor		[RECORD NUM 0-9999]
6. Metal halide – standard		[RECORD NUM 0-9999]

7. Metal halide – Pulse start		**[RECORD NUM 0-9999]**
8. High pressure sodium		**[RECORD NUM 0-9999]**
9. Low pressure sodium		**[RECORD NUM 0-9999]**
10. Neon		**[RECORD NUM 0-9999]**
11. Self / battery powered exit signs		**[RECORD NUM 0-9999]**
12. Quartz / halogen		**[RECORD NUM 0-9999]**
13. Induction		**[RECORD NUM 0-9999]**
14. Other **[SPECIFY]**		**[RECORD NUM 0-9999]**
TOT. **Total number of lamps / fixtures**		**[CALCULATE TOTAL]**

Q41a/b. Of the **interior** lamps/fixtures that you have, what percentage are on during business and non-business hours?

[ONLY DISPLAY RESPONSE OPTIONS >0 AT Q41A]

Lamp/fixture type	Number that you have	Q41a. % on during business hours	Q41b. % on during non-business hours
1. Fluorescent (standard type, circuline type, U-type, etc.)	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
2. Incandescent	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
3. Compact fluorescent	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
4. Mercury vapor	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
5. Metal halide – standard	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
6. Metal halide – Pulse start	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
7. High pressure sodium	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
8. Low pressure sodium	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
9. Neon	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
10. LED	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
11. Self / battery powered exit signs	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
12. Quartz / halogen	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
13. Induction	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**
14. Other **[SPECIFY]**	**[DISPLAY Q41A RESPONSE]**	**[RECORD % 0-100]%**	**[RECORD % 0-100]%**

[IF Q41a_1 > 0, ASK Q42a; OTHERWISE SKIP TO Q43]

Q42a. What percentage of all the **interior** fluorescent lamps your business uses can be described as each of the following types?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

	[SET DEFAULT RESPONSE AT 0]	**% of all fluorescent lamps / fixtures used…**
1.	T-12	**[RECORD NUM 0-100]**%
2.	T-8	**[RECORD NUM 0-100]**%
3.	Super T-8	**[RECORD NUM 0-100]**%
4.	T-5	**[RECORD NUM 0-100]**%
5.	LED	**[RECORD NUM 0-100]**%
6.	Other **[SPECIFY]**	**[RECORD NUM 0-100]**%
TOT.	**Total**	**[CALCULATE TOTAL]**%

[PROGRAMMER: Q42ATOT MUST EQUAL 100 IN ORDER TO CONTINUE TO NEXT SCREEN]

[IF Q42A_1> 0, ASK Q42B. OTHERWISE SKIP TO Q43]

Q42B. Approximately how many T-12 lamps do you still have in inventory? *Your best estimate is fine*.
[RECORD NUMBER 1-10,000] T-12 lamps

Q43. Which of the following types of lighting controls are primarily used to control your interior lighting? *Select all that apply.*

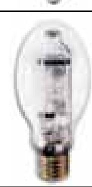
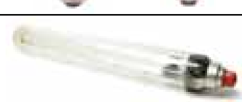
1. Manual – circuit breaker
2. Manual – single switch
3. Manual – bi-level (dual) switch
4. Occupancy sensor
5. Timers / Time clock
6. Photocell
8. Daylighting sensor
9. Energy management system

990. Other **[SPECIFY]**
998. Not sure

[IF S10=5, ASK Q44; OTHERWISE SKIP TO INTRO TEXT BEFORE Q47]

Q44. Thinking about the exterior lighting that you pay for in your electric bill, how many of each of the following types of lamps / fixtures are used on the **exterior** of your business's building(s)?

Your best estimate is fine, but please enter a whole number for each type of lamp / fixture.

Lamp/fixture type	Example Images	Number of exterior lamps / fixtures	Q44a. % on during business hours	Q44b. % on during non-business hours
1. Fluorescent (standard type, circuline type, U-type, etc.)		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
2. Incandescent		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
3. Compact fluorescent		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
4. Mercury vapor		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
5. Metal halide – standard		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
6. Metal halide – Pulse start		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
7. High pressure sodium		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
8. Low pressure sodium		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%

9. Neon		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
10. LED		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
11. Self / battery powered exit signs		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
12. Quartz / halogen		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
13. Induction		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
14. Other **[SPECIFY]**		[RECORD NUM 0-9999]	[RECORD % 0-100]%	[RECORD % 0-100]%
TOT. **Total number of lamps / fixtures**		[CALCULATE TOTAL]		

Q45. DELETED

Q46. Which of the following types of lighting controls is primarily used to control your exterior lighting?

1. Manual – circuit breaker
2. Manual – single switch
3. Manual – bi-level (dual) switch
4. Occupancy sensor
5. Timers / Time clock
6. Photocell
8. Daylighting sensor
9. Energy management system

990. Other **[SPECIFY]**
998. Not sure

OFFICE AND OTHER EQUIPMENT

Now we would like to ask you some questions about some facilities and equipment your business may operate.

Q47. How many units of the following computing or office equipment can be found within your business space?

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

Office Equipment type	Number
1. Server	**[RECORD NUMBER 0-500]**
2. Personal computer	**[RECORD NUMBER 0-500]**
3. Laptop/Netbook computer	**[RECORD NUMBER 0-500]**
4. Tablet computer	**[RECORD NUMBER 0-500]**
5. Monitor	**[RECORD NUMBER 0-500]**
6. Printer/Copier	**[RECORD NUMBER 0-500]**
7. Scanner	**[RECORD NUMBER 0-500]**
8. Fax machine	**[RECORD NUMBER 0-500]**
9. All-in-one fax/copy/scanner machine	**[RECORD NUMBER 0-500]**
10. Point of sale terminals (POS)	**[RECORD NUMBER 0-500]**
11. Projector	**[RECORD NUMBER 0-500]**

[IF Q11_3>0, ASK Q48; OTHERWISE SKIP TO FILTER BEFORE Q52]
The following questions focus on your kitchen, food preparation, and/or food storage or sales facilities.

Q48. What size kitchen, if any, is used for food preparation in your facility?

1. None
2. Small kitchenette
3. Residential-scale kitchen
4. Commercial-scale kitchen
5. Institution-scale kitchen (in larger hospitals, universities)

[IF Q48=2-5, ASK Q49; OTHERWISE SKIP TO FILTER BEFORE Q52]

Q49. How many of the following units can be found in your kitchen / food preparation / food storage and/or sales area(s)?

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

Kitchen Equipment type	Number
1. Broiler, electric	**[RECORD NUMBER 0-100]**
2. Broiler, gas	**[RECORD NUMBER 0-100]**
3. Infrared broiler, electric	**[RECORD NUMBER 0-100]**
4. Infrared broiler, gas	**[RECORD NUMBER 0-100]**
5. Fryer, electric	**[RECORD NUMBER 0-100]**
6. Fryer, gas	**[RECORD NUMBER 0-100]**
7. Griddle/grill, electric	**[RECORD NUMBER 0-100]**
8. Griddle/grill, gas	**[RECORD NUMBER 0-100]**
9. General oven, electric	**[RECORD NUMBER 0-100]**
10. General oven, gas	**[RECORD NUMBER 0-100]**
11. Baking oven, electric	**[RECORD NUMBER 0-100]**
12. Baking oven, gas	**[RECORD NUMBER 0-100]**
13. Combination oven, electric	**[RECORD NUMBER 0-100]**
14. Combination oven, gas	**[RECORD NUMBER 0-100]**
15. Convection oven, electric	**[RECORD NUMBER 0-100]**
16. Convection oven, gas	**[RECORD NUMBER 0-100]**
17. Conveyor oven, electric	**[RECORD NUMBER 0-100]**
18. Conveyor, gas	**[RECORD NUMBER 0-100]**
19. Pasta cooker, electric	**[RECORD NUMBER 0-100]**
20. Pasta cooker, gas	**[RECORD NUMBER 0-100]**
21. Infrared rotisserie oven, electric	**[RECORD NUMBER 0-100]**
22. Infrared rotisserie oven, gas	**[RECORD NUMBER 0-100]**
23. Infrared salamander broiler, electric	**[RECORD NUMBER 0-100]**
24. Infrared salamander broiler, gas	**[RECORD NUMBER 0-100]**
25. Range top, electric	**[RECORD NUMBER 0-100]**
26. Range top, gas	**[RECORD NUMBER 0-100]**
27. Dishwasher, electric	**[RECORD NUMBER 0-100]**
28. Dishwasher, gas	**[RECORD NUMBER 0-100]**
29. Refrigerator, units	**[RECORD NUMBER 0-100]**
30. Freezer, units	**[RECORD NUMBER 0-100]**
31. Refrigerator, walk-in	**[RECORD NUMBER 0-100]**
32. Freezer, walk-in	**[RECORD NUMBER 0-100]**

[IF Q49_19>0, ASK Q50; OTHERWISE SKIP TO FILTER BEFORE Q51]

Q50. How large is your **walk-in refrigerator space**? Please enter the approximate total square footage of all walk-in refrigerators.

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER, MIN 1] square feet

[IF Q49_20>0, ASK Q51; OTHERWISE SKIP TO FILTER BEFORE Q52]

Q51. How large is your **walk-in freezer space**? Please enter the approximate total square footage of all walk-in freezers.

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER, MIN 1] square feet

[IF Q11_8>0, ASK Q52; OTHERWISE SKIP TO FILTER BEFORE INTRO TEXT ABOVE Q55]

Q52. Do you have any warehouse space, or large storage space, within the area your business uses at this location?

1. No
2. Yes, unrefrigerated
3. Yes, refrigerated
4. Yes, both unrefrigerated and refrigerated

[IF Q52=2 OR 4, ASK Q53; OTHERWISE SKIP TO FILTER BEFORE Q54]

Q53. What is the approximate square footage of your **unrefrigerated warehouse space**?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER, MIN 1] square feet

[IF Q52=3-4, ASK Q54; OTHERWISE SKIP TO FILTER BEFORE INTRO TEXT ABOVE Q55]

Q54. What is the approximate square footage of your **refrigerated warehouse space**?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER, MIN 1] square feet

[IF Q11_9>0, ASK Q55; OTHERWISE SKIP TO FILTER ABOVE Q60B]

The following questions focus on your laundry facilities

Q55. DELETED

Q56. How many of the following units are there in your laundry facility?

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

Laundry Equipment type	Number
1. Standard, top loading washer	**[RECORD NUMBER 0-100]**
2. Standard, front loading washer	**[RECORD NUMBER 0-100]**
3. Super capacity washer	**[RECORD NUMBER 0-100]**
4. Clothes dryer, gas	**[RECORD NUMBER 0-100]**
5. Clothes dryer, electric	**[RECORD NUMBER 0-100]**

[IF ANY Q56_1 THROUGH Q56_3>0, ASK Q57; OTHERWISE SKIP TO FILTER BEFORE Q59]

Q57. On average, when was the typical washer installed? *Your best estimate is fine.*

1. Before 1970
2. 1970-1979
3. 1980-1989
4. 1990-1994
5. 1995-1999
6. 2000-2004

7. 2005-present
998. Not sure

Q58. On average, how many loads does each washer handle per week? *Your best estimate is fine.*

1. 1-5
2. 6-10
3. 11-20
4. 21-30
5. More than 30
6. Not sure

[IF Q56_4>0 OR Q56_5>0, ASK Q59; OTHERWISE SKIP TO FILTER BEFORE Q60]
Q59. On average, when was the typical dryer installed? *Your best estimate is fine.*

1. Before 1970
2. 1970-1979
3. 1980-1989
4. 1990-1994
5. 1995-1999
6. 2000-2004
7. 2005-present
998. Not sure

[IF ANY Q56_1 THROUGH Q56_5>0; ASK Q60; OTHERWISE SKIP TO FILTER BEFORE Q60B]
Q60. In general, how would you characterize the energy efficiency of your laundry equipment?

1. Mostly standard efficiency
2. Mostly high efficiency (ENERGY STAR®, Supersaver)
3. Mix of standard and high-efficiency

[IF S7=6, 7, 10, 12, 13 OR 15 OR 990, ASK Q60B. OTHERWISE SKIP TO FILTER BEFORE Q61]
Q60b. Do you have a pool and/or spa at this location? *Select all that apply.*

1. Pool
2. Spa
3. None of the above

[IF Q60b=1, ASK Q60c. OTHERWISE SKIP TO FILTER BEFORE Q60d]
Q60c. Is your pool pump controlled by a timer?

1. Yes
2. No
3. Not sure

[IF Q60b=1 OR 2, ASK Q60d. OTHERWISE SKIP TO FILTER BEFORE Q61]
Q60d. Do you heat your pool or spa?

1. No

2. Yes, year-round
3. Yes, summer only

Q60e. What type of fuel is used to generate heat for all / most of these water heaters?

1. Natural gas
2. Electricity
3. Solar
4. Other **[SPECIFY]**
5. Not sure

MANUFACTURING / PROCESSING OPERATIONS

[IF Q11_11>1, ASK Q61; OTHERWISE SKIP TO FILTER ABOVE INTRO TEXT ABOVE Q66a]
Now we would like to ask you some questions about your manufacturing / processing operations.

Q61. Which of the following types of motors are used at your business's location? *Select all that apply.*

1. Motors that drive the different **pumps** that are used at this facility
2. Motors that drive **other machines or uses** at this facility (e.g., mills, assembly lines, air compressors, etc.)
3. None of the above **[EXCLUSIVE]**

[IF Q61=1, ASK Q61a; OTHERWISE SKIP TO FILTER ABOVE Q64]
Q61a. How many motors are there in each of the following categories that drive the different **pumps** that are used at this facility? **[IF Q61=2, DISPLAY, "**(*Please consider only pumps in your response. Other motor uses are covered in later questions.)***"]**

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

	# of motors
1. Less than 5 HP	**[RECORD NUM 0-999]**
2. 5–24 HP	**[RECORD NUM 0-999]**
3. 25–99 HP	**[RECORD NUM 0-999]**
4. 100–249 HP	**[RECORD NUM 0-999]**
5. 250–499 HP	**[RECORD NUM 0-999]**
6. 500 or more HP	**[RECORD NUM 0-999]**
TOT. **Total**	**[CALCULATE TOTAL]**

[TOTAL MUST BE >=1; ALLOW BLANK CELLS TO BE AUTOCODED AS 0's]

Q62. Do these pumps tend to operate continuously, or for extended periods of time, while this facility is operating, or only for short periods of time?

1. Continuously / long periods of time
2. Short periods of time
3. Varies / some of both

Q63. Do these pumps generally have high efficiency motors, and/or variable speed drives, or not?

1. Most are high efficiency and/or high variable speed drives
2. Split 50/50 – some are high efficiency and/or high variable speed drives, some are not
3. Few or none are high efficiency and/or high variable speed drives

[IF Q61=2, ASK Q64; OTHERWISE SKIP TO FILTER ABOVE INTRO TEXT ABOVE Q66a]

Q64. How many **motors** are there in each of the following categories that drive **other machines or uses** at this facility (e.g., mills, assembly lines, air compressors, etc.)?

Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.

	# of motors
1. Less than 5 HP	**[RECORD NUM 0-999]**
2. 5–24 HP	**[RECORD NUM 0-999]**
3. 25–99 HP	**[RECORD NUM 0-999]**
4. 100–249 HP	**[RECORD NUM 0-999]**
5. 250–499 HP	**[RECORD NUM 0-999]**
6. 500 or more HP	**[RECORD NUM 0-999]**
TOT. **Total**	**[CALCULATE TOTAL]**

[TOTAL MUST BE >=1; ALLOW BLANK CELLS TO BE AUTOCODED AS 0's]

Q65. Do these motors tend to operate continuously, or for extended periods of time, while this facility is operating, or only for short periods of time?

1. Continuously / long periods of time
2. Short periods of time
3. Varies / some of both

Q66. Do these motors generally have high efficiency motors, and/or variable speed drives, or not?

1. Most are high efficiency and/or high variable speed drives
2. Split 50/50 – some are high efficiency and/or high variable speed drives, some are not
3. Few or none are high efficiency and/or high variable speed drives

[IFS11=5 ASK Q67, OTHERWISE SKIP TO Q69]

Q67. How many **charging stations** are at this location?
[RECORD NUM 0-999] charging stations

Q67b. Who pays for the charging stations?
1. Our company
2. The building management
3. Other (specify)
4. Not sure

Q68. Does your company use electric vehicles for business purposes? If so, how many electric vehicles are used at this location?
1. None
2. Number of Electric Vehicles **[RECORD NUM 0-999]**

ENERGY EFFICIENCY MEASURES

Finally, we'd like to ask you about some **energy efficiency measures** you may have implemented at this location in the recent past, as well as some that you may be planning on implementing in the near future.

Q68. Which of the following **energy efficiency measures** related to **lighting** have been implemented at this location **within the last three years**?

Select all that apply for each time period. Select "NONE" in the appropriate column if you have not implemented / do not plan to implement any of the measures within that time period.

	Energy Efficiency Measures: Interior and Exterior Lighting	**Have implemented in last 3 years**
1.	Upgrading or renovating fluorescent lighting system(s)	☐
2.	Eliminating some fluorescent fixtures and adding reflectors to others to reduce the total number of lighting fixtures or lamps without reducing the total light available (this is sometimes called "delamping")	☐
3.	Replacing traditional incandescent lights with CFLs or higher efficiency light bulbs in lighting fixtures	☐
4.	Replacing general overhead lighting with specific task lighting	☐
5.	Installing occupancy/motion sensors to turn lights off when rooms are not in use	☐
6.	Installing daylighting sensors to turn interior lights off when sufficient daylight is available	☐
990.	Other energy efficiency **lighting** measure(s) **[SPECIFY]**	☐
998.	**NONE / No energy efficiency lighting measures** implemented / planned / possible **[EXCLUSIVE]**	☐

Q69. Which of the following **energy efficiency measures** related to **heating / cooling** have been implemented at this location **within the last three years**?

Which of these measures does your business plan to implement at this location **within the next two years**?

Select all that apply for each time period. Select "NONE" in the appropriate column if you have not implemented / do not plan to implement any of the measures within that time period.

	Energy Efficiency Measures: Heating / Cooling (HVAC)	**Have implemented in last 3 years**	**Plan to implement in next 2 years**
1.	Purchasing a more energy efficient air conditioner, chiller, furnace or boiler when needing to replace a unit	☐	☐
3.	Installing solar panels on your roof that would provide power for some portion of your heating, cooling or water heating needs	☐	☐
4.	Installing a heat recovery system that would capture waste heat from chillers or refrigeration systems to use for heating	☐	☐
5.	Adding insulation to the ductwork that serves your heating and/or cooling systems	☐	☐

6.	Conducting a "retrocommissioning" of your HVAC systems – essentially reviewing all elements of system performance and flow to ensure your operating procedures optimize system performance	☐	☐
7.	Installing variable speed drives on fan motors that are part of your HVAC system – to allow the motors to run at many different speeds, rather than "on" or "off"	☐	☐
8.	Adding an economizer (air-side or water-side)	☐	☐
9.	Adding an energy management/control system	☐	☐
990.	Other energy efficiency **heating** measure(s) **[SPECIFY]**	☐	☐
991.	Other energy efficiency **cooling** measure(s) **[SPECIFY]**	☐	☐
998.	**NONE / No energy efficiency heating / cooling (HVAC) measures** implemented / planned / possible **[EXCLUSIVE]**	☐	☐

Q70. Which of the following **energy efficiency measures** related to **water heating** have been implemented at this location **within the last three years**?

Which of these measures does your business plan to implement at this location **within the next two years**?

Select all that apply for each time period. Select "NONE" in the appropriate column if you have not implemented / do not plan to implement any of the measures within that time period.

	Energy Efficiency Measures: Water Heating	**Have implemented in last 3 years**	**Plan to implement in next 2 years**
1.	Purchasing a more energy efficient water heater when needing to replace a unit	☐	☐
2.	Insulating, or improving the insulation, for the pipes that carry hot water throughout your facility	☐	☐
3.	Reducing the temperature of the hot water that your water heater(s) delivers	☐	☐
4.	Installing 'low flow' nozzles that reduce the amount of hot water used	☐	☐
5.	Installing faucet aerators that introduce air into the flow of hot water, reducing the total amount of water used	☐	☐
990.	Other energy efficiency **water heating** measure(s) **[SPECIFY]**	☐	☐
998.	**NONE / No energy efficiency water heating measures** implemented / planned / possible **[EXCLUSIVE]**	☐	☐

Q71. Which of the following **energy efficiency measures** related to **building structure** have been implemented at this location **within the last three years**?

Select all that apply for each time period. Select "NONE" if you have not implemented

	Energy Efficiency Measures: Building Structure	**Have implemented in last 3 years**
1.	Replacing windows with windows designated as "low-e" glass and/or have a gas core that increases their energy efficiency	☐
2.	Adding or upgrading insulation on exterior doors, walls, ceilings, or roofs	☐
3.	Adding window shades, external shades, reflective film on windows, or trees that would reduce that amount of direct sunlight that enters your buildings	☐
4.	Installing a "cool" or white-colored roof	☐
990.	Other high efficiency **building structure** measure(s)	☐
998.	**NONE / No energy efficiency building structure measures** implemented / planned / possible **[EXCLUSIVE]**	☐

Q72. Which of these **other energy efficiency measures** have been implemented at this location **within the last three years**?

Select all that apply for each time period. Select "NONE" if you have not implemented

	Energy Efficiency Measures: Other	**Have implemented in last 3 years**
1.	Purchasing a more energy efficient refrigeration unit when needing to replace a unit	☐
2.	Purchasing a higher than standard efficiency swimming pool pump or swimming pool heater when needing to replace this unit	☐
3.	Purchasing higher than standard efficiency computer, printer/copier or other office equipment when needing to replace a unit	☐
4.	Purchasing higher than standard efficiency dishwasher, stove or other kitchen equipment when needing to replace a unit	☐
990.	Other energy efficiency measure(s) **[SPECIFY]**	☐
998.	**NONE / No *other* energy efficiency measures** implemented / planned / possible **[EXCLUSIVE]**	☐

Q73. Some utilities offer rebate, low interest loan or price discount programs to encourage businesses to purchase highly energy efficient heating, cooling, lighting, or other equipment or appliances.

To the best of your knowledge, does Ameren Illinois offer any such programs that offer customers like you a discount off the purchase price on qualified items?

1. Yes
2. No
3. Not sure

[IF Q73=1, ASK Q73B; OTHERWISE SKIP TO Q74B]

Q73B. Are you aware of any of the following programs being offered by Ameren Illinois? Have you participated in any of the following programs in the past 3 years?

	Energy Efficiency Program	**Aware of program**	**Participated in the last 3 years**
1.	Standard Lighting	☐	☐
2.	Standard HVAC/Water Heater	☐	☐
3.	Standard VFD (Variable Frequency Drive)	☐	☐
4.	Standard Commercial Kitchen	☐	☐
5.	Standard Lodging	☐	☐
6.	Standard Grocery	☐	☐
7.	Standard Agriculture	☐	☐
8.	Standard Steam Trap	☐	☐
9.	Standard Leak Survey and Repair	☐	☐
10.	Competitive Large Project Incentive (CLPI)	☐	☐
11.	Staffing Grant	☐	☐
12.	New Construction	☐	☐
13.	Feasibility Study	☐	☐
14.	Retro-commissioning Compressed Air	☐	☐
15.	Retro-commissioning Commercial Building	☐	☐
16.	Retro-commissioning Healthcare	☐	☐
17.	Custom Program	☐	☐
18.	Online store	☐	☐
19.	Multi-Family Properties	☐	☐
990.	Other program(s) **[SPECIFY]**	☐	☐
998.	**NONE [EXCLUSIVE]**	☐	☐

Q74A. If we have any questions regarding your responses to the survey, may we contact you via email?

1. Yes
0. No

[IF Q74A=1, ASK Q74B; OTHERWISE SKIP TO Q75]

Q74B. Please provide your email address. It will only be used to contact you about this survey.

[RECORD EMAIL ADDRESS]

CONCLUSION

[INCENTIVE NAME/ADDRESS COLLECTION SCREEN]
Those are all the questions we have for you today. Thank you for your participation!

Q75. To receive the $25 Visa Card thank you payment you earned by completing our survey, please provide your name and address below.

A. Full name
B. Business name (optional)
C. Mailing Address Line #1
D. Mailing Address Line #2 (optional)
E. Mailing Address Line #3 (optional)
F. City
G. State
H. ZIP Code

[PROGRAMMER: INCLUDE OPTIONS FOR "I would prefer not to receive the $25 Visa Card thank you payment**" AND "**I would prefer not to receive this special report**"]**

[IF EITHER NAME/MAILING ADDRESS ENTERED, SHOW INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN; OTHERWISE SKIP TO INCENTIVE CONFIRMATION / GOODBYE SCREEN]

[INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN]
Please review the information you provided and verify that it is complete and correct:

[DISPLAY NAME/ADDRESS/EMAIL ADDRESS COLLECTED ON PREVIOUS SCREEN]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "Next" to submit your information.
[PROGRAMMER: INCLUDE BACK BUTTON FOR THIS SCREEN DURING LIVE VERSION]

[INCENTIVE CONFIRMATION / FOLLOW-UP REQUEST SCREEN]
[IF NAME/MAILING ADDRESS ENTERED, DISPLAY, "You have successfully submitted the information we need so we can send you your $25 Visa card thank you payment. This payment will be issued to the name you provided and will be mailed within 3-4 weeks to the address you provided.**"]**

[PROGRAMMER: DISPLAY ON SAME SCREEN AS ABOVE LANGUAGE]
Q76. If you would like information on how your business can save money on energy bills, please visit us at www.actonenergy.com.

Additionally, if you would like someone from the Ameren Illinois energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. **Yes,** we would like to be contacted by someone from the Ameren Illinois energy efficiency implementation team. *Please supply appropriate information.*

   Contact Name:____________________________

   Business Name:____________________________

   Preferred contact method(s) – *Select all that apply*:

   ☐ phone ☐ e-mail ☐ postal mail

   Daytime phone number :________________ **[ALLOW UP TO 20 CHARACTERS]**

   E-mail address:_____________________________

   Postal address:_____________________________

   ____

   ____

2. **No,** we would NOT like to be contacted

[IF Q76=1, GO TO FOLLOW-UP REQUEST VERIFICATION SCREEN; IF Q76=2, SKIP TO FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]

[FOLLOW-UP REQUEST VERIFICATION SCREEN]
Please review the contact information you provided and verify that it is complete and correct:

[DISPLAY PROVIDED INFORMATION]

If you would like to edit any of this information, please click the “Back” button to go to the previous screen, where you can make any needed changes.

Otherwise, please click “Next” to submit your information.

[PROGRAMMER NOTE: INCLUDE ‘BACK’ BUTTON ON THIS SCREEN WHEN SURVEY IS LIVE]

[FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]
[IF Q76=1, DISPLAY, “You have successfully submitted your contact information! You will be contacted by a representative from the Ameren Illinois energy efficiency implementation team within 10 business days.**”]**

If, at this time, you’d like to make any general comments or provide feedback to Ameren Illinois, please use the following text box:
[RECORD TEXT; ALLOW A HIGH MAX NUMBER OF CHARACTERS FOR LONG COMMENTS]

(Note: Any comments you submit here **will not** be linked to your previous survey responses or to any other identifying information when communicated to Ameren Illinois.)

Please click "Next" to submit your comment or to proceed without leaving a comment.

[GOODBYE SCREEN]
[IF STATUS=C, DISPLAY, "Thank you very much for your help with our research. It is greatly appreciated! Have a nice day!**"]**

[IF STATUS=T OR O, DISPLAY, "Thank you. Have a nice day!**"]**
[INCLUDE "Close window**" BUTTON]**

SURVEY CLOSED MESSAGE

We appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.

In order to achieve a representative sample for this survey, quotas with specific criteria needed to be designated. Because these quotas have now been filled, we are not accepting any more responses.

If you would like information on how your business can save money on energy bills, please visit us at http://www.actonenergy.com

---

Thank you. Have a nice day!

DEFINITIONS

[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

Heating systems	
Air-source heat pump	An air-source heat pump uses the difference between outdoor and indoor air temperatures to cool and heat the home.
Geo-thermal heat pump	Geothermal heat pumps are similar to ordinary heat pumps, but use the ground instead of outside air to provide heating, air conditioning and, in most cases, hot water.
Cooling systems/chillers	
District steam with chiller	A district steam system works by having a central steam plant that typically serves multiple clients, or in larger cities, even multiple city blocks or other areas; district steam with chiller systems use district steam to drive a local chiller system
Floor-by-floor packaged water-cooled DX units	Separate air conditioning units that serve each floor individually; these units are typically water-cooled, rather than air-cooled
Centrifugal	Compressor that uses centrifugal force to compress gas by feeding it into a wheel with radial vanes. The wheel is then sealed inside of a cylinder and spun. When the wheel rotates, the gas is thrown away from the wheel center. The outward spinning motion compresses the gas.
Reciprocating	Compressor that increases the pressure of a process gas by positive displacement, employing linear movement of the drive shaft
Rotary	The machine used to impart rotational power to the drill stem while permitting vertical movement of the pipe for rotary drilling
Scroll	Uses advanced engineering and flow dynamics to efficiently and smoothly compress gas refrigerant
Screw	A propeller with several angled blades that rotates to push against water or air
Absorption, hot water	Thermally driven chiller utilizing hot water
Absorption, steam	Indirect-fired chiller utilizing steam
Absorption, natural gas	Direct-fired chiller
Chiller, steam-driven turbine	Mechanical pump-driven refrigeration process powered by a steam turbine
Lighting	
Standard fluorescent tubes (T12)	Traditional fluorescent tube lights with standard efficiency (T12) tubes
Higher than standard efficiency fluorescent tubes (T10)	Fluorescent tube lights that provide more light output than a T12. The T10 lights have a 1 ¼ inch diameter while the T12 lights have a larger diameter of 1 ½ inches.
High-efficiency fluorescent tubes (T8)	Newer fluorescent tubes (T8s) that fit into traditional fixtures, but which represent a more efficient (lower wattage) tube
Super high-efficiency fluorescent tubes (T5)	Fluorescent, super high efficiency (T5) tube lights
Compact fluorescent (CFL)	A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional, "swirly" shape for a light bulb
Incandescent	Traditional screw in light bulbs that typically range from around 25 watts to around 120 watts
Neon	Tube shaped lights that contain neon or other inert gases at low pressure. Applying a high voltage, makes the gas glow brightly. Typically used in commercial advertising or signage.
LED lamp	A "light emitting diode" lamp is an electronic form of lighting that does not

	use filaments like traditional incandescent bulbs, but instead, uses solid state electronics.
Induction	Electrodeless lamps that can last up to 20 years before burning out. Typically used in exterior lighting.
High/Low pressure sodium	A sodium vapor lamp is a gas discharge lamp which uses sodium in an excited state to produce light. They are used in generating yellow light for lighting streets and highways. The low-pressure sodium lamp has remarkably high luminous efficiency, or efficacy, producing as much as 200 lumens per watt of input power. High pressure sodium (HPS) lamps are smaller and contain additional elements such as mercury, and produce a dark pink glow when first struck, and a pinkish orange light when warmed.
Photocell	A light sensing device used to control luminaires and dimmers in response to detected light levels. Also known as photosensor lights. These are typically used in outdoor lighting so that lights are turned off during daylight.
Metal halide – standard	A discharge lamp in which metal halide salts are added to the contents of a discharge tube in which there is a high-pressure arc in mercury vapor; the added metals generate different wavelengths, to give substantially white light at an efficiency approximating that of high-pressure sodium lamps
Metal halide – pulse start	Pulse start metal halide lamps do not require a starting electrode, and instead use a special starting circuit referred to as an igniter to generate a high-voltage pulse to the operating electrodes. Pulse start metal halide offers better efficiency than standard.
Mercury vapor	Pressurized gas inside an arc tube ionized by current flowing between electrodes, resulting in light being emitted. Contains mercury and small amounts of argon, neon and krypton gas.
Induction	Electrodeless lamps that can last up to 20 years before burning out. Typically used in exterior lighting.
Quartz halogen	An incandescent light bulb in which the envelope is made of quartz instead of glass, and the filament is surrounded by an atmosphere of a halogen gas, usually iodine.
Occupancy sensors	An occupancy sensor is a motion detector that is integrated with a timing device. It senses when motion has stopped for a specified time period in order to trigger a light extinguishing signal.
Daylighting sensors	Electronic devices that are used to control lights in a room, so that when there is sufficient daylight / sunlight present, then room lights are turned off
Manual – single switch	One switch controls one or more light fixtures
Manual – dual switch	Sometimes referred to as a "three-way switch"; two or more switches control one or more light fixtures. It is commonly used in locations with two different entrances/exits, such as at the top and bottom of a stairwell or in a classroom with doors in opposite corners.
Water Heater	
Tankless (instantaneous)	A water heater that only heats water for delivery to your application when you ask for it by using hot water. These systems do not keep a tank of water hot at all times.
Heat recovery	A water heater that uses heat "recovered" from another application (for example, by recovering "waste heat" from a process that heats another material) to heat water for different purposes
Domestic - type	A tank water heater similar to what you would find in a residential home.
Thermostat	
Standard	A traditional thermostat that you have to manually adjust and that has only one setting for the internal temperature you want
Programmable	A thermostat that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week
Energy management system	An electronic system that can be programmed to automatically turn on / off

	(or to otherwise operate) HVAC, lighting, and / or other building systems according to a schedule that a building operator has established ahead of time
Structural	
Glass curtain/spandrel	A non- load-bearing wall of glass, attached to a building's exterior structural frame.
Energy Efficiency Measures	
Delamping	Removing light bulbs (or fluorescent tubes) from a facility so that there is still sufficient light, but not more than is necessary
Economizers (air-side or water-side)	Heat exchanger used to pre-heat water before it enters boiler
Energy management / control system	An electronic system that can be programmed to automatically turn on / off (or to otherwise operate) HVAC, lighting, and / or other building systems according to a schedule that a building operator has established ahead of time

About EnerNOC Utility Solutions Consulting

EnerNOC Utility Solutions Consulting is part of EnerNOC Utility Solutions group, which provides a comprehensive suite of demand-side management (DSM) services to utilities and grid operators worldwide. Hundreds of utilities have leveraged our technology, our people, and our proven processes to make their energy efficiency (EE) and demand response (DR) initiatives a success. Utilities trust EnerNOC to work with them at every stage of the DSM program lifecycle – assessing market potential, designing effective programs, implementing those programs, and measuring program results.

EnerNOC Utility Solutions delivers value to our utility clients through two separate practice areas – Program Implementation and EnerNOC Utility Solutions Consulting.

- Our Program Implementation team leverages EnerNOC's deep "behind-the-meter expertise" and world-class technology platform to help utilities create and manage DR and EE programs that deliver reliable and cost-effective energy savings. We focus exclusively on the commercial and industrial (C&I) customer segments, with a track record of successful partnerships that spans more than a decade. Through a focus on high quality, measurable savings, EnerNOC has successfully delivered hundreds of thousands of MWh of energy efficiency for our utility clients, and we have thousands of MW of demand response capacity under management.
- The EnerNOC Utility Solutions Consulting team provides expertise and analysis to support a broad range of utility DSM activities, including: potential assessments; end-use forecasts; integrated resource planning; EE, DR, and smart grid pilot and program design and administration; load research; technology assessments and demonstrations; evaluation, measurement and verification; and regulatory support.

The EnerNOC Utility Solutions Consulting team has decades of combined experience in the utility DSM industry. The staff is comprised of professional electrical, mechanical, chemical, civil, industrial, and environmental engineers as well as economists, business planners, project managers, market researchers, load research professionals, and statisticians. Utilities view our experts as trusted advisors, and we work together collaboratively to make any DSM initiative a success.

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road, Suite 450
Walnut Creek, CA 94596

P: 925.482.2000
F: 925.284.3147

Ameren Illinois Energy Efficiency Market Potential Assessment

Report Number 1404

Volume 3: Energy Efficiency Potential Analysis

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road
Suite 450
Walnut Creek, CA 94596
925.482.2000
www.enernoc.com

Prepared for:
Ameren Illinois

Presented on:
May 20, 2013

This report was prepared by

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Blvd., Suite 450
Walnut Creek, CA 94596

I. Rohmund, Project Director
B. Kester, Project Manager

Subcontractor
YouGov|Definitive Insights
Washington University in St. Louis

In cooperation with
Applied Energy Group

R. Obeiter, Project Director
A. Cottrell, Project Manger

CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Background

Ameren Illinois contracted with EnerNOC to conduct an electricity and natural gas Energy Efficiency (EE) Market Potential study covering the period of performance from June 1, 2014 through May 31, 2017 to aid the development of a three year plan for programs implemented by Ameren Illinois in Cycle 3. In addition, the analysis also included the period of performance from June 1, 2017 through May 31, 2024 to aid in benchmarking and other tasks related to future analyses. This study identifies the potential to achieve the kWh and therm annual load reduction targets within the rated caps identified in Sections 8-103 and 8-104 of the Illinois Public Utilities Act. In addition, the electric component of the study identifies the potential to achieve additional kWh savings per Section 5/16-111.5Bnew of the Act absent rate cap limitations. This comprehensive study includes primary market research, a full demand side management (DSM) potential analysis for electricity and natural gas, energy efficiency program design, supply curve development, and analysis of wasted energy.

EnerNOC teamed with YouGov|Definitive Insights and Washington University in St. Louis to perform saturation surveys and program-interest research with Ameren Illinois customers. The EnerNOC team worked in collaboration with Applied Energy Group who, under separate contract with Ameren Illinois, performed the program analysis. This report represents the combined effort of these four organizations.

Objectives

The study addresses energy efficiency potential and informs the program design process in the following ways:

- Develop 3-year plan for electric and natural gas EE programs implemented in Cycle 3 (2014-2017)
- Develop EE potential estimates for 2017-2024 for benchmarking and future analyses
- Conduct market research to better represent customers in the Ameren Illinois service territory
- Quantify wasted energy due to customer behavior

Report Organization

This report is presented in 6 volumes as outlined below. This document is **Volume 3: Energy Efficiency Potential Analysis**.

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Energy Efficiency Potential Analysis
- Volume 4, Program Analysis
- Volume 5, Supply Curves
- Volume 6, EE Potential Analysis Appendices

Definitions of Potential

In this study, we estimate the potential for energy efficiency savings. The savings estimates represent net savings[1] developed into three types of potential: technical potential, economic potential, and achievable potential. Technical and economic potential are both theoretical limits to efficiency savings. Achievable potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase, the maintenance activities they undertake, the controls they use for energy-consuming equipment, and the elements of building construction. Because estimating achievable potential involves the inherent uncertainty of predicting human behaviors and responses to market conditions, we developed realistic and maximum achievable potential as boundaries for a likely range. The various levels are described below.

- **Technical Potential** is defined as the theoretical upper limit of energy efficiency potential. It assumes that customers adopt all feasible measures regardless of their cost. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option. Examples of measures that make up technical potential for electricity in the residential sector include:

    - Ductless mini-split air conditioners with variable refrigerant flow
    - Ground source (or geothermal) heat pumps
    - LED lighting

    Technical potential also assumes the adoption of every other available measure, where applicable. For example, it includes installation of high-efficiency windows in all new construction opportunities and air conditioner maintenance in all existing buildings with central and room air conditioning. These retrofit measures are phased in over a number of years, which is longer for higher-cost and complex measures.

- **Economic Potential** represents the adoption of all ***cost-effective*** energy efficiency measures. In this analysis, the cost effectiveness is measured by the total resource cost (TRC) test, which compares lifetime energy and capacity benefits to the incremental cost of the measure. If the benefits outweigh the costs (that is, if the TRC ratio is greater than 1.0), a given measure is considered in the economic potential. Customers are then assumed to purchase the most cost-effective option applicable to them at any decision juncture.

- **Maximum Achievable Potential** estimates customer adoption of economic measures when delivered through efficiency programs under ideal market, implementation, and customer preference conditions. Information channels are assumed to be established and efficient for marketing, educating consumers, and coordinating with trade allies and delivery partners. An appropriate regulatory framework is assumed so the utility is not financially penalized for offering programs. Maximum Achievable Potential establishes a maximum target for the EE savings that an administrator can hope to achieve through its EE programs and involves incentives that represent a substantial portion of the incremental cost combined with high administrative and marketing costs.

- **Realistic Achievable Potential** reflects expected program participation given barriers to customer acceptance, non-ideal implementation conditions, and limited program budgets. This represents a lower bound on achievable potential.

---

[1] Savings in "net" terms instead of "gross" terms mean that the baseline forecast does include naturally occurring efficiency. In other words, the baseline assumes that energy efficiency levels reflect that some customers are already purchasing the more efficient option. In the baseline forecast chapter we explore other types of baselines, including a codes and standards case and a business-as-usual case.

Abbreviations and Acronyms

Throughout the report we use several abbreviations and acronyms. Table 1-1 shows the abbreviation or acronym, along with an explanation.

Table 1-1 Explanation of Abbreviations and Acronyms

Acronym	Explanation
ACS	American Community Survey
AEO	Annual Energy Outlook forecast developed annual by the Energy Information Administration of the DOE
AHAM	Association of Home Appliance Manufacturers
B/C Ratio	Benefit to cost ratio
BEST	EnerNOC's Building Energy Simulation Tool
CAC	Central air conditioning
C&I	Commercial and industrial
CFL	Compact fluorescent lamp
DEEM	EnerNOC's Database of Energy Efficiency Measures
DEER	State of California Database for Energy-Efficient Resources
DSM	Demand side management
DR	Demand response
EE	Energy efficiency
EIA	Energy Information Administration
EISA	Energy Efficiency and Security Act of 2007
EPACT	Energy Policy Act of 2005
EPRI	Electric Power Research Institute
EUEA	Efficient Use of Energy Act
EUI	Energy-use index
HH	Household
HID	High intensity discharge lamps
LED	Light emitting diode lamp
LoadMAP	EnerNOC's Load Management Analysis and Planning™ tool
NWPCC	Northwest Power and Conservation Council
RTU	Roof top unit
Sq. ft.	Square feet
TRC	Total resource cost
TRM	Technical Reference Manual
UEC	Unit energy consumption

ANALYSIS APPROACH AND DATA DEVELOPMENT

This section describes the analysis approach taken for the study and the data sources used to develop the potential estimates.

Analysis Approach

To perform the energy efficiency analysis, EnerNOC used a bottom-up analysis approach as shown in Figure 2-1. This involved the following steps.

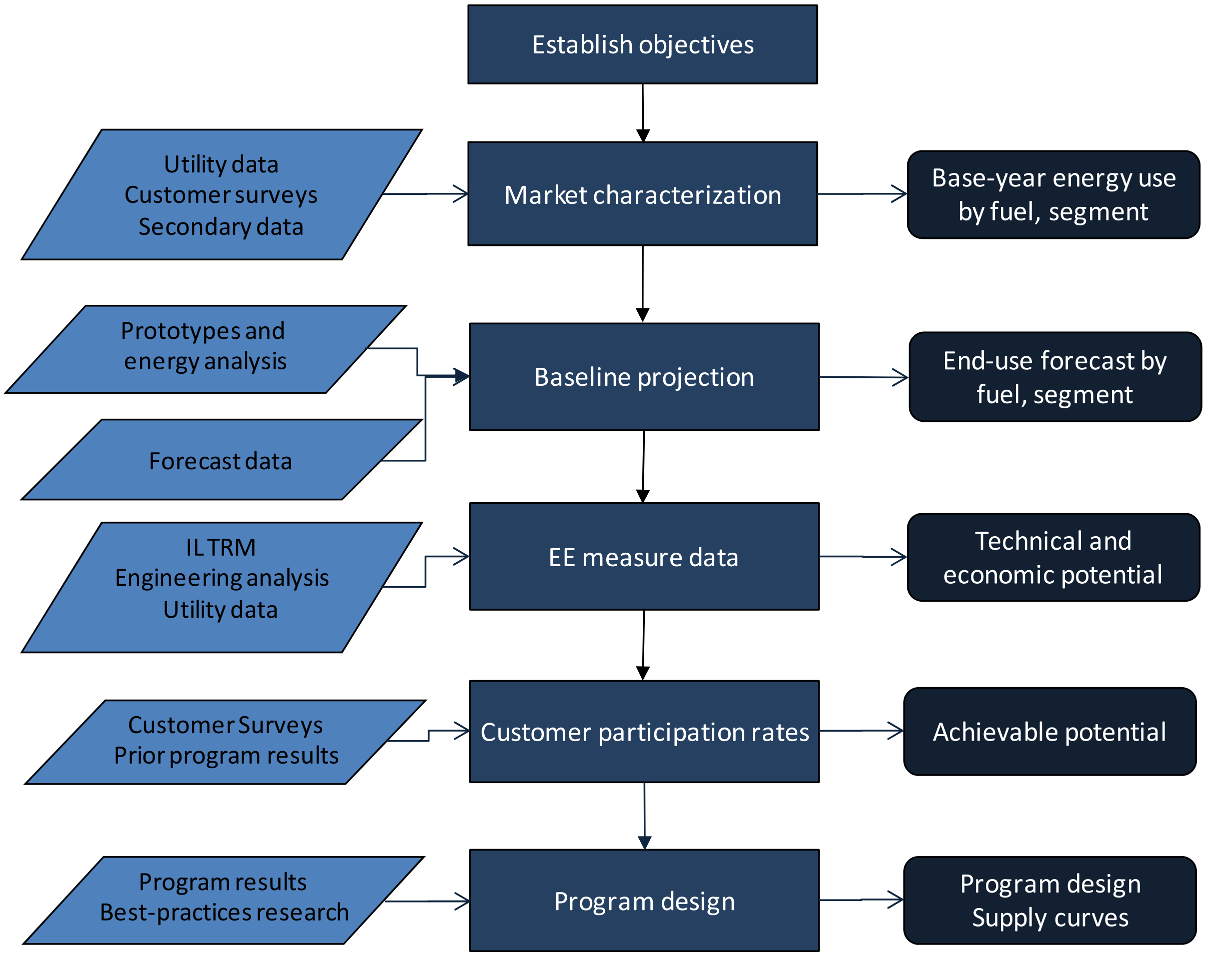
1. Held a meeting with the client project team to refine the objectives of the project in detail. This resulted in a work plan for the study.
2. Conducted primary market research to identify equipment saturations, building characteristics, measure applicability and saturations, occupant behavior, and customer interest in programs.[2]
3. Performed a market characterization to describe sector-level electricity and natural gas use for the residential, commercial, and industrial sectors for the base year, 2011. This included using the results from the customer surveys and other secondary data sources such as the Energy Information Administration (EIA).
4. Developed a baseline electricity and natural gas projection by sector, segment, and end use for 2011 through 2024. Results presented in this volume focus on the upcoming three-year implementation cycle of 2014 through 2016[3]. Results beyond 2016 are available in the Appendices and in the LoadMAP models.
5. Identified several hundred measures and estimated their effects in four levels of energy-efficiency potential: *Technical, Economic, Maximum Achievable,* and *Realistic Achievable*. Measure costs and savings were taken from the Illinois TRM where available.
6. Reviewed the current programs offered in Illinois in light of the study findings to make strategic program recommendations for achieving savings.
7. Worked with AEG to develop appropriate program designs.
8. Incorporated the results of the program design analysis to develop supply curves.
9. Quantified wasted energy due to customer behavior.

These steps are described in further detail throughout the remainder of this chapter.

[2] Details on the market research methodology and results are available in Volume 2, Market Research.

[3] Note that 2014 represents the plan year that runs June 1, 2014 through May 31, 2015 and 2016 represents the plan year that runs June 1, 2016, through May 31, 2017.

Figure 2-1 Overview of Analysis Approach



LoadMAP Model

We used EnerNOC's Load Management Analysis and Planning tool (LoadMAP™) version 3.0 to develop both the baseline projection and the estimates of energy efficiency potential. EnerNOC developed LoadMAP in 2007 and has enhanced it over time, using it for the EPRI National Potential Study and numerous utility-specific forecasting and potential studies. Built in Excel, the LoadMAP framework (see Figure 2-2) is both accessible and transparent and has the following key features.

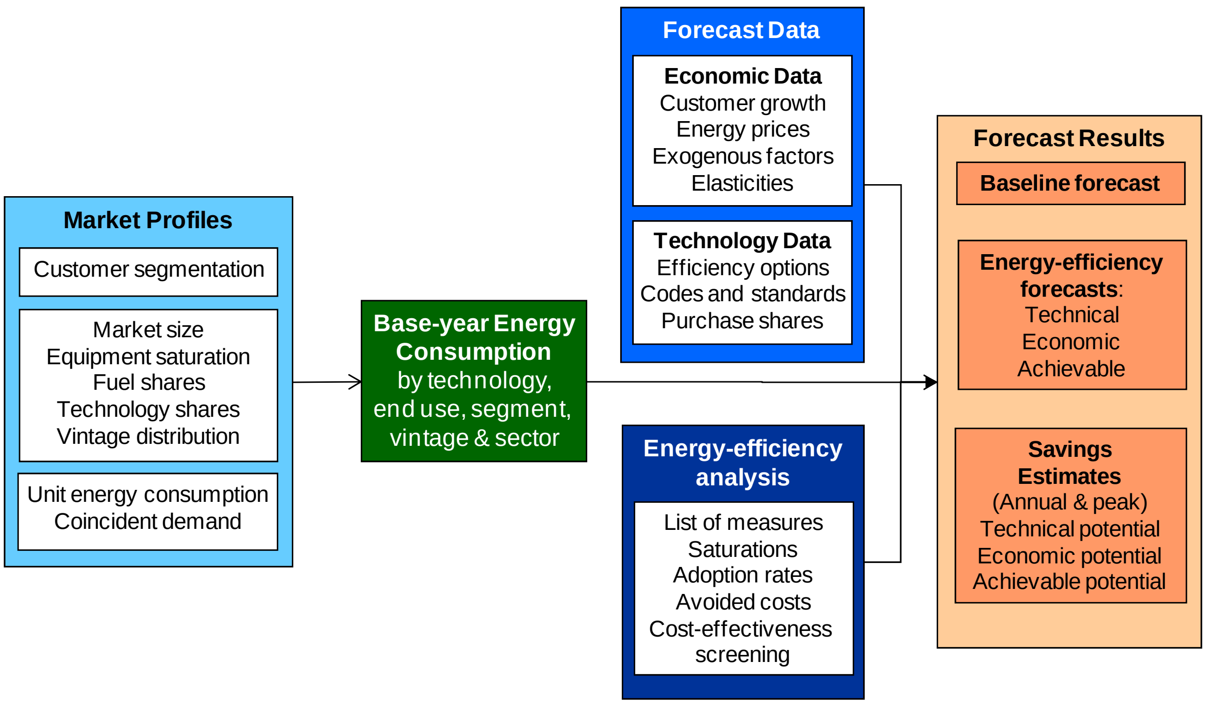
- Embodies the basic principles of rigorous end-use models (such as EPRI's REEPS and COMMEND) but in a more simplified, accessible form.
- Includes stock-accounting algorithms that treat older, less efficient appliance/equipment stock separately from newer, more efficient equipment. Equipment is replaced according to the measure life and appliance vintage distributions defined by the user.
- Balances the competing needs of simplicity and robustness by incorporating important modeling details related to equipment saturations, efficiencies, vintage, and the like, where market data are available, and treats end uses separately to account for varying importance and availability of data resources.
- Isolates new construction from existing equipment and buildings and treats purchase decisions for new construction and existing buildings separately.
- Uses a simple logic for appliance and equipment decisions. Other models available for this purpose embody complex decision choice algorithms or diffusion assumptions, and the model

parameters tend to be difficult to estimate or observe and sometimes produce anomalous results that require calibration or even overriding. The LoadMAP approach allows the user to drive the appliance and equipment choices year by year directly in the model. This flexible approach allows users to import the results from diffusion models or to input individual assumptions. The framework also facilitates sensitivity analysis.

- Includes appliance and equipment models customized by end use. For example, the logic for lighting is distinct from refrigerators and freezers.
- Can accommodate various levels of segmentation. Analysis can be performed at the sector level (e.g., total residential) or for customized segments within sectors (e.g., housing type or income level).

Consistent with the segmentation scheme and the market profiles we describe below, the LoadMAP model provides projections of baseline energy use by sector, fuel, segment, end use, and technology for existing and new buildings. It also provides projections of total energy use and energy-efficiency savings associated with the four types of potential.[4]

Figure 2-2 LoadMAP Analysis Framework



Market Characterization

In order to estimate the savings potential from energy-efficient measures, it is necessary to understand how much energy is used today and what equipment is currently being used. This characterization begins with a segmentation of Ameren Illinois' energy footprint to quantify energy use by sector, segment, fuel, end-use application, and the current set of technologies used. We incorporate information from the primary market research analysis to advise the market characterization.

[4] The model computes energy and peak-demand forecasts for each type of potential for each end use as an intermediate calculation. Annual-energy and peak-demand savings are calculated as the difference between the value in the baseline forecast and the value in the potential forecast (e.g., the technical potential forecast).

Segmentation for Modeling Purposes

The market assessment first defined the market segments (building types, end uses and other dimensions) that are relevant in Illinois. The segmentation scheme for this project is presented in Table 2-1.

Table 2-1 Overview of Segmentation Scheme for Potentials Modeling

Market Dimension	Segmentation Variable	Dimension Examples
1	Sector	Residential, commercial, industrial
2	Building type	Residential (housing type) Commercial (Office, Restaurant, Retail, etc.) Industrial (Food Products, Petroleum, Metals, etc.)
3	Vintage	Existing and new construction
4	Fuel	Electricity, natural gas
5	End uses	Cooling, heating, lighting, water heat, motors, etc. (as appropriate by sector)
6	Appliances/end uses and technologies	Technologies such as lamp type, air conditioning equipment, motors by functional use, etc.
7	Equipment efficiency levels for new purchases	Baseline and array of higher-efficiency options as appropriate for each technology

Following this scheme, the residential sector was segmented as described below, starting with customer segments by building type. The housing types are further separated based on what type of customer they are to Ameren Illinois. A single family- Electric only customer could represent an all-electric home or it could represent a single family home that gets the electricity service from Ameren Illinois, but the natural gas service from another utility. The designation Electric/Gas indicates that the customer receives both electricity and natural gas from Ameren Illinois. Gas only indicates that the customer receives natural gas from Ameren Illinois, but electricity from another utility. Ultimately, there are six segments in the residential analysis:

1. Single family - Electric only
2. Multi family – Electric only
3. Single family – Electric/Gas
4. Multi family – Electric/Gas
5. Single family – Gas only
6. Multi family Gas only

In addition to segmentation by housing type, we identified the set of end uses and technologies that are appropriate for Ameren Illinois. These are shown in Table 2-2 and Table 2-3.

Table 2-2 Residential Electric End Uses and Technologies

End Use	Technology
Cooling	Central AC
Cooling	Room AC
Cooling	Air-Source Heat Pump
Cooling	Geothermal Heat Pump
Cooling	PTHP
Heating	Electric Room Heat
Heating	Furnace
Heating	Air-Source Heat Pump
Heating	Geothermal Heat Pump
Heating	PTHP
Water Heating	Water Heater <= 55 gal
Water Heating	Water Heater > 55 gal
Interior Lighting	Screw-in
Interior Lighting	Linear Fluorescent
Interior Lighting	Specialty
Exterior Lighting	Screw-in
Appliances	Refrigerator
Appliances	Second Refrigerator
Appliances	Freezer
Appliances	Clothes Washer
Appliances	Clothes Dryer
Appliances	Dishwasher
Appliances	Stove
Appliances	Microwave
Electronics	Personal Computers
Electronics	Monitor
Electronics	Laptops
Electronics	TVs
Electronics	Printer/Fax/Copier
Electronics	Set-top Boxes/DVR
Electronics	Devices and Gadgets
Miscellaneous	Air Purifier/Cleaner
Miscellaneous	Dehumidifier
Miscellaneous	Pool Heater
Miscellaneous	Pool Pump
Miscellaneous	Hot Tub / Spa
Miscellaneous	Well Pump
Miscellaneous	Furnace Fan
Miscellaneous	Bathroom Exhaust Fan
Miscellaneous	Miscellaneous

Table 2-3 Residential Natural Gas End Uses and Technologies

End Use	Technology
Heating	Furnace
Heating	Boiler
Heating	Other Heating
Water Heating	Water Heater <= 55 gal
Water Heating	Water Heater > 55 gal
Appliances	Clothes Dryer
Appliances	Stove
Miscellaneous	Pool Heater
Miscellaneous	Hot Tub / Spa
Miscellaneous	Miscellaneous

For the commercial sector, it is useful to analyze the segments based on the unique characteristics of the building type. We also segmented electricity use and natural gas use. For this study, we used the following building types for each fuel.

- Office—all types of offices, including medical/dental offices, and large government facilities
- Restaurant—fast-food, sit-down and cafeteria-style restaurants
- Retail—retail establishments such as small boutiques, and large box retailers
- Grocery—convenience stores, small markets, and supermarkets
- College—colleges, universities and technical colleges
- School—primary and secondary schools
- Health—hospitals and nursing homes
- Lodging—motels, hotels, resorts and small inns
- Warehouse—storage facilities, refrigerated and unrefrigerated
- Miscellaneous—all remaining building types, such as police stations, parking garages, public assembly, amusement parks, etc.

In addition to segmentation by building type, we identified the set of end uses and technologies that are appropriate for Ameren Illinois. Table 2-4 and Table 2-5 list the end uses and technologies used in this study.

Table 2-4 Commercial Electric End Uses and Technologies

End Use	Technology
Cooling	Air-Cooled Chiller
Cooling	Water-Cooled Chiller
Cooling	Roof top AC
Cooling	Air Source Heat Pump
Cooling	Geothermal Heat Pump
Cooling	PTAC
Cooling	PTHP
Cooling	Evaporative AC
Heating	Air Source Heat Pump
Heating	Geothermal Heat Pump
Heating	Electric Room Heat
Heating	Electric Furnace
Heating	PTAC
Heating	PTHP
Ventilation	Ventilation
Water Heating	Water Heating
Interior Lighting	Screw-in
Interior Lighting	High-Bay Fixtures
Interior Lighting	Linear Fluorescent
Exterior Lighting	Screw-in
Exterior Lighting	HID
Exterior Lighting	Linear Fluorescent
Refrigeration	Walk-in Refrigerator
Refrigeration	Reach-in Refrigerator
Refrigeration	Glass Door Display
Refrigeration	Open Display Case
Refrigeration	Icemaker
Refrigeration	Vending Machine
Food Preparation	Oven
Food Preparation	Fryer
Food Preparation	Dishwasher
Food Preparation	Hot Food Container
Food Preparation	Other
Office Equipment	Desktop Computer
Office Equipment	Laptop
Office Equipment	Server
Office Equipment	Monitor
Office Equipment	Printer/Copier/Fax
Office Equipment	POS Terminal
Miscellaneous	Non-HVAC Motors
Miscellaneous	Pool Pump
Miscellaneous	Pool Heater
Miscellaneous	Miscellaneous

Table 2-5 Commercial Natural Gas End Uses and Technologies

End Use	Technology
Heating	Furnace
Heating	Boiler
Heating	Unit Heater
Water Heating	Water Heater
Food Preparation	Oven
Food Preparation	Fryer
Food Preparation	Broiler
Food Preparation	Griddle
Food Preparation	Range
Food Preparation	Steamer
Food Preparation	Other
Miscellaneous	Pool Heater
Miscellaneous	Miscellaneous

For the industrial sector, the study isolated the top four industries in Ameren Illinois by energy consumption, which accounted for 75% of the total 2011 industrial electricity sales and 65% of natural gas sales. The remaining group of industrial customers is considered in aggregate as "other industrial.[5]" While the commercial sector has a relatively small set of building types that have relatively uniform characteristics, the sheer number of unique industry types makes it infeasible to perform a deep dive into all but the largest ones. This results in a larger "other" segment than that which exists in the commercial sector. Nonetheless, these "other" industries typically have energy use characteristics that are similar enough to perform an accurate potential assessment.

The resulting segmentation is as follows for electricity and natural gas:

- Food products
- Petroleum
- Metals
- Machinery
- Other industrial

In addition to segmentation by industry, we identified the set of end uses and technologies that are appropriate for Ameren Illinois. These are shown in Table 2-6 and Table 2-7.

[5] Natural Gas customers that have opted out of energy efficiency programs (Self-Direct Customers) have been removed.

Table 2-6 Industrial Electric End Uses and Technologies

End Use	Technology
Cooling	Air-Cooled Chiller
Cooling	Water-Cooled Chiller
Cooling	Roof top AC
Cooling	Other Cooling
Cooling/Heating	Air-Source Heat Pump
Cooling/Heating	Geothermal Heat Pump
Heating	Electric Resistance
Heating	Electric Furnace
Ventilation	Ventilation
Interior Lighting	Screw-in
Interior Lighting	High-Bay Fixtures
Interior Lighting	Linear Fluorescent
Exterior Lighting	Screw-in
Exterior Lighting	HID
Exterior Lighting	Linear Fluorescent
Motors	Pumps
Motors	Fans & Blowers
Motors	Compressed Air
Motors	Material Handling
Motors	Material Processing
Motors	Other Motors
Process	Process Heating
Process	Process Cooling and Refrigeration
Process	Electro-Chemical Processes
Process	Other Process
Miscellaneous	Miscellaneous

Table 2-7 Industrial Natural Gas End Uses and Technologies

End Use	Technology
Heating	Furnace
Heating	Boiler
Heating	Other Heating
Process	Process Heating
Process	Process Boiler
Process	Process Cooling and Refrigeration
Process	Other Process
Miscellaneous	Miscellaneous

With the segmentation scheme defined, we then performed a high-level market characterization of electricity and natural gas sales in the base year to allocate sales to each customer segment. We used various data sources to identify the annual sales in each customer segment, as well as the market size for each segment. This information provided control totals at a sector level for calibrating the LoadMAP model to known data for the base-year.

Market Profiles

The next step was to develop market profiles for each sector, customer segment, end use, and technology. A market profile includes the following elements:

- **Market size** is a representation of the number of customers in the segment. For the residential sector, it is number of households. In the commercial sector, it is floor space measured in square feet. For the industrial sector, it is number of employees.
- **Saturations** define the fraction of homes and square feet with the various technologies. (e.g., homes with electric space heating, commercial floor space with gas water heating).
- **UEC (unit energy consumption) or EUI (energy-use index)** describes the amount of energy consumed in 2011 by a specific technology in buildings that have the technology. For electricity, UECs are expressed in kWh/household for the residential sector, and EUIs are expressed in kWh/square foot or kWh/employee for the commercial and industrial sectors, respectively.
- **Intensity** for the residential sector represents the average energy use for the technology across all homes in 2011. It is computed as the product of the saturation and the UEC and is defined as kWh/household for electricity. For the commercial and industrial sectors, intensity, computed as the product of the saturation and the EUI, represents the average use for the technology across all floor space or all employees in 2011.
- **Usage** is the annual energy use by a technology/end use in the segment. It is the product of the market size and intensity and is quantified in GWh for electricity and MMTherms for natural gas.

The market assessment results and the market profiles are presented in Chapter 3.

Baseline Projection

The next step was to develop the baseline projection of annual electricity and natural gas usage for 2011 through 2023 by customer segment and end use without new utility programs or naturally occurring efficiency. The end-use forecast does include the relatively certain impacts of codes and standards that will unfold over the study timeframe. All such mandates that were defined as of January 2012 are included in the baseline. The baseline projection is the foundation for the analysis of savings from future EE efforts as well as the metric against which potential savings are measured.

Inputs to the baseline projection include:

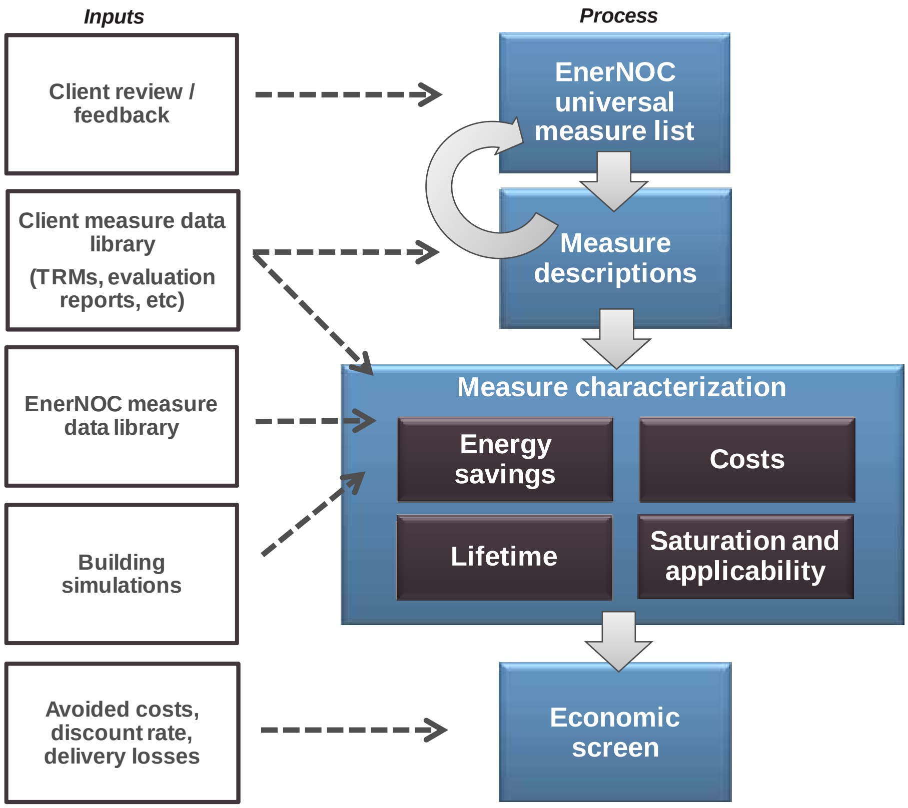
- Current economic growth forecasts (i.e., customer growth, income growth)
- Electricity and natural gas price forecasts
- Trends in fuel shares and equipment saturations
- Existing and approved changes to building codes and equipment standards

We present the results of the baseline projection development in Chapter 4.

Energy Efficiency Measure Analysis

This section describes the framework used to assess the savings, costs, and other attributes of energy-efficiency measures. These characteristics form the basis for measure-level cost-effectiveness analyses as well as for determining measure-level savings. For all measures, EnerNOC assembled information to reflect equipment performance, incremental costs, and equipment lifetimes. We used this information, along with Ameren Illinois' avoided costs data, in the economic screen to determine economically feasible measures. Figure 2-3 outlines the framework for measure analysis.

Figure 2-3 Approach for Measure Assessment



The framework for assessing savings, costs, and other attributes of energy efficiency measures involves identifying the list of energy efficiency measures to include in the analysis, determining their applicability to each market sector and segment, fully characterizing each measure, and performing cost-effectiveness screening.

We compiled a robust list of energy efficiency measures for each customer sector, drawing upon the Ameren Illinois program experience and protocols, the Illinois TRM, EnerNOC's own measure databases and building simulation models, stakeholder input and secondary sources. This universal list of EE measures covers all major types of end-use equipment, as well as devices and actions to reduce energy consumption. If considered today, some of these measures would not pass the economic screens initially, but may pass in future years as a result of lower projected equipment costs or higher avoided costs.

The selected measures are categorized into two types according to the LoadMAP taxonomy: equipment measures and non-equipment measures.

- **Equipment measures** are efficient energy-consuming pieces of equipment that save energy by providing the same service with a lower energy requirement than a standard unit. An example is an ENERGY STAR refrigerator that replaces a standard efficiency refrigerator. For equipment measures, many efficiency levels may be available for a given technology, ranging from the baseline unit (often determined by code or standard) up to the most efficient product commercially available. For instance, in the case of central air conditioners, this list begins with the current federal standard SEER 13 unit and spans a broad spectrum up to a maximum efficiency of a SEER 21 unit.
- **Non-equipment measures** save energy by reducing the need for delivered energy, but do not involve replacement or purchase of major end-use equipment (such as a refrigerator or air conditioner). An example would be a programmable thermostat that is pre-set to run heating and cooling systems only when people are home. Non-equipment measures can apply to more than one end use. For instance, addition of wall insulation will affect the energy use of both space heating and cooling. Non-equipment measures typically fall into one of the following categories:
    - Building shell (windows, insulation, roofing material)
    - Equipment controls (thermostat, energy management system)
    - Equipment maintenance (cleaning filters, changing setpoints)
    - Whole-building design (building orientation, passive solar lighting)
    - Lighting retrofits (included as a non-equipment measure because retrofits are performed prior to the equipment's normal end of life)
    - Displacement measures (ceiling fan to reduce use of central air conditioners)
    - Commissioning and retrocommissioning

We developed a preliminary list of EE measures, which was distributed to the stakeholders for review. The list was finalized after incorporating comments, and can be found in Chapter 5 of this report.

Once we assembled the list of EE measures, the project team assessed their energy-saving characteristics. For each measure we also characterized incremental cost, service life, and other performance factors. Following the measure characterization, we performed an economic screening of each measure, which serves as the basis for developing the economic and achievable potential.

Representative Measure Data Inputs

To provide an example of the measure data, Table 2-8 and Table 2-9 present samples of the detailed data inputs behind both equipment and non-equipment measures, respectively, for the case of residential CAC in single-family homes. Table 2-8 displays the various efficiency levels available as equipment measures, as well as the corresponding useful life, energy usage, and cost estimates. The columns labeled On Market and Off Market reflect equipment availability due to codes and standards or the entry of new products to the market.

Table 2-8 Sample Equipment Measures for Central Air Conditioning – Single Family Home

Efficiency Level	Useful Life	Equipment Cost	Energy Usage(kWh/yr)	On Market	Off Market
SEER 13	18	$3,311	2,287	2011	n/a
SEER 14.5 (ENERGY STAR)	18	$3,716	2,097	2011	n/a
SEER 15 (CEE Tier 2)	18	$4,120	2,013	2011	n/a
SEER 16 (CEE Tier 3)	18	$4,524	1,942	2011	n/a
SEER 17 (Ductless Mini-split)	18	$5,943	1,882	2011	n/a
SEER 21	18	$6,395	1,524	2011	n/a

Table 2-9 lists some of the non-equipment measures applicable to CAC in an existing single-family home. All measures are evaluated for cost effectiveness based on the lifetime benefits relative to the cost of the measure. The total savings and costs are calculated for each year of the study and depend on the base year saturation of the measure, the applicability[6] of the measure, and the savings as a percentage of the relevant energy end uses.

Table 2-9 Sample Non-Equipment Measures – Single Family Home, Existing

End Use	Measure	Saturation in 2011[7]	Applica-bility	Lifetime (yrs)	Measure Installed Cost	Energy Savings (%)
Cooling	Central AC - Maintenance	37%	100%	2	$175	5%
Cooling	Repair and Sealing – Ducting	16%	50%	18	$498	16%
Cooling	Insulation - Ceiling	33%	38%	20	$363	1%
Cooling	Windows – Install Reflective Film	5%	45%	10	$1,029	11%
Cooling	Windows - ENERGY STAR	47%	90%	20	$7,134	32%

Screening Measures for Cost-Effectiveness

Only measures that are cost-effective are included in economic and achievable potential. Therefore, for each individual measure, LoadMAP performs an economic screen. This study uses the TRC test that compares the lifetime energy benefits (and peak demand for electricity) of each applicable measure with its incremental installed cost, including material and labor. There is no program administration cost considered in this analysis, and therefore, no specific program delivery methods or mechanisms are assumed. The lifetime benefits are calculated by multiplying the annual energy and demand savings for each measure by all appropriate avoided costs for each year, and discounting the dollar savings to the present value equivalent. The analysis uses each measure’s values for savings, costs, and lifetimes that were developed as part of the measure characterization process described above.

[6] The applicability factors take into account whether the measure is applicable to a particular building type and whether it is feasible to install the measure. For instance, attic fans are not applicable to homes where there is insufficient space in the attic or there is no attic at all.

[7] Note that saturation levels reflected for the base year change over time as more measures are adopted.

The LoadMAP model performs this screening dynamically, taking into account changing savings and cost data over time. Thus, some measures pass the economic screen for some — but not all — of the years in the projection.

It is important to note the following about the economic screen:

- The economic evaluation of every measure in the screen is conducted relative to a baseline condition. For instance, in order to determine the kilowatt-hour (kWh) savings potential of a measure, kWh consumption with the measure applied must be compared to the kWh consumption of a baseline condition.
- The economic screening was conducted only for measures that are applicable to each building type and vintage; thus if a measure is deemed to be irrelevant to a particular building type and vintage, it is excluded from the respective economic screen.

Table 2-10 shows the results of the economic screen for CAC and select other measures. Throughout the time frame shown, the most cost-effective CAC option is SEER 16 (starting in 2022). For water heaters with 55 gallons or less, the baseline unit of EF 0.9 is cost effective until 2015, when the new standard comes into effect. For refrigerators the AHAM federal efficiency standards cause existing ENERGY STAR units to become unavailable in 2014. Units compliant with AHAM 2014 thus become the new minimum efficiency baseline and are therefore assigned a benefit-to-cost (B/C) ratio of 1. Since there is not a more efficient, cost-effective unit available, they become the economic unit by default. If the measure passes the screen (has a B/C ratio greater than or equal to 1), the measure is included in economic potential. Otherwise, it is screened out for that year. If multiple equipment measures have B/C ratios greater than or equal to 1.0, the most efficient technology is selected by the economic screen.

Table 2-10 Economic Screen Results for Selected Residential Equipment Measures

Technology	2013	2014	2015	2016
Central AC	SEER 13	SEER 14.5	SEER 14.5	SEER 14.5
Water heater <= 55 gal	EF 0.9	EF 0.9	EF 0.95	EF 0.95
Refrigerator	ENERGY STAR	AHAM (2014)	AHAM (2014)	AHAM (2014)

Energy-Efficiency Potential

The approach we used for this study adheres to the approaches and conventions outlined in the National Action Plan for Energy-Efficiency (NAPEE) Guide for Conducting Potential Studies (November 2007).[8] The NAPEE Guide represents the most credible and comprehensive industry practice for specifying energy-efficiency potential. As described in Chapter 1, four types of potentials were developed as part of this effort: Technical potential, Economic potential, Maximum Achievable Potential and Realistic Achievable Potential

The calculation of Technical and Economic potential is a straightforward algorithm. To develop estimates for **Achievable potential**, we develop market adoption rates for each measure that specify the percentage of customers that will select the highest–efficiency economic option. The market adoption rates are developed based on the results of the program interest surveys that were conducted as part of the primary market research. This more accurately reflects the attitudes of Ameren Illinois' customers.

For **Realistic Achievable**, we used the average take rates for a 3-year payback period for the measure. Several measures were tested in the survey. These were then mapped to the other remaining measures based on familiarity and ease of installing. For **Maximum Achievable**, we used the 1-year payback take rates for those respondents that were more aware and/or more experienced with the measure. This represents a scenario where customers are aware of the

[8] National Action Plan for Energy Efficiency (2007). *National Action Plan for Energy Efficiency Vision for 2025: Developing a Framework for Change*. www.epa.gov/eeactionplan.

measure and the program and receive a higher incentive that reduces the payback to one year. Volume 2 provides detailed information about the estimation of take rates.

Based on EnerNOC's experience running programs and evaluating programs at other utilities, we estimate that the take rates will increase slightly each year as the program and awareness ramps up. Therefore we increase the base year take rates by 0.5% per year. The overall energy efficiency potential results are available in Chapter 6, and the results by sector are given in Chapter 7.

Program Design

Once the measure level results were developed, EnerNOC provided the measure costs and savings to AEG to develop energy efficiency programs. AEG worked closely with the Ameren Illinois team to develop effective programs based on their recent experience and industry best practices. AEG provided a mapping of measures to programs and developed incentive and program administration budgets. Details about program design are presented in Volume 4.

Supply Curves

Based on the results of the program design step, EnerNOC then developed several supply curves to match a variety of scenarios:

- Achievable potential in aggregate for all rate classes; with rate cap limits specified in the Act
- Achievable potential in aggregate for all rate classes; without rate cap limits specified in the Act
- Achievable potential disaggregated by rate class
- Achievable potential disaggregated by rate class by rate cap limits specified in the Act
- Achievable potential disaggregated by rate class by 0.5% increments above rate cap limits all the way to the estimated limit of achievable potential
- For electricity only, achievable potential disaggregated for the "bundled service" customer segment defined as "eligible retail customers" per the Illinois Public Agency Act and which are 150 kW and below and not obtaining energy from alternate retail energy suppliers.

Additional information about supply curve development is presented in Volume 5.

Wasted Energy

The goal of the wasted energy task is to identify wasted energy and assess the potential energy savings that could be achieved by minimizing it. The term "wasted energy" is defined as excessive energy use that is a result of a customer's behavioral choices. Examples include leaving lights turned on in an unoccupied room, not performing regular maintenance on HVAC equipment, not replacing furnace filters, leaving office equipment on overnight, or leaving cell phone chargers plugged in when not in use.

For the Ameren Illinois study, we refined the definition of wasted energy to consider customer-lifestyle decisions. For example, if a customer prefers to maintain a temperature of 68 degrees year round when at home, this is not considered wasted energy. Similarly, if a customer leaves a light on overnight for personal security, it is not considered wasted energy.

In the study, we identified measures that eliminate the waste associated with customer behavior. Examples of the types of measures that address wasted energy include the following:

- Installing programmable thermostats
- Replacing furnace filters
- Installing occupancy sensors
- Sealing ducts

- Installing photosensors on exterior lighting
- Installing plug-load occupancy sensors
- Regular equipment maintenance

By categorizing measures into “wasted energy” we are then able to calculate the savings that can are associated with wasted energy, as opposed to efficient use of energy, or savings from increased efficiency of equipment. In Chapter 10, we show how we defined wasted energy and how much of the energy efficiency can be attributed to wasted energy.

Data Development

This section details the data sources used in this study, followed by a discussion of how these sources were applied. In general, data were adapted to local conditions, for example, by using local sources for measure data and local weather for building simulations.

Data Sources

The data sources are organized into the following categories:

- Ameren Illinois and Illinois - statewide data
- EnerNOC’s databases and analysis tools
- Other secondary data and reports

Ameren Illinois Data

Our highest priority data sources for this study were those that were specific to Ameren Illinois.

- **Utility 2011 billing data.** The data request included billing data for 2011, the most recent year that complete billing data was available. Ameren Illinois provided 2011 electricity sales, natural gas sales, customers by sector, and customer contact information for the primary market research.
- **Utility forecasts:** Ameren Illinois provided a customer growth forecast by sector; energy (electricity and natural gas) and peak demand sales forecasts at the sector level; and retail price history and forecast, where available.
- **Economic information:** Ameren Illinois provided the avoided costs, discount rate, and line loss factor.
- **Primary market research:** As part of the study, EnerNOC and You Gov| Definitive Insights conducted customer surveys to characterize equipment and measure saturation, as well as customer interest in energy efficiency measures and programs.
- **Illinois TRM:** Ameren Illinois provided EnerNOC the final copy of the Illinois TRM that went into effect in June 2012. The TRM was used for characterizing the energy efficiency measures evaluated as part of the study.

EnerNOC Databases, Analysis Tools, and Reports

EnerNOC maintains several databases and modeling tools that we use for forecasting and potential studies.

- ***EnerNOC Energy Market Profiles Database*:** For more than 10 years, EnerNOC staff have maintained profiles of end-use consumption for the residential, commercial, and industrial sectors. These profiles include market size, fuel shares, unit consumption estimates, and annual energy use by fuel (electricity and natural gas), customer segment and end use for 10 regions in the U.S. The Energy Information Administration surveys (RECS, CBECS and MECS) as well as state-level statistics and local customer research provide the foundation for these regional profiles.

- ***Building Energy Simulation Tool (BEST)***. EnerNOC's BEST is a derivative of the DOE 2.2 building simulation model, used to estimate base-year UECs and EUIs, as well as measure savings for the HVAC-related measures.
- ***EnerNOC's EnergyShape™*****:** This database of load shapes includes the following: Residential – electric load shapes for 10 regions, 3 housing types, 13 end uses; Commercial – electric load shapes for 9 regions, 54 building types, 10 end uses; Industrial – electric load shapes, whole facility only, 19 2-digit SIC codes, as well as various 3-digit and 4-digit SIC codes
- ***EnerNOC's Database of Energy Efficiency Measures (DEEM)*****:** EnerNOC maintains an extensive database of measure data for our studies. Our database draws upon reliable sources including the California Database for Energy Efficient Resources (DEER), the EIA Technology Forecast Updates – Residential and Commercial Building Technologies – Reference Case, RS Means cost data, and Grainger Catalog Cost data**.**
- **Recent studies**. EnerNOC has conducted numerous studies of EE potential in the last five years. We checked our input assumptions and analysis results against the results from these other studies, which include AmerenUE, State of New Jersey, Los Angeles Department of Water and Power, Consolidated Edison of New York, Avista Utilities, the State of New Mexico, Tennessee Valley Authority, and Seattle City Light. In addition, we used the information about impacts of building codes and appliance standards from a recent report for the Institute for Energy Efficiency.[9]

Other Secondary Data and Reports

Finally, a variety of secondary data sources and reports were used for this study. The main sources are identified below.

- **Annual Energy Outlook**. The Annual Energy Outlook (AEO), conducted each year by the U.S. Energy Information Administration (EIA), presents yearly projections and analysis of energy topics. For this study, we used data from the 2012 AEO.
- **EPRI End-Use Models (REEPS and COMMEND)**. These models provide the elasticities we apply to electricity prices, household income, home size and heating and cooling.
- **Database for Energy Efficient Resources (DEER).** The California Energy Commission and California Public Utilities Commission (CPUC) sponsor this database, which is designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) for the state of California. We used the DEER database to cross check the measure savings we developed using BEST and DEEM.
- **Northwest Power and Conservation Council Sixth Plan workbooks.** To develop its Power Plan, the Council maintains workbooks with detailed information about measures.
- **Other relevant regional sources:** These include reports from the Consortium for Energy Efficiency, the Northeast Energy Efficiency Partnership, the EPA, and the American Council for an Energy-Efficient Economy.

Data Application

We now discuss how the data sources described above were used for each step of the study.

Data Application for Market Characterization

To construct the high-level market characterization of electricity use and households/floor space for the residential, commercial, and industrial sectors, we applied the following data sources:

[9] "Assessment of Electricity Savings in the U.S. Achievable through New Appliance/Equipment Efficiency Standards and Building Efficiency Codes (2010 – 2025)." Global Energy Partners, LLC for the Institute for Electric Efficiency, May 2011. http://www.edisonfoundation.net/iee/reports/IEE_CodesandStandardsAssessment_2010-2025_UPDATE.pdf

- Ameren Illinois customer surveys to allocate residential customers by housing type. This was compared to American Community Survey (ACS) and other Ameren Illinois studies.
- Ameren Illinois billing data and customer surveys to estimate sales and square footage by building type for the commercial sector. The estimates were also compared with EIA, AEO 2012 and our Energy Market Profiles Database.
- Ameren Illinois billing data and customer surveys to estimate energy use by industry type and employment for the industrial sector. These estimates were then compared to EIA, Bureau of Labor Statistics and AEO 2012 data.

Data Application for Market Profiles

The specific data elements for the market profiles, together with the key data sources, are shown in Table 2-11. To develop the market profiles for each segment, we did the following:

1. Developed control totals for each segment. These include market size, segment-level annual electricity use, and annual intensity from the Ameren Illinois billing data.
2. Used the results of the saturation survey to incorporate information on existing appliance saturations, appliance and equipment characteristics, and building characteristics.
3. Incorporated secondary data sources to supplement and corroborate the data from items 1 and 2 above.
4. Compared and cross-checked with regional data obtained as part of the EPRI National Potential Study and with the Energy Market Profiles Database.
5. Ensured calibration to control totals for annual electricity and natural gas sales in each sector and segment.
6. Worked with Ameren Illinois staff to vet the data against their knowledge and experience.

Table 2-11 Data Applied for the Market Profiles

Model Inputs	Description	Key Sources
Market size	Base-year residential dwellings commercial floor space, and industrial employment	Utility billing data; Utility saturation survey
Annual intensity	Residential: Annual energy use (kWh/household) Commercial: Annual energy use (kWh/sq ft) Industrial: Annual energy use (kWh/employee)	Utility saturation survey Energy Market Profiles AEO 2012 Previous studies
Appliance/equipment saturations	Fraction of dwellings with an appliance/technology Percentage of C&I floor space/employment with equipment/technology	Utility saturation survey Energy Market Profiles
UEC/EUI for each end-use technology	UEC: Annual electricity use for a technology in dwellings that have the technology EUI: Annual electricity use per square foot/employee for a technology in floor space that has the technology	HVAC uses: BEST simulations using prototypes developed for Illinois Illinois TRM Engineering analysis DEEM Previous EnerNOC studies
Appliance/equipment vintage distribution	Age distribution for each technology	Utility saturation survey Previous EnerNOC studies
Efficiency options for each technology	List of available efficiency options and annual energy use for each technology	Illinois TRM DEEM DEER NWPCC workbooks AEO 2012

		Previous studies
Peak factors	Share of technology energy use that occurs during the peak hour	EnergyShape database

Data Application for Baseline Projection

Table 2-12 summarizes the LoadMAP model inputs required for the baseline projection. These inputs are required for each segment within each sector, as well as for new construction and existing dwellings/buildings.

Table 2-12 Data Needs for the Baseline Projection and Potentials Estimation in LoadMAP

Model Inputs	Description	Key Sources
Customer growth forecasts	Forecasts of new construction in residential and C&I sectors	Ameren Illinois forecast AEO 2012 growth forecast US BLS
Equipment purchase shares for baseline forecast	For each equipment/technology, purchase shares for each efficiency level; specified separately for existing equipment replacement and new construction	Shipments data from AEO AEO 2012 regional forecast assumptions[10] Appliance/efficiency standards analysis Ameren Illinois program results and evaluation reports
Electricity and natural gas prices	Forecast of average energy and capacity avoided costs and retail prices	Ameren Illinois forecast AEO 2012
Utilization model parameters	Price elasticities, elasticities for other variables (income, weather)	EPRI's REEPS and COMMEND models AEO 2012

The avoided cost forecasts implemented in the models, provided by Ameren Illinois, are available in Appendix G. The discount rate used for NPV analysis is a nominal rate of 7%.

We also implemented assumptions for known future equipment standards as of January, 2012, as shown in the tables below.

[10] We developed baseline purchase decisions using the Energy Information Agency's *Annual Energy Outlook* report (2011), which utilizes the National Energy Modeling System (NEMS) to produce a self-consistent supply and demand economic model. We calibrated equipment purchase options to match manufacturer shipment data for recent years and then held values constant for the study period. This removes any effects of naturally occurring conservation or effects of future DSM programs that may be embedded in the AEO forecasts.

Table 2-13 Residential Electric Equipment Standards Applicable to Illinois

Legend: Today's Efficiency or Standard Assumption; 1st Standard (relative to today's standard); 2nd Standard (relative to today's standard)

<table>
<tr><th>End Use</th><th>Technology</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td rowspan="4">Cooling</td><td>Central AC</td><td colspan="15">SEER 13</td></tr>
<tr><td>Room AC</td><td colspan="3">EER 9.8</td><td colspan="12">EER 11.0</td></tr>
<tr><td>Evaporative Central AC</td><td colspan="15">Conventional</td></tr>
<tr><td>Evaporative Room AC</td><td colspan="15">Conventional</td></tr>
<tr><td>Cooling/Heating</td><td>Heat Pump</td><td colspan="4">SEER 13.0/HSPF 7.7</td><td colspan="11">SEER 14.0/HSPF 8.0</td></tr>
<tr><td>Space Heating</td><td>Electric Resistance</td><td colspan="15">Electric Resistance</td></tr>
<tr><td rowspan="2">Water Heating</td><td>Water Heater (<=55 gallons)</td><td colspan="4">EF 0.90</td><td colspan="11">EF 0.95</td></tr>
<tr><td>Water Heater (>55 gallons)</td><td colspan="4">EF 0.90</td><td colspan="11">Heat Pump Water Heater</td></tr>
<tr><td rowspan="2">Lighting</td><td>Screw-in/Pin Lamps</td><td colspan="3">Incandescent</td><td colspan="6">Advanced Incandescent - tier 1 (20 lumens/watt)</td><td colspan="6">Advanced Incandescent - tier 2 (45 lumens/watt)</td></tr>
<tr><td>Linear Fluorescent</td><td colspan="2">T12</td><td colspan="13">T8</td></tr>
<tr><td rowspan="5">Appliances</td><td>Refrigerator/2nd Refrigerator</td><td colspan="3">NAECA Standard</td><td colspan="12">25% more efficient</td></tr>
<tr><td>Freezer</td><td colspan="3">NAECA Standard</td><td colspan="12">25% more efficient</td></tr>
<tr><td>Dishwasher</td><td colspan="2">Conventional (355kWh/yr)</td><td colspan="13">14% more efficient (307 kWh/yr)</td></tr>
<tr><td>Clothes Washer</td><td colspan="4">Conventional (MEF 1.26 for top loader)</td><td colspan="3">MEF 1.72 for top loader</td><td colspan="8">MEF 2.0 for top loader</td></tr>
<tr><td>Clothes Dryer</td><td colspan="4">Conventional (EF 3.01)</td><td colspan="11">5% more efficient (EF 3.17)</td></tr>
</table>

Table 2-14 Commercial and Industrial Electric Equipment Standards Applicable to Illinois

Today's Efficiency or Standard Assumption	1st Standard (relative to today's standard)
	2nd Standard (relative to today's standard)

<table>
<tr><th>End Use</th><th>Technology</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td>Cooling</td><td>Packaged Terminal AC/HP</td><td>EPACT 1992 Std</td><td colspan="14">EER 11.0/11.2</td></tr>
<tr><td>Lighting</td><td>Screw-in/Pin Lamps</td><td colspan="3">Incandescent</td><td colspan="6">Advanced Incandescent - tier 1 (20 lumens/watt)</td><td colspan="6">Advanced Incandescent - tier 2 (45 lumens/watt)</td></tr>
<tr><td></td><td>Linear Fluorescent</td><td colspan="2">T12</td><td colspan="13">T8</td></tr>
<tr><td rowspan="3">Refrigeration</td><td>Glass Door Display</td><td>EPACT 2005 Standard</td><td colspan="14">42% more efficient</td></tr>
<tr><td>Open Display Case</td><td>EPACT 2005 Standard</td><td colspan="14">18% more efficient</td></tr>
<tr><td>Vending Machines</td><td>EPACT 2005 Standard</td><td colspan="14">33% more efficient</td></tr>
<tr><td rowspan="2">Miscellaneous</td><td>Non-HVAC Motors</td><td colspan="4">62.3% Efficiency</td><td colspan="11">70% Efficiency</td></tr>
<tr><td>Commercial Laundry</td><td colspan="2">MEF 1.26</td><td colspan="13">MEF 1.6</td></tr>
</table>

Table 2-15 Residential Gas Appliance Standards Applicable to Illinois

Today's Efficiency or Standard Assumption
Next Standard (relative to today's standard)

<table>
<tr><th>End Use</th><th>Technology</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td rowspan="2">Space Heating</td><td>Furnace</td><td colspan="15">AFUE 80%</td></tr>
<tr><td>Boiler</td><td colspan="2">EF 0.81</td><td colspan="13">EF 0.82</td></tr>
<tr><td rowspan="2">Water Heating</td><td>Water Heater (<=55 gallons)</td><td colspan="4">EF 0.59</td><td colspan="11">EF 0.62</td></tr>
<tr><td>Water Heater (>55 gallons)</td><td colspan="4">EF 0.59</td><td colspan="11">Condensing Technology</td></tr>
<tr><td rowspan="2">Appliances</td><td>Clothes Dryer</td><td colspan="4">Conventional</td><td colspan="11">5% more efficient</td></tr>
<tr><td>Range/Oven</td><td>Conventional</td><td colspan="14">No Standing Pilot Light</td></tr>
<tr><td>Miscellaneous</td><td>Pool Heater</td><td colspan="2">Conventional</td><td colspan="13">EF 0.82</td></tr>
</table>

Table 2-16 Commercial and Industrial Gas Appliance Standards Applicable to Illinois

Today's Efficiency or Standard Assumption
Next Standard (relative to today's standard)

<table>
<tr><th>End Use</th><th>Technology</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td>Space Heating</td><td>Boiler</td><td>EF 0.76</td><td colspan="14">EF 0.82</td></tr>
<tr><td>Miscellaneous</td><td>Pool Heater</td><td colspan="2">Conventional</td><td colspan="13">EF 0.82</td></tr>
</table>

Energy Efficiency Measure Data Application

Table 2-17 details the data sources used for measure characterization.

Table 2-17 Data Needs for the Measure Characteristics in LoadMAP

Model Inputs	Description	Key Sources
Energy Impacts	The annual reduction in consumption attributable to each specific measure. Savings were developed as a percentage of the energy end use that the measure affects.	Illinois TRM BEST DEEM DEER NWPCC workbooks Other secondary sources
Peak Demand Impacts	Savings during the peak demand periods are specified for each electric measure. These impacts relate to the energy savings and depend on the extent to which each measure is coincident with the system peak.	Illinois TRM BEST EnergyShape
Costs	Equipment Measures: Includes the full cost of purchasing and installing the equipment on a per-household, per-square-foot, or per employee basis for the residential, commercial, and industrial sectors, respectively. Non-equipment measures: Existing buildings – full installed cost. New Construction - the costs may be either the full cost of the measure, or as appropriate, it may be the incremental cost of upgrading from a standard level to a higher efficiency level.	Illinois TRM DEEM DEER NWPCC workbooks RS Means Other secondary sources
Measure Lifetimes	Estimates derived from the technical data and secondary data sources that support the measure demand and energy savings analysis.	Illinois TRM DEEM DEER NWPCC workbooks Other secondary sources
Applicability	Estimate of the percentage of either dwellings in the residential sector or square feet/employment in the C&I sectors where the measure is applicable and where it is technically feasible to implement.	Illinois TRM DEEM DEER Other secondary sources
On Market and Off Market Availability	Expressed as years for equipment measures to reflect when the equipment technology is available or no longer available in the market.	EnerNOC appliance standards and building codes analysis

Data Application for Cost-effectiveness Screening

To perform the cost-effectiveness screening, a number of economic assumptions were needed. All cost and benefit values were analyzed as real 2011 dollars. A discount rate of 7% in nominal terms was used. This is equivalent to a 3.93% discount rate in real terms when adjusting for 2.92% inflation.[11] Electric delivery losses of 6.7% and natural gas delivery losses of 0.0085% were provided by Ameren Illinois.

[11] Inflation adjuster of 2.92% based on the average annual growth forecast in US Consumer Price Index from the 2012 Annual Energy Outlook for 2010-2035.

Achievable Potential Estimation

To estimate achievable potentials, three sets of parameters were required to account for the decision making behavior of humans in the efficiency marketplace.

- **Adoption curves for non-equipment measures**. Equipment measures are installed when existing units fail. Non-equipment measures do not have this natural periodicity, so rather than installing all available non-equipment measures in the first year of the projection (instantaneous potential), they are phased in according to adoption schedules that vary based on cost and complexity. The adoption rates used in this analysis take several factors into account to determine how quickly the market can absorb these measures. Typically, measures that cause disruption to the building, such as wall insulation in existing buildings, receive longer adoption curves, while those with drop-in installations, such as programmable thermostats in new buildings, receive shorter ones. High capital cost measures will also receive longer adoption curves than ones with low capital cost. These adoption rates are used within LoadMAP to generate the Technical and Economic potentials. In general, the rates align with the diffusion of similar equipment measures.
- **Maximum Achievable adoption rates**. These factors are applied to Economic potential to estimate the upper bound: Maximum Achievable. These estimate customer adoption of economic measures when delivered through efficiency programs under ideal market, implementation, and customer preference conditions. Information channels are assumed to be established and efficient for marketing, educating consumers, and coordinating with trade allies and delivery partners. The Maximum Achievable adoption rates are based on the take rates for a 1-year payback from customers that are aware and have information about energy efficiency measures and programs. The take rates were developed based on the results of the program interest survey conducted as part of this study and highlighted in Volume 1 of the report. Maximum Achievable Potential establishes a maximum target for the EE savings that an administrator can hope to achieve through its EE programs and involves incentives that represent a substantial portion of the incremental cost combined with high administrative and marketing costs.
- **Realistic Achievable adoption rates**. These factors are applied to Maximum Achievable Potential to calculate Realistic Achievable Potential. The Realistic Achievable adoption rates are based on the average three-year payback take rate from the primary market research. These rates reflect expected program participation given significant barriers to customer acceptance, non-ideal implementation conditions, and limited program budgets. This represents a lower bound on achievable potential.

Realistic Achievable and Maximum Achievable adoption rates are presented in Appendix E. The development of the take rates are detailed in Volume 2.

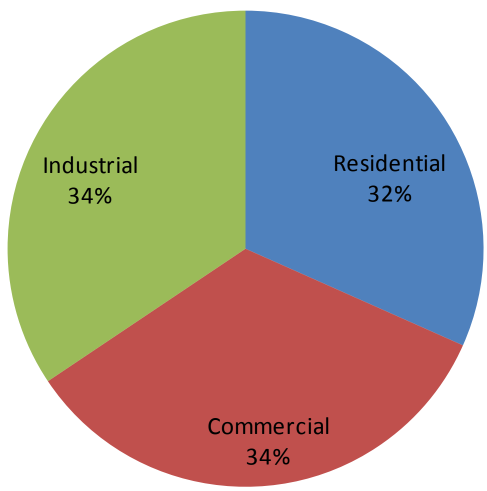
MARKET CHARACTERIZATION AND MARKET PROFILES

In this section, we describe how customers in Ameren Illinois' service area use electricity and natural gas in the base year of the study, 2011. It begins with a high-level summary of energy use by sector and then delves into each sector in detail.

Energy Use Summary

Total electricity use for the residential, commercial and industrial sectors for Illinois in 2011 was 36,571 GWh.[12] As shown in Figure 3-1, commercial and industrial account for 34% each (12,414 GWh for commercial and 12,580 GWh for industrial). The remaining consumption comes in the residential sector which in 2011 consumed 11,577 GWh.

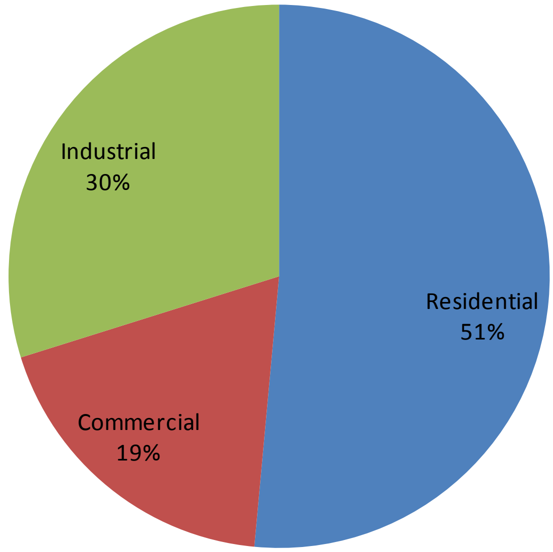
Figure 3-1 Sector-Level Electricity Use, 2011



Total natural gas use for all sectors in 2011 was 1,105 MMTherms. Note that the self-direct customers that have opted out of natural gas energy efficiency have been removed from the baseline projection. As shown in Figure 3-2, the largest sector is residential, accounting for 51%, or 569 MMTherms. The remaining use is split between the commercial and residential sectors, at 207 MMTherms and 330 MMTherms respectively.

[12] Energy given "at-the-meter," i.e. does not include line losses.

Figure 3-2 Sector-Level Natural Gas Use, 2011



Residential Sector

The total number of households, electric sales, and natural gas sales for the service area of Ameren Illinois were obtained for the year 2011 from Ameren Illinois customer database. In 2011, there were 1.25 million households in Ameren's service area. They used 11.6 GWh of electricity and 569 (MMTherms) of natural gas. We allocated these totals into the six residential segments based on the saturation survey data[13]. The values are shown in Table 3-1 below, and referred to throughout the study as the *control totals* to which all energy usage is calibrated in the base year of the study.

Table 3-1 Residential Sector Energy Usage and Intensity by Segment Type, 2011

Segment	No. of Households	Electricity Use (GWh)	Electricity Avg Use per Household (kWh/hh)	Natural Gas Use (MMTherms)	Natural Gas Avg Use per Household (therms/hh)
SF – Electric only	344,398	4,665	13,545	-	-
MF- Electric only	166,578	1,393	8,361	-	-
SF – Electric/Gas	455,512	4,772	10,476	373	818
MF- Electric/Gas	95,289	747	7,844	50	524
SF – Gas only	181,393	-	-	139	766
MF- Gas only	14,284	-	-	7	491
Total	**1,257,456**	**11,577**	**10,904**	**569**	**762**

Figure 3-3 and Figure 3-4 show the size of each of the segments as a percentage of customers and percentage of residential sector energy use.

[13] Note that the segment combines the housing type and the type of Ameren customer. Therefore Electric Only indicates that Ameren Illinois only provides electricity service to that household. This could indicate that it is an all electric home or that the customer receives natural gas from another utility. Electric/Gas indicates that Ameren Illinois provides both electricity and natural gas to the customer. Gas only indicates that Ameren Illinois only provides natural gas service, not electricity.

Figure 3-3 Residential Market Segmentation by Housing Type – Percent of Households

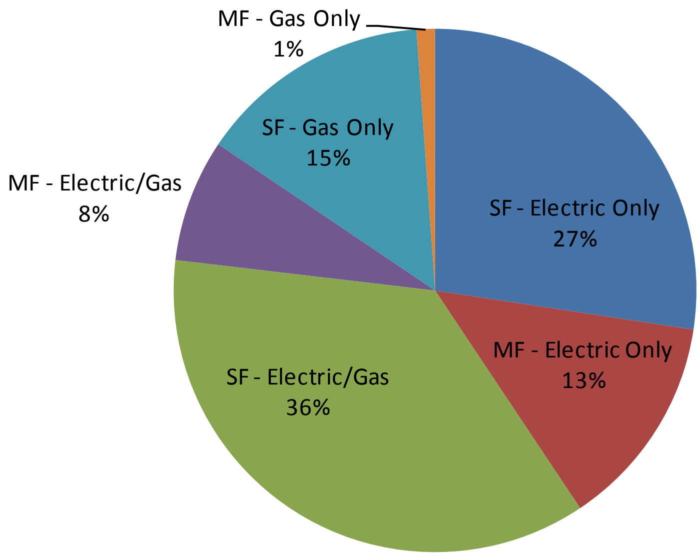
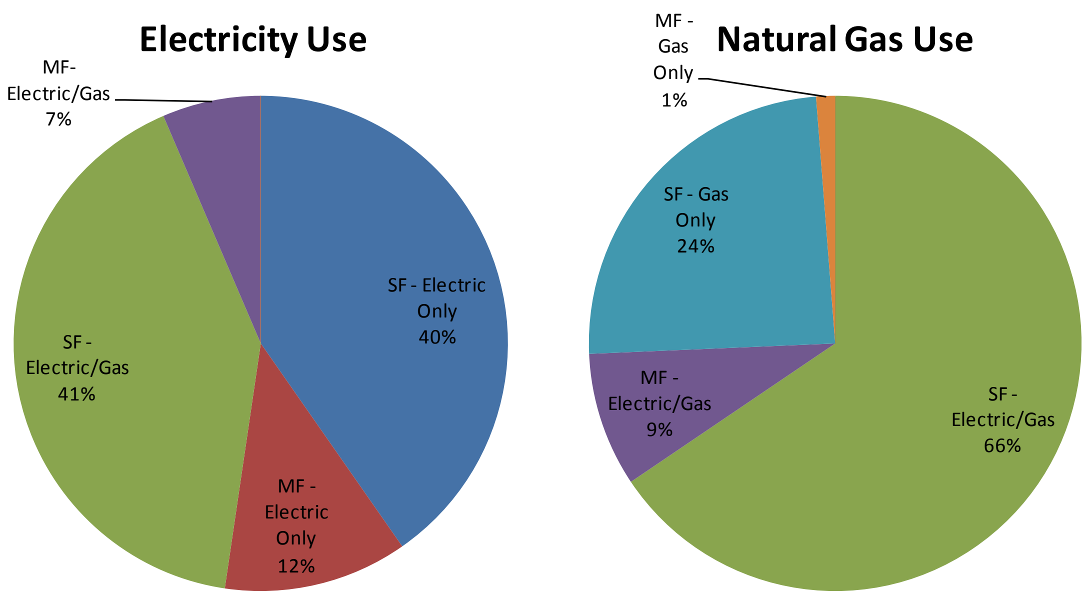


Figure 3-4 Residential Market Segmentation by Housing Type – Percent of Energy Use



As we describe in the previous chapter, the market profiles provide the foundation upon which we develop the baseline projection. The market profile for the residential sector as a whole is presented in Table 3-2 and Table 3-3. The residential market profiles for each housing segment are presented in Appendix A.

Table 3-2 Electric Market Profile for the Residential Sector

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	76.9%	2,276	1,749	1,857.4
Cooling	Room AC	16.0%	820	131	139.3
Cooling	Air-Source Heat Pump	2.4%	2,182	51	54.5
Cooling	Geothermal Heat Pump	1.7%	1,937	33	35.2
Cooling	PTHP	0.0%	0	0	0.0
Space Heating	Electric Resistance	3.2%	5,912	188	199.8
Space Heating	Electric Furnace	8.7%	7,709	672	713.0
Space Heating	Air-Source Heat Pump	1.7%	8,567	142	151.2
Space Heating	Geothermal Heat Pump	1.2%	4,897	59	62.8
Space Heating	PTHP	0.0%	0	0	0.0
Water Heating	Water Heater <= 55 gal	24.1%	2,194	530	562.2
Water Heating	Water Heater > 55 gal	6.0%	2,772	166	176.6
Interior Lighting	Screw-in	100.0%	1,067	1,067	1,132.9
Interior Lighting	Linear Fluorescent	100.0%	123	123	130.5
Interior Lighting	Specialty	100.0%	282	282	299.0
Exterior Lighting	Screw-in	100.0%	214	214	227.6
Appliances	Refrigerator	98.0%	718	704	747.2
Appliances	Second Refrigerator	26.7%	837	223	237.0
Appliances	Freezer	43.6%	572	250	265.0
Appliances	Clothes Washer	87.7%	95	83	88.5
Appliances	Clothes Dryer	72.0%	706	508	539.7
Appliances	Dishwasher	62.0%	395	245	260.4
Appliances	Stove	60.4%	445	269	285.1
Appliances	Microwave	97.0%	118	115	121.9
Electronics	Personal Computers	73.0%	249	182	193.3
Electronics	Monitor	73.0%	50	36	38.5
Electronics	Laptops	100.1%	107	107	114.1
Electronics	TVs	272.5%	203	552	586.2
Electronics	Printer/Fax/Copier	87.9%	38	34	35.6
Electronics	Set-top Boxes/DVR	245.5%	129	316	335.5
Electronics	Devices and Gadgets	100.0%	95	95	100.9
Miscellaneous	Air Purifier/Cleaner	10.0%	1,160	115	122.6
Miscellaneous	Dehumidifier	28.7%	1,809	519	550.6
Miscellaneous	Pool Pump	6.4%	1,425	91	96.7
Miscellaneous	Pool Heater	4.2%	4,732	198	210.5
Miscellaneous	Hot Tub / Spa	2.1%	903	19	20.4
Miscellaneous	Well Pump	9.4%	533	50	53.0
Miscellaneous	Furnace Fan	93.4%	445	415	440.7
Miscellaneous	Bathroom Exhaust Fan	30.4%	134	41	43.4
Miscellaneous	Miscellaneous	100.0%	328	328	348.8
	Total			**10,904**	**11,577.3**

Table 3-3 Natural Gas Market Profile for the Residential Sector

End Use	Technology	Saturation	UEC (therm)	Intensity (therm/HH)	Usage (MMtherm)
Space Heating	Furnace	88.2%	514	453	338.3
Space Heating	Boiler	8.4%	709	60	44.4
Space Heating	Other Heating	2.4%	411	10	7.5
Water Heating	Water Heater <= 55 gal	70.3%	180	126	94.4
Water Heating	Water Heater > 55 gal	18.0%	193	35	26.0
Appliances	Clothes Dryer	31.5%	27	8	6.3
Appliances	Stove/Oven	45.9%	55	25	18.9
Miscellaneous	Pool Heater	9.8%	154	15	11.3
Miscellaneous	Hot Tub / Spa	0.0%	0	0	0.0
Miscellaneous	Miscellaneous	100.0%	29	29	21.5
	Total			**762**	**568.5**

Figure 3-5 shows the distribution of electricity and natural gas energy consumption by end use for all homes. Three main electricity end uses — appliances, cooling, and interior lighting account for over 54% of total use. The remaining energy is allocated to electronics (computers, televisions, video game consoles, etc.), heating, water heating, exterior lighting and miscellaneous. The miscellaneous category includes furnace fans, pool pumps, and other “plug” loads (hair dryers, power tools, coffee makers, etc.).

Natural gas usage is dominated by space heating (69%) and water heating (21%), with small amounts in appliances for cooking or clothes drying, as well as miscellaneous uses such as pool heaters.

Figure 3-5 Residential Electricity and Natural Gas Use by End Use (2011), All Homes

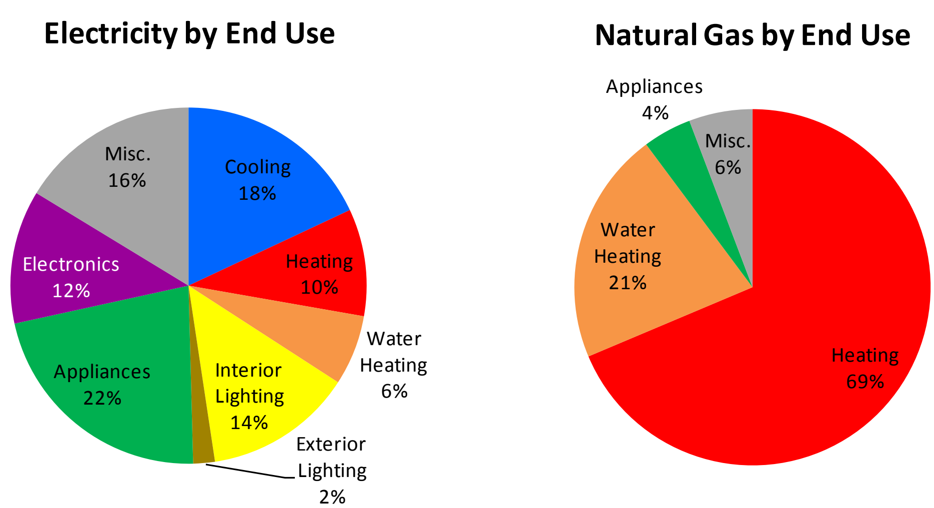


Figure 3-6 and Table 3-4 present the electricity intensities by end-use and housing segment, as well as all homes on average. Figure 3-7 shows the same data as a percentage of total energy use.

Figure 3-6 Residential Electricity Intensity by End Use and Segment (kWh/household, 2011)

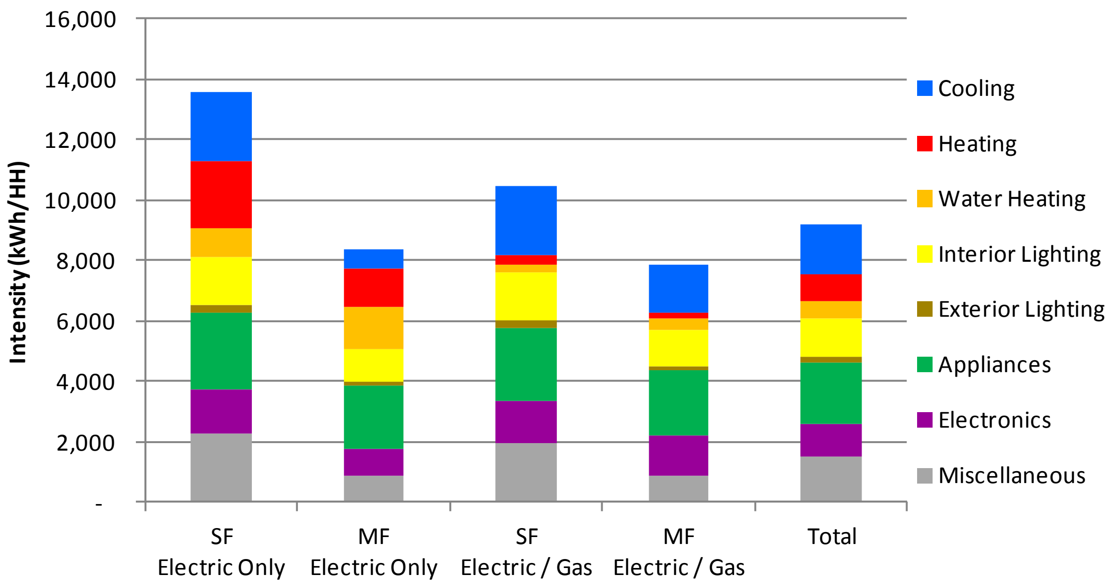


Table 3-4 Residential Electricity Use by End Use and Segment (kWh/HH/year, 2011)

End Use	SF-Electric only	MF-Electric only	SF-Electric/Gas	MF-Electric/Gas	Average of all Segments
Cooling	2,294	607	2,297	1,565	1,659
Space Heating	2,188	1,298	304	194	896
Water Heating	963	1,417	297	373	588
Interior Lighting	1,583	1,073	1,583	1,232	1,242
Exterior Lighting	247	108	247	125	181
Appliances	2,570	2,090	2,423	2,181	2,024
Electronics	1,421	925	1,396	1,312	1,117
Miscellaneous	2,279	844	1,930	862	1,500
Total	**13,545**	**8,361**	**10,476**	**7,844**	**9,207**

Figure 3-7 Breakdown of Residential Electricity Use by End Use and Segment (2011)

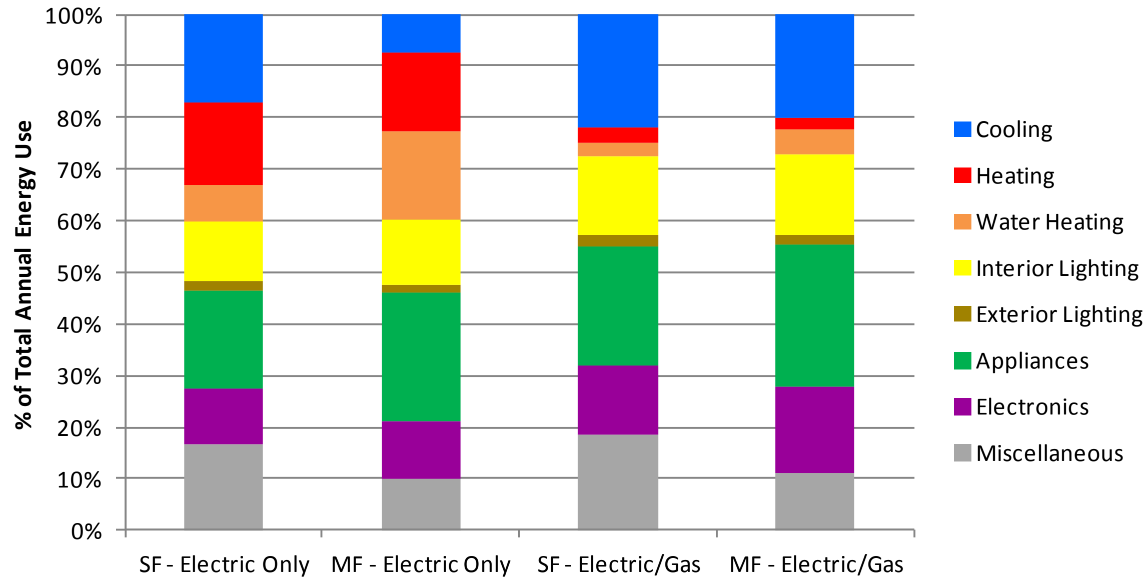


Figure 3-8 and Table 3-5 present the natural gas intensities by end-use and housing type, as well as all homes on average. Figure 3-9 shows the same data as a percentage of total energy use.

Figure 3-8 Residential Natural Gas Intensity by End Use and Segment (therm/household, 2011)

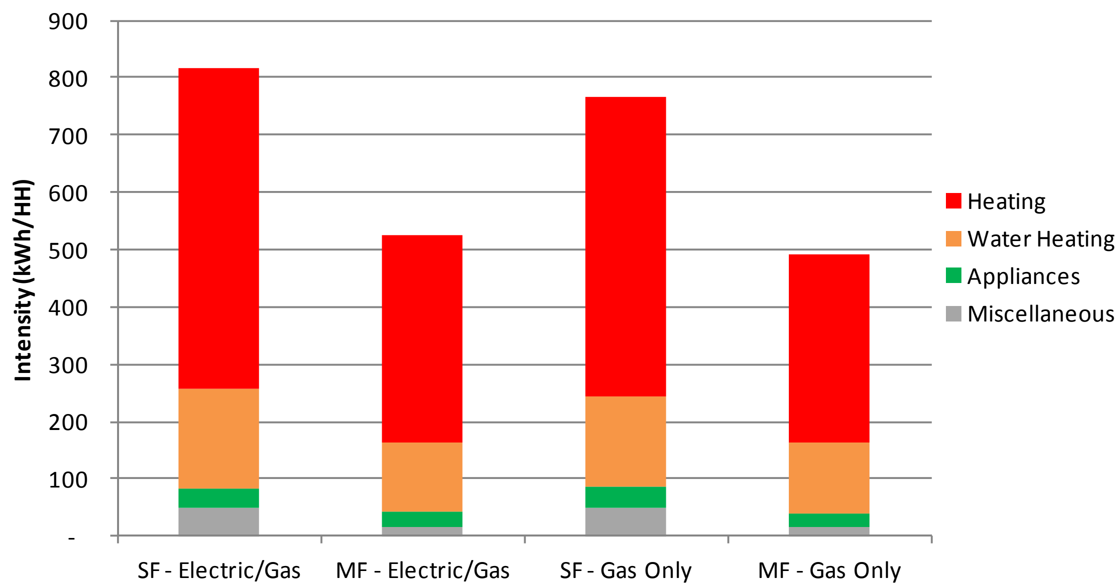
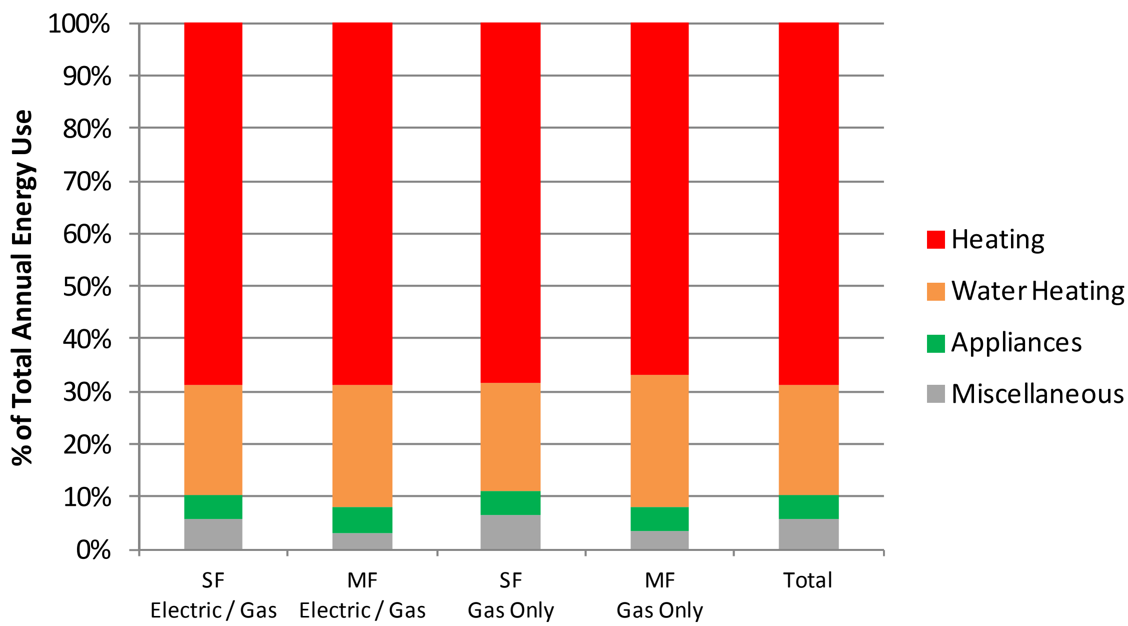


Table 3-5 Residential Natural Gas Use by End Use and Segment (therm/HH/year, 2011)

End Use	Single Family Electric / Gas	Multi Family Electric / Gas	Single Family Gas Only	Multi Family Gas Only	All Homes
Space Heating	562	361	524	328	310
Water Heating	173	122	156	124	96
Appliances	35	25	37	23	20
Miscellaneous	48	17	49	16	26
Total	**818**	**524**	**766**	**491**	**452**

Figure 3-9 Breakdown of Residential Natural Gas Use by End Use and Segment (2011)



Commercial Sector

The total electric energy consumed by commercial Ameren Illinois commercial customers in 2011 was 12,414 GWh and the total natural gas energy consumed was 207 (MMTherms). We used the results of the saturation survey to allocate this energy usage to the various building types. The values are shown in Table 3-6 below, and referred to throughout the study as the *control totals* to which all energy usage is calibrated in the base year of the study.

Table 3-6 Commercial Market Segmentation by Building Type, Base Year 2011

Segment	Floor Space (1,000 sq. ft.)	Electricity 2011 Use (GWh)	Natural Gas 2011 Use (MMTherms)
Office	152,614	1,962	13
Restaurant	32,237	1,094	23
Retail	154,792	1,659	31
Grocery	16,997	888	4
College	114,488	1,342	20
School	106,550	776	29
Health	81,656	1,462	37
Lodging	75,671	701	4
Warehouse	124,092	549	9
Miscellaneous	235,567	1,980	35
Total	**1,094,665**	**12,414**	**207**

Figure 3-10 shows the size of each of the building-types as a percentage of commercial sector energy sales.

Figure 3-10 Commercial Market Segmentation by Building Type – Percent of Energy Use

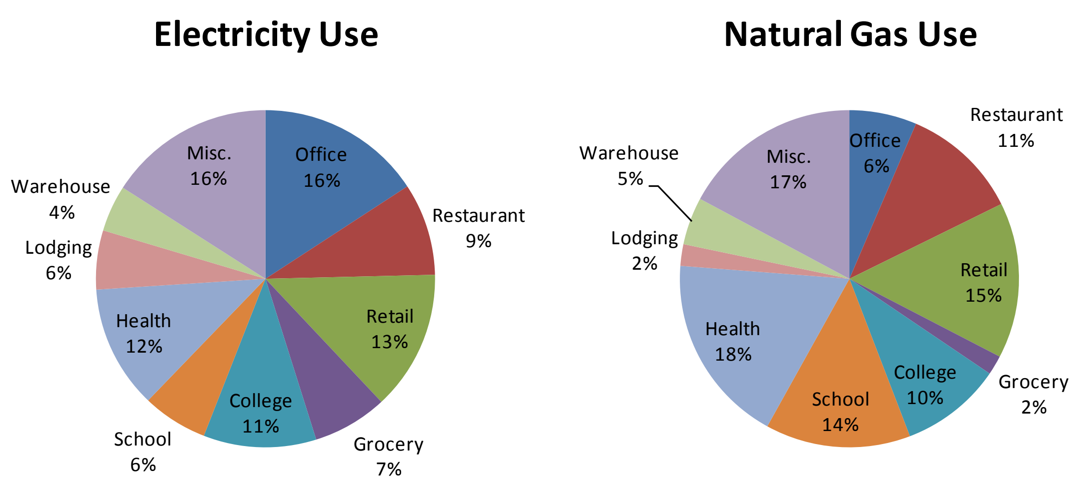


Table 3-7 shows the market profile for electricity of the commercial sector as a whole, representing a composite of all the building types. Overall, about 70% of commercial floor space is cooled. Only about 22% of commercial floor space is heated using electric equipment, either some form of resistance heating or heat pumps. Linear fluorescent lighting and screw-in lamps are the largest energy-consuming technologies in the commercial sector, followed by ventilation and roof top AC units.

Table 3-8 shows the natural gas market profile for the commercial sector as a whole. Boilers are the largest natural gas-consuming technology, followed by water heaters, and furnaces.

Market profiles for each building type are presented in Appendix A.

Table 3-7 Commercial Sector Composite Electric Market Profile, 2011

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	3.9%	3.78	0.15	160
Cooling	Water-Cooled Chiller	10.1%	3.61	0.36	399
Cooling	Roof top AC	48.1%	2.92	1.40	1,538
Cooling	Air-Source Heat Pump	0.5%	2.96	0.01	16
Cooling	Geothermal Heat Pump	0.9%	2.73	0.02	26
Cooling	PTAC	4.0%	2.26	0.09	100
Cooling	PTHP	3.2%	2.12	0.07	73
Cooling	Evaporative AC	0.0%	9.00	0.00	0
Heating	Air-Source Heat Pump	0.5%	2.43	0.01	13
Heating	Geothermal Heat Pump	0.9%	4.08	0.03	38
Heating	Electric Room Heat	0.8%	4.90	0.04	44
Heating	Electric Furnace	12.2%	4.12	0.50	552
Heating	PTAC	4.0%	2.93	0.12	130
Heating	PTHP	3.2%	1.67	0.05	58
Ventilation	Ventilation	100.0%	1.07	1.07	1,166
Water Heating	Water Heating	35.3%	1.21	0.43	469
Interior Lighting	Screw-in	100.0%	0.52	0.52	570
Interior Lighting	High-Bay Fixtures	100.0%	0.28	0.28	304
Interior Lighting	Linear Fluorescent	100.0%	2.86	2.86	3,126
Exterior Lighting	Screw-in	100.0%	0.17	0.17	183
Exterior Lighting	HID	100.0%	0.44	0.44	481
Exterior Lighting	Linear Fluorescent	100.0%	0.06	0.06	66
Refrigeration	Walk-in Refrigerator	9.2%	0.90	0.08	90
Refrigeration	Reach-in Refrigerator	14.0%	0.10	0.01	16
Refrigeration	Glass Door Display	54.5%	0.81	0.44	482
Refrigeration	Open Display Case	54.5%	0.36	0.20	218
Refrigeration	Icemaker	54.5%	0.17	0.09	103
Refrigeration	Vending Machine	54.5%	0.17	0.09	103
Food Preparation	Oven	19.6%	0.22	0.04	46
Food Preparation	Fryer	12.1%	0.47	0.06	63
Food Preparation	Dishwasher	32.6%	0.65	0.21	231
Food Preparation	Hot Food Container	17.1%	0.14	0.02	26
Food Preparation	Other	0.3%	0.07	0.00	0
Office Equipment	Desktop Computer	90.3%	0.44	0.39	432
Office Equipment	Laptop	71.8%	0.07	0.05	57
Office Equipment	Server	70.7%	0.17	0.12	129
Office Equipment	Monitor	89.8%	0.08	0.07	81
Office Equipment	Printer/Copier/Fax	82.5%	0.06	0.05	50
Office Equipment	POS Terminal	56.8%	0.05	0.03	29
Misc	Non-HVAC Motors	61.7%	0.24	0.15	160
Misc	Pool Pump	26.0%	0.00	0.00	1
Misc	Pool Heater	4.1%	0.00	0.00	0
Misc	Misc	100.0%	0.53	0.53	585
Total				**11.34**	**12,414**

Table 3-8 Commercial Sector Composite Natural Gas Market Profile, 2011

End Use	Technology	Saturation	EUI (therm)	Intensity (therm/Sqft)	Usage (MMtherm)
Heating	Furnace	68.6%	0.23	0.16	91
Heating	Boiler	10.7%	0.39	0.04	24
Heating	Unit Heater	3.2%	0.27	0.01	5
Water Heating	Water Heating	64.7%	0.14	0.09	50
Food Preparation	Oven	22.7%	0.02	0.01	3
Food Preparation	Fryer	18.7%	0.07	0.01	8
Food Preparation	Broiler	21.5%	0.05	0.01	6
Food Preparation	Griddle	24.3%	0.04	0.01	5
Food Preparation	Range	28.2%	0.04	0.01	6
Food Preparation	Steamer	3.4%	0.07	0.00	1
Food Preparation	Other	0.2%	0.02	0.00	0
Misc	Pool Heater	15.8%	0.01	0.00	1
Misc	Misc	9.4%	0.11	0.01	6
Total				**0.36**	**207**

Figure 3-11 shows the distribution of electricity and natural gas energy consumption by end use for all commercial buildings. Electric usage is dominated by lighting, with interior and exterior varieties accounting for over one third of consumption. After lighting, the largest end uses are cooling, ventilation, refrigeration and office equipment. The remaining end uses comprise 7% or less of total usage: miscellaneous, space heating, water heating, and food preparation.

Natural gas usage is dominated by space heating (58%) and water heating (24%), with a small amount in food preparation and miscellaneous.

Figure 3-11 Commercial Electricity and Natural Gas Use by End Use (2011), All Buildings

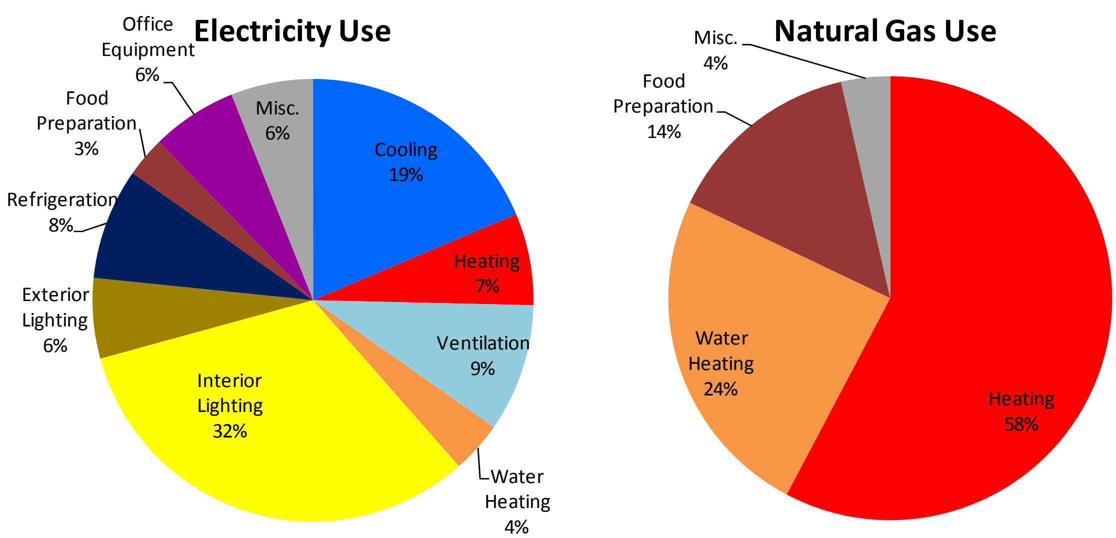


Figure 3-12 and Table 3-9 present the electricity intensity in kWh per square foot by end use and building type. Figure 3-13 shows the same data as a percentage of total energy use for each segment.

Figure 3-12 Commercial Electricity Intensity by End Use and Segment (kWh/sq ft, 2011)

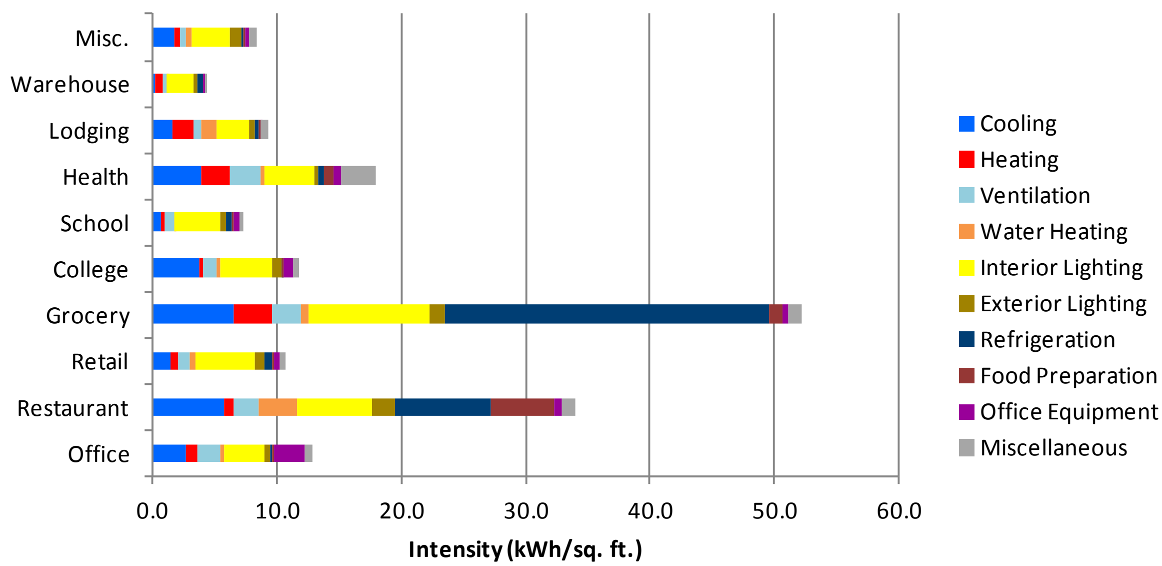


Figure 3-13 Breakdown of Commercial Electricity Consumption by End Use and Segment (2011)

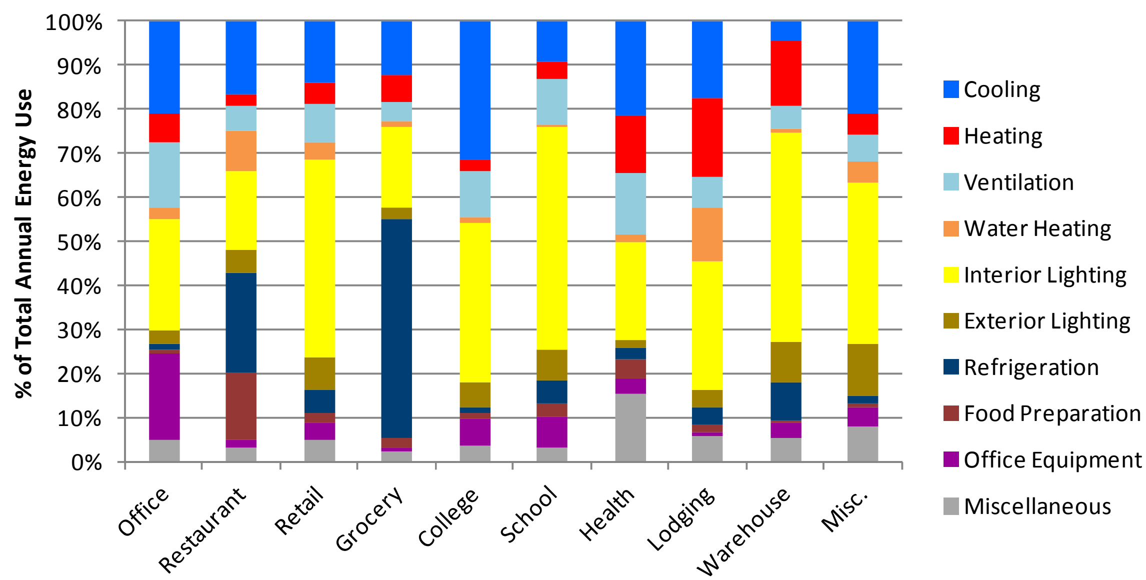


Table 3-9 Commercial Electricity Intensity by End Use and Segment (kWh/sq ft, 2011)

Segment	Cooling	Space Heating	Ventilation	Water Heat	Int. Lighting	Ext. Lighting	Food Prep	Refrigeration	Office Equip	Misc	Total
Office	2.7	0.8	1.9	0.3	3.3	0.4	0.1	0.1	2.5	0.6	**12.9**
Restaurant	5.7	0.8	2.0	3.1	6.1	1.8	7.7	5.1	0.6	1.0	**33.9**
Retail	1.5	0.5	0.9	0.5	4.8	0.8	0.6	0.2	0.4	0.5	**10.7**
Grocery	6.5	3.0	2.3	0.7	9.7	1.3	26.1	1.2	0.4	1.2	**52.3**
College	3.7	0.3	1.2	0.2	4.2	0.7	0.1	0.1	0.7	0.4	**11.7**
School	0.7	0.3	0.8	0.1	3.7	0.5	0.4	0.2	0.5	0.2	**7.3**
Health	3.8	2.4	2.5	0.3	3.9	0.4	0.5	0.8	0.7	2.7	**17.9**
Lodging	1.6	1.7	0.6	1.1	2.7	0.4	0.3	0.1	0.1	0.5	**9.3**
Warehouse	0.2	0.6	0.2	0.0	2.1	0.4	0.4	0.0	0.2	0.2	**4.4**
Misc.	1.8	0.4	0.5	0.4	3.1	1.0	0.2	0.1	0.4	0.7	**8.4**
Total	**28.2**	**10.8**	**13.0**	**6.7**	**43.6**	**7.5**	**36.4**	**8.0**	**6.4**	**8.1**	**168.8**

Table 3-10 and Figure 3-14present the natural gas intensity in therms per square foot by end use and building type. Figure 3-15 shows the same data as a percentage of total energy use for each segment.

Table 3-10 Commercial Natural Gas Intensity by End Use and Segment (therms/sq ft, 2011)

Segment	Heating	Water Heating	Food Preparation	Miscellaneous	Total
Office	0.20	0.04	0.02	0.01	**0.28**
Restaurant	0.24	0.33	0.80	0.02	**1.39**
Retail	0.32	0.04	0.01	0.01	**0.38**
Grocery	0.29	0.13	0.05	0.00	**0.46**
College	0.29	0.11	0.07	0.01	**0.49**
School	0.17	0.09	0.04	0.00	**0.30**
Health	0.40	0.32	0.13	0.04	**0.90**
Lodging	0.10	0.20	0.04	0.01	**0.34**
Warehouse	0.14	0.01	-	0.00	**0.15**
Misc.	0.13	0.05	0.01	0.02	**0.21**
Total	**2.28**	**1.33**	**1.18**	**0.12**	**4.90**

Figure 3-14 Commercial Natural Gas Intensity by End Use and Segment (therms/sq ft, 2011)

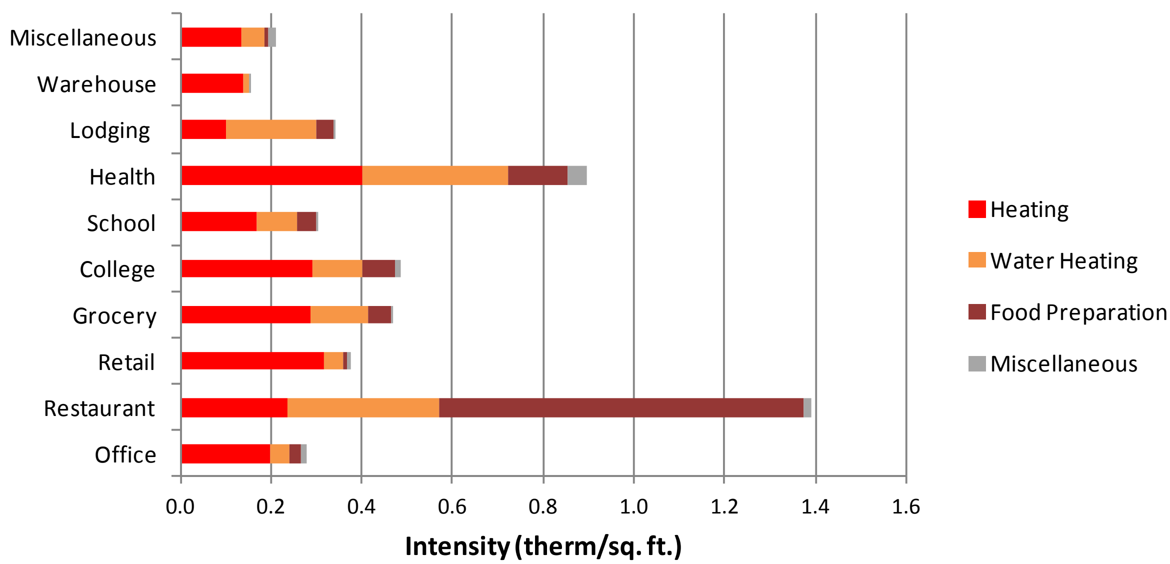
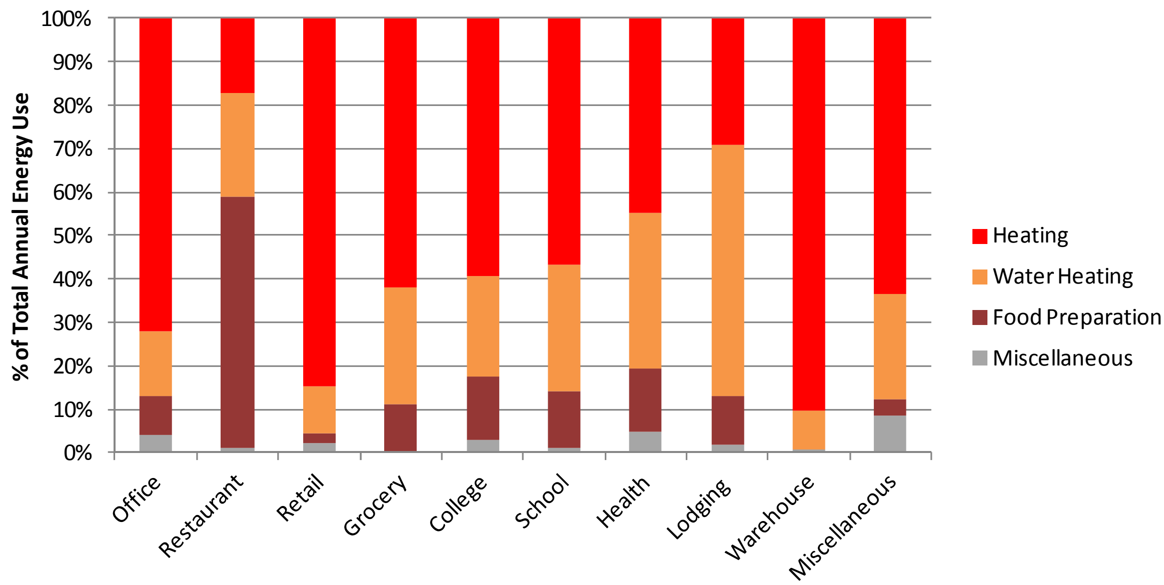


Figure 3-15 Breakdown of Commercial Natural Gas Use by End Use and Segment (2011)



Industrial Sector

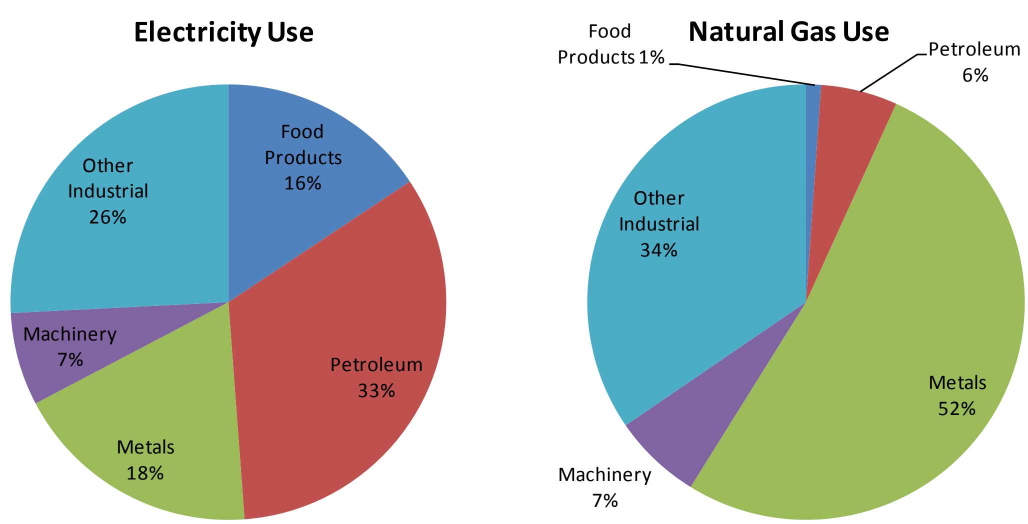
The total electric energy consumed by industrial customers in Ameren service territory in 2011 was 12,580 GWh and the total natural gas energy consumed was 330 (MMTherms)[14]. To allocate this energy usage to the various industries, we used the customer surveys to allocate energy use to the various industry types according to the number of employees and energy intensity. The resulting allocations are shown in Table 3-11 and referred to throughout the study as the *control totals* to which all energy usage is calibrated in the base year of the study.

Table 3-11 Industrial Market Segmentation by Industry Type, Base Year 2011

Segment	Employees	Electricity 2011 Use (GWh)	Natural Gas 2011 Use (MMTherms)
Food Products	68,236	1,971	3.6
Petroleum	13,195	4,207	18.7
Metals	68,010	2,337	171.7
Machinery	36,728	859	21.7
Other Industrial	174,778	3,245	113.9
Total	**360,948**	**12,580**	**329.7**

Figure 3-16 shows the size of each of the segments as a percentage of industrial sector energy sales.

Figure 3-16 Industrial Market Segmentation – Percentage of Energy Use



As with the residential and commercial sectors, the industrial market profiles characterize electricity and natural gas use in terms of end use and technology for the base year 2011. Table 3-12 and Table 3-13 show the composite market profiles for the industrial sector.

[14] This does not include the natural gas use for Self-Direct Customers.

Table 3-12 Industrial Sector Composite Electric Market Profile, 2011

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Employee)	Usage (GWh)
Cooling	Air-Cooled Chiller	2.5%	7,561	189	68.2
Cooling	Water-Cooled Chiller	2.5%	7,299	182	65.9
Cooling	Roof top AC	1.7%	11,525	192	69.4
Cooling	Air Source Heat Pump	0.1%	11,653	7	2.5
Cooling	Geothermal Heat Pump	3.7%	7,772	290	104.6
Cooling	Other Cooling	0.0%	0	0	0.0
Heating	Air Source Heat Pump	0.1%	22,945	14	5.0
Heating	Geothermal Heat Pump	3.7%	15,304	571	206.0
Heating	Electric Resistance	0.0%	0	0	0.0
Heating	Electric Furnace	6.0%	35,236	2,098	757.2
Ventilation	Ventilation	100.0%	0	0	0.0
Interior Lighting	Screw-in	100.0%	582	582	210.0
Interior Lighting	High-Bay Fixtures	100.0%	124	124	44.7
Interior Lighting	Linear Fluorescent	100.0%	1,695	1,695	611.8
Exterior Lighting	Screw-in	100.0%	1	1	0.4
Exterior Lighting	HID	100.0%	458	458	165.5
Exterior Lighting	Linear Fluorescent	100.0%	0	0	0.0
Motors	Pumps	100.0%	4,893	4,893	1,766.3
Motors	Fans & Blowers	100.0%	3,152	3,152	1,137.8
Motors	Compressed Air	100.0%	2,920	2,920	1,053.9
Motors	Matl Handling	100.0%	1,264	1,264	456.3
Motors	Matl Processing	100.0%	5,861	5,861	2,115.4
Motors	Other Motors	100.0%	1,246	1,246	449.8
Process	Process Heating	100.0%	4,180	4,180	1,508.7
Process	Process Cooling and Refrige	100.0%	2,612	2,612	942.9
Process	Electro-Chemical Processes	100.0%	1,062	1,062	383.2
Process	Other Process	100.0%	251	251	90.4
Misc	Misc	100.0%	1,008	1,008	363.8
	Total			**34,852**	**12,579.9**

Table 3-13 Industrial Sector Composite Natural Gas Market Profile, 2011

End Use	Technology	Saturation	EUI (therm)	Intensity (therm/Employee)	Usage (MMtherm)
Heating	Furnace	44.2%	885	391	102.6
Heating	Boiler	1.3%	11,317	152	40.0
Heating	Other Heating	24.2%	797	192	50.5
Process	Process Heating	100.0%	1,271	1,271	333.6
Process	Process Boiler	100.0%	837	837	219.6
Process	Process Cooling and Refrige	100.0%	8	8	2.0
Process	Other Process	100.0%	100	100	26.1
Misc	Misc	100.0%	128	128	33.7
Total				**3,079**	**808.1**

Figure 3-17 shows the distribution of electricity and natural gas energy consumption by end use for all industrial customers. Motors are clearly the largest overall electric end use for the industrial sector, accounting for 56% of energy use. Note that this end use includes a wide range of industrial equipment, such as air compressors, refrigeration compressors, pumps, conveyor motors, and fans. The process end use accounts for 23% of electricity use, which includes refrigeration, and electro-chemical processes. Heating is the next highest, followed by interior lighting, miscellaneous, and cooling.

Natural gas usage is dominated by the process end use at 69%, primarily coming from process heating. Space heating (27%) and miscellaneous (4%) comprise the remainder of the sector's natural gas usage.

Figure 3-17 Industrial Electricity and Natural Gas Use by End Use (2011), All Industries

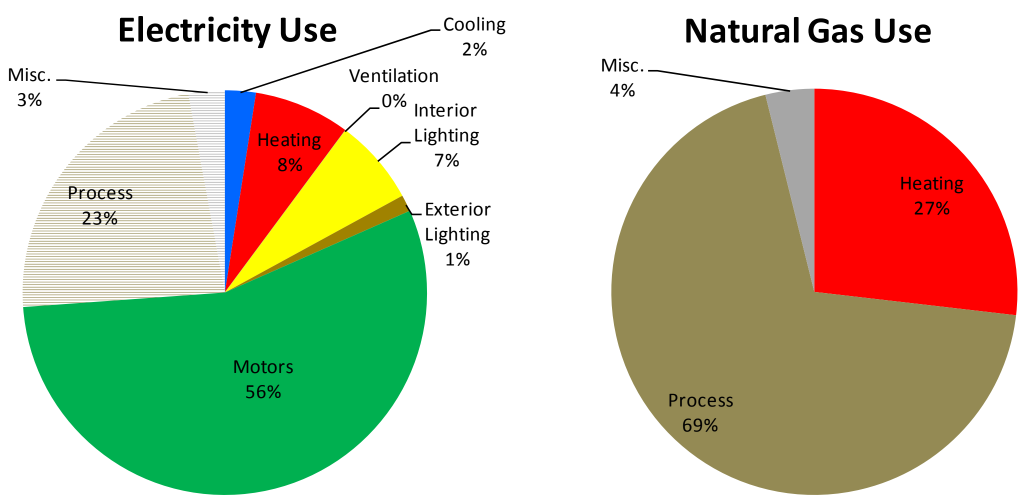


Figure 3-18 and Table 3-14 present the electric consumption by end-use and industry type. Figure 3-19 shows the same data as a percentage of total energy use for each segment.

Figure 3-18 Industrial Electricity Use by End Use and Segment (GWh, 2011)

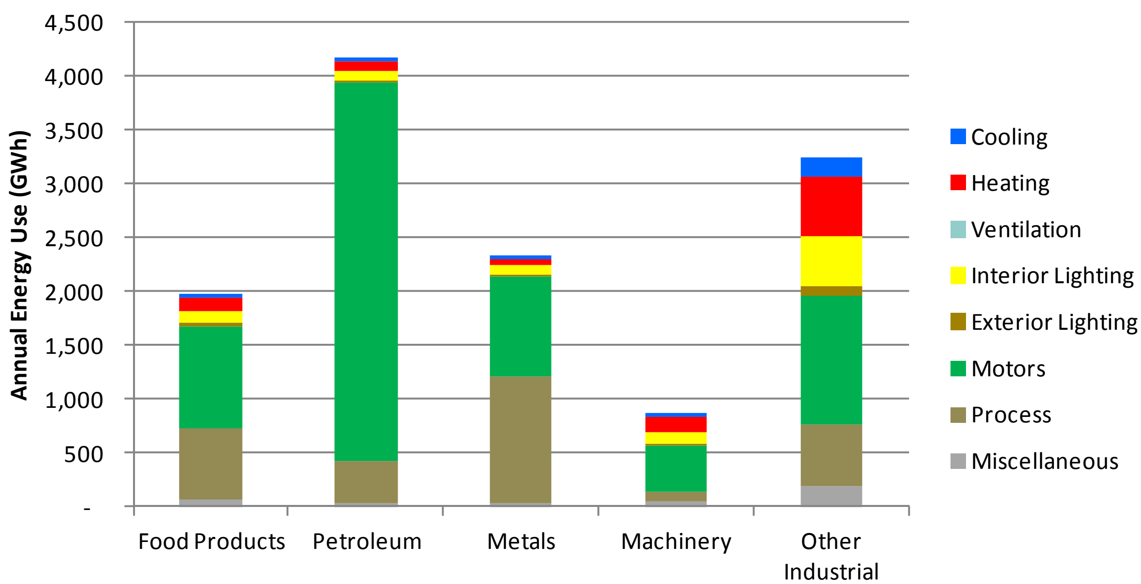


Table 3-14 Industrial Electricity Use by End Use and Segment (GWh, 2011)

End Use	Food Products	Petroleum	Metals	Machinery	Other Industrial	All Industries Combined
Cooling	36	31	21	44	179	311
Heating	111	97	66	138	556	968
Interior Lighting	121	83	84	108	470	867
Exterior Lighting	23	16	16	21	90	166
Motors	947	3,516	925	412	1,180	6,980
Process	663	393	1,181	103	585	2,925
Misc.	69	36	31	44	185	364
Total	**1,970**	**4,171**	**2,324**	**870**	**3,245**	**12,580**

Figure 3-19 Breakdown of Industrial Electricity Use by End Use and Segment (2011)

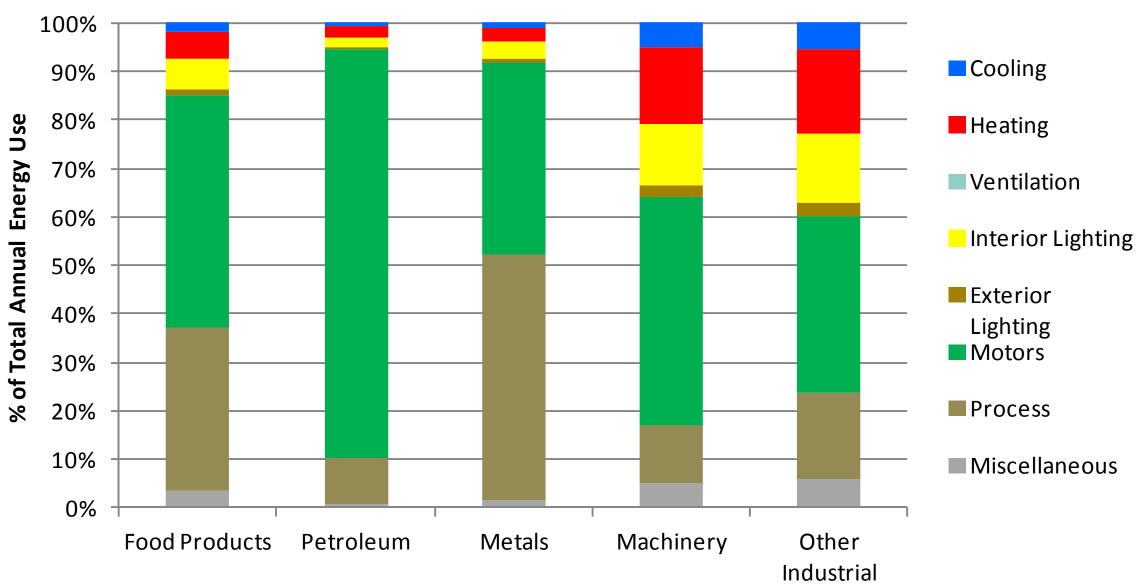


Figure 3-20 and Table 3-15 present the natural gas consumption by end-use and industry type. Figure 3-21 shows the same data as a percentage of total energy use.

Figure 3-20 Industrial Natural Gas Use by End Use and Segment (MMTherms, 2011)

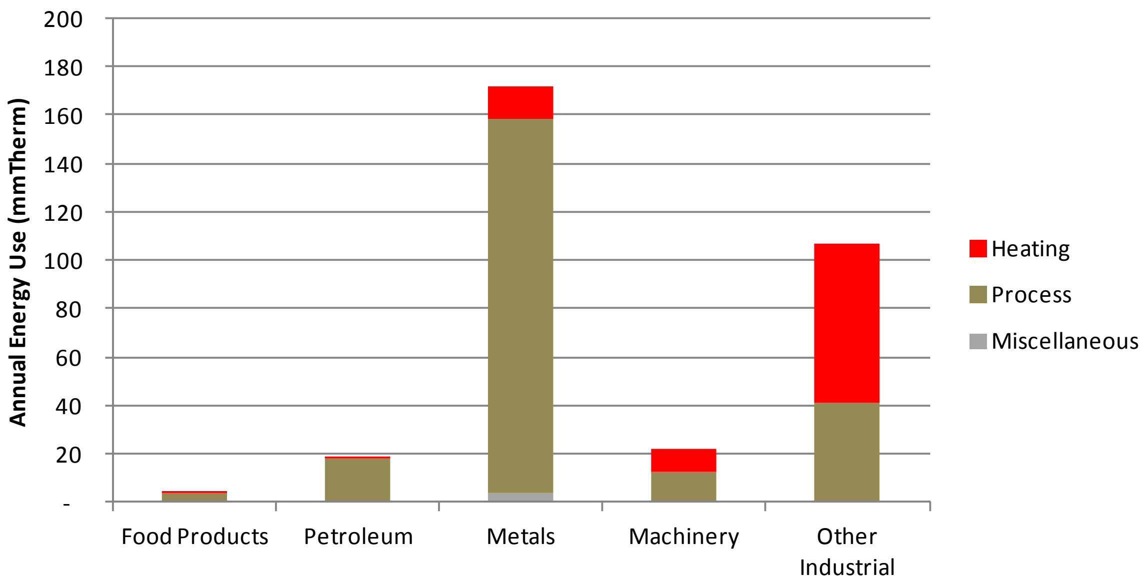
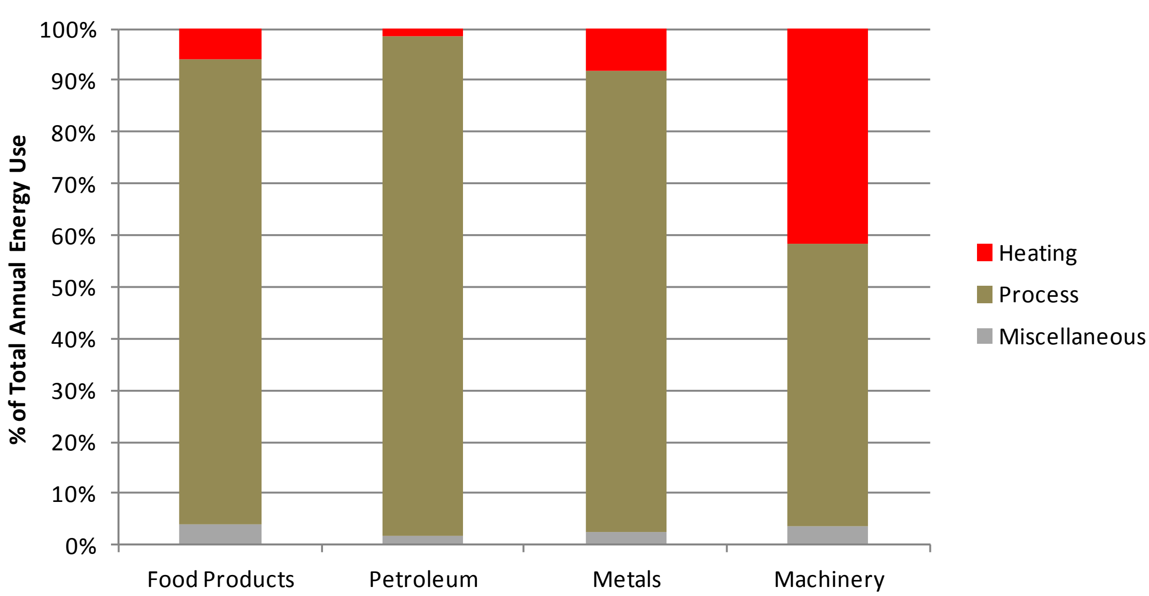


Table 3-15 Industrial Natural Gas Use by End Use and Segment (MMTherms, 2011)

End Use	Food Products	Petroleum	Metals	Machinery	Other Industrial	All Industries Combined
Heating	0.2	0.3	13.7	9.0	65.3	88
Process	3.3	18.1	153.9	11.8	41.2	228
Miscellaneous	0.1	0.3	4.2	0.8	7.4	13
Total	**3.7**	**18.7**	**171.7**	**21.7**	**113.9**	**330**

Figure 3-21 Breakdown of Industrial Natural Gas Use by End Use and Segment (2011)



BASELINE PROJECTION

The baseline projection is an end-use forecast that incorporates a forecast of customer growth, changes in electricity and natural gas prices and trends in fuel shares. It also includes expected impact of appliance/equipment standards and building codes. For this study, we developed two baseline projections: one without naturally occurring efficiency and a second with naturally occurring efficiency. The baseline projections represent what the consumption is likely to be in the future in absence of new efficiency programs and it serves as the metric against which energy efficiency potentials are measured.

In this chapter we present the two baseline projections -- Baseline w/o NO and Baseline with NO. The difference between the two projections is the savings from naturally occurring efficiency. For the potentials analysis, we measure the savings off the baseline forecast that **includes** naturally occurring efficiency.

Residential Sector

The baseline projections incorporate assumptions about economic growth, electricity prices, and appliance/equipment standards and building codes that are already mandated as described in Chapter 2. Figure 4-1 and Table 4-1 show the two baseline projections. The difference between the two lines is attributed to naturally occurring efficiency.

Figure 4-1 Residential Electricity Baseline Projections with and without Naturally Occurring Efficiency

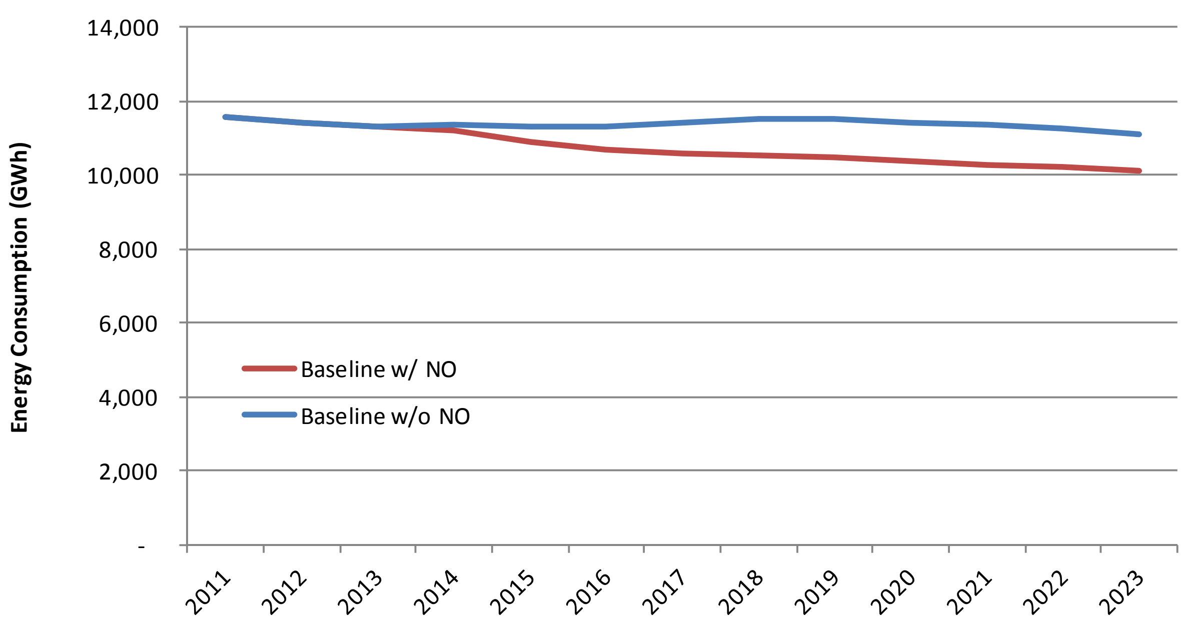


Table 4-1 Residential Electricity Baseline Projections (GWh)

Residential Electricity Baseline Projection (GWh)	2011	2014	2015	2016	% Change '14-'16
With Naturally Occurring Efficiency	11,577	11,188	10,915	10,712	-4.2%
Without Naturally Occurring Efficiency	11,577	11,355	11,360	11,332	-0.2%
Naturally Occurring Savings	0	167	445	620	

Table 4-2 presents the baseline projections for electricity at the end-use level for the residential sector as a whole.

- In the Baseline without Naturally Occurring efficiency, residential use decreases slightly from 11,577 GWh in 2011 to 11,332 GWh in 2016, a decrease of 0.2%, or an average reduction of 0.06% per year. This reflects the impact of the EISA lighting standard, additional appliance standards adopted in 2011, and modest customer growth.
- In the Baseline with Naturally Occurring efficiency, , residential use decreases from 11,577 GWh in 2011 to 10,712 GWh in 2016, a decrease of 4.2%, or an average reduction of 1.4% during the program years. The naturally occurring efficiency savings come primarily from interior lighting and exterior lighting, as customers adopt CFL light bulbs instead of the minimum standard.

Figure 4-2 shows the baseline with Naturally Occurring efficiency. Most notable is that lighting decreases as a result of efficiency standards and naturally occurring efficiency.

Table 4-2 Residential Electricity Consumption by End Use and Baseline Projection (GWh)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Cooling	2,086	1,981	1,944	-1.8%	1,975	1,929	-2.3%
Heating	1,127	1,145	1,153	0.8%	1,145	1,153	0.8%
Water Heating	739	741	736	-0.6%	741	734	-0.9%
Interior Lighting	1,562	1,600	1,570	-1.8%	1,506	1,187	-21.2%
Exterior Lighting	228	202	198	-2.2%	191	158	-17.6%
Appliances	2,545	2,268	2,107	-7.1%	2,266	2,103	-7.2%
Electronics	1,404	1,469	1,606	9.4%	1,425	1,466	2.9%
Miscellaneous	1,887	1,950	2,017	3.4%	1,939	1,983	2.3%
Total	**11,577**	**11,355**	**11,332**	**-0.2%**	**11,188**	**10,712**	**-4.2%**

Figure 4-2 Residential Electricity Baseline with Naturally Occurring Efficiency by End Use

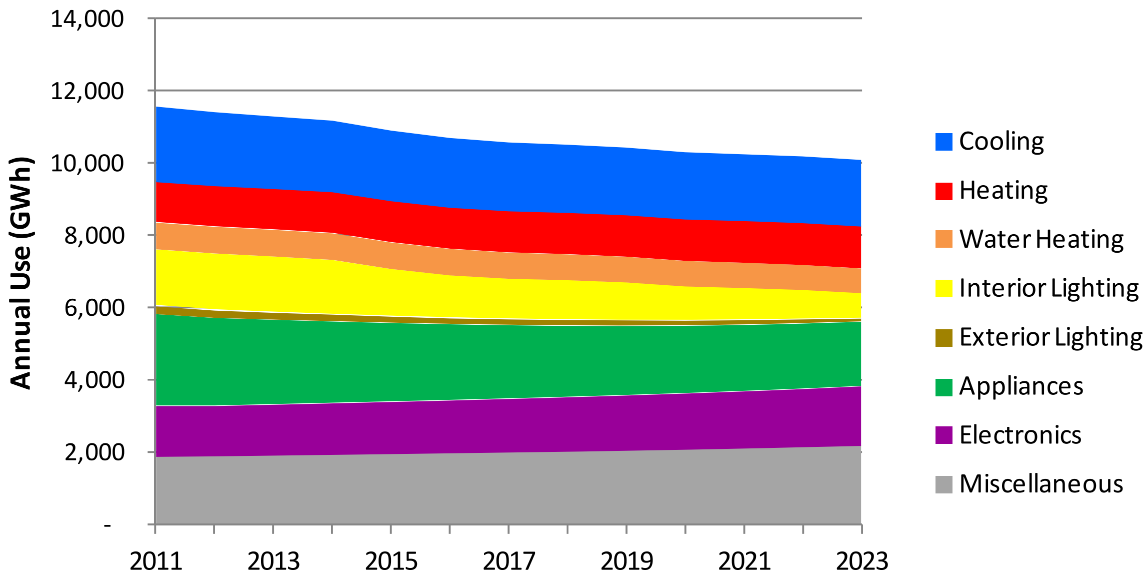


Table 4-3 shows the end-use projection at the technology level for the program years for the baseline with Naturally Occurring efficiency projection. Specific observations include:

1. The primary reason for the reduction in the baseline projection beginning in 2012 is the federal lighting standards. The standard phases general service incandescent lamps out of the market over a three-year period, causing a decline in interior screw-in lighting use by 22% over the projection period.
2. Appliance energy use decreases by about 7%, reflecting efficiency gains from standards.
3. Growth in use in electronics is modest and reflects an increase in the saturation of electronics and the trend toward higher-powered computers.
4. Growth in miscellaneous use is also modest. This use includes various plug loads not elsewhere classified (e.g., hair dryers, power tools, coffee makers, etc.). This end use has grown consistently in the past and we incorporate future growth assumptions that are consistent with the Annual Energy Outlook.

Table 4-3 Residential Electricity Baseline Projection with Naturally Occurring Efficiency by End Use and Technology (GWh)

End Use	Technology	2011	2014	2015	2016	% Change '14-'16	Avg. Growth Rate
Cooling	Central AC	1,857	1,759	1,741	1,720	-1.5%	-1.5%
	Room AC	139	133	132	130	-1.4%	-1.4%
	Air-Source Heat Pump	54	51	50	50	-1.9%	-1.9%
	Geothermal Heat Pump	35	31	30	29	-3.6%	-3.6%
	PTHP	-	-	-	-	0.0%	0.0%
Heating	Furnace	713	733	739	742	0.8%	0.8%
	Electric Room Heat	200	205	207	208	0.8%	0.8%
	Air-Source Heat Pump	151	143	141	139	-1.6%	-1.6%
	Geothermal Heat Pump	63	64	64	64	0.4%	0.4%
	PTHP	-	-	-	-	0.0%	0.0%
Water Heating	Water Heater > 55 gal	177	177	177	176	-0.1%	-0.1%
	Water Heater <= 55 gal	562	563	562	559	-0.1%	-0.1%
Interior Lighting	Screw-in	1,133	1,055	883	776	-7.6%	-7.6%
	Linear Fluorescent	130	131	131	130	-0.1%	-0.1%
	Specialty	299	321	300	281	-1.2%	-1.2%
Ext. Lighting	Screw-in	228	191	170	158	-7.4%	-7.4%
Appliances	Clothes Washer	88	84	82	80	-1.9%	-1.9%
	Clothes Dryer	540	482	465	449	-3.7%	-3.7%
	Dishwasher	260	209	197	187	-6.6%	-6.6%
	Refrigerator	747	635	594	557	-5.9%	-5.9%
	Freezer	265	244	238	233	-2.6%	-2.6%
	Second Refrigerator	237	196	185	176	-6.0%	-6.0%
	Stove	285	293	296	297	0.8%	0.8%
	Microwave	122	123	124	124	0.3%	0.3%
Electronics	Personal Computers	193	212	217	221	2.7%	2.7%
	Monitor	38	41	42	43	2.4%	2.4%
	Laptops	114	122	126	129	2.5%	2.5%
	TVs	586	570	568	566	-0.7%	-0.7%
	Printer/Fax/Copier	36	34	34	34	-0.9%	-0.9%
	Set-top Boxes/DVR	335	329	337	345	0.6%	0.6%
	Devices and Gadgets	101	117	122	128	4.7%	4.7%
Misc.	Pool Pump	97	102	104	105	1.7%	1.7%
	Pool Heater	210	207	207	208	-0.2%	-0.2%
	Hot Tub / Spa	20	22	22	22	1.7%	1.7%
	Well Pump	53	55	56	56	1.2%	1.2%
	Furnace Fan	441	455	460	464	1.0%	1.0%
	Miscellaneous	349	408	429	451	5.1%	5.1%
	Air Purifier/Cleaner	123	129	132	134	1.7%	1.7%
	Dehumidifier	551	521	512	502	-1.8%	-1.8%
	Bathroom Exhaust Fan	43	40	40	41	-1.3%	-1.3%
Total		**11,577**	**11,577**	**11,188**	**10,915**	**-4.2%**	**-1.6%**

Figure 4-3 and Table 4-4 show the two baseline projections for natural gas. The very subtle difference between the two lines is attributed to naturally occurring efficiency.

Figure 4-3 Residential Natural Gas Baseline Projections

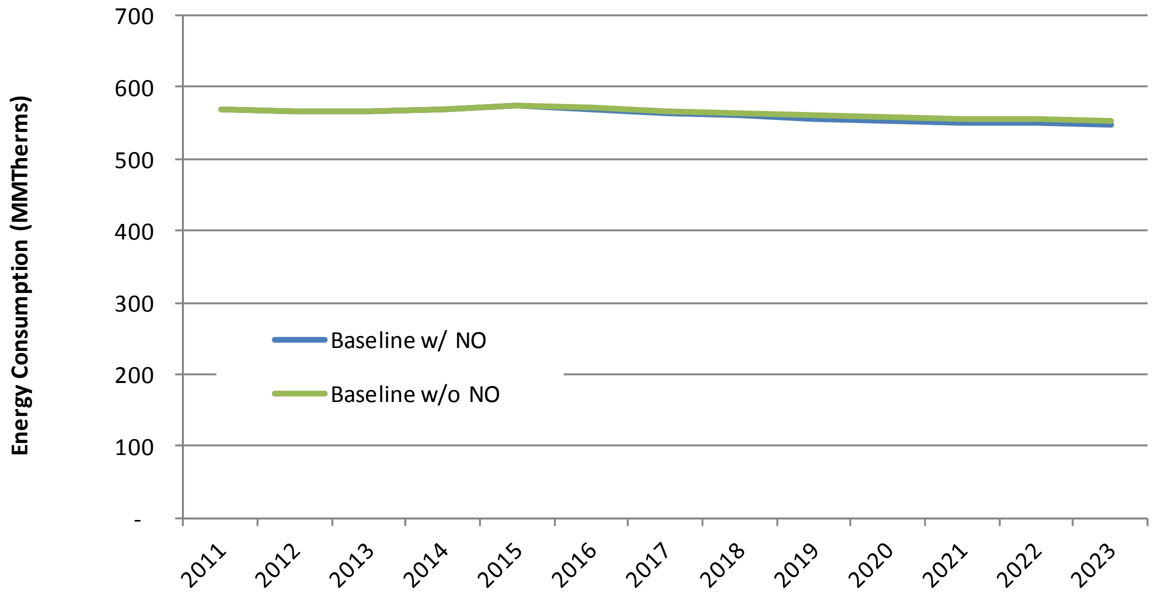


Table 4-4 Residential Natural Gas Baseline Projections (MMTherms)

Residential Natural Gas Baseline Projection (MMTherms)	2011	2014	2015	2016	%Change ‘14-‘16
With Naturally Occurring Efficiency	569	569	574	570	0.2%
Without Naturally Occurring Efficiency	569	570	575	571	0.5%
Naturally Occurring Savings	0.0	0.6	1.1	1.6	

Table 4-5 presents the residential sector baseline projections for natural gas at the end use level. Natural gas use remains essentially flat under both projections. The baseline without Naturally Occurring efficiency goes from 569 (MMTherms) in 2011 to 571 (MMTherms) in 2016, an overall increase of 0.3%. The baseline projection, which includes Naturally Occurring efficiency, increases slightly from 569 (MMTherms) in 2011 to 570 (MMTherms) in 2016.

Figure 4-4 shows the Baseline projection with Naturally Occurring efficiency by end use.

Table 4-5 Residential Natural Gas Consumption by End Use and Baseline Projection (MMTherms)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Heating	390	390	389	-0.2%	389	388	-0.6%
Water Heating	120	120	120	-0.5%	120	120	-0.6%
Appliances	25	24	24	-5.5%	24	24	-5.7%
Miscellaneous	33	36	38	16.7%	36	38	16.7%
Total	**569**	**570**	**571**	**0.5%**	**569**	**570**	**0.2%**

Figure 4-4 Residential Natural Gas Baseline with Naturally Occurring Efficiency by End Use

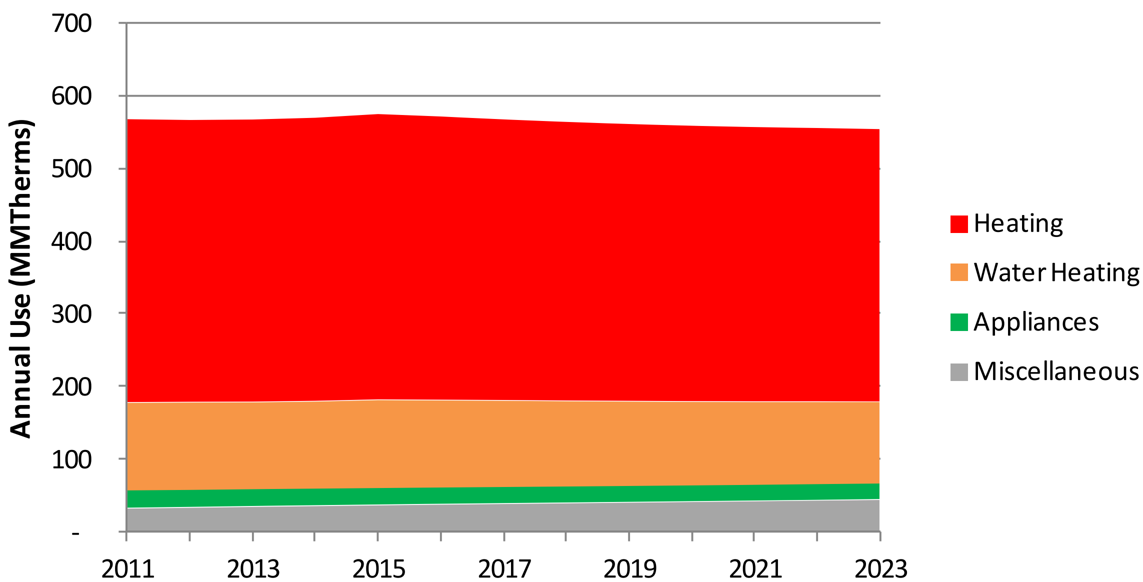


Table 4-6 shows the end use projection for natural gas at the technology level for the baseline with Naturally Occurring efficiency. Usage from natural gas boilers decreases by almost 6% due to the appliance standard.

Table 4-6 Residential Natural Gas Baseline Projection with Naturally Occurring Efficiency by End Use and Technology (MMTherms)

End Use	Technology	2011	2014	2015	2016	% Change ’14-‘16	Avg. Growth Rate
Heating	Furnace	338	341	344	342	0.3%	0.1%
	Boiler	44	41	40	38	-5.7%	-1.9%
	Other Heating	8	8	8	8	2.0%	0.7%
Water Heating	Water Heater <=55 gal	26	26	26	26	-0.2%	-0.1%
	Water Heater > 55 gal	94	94	95	94	-0.2%	-0.1%
Appliances	Clothes Dryer	6	5	5	5	-10.0%	-3.3%
	Stove	19	19	19	19	0.6%	0.2%
Miscellaneous	Pool Heater	11	12	12	12	1.5%	0.5%
	Hot Tub / Spa	-	-	-	-	0.0%	0.0%
	Miscellaneous	21	24	26	26	8.6%	2.9%
Total		**569**	**569**	**574**	**570**	**0.2%**	**-0.1%**

Commercial Sector

The baseline projections incorporate assumptions about economic growth, electricity prices, and appliance/equipment standards and building codes that are already mandated as described in Chapter 2. Table 4-7 shows the two baseline projections. The difference between the two lines is attributed to Naturally Occurring efficiency.

Figure 4-5 Commercial Electricity Baseline Projections

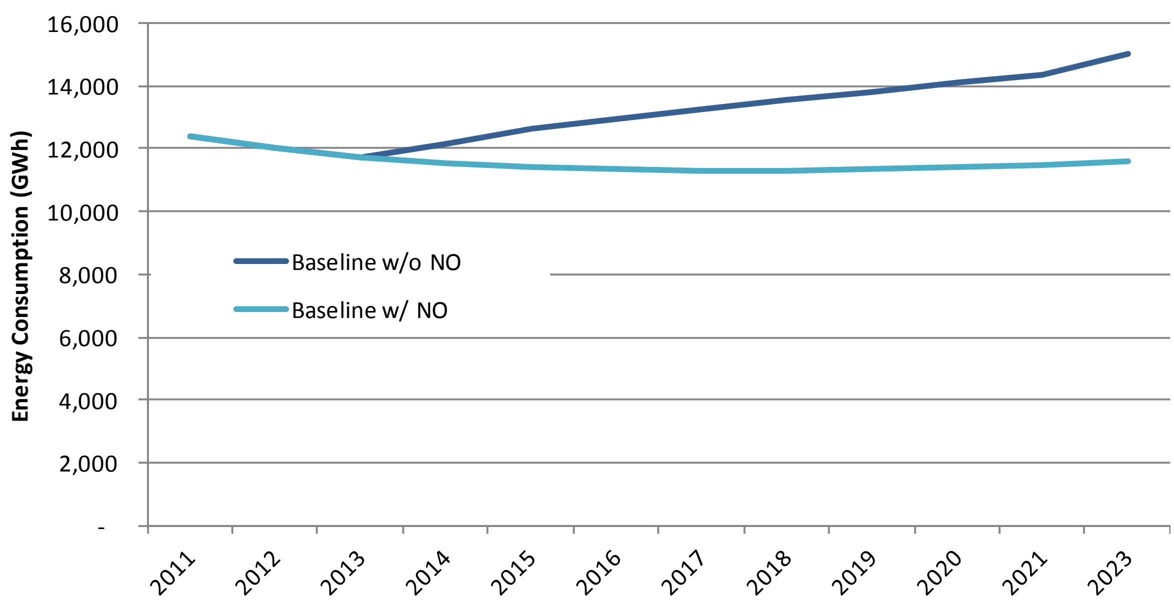


Table 4-7 Commercial Electricity Baseline Projections (GWh)

Commercial Electricity Baseline Projection (GWh)	2011	2014	2015	2016	%Change '14-'16
With Naturally Occurring Efficiency	12,414	11,547	11,415	11,332	-2%
Without Naturally Occurring Efficiency	12,414	12,168	12,642	12,919	6%
Naturally Occurring Savings	0	621	1,228	1,587	

Table 4-8 and Figure 4-6 present the electricity baseline projections at the end-use level for the commercial sector as a whole. In the baseline without Naturally Occurring efficiency, commercial electricity use increases from 12,414 GWh in 2011 to 12,919 GWh in 2016, an increase of 6%. Electricity use in the baseline with Naturally Occurring efficiency shows a decline of 2% overall during the program years. Commercial usage starts at 12,414 GWh in 2011, and decreases to 11,332 GWh in 2016. The largest difference between the two projections is in the lighting end uses. Although the EISA standard reduces the growth in lighting usage, customers are already adopting the higher efficiency lighting options that are currently available.

Table 4-8 Commercial Electricity Consumption by End Use and Baseline Projection (GWh)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Cooling	2,312	2,182	2,137	-2.0%	2,174	2,115	-2.7%
Heating	835	860	879	2.2%	860	879	2.2%
Ventilation	1,166	1,184	1,356	14.5%	1,091	1,085	-0.5%
Water Heating	469	471	477	1.3%	471	477	1.2%
Interior Lighting	4,000	3,859	4,209	9.1%	3,517	3,365	-4.3%
Exterior Lighting	730	712	811	13.8%	587	537	-8.5%
Refrigeration	1,012	879	850	-3.4%	881	854	-3.1%
Food Preparation	366	375	397	5.9%	367	373	1.6%
Office Equipment	778	829	935	12.8%	782	780	-0.3%
Miscellaneous	746	816	866	6.2%	816	866	6.2%
Total	**12,414**	**12,168**	**12,919**	**6.2%**	**11,547**	**11,332**	**-1.9%**

Figure 4-6 Commercial Electricity Baseline with Naturally Occurring Efficiency by End Use

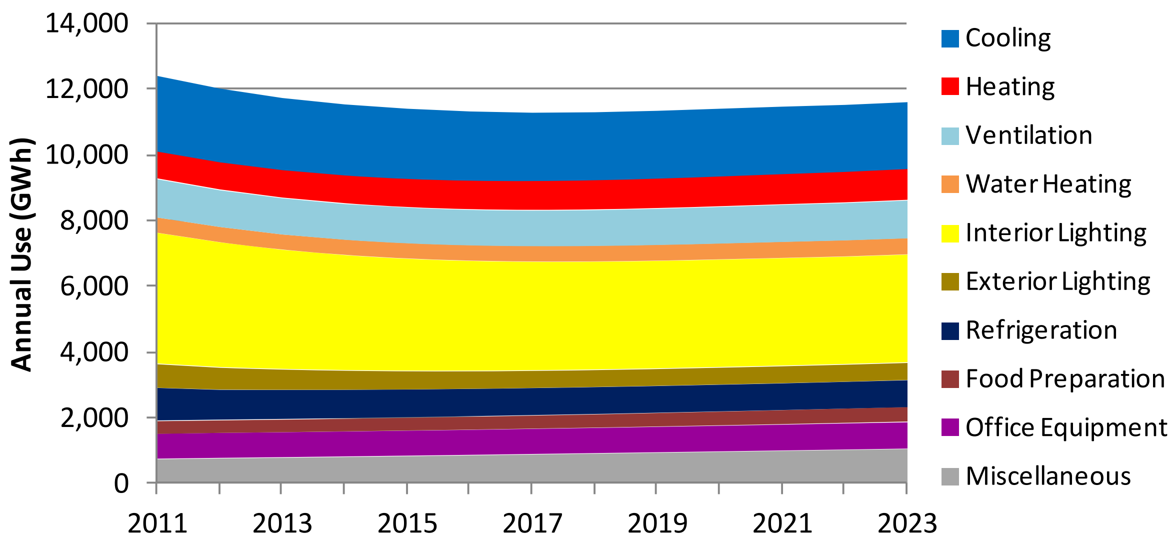


Table 4-9 presents the commercial sector electricity baseline with Naturally Occurring efficiency by technology. Interior screw-in lighting and refrigeration decrease significantly over the projection period as a result of efficiency standards.

Table 4-9 Commercial Electricity Baseline Projection with Naturally Occurring Efficiency by End Use and Technology (GWh)

End Use	Technology	2011	2014	2015	2016	% Change	Avg. Growth Rate
Cooling	Air-Cooled Chiller	160	157	157	158	0.6%	0.2%
	Water-Cooled Chiller	399	355	347	340	-4.2%	-1.4%
	Roof top AC	1,538	1,453	1,430	1,411	-2.9%	-1.0%
	Geothermal Heat Pump	26	25	25	26	4.0%	1.3%
	Air Source Heat Pump	16	15	15	14	-6.7%	-2.3%
	PTAC	100	98	97	97	-1.0%	-0.3%
	PTHP	73	71	70	69	-2.8%	-1.0%
	Evaporative AC	0	0	0	0	0.0%	0.0%
Heating	Geothermal Heat Pump	38	38	38	39	2.6%	0.9%
	Electric Room Heat	44	45	45	46	2.2%	0.7%
	Electric Furnace	552	566	572	577	1.9%	0.6%
	Air Source Heat Pump	13	13	13	13	0.0%	0.0%
	PTAC	130	140	143	146	4.3%	1.4%
	PTHP	58	59	59	59	0.0%	0.0%
Ventilation	Ventilation	1,166	1,091	1,086	1,085	-0.5%	-0.2%
Water Heating	Water Heating	469	471	474	477	1.3%	0.4%
Interior Lighting	Screw-in	570	424	415	414	-2.4%	-0.8%
	High-Bay Fixtures	304	270	265	264	-2.2%	-0.7%
	Linear Fluorescent	3,126	2,823	2,748	2,687	-4.8%	-1.6%
Exterior Lighting	Screw-in	183	128	122	119	-7.0%	-2.4%
	HID	481	390	367	350	-10.3%	-3.6%
	Linear Fluorescent	66	69	70	68	-1.4%	-0.5%
Refrigeration	Walk-in Refrigerator	90	66	61	57	-13.6%	-4.9%
	Reach-in Refrigerator	16	12	11	10	-16.7%	-6.1%
	Glass Door Display	482	415	414	414	-0.2%	-0.1%
	Open Display Case	218	200	196	194	-3.0%	-1.0%
	Icemaker	103	100	100	101	1.0%	0.3%
	Vending Machine	103	88	84	79	-10.2%	-3.6%
Food Preparation	Oven	46	49	51	52	6.1%	2.0%
	Fryer	63	69	72	74	7.2%	2.3%
	Dishwasher	231	227	227	227	0.0%	0.0%
	Hot Food Container	26	21	21	20	-4.8%	-1.6%
	Other	0	0	0	0	0.0%	0.0%
Office Equipment	Desktop Computer	432	433	431	428	-1.2%	-0.4%
	Laptop	57	59	59	59	0.0%	0.0%
	Server	129	126	124	124	-1.6%	-0.5%
	Monitor	81	81	82	83	2.5%	0.8%
	Printer/Copier/Fax	50	57	59	60	5.3%	1.7%
	POS Terminal	29	26	26	25	-3.8%	-1.3%

End Use	Technology	2011	2014	2015	2016	% Change	Avg. Growth Rate
Miscellaneous	Non-HVAC Motors	160	163	165	166	1.8%	0.6%
	Pool Pump	1	1	1	1	0.0%	0.0%
	Pool Heater	0	0	0	0	0.0%	0.0%
	Miscellaneous	585	651	675	699	7.4%	2.4%
Total		**12,414**	**11,547**	**11,415**	**11,332**	**-1.9%**	**-0.6%**

Figure 4-7 and Table 4-10 show the two baseline projections for natural gas. The very subtle difference between the two lines is attributed to naturally occurring efficiency.

Figure 4-7 Commercial Natural Gas Baseline Projections

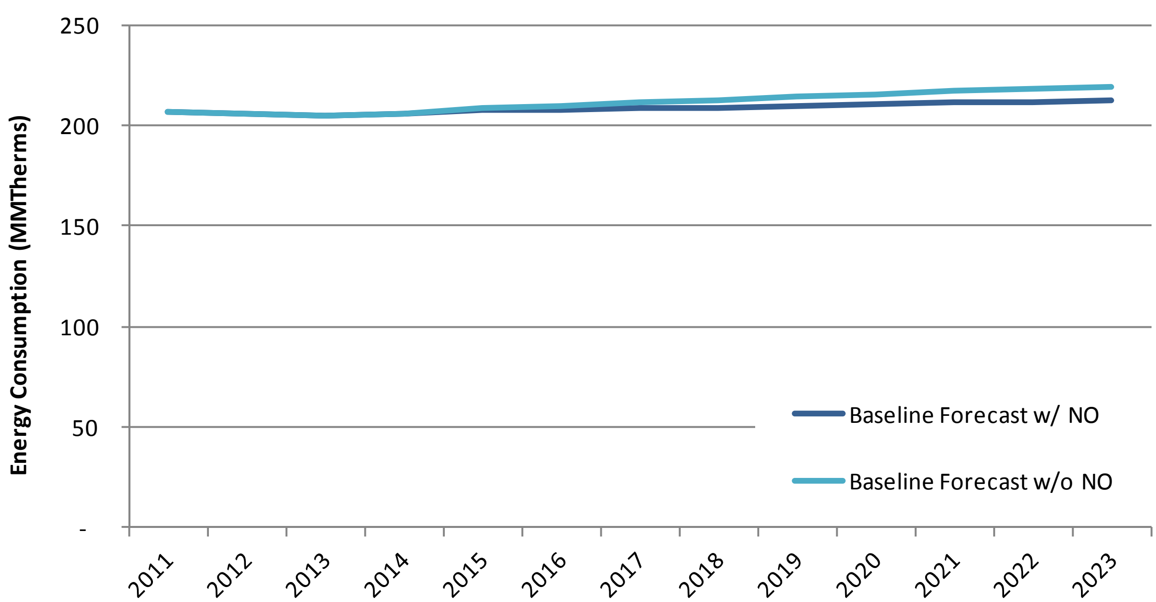


Table 4-10 Commercial Natural Gas Baseline Projections (MMTherms)

Commercial Natural Gas Baseline Projection (MMTherms)	2011	2014	2015	2016	%Change '14-'16
With Naturally Occurring Efficiency	207	205	207	208	1.2%
Without Naturally Occurring Efficiency	207	206	209	210	1.8%
Naturally Occurring Savings	0.0	0.8	1.5	2.2	

Table 4-11 shows the baseline projections for natural gas, which is expected to increase by 1.8% between 2011 and 2016 under the Without Naturally Occurring projection, but only increases by 1.2% under the With Naturally Occurring projection. The cumulative natural gas savings due to naturally occurring efficiency reach 2.2 (MMTherms) by 2016.

Table 4-11 Commercial Natural Gas Consumption by End Use and Baseline Projection (MMTherms)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Heating	119	118	120	1.6%	118	119	1.2%
Water Heating	50	50	51	1.8%	50	50	0.8%
Food Preparation	30	30	31	3.1%	30	31	1.5%
Miscellaneous	7	8	8	1.8%	8	8	2.1%
Total	**207**	**206**	**210**	**1.8%**	**205**	**208**	**1.2%**

Figure 4-8 Commercial Natural Gas Baseline with Naturally Occurring Efficiency by End Use

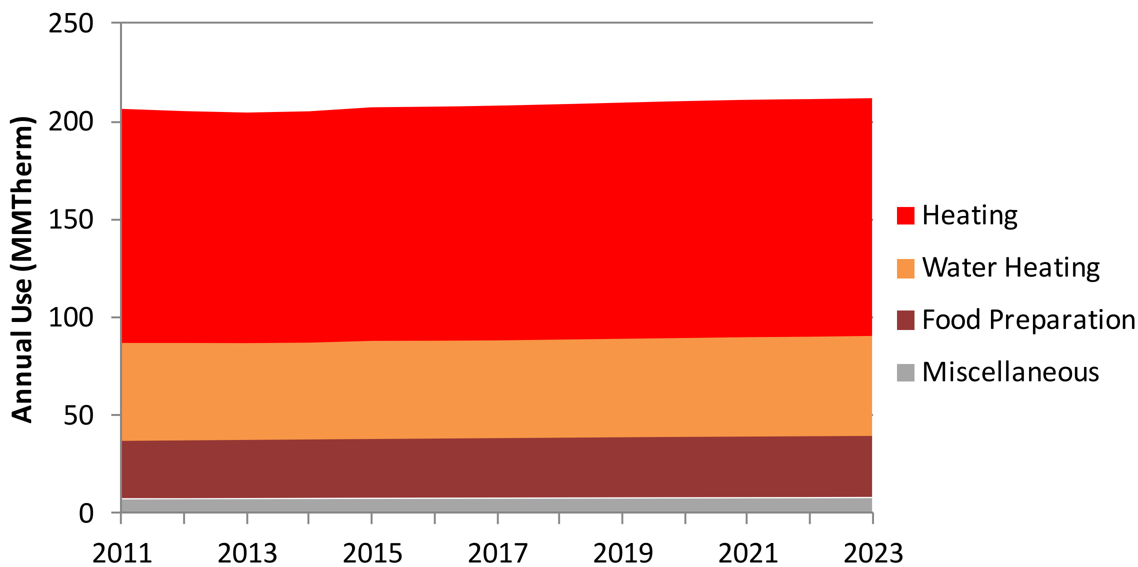


Table 4-12 shows the commercial baseline gas projection at the technology level.

Table 4-12 Commercial Natural Gas Baseline Projection with Naturally Occurring Efficiency by End Use and Technology (MMTherms)

End Use	Technology	2011	2014	2015	2016	% Change ('14-'16)	Avg. Growth Rate
Heating	Furnace	91	92	93	93	1.6%	0.5%
	Boiler	24	21	21	21	-0.6%	-0.2%
	Unit Heater	5	5	5	5	2.1%	0.7%
Water Heating	Water Heater	50	50	50	50	0.8%	0.3%
Food Preparation	Oven	3	3	3	3	-1.0%	-0.3%
	Fryer	8	9	9	9	5.1%	1.7%
	Broiler	6	6	6	6	-0.8%	-0.3%
	Griddle	5	5	5	5	2.0%	0.7%
	Range	6	6	6	6	0.1%	0.0%
	Steamer	1	1	1	1	-1.7%	-0.6%
	Other	0	0	0	0	1.7%	0.6%
Miscellaneous	Pool Heater	1	1	1	1	2.0%	0.7%
	Miscellaneous	6	6	6	6	2.1%	0.7%
Total		**207**	**205**	**207**	**208**	**1.2%**	**0.4%**

Industrial Sector

The baseline projections incorporate assumptions about economic growth, electricity prices, and appliance/equipment standards and building codes that are already mandated as described in Chapter 2. Figure 4-9 and Table 4-13 show the two baseline projections. The difference between the two lines is attributed to naturally occurring efficiency.

Figure 4-9 Industrial Electricity Baseline Forecast w/ and w/o NO Efficiency

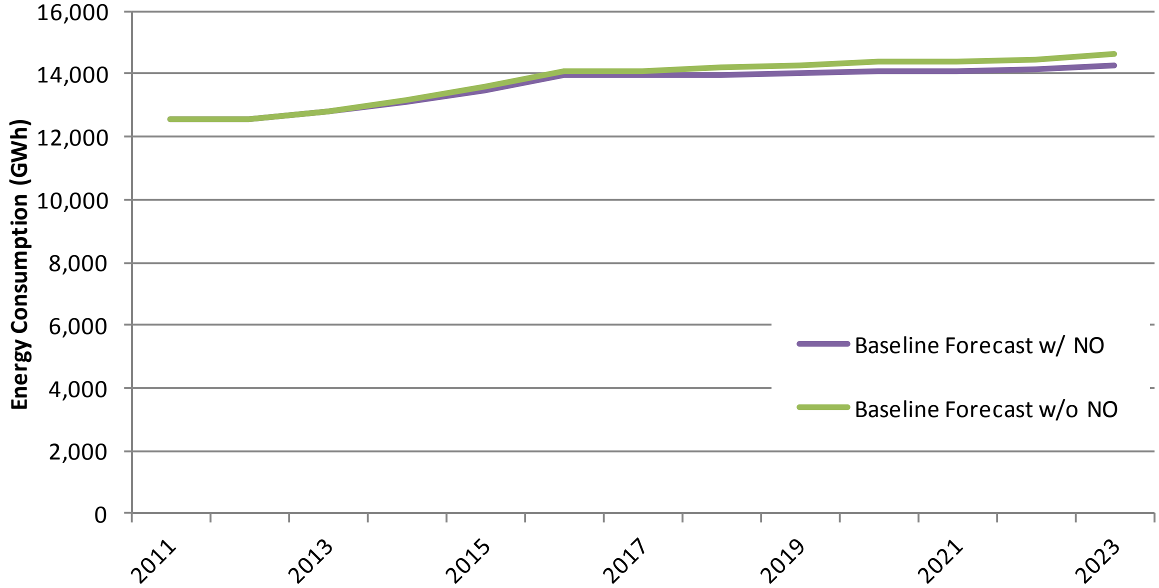


Table 4-13 Industrial Electricity Baseline Projections (GWh)

Industrial Electricity Baseline Projection (GWh)	2011	2014	2015	2016	%Change '14-'16
With Naturally Occurring Efficiency	12,580	13,130	13,480	13,955	6%
Without Naturally Occurring Efficiency	12,580	13,181	13,571	14,065	7%
Naturally Occurring Savings	0	51	91	110	

Table 4-14 and Figure 4-10 present the electricity baseline projection at the end-use level for the industrial sector as a whole. In the baseline forecast without Naturally Occurring efficiency, industrial annual electricity use increases from 12,580 GWh in 2011 to 14,065 GWh in 2016. In the Baseline projection with Naturally Occurring efficiency, industrial electricity use increases from 12,580 GWh in 2011 to 13,955 GWh in 2016, an increase of 6.3%, during the program years. This is largely driven by the recovery of the economy.

Table 4-14 Industrial Electricity Consumption by End Use and Baseline Projection (GWh)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Cooling	311	316	333	5.3%	314	326	4.0%
Heating	968	993	1,034	4.1%	993	1,034	4.1%
Ventilation	-	-	-	0.0%	-	-	0.0%
Interior Lighting	867	744	770	3.4%	709	698	-1.6%
Exterior Lighting	166	128	138	8.5%	115	109	-5.5%
Motors	6,980	7,460	7,989	7.1%	7,459	7,988	7.1%
Process	2,925	3,129	3,344	6.9%	3,129	3,344	6.9%
Miscellaneous	364	411	456	10.8%	411	456	10.8%
Total	**12,580**	**13,181**	**14,065**	**6.7%**	**13,130**	**13,955**	**6.3%**

Figure 4-10 Industrial Electricity Baseline Projection with Naturally Occurring by End Use

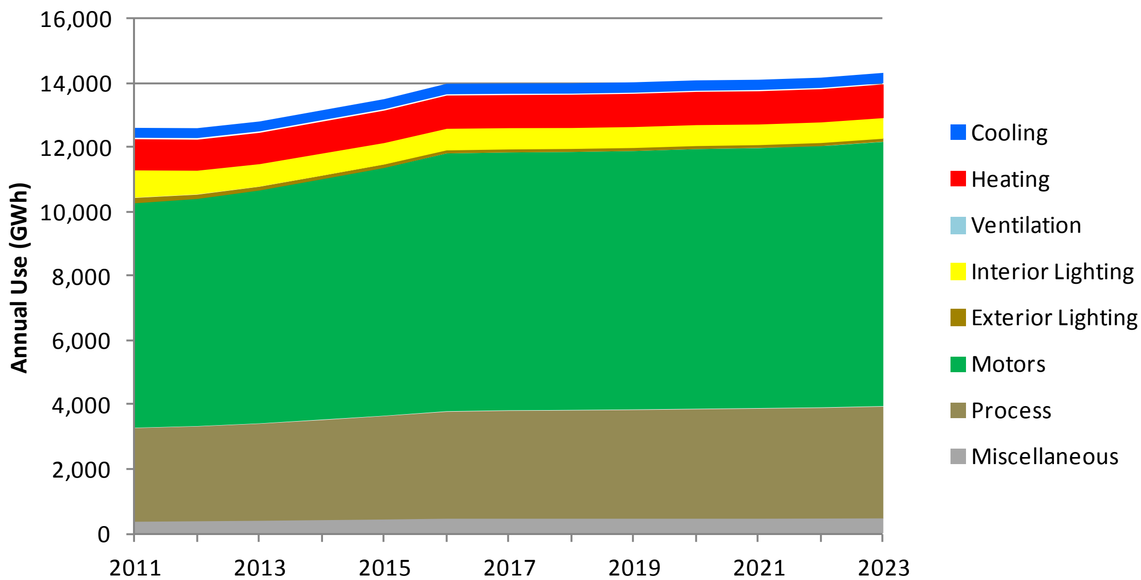


Table 4-15 presents the industrial sector electricity baseline with Naturally Occurring efficiency by technology. Interior lighting and exterior lighting decrease significantly over the projection period as a result of efficiency standards.

Table 4-15 Industrial Electricity Baseline Projection with Naturally Occurring Efficiency by End Use and Technology (GWh)

End Use	Technology	2011	2014	2015	2016	% Change ('14-'16)	Avg. Growth Rate
Cooling	Air-Cooled Chiller	68	70	72	74	5.7%	1.9%
	Water-Cooled Chiller	66	69	70	73	5.8%	1.9%
	Roof top AC	69	67	67	68	1.5%	0.5%
	Other Cooling	0	0	0	0	0.0%	0.0%
	Geothermal Heat Pump	105	105	106	108	2.9%	0.9%
	Air Source Heat Pump	3	3	3	3	0.0%	0.0%
Heating	Electric Furnace	757	782	796	817	4.5%	1.5%
	Geothermal Heat Pump	206	206	208	212	2.9%	1.0%
	Air Source Heat Pump	5	5	5	5	0.0%	0.0%
	Electric Resistance	-	-	-	-	0.0%	0.0%
Ventilation	Ventilation	0	0	0	0	0.0%	0.0%
Interior Lighting	Screw-in	210	128	117	115	-10.2%	-3.6%
	High-Bay Fixtures	45	33	31	31	-6.1%	-2.1%
	Linear Fluorescent	612	548	546	551	0.5%	0.2%
Exterior Lighting	Screw-in	0	0	0	0	0.0%	0.0%
	HID	165	115	109	108	-6.1%	-2.1%
	Linear Fluorescent	0	0	0	0	0.0%	0.0%
Motors	Pumps	1,766	1,888	1,945	2,021	7.0%	2.3%
	Fans & Blowers	1,138	1,216	1,253	1,303	7.2%	2.3%

End Use	Technology	2011	2014	2015	2016	% Change ('14-'16)	Avg. Growth Rate
	Compressed Air	1,054	1,126	1,161	1,206	7.1%	2.3%
	Material Handling	456	488	503	522	7.0%	2.2%
	Material Processing	2,115	2,261	2,330	2,421	7.1%	2.3%
	Other Motors	450	481	495	515	7.1%	2.3%
Process	Process Heating	1,509	1,614	1,666	1,725	6.9%	2.2%
	Process Cooling and Refrig	943	1,009	1,041	1,078	6.8%	2.2%
	Electro-Chemical Processes	383	410	423	438	6.8%	2.2%
	Other Process	90	97	100	103	6.2%	2.0%
Miscellaneous	Miscellaneous	364	411	431	456	10.9%	3.5%
Total		**12,580**	**13,130**	**13,480**	**13,955**	**6.3%**	**2.0%**

Table 4-17 and Figure 4-11 show a different story for the industrial natural gas baseline projection. Industrial natural gas use remains essentially flat from 2011 to 2016. The difference between the two lines is attributed to naturally occurring efficiency.

Table 4-16 Industrial Natural Gas Baseline Projections (MMTherms)

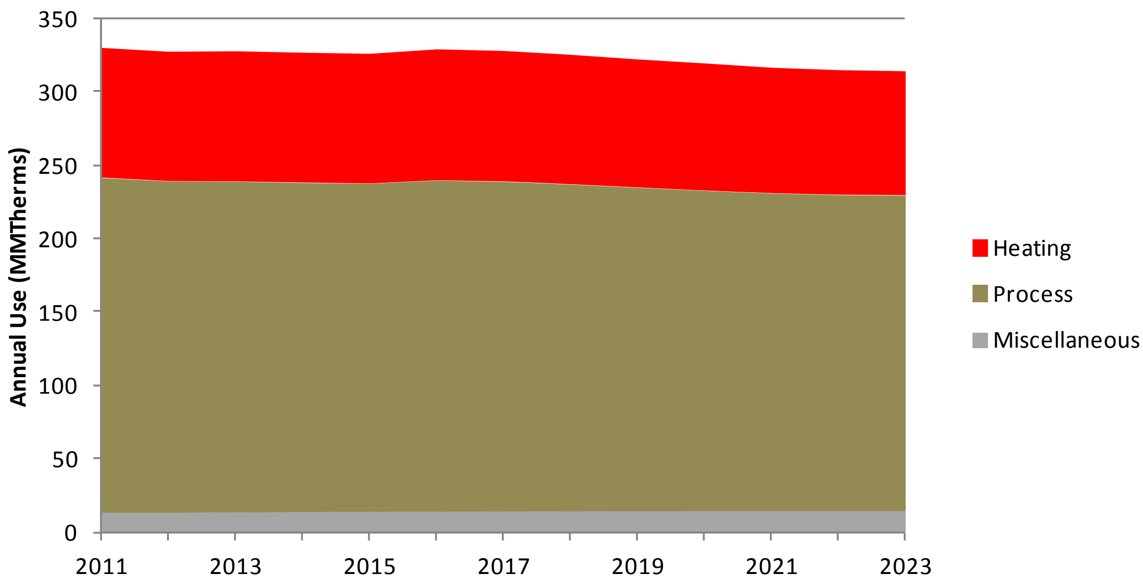
Industrial Natural Gas Baseline Projection (MMTherms)	2011	2014	2015	2016	%Change '14-'16
With Naturally Occurring Efficiency	330	326	326	329	0.7%
Without Naturally Occurring Efficiency	330	327	326	329	0.8%
Naturally Occurring Savings	0.0	0.1	0.2	0.4	

In the Codes and Standards projection, industrial natural gas use remains essentially flat from 330 MMTherms in 2011 to 329 MMTherms in 2016. In the Baseline projection, natural gas use also remains flat, going from 330 MMTherms in 2011 to 329 MMTherms in 2016. The subtle differences between projections occur in the heating end use.

Table 4-17 Industrial Natural Gas Consumption by End Use and Baseline Projection (MMTherms)

End Use	Base year	Without Naturally Occurring Efficiency			With Naturally Occurring Efficiency		
	2011	2014	2016	% Change ('14-'16)	2014	2016	% Change ('14-'16)
Heating	88	89	90	1.0%	89	89	0.8%
Process	228	225	226	0.5%	225	226	0.5%
Miscellaneous	13	13	14	3.5%	13	14	3.5%
Total	**330**	**327**	**329**	**0.8%**	**326**	**329**	**0.7%**

Figure 4-11 Industrial Natural Gas Baseline with Naturally Occurring Efficiency by End Use



Baseline Projection Summary

For the remainder of the report, the baseline forecast refers only to the baseline that **includes** naturally occurring efficiency. Table 4-18 and Figure 4-12 provide a summary of the baseline projection for electricity by sector for the Ameren Illinois service territory. Overall, the projection shows a slight decrease in electricity use, due to a challenging macroeconomic environment and codes and standards.

Table 4-18 Electricity Baseline Projection Summary (GWh)

Sector	2011	2014	2015	2016	% Change	Avg. Growth Rate
Residential	11,577	11,184	10,897	10,687	-7.7%	-1.6%
Commercial	12,414	11,547	11,415	11,332	-8.7%	-0.6%
Industrial	12,580	13,130	13,480	13,955	10.9%	1.1%
Total	**36,571**	**35,861**	**35,792**	**35,973**	**-1.6%**	**-0.1%**

Figure 4-12 Electricity Baseline Projection Summary (GWh)

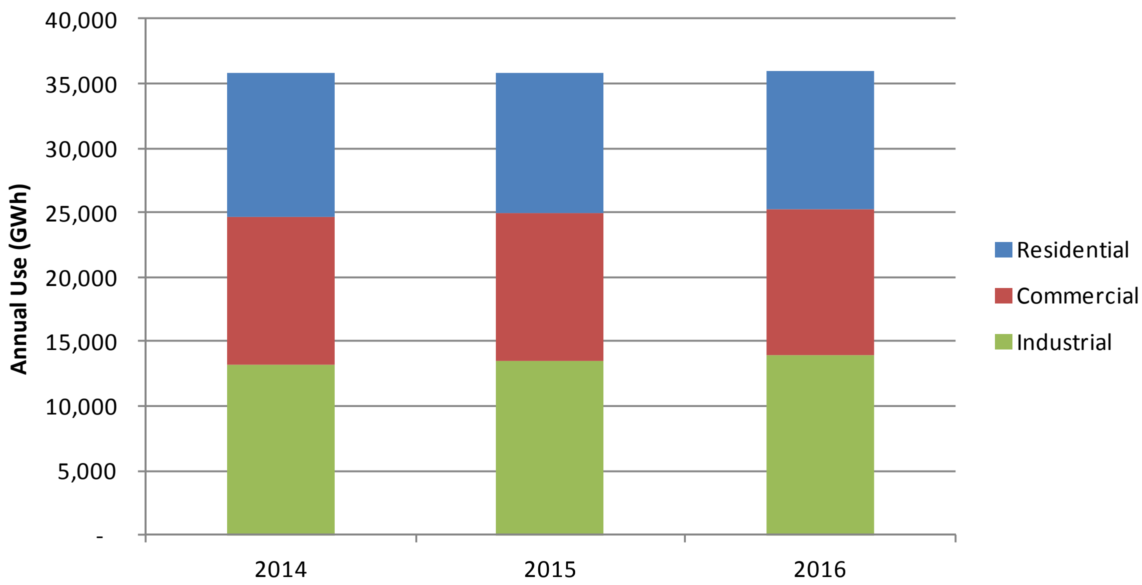
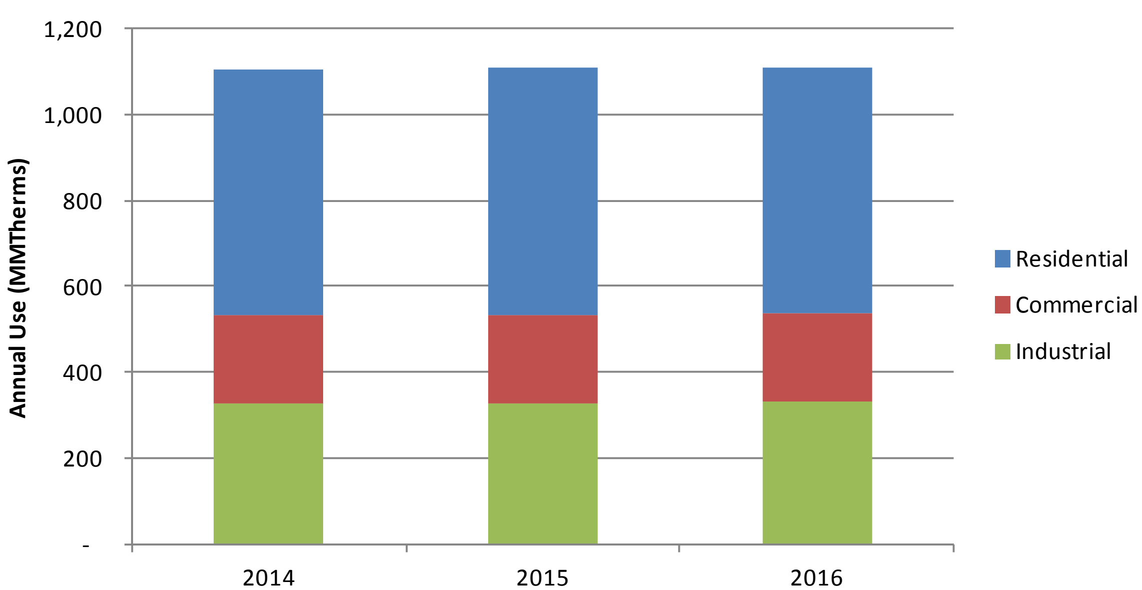


Table 4-19 and Figure 4-13 provide a summary of the natural gas baseline projection by sector for Ameren Illinois. Overall, the projection is increasing slightly across all sectors.

Table 4-19 Natural Gas Baseline Projection Summary (MMTherms)

Sector	2011	2014	2015	2016	% Change	Avg. Growth Rate
Residential	569	569	574	570	0.2%	0.2%
Commercial	207	205	207	208	0.6%	0.5%
Industrial	330	326	326	329	-0.3%	-0.3%
Total	**1,105**	**1,101**	**1,107**	**1,106**	**0.1%**	**0.1%**

Figure 4-13 Natural Gas Baseline Projection Summary (MMTherms)



ENERGY EFFICIENCY MEASURES

List of Energy Efficiency Measures

The first step of the energy efficiency measure analysis is to identify the list of all relevant energy efficiency measures that should be considered for the Ameren Illinois potential assessment.

For this study, EnerNOC prepared a preliminary list of measures for Ameren Illinois staff and stakeholders to review. After incorporating feedback, we populated the full databases for the three sectors.

Sources for the measure assumptions were primarily drawn from the Illinois TRM. Additional sources included Ameren Illinois past program experience, EnerNOC's building simulation tool (BEST), EnerNOC's measure database (DEEM), DEER, NWPCC workbooks, other secondary sources, and data from EnerNOC's previous studies and program work.

- **Residential Measures**. The residential measures span all end uses and vary significantly in the manner in which they impact energy consumption. Table 5-1shows the residential equipment measure options and the segments for which they were modeled. The electric measures are listed first, followed by natural gas measures. Table 5-2 shows the residential non-equipment measure options. All residential measures considered for this study are described in Appendix B.
- **Commercial Measures**. Table 5-3 and Table 5-4 present a summary of the commercial equipment and non-equipment measures, respectively. The measures shown were modeled for nearly all of the commercial building types, both new and existing, with only a few exceptions. For instance, hotel guest room controls were only modeled for the lodging sector. All commercial measures considered for this study are described in Appendix C.
- **Industrial Measures.** Table 5-5 and Table 5-6 present a summary of the industrial equipment and non-equipment measures, respectively. All industrial measures considered for this study are described in Appendix D.

Table 5-1 Summary of Residential Equipment Measures

End Use	Fuel	Technology	Efficiency Option
Cooling	Electric	Central AC	SEER 13
Cooling	Electric	Central AC	SEER 14.5 (ENERGY STAR)
Cooling	Electric	Central AC	SEER 15 (CEE Tier 2)
Cooling	Electric	Central AC	SEER 16 (CEE Tier 3)
Cooling	Electric	Central AC	Ductless Minisplit
Cooling	Electric	Central AC	SEER 21
Cooling	Electric	Room AC	EER 9.8
Cooling	Electric	Room AC	EER 10.8 (ENERGY STAR)
Cooling	Electric	Room AC	EER 11.0
Cooling	Electric	Room AC	EER 11.5
Cooling	Electric	Room AC	EER 12.0
Cooling	Electric	Air-Source Heat Pump	SEER 13, HSPF 7.7
Cooling	Electric	Air-Source Heat Pump	SEER 14, HSPF 8.0
Cooling	Electric	Air-Source Heat Pump	SEER 15, HSPF 8.2
Cooling	Electric	Air-Source Heat Pump	SEER 16, HSPF 8.5
Cooling	Electric	Air-Source Heat Pump	Ductless Minisplit
Cooling	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Cooling	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Cooling	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Cooling	Electric	Geothermal Heat Pump	EER 30, COP 5
Cooling	Electric	PTHP	EER 9.8
Cooling	Electric	PTHP	EER 10.2
Cooling	Electric	PTHP	EER 10.8
Cooling	Electric	PTHP	EER 11
Cooling	Electric	PTHP	EER 11.5
Heating	Electric	Furnace	Standard
Heating	Electric	Electric Room Heat	Standard
Heating	Electric	Air-Source Heat Pump	SEER 13, HSPF 7.7
Heating	Electric	Air-Source Heat Pump	SEER 14, HSPF 8.0
Heating	Electric	Air-Source Heat Pump	SEER 15, HSPF 8.2
Heating	Electric	Air-Source Heat Pump	SEER 16, HSPF 8.5
Heating	Electric	Air-Source Heat Pump	Ductless Minisplit
Heating	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Heating	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Heating	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Heating	Electric	Geothermal Heat Pump	EER 30, COP 5
Heating	Electric	PTHP	EER 9.8
Heating	Electric	PTHP	EER 10.2
Heating	Electric	PTHP	EER 10.8
Heating	Electric	PTHP	EER 11
Heating	Electric	PTHP	EER 11.5
Water Heating	Electric	Water Heater <= 55 gal	EF 0.9
Water Heating	Electric	Water Heater <= 55 gal	EF 0.95
Water Heating	Electric	Water Heater <= 55 gal	EF 2.0 (HP)
Water Heating	Electric	Water Heater <= 55 gal	EF 2.3 (HP)
Water Heating	Electric	Water Heater > 55 gal	EF 0.9
Water Heating	Electric	Water Heater > 55 gal	EF 0.95
Water Heating	Electric	Water Heater > 55 gal	EF 2.0 (HP)

End Use	Fuel	Technology	Efficiency Option
Water Heating	Electric	Water Heater > 55 gal	EF 2.3 (HP)
Interior Lighting	Electric	Screw-in	Incandescent
Interior Lighting	Electric	Screw-in	Infrared Halogen
Interior Lighting	Electric	Screw-in	Infrared Halogen (2020)
Interior Lighting	Electric	Screw-in	CFL
Interior Lighting	Electric	Screw-in	LED
Interior Lighting	Electric	Screw-in	LED (2020)
Interior Lighting	Electric	Linear Fluorescent	T12
Interior Lighting	Electric	Linear Fluorescent	T8
Interior Lighting	Electric	Linear Fluorescent	LED (2011)
Interior Lighting	Electric	Linear Fluorescent	Super T8
Interior Lighting	Electric	Linear Fluorescent	T5
Interior Lighting	Electric	Linear Fluorescent	LED (2020)
Interior Lighting	Electric	Specialty	Incandescent
Interior Lighting	Electric	Specialty	Infrared Halogen
Interior Lighting	Electric	Specialty	CFL
Interior Lighting	Electric	Specialty	LED
Interior Lighting	Electric	Specialty	LED (2020)
Exterior Lighting	Electric	Screw-in	Incandescent
Exterior Lighting	Electric	Screw-in	Infrared Halogen
Exterior Lighting	Electric	Screw-in	Infrared Halogen (2020)
Exterior Lighting	Electric	Screw-in	CFL
Exterior Lighting	Electric	Screw-in	LED
Exterior Lighting	Electric	Screw-in	LED (2020)
Appliances	Electric	Refrigerator	Standard
Appliances	Electric	Refrigerator	ENERGY STAR
Appliances	Electric	Refrigerator	High Efficiency
Appliances	Electric	Refrigerator	AHAM (2014)
Appliances	Electric	Refrigerator	High Efficiency (2014)
Appliances	Electric	Second Refrigerator	Standard
Appliances	Electric	Second Refrigerator	ENERGY STAR
Appliances	Electric	Second Refrigerator	High Efficiency
Appliances	Electric	Second Refrigerator	AHAM (2014)
Appliances	Electric	Second Refrigerator	High Efficiency (2014)
Appliances	Electric	Freezer	Standard
Appliances	Electric	Freezer	ENERGY STAR
Appliances	Electric	Freezer	High Efficiency
Appliances	Electric	Freezer	AHAM (2014)
Appliances	Electric	Freezer	High Efficiency (2014)
Appliances	Electric	Clothes Washer	Standard (1.26)
Appliances	Electric	Clothes Washer	ENERGY STAR (1.72)
Appliances	Electric	Clothes Washer	ENERGY STAR (MEF 2.0)
Appliances	Electric	Clothes Washer	Compact (MEF 2.79)
Appliances	Electric	Clothes Dryer	Baseline
Appliances	Electric	Clothes Dryer	High Efficiency
Appliances	Electric	Clothes Dryer	Baseline (2015+)
Appliances	Electric	Clothes Dryer	High Efficiency (2015+)
Appliances	Electric	Dishwasher	Standard (EF 0.63)
Appliances	Electric	Dishwasher	ENERGY STAR (EF 0.73)
Appliances	Electric	Dishwasher	AHAM (EF 0.73)
Appliances	Electric	Dishwasher	Ultra Efficient (EF 1.1)
Appliances	Electric	Stove	Standard

End Use	Fuel	Technology	Efficiency Option
Appliances	Electric	Stove	Convection
Appliances	Electric	Stove	Halogen Burner
Appliances	Electric	Stove	Induction
Appliances	Electric	Microwave	Standard
Electronics	Electric	Personal Computers	Standard
Electronics	Electric	Personal Computers	ENERGY STAR
Electronics	Electric	Monitor	Standard
Electronics	Electric	Monitor	ENERGY STAR
Electronics	Electric	Laptops	Standard
Electronics	Electric	Laptops	ENERGY STAR
Electronics	Electric	TVs	Standard
Electronics	Electric	TVs	ENERGY STAR (3.1)
Electronics	Electric	TVs	ENERGY STAR (4.1)
Electronics	Electric	TVs	ENERGY STAR (5.1)
Electronics	Electric	Printer/Fax/Copier	Standard
Electronics	Electric	Printer/Fax/Copier	ENERGY STAR
Electronics	Electric	Set-top Boxes/DVR	Standard
Electronics	Electric	Set-top Boxes/DVR	ENERGY STAR (2009)
Electronics	Electric	Set-top Boxes/DVR	ENERGY STAR (2011)
Electronics	Electric	Devices and Gadgets	Standard
Miscellaneous	Electric	Air Purifier/Cleaner	Standard
Miscellaneous	Electric	Air Purifier/Cleaner	ENERGY STAR
Miscellaneous	Electric	Dehumidifier	Standard
Miscellaneous	Electric	Dehumidifier	ENERGY STAR
Miscellaneous	Electric	Pool Pump	Standard
Miscellaneous	Electric	Pool Pump	High Efficiency
Miscellaneous	Electric	Pool Pump	Two-Speed
Miscellaneous	Electric	Pool Heater	Electric Resistance
Miscellaneous	Electric	Pool Heater	Heat Pump (COP = 5.0)
Miscellaneous	Electric	Hot Tub / Spa	Standard
Miscellaneous	Electric	Hot Tub / Spa	Efficient Pumps
Miscellaneous	Electric	Hot Tub / Spa	Improved Controls and Pumps
Miscellaneous	Electric	Well Pump	Standard
Miscellaneous	Electric	Furnace Fan	Standard
Miscellaneous	Electric	Furnace Fan	ECM
Miscellaneous	Electric	Bathroom Exhaust Fan	Standard
Miscellaneous	Electric	Bathroom Exhaust Fan	High Efficiency
Miscellaneous	Electric	Miscellaneous	Standard
Heating	Natural Gas	Furnace	AFUE 0.8
Heating	Natural Gas	Furnace	AFUE 0.9
Heating	Natural Gas	Furnace	AFUE 0.92
Heating	Natural Gas	Furnace	AFUE 0.95
Heating	Natural Gas	Furnace	AFUE 0.97
Heating	Natural Gas	Boiler	EF 0.8
Heating	Natural Gas	Boiler	EF 0.9
Heating	Natural Gas	Boiler	EF 0.92
Heating	Natural Gas	Boiler	EF 0.95
Heating	Natural Gas	Other Heating	Gas Fireplace
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.59
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.67
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.74
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.76

End Use	Fuel	Technology	Efficiency Option
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.82 (Tankless)
Water Heating	Natural Gas	Water Heater <= 55 gal	EF 0.86 (Condensing)
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.59
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.67
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.74
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.76
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.82 (Tankless)
Water Heating	Natural Gas	Water Heater > 55 gal	EF 0.86 (Condensing)
Appliances	Natural Gas	Clothes Dryer	Standard
Appliances	Natural Gas	Clothes Dryer	Standard (AHAM)
Appliances	Natural Gas	Clothes Dryer	Efficient
Appliances	Natural Gas	Stove	Standard (EF .399)
Appliances	Natural Gas	Stove	Efficient (EF .42)
Miscellaneous	Natural Gas	Pool Heater	EF .78
Miscellaneous	Natural Gas	Pool Heater	EF .82
Miscellaneous	Natural Gas	Pool Heater	EF .90
Miscellaneous	Natural Gas	Pool Heater	EF .95
Miscellaneous	Natural Gas	Hot Tub / Spa	EF .78
Miscellaneous	Natural Gas	Hot Tub / Spa	EF .82
Miscellaneous	Natural Gas	Hot Tub / Spa	EF .90
Miscellaneous	Natural Gas	Hot Tub / Spa	EF .95
Miscellaneous	Natural Gas	Miscellaneous	Standard

Table 5-2 Summary of Residential Non-Equipment Measures

Measure	Existing	New
Insulation - Ceiling	X	X
Insulation - Ducting	X	X
Insulation - Foundation	X	X
Insulation - Infiltration Control	X	X
Insulation - Radiant Barrier	X	X
Insulation - Wall Cavity	X	X
Insulation - Wall Sheathing	X	X
Ducting - Repair and Sealing	X	X
Windows - High Efficiency/ENERGY STAR	X	X
Windows - Install Reflective Film	X	X
Doors - Storm and Thermal	X	X
Roofs - High Reflectivity	X	X
Attic Fan - Installation	X	X
Attic Fan - Photovoltaic - Installation	X	X
Whole-House Fan - Installation	X	X
Ceiling Fan - Installation	X	X
Thermostat - Clock/Programmable	X	X
Home Energy Management System	X	X
Central AC - Early Replacement	X	X
Central AC - Maintenance and Tune-Up	X	X

Measure	Existing	New
Central Heat Pump - Maintenance	X	X
Room AC - Removal of Second Unit	X	X
Boiler - Hot Water Reset	X	X
Boiler - Pipe Insulation	X	X
Boiler - Maintenance	X	X
Furnace - Maintenance	X	X
Water Heater - Drainwater Heat Recovery	X	X
Water Heater - Faucet Aerators	X	X
Water Heater - Low-Flow Showerheads	X	X
Water Heater - Pipe Insulation	X	X
Water Heater - Tank Blanket/Insulation	X	X
Water Heater - Thermostat Setback	X	X
Water Heater - Timer	X	X
Water Heater - Desuperheater	X	X
Water Heater - Solar System	X	X
Interior Lighting - Occupancy Sensors	X	X
Exterior Lighting - Photosensor Control	X	X
Exterior Lighting - Photovoltaic Installation	X	X
Exterior Lighting - Timeclock Installation	X	X
Refrigerator - Early Replacement	X	X
Refrigerator - Maintenance	X	X
Refrigerator - Remove Second Unit	X	X
Freezer - Remove Second Unit	X	X
Freezer - Early Replacement	X	X
Freezer - Maintenance	X	X
Electronics - Smart Power Strip	X	X
Pool Pump - Timer	X	X
Pool Heater - Solar System	X	X
ENERGY STAR Home Design	X	X
Information Based Energy Efficiency Programs	X	X
Combined Boiler & Water Heating Unit	X	X
Pool/Spa cover	X	X

Table 5-3 Summary of Commercial Equipment Measures

End Use	Fuel	Technology	Efficiency Option
Cooling	Electric	Air-Cooled Chiller	1.5 kw/ton, COP 2.3
Cooling	Electric	Air-Cooled Chiller	1.3 kw/ton, COP 2.7
Cooling	Electric	Air-Cooled Chiller	1.26 kw/ton, COP 2.8
Cooling	Electric	Air-Cooled Chiller	1.0 kw/ton, COP 3.5
Cooling	Electric	Air-Cooled Chiller	0.97 kw/ton, COP 3.6
Cooling	Electric	Water-Cooled Chiller	0.75 kw/ton, COP 4.7
Cooling	Electric	Water-Cooled Chiller	0.60 kw/ton, COP 5.9
Cooling	Electric	Water-Cooled Chiller	0.58 kw/ton, COP 6.1

End Use	Fuel	Technology	Efficiency Option
Cooling	Electric	Water-Cooled Chiller	0.55 kw/Ton, COP 6.4
Cooling	Electric	Water-Cooled Chiller	0.51 kw/ton, COP 6.9
Cooling	Electric	Water-Cooled Chiller	0.50 kw/Ton, COP 7.0
Cooling	Electric	Water-Cooled Chiller	0.48 kw/ton, COP 7.3
Cooling	Electric	Roof top AC	EER 9.2
Cooling	Electric	Roof top AC	EER 10.1
Cooling	Electric	Roof top AC	EER 11.2
Cooling	Electric	Roof top AC	EER 12.0
Cooling	Electric	Roof top AC	Ductless Minisplit
Cooling	Electric	Air Source Heat Pump	EER 9.3, COP 3.1
Cooling	Electric	Air Source Heat Pump	EER 10.3, COP 3.2
Cooling	Electric	Air Source Heat Pump	EER 11.0, COP 3.3
Cooling	Electric	Air Source Heat Pump	EER 11.7, COP 3.4
Cooling	Electric	Air Source Heat Pump	EER 12.0, COP 3.4
Cooling	Electric	Air Source Heat Pump	Ductless Minisplit
Cooling	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Cooling	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Cooling	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Cooling	Electric	Geothermal Heat Pump	EER 30, COP 5.0
Cooling	Electric	PTAC	EER 9.8
Cooling	Electric	PTAC	EER 10.2
Cooling	Electric	PTAC	EER 10.8
Cooling	Electric	PTAC	EER 11
Cooling	Electric	PTAC	EER 11.5
Cooling	Electric	PTHP	EER 9.8
Cooling	Electric	PTHP	EER 10.2
Cooling	Electric	PTHP	EER 10.8
Cooling	Electric	PTHP	EER 11
Cooling	Electric	PTHP	EER 11.5
Cooling	Electric	Evaporative AC	Direct
Cooling	Electric	Evaporative AC	Indirect
Cooling	Electric	Evaporative AC	Direct/Indirect
Heating	Electric	Air Source Heat Pump	EER 9.3, COP 3.1
Heating	Electric	Air Source Heat Pump	EER 10.3, COP 3.2
Heating	Electric	Air Source Heat Pump	EER 11.0, COP 3.3
Heating	Electric	Air Source Heat Pump	EER 11.7, COP 3.4
Heating	Electric	Air Source Heat Pump	EER 12.0, COP 3.4
Heating	Electric	Air Source Heat Pump	Ductless Minisplit
Heating	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Heating	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Heating	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Heating	Electric	Geothermal Heat Pump	EER 30, COP 5.0
Heating	Electric	Electric Room Heat	Standard
Heating	Electric	Electric Furnace	Standard
Heating	Electric	PTAC	EER 9.8
Heating	Electric	PTAC	EER 10.2
Heating	Electric	PTAC	EER 10.8
Heating	Electric	PTAC	EER 11
Heating	Electric	PTAC	EER 11.5
Heating	Electric	PTHP	EER 9.8
Heating	Electric	PTHP	EER 10.2
Heating	Electric	PTHP	EER 10.8

End Use	Fuel	Technology	Efficiency Option
Heating	Electric	PTHP	EER 11
Heating	Electric	PTHP	EER 11.5
Ventilation	Electric	Ventilation	Constant Volume
Ventilation	Electric	Ventilation	Variable Air Volume
Water Heating	Electric	Water Heating	EF .97
Water Heating	Electric	Water Heating	EF .98
Water Heating	Electric	Water Heating	EF 2.0
Water Heating	Electric	Water Heating	EF 2.3
Water Heating	Electric	Water Heating	EF 2.4
Interior Lighting	Electric	Screw-in	Incandescent
Interior Lighting	Electric	Screw-in	90W Halogen PAR-38
Interior Lighting	Electric	Screw-in	70W HIR PAR-38
Interior Lighting	Electric	Screw-in	CFL
Interior Lighting	Electric	Screw-in	LED (2010)
Interior Lighting	Electric	Screw-in	LED (2020)
Interior Lighting	Electric	High-Bay Fixtures	Metal Halides
Interior Lighting	Electric	High-Bay Fixtures	LED (2010)
Interior Lighting	Electric	High-Bay Fixtures	T8
Interior Lighting	Electric	High-Bay Fixtures	High Pressure Sodium
Interior Lighting	Electric	High-Bay Fixtures	Light Emitting Plasma
Interior Lighting	Electric	High-Bay Fixtures	T5
Interior Lighting	Electric	High-Bay Fixtures	LED (2020)
Interior Lighting	Electric	Linear Fluorescent	T12
Interior Lighting	Electric	Linear Fluorescent	LED (2010)
Interior Lighting	Electric	Linear Fluorescent	T8
Interior Lighting	Electric	Linear Fluorescent	Super T8
Interior Lighting	Electric	Linear Fluorescent	T5
Interior Lighting	Electric	Linear Fluorescent	LED (2020)
Exterior Lighting	Electric	Screw-in	Incandescent
Exterior Lighting	Electric	Screw-in	90W Halogen PAR-38
Exterior Lighting	Electric	Screw-in	70W HIR PAR-38
Exterior Lighting	Electric	Screw-in	CFL
Exterior Lighting	Electric	Screw-in	LED (2010)
Exterior Lighting	Electric	Screw-in	LED (2020)
Exterior Lighting	Electric	HID	Metal Halides
Exterior Lighting	Electric	HID	LED (2010)
Exterior Lighting	Electric	HID	T8
Exterior Lighting	Electric	HID	High Pressure Sodium
Exterior Lighting	Electric	HID	Light Emitting Plasma
Exterior Lighting	Electric	HID	T5
Exterior Lighting	Electric	HID	LED (2020)
Exterior Lighting	Electric	Linear Fluorescent	T12
Exterior Lighting	Electric	Linear Fluorescent	LED (2010)
Exterior Lighting	Electric	Linear Fluorescent	T8
Exterior Lighting	Electric	Linear Fluorescent	Super T8
Exterior Lighting	Electric	Linear Fluorescent	T5
Exterior Lighting	Electric	Linear Fluorescent	LED (2020)
Refrigeration	Electric	Walk-in Refrigerator	14600 kWh/yr
Refrigeration	Electric	Walk-in Refrigerator	10800 kWh/yr
Refrigeration	Electric	Walk-in Refrigerator	10000 kWh/yr
Refrigeration	Electric	Walk-in Refrigerator	9000 kWh/yr
Refrigeration	Electric	Reach-in Refrigerator	3800 kWh/yr

End Use	Fuel	Technology	Efficiency Option
Refrigeration	Electric	Reach-in Refrigerator	3100 kWh/yr
Refrigeration	Electric	Reach-in Refrigerator	2500 kWh/yr
Refrigeration	Electric	Reach-in Refrigerator	2400 kWh/yr
Refrigeration	Electric	Reach-in Refrigerator	1500 kWh/yr
Refrigeration	Electric	Glass Door Display	14480 kWh/yr
Refrigeration	Electric	Glass Door Display	11700 kWh/yr
Refrigeration	Electric	Glass Door Display	8400 kWh/yr
Refrigeration	Electric	Glass Door Display	6800 kWh/yr
Refrigeration	Electric	Open Display Case	6500 kWh/yr
Refrigeration	Electric	Open Display Case	5350 kWh/yr
Refrigeration	Electric	Open Display Case	5300 kWh/yr
Refrigeration	Electric	Open Display Case	4330 kWh/yr
Refrigeration	Electric	Icemaker	7.0 kWh/100 lbs
Refrigeration	Electric	Icemaker	6.3 kWh/100 lbs
Refrigeration	Electric	Icemaker	6.0 kWh/100 lbs
Refrigeration	Electric	Icemaker	5.5 kWh/100 lbs
Refrigeration	Electric	Vending Machine	3400 kWh/year
Refrigeration	Electric	Vending Machine	3000 kWh/year
Refrigeration	Electric	Vending Machine	2400 kWh/year
Refrigeration	Electric	Vending Machine	1700 kWh/year
Food Preparation	Electric	Oven	Standard
Food Preparation	Electric	Oven	ENERGY STAR
Food Preparation	Electric	Fryer	Standard
Food Preparation	Electric	Fryer	ENERGY STAR
Food Preparation	Electric	Dishwasher	Standard
Food Preparation	Electric	Dishwasher	ENERGY STAR
Food Preparation	Electric	Hot Food Container	Standard
Food Preparation	Electric	Hot Food Container	ENERGY STAR
Food Preparation	Electric	Other	Standard
Office Equipment	Electric	Desktop Computer	Standard
Office Equipment	Electric	Desktop Computer	ENERGY STAR
Office Equipment	Electric	Laptop	Standard
Office Equipment	Electric	Laptop	ENERGY STAR
Office Equipment	Electric	Server	Standard
Office Equipment	Electric	Server	ENERGY STAR
Office Equipment	Electric	Monitor	Standard
Office Equipment	Electric	Monitor	ENERGY STAR
Office Equipment	Electric	Printer/Copier/Fax	Standard
Office Equipment	Electric	Printer/Copier/Fax	ENERGY STAR
Office Equipment	Electric	POS Terminal	Standard
Office Equipment	Electric	POS Terminal	ENERGY STAR
Miscellaneous	Electric	Non-HVAC Motors	Standard (EPAct)
Miscellaneous	Electric	Non-HVAC Motors	Standard (EPAct 2015)
Miscellaneous	Electric	Non-HVAC Motors	High Efficiency
Miscellaneous	Electric	Non-HVAC Motors	High Efficiency (2015)
Miscellaneous	Electric	Non-HVAC Motors	Premium (NEMA)
Miscellaneous	Electric	Non-HVAC Motors	Premium (NEMA 2015)
Miscellaneous	Electric	Pool Pump	Standard
Miscellaneous	Electric	Pool Pump	High Efficiency
Miscellaneous	Electric	Pool Pump	High Efficiency, Multi-Speed
Miscellaneous	Electric	Pool Heater	Standard
Miscellaneous	Electric	Pool Heater	Heat Pump

End Use	Fuel	Technology	Efficiency Option
Miscellaneous	Electric	Miscellaneous	Standard
Heating	Natural Gas	Furnace	EF .76
Heating	Natural Gas	Furnace	EF .80
Heating	Natural Gas	Furnace	EF .82
Heating	Natural Gas	Furnace	EF .90
Heating	Natural Gas	Furnace	EF .96
Heating	Natural Gas	Boiler	EF .76
Heating	Natural Gas	Boiler	EF .80
Heating	Natural Gas	Boiler	EF .83
Heating	Natural Gas	Boiler	EF .90
Heating	Natural Gas	Boiler	EF .96
Heating	Natural Gas	Unit Heater	Standard
Heating	Natural Gas	Unit Heater	Condensing
Water Heating	Natural Gas	Water Heating	EF 0.77
Water Heating	Natural Gas	Water Heating	EF 0.80
Water Heating	Natural Gas	Water Heating	Tankless
Water Heating	Natural Gas	Water Heating	Indirect Fired
Water Heating	Natural Gas	Water Heating	EF 0.94
Food Preparation	Natural Gas	Oven	Standard
Food Preparation	Natural Gas	Oven	ENERGY STAR
Food Preparation	Natural Gas	Fryer	Standard
Food Preparation	Natural Gas	Fryer	ENERGY STAR
Food Preparation	Natural Gas	Broiler	Standard
Food Preparation	Natural Gas	Broiler	High Efficiency
Food Preparation	Natural Gas	Griddle	Standard
Food Preparation	Natural Gas	Griddle	High Efficiency
Food Preparation	Natural Gas	Range	Standard
Food Preparation	Natural Gas	Range	High Efficiency
Food Preparation	Natural Gas	Steamer	Standard
Food Preparation	Natural Gas	Steamer	ENERGY STAR
Food Preparation	Natural Gas	Other	Standard
Food Preparation	Natural Gas	Other	ENERGY STAR
Miscellaneous	Natural Gas	Pool Heater	EF .78
Miscellaneous	Natural Gas	Pool Heater	EF .82
Miscellaneous	Natural Gas	Pool Heater	EF .90
Miscellaneous	Natural Gas	Pool Heater	EF .95
Miscellaneous	Natural Gas	Miscellaneous	Standard

Table 5-4 Summary of Commercial Non-Equipment Measures

Measure	Existing	New
Insulation - Ceiling	X	X
Insulation - Ducting	X	X
Insulation - Radiant Barrier	X	X
Insulation - Wall Cavity	X	X
HVAC - Duct Repair and Sealing	X	X
Doors - High Efficiency	X	X
Windows - High Efficiency	X	X
Roof - High Reflectivity	X	X

Measure	Existing	New
Air-Cooled Chiller - Condenser Air Temperature Reset	X	X
Air-Cooled Chiller - Economizer	X	X
Air-Cooled Chiller - Thermal Energy Storage	X	X
Air-Cooled Chiller - VSD on fans	X	X
Air-Cooled Chiller - Chilled Water Reset	X	X
Air-Cooled Chiller - Chilled Water Variable-Flow System	X	X
Air-Cooled Chiller - High Efficiency Cooling Tower Fans	X	X
Air-Cooled Chiller - Maintenance	X	X
Water-Cooled Chiller - Condenser Water Temperature Reset	X	X
Water-Cooled Chiller - Economizer	X	X
Water-Cooled Chiller - Thermal Energy Storage	X	X
Water-Cooled Chiller - VSD on Fans	X	X
Water-Cooled Chiller - Chilled Water Reset	X	X
Water-Cooled Chiller - Chilled Water Variable-Flow System	X	X
Water-Cooled Chiller - High Efficiency Cooling Tower Fans	X	X
Water-Cooled Chiller - Maintenance	X	X
RTU - Evaporative Precooler	X	X
RTU - Maintenance	X	X
Gas Boiler - High Efficiency Hot Water Circulation	X	X
Gas Boiler - Hot Water Reset	X	X
Gas Boiler - Maintenance	X	X
Gas Furnace - Maintenance	X	X
Space Heating - Heat Recovery Ventilator	X	X
Heat Pump - Maintenance	X	X
Ventilation - ECM on VAV Boxes	X	X
Ventilation - Variable Speed Control	X	X
Ventilation - CO2 Controlled	X	X
Water Heater - Drainwater Heat Recovery	X	X
Water Heater - Faucet Aerators	X	X
Water Heater - Low Flow Showerheads	X	X
Water Heater - High Efficiency Circulation Pump	X	X
Water Heater - Desuperheater	X	X
Water Heater - Solar System	X	X
Water Heater - Install Timer	X	X
Water Heater - Pipe Insulation	X	X
Water Heater - Tank Blanket/Insulation	X	X
Water Heater - Pre-Rinse Spray Valve	X	X
Combined Boiler & Water Heating Unit	X	X
Interior Lighting - Daylighting Controls	X	X
Interior Lighting - LED Exit Lighting	X	X
Interior Lighting - Occupancy Sensors	X	X
Interior Lighting - Task Lighting	X	X

Measure	Existing	New
Interior Lighting - Timeclocks and Timers	X	X
Interior Fluorescent - Bi-Level Fixture	X	X
Interior Fluorescent - Delamp and Install Reflectors	X	X
Exterior Lighting - Bi-Level Fixture	X	X
Exterior Lighting - Daylighting Controls	X	X
Exterior Lighting - Photovoltaic Installation	X	X
Refrigerator - Anti-Sweat Door Heater	X	X
Refrigerator - Auto Door Closer	X	X
Refrigerator - Decommissioning	X	X
Refrigerator - Demand Defrost	X	X
Refrigerator - Door Gasket Replacement	X	X
Refrigerator - Economizer	X	X
Refrigerator - Evaporator Fan Controls	X	X
Refrigerator - Floating Head Pressure	X	X
Refrigerator - Strip Curtain	X	X
Refrigerator - High Efficiency Compressor	X	X
Refrigerator - Variable Speed Compressor	X	X
Vending Machine - Controller	X	X
Grocery - Display Case - LED Lighting	X	X
Grocery - Display Case Motion Sensors	X	X
Grocery - ECMs for Display Cases	X	X
Grocery - Open Display Case - Night Covers	X	X
Cooking - Exhaust Hoods with Sensor Control	X	X
Office Equipment - ENERGY STAR Power Supplies	X	X
Office Equipment - Plug Load Occupancy Sensors	X	X
Pool Pump - Timer	X	X
Pool Heater - Solar	X	X
Non-HVAC Motors - Variable Speed Control	X	X
Energy Management System	X	X
Thermostat - Clock/Programmable	X	X
Lodging - Guest Room Controls	X	X
HVAC - Occupancy Sensors	X	X
Commissioning - HVAC	X	X
Commissioning - Lighting	X	X
Retrocommissioning - HVAC	X	X
Retrocommissioning - Lighting	X	X
Advanced New Construction Designs	X	X
Custom Measures	X	X
Refrigerator - eCube	X	X
Electronics - Smart Power Strip	X	X
Electronics - Monitor Power Management	X	X
Insulation - Foundation	X	X

Measure	Existing	New
Water Heating - Booster Water Heater	X	X
Refrigeration - High Efficiency Evaporator Fan Motors	X	X
Boiler O2 Trim Controls	X	X
Boiler Parallel Positioning Control	X	X
Boiler blowdown heat exchanger (steam)	X	X
Repair malfunctioning steam traps	X	X
Insulate steam lines/condensate tank	X	X
Destratification Fans (HVLS)	X	X
Exhaust Hood Makeup Air	X	X
Optimizing Kitchen Ventilation	X	X

Table 5-5 Summary of Industrial Equipment Measures

End Use	Fuel	Technology	Efficiency Option
Cooling	Electric	Air-Cooled Chiller	1.5 kw/ton, COP 2.3
Cooling	Electric	Air-Cooled Chiller	1.3 kw/ton, COP 2.7
Cooling	Electric	Air-Cooled Chiller	1.26 kw/ton, COP 2.8
Cooling	Electric	Air-Cooled Chiller	1.0 kw/ton, COP 3.5
Cooling	Electric	Air-Cooled Chiller	0.97 kw/ton, COP 3.6
Cooling	Electric	Water-Cooled Chiller	0.75 kw/ton, COP 4.7
Cooling	Electric	Water-Cooled Chiller	0.60 kw/ton, COP 5.9
Cooling	Electric	Water-Cooled Chiller	0.58 kw/ton, COP 6.1
Cooling	Electric	Water-Cooled Chiller	0.55 kw/Ton, COP 6.4
Cooling	Electric	Water-Cooled Chiller	0.51 kw/ton, COP 6.9
Cooling	Electric	Water-Cooled Chiller	0.50 kw/Ton, COP 7.0
Cooling	Electric	Water-Cooled Chiller	0.48 kw/ton, COP 7.3
Cooling	Electric	Roof top AC	EER 9.2
Cooling	Electric	Roof top AC	EER 10.1
Cooling	Electric	Roof top AC	EER 11.2
Cooling	Electric	Roof top AC	EER 12.0
Cooling	Electric	Roof top AC	Ductless Minisplit
Cooling	Electric	Air Source Heat Pump	EER 9.3, COP 3.1
Cooling	Electric	Air Source Heat Pump	EER 10.3, COP 3.2
Cooling	Electric	Air Source Heat Pump	EER 11.0, COP 3.3
Cooling	Electric	Air Source Heat Pump	EER 11.7, COP 3.4
Cooling	Electric	Air Source Heat Pump	EER 12.0, COP 3.4
Cooling	Electric	Air Source Heat Pump	Ductless Minisplit
Cooling	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Cooling	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Cooling	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Cooling	Electric	Geothermal Heat Pump	EER 30, COP 5.0
Cooling	Electric	Other Cooling	EER 9.8
Cooling	Electric	Other Cooling	EER 10.2
Cooling	Electric	Other Cooling	EER 10.8
Cooling	Electric	Other Cooling	EER 11
Cooling	Electric	Other Cooling	EER 11.5
Heating	Electric	Air Source Heat Pump	EER 9.3, COP 3.1
Heating	Electric	Air Source Heat Pump	EER 10.3, COP 3.2
Heating	Electric	Air Source Heat Pump	EER 11.0, COP 3.3
Heating	Electric	Air Source Heat Pump	EER 11.7, COP 3.4
Heating	Electric	Air Source Heat Pump	EER 12.0, COP 3.4
Heating	Electric	Air Source Heat Pump	Ductless Minisplit
Heating	Electric	Geothermal Heat Pump	EER 14.1, COP 3.3
Heating	Electric	Geothermal Heat Pump	EER 16, COP 3.5
Heating	Electric	Geothermal Heat Pump	EER 18, COP 3.8
Heating	Electric	Geothermal Heat Pump	EER 30, COP 5.0
Heating	Electric	Electric Resistance	Standard
Heating	Electric	Electric Furnace	Standard
Ventilation	Electric	Ventilation	Constant Volume
Ventilation	Electric	Ventilation	Variable Air Volume
Interior Lighting	Electric	Screw-in	Incandescent
Interior Lighting	Electric	Screw-in	90W Halogen PAR-38

End Use	Fuel	Technology	Efficiency Option
Interior Lighting	Electric	Screw-in	70W HIR PAR-38
Interior Lighting	Electric	Screw-in	CFL
Interior Lighting	Electric	Screw-in	LED (2010)
Interior Lighting	Electric	Screw-in	LED (2020)
Interior Lighting	Electric	High-Bay Fixtures	Metal Halides
Interior Lighting	Electric	High-Bay Fixtures	LED (2010)
Interior Lighting	Electric	High-Bay Fixtures	T8
Interior Lighting	Electric	High-Bay Fixtures	High Pressure Sodium
Interior Lighting	Electric	High-Bay Fixtures	Induction
Interior Lighting	Electric	High-Bay Fixtures	Light Emitting Plasma
Interior Lighting	Electric	High-Bay Fixtures	T5
Interior Lighting	Electric	High-Bay Fixtures	LED (2020)
Interior Lighting	Electric	Linear Fluorescent	T12
Interior Lighting	Electric	Linear Fluorescent	LED (2010)
Interior Lighting	Electric	Linear Fluorescent	T8
Interior Lighting	Electric	Linear Fluorescent	Super T8
Interior Lighting	Electric	Linear Fluorescent	T5
Interior Lighting	Electric	Linear Fluorescent	LED (2020)
Exterior Lighting	Electric	Screw-in	Incandescent
Exterior Lighting	Electric	Screw-in	90W Halogen PAR-38
Exterior Lighting	Electric	Screw-in	70W HIR PAR-38
Exterior Lighting	Electric	Screw-in	CFL
Exterior Lighting	Electric	Screw-in	LED (2010)
Exterior Lighting	Electric	Screw-in	LED (2020)
Exterior Lighting	Electric	HID	Metal Halides
Exterior Lighting	Electric	HID	LED (2010)
Exterior Lighting	Electric	HID	T8
Exterior Lighting	Electric	HID	High Pressure Sodium
Exterior Lighting	Electric	HID	Light Emitting Plasma
Exterior Lighting	Electric	HID	T5
Exterior Lighting	Electric	HID	LED (2020)
Exterior Lighting	Electric	Linear Fluorescent	T12
Exterior Lighting	Electric	Linear Fluorescent	LED (2010)
Exterior Lighting	Electric	Linear Fluorescent	T8
Exterior Lighting	Electric	Linear Fluorescent	Super T8
Exterior Lighting	Electric	Linear Fluorescent	T5
Exterior Lighting	Electric	Linear Fluorescent	LED (2020)
Motors	Electric	Pumps	Standard
Motors	Electric	Pumps	High Efficiency
Motors	Electric	Fans & Blowers	Standard
Motors	Electric	Fans & Blowers	High Efficiency
Motors	Electric	Compressed Air	Standard
Motors	Electric	Compressed Air	High Efficiency
Motors	Electric	Material Handling	Standard
Motors	Electric	Material Handling	High Efficiency
Motors	Electric	Material Processing	Standard
Motors	Electric	Material Processing	High Efficiency
Motors	Electric	Other Motors	Standard
Motors	Electric	Other Motors	High Efficiency
Process	Electric	Process Heating	Standard
Process	Electric	Process Cooling and Refrig	Standard
Process	Electric	Electro-Chemical Processes	Standard

End Use	Fuel	Technology	Efficiency Option
Process	Electric	Other Process	Standard
Miscellaneous	Electric	Miscellaneous	Standard
Heating	Natural Gas	Furnace	EF .76
Heating	Natural Gas	Furnace	EF .80
Heating	Natural Gas	Furnace	EF .82
Heating	Natural Gas	Furnace	EF .90
Heating	Natural Gas	Furnace	EF .96
Heating	Natural Gas	Boiler	EF .76
Heating	Natural Gas	Boiler	EF .80
Heating	Natural Gas	Boiler	EF .83
Heating	Natural Gas	Boiler	EF .90
Heating	Natural Gas	Boiler	EF .96
Heating	Natural Gas	Other Heating	AFUE .74
Heating	Natural Gas	Other Heating	AFUE .75
Heating	Natural Gas	Other Heating	AFUE .76
Heating	Natural Gas	Other Heating	AFUE .77
Heating	Natural Gas	Other Heating	AFUE .80
Process	Natural Gas	Process Heating	Standard
Process	Natural Gas	Process Boiler	EF .76
Process	Natural Gas	Process Boiler	EF .80
Process	Natural Gas	Process Boiler	EF .83
Process	Natural Gas	Process Boiler	EF .90
Process	Natural Gas	Process Boiler	EF .96
Process	Natural Gas	Process Cooling	Standard
Process	Natural Gas	Other Process	Standard
Miscellaneous	Natural Gas	Miscellaneous	Standard

Table 5-6 Summary of Industrial Non-Equipment Measures

Measure	Existing	New
Insulation - Ceiling	X	X
Insulation - Ducting	X	X
Insulation - Wall Cavity	X	X
HVAC - Duct Repair and Sealing	X	X
Air-Cooled Chiller - Economizer	X	X
Air-Cooled Chiller - Efficient Mechanical Layout	X	X
Air-Cooled Chiller - Maintenance	X	X
Air-Cooled Chiller - Chilled Water Reset	X	X
Air-Cooled Chiller - Chilled Water Variable-Flow System	X	X
Air-Cooled Chiller - Condenser Water Temperature Reset	X	X
Air-Cooled Chiller - High Efficiency Cooling Tower Fans	X	X
Air-Cooled Chiller - VSD on Fans	X	X
Water-Cooled Chiller - Economizer	X	X
Water-Cooled Chiller - Efficient Mechanical Layout	X	X
Water-Cooled Chiller - Maintenance	X	X
Water-Cooled Chiller - Chilled Water Reset	X	X
Water-Cooled Chiller - Chilled Water Variable-Flow System	X	X
Water-Cooled Chiller - Condenser Water Temperature Reset	X	X

Measure	Existing	New
Water-Cooled Chiller - High Efficiency Cooling Tower Fans	X	X
Water-Cooled Chiller - VSD on Fans	X	X
RTU - Maintenance	X	X
Heat Pump - Maintenance	X	X
Process Boilers - Hot Water Reset	X	X
Process Boiler - Combustion Controls (O2 Trim)	X	X
Process Boiler - Condensate Return Lines	X	X
Process Boiler - Condensing Economizer	X	X
Process Boiler - Pipe Insulation	X	X
Process Boiler - Steam Trap Maintenance	X	X
Roofs - High Reflectivity	X	X
Energy Management System	X	X
Thermostat - Clock/Programmable	X	X
Interior Lighting - Occupancy Sensors	X	X
Interior Lighting - Skylights	X	X
Interior Lighting - Time Clocks and Timers	X	X
Interior Lighting - LED Exit Lighting	X	X
Interior Lighting - Daylighting Controls	X	X
Interior Screw-in - Task Lighting	X	X
Interior Fluorescent - Bi-Level Fixture	X	X
Interior Fluorescent - Delamp and Install Reflectors	X	X
Exterior Lighting - Bi-Level Fixture	X	X
Exterior Lighting - Daylighting Controls	X	X
Exterior Lighting - Photovoltaic Installation	X	X
Process - Conductivity Controls	X	X
Process - Controls on Fume Hoods	X	X
Process - Timers and Controls	X	X
Refrigeration - Floating Head Pressure	X	X
Refrigeration - System Controls	X	X
Refrigeration - System Maintenance	X	X
Refrigeration - System Optimization	X	X
Compressed Air - Air Usage Reduction	X	X
Compressed Air - Compressor Replacement	X	X
Compressed Air - System Controls	X	X
Compressed Air - System Maintenance	X	X
Compressed Air - System Optimization and Improvements	X	X
Pumping System - Controls	X	X
Pumping System - Maintenance	X	X
Pumping System - Optimization	X	X
Pumps - Variable Speed Control	X	X
Pump Equipment Upgrade	X	X
Fan Equipment Upgrade	X	X

Measure	Existing	New
Fan System - Controls	X	X
Fan System - Maintenance	X	X
Fan System - Optimization	X	X
Fans - Variable Speed Control	X	X
Motors - Magnetic Adjustable Speed Drives	X	X
Motors - Efficient Rewind	X	X
Motors - Variable Frequency Drive	X	X
Commissioning - HVAC	X	X
Commissioning - Lighting	X	X
Retrocommissioning - HVAC	X	X
Retrocommissioning - Lighting	X	X
Ventilation - CO2 Controlled	X	X
Gas Boiler - High Efficiency Hot Water Circulation	X	X
Gas Boiler - Hot Water Reset	X	X
Gas Boiler - Maintenance	X	X
Gas Furnace - Maintenance	X	X
Custom Measures	X	X
Boiler Blowdown Heat Exchanger (Steam)	X	X
Insulate Steam Lines / Condensate Tank	X	X
Direct Fired Make-up Air System	X	X
Direct Contact Water Heater	X	X
HVAC - Infrared Heater	X	X

Results of the Economic Screen

Table 5-7 summarizes the number of equipment and non-equipment measures evaluated for each segment within each sector.

Table 5-7 Number of Measures Evaluated

	Residential	Commercial	Industrial	Total Number of Measures
Equipment Measures Evaluated	165	179	125	**469**
Non-Equipment Measures Evaluated	49	94	87	**229**
Total Measures Evaluated	**214**	**273**	**212**	**699**

Appendix B gives results for the economic screening process by segment, vintage, end use and measure for the residential sector. Appendices C and D shows the equivalent information for the commercial and industrial sectors, respectively.

ENERGY EFFICIENCY POTENTIAL RESULTS

This chapter presents the overall results of the energy-efficiency analysis for the entire service territory of Ameren Illinois[15]. Year by year savings for electric energy, electric peak demand, and natural gas energy are available in Appendix F. Details for each sector are presented in Chapter 7.

Electric Energy Efficiency – Overall Results

Table 6-1 and Figure 6-1 summarize the electric energy-efficiency savings for the different levels of potential relative to the baseline projection. Note that naturally occurring efficiency is already included in the baseline; therefore all potential estimates shown in the report represent ***net*** savings. Figure 6-2 displays the electric energy-efficiency projections.

Key findings related to net electric potentials are summarized below.

- **Realistic Achievable Potential.** In 2014, net realistic achievable savings are 483 GWh which is 1.3% of the baseline projection. By 2016, cumulative net realistic achievable savings grow to 1,093 GWh which represents 3.0% of the baseline projection.
- **Maximum Achievable Potential**. In 2014 savings for this case are 630 GWh or 1.8% of the baseline and by 2016 cumulative net savings reach 1,432 GWh or 4.0% of the baseline projection.
- **Economic potential**, which reflects the savings when all cost-effective measures are taken. The savings for this case in 2014 are 1,149 GWh or 3.2% of the baseline projection and by 2016 the cumulative net savings reach 2,650, about 7.4% of the baseline.
- **Technical potential**, which reflects the adoption of all energy efficiency measures regardless of cost-effectiveness, is a theoretical upper bound on savings. Cumulative net savings in 2014 for the technical case are 1,584 GWh 4.4% of the baseline and by 2016 these savings reach 3,516 GWh about 9.8% of the baseline.

Table 6-1 Summary of Electric Energy Efficiency Potential

	2014	2015	2016
Baseline Projection (GWh)	35,861	35,792	35,973
Cumulative Savings (GWh)			
Realistic Achievable Potential	483	803	1,093
Maximum Achievable Potential	630	1,051	1,432
Economic Potential	1,149	1,958	2,650
Technical Potential	1,584	2,604	3,516
Energy Savings (% of Baseline)			
Realistic Achievable Potential	1.3%	2.2%	3.0%
Maximum Achievable Potential	1.8%	2.9%	4.0%
Economic Potential	3.2%	5.5%	7.4%

[15] Note that this includes the potential that would be achieved through programs offered through DCEO.

Technical Potential	4.4%	7.3%	9.8%

Figure 6-1 Summary of Electric Energy Savings

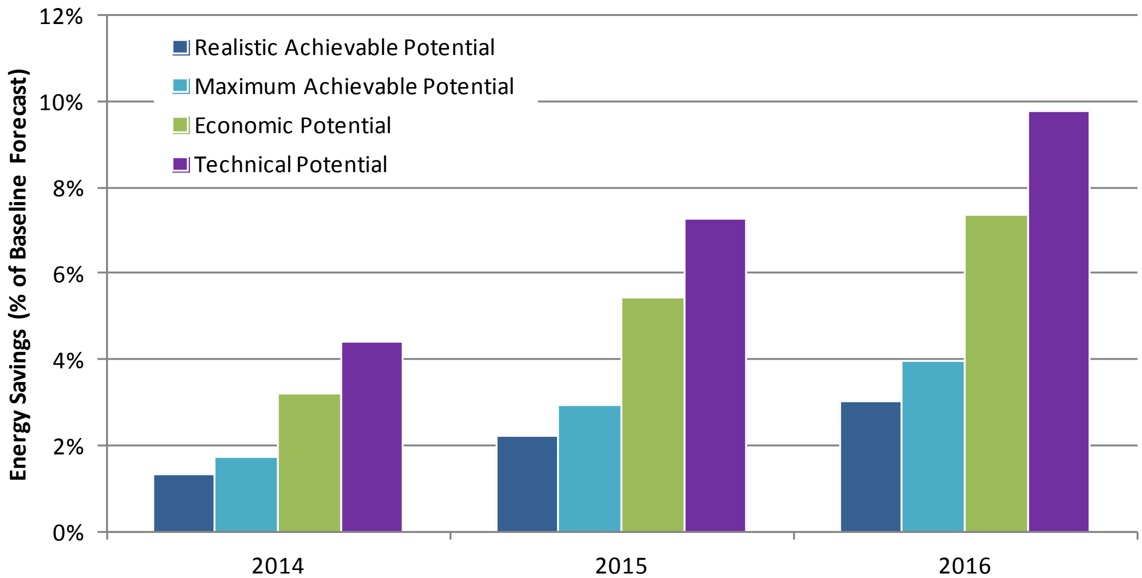
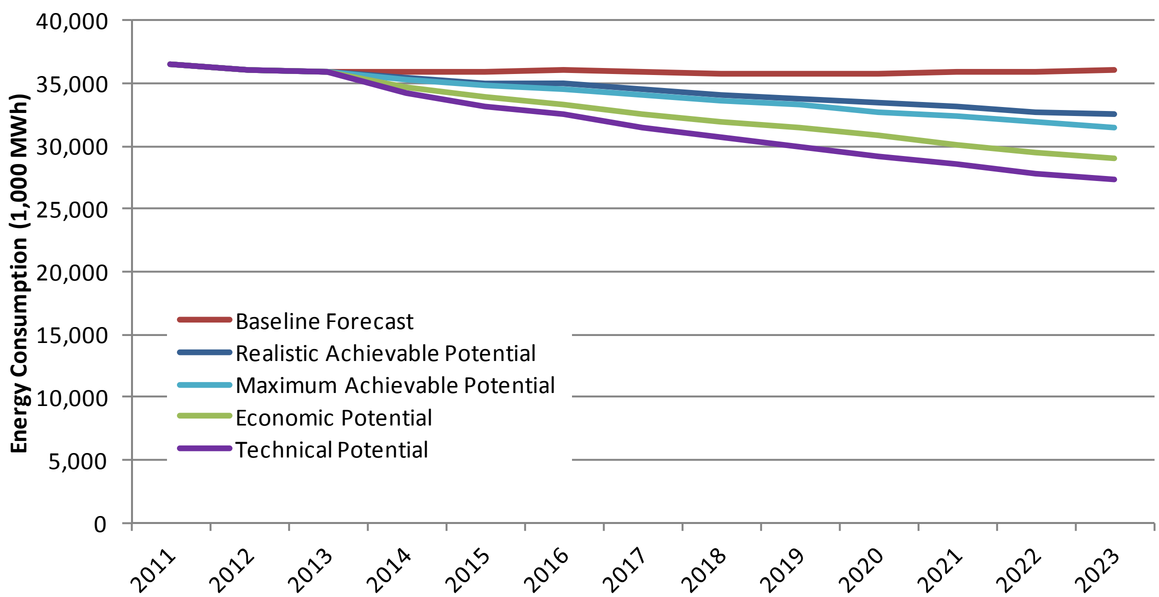


Figure 6-2 Electric Potentials Projections (GWh)



Natural Gas Energy Efficiency – Overall Results

Table 6-2 and Figure 6-3 summarize the natural gas energy-efficiency savings for the different levels of potential relative to the baseline projection. Figure 6-4 displays the natural gas energy-efficiency projections.

Key findings related to net natural gas potentials are summarized below.

- **Realistic Achievable Potential**. In 2014, net realistic achievable savings are 6.1 (MMTherms) which is 0.5% of the baseline projection. By 2016, cumulative net realistic achievable savings grow to 14.1 (MMTherms) which represent 1.3% of the baseline projection.
- **Maximum Achievable Potential**. In 2014 cumulative net savings for this case are 9.0 MMTherms or 0.8% of the baseline and by 2016 cumulative net savings reach 20.8 (MMTherms) or 1.9% of the baseline projection.
- **Economic potential**. The cumulative net savings for this case in 2014 are 17.4 (MMTherms) or 1.6% of the baseline projection and by 2016 the cumulative net savings reach 39.6 (MMTherms), about 3.6% of the baseline.
- **Technical potential**. Cumulative net savings in 2014 for the technical case are 29.1 (MMTherms), 2.6% of the baseline and by 2016 these savings reach 65.3 (MMTherms), about 5.9% of the baseline.

Table 6-2 Summary of Natural Gas Energy Efficiency Potential

	2014	2015	2016
Baseline Energy Forecasts (MMTherms)	**1,102**	**1,109**	**1,109**
Cumulative Energy Savings (MMTherms)			
Realistic Achievable Potential	6.1	9.5	14.1
Maximum Achievable Potential	9.0	14.1	20.8
Economic Potential	17.4	27.0	39.6
Technical Potential	29.1	45.2	65.3
Energy Savings (% of Baseline)			
Realistic Achievable Potential	0.5%	0.9%	1.3%
Maximum Achievable Potential	0.8%	1.3%	1.9%
Economic Potential	1.6%	2.4%	3.6%
Technical Potential	2.6%	4.1%	5.9%

Figure 6-3 Summary of Natural Gas Energy Savings

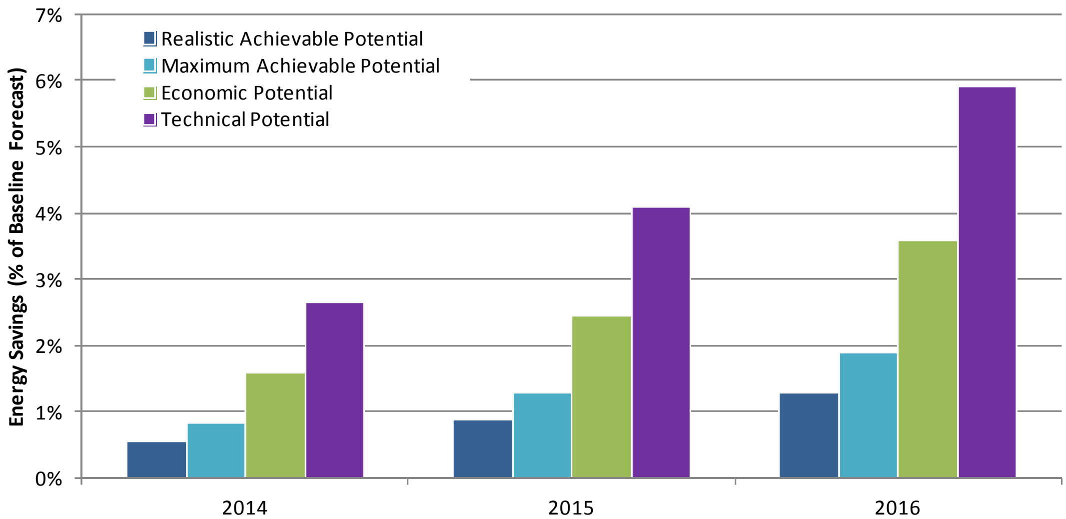
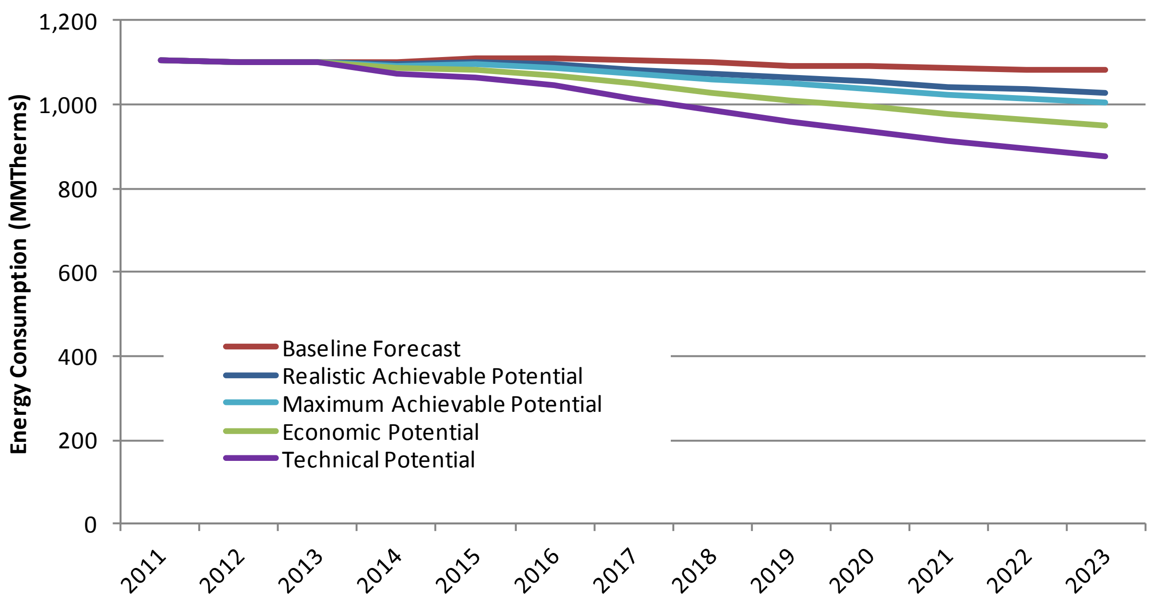


Figure 6-4 Natural Gas Potential Projections (MMTherms)



Overview of Energy Efficiency Potential by Sector and Fuel

Table 6-3 and Figure 6-5 summarize the range of cumulative net electric achievable potential by sector. The commercial sector accounts for the largest portion of the savings, followed by industrial and then residential.

Table 6-3 Electric Achievable Potential by Sector (GWh)

	2014	2015	2016
Realistic Achievable Savings (GWh)			
Residential	103	233	322
Commercial	197	319	434
Industrial	182	251	336
Total	**482**	**803**	**1,093**
Maximum Achievable Savings (GWh)			
Residential	135	296	409
Commercial	269	442	604
Industrial	226	312	418
Total	**630**	**1,051**	**1,432**

Figure 6-5 Maximum Achievable and Low Electric Potential by Sector (GWh)

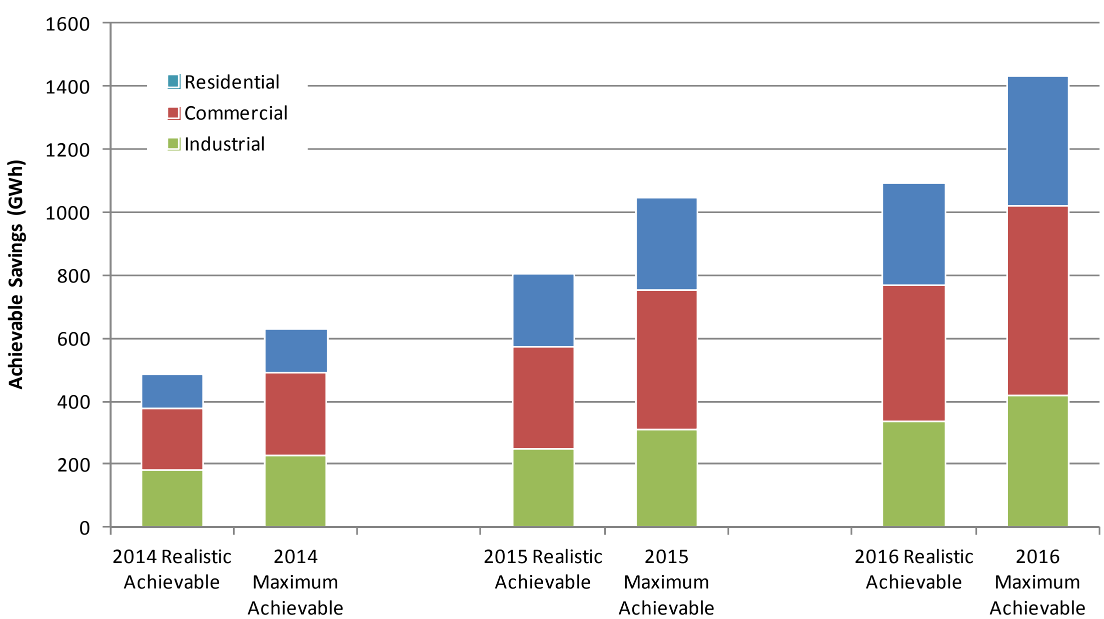
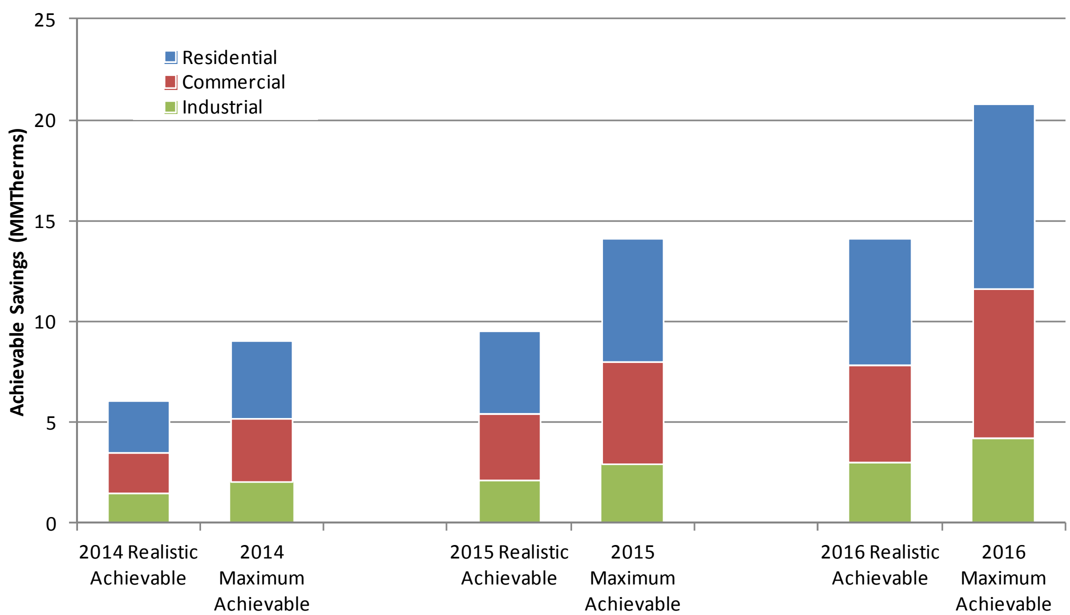


Table 6-4 and Figure 6-6 present the range of cumulative net natural gas achievable potential by sector. The residential sector accounts for the largest portion of the natural gas savings, followed by the commercial and then the industrial sectors.

Table 6-4 Natural Gas Achievable Potential by Sector (MMTherms)

	2014	2015	2016
Realistic Achievable Savings (MMTherms)			
Residential	2.6	4.1	6.3
Commercial	2.0	3.3	4.8
Industrial	1.5	2.1	3.0
Total	**6.1**	**9.5**	**14.1**
Maximum Achievable Savings (MMTherms)			
Residential	3.8	6.1	9.2
Commercial	3.1	5.0	7.4
Industrial	2.0	2.9	4.2
Total	**9.0**	**14.1**	**20.8**

Figure 6-6 Maximum Achievable and Low Natural Gas Potential by Sector (MMTherms)



ENERGY EFFICIENCY POTENTIAL BY SECTOR

This chapter presents the results of the energy efficiency analysis at the sector level. First, the residential potential is presented, followed by the commercial, and lastly, industrial. Within each sector, electric results are presented first and natural gas results second.

Residential Electricity Potential

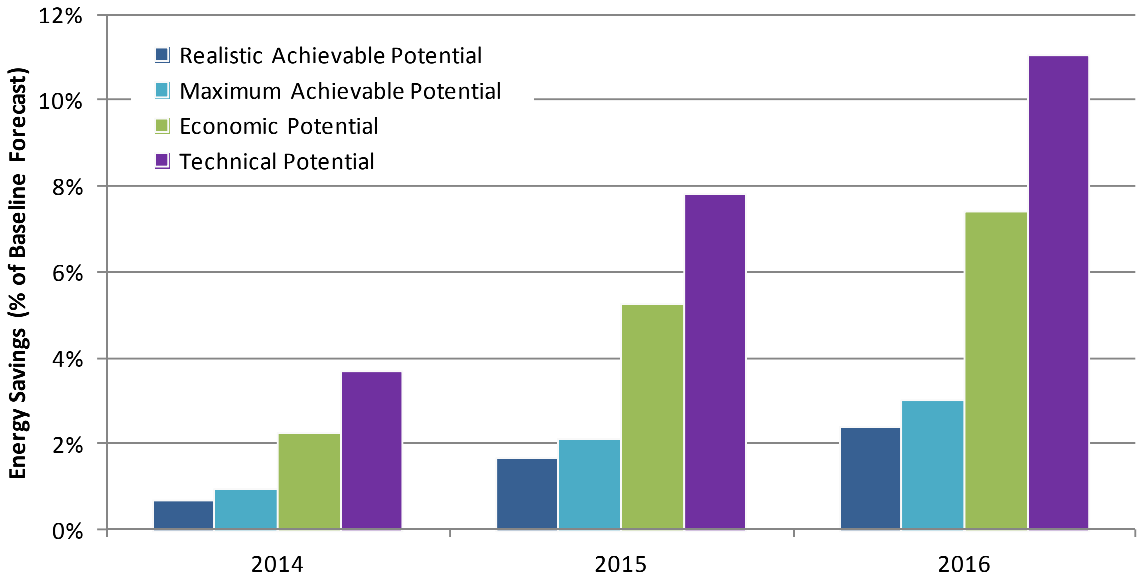
Table 7-1 presents estimates for the four types of potential for the residential electricity sector. Figure 7-1 depicts these potential energy savings estimates graphically.

- **Realistic Achievable Potential** projects 103 GWh of cumulative net energy savings in 2014, 0.9% of the baseline projection. This increases to 322 GWh, 3.0% of the baseline projection, in 2016.
- **Maximum Achievable Potential** is 135 GWh in 2014, which represents 1.2% of the baseline projection. By 2016, the cumulative net energy savings are 409 GWh, 3.8% of the baseline projection.
- **Economic potential** is 317 GWh in 2014. This represents 2.8% of the baseline energy projection. By 2016, cumulative net savings reaches 996 GWh, 9.3% of the baseline energy projection.
- **Technical potential** is 520 GWh, or 4.7% of the baseline energy projection in 2014. By 2016, cumulative net savings reaches 1,478 GWh, 13.8% of the baseline energy projection.

Table 7-1 Electricity Energy Efficiency Potential for the Residential Sector

	2014	2015	2016
Baseline Projection (GWh)	11,188	10,915	10,712
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	103	233	322
Maximum Achievable Potential	135	296	409
Economic Potential	317	721	996
Technical Potential	520	1,069	1,478
Energy Savings (% of Baseline)			
Realistic Achievable Potential	0.9%	2.1%	3.0%
Maximum Achievable Potential	1.2%	2.7%	3.8%
Economic Potential	2.8%	6.6%	9.3%
Technical Potential	4.7%	9.8%	13.8%

Figure 7-1 Residential Electric Energy Efficiency Potential Savings



Residential Electric Potential by Market Segment

Single-family homes in Illinois account for the majority of this sector's total sales in the base year and throughout the projection. Similarly, single-family homes account for the largest share of potential savings by segment, as displayed in Table 7-2, which shows results for 2016.

Table 7-3 shows the Realistic Achievable savings by end use and market segment in 2016. The segments are similar in terms of the distribution of savings opportunities by end use, but there are a few notable differences. Single-family homes have more exterior lighting therefore have more savings potential for this end use. Similarly, single-family homes are more likely to have swimming pools and therefore have more potential for savings in pool pumps (captured in the miscellaneous end use). Multi-family homes have a relatively larger opportunity in home electronics and air conditioning compared to single-family homes, reflecting an older appliance stock.

Table 7-2 Residential Electric Potential by Market Segment, 2016

	SF - Electric Only	MF - Electric Only	SF - Electric/Gas	MF - Electric/Gas
Baseline Projection (GWh)	4,266	1,277	4,477	693
Cumulative Net Energy Savings (GWh)				
Realistic Achievable Potential	93	30	167	27
Maximum Achievable Potential	120	39	209	33
Economic Potential	288	106	502	83
Technical Potential	496	156	709	117
Energy Savings as % of Baseline				
Realistic Achievable Potential	2.2%	2.4%	3.7%	3.8%
Maximum Achievable Potential	2.8%	3.0%	4.7%	4.8%
Economic Potential	6.7%	8.3%	11.2%	12.0%
Technical Potential	11.6%	12.2%	15.8%	16.9%

Table 7-3 Residential Electric Realistic Achievable Potential by End Use and Market Segment, 2016 (GWh)

End Use	SF - Electric Only	MF - Electric Only	SF - Electric/Gas	MF - Electric/Gas
Cooling	12.5	1.9	15.8	2.2
Heating	5.9	3.7	0.9	0.3
Water Heating	6.9	4.7	2.3	1.0
Interior Lighting	42.4	15.4	93.0	16.3
Exterior Lighting	6.2	1.4	25.5	2.6
Appliances	7.6	0.9	8.5	0.8
Electronics	4.7	1.4	14.8	2.9
Miscellaneous	6.5	0.7	6.0	0.5
Total	**92.5**	**30.0**	**166.9**	**26.6**

Residential Electric Potential by End Use

Table 7-4 provides estimates of net savings for each end use and type of potential. The most significant savings opportunities come from the lighting end use.

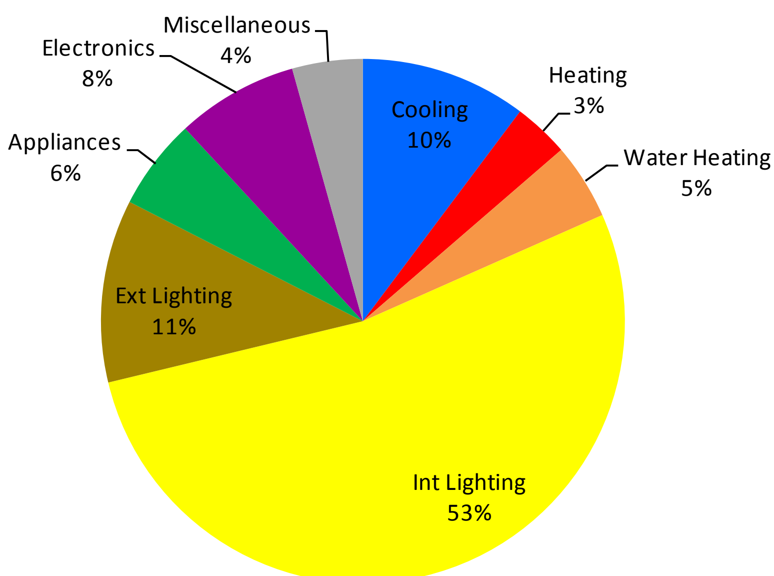
Table 7-4 Residential Electric Savings by End Use and Potential Type (GWh)

End Use	Case	2014	2015	2016
Cooling	Realistic Achievable Potential	14.66	22.51	32.38
	Maximum Achievable Potential	21.79	32.85	46.71
	Economic Potential	49.03	72.29	101.09
	Technical Potential	119.96	185.23	256.16
Heating	Realistic Achievable Potential	4.16	6.88	10.82
	Maximum Achievable Potential	6.05	9.94	15.56
	Economic Potential	15.27	24.75	38.24
	Technical Potential	25.28	40.08	59.56
Water Heating	Realistic Achievable Potential	4.65	8.87	14.85
	Maximum Achievable Potential	6.32	11.99	20.02
	Economic Potential	15.16	28.39	46.86
	Technical Potential	30.43	55.61	85.86
Interior Lighting	Realistic Achievable Potential	48.23	127.58	167.13
	Maximum Achievable Potential	58.13	153.61	201.10
	Economic Potential	143.61	407.71	539.72
	Technical Potential	177.84	470.03	617.84
Exterior Lighting	Realistic Achievable Potential	8.76	26.05	35.63
	Maximum Achievable Potential	10.57	31.37	42.88
	Economic Potential	21.96	64.72	88.13
	Technical Potential	30.89	80.07	106.69
Appliances	Realistic Achievable Potential	5.65	10.47	17.75
	Maximum Achievable Potential	7.23	13.36	22.59
	Economic Potential	14.18	25.94	43.47
	Technical Potential	38.89	70.66	108.31
Electronics	Realistic Achievable Potential	7.51	15.45	23.76
	Maximum Achievable Potential	9.16	18.89	29.06
	Economic Potential	23.60	48.23	73.59
	Technical Potential	38.56	76.72	122.95
Miscellaneous	Realistic Achievable Potential	8.19	10.82	13.76
	Maximum Achievable Potential	13.97	18.46	23.42
	Economic Potential	29.21	38.41	48.43
	Technical Potential	58.62	90.25	120.35
Total	**Realistic Achievable Potential**	**101.81**	**228.63**	**316.08**
	Maximum Achievable Potential	**133.21**	**290.46**	**401.34**
	Economic Potential	**312.02**	**710.44**	**979.53**
	Technical Potential	**520.48**	**1,068.65**	**1,477.73**

Figure 7-2 focuses on the net residential achievable potential in 2016. Lighting equipment replacement accounts for the highest portion of the savings in the near term as a result of the efficiency gap between CFL lamps and advanced incandescent lamps, even those that will meet the EISA 2007 standard. Although Ameren Illinois has achieved significant savings in lighting already, there are still significant savings available. Electronics, cooling, and appliances also contribute significantly to the savings. Detailed measure information is available in Volume 6, Appendix B. The key measures comprising the potential are listed below:

- Lighting: mostly CFL lamps and specialty bulbs
- Electronics (reduce standby wattage, televisions, set top boxes, PCs)
- Second refrigerator/ freezer removal
- HVAC: Removal of second room AC unit, efficient air conditioners, ducting repair/sealing, insulation, home energy management system and programmable thermostats

Figure 7-2 Residential Electric Realistic Achievable Potential by End Use in 2016



Residential Natural Gas Potential

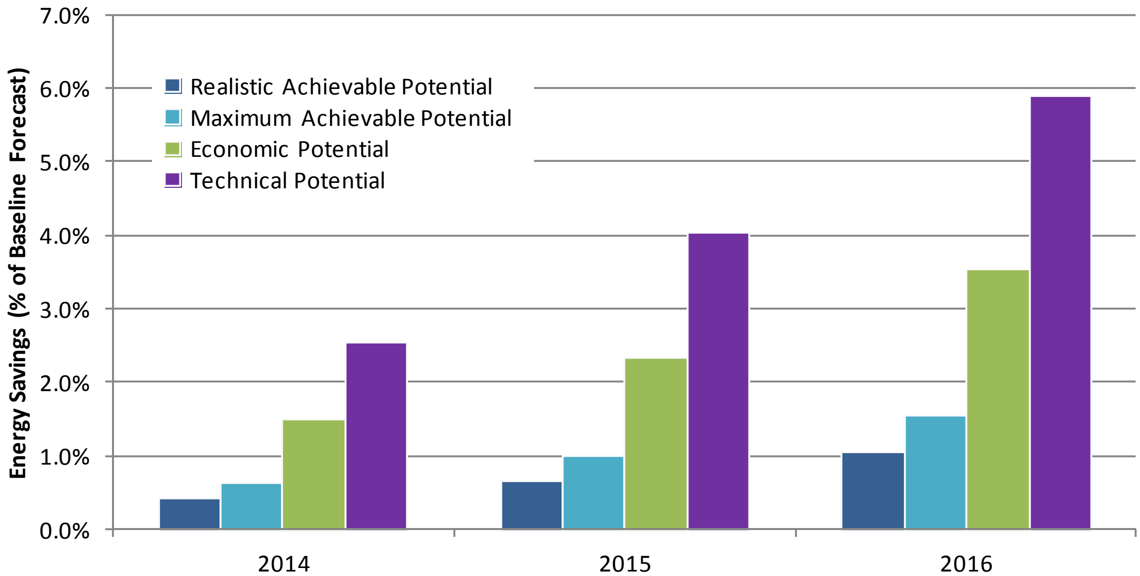
Table 7-5 presents estimates for the four types of potential for natural gas usage in the residential sector. Figure 7-3 depicts these potential energy savings estimates graphically.

- **Realistic Achievable Potential** projects 2.6 (MMTherms) of net energy savings in 2014, 0.4% of the baseline projection. This increases to 6.3 (MMTherms), 1.1% of the baseline projection in 2016.
- **Maximum Achievable Potential** is 3.8 (MMTherms) in 2014, which represents 0.7% of the baseline projection. By 2016, the cumulative net energy savings are 9.2 (MMTherms), 1.6% of the baseline projection.
- **Economic potential** is 8.9 (MMTherms) in 2014. This represents 1.6% of the baseline energy projection. By 2016, economic potential reaches 20.8 (MMTherms), 3.6% of the baseline energy projection.
- **Technical potential** savings in 2014 are 15.1 (MMTherms), or 2.6% of the baseline energy projection. By 2016, technical potential reaches 34.8 (MMTherms), 6.1% of the baseline energy projection.

Table 7-5 Natural Gas Energy Efficiency Potential for the Residential Sector

	2014	2015	2016
Energy Projections (MMTherms)	570	575	572
Cumulative Net Energy Savings (MMTherms)			
Realistic Achievable Potential	2.6	4.1	6.3
Maximum Achievable Potential	3.8	6.1	9.2
Economic Potential	8.9	13.9	20.8
Technical Potential	15.1	23.9	34.8
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	0.4%	0.7%	1.1%
Maximum Achievable Potential	0.7%	1.1%	1.6%
Economic Potential	1.6%	2.4%	3.6%
Technical Potential	2.6%	4.2%	6.1%

Figure 7-3 Residential Natural Gas Potential Savings



Residential Natural Gas Potential by Market Segment

Single-family homes in Illinois account for the majority of this sector's total sales in the base year and throughout the projection. Similarly, single-family homes account for the largest share of potential savings by segment, as displayed in Table 7-6, which shows results for 2016. Table 7-7 shows the net savings by end use and market segment in 2016. Heating provides the lion share of savings.

Table 7-6 Residential Natural Gas Potential by Market Segment, 2016 (MMTherms)

	SF - Electric/Gas	MF - Electric/Gas	SF - Gas Only	MF - Gas Only
Baseline Projection (MMTherms)	376	50	139	7
Cumulative Net Energy Savings (MMTherms)				
Realistic Achievable Potential	3.9	0.8	1.4	0.1
Maximum Achievable Potential	5.8	1.1	2.1	0.2
Economic Potential	12.6	3.2	4.6	0.4
Technical Potential	21.6	4.7	7.9	0.6
Energy Savings as % of Baseline				
Realistic Achievable Potential	1.0%	1.6%	1.0%	1.6%
Maximum Achievable Potential	1.5%	2.3%	1.5%	2.3%
Economic Potential	3.4%	6.4%	3.3%	6.4%
Technical Potential	5.7%	9.4%	5.6%	9.3%

Table 7-7 Residential Realistic Achievable Potential by End Use and Market Segment, 2016 (MMTherms)

End Use	SF - Electric/Gas	MF - Electric/Gas	SF - Gas Only	MF - Gas Only
Heating	2.7	0.6	1.0	0.1
Appliances	0.9	0.2	0.3	0.0
Miscellaneous	-	-	-	-
Water Heating	0.3	-	0.2	-
Total	**3.9**	**0.8**	**1.4**	**0.1**

Residential Natural Gas Potential by End Use

Table 7-8 provides estimates of cumulative net savings for each end use and type of potential.

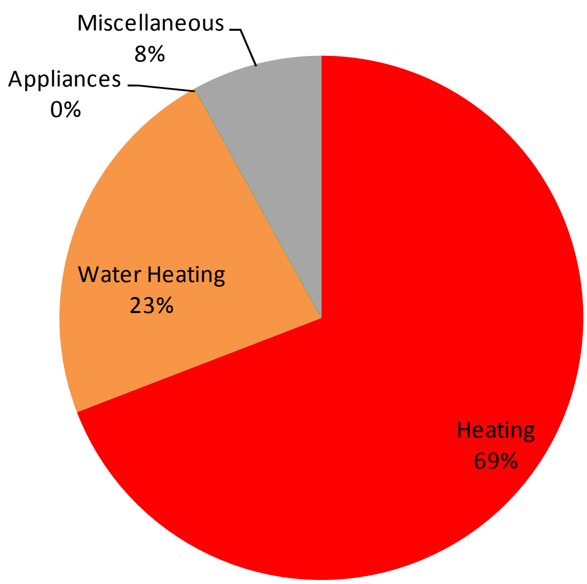
Table 7-8 Residential Natural Gas Savings by End Use and Potential Type (MMTherms)

End Use	Case	2014	2015	2016
Heating	Realistic Achievable Potential	1.71	2.81	4.34
	Maximum Achievable Potential	2.52	4.13	6.32
	Economic Potential	5.93	9.50	14.34
	Technical Potential	10.05	15.68	22.67
Appliances	Realistic Achievable Potential	0.47	0.85	1.43
	Maximum Achievable Potential	0.68	1.22	2.02
	Economic Potential	1.65	2.93	4.84
	Technical Potential	3.13	5.76	9.06
Miscellaneous	Realistic Achievable Potential	-	-	-
	Maximum Achievable Potential	-	-	-
	Economic Potential	-	-	-
	Technical Potential	0.10	0.20	0.30
Water Heating	Realistic Achievable Potential	0.38	0.44	0.50
	Maximum Achievable Potential	0.64	0.74	0.84
	Economic Potential	1.30	1.49	1.67
	Technical Potential	1.80	2.27	2.74
Total	**Realistic Achievable Potential**	**2.56**	**4.11**	**6.27**
	Maximum Achievable Potential	**3.84**	**6.08**	**9.18**
	Economic Potential	**8.88**	**13.93**	**20.85**
	Technical Potential	**15.07**	**23.91**	**34.77**

Figure 7-4 focuses on the range of net realistic achievable potential in 2016. As expected, space heating and water heating savings are the largest opportunities. Detailed measure information is available in Appendix B. The key measures comprising the potential are listed below:

- Efficient furnaces & boilers, boiler hot water reset ,ducting repair/sealing, insulation, home energy management system & programmable thermostats
- Efficient water heaters, low-flow showerheads, faucet aerators, and water heater tank blankets

Figure 7-4 Residential Natural Gas Realistic Achievable Potential by End Use in 2016



Commercial Electricity Potential

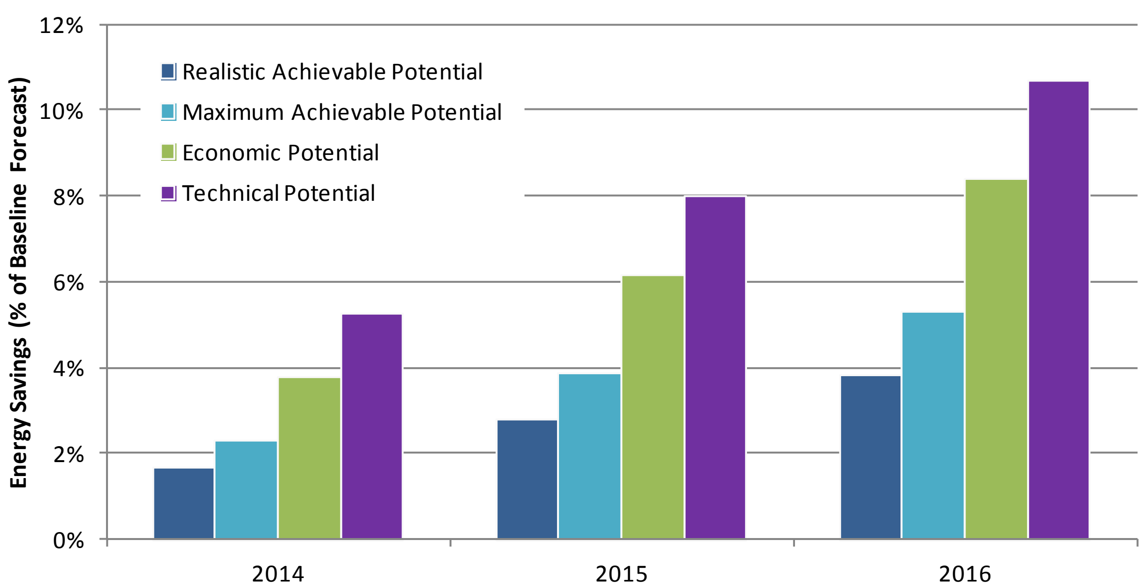
The baseline projection for the commercial sector only grows slightly, which reflects the sluggish near-term economy and forthcoming codes and standards. Nevertheless, the opportunity for energy-efficiency savings is still significant for the commercial sector. Table 7-9 presents estimates for the four types of potential for the residential electricity sector. Figure 7-5 depicts these potential energy savings estimates graphically.

- **Realistic Achievable Potential** projects 197 GWh of net energy savings in 2014, 1.7% of the baseline projection. This increases to 434 GWh, 3.8% of the baseline projection, in 2016.
- **Maximum Achievable Potential** is 269 GWh in 2014, which represents 2.3% of the baseline projection. By 2016, the cumulative net energy savings are 604 GWh, 5.3% of the baseline projection.
- **Economic potential** is 440 GWh in 2014. This represents 3.8% of the baseline energy projection. By 2016, economic potential reaches 950 GWh, 8.4% of the baseline energy projection.
- **Technical potential** is 610 GWh, or 5.3% of the baseline energy projection in 2014. By 2016, technical potential reaches 1,211 GWh, 10.7% of the baseline energy projection.

Table 7-9 Electricity Efficiency Potential for the Commercial Sector

	2014	2015	2016
Baseline Projection (GWh)	11,547	11,415	11,332
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	197	319	434
Maximum Achievable Potential	269	442	604
Economic Potential	440	704	950
Technical Potential	610	915	1,211
Savings (% of Baseline)			
Realistic Achievable Potential	1.7%	2.8%	3.8%
Maximum Achievable Potential	2.3%	3.9%	5.3%
Economic Potential	3.8%	6.2%	8.4%
Technical Potential	5.3%	8.0%	10.7%

Figure 7-5 Commercial Energy Efficiency Potential Savings



Commercial Electric Potential by Market Segment

Table 7-10 shows net potential estimates by building type segment in 2016. Office has the largest absolute realistic achievable savings potential in 2016, followed by grocery, retail and miscellaneous. Table 7-11 summarizes achievable potential for each segment and end use.

Table 7-10 Commercial Electric Potential by Market Segment, 2016

	Office	Restaurant	Retail	Grocery	College
Baseline Projection	1,868	990	1,476	777	1,247
Cumulative Net Energy Savings (GWh)					
Realistic Achievable Potential	64	46	58	60	50
Maximum Achievable Potential	89	64	80	78	70
Economic Potential	140	102	127	127	110
Technical Potential	182	121	161	146	132
Energy Savings (% of Baseline)					
Realistic Achievable Potential	3%	5%	4%	8%	4%
Maximum Achievable Potential	5%	6%	5%	10%	6%
Economic Potential	7%	10%	9%	16%	9%
Technical Potential	10%	12%	11%	19%	11%

	School	Health	Lodging	Warehouse	Misc.	Total
Baseline Projection	698	1,368	652	482	1,773	**11,332**
Cumulative Net Energy Savings (GWh)						
Realistic Achievable Potential	21	34	33	14	57	**434**
Maximum Achievable Potential	29	47	47	20	82	**604**
Economic Potential	45	74	70	30	125	**950**
Technical Potential	61	100	84	48	175	**1,211**
Energy Savings (% of Baseline)						
Realistic Achievable Potential	3%	2%	5%	3%	3%	**4%**
Maximum Achievable Potential	4%	3%	7%	4%	5%	**5%**
Economic Potential	7%	5%	11%	6%	7%	**8%**
Technical Potential	9%	7%	13%	10%	10%	**11%**

Table 7-11 Commercial Electric Realistic Achievable Potential by End Use and Market Segment, 2016 (GWh)

Segment	Cooling	Space Heating	Ventilation	Water Heat	Int. Lighting	Ext. Lighting	Food Prep	Refrigeration	Office Equip	Misc	Total
Office	14.5	2.7	7.9	2.3	21.2	1.3	0.4	0.5	13.0	0.2	**64.0**
Restaurant	5.6	0.3	2.7	7.5	14.6	0.8	3.6	9.8	0.6	0.0	**45.6**
Retail	7.7	0.9	7.0	3.4	28.2	4.3	1.4	2.2	2.2	0.2	**57.5**
Grocery	4.5	1.3	2.1	0.6	6.8	0.2	8.7	35.0	0.2	0.0	**59.5**
College	20.7	0.4	3.3	1.2	18.6	2.1	0.2	0.5	3.0	0.1	**50.0**
School	3.1	0.6	2.3	0.3	9.9	0.7	0.5	1.1	2.1	0.0	**20.6**
Health	10.2	0.9	3.5	1.5	13.0	0.1	0.5	1.6	1.8	0.6	**33.6**
Lodging	3.6	1.0	1.7	6.3	17.6	1.0	0.4	0.6	0.3	0.1	**32.5**
Warehouse	1.8	0.8	1.1	0.2	7.8	0.1	0.3	0.9	0.9	0.1	**14.0**
Misc.	15.0	1.7	3.3	4.1	24.0	4.9	0.6	0.4	2.7	0.5	**57.2**
Total	**86.6**	**10.7**	**34.8**	**27.3**	**161.9**	**15.5**	**16.6**	**52.5**	**26.7**	**1.8**	**434.4**

Commercial Electric Potential by End Use

Table 7-12 presents the net commercial sector savings by end use and potential type. The end uses with the highest technical and economic potential are lighting, cooling, refrigeration, and ventilation.

Figure 7-6 focuses on achievable potential savings by end use. Not surprisingly, interior lighting delivers the highest achievable savings throughout the study period. In 2016, exterior lighting is second, and refrigeration is third. Refrigeration energy savings are then followed in descending order by cooling, ventilation, office equipment, and small amounts of the other end uses.

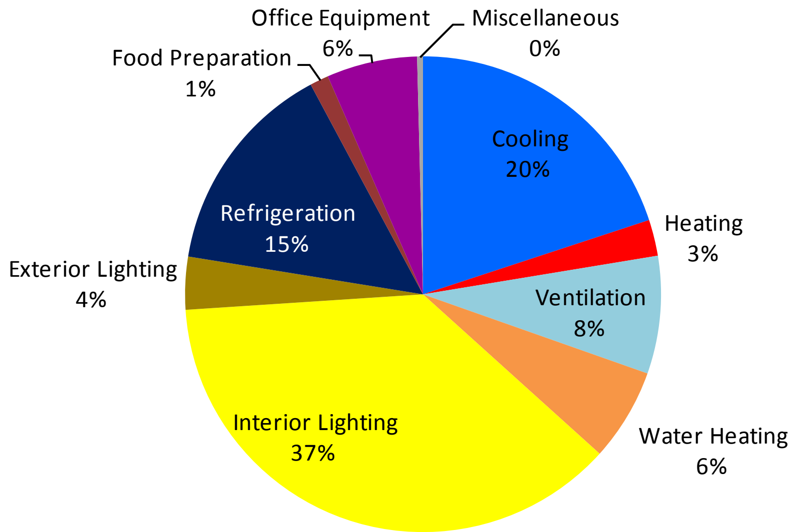
Detailed measure information is available in Volume 6, Appendix C. The key measures comprising the potential are listed below:

- Lighting – CFLs, LED lamps, linear fluorescent, daylighting controls, occupancy sensors, and HID lamps for exterior lighting
- Energy management systems & programmable thermostats
- Ventilation – variable speed control
- Refrigeration – efficient equipment, control systems, and anti-sweat door heater
- Custom measures

Table 7-12 Commercial Potential by End Use and Potential Type (GWh)

End Use	Case	2014	2015	2016
Cooling	Realistic Achievable Potential	46	64	87
	Maximum Achievable Potential	64	92	125
	Economic Potential	108	151	202
	Technical Potential	141	191	248
Heating	Realistic Achievable Potential	6	8	11
	Maximum Achievable Potential	8	11	15
	Economic Potential	13	18	24
	Technical Potential	17	25	35
Ventilation	Realistic Achievable Potential	17	25	35
	Maximum Achievable Potential	23	35	49
	Economic Potential	40	60	82
	Technical Potential	43	64	88
Water Heating	Realistic Achievable Potential	9	18	27
	Maximum Achievable Potential	14	29	44
	Economic Potential	23	47	71
	Technical Potential	26	50	75
Interior Lighting	Realistic Achievable Potential	64	118	162
	Maximum Achievable Potential	85	161	221
	Economic Potential	132	240	325
	Technical Potential	194	315	419
Exterior Lighting	Realistic Achievable Potential	7	13	16
	Maximum Achievable Potential	9	19	22
	Economic Potential	13	27	31
	Technical Potential	22	39	48
Refrigeration	Realistic Achievable Potential	36	49	64
	Maximum Achievable Potential	47	64	84
	Economic Potential	80	107	138
	Technical Potential	105	138	174
Food Preparation	Realistic Achievable Potential	2	4	6
	Maximum Achievable Potential	2	5	7
	Economic Potential	4	8	13
	Technical Potential	4	8	13
Office Equipment	Realistic Achievable Potential	11	19	27
	Maximum Achievable Potential	15	26	36
	Economic Potential	25	44	61
	Technical Potential	55	82	106
Miscellaneous	Realistic Achievable Potential	1	1	2
	Maximum Achievable Potential	1	2	2
	Economic Potential	2	3	4
	Technical Potential	2	3	4
Total	**Realistic Achievable Potential**	**197**	**319**	**434**
	Maximum Achievable Potential	**269**	**442**	**604**
	Economic Potential	**440**	**704**	**950**
	Technical Potential	**610**	**915**	**1,211**

Figure 7-6 Commercial Realistic Achievable Potential Electricity Savings by End Use in 2016



Commercial Natural Gas Potential

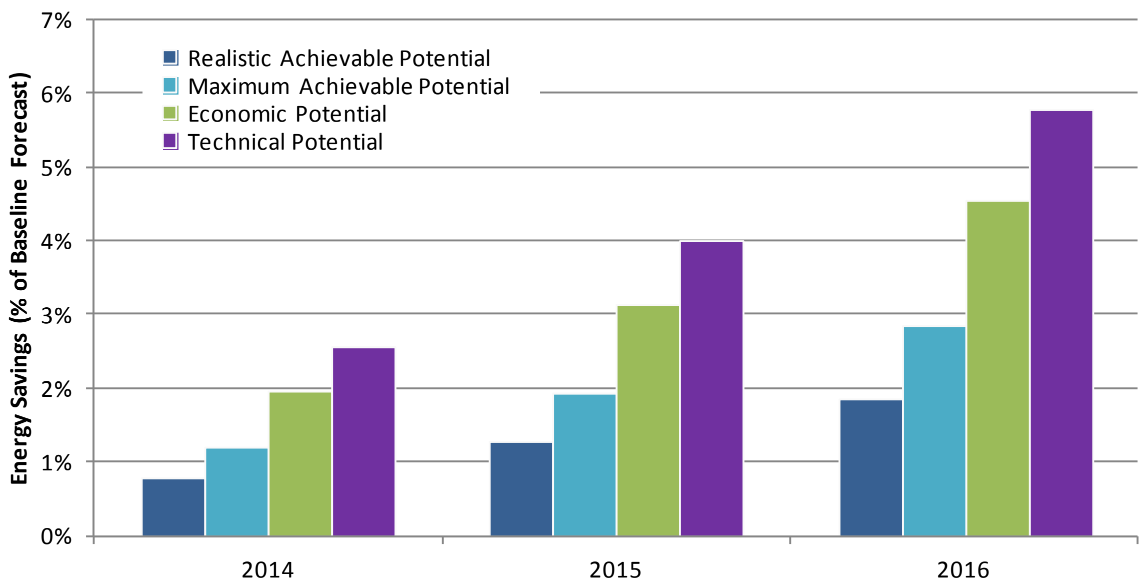
Table 7-13 and Figure 7-7 present the net savings associated with each level of potential. The highlights from the potentials are described below.

- **Realistic Achievable Potential** projects 2.03 (MMTherms) of cumulative net energy savings in 2014, 1.0% of the baseline projection. This increases to 4.83 (MMTherms), 2.3% of the baseline projection, in 2016.
- **Maximum Achievable Potential** is 3.10 (MMTherms) in 2014, which represents 1.5% of the baseline projection. By 2016, the cumulative net energy savings are 7.38 (MMTherms), 2.3% of the baseline projection.
- **Economic potential** is 5.04 (MMTherms) in 2014. This represents 2.5% of the baseline energy projection. By 2016, cumulative net savings reaches 11.78 (MMTherms), 5.7% of the baseline energy projection.
- **Technical potential** in 2014 is 6.54 (MMTherms), or 3.2% of the baseline energy projection. By 2016, cumulative net savings reaches 14.98 (MMTherms), 7.2% of the baseline energy projection.

Table 7-13 Natural Gas Efficiency Potential for the Commercial Sector (MMTherms)

	2014	2015	2016
Energy Projections (MMTherms)	205	207	208
Cumulative Net Energy Savings (MMTherms)			
Realistic Achievable Potential	2.0	3.3	4.8
Maximum Achievable Potential	3.1	5.0	7.4
Economic Potential	5.0	8.1	11.8
Technical Potential	6.5	10.4	15.0
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	1.0%	1.6%	2.3%
Maximum Achievable Potential	1.5%	2.4%	3.6%
Economic Potential	2.5%	3.9%	5.7%
Technical Potential	3.2%	5.0%	7.2%

Figure 7-7 Commercial Natural Gas Potential Savings



Commercial Natural Gas Potential by Market Segment

Table 7-14 below shows net natural gas potential estimates by segment in 2016. Table 7-15 summarizes the achievable potential for each segment by end use.

Table 7-14 Commercial Natural Gas Potential by Market Segment, 2016 (MMTherms)

	Office	Restaurant	Retail	Grocery	College
Baseline Projection	13.84	23.86	31.42	3.89	20.04
Cumulative Net Energy Savings (MMTherms)					
Realistic Achievable Potential	0.32	0.68	0.47	0.11	0.50
Maximum Achievable Potential	0.51	0.96	0.66	0.16	0.80
Economic Potential	0.81	1.56	1.09	0.26	1.25
Technical Potential	0.83	1.78	2.75	0.32	1.28
Energy Savings (% of Baseline)					
Realistic Achievable Potential	2.3%	2.8%	1.5%	2.8%	2.5%
Maximum Achievable Potential	3.7%	4.0%	2.1%	4.1%	4.0%
Economic Potential	5.8%	6.6%	3.5%	6.8%	6.2%
Technical Potential	6.0%	7.4%	8.8%	8.2%	6.4%

	School	Health	Lodging	Warehouse	Misc.	Total
Baseline Projection	27.17	37.74	4.22	9.48	36.08	**207.76**
Cumulative Net Energy Savings (MMTherms)						
Realistic Achievable Potential	0.64	0.89	0.16	0.17	0.90	**4.83**
Maximum Achievable Potential	1.00	1.39	0.23	0.26	1.40	**7.38**
Economic Potential	1.58	2.20	0.38	0.41	2.23	**11.78**
Technical Potential	1.95	2.25	0.42	0.85	2.56	**14.98**
Energy Savings (% of Baseline)						
Realistic Achievable Potential	2.3%	2.4%	3.8%	1.8%	2.5%	**2.3%**
Maximum Achievable Potential	3.7%	3.7%	5.5%	2.8%	3.9%	**3.6%**
Economic Potential	5.8%	5.8%	8.9%	4.4%	6.2%	**5.7%**
Technical Potential	7.2%	6.0%	9.9%	9.0%	7.1%	**7.2%**

Table 7-15 Commercial Natural Gas Maximum Achievable Potential by End Use and Market Segment, 2016 (MMTherms)

Segment	Heating	Water Heat	Food Prep	Misc.	Total
Office	0.4	0.1	0.0	0.0	0.5
Restaurant	0.1	0.5	0.4	0.0	1.0
Retail	0.5	0.2	0.0	0.0	0.7
Grocery	0.1	0.1	0.0	0.0	0.2
College	0.5	0.2	0.1	0.0	0.8
School	0.6	0.3	0.1	0.0	1.0
Health	0.6	0.6	0.2	0.0	1.4
Lodging	0.1	0.2	0.0	0.0	0.2
Warehouse	0.2	0.0	0.0	0.0	0.3
Misc.	1.1	0.3	0.0	0.0	1.4
Total	**4.1**	**2.4**	**0.9**	**0.0**	**7.4**

Commercial Natural Gas Potential by End Use

Table 7-16 presents the commercial sector net savings by end use and potential type. The end uses with the highest technical and economic potential are heating, water heating, and food preparation. This study shows no savings available in the miscellaneous end use due to its uncertain composition.

Table 7-16 Commercial Natural Gas Potential by End Use and Potential Type (MMTherms)

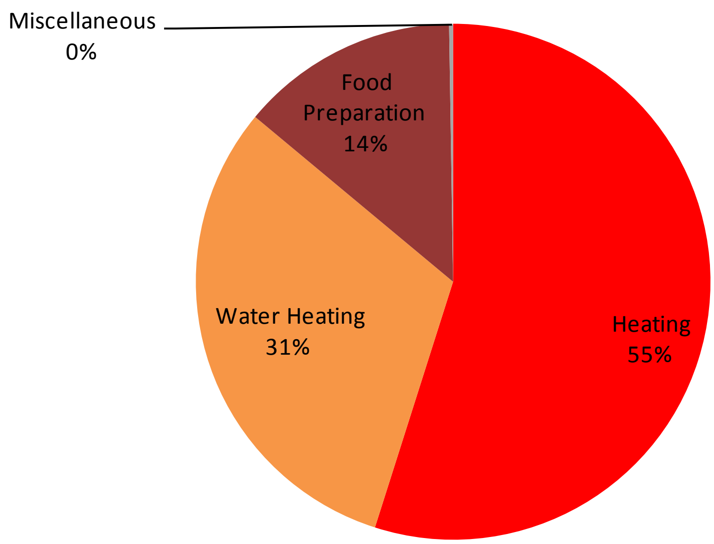
End Use	Case	2014	2015	2016
Heating	Realistic Achievable Potential	1.19	1.82	2.65
	Maximum Achievable Potential	1.83	2.81	4.10
	Economic Potential	2.96	4.50	6.50
	Technical Potential	4.18	6.35	9.24
Water Heating	Realistic Achievable Potential	0.61	1.02	1.51
	Maximum Achievable Potential	0.97	1.61	2.36
	Economic Potential	1.55	2.57	3.73
	Technical Potential	1.79	2.89	4.08
Food Preparation	Realistic Achievable Potential	0.22	0.45	0.66
	Maximum Achievable Potential	0.30	0.60	0.89
	Economic Potential	0.52	1.03	1.52
	Technical Potential	0.52	1.03	1.52
Miscellaneous	Realistic Achievable Potential	0.00	0.01	0.01
	Maximum Achievable Potential	0.01	0.01	0.02
	Economic Potential	0.01	0.02	0.03
	Technical Potential	0.05	0.09	0.13
Total	**Realistic Achievable Potential**	**2.03**	**3.30**	**4.83**
	Maximum Achievable Potential	**3.10**	**5.04**	**7.38**

	Economic Potential	**5.04**	**8.13**	**11.78**
	Technical Potential	**6.54**	**10.36**	**14.98**

Figure 7-8 below shows net achievable potential savings by end use. Water heating provides the largest share of the savings, with heating and food preparation each successively smaller. Detailed measure information is available in Appendix C. The key measures comprising the potential are listed below:

- Energy management systems, programmable thermostats, HVAC occupancy sensors
- Efficient boilers, boiler maintenance, steam trap repair and hot water reset
- Efficient water heaters
- Efficient food preparation equipment for the restaurant segment
- Insulation and high efficiency windows

Figure 7-8 Commercial Natural Gas Realistic Achievable Potential Savings by End Use in 2016



Industrial Electricity Potential

The industrial sector in Ameren Illinois accounts for about one-third of total energy consumption, but slightly more than one-third of the savings. Table 7-17 and Figure 7-9 present the net savings for the various types of potential considered in this study.

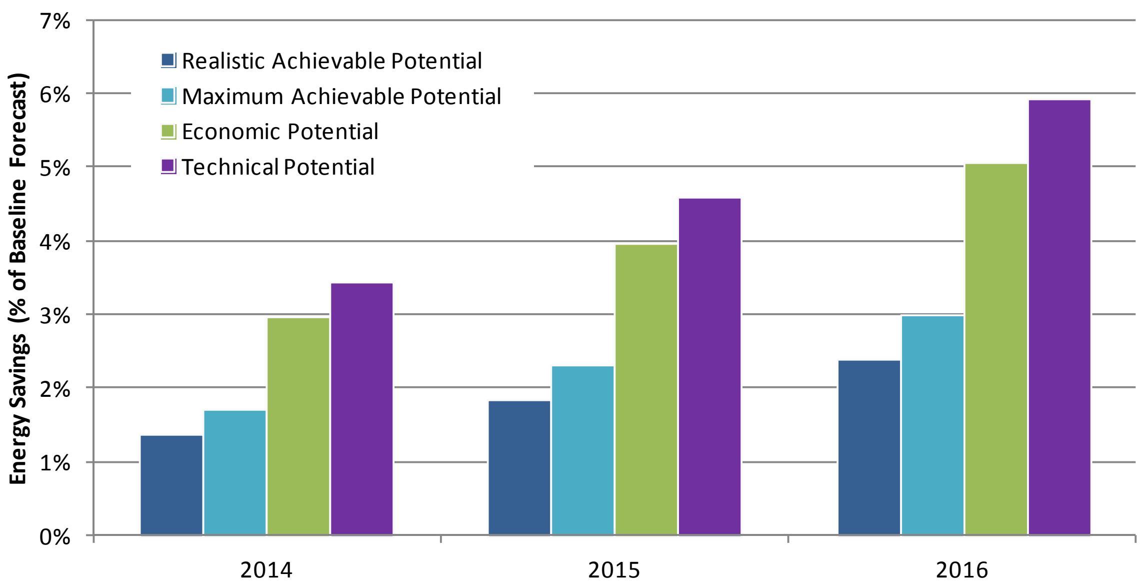
- **Realistic Achievable Potential** is 182 GWh of cumulative net energy savings in 2014 and 336 GWh in 2016. This corresponds to 1.4% of the baseline projection in 2014 and 2.4% in 2016.
- **Maximum Achievable Potential** is 226 GWh in 2014, which represents 1.7% of the baseline projection. By 2016, the cumulative net energy savings are 418 GWh, 3% of the baseline projection.
- **Economic potential** is 392 GWh in 2014. This represents 3% of the baseline energy projection. By 2016, cumulative net savings reaches 705 GWh, 5.0% of the baseline energy projection.

- **Technical potential** in 2014 is 453 GWh, or 3.5% of the baseline energy projection. By 2016, cumulative net savings reaches 828 GWh, 5.9% of the baseline energy projection.

Table 7-17 Electric Efficiency Potential for the Industrial Sector

	2014	2015	2016
Energy Projections (GWh)	13,130	13,480	13,955
Cumulative Net Energy Savings (GWh)			
Realistic Achievable Potential	182	251	336
Maximum Achievable Potential	226	312	418
Economic Potential	392	533	705
Technical Potential	453	620	828
Energy Savings (% of Baseline Projection)			
Realistic Achievable Potential	1.4%	1.9%	2.4%
Maximum Achievable Potential	1.7%	2.3%	3.0%
Economic Potential	3.0%	4.0%	5.0%
Technical Potential	3.5%	4.6%	5.9%

Figure 7-9 Industrial Electric Potential Savings



Industrial Electric Potential by Market Segment

Table 7-18 shows net electric energy efficiency potential for the five industrial segments in 2016. Table 7-19 shows the Realistic Achievable savings by end use and market segment in 2016.

Table 7-18 Industrial Electric Potential by Market Segment, 2016

	Food	Petroleum	Metals	Machinery	Other Industrial	Total
Baseline Projection (GWh)	2,195	4,728	2,617	938	3,477	**13,955**
Cumulative Net Energy Savings (GWh)						
Realistic Achievable Potential	53	134	39	25	86	**336**
Maximum Achievable Potential	65	163	48	32	111	**418**
Economic Potential	111	280	82	52	180	**705**
Technical Potential	132	299	91	66	240	**828**
Energy Savings as % of Baseline						
Realistic Achievable Potential	2.4%	2.8%	1.5%	2.6%	2.5%	2.4%
Maximum Achievable Potential	3.0%	3.4%	1.8%	3.4%	3.2%	3.0%
Economic Potential	5.0%	5.9%	3.1%	5.5%	5.2%	5.0%
Technical Potential	6.0%	6.3%	3.5%	7.1%	6.9%	5.9%

Table 7-19 Industrial Electric Realistic Achievable Potential by End Use and Market Segment, 2016

End Use	Food	Petroleum	Metals	Machinery	Other Industrial
Cooling	2.5	2.2	1.5	3.1	12.7
Heating	1.1	1.0	0.7	1.4	5.7
Ventilation	-	-	-	-	-
Interior Lighting	3.9	2.7	2.7	3.5	15.1
Exterior Lighting	0.9	0.6	0.6	0.8	3.4
Motors	33.3	122.5	27.3	14.8	42.6
Process	11.1	5.2	6.1	1.0	6.0
Miscellaneous	-	-	-	-	-
Total	**52.8**	**134.1**	**38.9**	**24.6**	**85.5**

Industrial Electric Potential by End Use

Table 7-20 presents estimates of net savings for each end use and type of potential. Not surprisingly, the largest savings opportunities are found in motors and drives.

Table 7-20 Industrial Electric Potential by End Use and Potential Type (GWh)

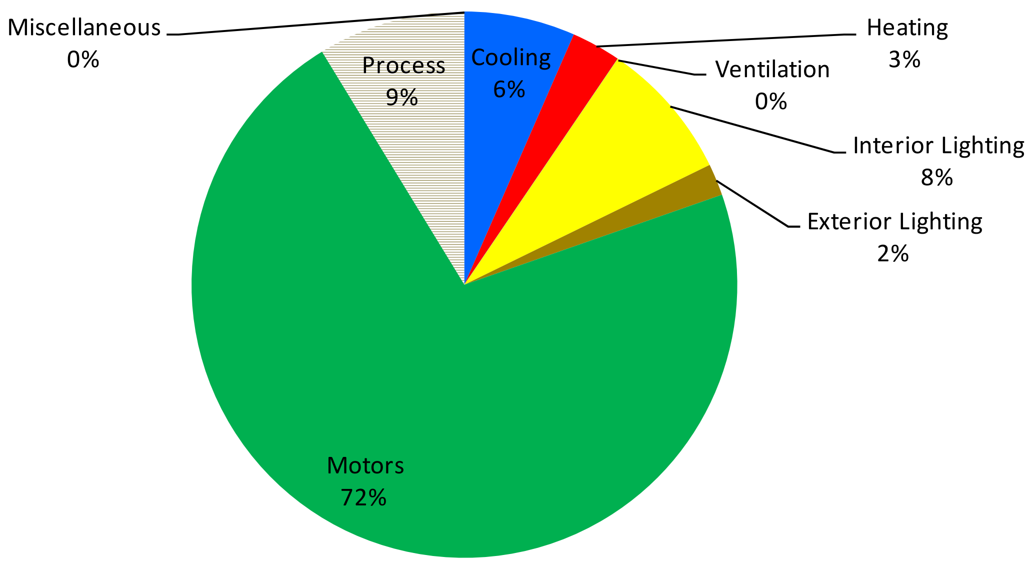
End Use	Potential	2014	2015	2016
Cooling	Realistic Achievable Potential	11	16	22
	Maximum Achievable Potential	16	23	33
	Economic Potential	25	36	50
	Technical Potential	27	39	54
Heating	Realistic Achievable Potential	6	8	10
	Maximum Achievable Potential	7	10	13
	Economic Potential	14	17	22
	Technical Potential	38	56	81
Ventilation	Realistic Achievable Potential	-	-	-
	Maximum Achievable Potential	-	-	-
	Economic Potential	-	-	-
	Technical Potential	-	-	-
Interior Lighting	Realistic Achievable Potential	9	20	28
	Maximum Achievable Potential	13	27	38
	Economic Potential	19	39	55
	Technical Potential	42	65	87
Exterior Lighting	Realistic Achievable Potential	3	5	6
	Maximum Achievable Potential	4	7	9
	Economic Potential	6	10	13
	Technical Potential	7	12	16
Motors	Realistic Achievable Potential	139	183	241
	Maximum Achievable Potential	168	220	290
	Economic Potential	298	387	502
	Technical Potential	302	395	514
Process	Realistic Achievable Potential	14	20	29
	Maximum Achievable Potential	17	25	35
	Economic Potential	31	44	62
	Technical Potential	37	53	76
Miscellaneous	Realistic Achievable Potential	-	-	-
	Maximum Achievable Potential	-	-	-
	Economic Potential	-	-	-
	Technical Potential	-	-	-
Total	**Realistic Achievable Potential**	**182**	**251**	**336**
	Maximum Achievable Potential	**226**	**312**	**418**
	Economic Potential	**392**	**533**	**705**
	Technical Potential	**453**	**620**	**828**

Figure 7-10 illustrates the achievable potential savings by electric end use in 2016 for the industrial sector. The largest shares of savings opportunities are in the motors and machine drives. Potential savings for straight equipment change-outs are diminishing due to the National Electrical Manufacturer's Association (NEMA) standards, which now make premium efficiency motors the baseline efficiency level. As a result, there are no substantially more efficient upgrade options to increase efficiency improvements. Many of the savings opportunities in this end use come from controls, timers, and variable speed drives, which improve system efficiencies where motors are utilized.

Beyond the replacement of motors, there are large opportunities for savings in cooling, lighting, process, ventilation, and finally space heating. Detailed measure information is available in Appendix D. The key measures comprising the potential are listed below:

- Motors – drives and controls
- Custom measures
- Application optimization and control – fans, pumps, compressed air
- Process – timers and controls
- Efficient high bay lighting

Figure 7-10 Industrial Realistic Achievable Electricity Potential Savings by End Use in 2016



Industrial Natural Gas Potential

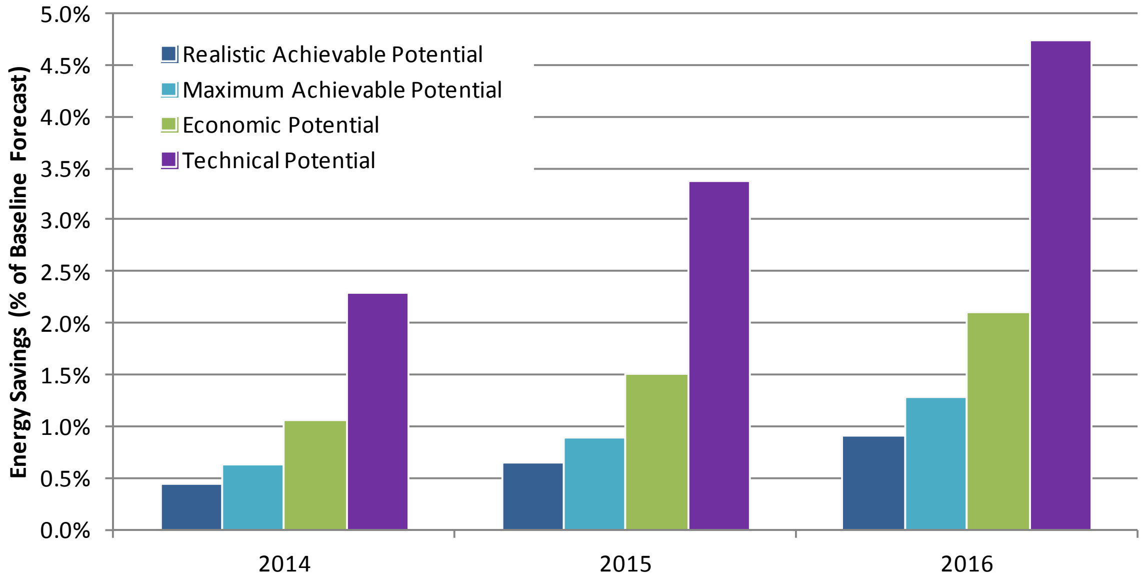
Table 7-21 and Figure 7-11 present the net savings for the various types of potential considered in this study for the industrial sector.

- **Realistic Achievable Potential** projects 1.5 (MMTherms) of cumulative net energy savings in 2014, 0.5% of the baseline projection. This increases to 3.0 (MMTherms), 0.9% of the baseline projection, in 2016.
- **Maximum Achievable Potential** is 2.0 (MMTherms) in 2014, which represents 0.6% of the baseline projection. By 2016, the cumulative net energy savings are 4.2 (MMTherms), 1.3% of the baseline projection.
- **Economic potential** is 3.5 (MMTherms) in 2014. This represents 1.1% of the baseline energy projection. By 2016, cumulative net savings are 6.9 (MMTherms), 2.1% of the baseline energy projection.
- **Technical potential** in 2014 is 7.5 (MMTherms), or 2.3% of the baseline energy projection. By 2016, cumulative net savings are 15.6 (MMTherms), 4.7% of the baseline energy projection.

Table 7-21 Natural Gas Efficiency Potential for the Industrial Sector

	2014	2015	2016
Energy Projections (MMTherms)	326	326	329
Cumulative Net Energy Savings			
Realistic Achievable Potential	1.5	2.1	3.0
Maximum Achievable Potential	2.0	2.9	4.2
Economic Potential	3.5	4.9	6.9
Technical Potential	7.5	11.0	15.6
Energy Savings as a % of Baseline			
Realistic Achievable Potential	0.5%	0.6%	0.9%
Maximum Achievable Potential	0.6%	0.9%	1.3%
Economic Potential	1.1%	1.5%	2.1%
Technical Potential	2.3%	3.4%	4.7%

Figure 7-11 Industrial Natural Gas Potential Savings



Industrial Natural Gas Potential by Market Segment

Table 7-22 shows net natural gas energy efficiency potential for the four industrial segments in 2016. Table 7-23 shows the net realistic achievable savings by end use and market segment in 2016. A large portion of the savings comes from space heating improvements in the Other Industrial category. The largest industrial segments typically dedicate very little of their energy to space conditioning, so the smaller businesses that are grouped into the Other Industrial category will have more by comparison.

Table 7-22 Industrial Natural Gas Potential by Market Segment, 2016

	Food Products	Petroleum	Metals	Machinery	Other Industrial	Total
Baseline Projection (MMTherms)	3.70	18.65	169.64	21.81	114.88	328.69
Cumulative Net Energy Savings (MMTherms)						
Realistic Achievable Potential	0.04	0.13	0.95	0.27	1.62	3.01
Maximum Achievable Potential	0.06	0.19	1.28	0.39	2.29	4.20
Economic Potential	0.09	0.31	2.15	0.64	3.77	6.95
Technical Potential	0.21	0.67	4.57	1.46	8.65	15.56
Energy Savings as % of Baseline						
Realistic Achievable Potential	1.0%	0.7%	0.6%	1.3%	1.4%	0.9%
Maximum Achievable Potential	1.5%	1.0%	0.8%	1.8%	2.0%	1.3%
Economic Potential	2.4%	1.6%	1.3%	2.9%	3.3%	2.1%
Technical Potential	5.5%	3.6%	2.7%	6.7%	7.5%	4.7%

Table 7-23 Industrial Natural Gas Realistic Achievable Potential by End Use and Market Segment, 2016 (MMTherms)

End Use	Food Products	Petroleum	Metals	Machinery	Other Industrial
Heating	0.004	0.005	0.278	0.184	1.326
Process	0.033	0.124	0.670	0.090	0.297
Miscellaneous	0.033	0.117	0.896	0.250	1.494
Total	**0.070**	**0.245**	**1.843**	**0.524**	**3.177**

Industrial Natural Gas Potential by End Use

Table 7-24 provides estimates of savings for each end use and type of potential. Since natural gas is chiefly used for heating, the number of end uses is more limited than the electricity analysis.

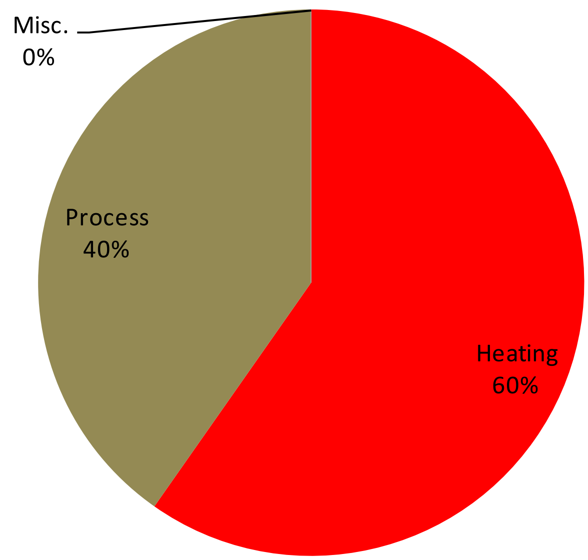
Table 7-24 Industrial Natural Gas Potential by End Use and Potential Type (MMTherms)

End Use	Potential	2014	2015	2016
Heating	Realistic Achievable Potential	0.85	1.25	1.80
	Maximum Achievable Potential	1.19	1.75	2.52
	Economic Potential	2.00	2.92	4.14
	Technical Potential	4.44	6.73	9.61
Process	Realistic Achievable Potential	0.63	0.86	1.21
	Maximum Achievable Potential	0.86	1.19	1.69
	Economic Potential	1.46	2.01	2.81
	Technical Potential	3.02	4.25	5.95
Miscellaneous	Realistic Achievable Potential	-	-	-
	Maximum Achievable Potential	-	-	-
	Economic Potential	-	-	-
	Technical Potential	-	-	-
Total	**Realistic Achievable Potential**	**1.48**	**2.11**	**3.01**
	Maximum Achievable Potential	**2.04**	**2.94**	**4.20**
	Economic Potential	**3.47**	**4.92**	**6.95**
	Technical Potential	**7.46**	**10.97**	**15.56**

Figure 7-12 illustrates the net achievable potential savings by natural gas end use in 2016 for the industrial sector. Space heating and process heating are the only opportunities to speak of. Detailed measure information is available in Appendix D. The key measures comprising the potential are listed below:

- Energy management systems & programmable thermostats
- Efficient boilers & furnaces
- Insulation

Figure 7-12 Industrial Natural Gas Realistic Achievable Potential Savings by End Use in 2016



WASTED ENERGY

One of the goals of the study was to identify "wasted energy" and assess the potential energy savings that could be achieved by minimizing it. This task involved defining "wasted energy," identifying measures that could remove wasted energy, and quantifying the amount of energy that could be saved by eliminating the wasted energy.

Definition of Wasted Energy

The term "wasted energy" is defined as excessive energy use that is a result of a customer's behavioral choices. Examples include leaving lights turned on in an unoccupied room, not performing regular maintenance on HVAC equipment, not replacing furnace filters, leaving office equipment on overnight, or leaving cell phone chargers plugged in when not in use.

For the Ameren study, the definition of wasted energy takes into consideration customer-lifestyle decisions. For example, if a customer prefers to maintain a temperature of 68 degrees year round when at home, this is not considered wasted energy. Similarly, if a customer leaves a light on overnight for personal security, it is not considered wasted energy.

Approach to Estimating Wasted Energy

There are at least two different ways to estimate the amount of energy that is currently wasted.

- One way is to conduct extensive on-site surveys with customers coupled with end-use metering and use the information to observe how customers use energy and to identify "waste" directly. For example, one approach is to ask customers whether they turn the lights off in unoccupied rooms and also meter the energy use in rooms to see if they actually do what they say. The result of this approach will be an estimate of wasted energy as well as an estimate of total energy, each by end use.
- Another approach is to infer the amount of energy that is currently wasted by estimating the savings that would occur from measures that reduce waste. So rather than estimating the waste directly, this second approach backs into it.

For the Ameren study, the second approach was used to estimate the amount of wasted energy in the base year. A set of measures that reduces waste was identified and an estimate of savings was determined if every eligible customer (to whom the measures apply) were to adopt those measures. Table 8-2, Table 8-4 and Table 8-6 identify the measures associated with wasted energy in the residential, commercial and industrial sectors. These measures were vetted with Ameren staff and stakeholders in the early stages of the study.

In Table 8-1 the total net realistic achievable potential savings attributed to preventing wasted energy are separated from the total potential savings estimates. Figure 8-1 shows the distribution of the savings by the source. The measures that prevent wasted energy account for almost 12% of the potential savings in 2014, and up to 18% in 2016.

Table 8-1 Residential Realistic Achievable Savings by Source

Total Cumulative Net Savings (GWh)	2014	2015	2016
Measures Associated with Wasted Energy	11.80	21.98	58.30
All Other Measures	90.00	206.65	257.79
Total Potential Savings	**101.81**	**228.63**	**316.08**
Savings (% of total)			
Measures Associated with Wasted Energy	12%	10%	18%
All Other Measures	88%	90%	82%
Total Potential Savings	**100%**	**100%**	**100%**

Figure 8-1 Residential Realistic Achievable Savings by Source

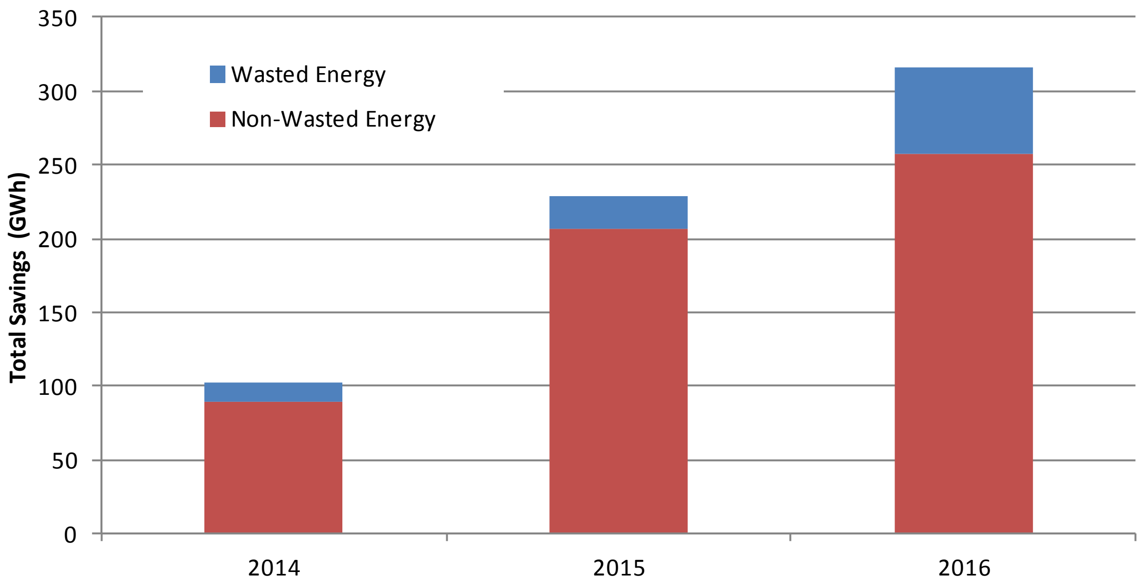


Table 8-2 shows the net cumulative savings for 2016 for each level of potential for the residential sector. If a measure is shown, but only shows Technical savings, that indicates that the measure was not cost-effective.

Table 8-2 Residential Cumulative Savings from Measures Associated with Wasted Energy by Level of Potential (2016)

Measures Associated with Wasted	Realistic Achievable	Maximum Achievable	Economic	Technical
Boiler - Maintenance	0.00	0.00	0.01	0.68
Ceiling Fan - Installation	3.21	5.45	12.95	12.26
Doors - Storm and Thermal	0.36	0.56	1.08	1.07
Ducting - Repair and Sealing	3.95	5.54	12.55	12.00
ENERGY STAR Home Design	0.14	0.21	0.40	1.31
Freezer - Remove Second Unit	6.65	8.46	16.29	16.18
Home Energy Management System	0.86	0.86	2.11	8.48
Insulation - Ceiling	0.40	0.60	1.41	1.40
Insulation - Ducting	1.06	1.69	3.60	3.43
Insulation - Foundation	0.36	0.55	1.21	1.15
Insulation - Infiltration Control	4.95	7.51	18.68	18.28
Insulation - Radiant Barrier	1.45	2.20	5.34	5.17
Insulation - Wall Cavity	0.08	0.12	0.33	2.53
Insulation - Wall Sheathing	0.68	1.02	2.96	11.23
Pool Pump - Timer	0.12	0.21	0.41	0.80
Pool/Spa cover	6.97	11.60	23.59	18.39
Refrigerator - Remove Second Unit	7.56	9.62	18.48	18.27
Roofs - High Reflectivity	0.88	1.33	3.00	2.83
Room AC - Removal of Second Unit	5.10	6.72	13.55	13.37
Thermostat - Clock/Programmable	1.88	2.56	6.33	6.29
Water Heater - Desuperheater	0.16	0.20	0.41	0.39
Water Heater - Drainwater Heat Recovery	0.13	0.20	0.45	0.43
Water Heater - Faucet Aerators	1.59	2.20	5.28	4.99
Water Heater - Low-Flow Showerheads	5.10	7.07	17.27	16.31
Water Heater - Solar System	0.65	0.82	1.70	1.61
Water Heater - Thermostat Setback	1.33	1.80	4.56	4.31
Windows - High Efficiency/ENERGY STAR	0.41	0.64	1.63	26.56
Windows - Install Reflective Film	2.26	3.52	6.83	6.54
Total	**58.30**	**83.27**	**182.43**	**216.24**

In Table 8-3 the total net realistic achievable potential savings attributed to preventing wasted energy are separated from the total potential savings estimates. Figure 8-2 shows the distribution of the savings by the source. The measures that prevent wasted energy account for 37% of the potential savings in 2014, and about 27% in 2016.

Table 8-3 Commercial Realistic Achievable Savings by Source

Total Cumulative Net Savings (GWh)	2014	2015	2016
Measures Associated with Wasted Energy	73.8	94.4	119.4
All other Measures	123.7	224.9	315.0
Total Potential Savings	**197.5**	**319.3**	**434.4**
Savings (% of total)			
Measures Associated with Wasted Energy	37%	30%	27%
All Other Measures	63%	70%	73%
Total Potential Savings	**100%**	**100%**	**100%**

Figure 8-2 Commercial Realistic Achievable Savings by Source

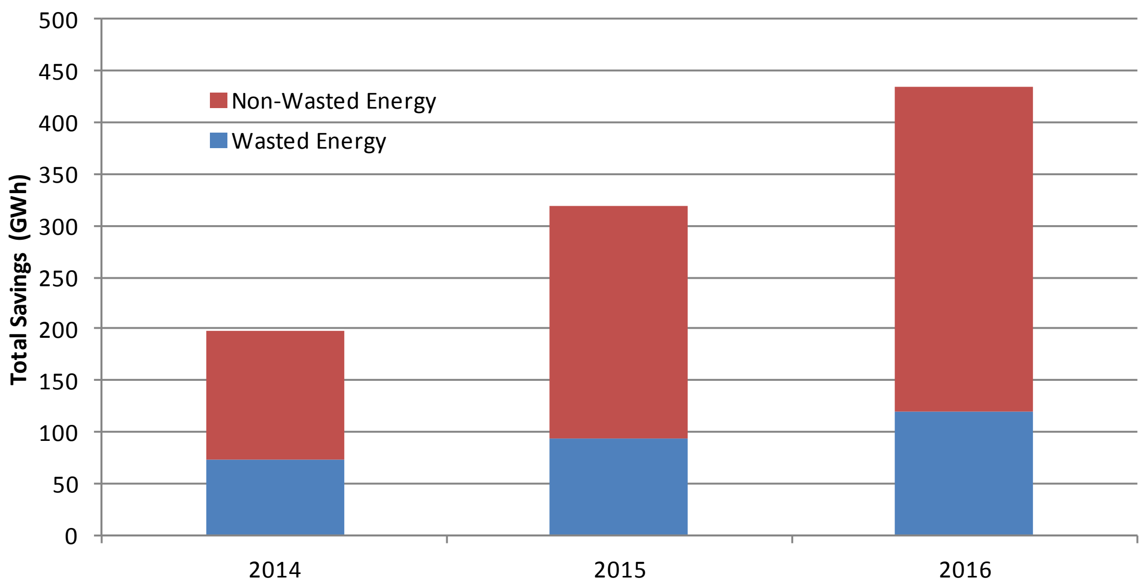


Table 8-4 shows the net cumulative savings for 2016 for each level of potential for the commercial sector. If a measure is shown, but does not show any savings, that indicates that the measure was not cost-effective.

Table 8-4 Commercial Cumulative Savings from Measures Associated with Wasted Energy by Level of Potential (2016)

Measures Associated with Wasted Energy	Realistic Achievable	Maximum Achievable	Economic	Technical
Air-Cooled Chiller - Chilled Water Variable-Flow System	-	-	-	0.18
Air-Cooled Chiller - Maintenance	0.81	1.36	2.14	2.14
Commissioning - HVAC	1.14	1.31	1.96	1.95
Commissioning - Lighting	2.87	3.94	6.49	6.48
Electronics - Monitor Power Management	5.89	7.02	10.97	10.97
Electronics - Smart Power Strip	0.40	0.47	0.71	0.71
Energy Management System	19.17	24.67	41.28	54.60
Exterior Lighting - Bi-Level Fixture	-	-	-	3.50
Exterior Lighting - Daylighting Controls	0.45	0.73	1.26	9.43
Grocery - Display Case Motion Sensors	-	-	-	3.72
Heat Pump - Maintenance	0.15	0.29	0.46	0.46
HVAC - Occupancy Sensors	0.54	0.64	1.11	6.97
Interior Fluorescent - Bi-Level Fixture	-	-	-	11.51
Interior Fluorescent - Delamp and Install Reflectors	-	-	-	17.95
Interior Lighting - Daylighting Controls	23.28	26.69	47.14	55.19
Interior Lighting - Occupancy Sensors	1.83	2.15	3.78	32.27
Interior Lighting - Timeclocks and Timers	-	-	-	16.71
Lodging - Guest Room Controls	1.24	1.43	2.56	2.56
Non-HVAC Motors - Variable Speed Control	1.27	1.62	2.76	2.76
Pool Pump - Timer	0.01	0.02	0.03	0.03
Refrigerator - Decommissioning	5.88	8.83	13.93	13.72
Refrigerator - Variable Speed Compressor	-	-	-	3.87
Retrocommissioning - HVAC	2.58	3.08	4.82	18.82
Retrocommissioning - Lighting	6.88	9.53	15.84	23.66
RTU - Maintenance	6.99	11.82	18.78	18.78
Thermostat - Clock/Programmable	3.09	3.39	6.08	6.16
Vending Machine - Controller	0.68	0.81	1.43	1.43
Ventilation - CO2 Controlled	6.04	8.41	13.94	13.94
Ventilation - Variable Speed Control	14.32	19.42	32.69	36.65
Water Heater - Faucet Aerators	0.73	0.87	1.60	1.60
Water Heater - Install Timer	0.25	0.28	0.42	1.23
Water Heater - Low Flow Showerheads	2.15	2.57	4.72	4.72
Water Heater - Pre-Rinse Spray Valve	2.52	3.30	6.03	6.03
Water-Cooled Chiller - Chilled Water Variable-Flow System	-	-	-	0.23
Water-Cooled Chiller - Maintenance	1.59	2.69	4.25	4.25
Water-Cooled Chiller - VSD on Fans	6.65	9.62	15.82	15.86

Total	**119.38**	**156.96**	**263.00**	**411.06**

In Table 8-5 the total net realistic achievable potential savings attributed to preventing wasted energy are separated from the total potential savings estimates. Figure 8-3 shows the distribution of the savings by the source. The measures that prevent wasted energy account for almost half of the potential savings in 2014, and about 45% in 2016.

Table 8-5 Industrial Realistic Achievable Savings by Source

Total Cumulative Net Savings (GWh)	2014	2015	2016
Measures Associated with Wasted Energy	86.7	114.7	151.3
All Other Measures	95.2	136.1	184.7
Total Potential Savings	**181.8**	**250.9**	**336.0**
Savings (% of total)			
Measures Associated with Wasted Energy	48%	46%	45%
All Other Measures	52%	54%	55%
Total Potential Savings	**100%**	**100%**	**100%**

Figure 8-3 Industrial Realistic Achievable Savings by Source

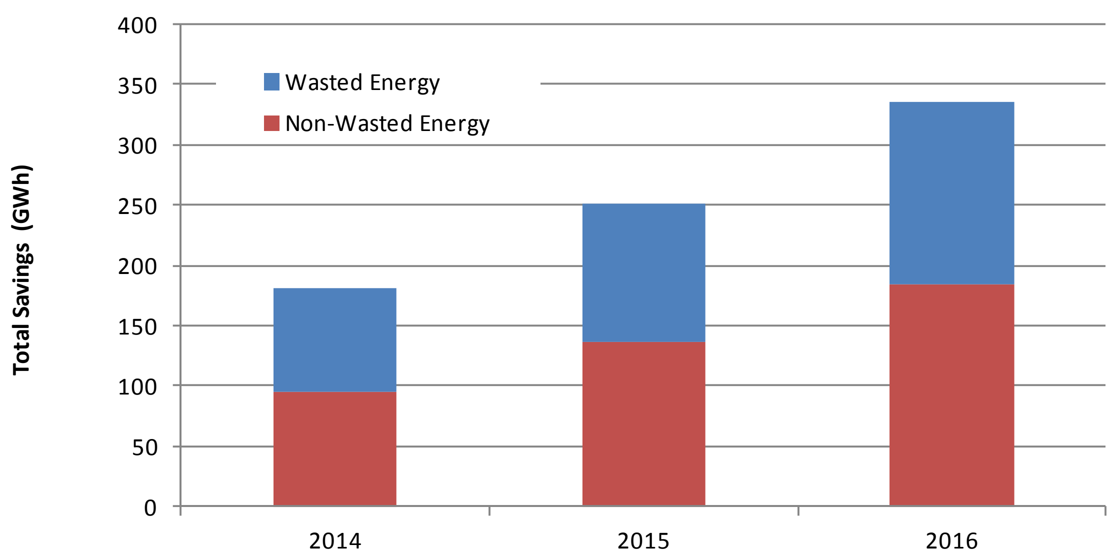


Table 8-6 shows the net cumulative savings for 2016 for each level of potential for the industrial sector. If a measure is shown, but does not show any savings, that indicates that the measure was not cost-effective.

Table 8-6 Industrial Cumulative Savings from Measures Associated with Wasted Energy by Level of Potential (2016)

Measures Associated with Wasted Energy	Realistic Achievable	Maximum Achievable	Economic	Technical
Air-Cooled Chiller - Chilled Water Variable-Flow System	-	-	-	0.18
Air-Cooled Chiller - Maintenance	0.81	1.36	2.14	2.14
Commissioning - HVAC	1.14	1.31	1.96	1.95
Commissioning - Lighting	2.87	3.94	6.49	6.48
Electronics - Monitor Power Management	5.89	7.02	10.97	10.97
Electronics - Smart Power Strip	0.40	0.47	0.71	0.71
Energy Management System	19.17	24.67	41.28	54.60
Exterior Lighting - Bi-Level Fixture	-	-	-	3.50
Exterior Lighting - Daylighting Controls	0.45	0.73	1.26	9.43
Grocery - Display Case Motion Sensors	-	-	-	3.72
Heat Pump - Maintenance	0.15	0.29	0.46	0.46
HVAC - Occupancy Sensors	0.54	0.64	1.11	6.97
Interior Fluorescent - Bi-Level Fixture	-	-	-	11.51
Interior Fluorescent - Delamp and Install Reflectors	-	-	-	17.95
Interior Lighting - Daylighting Controls	23.28	26.69	47.14	55.19
Interior Lighting - Occupancy Sensors	1.83	2.15	3.78	32.27
Interior Lighting - Timeclocks and Timers	-	-	-	16.71
Lodging - Guest Room Controls	1.24	1.43	2.56	2.56
Non-HVAC Motors - Variable Speed Control	1.27	1.62	2.76	2.76
Pool Pump - Timer	0.01	0.02	0.03	0.03
Refrigerator - Decommissioning	5.88	8.83	13.93	13.72
Refrigerator - Variable Speed Compressor	-	-	-	3.87
Retrocommissioning - HVAC	2.58	3.08	4.82	18.82
Retrocommissioning - Lighting	6.88	9.53	15.84	23.66
RTU - Maintenance	6.99	11.82	18.78	18.78
Thermostat - Clock/Programmable	3.09	3.39	6.08	6.16
Vending Machine - Controller	0.68	0.81	1.43	1.43
Ventilation - CO2 Controlled	6.04	8.41	13.94	13.94
Ventilation - Variable Speed Control	14.32	19.42	32.69	36.65
Water Heater - Faucet Aerators	0.73	0.87	1.60	1.60
Water Heater - Install Timer	0.25	0.28	0.42	1.23
Water Heater - Low Flow Showerheads	2.15	2.57	4.72	4.72
Water Heater - Pre-Rinse Spray Valve	2.52	3.30	6.03	6.03
Water-Cooled Chiller - Chilled Water Variable-Flow System	-	-	-	0.23
Water-Cooled Chiller - Maintenance	1.59	2.69	4.25	4.25
Water-Cooled Chiller - VSD on Fans	6.65	9.62	15.82	15.86

Total	**119.38**	**156.96**	**263.00**	**411.06**

ALTERNATE AVOIDED COST SCENARIO

To observe the sensitivity of study results to changes in forecast market prices of electricity and natural gas, we ran a scenario with revised avoided costs. Ameren provided revised avoided costs that included T&D costs since the reference case did not include them. At the time of running this sensitivity, Ameren had revised their avoided energy costs. Therefore we included the most recent avoided energy costs as part of this scenario. The models were then re-run with revised avoided costs and all other variables held constant. While the capacity cost increased significantly with the addition of T&D costs, the avoided energy costs were significantly lower than the reference case. The end result was a decrease in potential.

The total number of measures passing the economic screen (with TRC benefit-to-cost ratio greater or equal to 1.0) decreased from 6,112 to 5,934.[16] This is a decrease of 2.9%. Details by sector can be seen below in Table 9-1.

Table 9-1 Alternate Avoided Cost Scenario, Count of Measures Passing Economic Screen

Sector	Count of All Measures with B/C ratio > 1.0, All Fuels		
	Reference Case	Revised Avoided Costs	Delta
Residential	811	741	-8.6%
Commercial	4,191	4,118	-1.7%
Industrial	1,110	1,075	-3.2%
Total	**6,112**	**5,934**	**-2.9%**

With the newly passing measures migrating from technical potential into economic and achievable potential, the savings are decreased by a significant amount. The electric realistic achievable potential, as a percentage of baseline energy, for instance, decreased from 3.0% to 2.6% in 2016. This is a decrease of 154 GWh or -14% of total cumulative net savings, as shown in Table 9-2.

Table 9-2 Realistic Achievable Potential by Scenario, 2016 (GWh savings)

Sector	Reference Case	Revised Avoided Costs	Delta
Residential	322	293	-9.2%
Commercial	434	334	-23.1%
Industrial	336	311	-7.3%
Total	**1,093**	**938**	**-14.1%**

The effects of the changes are similar for natural gas measures, as the savings potential in the reference case is already quite low. The natural gas realistic achievable potential in 2016 decreased from 1.3% to 1.1%. This is a decrease of 1.5 MMTherms or -10.8% of total cumulative net savings in the reference case, as shown in Table 9-3.

[16] The number of measures cited here includes all permutations of technologies and measures, as well as their inclusion in the various building segments. It should be noted that this is distinct from the measure count given in Chapter 5, which for simplicity of reporting does not consider the dimension of building segment.

Table 9-3 Realistic Achievable Potential by Scenario, 2016 (MMTherm savings)

Sector	Reference Case	Revised Avoided Costs	Delta
Residential	6.3	5.6	-11.2%
Commercial	4.8	4.3	-11.2%
Industrial	3.0	2.7	-9.3%
Total	**14.1**	**12.6**	**-10.8%**

About EnerNOC Utility Solutions Consulting

EnerNOC Utility Solutions Consulting is part of EnerNOC Utility Solutions group, which provides a comprehensive suite of demand-side management (DSM) services to utilities and grid operators worldwide. Hundreds of utilities have leveraged our technology, our people, and our proven processes to make their energy efficiency (EE) and demand response (DR) initiatives a success. Utilities trust EnerNOC to work with them at every stage of the DSM program lifecycle – assessing market potential, designing effective programs, implementing those programs, and measuring program results.

EnerNOC Utility Solutions delivers value to our utility clients through two separate practice areas – Program Implementation and EnerNOC Utility Solutions Consulting.

- Our Program Implementation team leverages EnerNOC's deep "behind-the-meter expertise" and world-class technology platform to help utilities create and manage DR and EE programs that deliver reliable and cost-effective energy savings. We focus exclusively on the commercial and industrial (C&I) customer segments, with a track record of successful partnerships that spans more than a decade. Through a focus on high quality, measurable savings, EnerNOC has successfully delivered hundreds of thousands of MWh of energy efficiency for our utility clients, and we have thousands of MW of demand response capacity under management.
- The EnerNOC Utility Solutions Consulting team provides expertise and analysis to support a broad range of utility DSM activities, including: potential assessments; end-use forecasts; integrated resource planning; EE, DR, and smart grid pilot and program design and administration; load research; technology assessments and demonstrations; evaluation, measurement and verification; and regulatory support.

The EnerNOC Utility Solutions Consulting team has decades of combined experience in the utility DSM industry. The staff is comprised of professional electrical, mechanical, chemical, civil, industrial, and environmental engineers as well as economists, business planners, project managers, market researchers, load research professionals, and statisticians. Utilities view our experts as trusted advisors, and we work together collaboratively to make any DSM initiative a success.

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road, Suite 450
Walnut Creek, CA 94596

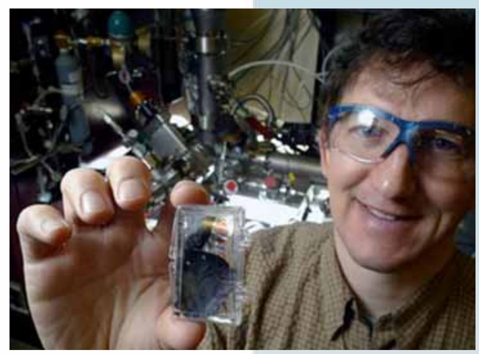
P: 925.482.2000
F: 925.284.3147

AEG
Applied Energy Group

Report specifically developed for:

Ameren Illinois

August 30, 2013



Volume 4: Program Analysis

Applied Energy Group • 1377 Motor Parkway, Suite 401 • Islandia, NY 11749 • P: 631-434-1414 • www.appliedenergygroup.com

This report was prepared by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401
Islandia, NY 11749

R. Obeiter, Project Director
A. Cottrell, Project Manager

In cooperation with

EnerNOC Utility Solutions Consulting

I. Rohmund, Project Director
B. Kester, Project Manager

Table of Contents

Table of Tables

Table of Figures

Introduction

Background

Ameren Illinois contracted with Applied Energy Group (AEG) to provide consulting services relating to the development of a Demand-Side Management (DSM) Potential Study conducted by EnerNOC Utility Solutions (EnerNOC) covering the period of performance from June 1, 2014 through May 31, 2017. The Potential Study performance period coincides with the development of a three year plan for programs implemented by Ameren Illinois in Cycle 3. Cycle 3 DSM program design covers the period June 2014 through May 2017 per 220 ILCS Sections 5/8-103 (electric) and 220 ILCS 5/8-104 (natural gas) of the Public Utilities Act (the "Act"). Statutory annual load reductions for the period are shown in Table 1 below.

Table 1. Ameren Illinois DSM Targets, June 2014 – May 2017

Time Period	% Incremental Annual Electric Energy		% Incremental Annual Natural Gas Energy	
	kWh at Meter	% of Sales	Therms at Meter	% of Sales
6/1/2014 -5/31/2015	707,857,975	1.8%	9,030,493	0.8%
6/1/2015 -5/31/2016	800,865,681	2.0%	11,288,116	1.0%
6/1/2016 -5/31/2017	805,204,838	2.0%	13,545,739	1.2%

In addition to satisfying the requirements of Sections 8-103 and 8-104 of the Act, Ameren Illinois must also satisfy the requirements of the Illinois Power Agency (IPA) procurement process to acquire additional savings as approved by SB1652 and per 220 ILCS Section 5/16-111.5B. This legislation requires that Ameren Illinois submit a plan each year to capture the potential for achievable cost-effective savings subject to certain requirements.

The purpose of the analysis conducted by AEG was to perform preliminary program design to inform the Cycle 3 program design with the purpose of assigning costs to group of measures in EnerNOC's Program Achievable High (PAH) and Program Achievable Low (PAL) scenarios. The energy efficiency information developed will be utilized as a resource in the development of new programs for Ameren Illinois' upcoming Cycle 3 DSM filing.

AEG utilized measure-level information from the PAH and PAL scenarios provided by EnerNOC in order to group the measures into deliverable programs and assign implementation and delivery costs. Each of the measures provided by EnerNOC was designed to be cost-effective on an individual basis utilizing the measure's individual costs and savings. The measures were then grouped into programs in order to assign program costs to achieve the specified savings.[1]

Objectives

The study analyzes cost expenditures required to achieve different levels of energy efficiency potential and informs the program design process in the following ways:

- Develops preliminary program options for electric and natural gas DSM programs implemented in Cycle 3 (2014-2017)
- Develops cost information for the PAH and PAL to feed the development of energy efficiency supply curves (developed by EnerNOC)
- Provides the total cost associated with achieving different levels of energy efficiency potential

Report Organization

This report is presented in 6 volumes as outlined below. This document is **Volume 4: Program Analysis**.

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Energy Efficiency Potential Analysis
- Volume 4, Program Analysis
- Volume 5, Supply Curves
- Volume 6, EE Potential Analysis Appendices

Definitions of Potential

In this study, AEG estimates the program potential for energy efficiency savings. The savings estimates represent net savings[2] developed into two of potential: program maximum achievable potential and program realistic achievable potential. Program achievable potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase, the maintenance activities they undertake, the controls they use for energy-consuming equipment, and the elements of building construction. Because estimating achievable potential involves the inherent uncertainty of predicting human behaviors and responses to market conditions, we developed low and high achievable potential as boundaries for a likely range. The various levels are described below.

- **High Achievable Potential** estimates customer adoption of economic measures when delivered through efficiency programs under ideal market, implementation, and customer preference conditions. Information channels are assumed to be established and efficient for marketing, educating consumers, and coordinating with trade allies and delivery partners. High Achievable Potential establishes a maximum target for the EE savings that an administrator can hope to achieve through its EE programs and involves incentives that

[1] Programs in these scenarios are groupings of measures in order to more accurately assign administrative costs for the purpose of creating supply curves. The Programs were developed strictly for the Potential Study and are not meant to be used directly for Ameren Illinois' Plan 3 filing.

[2] Savings in "net" terms instead of "gross" terms mean that the baseline forecast does include naturally occurring efficiency. In other words, the baseline assumes that energy efficiency levels reflect that some customers are already purchasing the more efficient option. In the baseline forecast chapter we explore other types of baselines, including a codes and standards case and a business-as-usual case.

represent a substantial portion of the incremental cost combined with high administrative and marketing costs.

- **Low Achievable Potential** reflects expected program participation given barriers to customer acceptance, non-ideal implementation conditions, and limited program budgets. This represents a lower bound on achievable potential.

Methodology

AEG was received detailed information from EnerNOC that provided individual measure-level potential by year for each scenario (PAH and PAL). The information included the measure level savings (kWh and therms), measure incremental costs, and yearly incremental installations. AEG then grouped the measure into programs in order to assign more accurate implementation costs to each measure grouping.

Measure Allocation

Measures were grouped into fifteen separate programs in order to more accurately estimate program costs associated with implementing each program. The fifteen programs were grouped into two main sectors Residential and Commercial & Industrial. The programs the measures are grouped into are listed in Table 2.

Table 2. Programs for Measure Allocation

Sector	Program
Residential	Residential Lighting
Residential	ENERGY STAR Homes
Residential	Home Performance with ENERGY STAR
Residential	Multi Family
Residential	Moderate Income
Residential	Appliance Recycling
Residential	HVAC
Residential	Efficient Products
Residential	School Kits
C&I	Small Business Direct Install
C&I	Business
C&I	Custom
C&I	Behavior Change
C&I	Building Codes and Standards
C&I	Retro Commissioning

The development of programs was based on factors including existing Ameren Illinois Act On Energy programs, programs included in Ameren's current Illinois Power Authority (IPA) programs, and potential future programs.[3]

[3] Potential future programs were developed with the purpose of analysis for the Plan 3 filing. Potential programs are for consideration in Plan 3 and non-binding in that planning process.

EnerNOC provided AEG with the gross yearly incremental installations by measure for each potential scenario. In order to distribute measure installations per program, allocation factors were used to determine the number of incremental measures installed by program per year. Each individual measure was assigned a percentage factor for each program, totaling 100 percent for each measure across all programs. The percentage factor for each measure is multiplied by the total yearly incremental measure installations to determine the measure installations by program. A stylistic measure allocation example for a generic measure and program is detailed below in Table 3.

Table 3. Measure Allocation Stylistic Example

Total Incremental Installations	
Existing Building CAC	1,500
New Construction CAC	500

	Measure Allocation		Program Installations	
	Existing Building CAC	New Construction CAC	Existing Building CAC	New Construction CAC
Residential Lighting	0%	0%	0	0
Res ENERGY STAR Homes	0%	85%	0	425
Res Home Performance	35%	0%	525	0
Res Multi Family	0%	0%	0	0
Res Moderate Income	2%	0%	30	0
Res Appliance Recycling	0%	0%	0	0
Res HVAC	63%	15%	945	75
Res Behavior Change	0%	0%	0	0
Res Efficient Products	0%	0%	0	0
Res School Kits	0%	0%	0	0
Total	100%	100%	1,500	500

Measure program allocations were based on participation levels in existing Act On Energy programs, and expected contributions to future programs.

Measure Installation Smoothing

EnerNOC provided AEG with the gross yearly incremental installations by measure for each potential scenario. In many cases the yearly incremental installations were unbalanced, i.e. there were large installations in the first program year and declining installations in subsequent years. In order to balance measure installations across program years for budgetary purposes, the yearly incremental installations were "smoothed" across the three program years.

Smoothing was calculated by multiplying the total incremental measure installations across all three program years by a yearly installation smoothing percentage. In cases where EnerNOC's model showed incremental installations in only specific program years (for example, installations only in years two through three because of changing codes and standards, technology availability, etc.) the smoothing algorithm only accounted for installations in those program years. Table 4 provides three stylistic examples of the smoothing algorithm applied to a generic measure given the various installation scenarios.

Table 4. Measure Smoothing Example

Scenario 1: Installations in all Three Program Years

	2014	2015	2016	Total
EnerNOC Modeling Output	20,000	5,000	6,000	31,000
Yearly Smoothing %	33%	33%	34%	100%
Incremental Yearly Installations	10,230	10,230	10,540	31,000

Scenario 2: Installations in Two Program Years

	2014	2015	2016	Total
EnerNOC Modeling Output	0	8,500	4,500	13,000
Yearly Smoothing %	0%	50%	50%	100%
Incremental Yearly Installations	0	6,500	6,500	13,000

Scenario 3: Installations in One Program Year

	2014	2015	2016	Total
EnerNOC Modeling Output	0	0	7,500	7,500
Yearly Smoothing %	0%	0%	100%	100%
Incremental Yearly Installations	0	0	7,500	7,500

Measures details by program are located in Volume 6 of this report.

Measure Removal/Reduction

Specific measures or measure types were removed or reduced from the program-level analysis due to either the realistic potential installations being too high to implement over the three program years or the measures could not be delivered through traditional Ameren Illinois programs. There were two main segments where electric measures were removed or reduced:

- **Residential Consumer Electronics:** Past program experience and evaluation has shown the consumer electronics market is extremely difficult to reach and has had limited participation.
- **Business Energy Management Systems:** The measure-level model predicts installations of Energy Management Systems for most commercial and industrial buildings in the Ameren Illinois service territory. The levels of installations were reduced to more realistic implementation levels and to control program costs (Energy Management Systems have very high costs with relatively low energy savings).

Program Cost Development

The estimates for technical, economic, and achievable potential in this report were determined by screening measure for cost-effectiveness at the measure-level. This method does not take into account the program costs of delivering measures to end-use customers. The additional costs associated with the delivery of energy efficiency measures includes: Measure Incentives, Program Administration, Education and Marketing, Implementation, and Evaluation. For budgeting and cost-effectiveness purposes the major categories are broken down into Incentives and Non-Incentives.

Program costs were calculated in order to calculate program Total Resource Cost Test (TRC) results and to provide EnerNOC with cost information in order to create energy efficiency supply curves. Program costs were broken out into five separate categories: Incentives, Program Administration, Education and Marketing, Implementation, and Evaluation. A description of each cost category is provided in Table 5.

Table 5. Program Costs Descriptions

Cost Category	Cost Definition
Incentives	Costs paid to the program participant or intermediary to offset the incremental cost of purchasing energy efficient measures.
Administration	The cost accrued to the program implementer to run the day-to-day operations of the program.
Education and Marketing	Direct and indirect marketing including print media, television, internet, and radio advertising and marketing. Education includes both customer and trade ally/contractor education.
Implementation	Direct cost to program implementer including account managers, direct install measures, rebate processing, project inspections, tracking systems, etc.
Evaluation	Cost of evaluation of the program including baseline studies, potential studies, process evaluations, and impact evaluations.

Each cost category is a derivative of a separate cost item of piece of measure information. Table 6 describes how each cost category was calculated.[4]

Table 6. Cost Development by Category

Cost Category	Calculation Methodology	Calculation Strategy
Incentives	Based on a percentage of measure incremental costs	Percentages range from 25-100% of incremental costs dependent on program implementation strategy
Administration	Based on a percentage of incentive costs	Percentages range from 5-50% of incentive costs dependent program maturity and history
Education and Marketing	Based on a percentage of incentive costs	Percentages range from 0-20% of incentive costs dependent on program maturity and history
Implementation	Based on a percentage of incentive costs	Percentages range from 0-100% of incentive costs dependent on program implementation strategy

[4] Detailed implementation plans and delivery methods were not designed in this process. Implementation strategies for each program were designated in order to develop cost allocation percentages.

Evaluation	Based on a percentage of total program costs	A set percentage of 3.5% of total program costs was utilized for Evaluation

Program Development

The purpose of program development is to group measures with similar characteristics, end uses, implementation strategies, or target markets. The development of the fifteen programs were based on a variety of factors including existing Ameren Illinois Act On Energy programs, programs included in Ameren's current Illinois Power Authority (IPA) programs, and potential future programs.[5] Each program was developed to inform the program design process for Cycle 3.

Measure Level Screening

All measures provided to AEG by EnerNOC were screened through various measures-level models[6] and were found to be cost-effective at the measure level. In total, approximately 50 unique residential measures (accounting for over 350 fuel, vintage, and segment combinations), and 150 unique commercial and industrial measures (accounting for over 2,350 sector, fuel, vintage, and segment combinations) were considered for program inclusion.

Bundling Measures into Programs

Each program is made up of individual measures where customers receive rebates for each measure based on a pre-determined incentive level (discussed in the Cost Allocation section of this report). The measure list from the PAH and PAL scenarios were used as the starting point for measure inclusions. All measures, with the exception of measures discussed in the measures removal/reduction section, were included in programs.

A program combines a number of measures into a useful delivery mechanism. Multiple measures usually are bundled within a program. A measure can also be included in multiple programs. Broad (multi-measure) programs are preferred over single-measure programs except where market segments dictate a targeted focus.

Measure categories included by program are described in Table 7 and in Table 7.

[5] Potential future programs were developed with the purpose of analysis for the Cycle 3 filing. Potential programs are for consideration in Cycle 3 and non-binding in that planning process.

[6] As described in Volume 3: Energy Efficiency Potential Analysis

Table 7. Residential Programs Measure Inclusions

Residential - High Efficiency Lighting	**Residential - Multifamily**
Energy Efficient Lighting (CFLs/LEDs)	Air Sealing & Insulation
Residential - HVAC	Combined Boiler & Water Heating Unit
High Efficiency Furnaces (AFUE 90%)	Combined Boiler & Water Heating Unit
Residential - Appliance Recycling	Drainwater Heat Recovery
Recycled Freezer	Energy Efficient Lighting (Specialty & Standard CFLs/LEDs)
Recycled Refrigerator	ENERGY STAR Windows
Recycled Room Air Conditioner	Faucet Aerators
Residential - Home Energy Performance	High Efficiency Bathroom Exhaust Fan
Air Sealing & Insulation	Home Energy Management System
Air-Source Heat Pump (SEER 16, HSPF 8.5)	Hot Water Heater > 55 gal (EF 0.95, 2.0)
Boiler Maintenance & Hot Water Reset	Low-Flow Showerheads
Central Air Conditioner (SEER 14.5+)	Programmable Thermostats
Combined Boiler & Water Heating Unit	Water Heater Desuperheater
Drainwater Heat Recovery	Water Heater Solar System
Energy Efficient Lighting (CFLs)	**Residential - Moderate Income**
ENERGY STAR Windows	Air Sealing & Insulation
Faucet Aerators	Air-Source Heat Pump (SEER 16, HSPF 8.5)
Low-Flow Showerheads	Ceiling Fans
Programmable Thermostats	Central Air Conditioner (SEER 14.5+)
Water Heater > 55 gal (EF 2.3)	Combined Boiler & Water Heating Unit
Water Heater Desuperheater	Energy Efficient Lighting (Specialty & Standard CFLs)
Water Heater Solar System	Faucet Aerators
Water Heater Thermostat Setback	High Efficiency Furnaces (AFUE 90%)
Residential - ENERGY STAR New Homes	Low-Flow Showerheads
Air Sealing & Insulation	**Residential - Efficient Products**
Air-Source Heat Pump (SEER 16, HSPF 8.5)	Drainwater Heat Recovery
Boiler Maintenance & Hot Water Reset	ENERGY STAR Appliances (PCs, TVs, Air Purifier, Printer/Fax/Copiers)
Central Air Conditioner (SEER 14.5+)	ENERGY STAR Windows
Drainwater Heat Recovery	High Efficiency Bathroom Exhaust Fan
Energy Efficient Lighting (CFLs/LEDs)	High Efficiency Pool Pump
ENERGY STAR Home Design	Hot Water Heater > 55 gal (EF 0.95, 2.0)
ENERGY STAR Windows	Pool Pump Timer
Faucet Aerators	Pool/Spa cover
Low-Flow Showerheads	**Residential - School Kits**

Programmable Thermostats	Faucet Aerators
Water Heater > 55 gal (EF 2.3)	Low-Flow Showerheads
Water Heater Desuperheater	
Water Heater Solar System	
Water Heater Thermostat Setback	

Table 8. Commercial Programs Measure Inclusions

C&I – Standard Incentive	C&I - Small Business Direct Install
Air Source Heat Pump (Ductless Mini-split, EER 11.7, COP 3.4)	Energy Efficient Lighting (LED, CFLs, T5)
Air-Cooled Chiller (0.97 kw/ton, COP 3.6)	ENERGY STAR Appliances (PCs, Printer/Fax/Copiers, Steamer, Dishwasher, Fryer)
Boiler (EF .96)	Exhaust Hood Makeup Air
Condensing Unit Heater	Glass Door Display (6800 kWh/yr)
Energy Efficient Lighting (CLFs, LEDs, T5)	High Efficiency Broiler
ENERGY STAR Appliances (PCs, Printer/Fax/Copiers, Steamer, Dishwasher)	High Efficiency Griddle
Furnace (EF .96)	High Efficiency Range
Geothermal Heat Pump (EER 30, COP 5.0)	Icemaker (5.5 kWh/100 lbs)
Glass Door Display (6800 kWh/yr)	Interior Lighting Controls (Daylighting, Occupancy Sensors)
High Efficiency Broiler	LED Exit Lighting
High Efficiency Griddle	Open Display Case (4330 kWh/yr)
High Efficiency Multi-Speed Pool Pump	Reach-in Refrigerator (1500 kWh/yr)
High Efficiency Range	Walk-in Refrigerator (9000 kWh/yr)
Icemaker (5.5 kWh/100 lbs)	Water Heater - Faucet Aerators
Non-HVAC Motors	Water Heater - Low Flow Showerheads
Open Display Case (4330 kWh/yr)	Water Heater - Pipe Insulation
Packaged Terminal Air Conditioner	Water Heater - Pre-Rinse Spray Valve
Packaged Terminal Heat Pump	Water Heater - Tank Blanket/Insulation
Pool Heater (EF .82, EF .95)	**C&I – Custom Incentive**
Reach-in Refrigerator (1500 kWh/yr)	Combined Boiler & Water Heating Unit
Roof Top AC (Ductless Minisplit)	Energy Management System
Variable Air Volume Ventilation	High Efficiency, Multi-Speed Pool Pump
Walk-in Refrigerator (9000 kWh/yr)	High Reflectivity Roof
C&I - Retro-Commissioning	Non-HVAC Motors
HVAC	Ventilation - CO2 Controlled
Lighting	Water Heater - Solar System
C&I – Behavior Change	**C&I - Building Codes and Standards**
Heat Pump Maintenance	Advanced New Construction Designs
Fan System Maintenance & Optimization	
Gas Boiler - Maintenance	

Program Descriptions

Each program was designed to leverage similar technologies, delivery strategies, or target markets in order to most effectively deliver programs and measures to Ameren customers. Table 9 provides a description of each program.

Table 9. Program Descriptions

Residential Programs	
Residential - High Efficiency Lighting	Residential customers receive rebates for the purchase of qualified ENERGY STAR or other high-efficiency lighting products.
Residential - HVAC	HVAC retrofit, and replacement upgrades for air conditioners, heat pumps, and heating and cooling systems, achieving both gas and electric energy savings.
Residential - Appliance Recycling	Provides an incentive for the removal of inefficiency primary or secondary refrigerators or freezers.
Residential - Home Energy Performance	Provides a home energy audit, direct install measures, and follow up sealing and insulation measures, achieving both gas and electric energy savings.
Residential - ENERGY STAR New Homes	Incentivizes the construction of ENERGY STAR homes, achieving both gas and electric energy savings.
Residential - Multifamily	Provides installation of measures in tenant spaces and common area lighting, exit signs, and incentives for prescriptive measures installed only in multi-family settings, achieving both gas and electric energy savings.
Residential - Moderate Income (Subset of HEP)	Provides increased incentives for energy efficiency improvements and retrofits in moderate income households, achieving both gas and electric energy savings.
Residential - Efficient Products	Provides rebates for measures such as hot water heaters, window ACs, smart strips, and pool pumps.
Residential - School Kits	Distributes energy efficiency kits to customers with children in grades 5-8.
Commercial and Industrial Programs	
C&I – Standard Incentive	C&I customers receive prescriptive rebates for the installation, replacement, or retrofit of qualifying energy savings equipment.
C&I - Small Business Direct Install	AIC covers a percentage of the total project costs when small commercial customers purchase and install approved energy efficiency measures.
C&I – Custom Incentive	Applies to energy efficient measures that do not fall into the Standard Incentive program. These projects normally are complex and unique, requiring separate incentive applications and calculations of estimated energy savings, achieving both gas and electric energy savings.

C&I - Building Codes and Standards	C&I customers receive incentives for the design and construction of energy efficient certified new buildings.
C&I - Retro-Commissioning	Provides options and incentives for businesses to improve operations and maintenance practices for buildings, systems, and processes, achieving both gas and electric energy savings.

Program Delivery Mechanisms

Each program was designed with a specific delivery mechanism that is the major influence on program costs. Each program's delivery mechanism is described in Table 10.

Table 10. Program Delivery Mechanisms

Residential Programs	
Residential - High Efficiency Lighting	Offer incentives to the manufacturing and retail partners to increase sales of qualified lighting.
Residential - HVAC	Targeted marketing approach for contractor recruitment and training. Incentives will be provided mid-stream to encourage sales of energy efficiency products.
Residential - Appliance Recycling	A regional/national appliance recycling company will provide comprehensive, turnkey implementation services from eligibility verification to proper disposal/recycling of turned-in appliances. Rebates will be provided directly to program participants.
Residential - Home Energy Performance	Provides the direct installation of measures in addition to mid-stream incentives to independent contractors for follow-up measure installation.
Residential - ENERGY STAR New Homes	Delivery focuses on building a rating network, recruiting builders, providing builder training, recruiting trade allies, encouraging builders to achieve progressively better efficiency, and providing training to other market actors. Rebates will be provided directly to program participants.
Residential - Multifamily	Program consisting of two parts: 1.) Direct installation of in-unit measures; 2.) Provide incentives for common-area measures and major building measures (HVAC, motors, etc).
Residential - Moderate Income (Subset of HEP)	Provides the direct installation of measures in addition to mid-stream incentives to independent contractors for follow-up measure installation.
Residential - Efficient Products	Offer incentives to the manufacturing and retail partners to increase sales of efficient products.
Residential - School Kits	Distribute pre-packaged school kits to selected schools in the AIC service territory.
Commercial and Industrial Programs	
C&I – Standard Incentive	Due to the broad array of measures in the program delivery mechanism include end user incentives, dealer stocking programs, upstream dealer incentives, and education/evaluation programs.
C&I - Small Business Direct Install	Provides enhanced incentives to small business customers through a third partly contractor that interfaces with the customer and provides measures installation.

C&I – Custom Incentive	Implementation and installation of measures is the responsibility of the customers where they submit an application outlining potential upgrades.
C&I - Building Codes and Standards	Provides direct financial incentive to participants who utilize advanced building techniques and higher codes and standards.
C&I - Retro-Commissioning	Provides direct financial incentive to participants who complete qualified projects.

Cost Development

The estimates for technical, economic, and achievable potential in previous volumes of this report were determined by screening measure for cost-effectiveness at the measure-level. This method does not take into account the program costs of delivering measures to end-use customers. The additional costs associated with the delivery of energy efficiency measures includes: Measure Incentives, Program Administration, Education and Marketing, Implementation, and Evaluation. For budgeting and cost-effectiveness purposes the major categories are broken down into Incentives and Non-Incentives.

Utility Program Cost Assumptions

Utility program costs were developed for each program-level achievable potential scenario, with estimates of incentives and non-incentives required to achieve the related savings levels. The cost estimates were based on past program costs for Ameren Illinois, evaluations of past programs, and industry best practices.

Table 11 presents the program spending levels for each program-level achievable scenario. Also presented are Ameren Illinois' first year costs per energy saved for each scenario by fuel type. Key cost assumptions include:

- Incentives required to achieve savings ranged from 53-75% of measure incremental cost
- Non-Incentive costs required to achieve savings ranged from 23-37% of measure incremental cost
- First year electricity cost per kWh saved ranged from $0.25-0.40 per first year kWh saved
- First year natural gas cost per therm saved ranged from $3.16-4.63 per first year therm saved

Table 11. Program Cost Assumptions by Scenario

	Average Costs as Percent of Measure Cost		Average Utility cost per First-Year Unit of Energy Saved	
Achievable Scenario	Incentive	Non-Incentive	Electricity ($/kWh)	Natural Gas ($/therm)
Program Achievable Low	52%	23%	$0.25	$3.16
Program Achievable High	75%	37%	$0.40	$4.63

Table 12 shows the program incentive cost as a percentage of the measure incremental cost.

Table 12. Program Incentive Cost as a Percentage of Measure Incremental Cost

Program	PAH	PAL
Residential Lighting	75%	50%
Res ENERGY STAR Homes	75%	50%
Res Home Energy Performance	75%	50%
Res Multi Family	75%	50%
Res Moderate Income	90%	90%
Res Appliance Recycling	75%	50%
Res HVAC	70%	50%
Res Behavior Change	70%	55%
Res Efficient Products	40%	30%
Res School Kits	100%	100%
C&I Small Business Direct Install	100%	80%
C&I Business	75%	50%
C&I Custom	80%	50%
C&I Behavior Change	50%	40%
C&I Building Codes and Standards	100%	80%
C&I Retro Commissioning	75%	50%

Program Level Total Savings Potential

Electric Program-level Potential

Key findings related to program-level electric potentials are summarized as follows:

- **Program Low achievable potential.** In 2014 program low achievable savings are 341 GWh which is 0.9% of the baseline projection at a cost of $86.4 million. By 2016 cumulative realistic achievable savings grow to 992 GWh which represents 2.8% of the baseline projection at a cumulative cost of $264.9 million.
- **Program High achievable potential.** In 2014 savings for this case are 449 GWh or 1.3% of the baseline at a cost of $178.2 million. By 2016 cumulative savings reach 1,308 GWh or 3.6% of the baseline projection at a cumulative cost of $544.3.

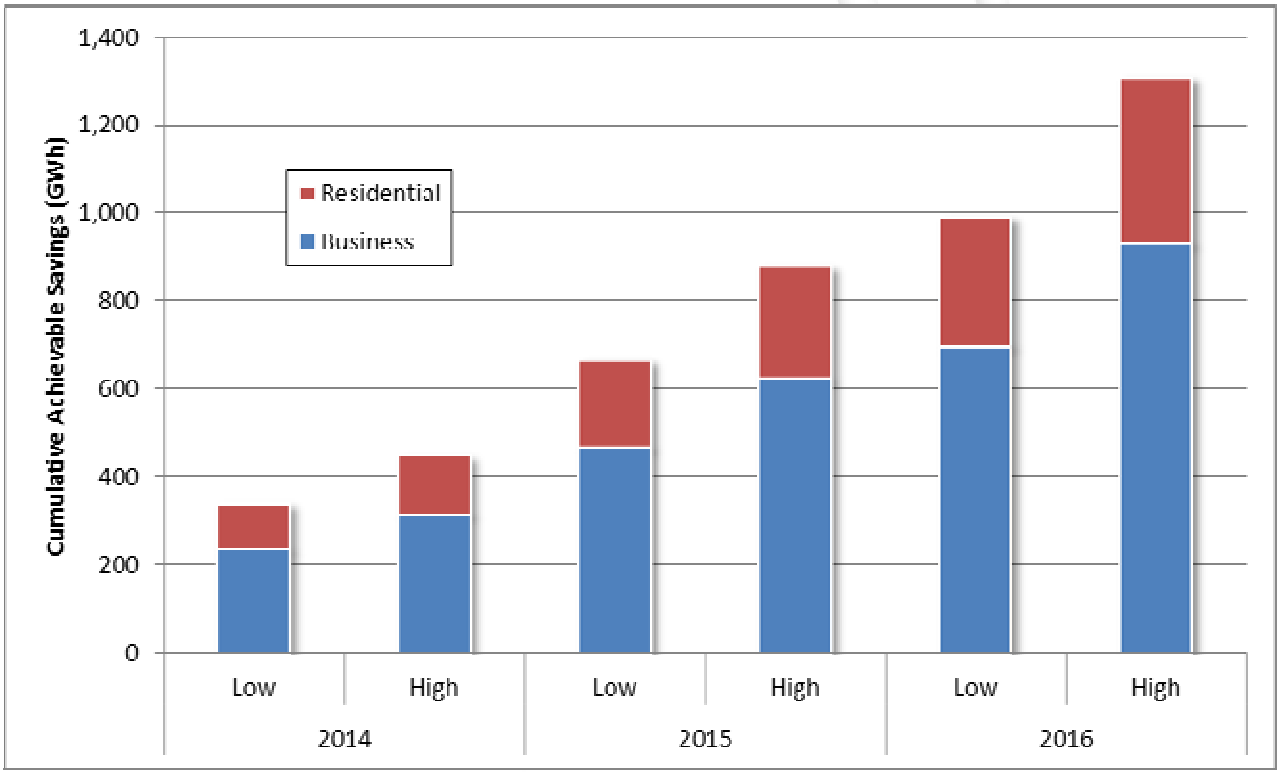
Table 13 summarizes the electric energy-efficiency savings for the different levels of potential relative to the baseline projection.

Table 13. Cumulative, Net, Program-Level Electric Energy Efficiency Potential Summary

	2014	2015	2016
Baseline Projection (GWh)	35,861	35,792	35,973
Annual Savings (GWh)			
Program Achievable Low Potential	341	667	992
Program Achievable High Potential	449	880	1,308
Energy Savings (% of Baseline)			
Program Achievable Low Potential	0.9%	1.9%	2.8%
Program Achievable High Potential	1.3%	2.5%	3.6%
Energy Costs (Million $)			
Program Achievable Low Potential	$86.4	$171.8	$264.9
Program Achievable High Potential	$178.2	$354.0	$544.3

Figure 1 summarizes the range of electric program-level achievable potential by sector. Sectors were adjusted to Residential and Business (which includes both Commercial and Industrial) to align with Ameren Illinois program sectors. The business sector accounts for the largest portion of the savings, followed by residential.

Figure 1. Cumulative, Net, Program-Level Potential by Sector (GWh)



Natural Gas Program-level Potential

Key findings related to program-level natural gas potentials are summarized as follows:

- **Program Low achievable potential.** In 2014 program low achievable savings are 4.2 million therms which is 0.4% of the baseline projection at a cost of $13.3 million. By 2016 cumulative program low achievable savings grow to 12.5 million therms or 1.1% of the baseline projection at a cumulative cost of $40.7 million.
- **Program High achievable potential.** In 2014 savings for this case are 6.3 million therms or 0.6% of the baseline at a cost of $28.9 million. By 2016 cumulative savings reach 18.7 million therms or 1.7% of the baseline projection at a cumulative cost of $89.0 million.

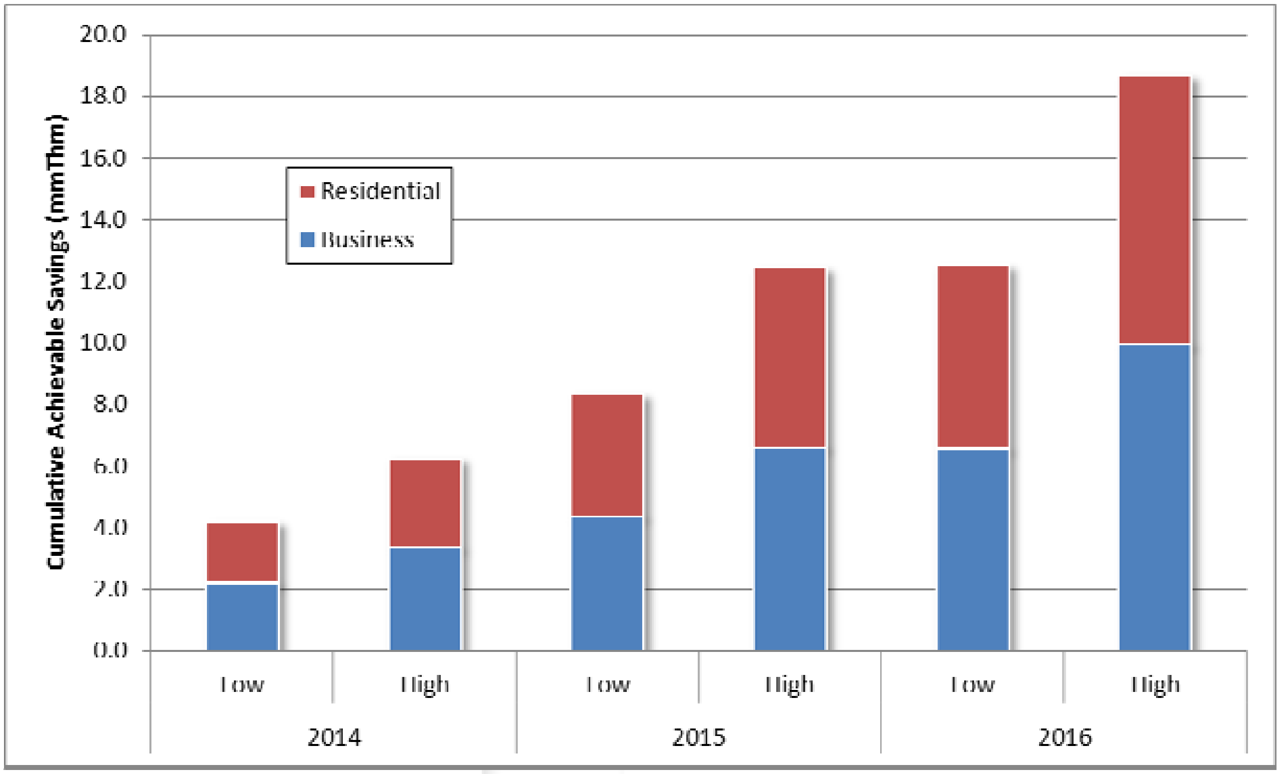
Table 14 summarizes the electric energy-efficiency savings for the different levels of potential relative to the baseline projection.

Table 14. Cumulative, Net, Program-Level Natural Gas Energy Efficiency Potential Summary

	2014	2015	2016
Baseline Energy Forecasts (million therms)	**1,102**	**1,109**	**1,109**
Annual Savings (million therms)			
Program Low Potential	4.2	8.3	12.5
Program High Potential	6.3	12.5	18.7
Energy Savings (% of Baseline)			
Program Low Potential	0.4%	0.8%	1.1%
Program High Potential	0.6%	1.1%	1.7%
Energy Costs (Million $)			
Program Low Potential	$13.3	$26.6	$40.7
Program High Potential	$28.9	$58.1	$89.0

Figure 2 summarizes the range of natural gas program-level achievable potential by sector. Sectors were adjusted to Residential and Business (which includes both Commercial and Industrial) to align with Ameren Illinois program sectors. The business sector accounts for the largest portion of the savings, followed by residential.

Figure 2. Cumulative, Net, Program-Level Potential by Sector (mmTherms)



Program Achievable High Scenario Program Level Savings Potential

Table 15 and Table 16 summarize the high scenario total potential savings achievable through residential and commercial programs, respectively.

Table 15. PAH Program-Level Potential Savings, Residential Programs

Lighting	kWh	69,015,967	64,062,114	63,335,527	196,413,607
	kW	4,651	4,317	4,268	13,236
	therms	0	0	0	0
ENERGY STAR Homes	kWh	855,992	816,584	808,669	2,481,246
	kW	288	314	312	914
	Therms	41,889	54,441	54,398	150,728
Home Energy Performance	kWh	21,736,894	20,726,854	20,527,468	62,991,217
	kW	9,405	9,105	8,956	27,466
	therms	1,653,764	1,630,282	1,613,481	4,897,526
Multi Family	kWh	11,179,713	10,609,052	10,310,731	32,099,495
	kW	1,964	1,884	1,842	5,690
	therms	388,094	384,215	380,694	1,153,003
Moderate Income	kWh	860,366	807,134	801,945	2,469,444
	kW	116	110	108	335

	therms	23,476	23,121	22,946	69,543
Appliance Recycling	kWh	11,417,027	10,633,333	10,230,219	32,280,579
	kW	5,059	4,820	4,725	14,604
	therms	0	0	0	0
HVAC	kWh	1,460,541	1,250,925	1,192,455	3,903,921
	kW	222	161	142	525
	therms	345,733	414,767	413,241	1,173,741
Behavior Change	kWh	0	0	0	0
	kW	0	0	0	0
	therms	0	0	0	0
Efficient Products	kWh	14,349,391	13,821,377	13,973,198	42,143,965
	kW	3,049	2,939	2,919	8,907
	therms	399,155	390,987	388,122	1,178,264
School Kits	kWh	700,338	671,548	666,088	2,037,974
	kW	51	49	49	149
	therms	35,730	34,878	34,596	105,204
Total	**kWh**	**131,576,229**	**123,398,921**	**121,846,299**	**376,821,449**
	kW	**24,804**	**23,700**	**23,322**	**71,826**
	therms	**2,887,841**	**2,932,691**	**2,907,478**	**8,728,010**

Table 16. PAH Program-Level Potential Savings, Commercial Programs

Small Business Direct Install	kWh	36,609,731	34,541,059	34,146,603	105,297,392
	kW	4,316	4,091	4,010	12,418
	therms	90,829	88,719	88,300	267,848
Business	kWh	205,544,055	198,538,685	198,623,108	602,705,848
	kW	39,206	37,969	37,974	115,149
	therms	2,748,868	2,668,685	2,703,553	8,121,107
C&I Custom	kWh	66,402,578	64,263,532	64,374,939	195,041,049
	kW	11,964	11,576	11,596	35,136
	therms	382,956	369,147	398,785	1,150,888
C&I Behavior Change	kWh	1,481,618	1,431,057	1,439,390	4,352,065
	kW	298	286	286	870
	therms	10,795	10,451	10,462	31,709
Building Codes and Standards	kWh	1,857,277	1,792,779	1,784,260	5,434,315
	kW	1,213	1,173	1,169	3,556
	therms	0	0	0	0
Retro Commissioning	kWh	5,891,128	6,386,065	6,492,389	18,769,582
	kW	610	586	586	1,781

	therms	129,467	123,110	122,125	374,701
Total	**kWh**	**317,786,387**	**306,953,177**	**306,860,689**	**931,600,252**
	kW	**57,607**	**55,682**	**55,621**	**168,910**
	therms	**3,362,915**	**3,260,112**	**3,323,225**	**9,946,252**

Program Achievable Low Scenario Program Level Savings Potential

Table 17 and Table 18 summarize the low scenario total potential savings achievable through residential and commercial programs, respectively.

Table 17. PAL Program-Level Potential Savings, Residential Programs

Lighting	kWh	57,343,865	53,225,965	52,622,230	163,192,060
	kW	3,864	3,587	3,546	10,997
	therms	0	0	0	0
ENERGY STAR Homes	kWh	640,865	609,402	603,623	1,853,890
	kW	194	210	209	613
	therms	28,843	37,161	37,177	103,181
Home Energy Performance	kWh	16,202,775	15,422,347	15,281,959	46,907,081
	kW	6,367	6,160	6,062	18,588
	therms	1,140,693	1,123,877	1,112,272	3,376,843
Multi Family	kWh	8,457,496	8,001,353	7,760,803	24,219,653
	kW	1,339	1,282	1,252	3,873
	therms	263,635	260,879	258,477	782,990
Moderate Income	kWh	689,690	646,413	642,439	1,978,542
	kW	85	81	80	246

	therms	16,373	16,119	15,999	48,491
Appliance Recycling	kWh	8,890,889	8,278,319	7,962,649	25,131,857
	kW	3,862	3,679	3,606	11,147
	therms	0	0	0	0
HVAC	kWh	1,091,506	933,310	889,124	2,913,939
	kW	167	122	108	397
	therms	242,357	287,549	286,434	816,341
Behavior Change	kWh	0	0	0	0
	kW	0	0	0	0
	therms	0	0	0	0
Efficient Products	kWh	8,692,591	8,368,082	8,456,789	25,517,462
	kW	1,812	1,748	1,737	5,296
	therms	254,658	249,426	247,588	751,673
School Kits	kWh	514,455	493,033	489,221	1,496,709
	kW	38	36	36	109
	therms	25,744	25,130	24,926	75,800
Total	**kWh**	**102,524,130**	**95,978,226**	**94,708,837**	**293,211,193**
	kW	**17,728**	**16,904**	**16,634**	**51,267**
	therms	**1,972,303**	**2,000,142**	**1,982,873**	**5,955,317**

Table 18. PAL Program-Level Potential Savings, Commercial Programs

Small Business Direct Install	kWh	26,524,224	25,066,739	24,847,523	76,438,487
	kW	3,137	2,979	2,924	9,040
	therms	67,513	65,945	65,634	199,092
Business	kWh	150,996,454	146,026,411	146,218,155	443,241,020
	kW	26,543	25,752	25,762	78,056
	therms	1,770,417	1,714,594	1,739,474	5,224,485
C&I Custom	kWh	53,237,979	51,535,910	51,637,331	156,411,219
	kW	8,986	8,692	8,702	26,381
	therms	273,670	261,266	284,201	819,136
C&I Behavior Change	kWh	1,178,613	1,138,869	1,146,181	3,463,663
	kW	203	195	196	594
	therms	5,834	5,599	5,567	17,000
Building Codes and Standards	kWh	1,548,931	1,495,135	1,488,023	4,532,088
	kW	1,012	979	975	2,966
	therms	0	0	0	0
Retro Commissioning	kWh	4,566,641	4,902,969	4,975,782	14,445,392
	kW	508	488	488	1,483
	therms	107,913	102,635	101,844	312,392

Total	kWh	238,052,842	230,166,033	230,312,994	698,531,869
	kW	40,388	39,085	39,047	118,519
	therms	2,225,348	2,150,039	2,196,719	6,572,106

Costs to Achieve Program Potential

The costs associated with achieving energy efficiency potential are broken down into Incentive and Non-Incentive (Administration, Marketing, Delivery, and Evaluation) costs. The costs to achieve the electric and natural gas program-level potential are detailed in Table 19 and Table 20.

Total Program costs were calculated for both the PAH and PAL scenarios using the methodology described in the Cost Allocations section. The program costs are presented in two main categories: incentives and non-incentives. Non-incentive costs include all costs associated with running the program including administration, marketing, implementation, and evaluation.

Table 19. Cost to Achieve Electric Program-Level Achievable Savings, Portfolio

	2014	2015	2016
Incentive Costs			
Program Achievable Low	$59,429,878	$58,898,918	$64,662,372
Program Achievable High	$118,549,915	$117,232,208	$127,827,355
Non-Incentive Costs			
Program Achievable Low	$27,015,797	$26,543,492	$28,380,775
Program Achievable High	$59,690,137	$58,584,466	$62,454,870
Total Utility Costs			
Program Achievable Low	**$86,445,675**	**$85,442,410**	**$93,043,147**
Program Achievable High	**$178,240,052**	**$175,816,674**	**$190,282,224**

Table 20. Cost to Achieve Gas Program-Level Achievable Savings, Portfolio

	2014	2015	2016
Incentive Costs			
Program Achievable Low	$9,510,317	$9,576,566	$10,093,826
Program Achievable High	$19,740,073	$19,907,091	$21,227,937
Non-Incentive Costs			
Program Achievable Low	$3,771,990	$3,797,531	$3,930,407
Program Achievable High	$9,203,424	$9,274,397	$9,654,207
Total Utility Costs			
Program Achievable Low	**$13,282,307**	**$13,374,097**	**$14,024,233**
Program Achievable High	**$28,943,497**	**$29,181,488**	**$30,882,143**

Program Achievable High Program Level Costs

Table 21 and Table 22 summarize the costs associated with the Program Achievable High Scenario for both residential and commercial programs, respectively.

Table 21. PAH Total Utility Costs, Residential Programs

Program	Cost Category	2014	2015	2016	Total
Lighting	Incentive Costs	$5,930,637	$5,757,268	$5,721,176	$17,409,081
	Non-Incentive Costs	$5,370,192	$5,213,206	$5,180,525	$15,763,923
	Utility Costs	$11,300,829	$10,970,474	$10,901,700	$33,173,003
ENERGY STAR Homes	Incentive Costs	$473,211	$587,281	$591,910	$1,652,401
	Non-Incentive Costs	$428,492	$531,783	$535,975	$1,496,249
	Utility Costs	$901,703	$1,119,063	$1,127,885	$3,148,651
Home Performance	Incentive Costs	$19,640,425	$19,416,533	$19,420,026	$58,476,985
	Non-Incentive Costs	$12,423,551	$12,281,928	$12,284,137	$36,989,617
	Utility Costs	$32,063,977	$31,698,462	$31,704,163	$95,466,601
Multi Family	Incentive Costs	$4,894,280	$4,850,954	$4,846,910	$14,592,144
	Non-Incentive Costs	$2,339,711	$2,318,999	$2,317,065	$6,975,774
	Utility Costs	$7,233,990	$7,169,953	$7,163,975	$21,567,918
Moderate Income	Incentive Costs	$0	$0	$0	$0
	Non-Incentive Costs	$597,615	$585,984	$585,984	$1,769,582
	Utility Costs	$597,615	$585,984	$585,984	$1,769,582
Appliance Recycling	Incentive Costs	$2,309,486	$2,241,560	$2,241,560	$6,792,606
	Non-Incentive Costs	$3,280,625	$3,184,136	$3,184,136	$9,648,897
	Utility Costs	$5,590,111	$5,425,696	$5,425,696	$16,441,503
HVAC	Incentive Costs	$1,674,203	$1,742,411	$1,742,411	$5,159,025
	Non-Incentive Costs	$541,688	$563,757	$563,757	$1,669,203
	Utility Costs	$2,215,891	$2,306,168	$2,306,168	$6,828,228
Efficient Products	Incentive Costs	$0	$0	$0	$0
	Non-Incentive Costs	$0	$0	$0	$0
	Utility Costs	$0	$0	$0	$0
School Kits	Incentive Costs	$1,423,156	$1,388,046	$1,497,738	$4,308,940
	Non-Incentive Costs	$2,050,910	$2,000,313	$2,158,390	$6,209,613
	Utility Costs	$3,474,066	$3,388,359	$3,656,127	$10,518,553
Total	**Incentive Costs**	**$36,345,398**	**$35,984,054**	**$36,061,730**	**$108,391,182**
	Non-Incentive Costs	**$27,032,784**	**$26,680,106**	**$26,809,968**	**$80,522,858**

	Utility Costs	**$63,378,182**	**$62,664,159**	**$62,871,698**	**$188,914,040**

Table 22. PAH Total Utility Costs, Commercial Programs

Program	Cost Category	2014	2015	2016	Total
Small Business Direct Install	Incentive Costs	$12,916,365	$12,201,033	$12,738,743	$37,856,141
	Non-Incentive Costs	$10,831,018	$10,231,176	$10,682,073	$31,744,267
	Utility Costs	$23,747,383	$22,432,208	$23,420,816	$69,600,408
Business	Incentive Costs	$59,666,672	$60,078,533	$70,712,779	$190,457,984
	Non-Incentive Costs	$19,305,152	$19,438,410	$22,879,120	$61,622,681
	Utility Costs	$78,971,824	$79,516,943	$93,591,898	$252,080,665
Custom	Incentive Costs	$20,517,969	$20,032,197	$20,643,976	$61,194,142
	Non-Incentive Costs	$7,061,259	$6,894,081	$7,104,624	$21,059,964
	Utility Costs	$27,579,228	$26,926,278	$27,748,600	$82,254,106
Behavior Change	Incentive Costs	$77,790	$75,181	$75,650	$228,620
	Non-Incentive Costs	$114,506	$110,666	$111,357	$336,529
	Utility Costs	$192,296	$185,846	$187,007	$565,149
Building Codes and Standards	Incentive Costs	$512,155	$497,092	$497,092	$1,506,339
	Non-Incentive Costs	$1,703,429	$1,653,328	$1,653,328	$5,010,084
	Utility Costs	$2,215,584	$2,150,420	$2,150,420	$6,516,424
Retro Commissioning	Incentive Costs	$8,253,639	$8,271,209	$8,325,322	$24,850,170
	Non-Incentive Costs	$2,670,465	$2,676,150	$2,693,658	$8,040,272
	Utility Costs	$10,924,104	$10,947,358	$11,018,980	$32,890,442
Total	**Incentive Costs**	**$101,944,590**	**$101,155,244**	**$112,993,561**	**$316,093,396**
	Non-Incentive Costs	**$41,685,829**	**$41,003,809**	**$45,124,159**	**$127,813,797**
	Utility Costs	**$143,630,419**	**$142,159,054**	**$158,117,721**	**$443,907,193**

PAL Program Level Costs

Table 23 and Table 24 summarize the costs associated with the Program Achievable Low Scenario for both residential and commercial programs, respectively.

Table 23. PAL Total Utility Costs, Residential Programs

Program	Cost Category	2014	2015	2016	Total
Lighting	Incentive Costs	$3,789,370	$3,678,270	$3,666,285	$11,133,925
	Non-Incentive Costs	$3,158,061	$3,065,471	$3,055,482	$9,279,013
	Utility Costs	$6,947,431	$6,743,741	$6,721,766	$20,412,938
ENERGY STAR Homes	Incentive Costs	$217,892	$266,796	$268,841	$753,529
	Non-Incentive Costs	$174,858	$214,104	$215,745	$604,707
	Utility Costs	$392,750	$480,899	$484,586	$1,358,235
Home Performance	Incentive Costs	$8,839,058	$8,729,682	$8,731,225	$26,299,965
	Non-Incentive Costs	$4,680,723	$4,622,803	$4,623,620	$13,927,147
	Utility Costs	$13,519,782	$13,352,485	$13,354,845	$40,227,112
Multi Family	Incentive Costs	$2,210,206	$2,192,593	$2,191,924	$6,594,723
	Non-Incentive Costs	$897,233	$890,083	$889,811	$2,677,128
	Utility Costs	$3,107,440	$3,082,676	$3,081,735	$9,271,851
Moderate Income	Incentive Costs	$0	$0	$0	$0
	Non-Incentive Costs	$238,350	$233,630	$233,630	$705,610
	Utility Costs	$238,350	$233,630	$233,630	$705,610
Appliance Recycling	Incentive Costs	$1,205,208	$1,169,760	$1,169,760	$3,544,728
	Non-Incentive Costs	$1,476,138	$1,432,722	$1,432,722	$4,341,583
	Utility Costs	$2,681,346	$2,602,483	$2,602,483	$7,886,311
HVAC	Incentive Costs	$848,187	$859,704	$859,704	$2,567,595
	Non-Incentive Costs	$239,486	$242,737	$242,737	$724,960
	Utility Costs	$1,087,672	$1,102,441	$1,102,441	$3,292,555
Efficient Products	Incentive Costs	$669,097	$652,463	$701,945	$2,023,505
	Non-Incentive Costs	$906,345	$883,813	$950,841	$2,741,000
	Utility Costs	$1,575,442	$1,536,277	$1,652,787	$4,764,505
School Kits	Incentive Costs	$0	$0	$0	$0
	Non-Incentive Costs	$121,939	$121,939	$121,939	$365,817
	Utility Costs	$121,939	$121,939	$121,939	$365,817
Total	**Incentive Costs**	**$17,779,018**	**$17,549,268**	**$17,589,684**	**$52,917,970**
	Non-Incentive Costs	**$11,893,133**	**$11,707,303**	**$11,766,529**	**$35,366,965**

	Utility Costs	**$29,672,151**	**$29,256,571**	**$29,356,213**	**$88,284,935**

Table 24. PAL Total Utility Costs, Commercial Programs

Program	Cost Category	2014	2015	2016	Total
Small Business Direct Install	Incentive Costs	$7,451,121	$7,074,786	$7,426,176	$21,952,083
	Non-Incentive Costs	$5,173,686	$4,912,378	$5,156,365	$15,242,429
	Utility Costs	$12,624,807	$11,987,164	$12,582,542	$37,194,512
Business	Incentive Costs	$28,132,600	$28,538,632	$34,167,145	$90,838,377
	Non-Incentive Costs	$7,943,240	$8,057,883	$9,647,093	$25,648,216
	Utility Costs	$36,075,840	$36,596,515	$43,814,238	$116,486,593
Custom	Incentive Costs	$10,583,871	$10,349,566	$10,584,759	$31,518,196
	Non-Incentive Costs	$3,162,778	$3,092,761	$3,163,044	$9,418,583
	Utility Costs	$13,746,649	$13,442,327	$13,747,803	$40,936,779
Behavior Change	Incentive Costs	$49,380	$47,713	$48,015	$145,107
	Non-Incentive Costs	$68,618	$66,301	$66,722	$201,641
	Utility Costs	$117,998	$114,014	$114,737	$346,748
Building Codes and Standards	Incentive Costs	$427,086	$414,525	$414,525	$1,256,135
	Non-Incentive Costs	$1,270,923	$1,233,543	$1,233,543	$3,738,008
	Utility Costs	$1,698,009	$1,648,067	$1,648,067	$4,994,144
Retro Commissioning	Incentive Costs	$4,517,120	$4,500,994	$4,525,894	$13,544,008
	Non-Incentive Costs	$1,275,409	$1,270,856	$1,277,886	$3,824,151
	Utility Costs	$5,792,529	$5,771,849	$5,803,780	$17,368,158
Total	**Incentive Costs**	**$51,161,177**	**$50,926,215**	**$57,166,514**	**$159,253,907**
	Non-Incentive Costs	**$18,894,653**	**$18,633,721**	**$20,544,653**	**$58,073,027**
	Utility Costs	**$70,055,830**	**$69,559,936**	**$77,711,167**	**$217,326,934**

Program Cost-Effectiveness

After the initial measure groupings, programs were evaluated for cost-effectiveness, with a Total Resource Cost Test (TRC) result of greater than 1.0 being the threshold. Measure inclusions by program were then adjusted in order for each program to have a TRC ratio greater than 1.0. Table 25 and Table 26 present the cost effective results for both the PAH and the PAL scenarios.

Program Achievable High Cost-Effectiveness Results

Table 25 presents the cost-effectiveness results for the Program Achievable High scenario.

Table 25. Program Achievable High Scenario TRC Results

Lighting	2.36	N/A	2.36
ENERGY STAR Homes	1.09	0.96	1.05
Home Performance	0.86	0.91	0.88
Multi Family	0.86	2.36	1.07
Moderate Income	1.17	0.51	0.84
Appliance Recycling	0.72	N/A	0.72
HVAC	0.86	1.31	1.14
Efficient Products	1.34	1.69	1.38
School Kits	2.43	1.70	2.11
Small Business Direct Install	1.08	3.97	1.10
Business	1.75	1.34	1.71
C&I Custom	1.30	1.06	1.28
C&I Behavior Change	3.97	1.36	3.86
Building Codes and Standards	2.87	N/A	2.87
Retro Commissioning	0.67	0.27	0.50
Portfolio Total	**1.41**	**1.04**	**1.35**

Program Achievable Low Cost-Effectiveness Results

Table 26 presents the cost-effectiveness results for the Program Achievable High scenario.

Table 26. Program Achievable Low Scenario TRC Results

Lighting	3.09	N/A	3.09
ENERGY STAR Homes	1.32	1.16	1.27
Home Performance	1.04	1.08	1.06
Multi Family	1.02	2.69	1.25
Moderate Income	2.12	0.91	1.55
Appliance Recycling	0.92	N/A	0.92
HVAC	0.93	1.42	1.22
Efficient Products	1.46	1.92	1.50
School Kits	2.52	1.74	2.17
Small Business Direct Install	1.26	4.69	1.28
Business	1.89	1.39	1.83
C&I Custom	1.40	1.17	1.39
C&I Behavior Change	3.94	1.51	3.87
Building Codes and Standards	3.20	N/A	3.20
Retro Commissioning	0.74	0.29	0.55
Portfolio Total	**1.57**	**1.13**	**1.51**

Ameren Illinois Energy Efficiency Market Potential Assessment

Report Number 1404

Volume 5: Supply Curves

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road
Suite 450
Walnut Creek, CA 94596
925.482.2000
www.enernoc.com

Prepared for:
Ameren Illinois

Presented on:
July 5, 2013

This report was prepared by

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Blvd., Suite 450
Walnut Creek, CA 94596

I. Rohmund, Project Director
B. Kester, Project Manager

Subcontractor
YouGov|Definitive Insights
Washington University in St. Louis

In cooperation with
Applied Energy Group

CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Background

Ameren Illinois contracted with EnerNOC to conduct an electricity and natural gas Energy Efficiency (EE) Market Potential study covering the period of performance from June 1, 2014 through May 31, 2017 to aid the development of a three year plan for programs implemented by Ameren Illinois in Cycle 3. In addition, the analysis also included the period of performance from June 1, 2017 through May 31, 2024 to aid in benchmarking and other tasks related to future analyses. This study identifies the potential to achieve the kWh and therm annual load reduction targets within the rate caps identified in Sections 8-103 and 8-104 of the Illinois Public Utilities Act. In addition, the electric component of the study identifies the potential to achieve additional kWh savings per Section *5/16-111.5Bnew* of the Act absent rate cap limitations. This comprehensive study includes primary market research, a full demand side management (DSM) potential analysis for electricity and natural gas, energy efficiency program design, supply curve development, and analysis of wasted energy.

EnerNOC teamed with YouGov|Definitive Insights and Washington University in St. Louis to perform saturation surveys and program-interest research with Ameren Illinois customers. The EnerNOC team worked in collaboration with Applied Energy Group who, under separate contract with Ameren Illinois, performed the program analysis. This report represents the combined effort of these four organizations.

Objectives

The study addresses energy efficiency potential and informs the program design process in the following ways:

- Develop three-year plan for electric and natural gas EE programs implemented in Cycle 3 (2014-2017)
- Develop EE potential estimates for 2017-2024 for benchmarking and future analyses
- Conduct market research to better represent customers in the Ameren Illinois service territory
- Quantify wasted energy due to customer behavior

Report Organization

This report is presented in 6 volumes as outlined below. This document is **Volume 5: Supply Curves**.

- Volume 1, Executive Summary
- Volume 2, Market Research Report
- Volume 3, Energy Efficiency Potential Analysis
- Volume 4, Program Analysis
- Volume 5, Supply Curves
- Volume 6, EE Potential Analysis Appendices

ANALYSIS APPROACH

The purpose of supply curves is to better understand the relationship between energy efficiency savings and the costs required to reach those savings levels. Supply curves can yield insights about a portfolio of conservation programs that are not easily attained by looking at the impacts and costs associated with any one individual program.

Energy efficiency measures and/or programs and their associated impacts are rank-ordered according to their cost per unit of savings. The two data points (unit cost and savings impacts) are plotted successively on a set of axes to create a curve. As programs become more expensive, there is a point on the supply curve where it appears that significantly greater cost will be required to reach a diminishing amount of EE savings.

Supply curves consist of two axes – a y-axis that depicts the cost of the saved energy, and an x-axis that shows the energy savings impacts. The following data were considered and assembled as part of the supply curve.

Y-axis: Unit Cost

To construct the data for the y component of the supply curve data pairs, one must represent each measure or program's cost per unit of energy saved. This can be done on a first-year basis or a levelized/lifetime basis, wherein the cost is amortized or spread across the lifetime of the savings. Once this data is assembled, it is rank-ordered from least cost to highest cost. An example data set is shown in Table 2-1 below.

X-axis: Energy Savings Impacts

To construct the data for the x-axis, one must represent the energy savings obtained by each measure or program. This can be done in terms of absolute energy savings or as a percentage of the baseline forecast. The supply curve and associated data can also be prepared for a single year at a time, or for a summation of cumulative savings over multiple years. Different formulations are useful for different purposes, and it is important to specify the assumptions when presenting the data. An example data set is show in Table 2-1 below.

Table 2-1 Example of Measure Data Preparation for Supply Curve

Measures Entering Supply Curve	Incremental Measure Cost	Number of Units	Annual kWh Savings/Unit	Effective Useful Life (years)	X-Axis	Y-Axis (option 1)	Y-Axis (option 2)
					Total First-Year kWh Savings	First-Year $/kWh	Lifetime or Levelized $/kWh*
	A	B	C	D	B * C	A / C	(A amortized over D)* / C
CFL lamp	$2	100,000	30	5	3,000,000	$0.07	$0.01
Ceiling Insulation	$500	1,200	1500	25	1,800,000	$0.33	$0.02
SEER 16 AC	$150	800	350	14	280,000	$0.43	$0.04
Heat Pump Maintenance	$50	150	90	3	13,500	$0.56	$0.19

Overall Savings and Costs

The first step toward creating the program-level supply curves was to create two separate scenarios that correspond to the measure-level energy efficiency potentials assessed in Volume 3: Energy Efficiency Potential: Realistic Achievable Potential (RAP) and Maximum Achievable Potential (MAP).

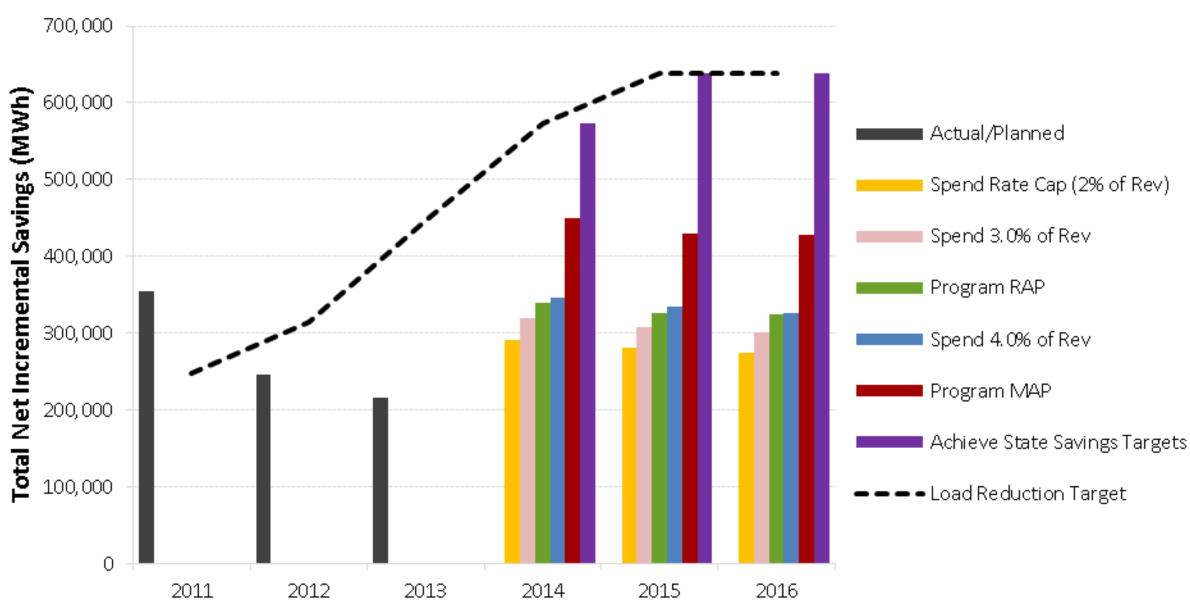
EnerNOC provided the measure-level costs and savings to AEG, who in-turn developed the energy efficiency programs. The cost-effective measures were combined to develop two portfolios of energy efficiency programs – Program RAP and Program MAP. As described in Volume 4, the savings are levied with appropriate costs for incentives, implementation, marketing and education, evaluation, and program administration. After applying all the delivery and cost structures, the Program RAP and Program MAP portfolios resulted in a set of program potential savings and estimated budgets.[1]

Using RAP and MAP to Interpolate or Extrapolate to New Portfolio Scenarios

These two portfolios provided guidelines, allowing us to create various portfolio scenarios by interpolating between Program RAP and Program MAP, optimizing to consider a number of other scenarios relevant to planning considerations; namely: attainment of the Illinois state goals, spending exactly at the rate caps, and increments of spending between (for example: spending 3% of revenue or 4% of revenue).

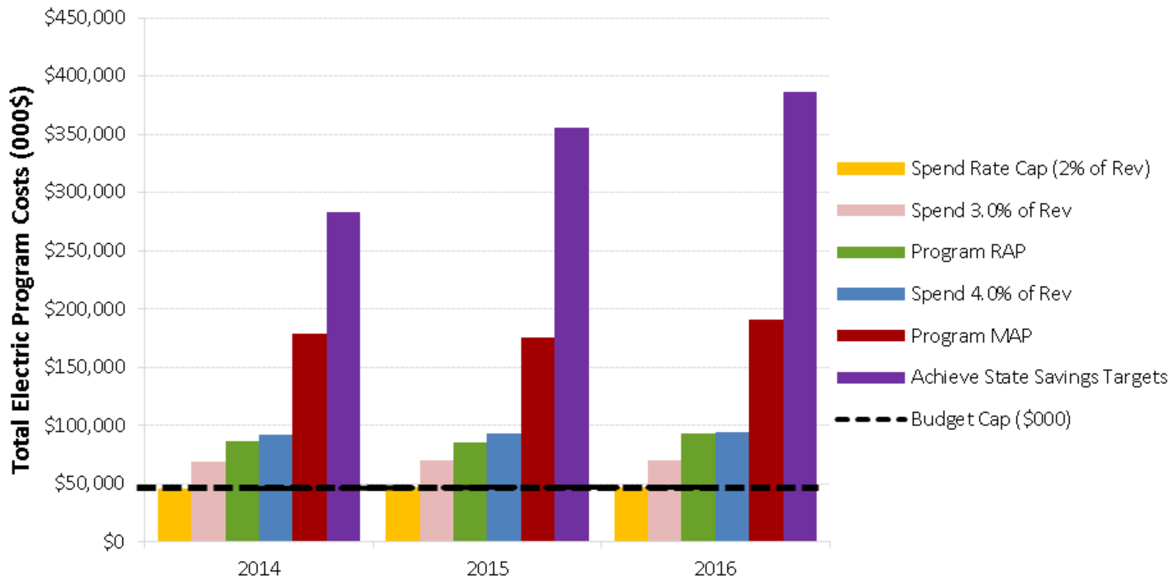
Figure 2-1 below shows the resulting Net Incremental MWh savings per year for the various portfolios, along with a line indicating the level of load reduction necessary to meet the IL state targets in any year. Figure 2-2 shows the total program costs to achieve these electricity savings.

Figure 2-1 Net Incremental Electricity Savings (MWh)



[1] For details on the development of programs, please refer to Volume 4: Program Design.

Figure 2-2 Total Electric Program Costs



For the natural gas portfolios, the resulting Net Incremental therm savings per year are shown in Figure 2-3. The respective costs to achieve the savings are shown in Figure 2-4 below.

Figure 2-3 Net Incremental Natural Gas Savings (1,000 therms)

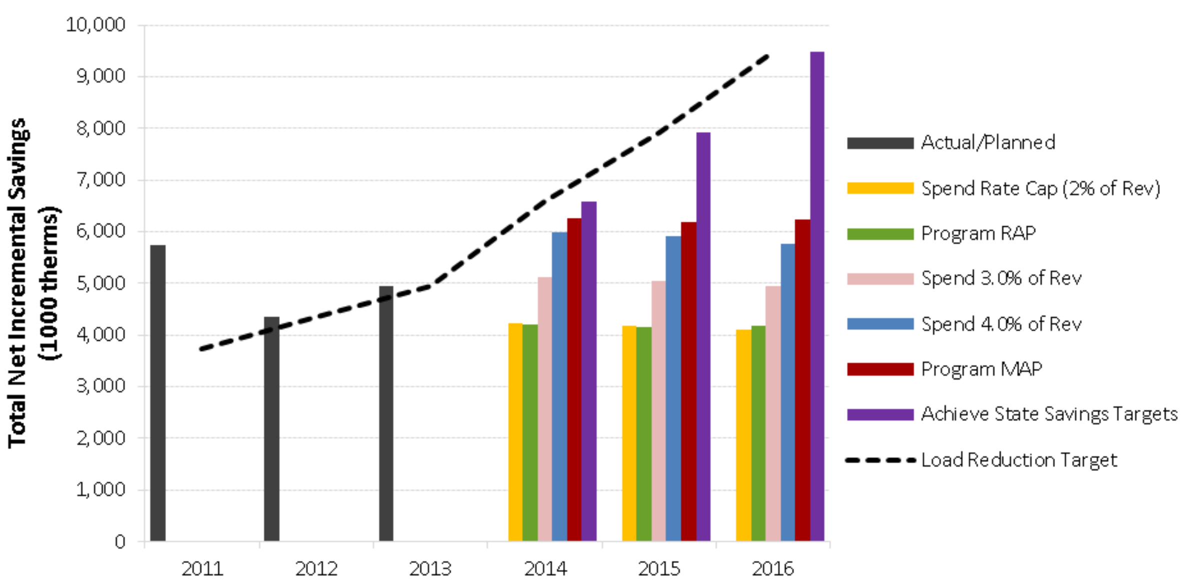
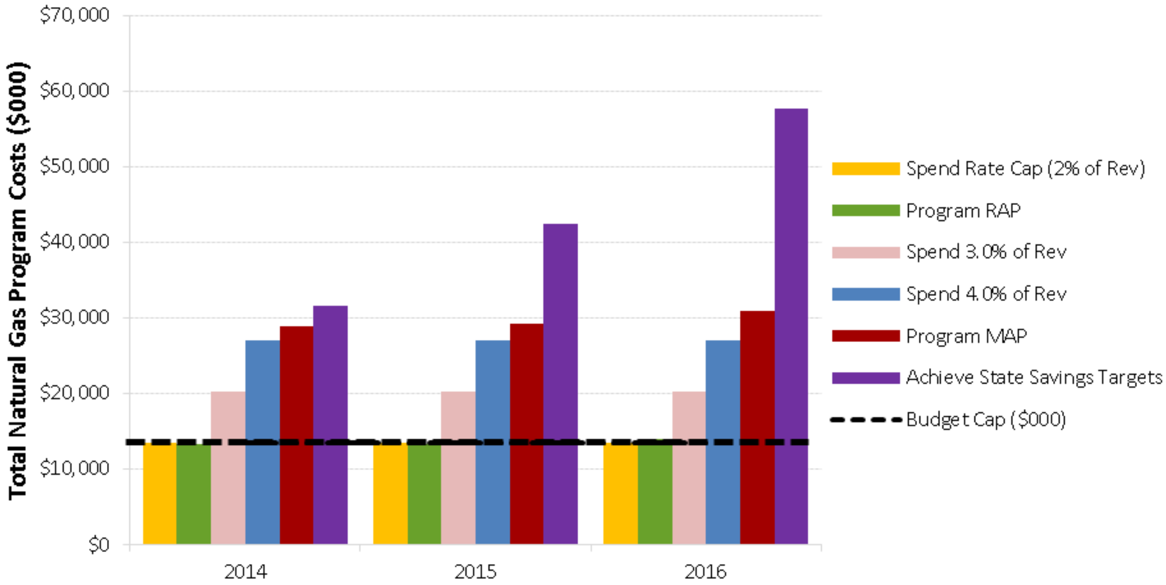


Figure 2-4 Total Natural Gas Program Costs



Supply Curve Formats

To develop the supply curves in this report, the following formats and assumptions were applied:

- First, values representing the y-axis of the curves were constructed. The y-axis values represent the total program cost divided by the program's savings in the first year to yield an incremental or first-year cost per kilowatt-hour ($/kWh). This cost is considered to be the same for every unit of savings acquired in a given program, and therefore creates a unique horizontal line for each program.
- Values representing the x-axis of the curves were then constructed. The x-axis values represent the first-year potential energy savings (in terms of annual MWh savings) by individual EE program for a given program year.

ELECTRICITY SUPPLY CURVE RESULTS

Figure 3-1 through Figure 3-3 show the supply curves for the various electric EE programs, at the various implementation levels, for the program years 2014-2016. Each horizontal line is a discrete program with a bundle of measures and an explicit delivery mechanism and cost structure. Several program levels are shown, as well as the supply curve for achieving the state target.

Figure 3-1 Electric Energy Efficiency Program Supply Curves—Potential in 2014

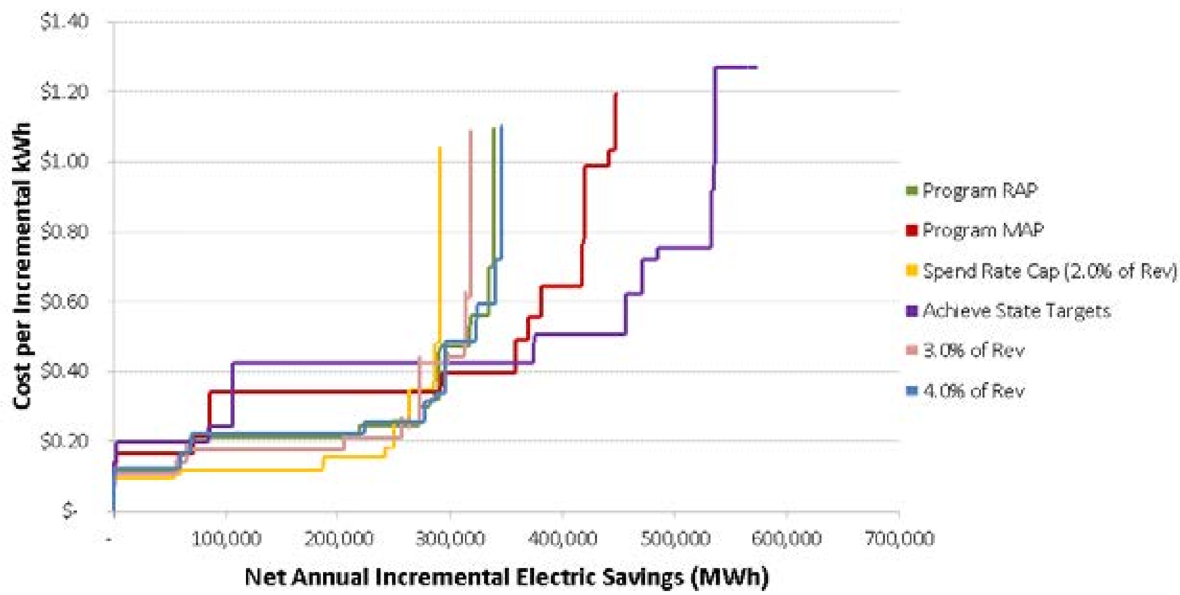


Figure 3-2 Electric Energy Efficiency Program Supply Curves—Potential in 2015

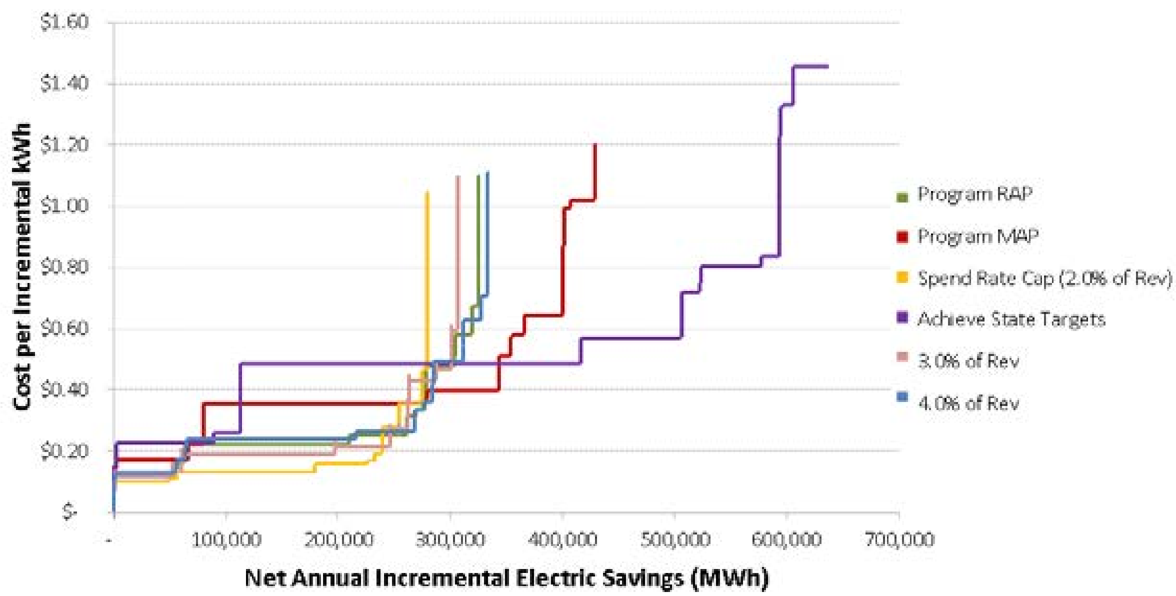
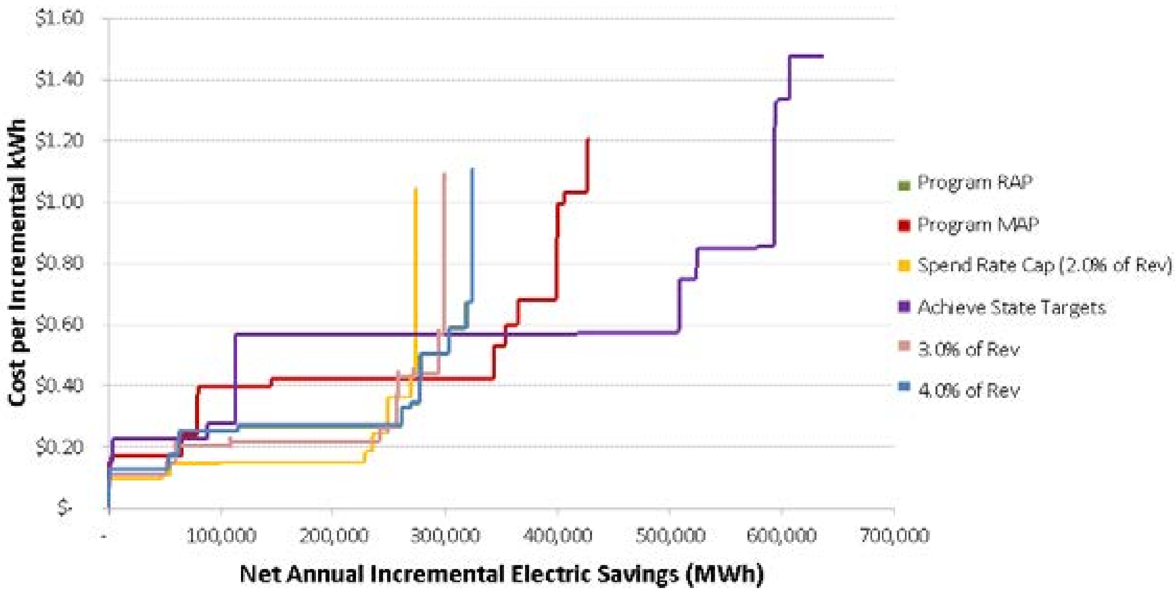


Figure 3-3 Electric Energy Efficiency Program Supply Curves—Potential in 2016



In general, several observations can be made from the results of the supply curve analysis:

- Overall, the analysis shows a significant majority of the EE program savings fall under $0.40/kWh, where kWh are given in incremental or first-year terms.
- The portfolio representing spending at the rate cap level of 2% of revenue is significantly lower than the Program RAP level from the EE potential analysis[2].
- While most of the programs are very cost-effective at an aggregate, program level, there are some higher cost programs which include: Residential HVAC, Retro Commissioning and the Building Codes and Standards program. Building Codes and Standards unit costs are significantly higher than the second most expensive program.

Analysis and Recommendations

Based on the results presented above, it is clear that each implementation level presents certain risks and rewards. For the Spend Rate Cap portfolio, there is less risk posed and savings would remain close to historic and current levels. The Program High portfolio provides the largest amount of savings of any achievable level, but those savings are realized at a very high cost in absolute terms. Budgets would need to be increased dramatically beyond current and historic levels to accommodate the intense level of program activities.

Regarding the electric EE programs, the Program RAP portfolio offers the best opportunity for Ameren Illinois to achieve a cost-effective portfolio with levels of savings greater than the current Cycle 2 portfolio and the Cycle 3 “Spend Rate Cap” portfolio, while also having less risk and uncertainty than the Program MAP portfolio. As can be seen from the supply curves, the Program RAP would be very similar to the portfolio that spends 4.0% of Revenue in the three program years. This gives a barometer of the level of spending that would be required to achieve the savings in the Program RAP scenario.

[2] Note that the Program RAP scenario in the chart is obscured by the 4.0% of revenue line since the values are so close to each other.

NATURAL GAS SUPPLY CURVE RESULTS

The supply curves for the various natural gas EE programs portfolios are presented below in Figure 4-1 through Figure 4-3 for the program years 2014-2016:

Figure 4-1 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2014

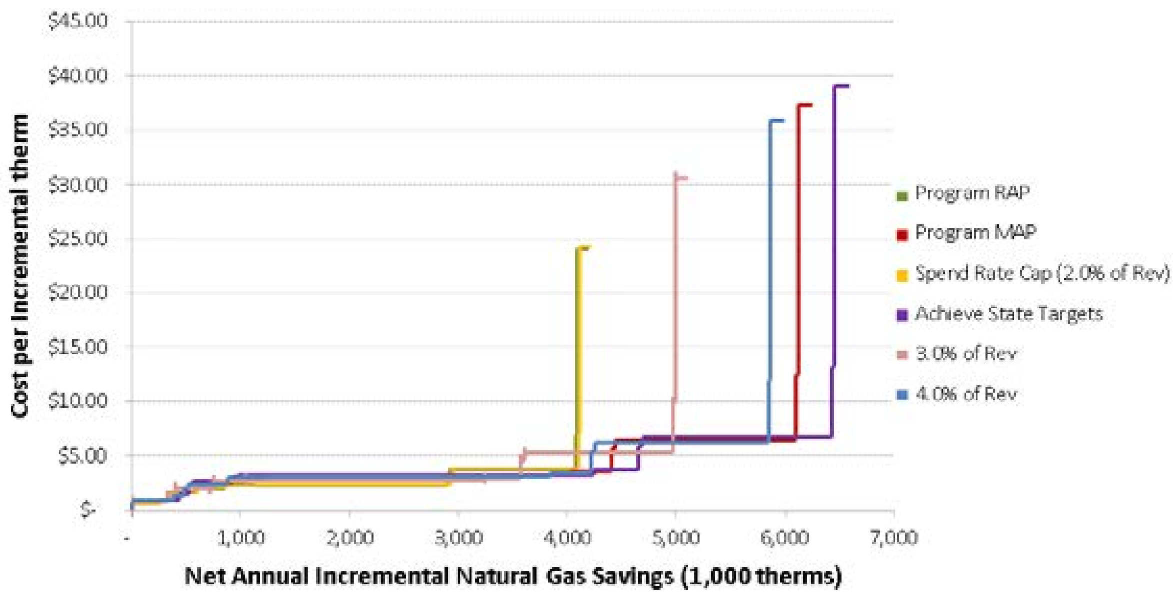


Figure 4-2 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2015

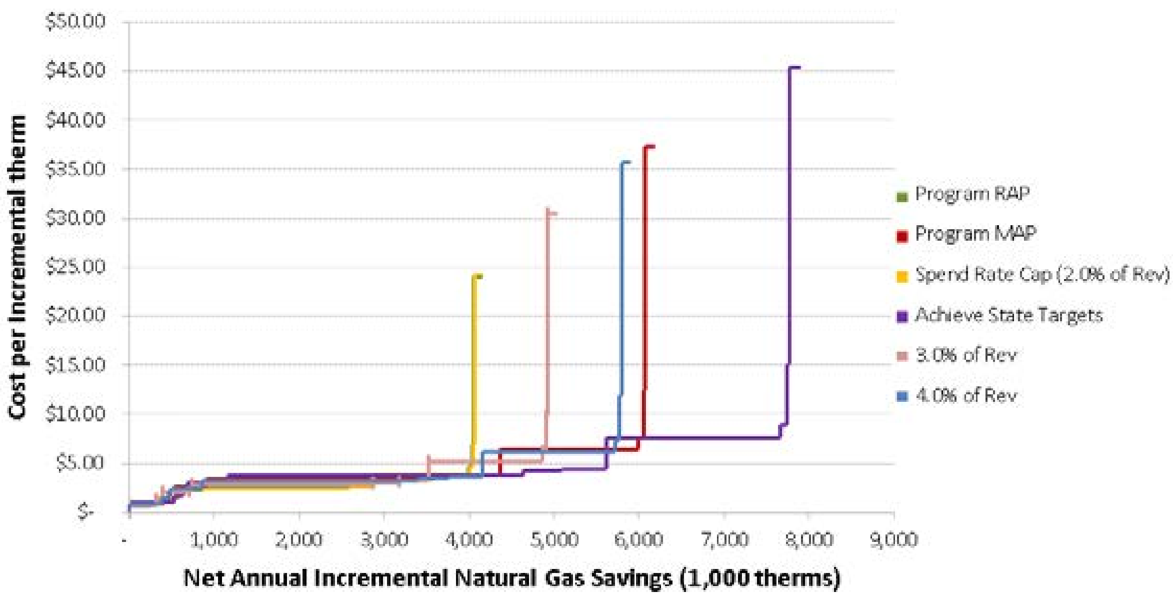
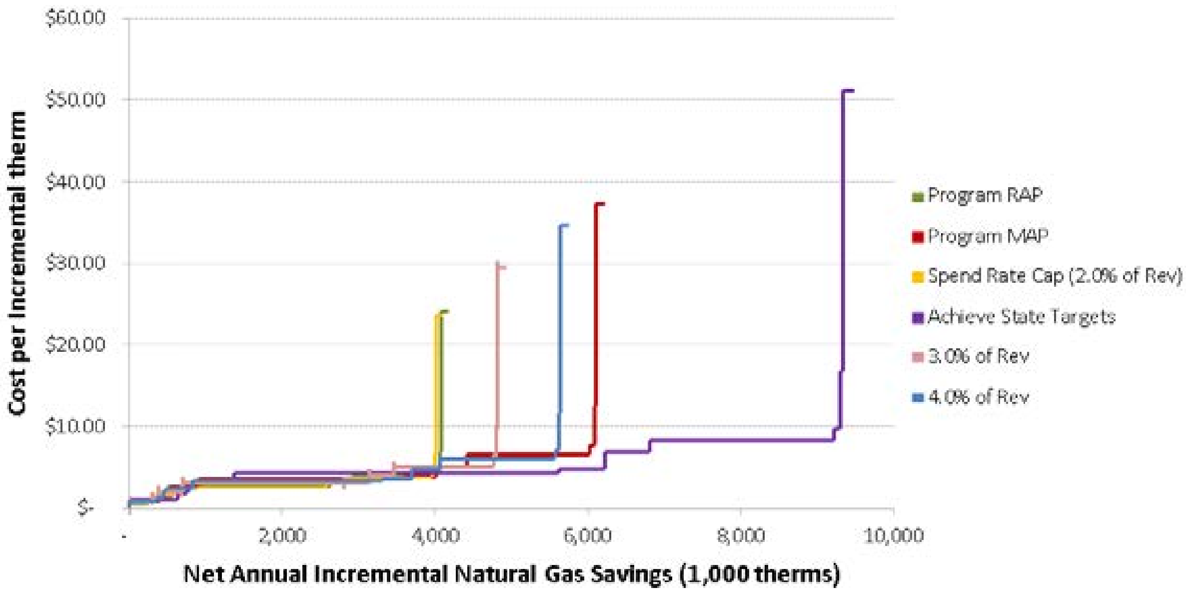


Figure 4-3 Natural Gas Energy Efficiency Program Supply Curves—Potential in 2016



Observations that can be made from the natural gas supply curves analysis include:

- A majority of the EE program savings for natural gas are under and around the $5.00/therm level, where therms are given in incremental or first-year terms.
- The portfolio representing spending at the rate cap level of 2% of revenue is closer to the Program RAP scenario for natural gas than it is in the electricity analysis.
- There are several programs with a high per-unit savings cost, including: Residential ENERGY STAR Homes, Residential Moderate Income, and Retro Commissioning.

Analysis and Recommendations

Based on the results presented above, it is clear that each implementation level presents certain risks and rewards. For the Spend Rate Cap portfolio, there is less risk posed and savings would remain close to historic and current levels. The Program High portfolio provides the largest amount of savings of any achievable level, but those savings are realized at a very high cost in absolute terms. Budgets would need to be increased dramatically beyond current and historic levels to accommodate the intense level of program activities.

For the natural gas EE programs, the Program RAP portfolio offers the most cost-effective portfolio for Ameren Illinois, maintaining spending levels close to the “Spend Rate Cap” portfolio and providing slightly lower $/therm cost.

About EnerNOC Utility Solutions Consulting

EnerNOC Utility Solutions Consulting is part of EnerNOC Utility Solutions group, which provides a comprehensive suite of demand-side management (DSM) services to utilities and grid operators worldwide. Hundreds of utilities have leveraged our technology, our people, and our proven processes to make their energy efficiency (EE) and demand response (DR) initiatives a success. Utilities trust EnerNOC to work with them at every stage of the DSM program lifecycle – assessing market potential, designing effective programs, implementing those programs, and measuring program results.

EnerNOC Utility Solutions delivers value to our utility clients through two separate practice areas – Program Implementation and EnerNOC Utility Solutions Consulting.

- Our Program Implementation team leverages EnerNOC's deep "behind-the-meter expertise" and world-class technology platform to help utilities create and manage DR and EE programs that deliver reliable and cost-effective energy savings. We focus exclusively on the commercial and industrial (C&I) customer segments, with a track record of successful partnerships that spans more than a decade. Through a focus on high quality, measurable savings, EnerNOC has successfully delivered hundreds of thousands of MWh of energy efficiency for our utility clients, and we have thousands of MW of demand response capacity under management.
- The EnerNOC Utility Solutions Consulting team provides expertise and analysis to support a broad range of utility DSM activities, including: potential assessments; end-use forecasts; integrated resource planning; EE, DR, and smart grid pilot and program design and administration; load research; technology assessments and demonstrations; evaluation, measurement and verification; and regulatory support.

The EnerNOC Utility Solutions Consulting team has decades of combined experience in the utility DSM industry. The staff is comprised of professional electrical, mechanical, chemical, civil, industrial, and environmental engineers as well as economists, business planners, project managers, market researchers, load research professionals, and statisticians. Utilities view our experts as trusted advisors, and we work together collaboratively to make any DSM initiative a success.

EnerNOC Utility Solutions Consulting
500 Ygnacio Valley Road, Suite 450
Walnut Creek, CA 94596

P: 925.482.2000
F: 925.284.3147