COMMONWEALTH EDISON COMPANY

Load Forecast for Five-Year Planning Period
June 2017 – May 2022

July 15, 2016

TABLE OF CONTENTS

Page

I. INTRODUCTION AND SUMMARY

The Public Utilities Act ("PUA") provides that beginning in 2008 electric utilities in Illinois shall provide a range of load forecasts to the Illinois Power Agency ("IPA") by July 15th of each year. The PUA further provides that these load forecasts shall cover the 5-year planning period for the next procurement plan and shall include hourly data representing high-load, low-load and expected-load scenarios for the load of eligible retail customers ("Eligible Retail Customers"). The electric utility is also to provide supporting data and assumptions (220 ILCS 5/16-111.5(d)(2)). This document presents Commonwealth Edison Company's ("ComEd") load forecast for the planning period of June 2017 through May 2022.

ComEd's 5-year hourly load forecast ("Forecast") is based on the PUA's definition of Eligible Retail Customers. Eligible Retail Customers include residential and non-residential customers who purchase power and energy from ComEd under fixed-price bundled service ("Blended Service") tariffs, other than those customers whose service has been declared competitive. Because service to certain classes of customers has been declared competitive either by statute or by the Illinois Commerce Commission ("ICC"), only residential and non-residential customers below 100 kW in size are eligible for Blended Service.[1]

The Forecast includes the effects of energy efficiency, demand response and renewable energy resources programs. The Forecast anticipates that these programs will be observed in full compliance with the PUA's requirements, subject to the defined rate impact test.

II. LOAD FORECAST

A. Purpose and Summary

This section of the Forecast provides forecasted energy usage for the Eligible Retail Customers within ComEd's service territory for the 5-year procurement planning period beginning on June 1, 2017. In accordance with Section 16-111.5(b) of the PUA, the Forecast includes a multi-year historical analysis of hourly loads, a review of switching trends and competitive retail market development, a discussion of known and projected changes to future loads and growth forecasts by customer classes. The Forecast also addresses the impacts of demand response and energy efficiency programs on the forecast. Lastly, this Forecast discusses any supply side needs that are projected to be offset by the purchase of renewable energy resources.

[1] There is one exception to this statement. The common area accounts for the condominium associations are exempted from this competitive declaration (see Section 16-103.1 of the PUA).

B. Development of the Five-Year Load Forecast (June 1, 2017 – May 31, 2022)

The hourly load analysis provides the means to determine the on-peak and off-peak quantities needed in the procurement process. In presenting the Forecast, this document focuses on average usage or load during the 12 monthly on-peak and off-peak periods during a year. For the purposes of this Forecast, the definitions of the on-peak and off-peak periods are consistent with those commonly used in the wholesale power markets, and on trading platforms such as the New York Mercantile Exchange ("NYMEX") and the Intercontinental Exchange, Inc. ("ICE"). The on-peak period consists of the week day period from 6 a.m. to 10 p.m. CPT excluding NERC holidays (this is referred to as the 5X16 peak period). The off-peak period consists of all other hours (this is referred to as the off-peak "wrap" period). The Forecast therefore has been summarized as load requirements using the 24 different time periods covered by these standard products. This is the same approach that was presented in past forecasts and approved by the ICC. The hourly load data is being supplied with the supporting data and assumptions materials.

1. Hourly Load Analysis

a. Multi-year historical analysis of hourly load

The 2016 multi-year historical analysis of hourly load is very similar to the approach used in past procurement filings. The hourly models that were developed last year were updated with 2015 data and reviewed with subsequent enhancements. The models continue to perform well.

The 2016 multi-year historical analysis of load during the 24 monthly on-peak and off-peak periods is based on hourly profile data for the period from January 2009 to December 2015. The profiles are based on statistically significant samples from ComEd's residential customer population along with customers applicable to the non-residential watt-hour and 0 to 100 kW delivery classes. As discussed in greater detail below, the profiles show distinct and stable weather-related usage patterns that are indicative of how residential and the small non-residential customers use electricity. Thus, the customer load profiles provide reliable information on the historical hourly usage of customers.

Using the hourly load profiles and actual customer aggregate usage, Table II-1 depicts the historical on-peak and off-peak hourly usage of the major customer groups within the Eligible Retail Customers for the period from January 2013 to December 2015.

Table II-1

Load Forecast Table (Historical Detail 2013-2015)

ComEd Historical Actual Usage

Historical Energy Usage in MWh for Eligible Retail Customers (Line Loss Adjusted)

		Residential Load		Watthour		Small Load (0 to 100kW)		Street Lighting Load		Total Load (MWh)	
Year	Month	On-Peak	Off-Peak	On-Peak	Off-Peak	On-Peak	Off-Peak	On-Peak	Off-Peak	On-Peak	Off-Peak
2013	1	709,022	729,531	11,005	8,620	222,782	176,308	761	1,625	943,571	916,084
2013	2	530,438	543,446	10,193	8,065	211,719	167,634	654	1,460	753,004	720,604
2013	3	387,593	432,669	5,503	4,645	206,030	176,682	615	1,635	599,741	615,632
2013	4	311,744	293,296	6,430	4,634	205,178	148,734	498	1,688	523,850	448,353
2013	5	349,970	329,147	5,824	4,106	195,451	137,371	362	1,869	551,607	472,493
2013	6	386,495	397,394	3,761	2,882	187,643	153,626	312	1,608	578,212	555,510
2013	7	560,482	505,810	6,183	4,122	238,230	174,345	227	1,101	805,122	685,377
2013	8	489,582	422,316	5,618	3,684	229,295	165,152	487	2,294	724,982	593,446
2013	9	360,727	374,591	4,522	3,458	195,081	157,510	561	1,791	560,892	537,350
2013	10	310,549	276,439	4,810	3,202	192,302	132,280	631	1,543	508,292	413,464
2013	11	332,394	379,224	4,414	3,899	170,008	151,769	696	1,537	507,512	536,429
2013	12	414,448	456,939	5,572	4,819	203,518	180,521	859	1,601	624,397	643,880
Totals		**5,143,445**	**5,140,803**	**73,835**	**56,135**	**2,457,238**	**1,921,932**	**6,663**	**19,753**	**7,681,180**	**7,138,621**
2014	1	472,529	469,785	5,695	4,803	244,024	198,856	2,089	4,900	724,337	678,345
2014	2	408,966	422,851	5,542	4,726	212,965	173,018	1,577	3,696	629,051	604,291
2014	3	335,205	392,328	5,078	4,725	218,180	197,294	1,699	4,808	560,163	599,155
2014	4	303,227	280,120	4,664	3,617	201,577	146,047	1,472	5,496	510,941	435,279
2014	5	309,228	326,447	3,927	3,365	200,794	162,828	611	3,344	514,560	495,984
2014	6	448,593	439,373	4,700	3,752	226,571	171,759	744	4,582	680,608	619,466
2014	7	464,601	464,645	5,191	3,909	244,749	181,444	692	4,072	715,233	654,070
2014	8	524,114	553,617	5,286	4,361	241,702	195,592	810	3,977	771,912	757,547
2014	9	385,897	378,771	4,541	3,613	214,543	161,050	1,428	4,974	606,409	548,408
2014	10	373,954	346,352	4,580	3,378	210,659	144,084	1,683	4,353	590,876	498,167
2014	11	400,930	485,673	4,820	4,913	192,799	186,043	1,765	4,019	600,314	680,648
2014	12	482,856	466,095	6,155	5,151	235,197	187,914	2,344	4,489	726,551	663,649
Totals		**4,910,102**	**5,026,057**	**60,179**	**50,314**	**2,643,760**	**2,105,929**	**16,914**	**52,710**	**7,630,955**	**7,235,010**
2015	1	476,714	538,625	5,863	5,335	214,141	190,941	589	1,257	697,308	736,157
2015	2	476,714	484,624	6,645	5,567	207,164	169,191	490	1,091	691,014	660,473
2015	3	427,317	467,237	5,275	4,394	212,538	172,854	465	1,225	645,594	645,711
2015	4	310,909	309,919	4,378	3,317	184,811	134,831	413	1,382	500,511	449,448
2015	5	337,101	416,319	4,376	4,035	183,401	164,164	269	1,368	525,147	585,886
2015	6	527,083	481,903	5,315	3,685	214,500	148,479	249	1,316	747,146	635,384
2015	7	668,905	613,692	5,892	3,915	237,741	165,813	282	1,401	912,820	784,821
2015	8	686,980	783,783	5,786	4,771	225,439	189,435	280	1,260	918,485	979,247
2015	9	655,298	669,285	8,687	6,431	221,562	166,578	373	1,172	885,920	843,466
2015	10	493,319	503,808	6,774	4,926	199,321	141,220	442	1,180	699,855	651,134
2015	11	502,636	616,626	7,400	6,441	185,017	163,033	45	526	695,097	786,625
2015	12	647,226	661,219	7,577	6,007	203,756	163,479	546	1,080	859,105	831,786
Totals		**6,210,203**	**6,547,038**	**73,968**	**58,824**	**2,489,390**	**1,970,019**	**4,442**	**14,257**	**8,778,002**	**8,590,138**

Table II-2 carries forward the total load in MWh from Table II-1 and then provides the average load for each period in MW, which is useful in determining the required volume of standard wholesale energy products.

Table II-2

Load Forecast Table (Historical Summary 2013-2015)

ComEd Historical Actual Usage
Historical Energy Usage for Eligible Retail Customers
(Line Loss Adjusted)

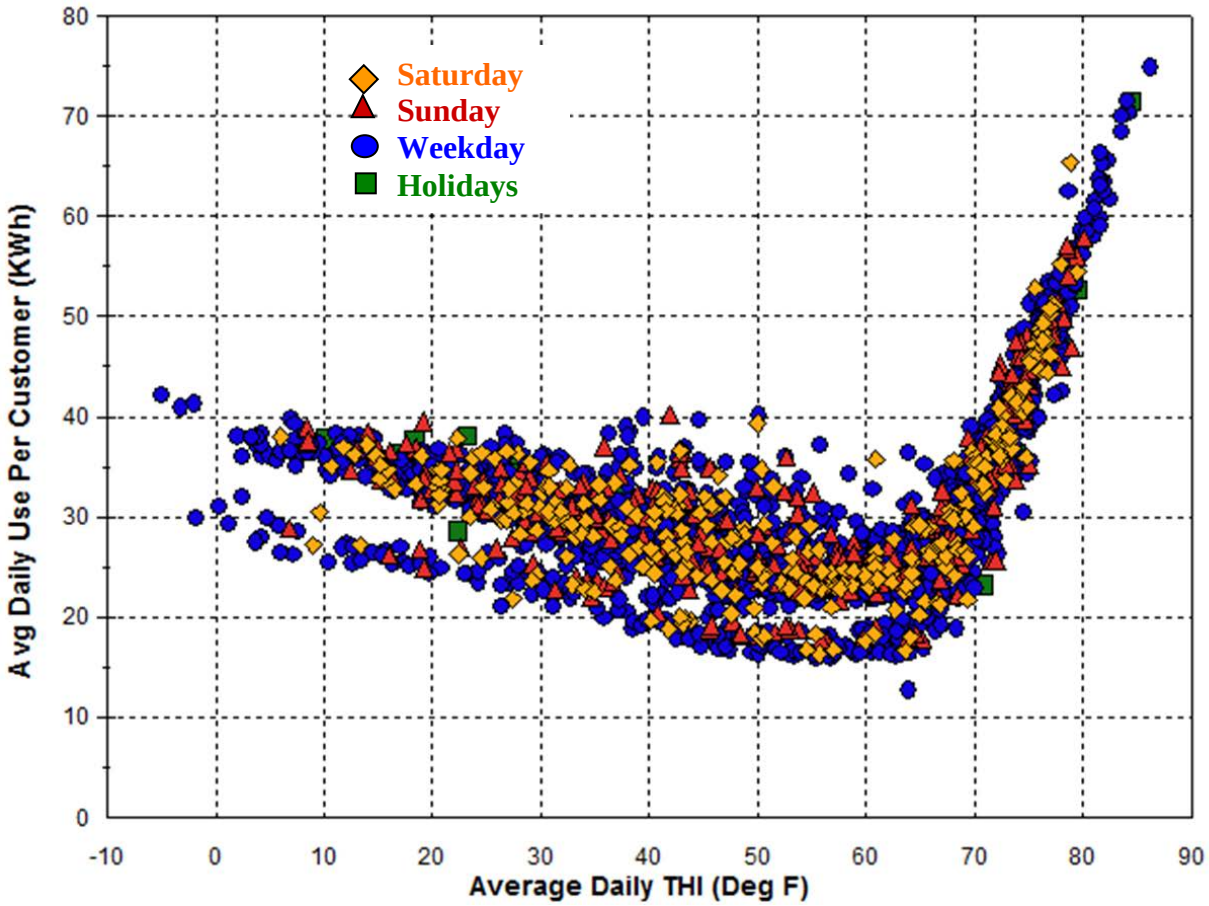
Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2013	1	943,571	916,084	2,681	2,337
2013	2	753,004	720,604	2,353	2,047
2013	3	599,741	615,632	1,785	1,509
2013	4	523,850	448,353	1,488	1,218
2013	5	551,607	472,493	1,567	1,205
2013	6	578,212	555,510	1,807	1,389
2013	7	805,122	685,377	2,287	1,748
2013	8	724,982	593,446	2,060	1,514
2013	9	560,892	537,350	1,753	1,343
2013	10	508,292	413,464	1,381	1,100
2013	11	507,512	536,429	1,586	1,341
2013	12	624,397	643,880	1,858	1,578
Totals		**7,681,180**	**7,138,621**		
2014	1	724,337	678,345	2,058	1,730
2014	2	629,051	604,291	1,966	1,717
2014	3	560,163	599,155	1,667	1,469
2014	4	510,941	435,279	1,452	1,183
2014	5	514,560	495,984	1,531	1,216
2014	6	680,608	619,466	2,026	1,613
2014	7	715,233	654,070	2,032	1,669
2014	8	771,912	757,547	2,297	1,857
2014	9	606,409	548,408	1,805	1,428
2014	10	590,876	498,167	1,606	1,325
2014	11	600,314	680,648	1,975	1,636
2014	12	726,551	663,649	2,064	1,693
Totals		**7,630,955**	**7,235,010**		
2015	1	697,308	736,157	2,075	1,804
2015	2	691,014	660,473	2,159	1,876
2015	3	645,594	645,711	1,834	1,647
2015	4	500,511	449,448	1,422	1,221
2015	5	525,147	585,886	1,641	1,382
2015	6	747,146	635,384	2,123	1,727
2015	7	912,820	784,821	2,480	2,087
2015	8	918,485	979,247	2,734	2,400
2015	9	885,920	843,466	2,637	2,197
2015	10	699,855	651,134	1,988	1,661
2015	11	695,097	786,625	2,172	1,967
2015	12	859,105	831,786	2,441	2,122
Totals		**8,778,002**	**8,590,138**		

ComEd analyzed the hourly load profiles for all the major customer groups within the Eligible Retail Customers. As a result of that analysis, ComEd developed hourly load models for those major customer groups that determined the average percentage of monthly usage that each customer group used in each hour of that month. Those hourly models were then used to develop the monthly on-peak and off-peak usage percentages for the planning periods. These percentages were applied to ComEd's forecasted monthly usage to obtain the forecasted procurement quantities. In the following section, the hourly analysis of the residential single-family non-space heating customer segment is described. This class represents approximately half of the annual usage of the Eligible Retail Customer segment and provides a good example of how the hourly load profile data were analyzed and modeled.

(i) Residential Single-Family Hourly Load Profile Analysis

One of the most significant, and easily understood, determinants of residential energy usage is weather. The "scatter plot" shown below (Chart II-1) demonstrates the significant relationship that exists between weather and usage for the single-family non-space heating residential customer segment.

Chart II-1
Single Family Non-Space Heating Daily Usage vs. Temperature/Humidity



A scatter plot shows the relationship between two variables. Each point represents a single observation (a day in this case). In this chart, the values shown on the vertical or Y-axis are daily usage per customer ("UPC"). The values shown on the horizontal or X-axis are the daily average temperature-humidity index ("THI"). The graph shows daily UPC based on observations from January 2010 to December 2015 and the average THI on those days. THI, rather than temperature alone, is used because residential usage is sensitive to humidity. Different geometric shapes are used to distinguish points representing weekdays from those depicting Saturday, Sunday or holiday usage.

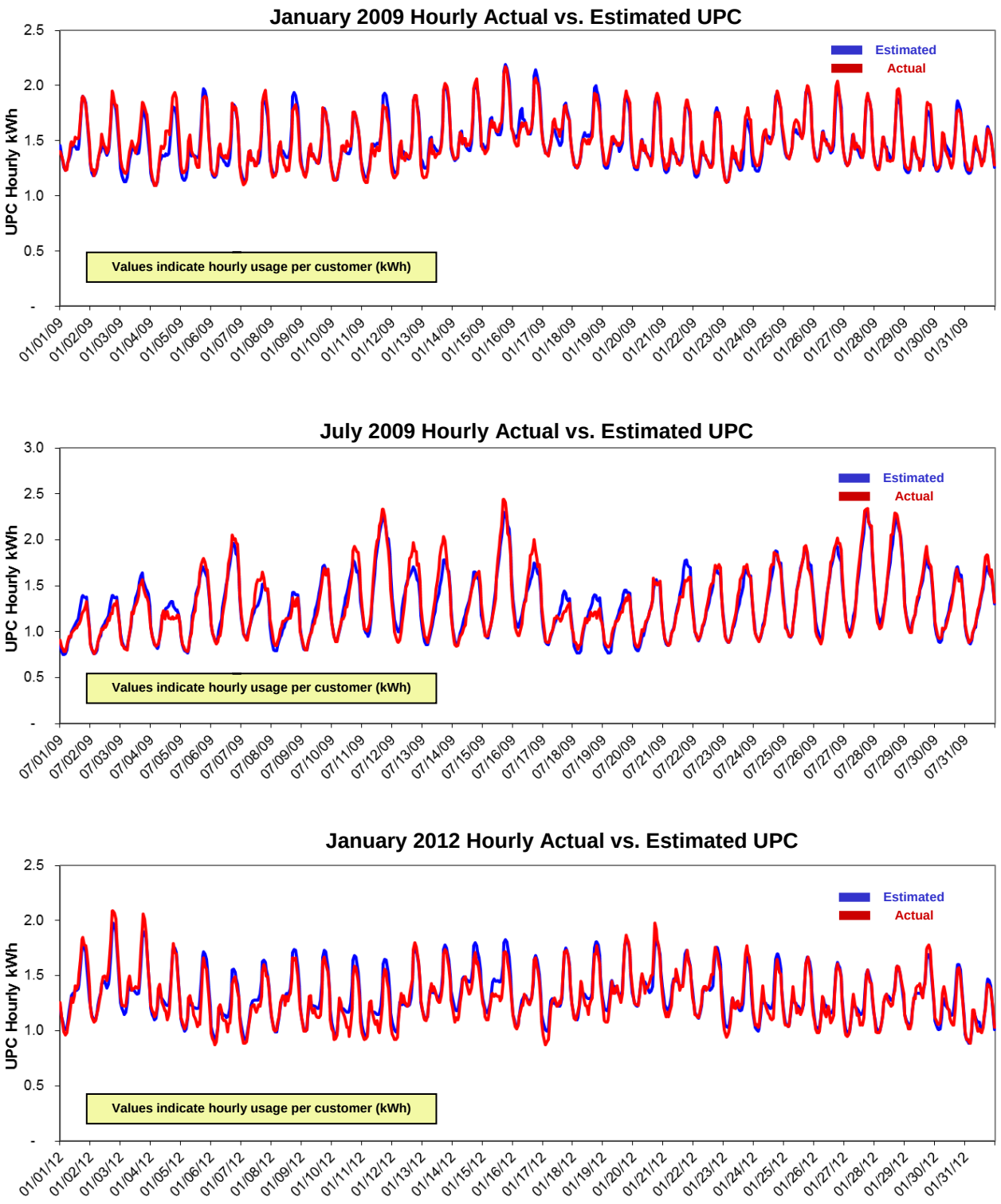
The scatter plot is very useful in understanding the relationship between customer usage and weather. If there were no relationship between usage and weather, then the graph would not display a clear pattern. However, it is apparent that there is a clear pattern. The right side of the graph at the high end of the horizontal axis shows the days on which THI was the highest. The points at that end of the graph indicate that the highest UPC occurred when THI levels were at their peak -- 80 plus degrees. Moving to the left, the points show UPC declining rapidly as the THI decreases until the 60 degree level is reached at which a base usage appears. From that base level, UPC gradually increases as colder temperatures are experienced.

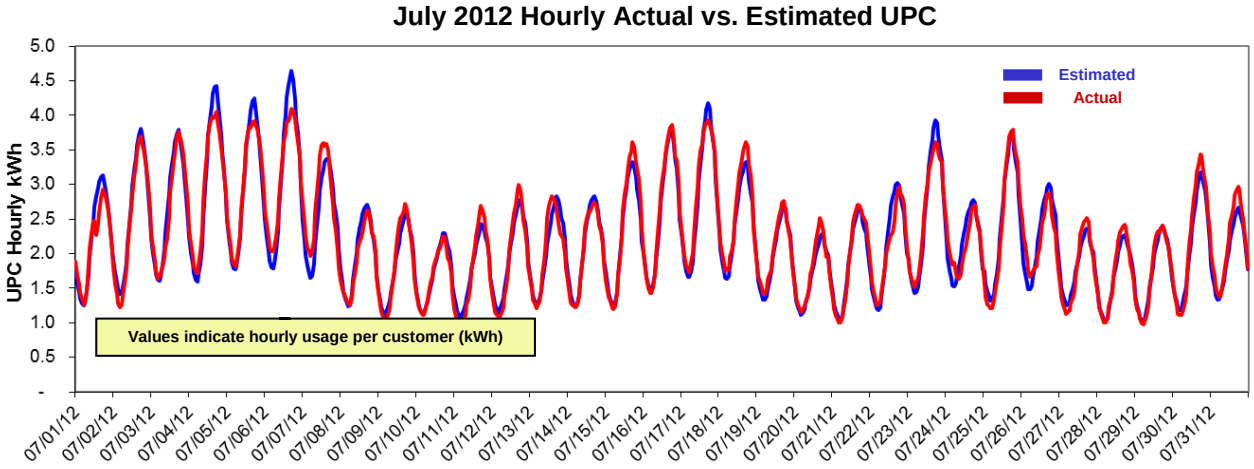
Hourly models were developed to account for the strong weather relationship shown in the graph and to account for numerous other factors that influence residential usage. The models explicitly account for the differing effects of energy use at various temperatures. Variables are included to allow for seasonal usage patterns in water heating, refrigeration and other seasonal uses. Weekend and holiday variables are included to allow for behavioral differences on those days relative to weekdays. Weather variables for prior days are included in the model to account for the dynamic effects of temperature buildup. The full list of variables included in the residential single-family model is shown in Appendix A-1.

One way to visualize the model's performance is to look at plots of actual and estimated[2] values for the historical estimation period. The following charts demonstrate the performance of the model over four time periods at the hourly level for January and July of 2009 and January and July of 2012. These four months were selected as those months reflect well above and below normal monthly weather conditions. This illustrates the models ability to accurately estimate under varying weather conditions. The heating degree days in January 2009 were 1,516 (above the normal heating degree days of 1,279) and January 2012 was 1,071 (below the normal HDD). The cooling degree days in July 2009 were 150 compared to a normal total of 283 and July 2012 was 506.

[2] The estimated data in Chart II-2 is based on the actual weather experienced over the relevant period.

Chart II-2
ComEd Single Family Profile: Estimated vs. Actual





In all of the graphs above in Chart II-2, the red line indicates the "actual" load data and the blue line indicates the model's estimated values, adjusted for actual weather. It is important to understand that the actual load data itself is an estimate based on a statistical sample of single family residential customers, and minor variations do occur in the sample. Despite these variations, the charts demonstrate that the model's estimated usage closely mirrors the actual usage. The close alignment of the estimated and actual lines on the charts demonstrates that the model is very effective in estimating variations in electrical usage patterns that are significantly influenced by weather conditions.

b. Switching Trends and Competitive Retail Market Analysis

In determining the expected load requirements for which standard wholesale products will be procured, it is important to provide the best possible estimate of the number of Eligible Retail Customers that are likely to be served by Retail Electric Suppliers ("RES"). That issue is considered in the following discussion, which reviews retail development in ComEd's service territory, the entry of RES, the rate of customer switching in the past, future trends affecting customer choice and ComEd's 5-year forecast of the percentage of load from various customer segments that will continue to be served with supply procured by ComEd.

(i) Introduction and Brief Overview of Retail Development

Retail choice is very active within ComEd's service territory as demonstrated in several ways:

1. Approximately 1.46 million residential customers in the ComEd service territory were taking RES supply as of April 2016. That is down from the 2.17 million in April 2015. The decline stems from the City of Chicago ending its Municipal Aggregation ("Muni Agg") program in August through September of 2015. However, the number of residential RES customers was 1.48 million in January 2013 just prior to the City of Chicago starting its Muni Agg program. The point is that over the past

several years there have been a very large number of residential customers engaged in customer choice that might not be apparent when one focuses on the more recent movements of various communities. This level of engagement over the past several years speaks to the good health of customer choice in the ComEd service territory.

2. Muni Agg has been a major factor in the expansion of residential RES supply over time. In total there are approximately 358 governmental entities (i.e., municipalities, townships or counties, hereinafter jointly referred to as "Communities") within the ComEd service territory that had approved a Muni Agg referendum as of April 2016. Approximately 281 of those Communities (or 78% of the total) were being served under a Muni Agg contract as of April 2016. The large number of on-going Muni Agg Communities highlights the viability of customer choice in the service territory.

3. As noted below, there are a very large number of residential retailers in the ComEd service territory.

4. Smaller sized non-residential customers are actively participating in customer choice. For the record, approximately 92% of ComEd's entire non-residential usage is supplied through either RES or Hourly service as of May 2016. Even more meaningful is the substantial participation by the smaller sized non-residential customers. Approximately 63% of the non-residential watt-hour only delivery class was taking RES supply as of May 2016. Approximately 60% of the 0 to 100 kW non-residential delivery class was taking RES in May 2016. These meaningful percentages illustrate that customer choice is very active among small non-residential customers within the ComEd service territory.

In summary, customers are actively engaged in retail choice within the ComEd service territory.

(ii) RES Development

There continues to be growth in the number of RESs within the ComEd service territory. This growth is shown in the table below:

Table II-3
RES Development in the ComEd Service Territory

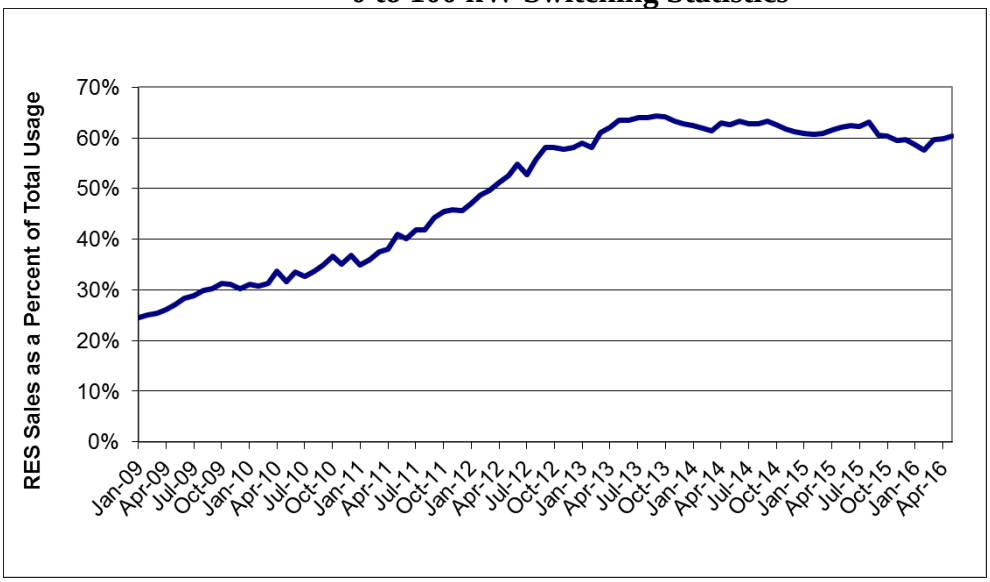
RES Category	May 2011	May 2012	May 2013	May 2014	May 2015	May 2016
Number of Active RESs[3]	31	48	66	70	71	74
Number of RESs approved to serve Residential customers	16	32	49	55	56	63
Number of entities in the RES certification process as of May 2016	N.A.	N.A.	N.A.	N.A.	N.A.	0

From May 2011 to May 2016 there has been an approximately 140% increase in the number of active RES in the ComEd service territory. The increase in RES approved to serve residential customers is even greater. The number of RES approved to serve residential customers has increased by 300% since 2011. This growth in the number of RES highlights the active retail market in ComEd's service territory.

(iii) Future Trends

The future trends reflect an active retail market for several reasons. First, RES supply to customers in the 0 to 100 kW class continues to be very significant. Chart II-3 contains the monthly percentage of usage by RES customers from January 2009 through May 2016. RES usage was approximately 30% in May 2010 and essentially doubled to approximately 60% by early 2013. The percentage of RES usage within this group has been relatively steady since early 2013 at approximately 60%.

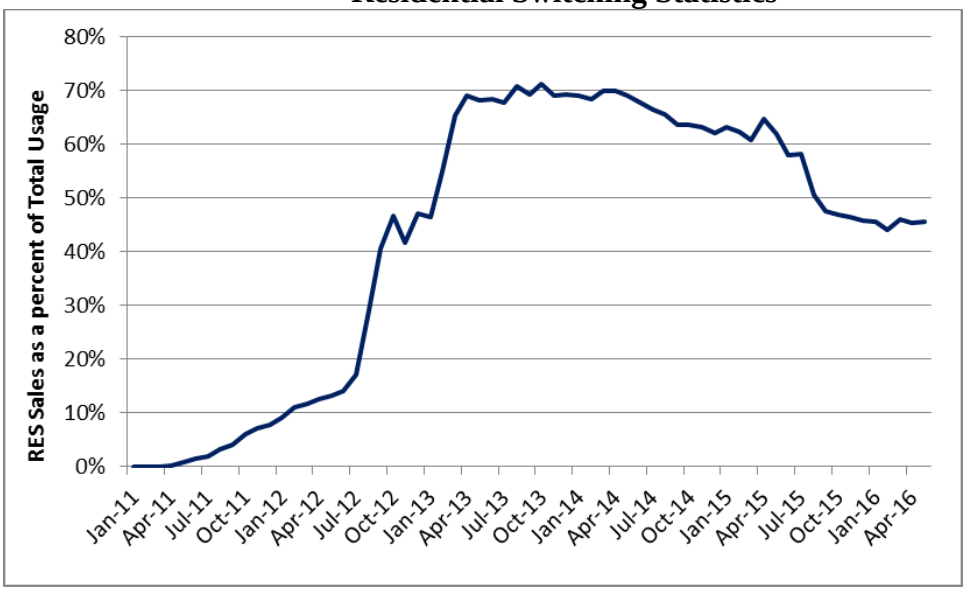
Chart II-3
0 to 100 kW Switching Statistics



[3] An "Active RES" is defined as an ICC-approved RES that has passed ComEd's certification process.

Second, the retail market for residential customers has found wide-spread acceptance over the past few years. Chart II-4 contains the monthly percentage of usage by RES customers from January 2011 to May 2016. In just over four years, residential RES usage went from essentially zero usage in May 2011 to approximately 70% of total residential usage by late 2013 and then declined to currently around 45%. The decline results from various Muni Agg Communities suspending their programs. However, for the purposes of judging the acceptance and engagement in retail choice by residential customers, Chart II-4 highlights that customers have been very active in the retail markets.

Chart II-4
Residential Switching Statistics



Third, as previously noted, Muni Agg is very active within the ComEd service territory with approximately 358 Communities passing a Muni Agg referendum. Muni Agg by its very nature requires engagement not only by public officials within each community, but also by the citizens of the community that approve the Muni Agg referendums. This large number of Communities is another indicator of an engaged customer base that is active in retail choice.

For these reasons, we expect retail markets to continue to reflect a significant level of engagement during the Forecast period.

(iv) Forecasted Retail Usage

The forecast percentages of Blended Service usage are shown below, along with some historical perspective.

Table II-4
Percentage of Blended Service Usage

Month	Residential	Watthour	0-100 kW
Jul-05	100.0%	99.4%	87.3%
Jul-06	100.0%	99.6%	90.7%
Jul-07	100.0%	97.4%	76.5%
Jun-08	99.9%	98.0%	75.2%
May-09	99.8%	98.0%	72.1%
Jun-10	99.9%	95.0%	65.8%
Jun-11	98.3%	92.3%	57.3%
Jun-12	85.6%	76.3%	43.8%
Jun-13	31.0%	25.2%	34.4%
Jun-14	31.5%	24.0%	34.3%
Jun-15	40.4%	26.4%	34.8%
May-16	53.9%	37.0%	36.9%
Jun-17	63.8%	46.3%	37.8%
Jun-18	63.8%	46.3%	38.0%
Jun-19	63.8%	46.3%	38.0%
Jun-20	63.8%	46.3%	38.0%

The main drivers of this forecast are:

1. Residential Blended supply is expected to increase from the approximately 53.9% as of May 2016 to approximately 57.0% by the end of 2016. The increase reflects the actual decisions from numerous Muni Agg contract renewals in the first several months of 2016 and an estimate for the remaining Muni Agg communities with contract expirations in 2016. Muni Agg continues to be a popular choice as the majority of Muni Agg Communities are renewing their contracts (be it with the incumbent supplier or a new supplier). For example, only 4 of the 39 Muni Agg communities that have made a decision as of mid-June 2016 suspended their program and opted for ComEd supply. See the spreadsheet entitled "2016 Muni Agg Tracking.xlsx" for additional details. The four communities that have opted for ComEd supply during 2016 are larger communities relative to the 39 communities that have made a decision. As a result, based on usage (kWh) approximately 44% of the Muni Agg communities have opted for ComEd supply in the first several months of 2016. Using 2015 Muni Agg renewal results are helpful in estimating future Muni Agg activity to avoid four particular data points skewing the

percentages. In 2015 there were 88 Muni Agg communities that underwent a renewal and 16 suspended their Muni Agg program. In terms of usage, approximately 30% opted for ComEd supply in 2015. See the spreadsheet entitled "2015 Muni Agg Tracking.xlsx" for additional details. It is important to note that the 30% figure excludes the City of Chicago (which opted for ComEd supply in August - September of 2015). Given its sheer size the City of Chicago decision needs to be properly accounted for in understanding the Muni Agg renewal patterns of the remaining approximately 350 Muni Agg Communities. For the 2016 Muni Agg communities that have not made a renewal decision it is assumed that 35% will opt for ComEd supply (based on usage). The 35% reflects the 2015 results, but increased to reflect a higher suspension percentage for 2016 based on year-to-date results. Assuming that 35% of the remaining 2016 Muni Agg Communities with a contract expiring in 2016 opt for ComEd supply essentially produces an approximately 3.1 percentage point increase in Blended usage from May 2016 to the end of 2016. There are four additional items (and related assumptions) that are used in preparing the 2016 forecast. Those items are as follows and noted herein as those same assumptions are used in future years:

a. The City of Chicago is assumed to continue to take ComEd supply during 2016, and for that matter, the remainder of this Forecast period. ComEd has not received any indications from the City of Chicago that would indicate a desire to resume its Muni Agg program.

b. Additional suburban communities (i.e., other than the City of Chicago) are not anticipated to resume their Muni Agg programs during the remainder of 2016. A couple of communities have resumed their Muni Agg programs during 2016 (see details in the 2016 Muni Agg Tracking spreadsheet on the "New Contract" tab). Given the limited resumptions in 2016 year-to-date no additional resumptions are anticipated in 2016. The same assumption is made for 2017 and thereafter.

c. Not all of the customers within a Muni Agg Community opting for ComEd supply will be taking ComEd supply as some customers prefer RES supply. Of the 16 suburban communities that opted for ComEd supply in 2015 approximately 15% of the usage in those communities was RES supply as of May 2016. This assumption is used going forward as it is similar to the past assumption of 10%, but reflective of data pertaining to recent suspensions.

d. ComEd continues to utilize individual Muni Agg Community data in preparing its forecast. This granular level of tracking over 800 Communities enhances the forecast accuracy given the variety of Communities involved in Muni Agg and many of those

Communities have different contract provisions; especially the contract term.

2. Looking to the Planning Year ("Planning Year")[4] 2017 and beyond, the savings opportunity will continue to be an important factor. The Blended Service supply price will likely be slightly higher than market prices for the next few years given the existing contracts within the portfolio. This small amount of headroom is due principally to the above market Long Term renewables and Rate Stability contracts ComEd was required to enter into in 2010 and 2012, respectively. These contracts, in addition to the administrative and general costs related to the IPA and the ComEd call center costs the ICC requires ComEd to allocate to ComEd supplied customers, are anticipated to provide a relatively small amount of savings (or headroom) between Blended Service and RES pricing going forward.

3. The small savings opportunity combined with some Muni Agg Communities suspending their programs in 2015 and 2016 supports the forecast of increases in Blended usage as a portion of total Residential usage. Muni Agg Communities generally have a preference to continue with their programs as demonstrated by 72 out of 88 renewing in 2015 and 34 out of 38 renewing as of mid-June 2016. However, other considerations have caused some Communities not to renew and this pattern of some Muni Agg Communities suspending their programs is expected to continue into 2017 for those with a contract expiring in that year. Given the recent results, it is assumed that 35% (based on usage) of the Muni Agg Communities with contracts expiring in 2017 will suspend their programs. The comparable figures were 30% in 2015 (based on decisions by 87 suburban communities) and approximately 46% in 2016 (based on decisions by 38 suburban communities). An important factor to consider is that almost all of the Muni Agg Communities with contracts expiring in 2017 have renewed their program at least once and many on more than one occasion. Thus, the existing group of active Muni Agg Communities has demonstrated a level of comfort with their programs and are likely to continue their programs as long as they can demonstrate benefits to their citizens. These considerations and actual experience in 2015 and 2016 are the basis for the 35% suspension assumption in 2017. That percentage was applied against the group of Muni Agg communities with a contract expiring in 2017 to essentially result in an approximately 1,900 GWh movement of RES supply to ComEd supply during 2017. The spreadsheet "2017 Muni Agg Tracking.xlsx" provides additional details. For the years 2018 and thereafter a status-quo environment of Muni Agg activity is anticipated. Given the general popularity of Muni Agg and the group of Muni Agg Communities after 2017 having demonstrated a

[4] A Planning Year runs from June 1 through May 31.

repeated interest in their programs, along with an anticipated savings opportunity, the number of Muni Agg Communities is expected to stabilize. Additional Muni Agg referendums are not anticipated as those referendums have been very few in the past couple of years (e.g., only one small township in the past year). In summary, a combination of very granular data (e.g., community level data), the best available information and recent trends are used in preparing the Forecast.

ComEd will continue to monitor and analyze Muni Agg activity (along with other switching activities) and keep the IPA informed of any developments. The best approach in forecasting switching activity, especially in a market that is responding to changing conditions, is to provide regular updates. ComEd will provide a forecast update in March 2017 and July 2017; subject to any meaningful development related to switching activity during the remainder of 2016 that will be communicated to the IPA.

4. Regarding the non-residential customer forecast there are two rather distinct groups. The 0 to 100 kW customer group is not materially impacted by Muni Agg activity and has shown little change in overall switching activity the past couple of years (see Chart II-3). Given no meaningful change in the savings opportunity this group is expected to continue with a steady level of switching activity. The Watt-hour customer group is influenced by Muni Agg activity. The percentage of RES supplied usage for the watt-hour group often follows the same pattern as the residential customer group. Therefore, the Watt-hour Blended Service percentage is expected to increase.

The effects of those drivers by customer group are as follows:

1. The Blended Service portion of the 0 to 100 kW customer class is expected to hold fairly steady in a range of approximately 37% to 38% during the Forecast period.

2. The Blended Service portion of the Watthour customer class is expected to increase from approximately 37% (May 2016) to approximately 47% by December 2017. As previously noted, this class moves in general tandem with the assumptions described above for the residential class resulting from Muni Agg.

3. The Blended Service portion of the Residential customer class is expected to increase from 54% (May 2016) to approximately 64% by December 2017 for the reasons noted above. This increase is driven by the Muni Agg activity previously noted above.

c. Known or Projected Changes to Future Load

Typically when ComEd forecasts future loads it considers whether there are any known major customer decisions that would impact load, such as the relocation of part or all of a business. For the Eligible Retail Customers, other than the factors we have discussed elsewhere, e.g. switching, energy efficiency measures, growth, etc., there is only one known or projected change that ComEd is aware of that is different from past conditions and could affect future loads for this group of customers. This is the residential real-time pricing program ("RRTP").

In compliance with Section 16-107(b-5) of the PUA, ComEd received ICC approval to implement an RRTP program for a four-year period,[5] and, more recently, to continue the program post-2012.[6] Accordingly, ComEd still anticipates expansion of its marketing for RRTP. The expectation is for RRTP customers to grow from approximately 10,800 in mid-2016 to approximately 32,500 by the end of the year 2021. This forecasted increase is reasonable given the program administrator's marketing plan. The expected 32,500 RRTP customers are a very small percent of the existing 3.6 million residential customers.

d. Growth Forecast by Customer Class

(i) Introduction

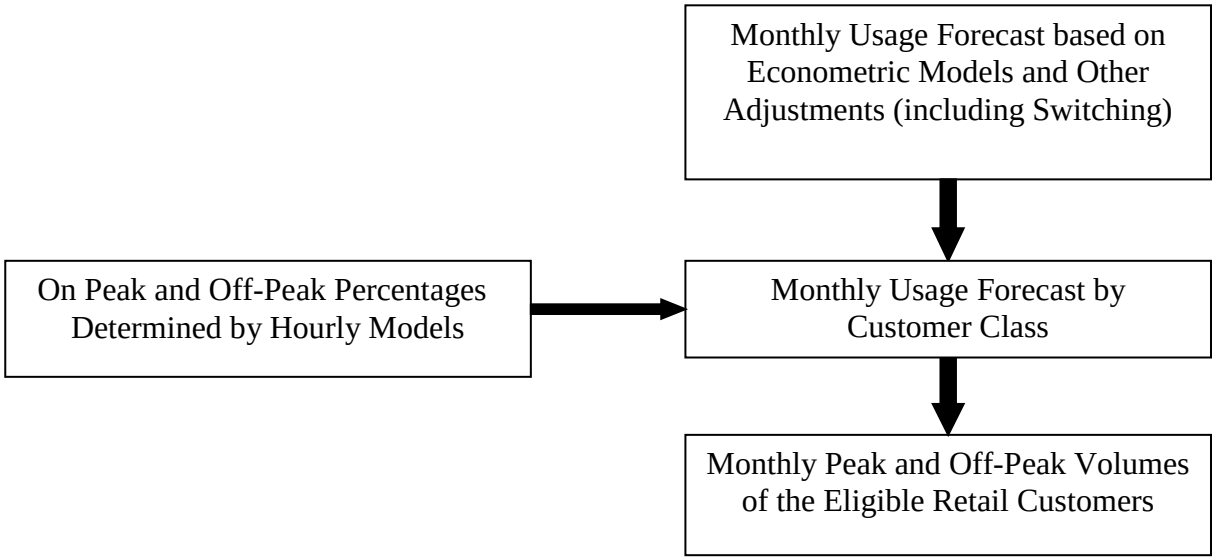
This section describes ComEd's growth forecast by customer class for the 5-year procurement planning period beginning on June 1, 2017. Section II(B)(1) discussed the hourly customer load profiles used by ComEd to develop models to present the historical load analysis required by the PUA and to predict UPC, or usage per customer. As indicated in this section, in arriving at a growth forecast by customer class, there are additional models beyond those customer-level hourly models that are used to forecast future customer class usage. These other models play an important role in determining expected load during the 5-year planning period among the Eligible Retail Customer groups.

[5] See ICC Order of December 20, 2006, in Docket No. 06-0617.

[6] See ICC Order of May 29, 2012 in Docket No. 11-0546. The RRTP program is again up for review in the Fall of 2015. While ComEd anticipates that the program will continue in a similar fashion as it currently operates, it is possible that certain changes to the program will come from this review that could impact the forecasted customer growth for the program. ComEd will address any such changes in the updated forecast it will present in March 2017.

The following chart illustrates the steps in the ComEd load forecasting process.

Chart II-5
ComEd Energy Usage Forecast Process

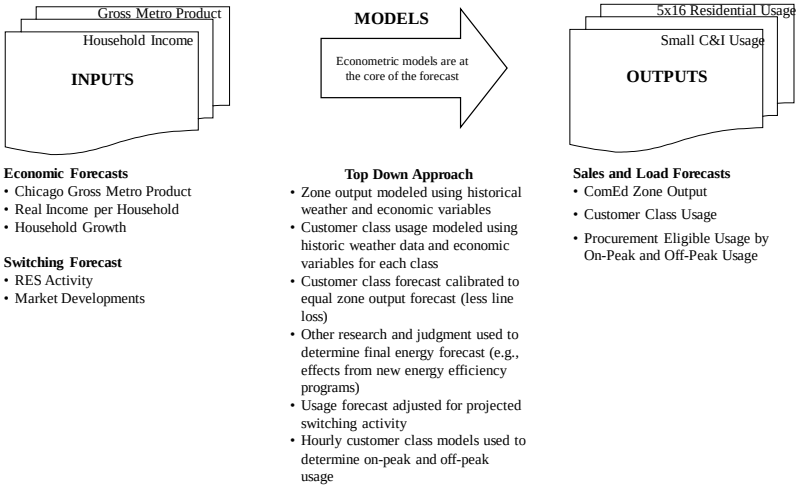


The forecasting process is model based subject to adjustments and judgment. A suite of econometric models is used to produce monthly usage forecasts for ComEd's revenue customer classes. The two major customer classes applicable to this Forecast are Residential and Small C&I. That monthly forecast is adjusted for other considerations (e.g., switching activity) and allocated to more granular delivery service classes (e.g., the residential customer class is composed of four delivery services classes). The forecast usage is combined with the input from the hourly models to obtain on-peak and off-peak quantities for each month and delivery service class.

The econometric modeling portion of the process is described in the following chart:

Chart
II-6

Econometric Modeling Process



As the chart indicates, ComEd's forecasts of usage for its service territory are based on a "top-down" approach. The top-down approach provides a forecast of total usage for the entire service territory and allocates the usage to various customer classes using the models specific to each class. The allocation is achieved by reducing the forecasted zone usage by the inherent difference between zone and customer class usage (in particular, line loss) and then calibrating the forecasted customer class usage to equal that system-wide at the meter usage. The econometric models are based on monthly data and have very robust characteristics. Subsequent sections describe the significant relationship between energy usage and other independent variables. For example, the zone model contains sophisticated variables to reflect the effects of temperature and humidity, as well as seasonal usage patterns and other factors. The zone model includes an energy efficiency variable to capture the relationship of ComEd's energy efficiency efforts in reducing usage. Economic variables are also included. Again, by way of example, the gross metropolitan product ("GMP") for the Chicago and other metropolitan areas within ComEd's service territory is a useful measure of economic activity of the service territory. As GMP (which is expressed in billions of dollars) increases, use of electric energy rises as well. There are other economic variables used in the econometric models and those are described below. The economic assumptions (i.e., economic outlook) related to the economic variables are shown in Table II-6.

Table II-6

Chicago Area Economic Forecasts - Global Insight (May 2016)

Economic Variables	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross Metro Product (Billions)	$ 520	$ 532	$ 526	$ 537	$ 550	$ 555	$ 566	$ 578	$ 588	$ 599
Real Disposable Income (Millions)	$360,131	$371,618	$363,590	$368,361	$381,879	$393,394	$403,690	$415,333	$ 424,678	$434,118
# of Households (Thousands)	3,313	3,338	3,354	3,354	3,362	3,372	3,383	3,400	3,421	3,447
Real Income/HH	$108,707	$111,329	$108,405	$109,814	$113,597	$116,655	$119,326	$122,160	$ 124,147	$125,925
Total Employment (Thousands)	4,167	4,237	4,304	4,372	4,447	4,511	4,564	4,596	4,622	4,657
Non-Manufacturing	3,765	3,831	3,899	3,967	4,039	4,105	4,158	4,189	4,210	4,240
Manufacturing	403	406	405	405	408	405	406	407	411	417
Housing Starts	6,055	7,902	10,159	13,774	11,826	12,984	17,483	20,599	22,495	25,515
U.S. GDP	15,021	15,355	15,583	15,962	16,349	16,622	17,077	17,523	17,922	18,339

Growth Rate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross Metro Product	1.3%	2.3%	(1.0%)	2.0%	2.4%	0.9%	2.1%	2.0%	1.8%	1.8%
Real Disposable Income	0.6%	3.2%	(2.2%)	1.3%	3.7%	3.0%	2.6%	2.9%	2.3%	2.2%
# of Households	(0.1%)	0.8%	0.5%	0.0%	0.2%	0.3%	0.3%	0.5%	0.6%	0.8%
Real Income/HH	0.7%	2.4%	(2.6%)	1.3%	3.4%	2.7%	2.3%	2.4%	1.6%	1.4%
Total Employment	1.4%	1.7%	1.6%	1.6%	1.7%	1.4%	1.2%	0.7%	0.6%	0.8%
Non-Manufacturing	1.3%	1.8%	1.8%	1.7%	1.8%	1.6%	1.3%	0.7%	0.5%	0.7%
Manufacturing	2.0%	1.0%	(0.4%)	(0.0%)	0.9%	(0.7%)	0.2%	0.2%	1.1%	1.4%
Housing Starts	11.5%	30.5%	28.6%	35.6%	(14.1%)	9.8%	34.7%	17.8%	9.2%	13.4%
U.S. GDP	1.6%	2.2%	1.5%	2.4%	2.4%	1.7%	2.7%	2.6%	2.3%	2.3%

Source: Global Insight

All of the variables used in each of the models in the forecasting process are identified in Appendix A-4.[7]

The remainder of this section will provide a brief description of the models, starting with the ComEd's Monthly Zone energy usage model ("Monthly Zone Model") and proceeding to the three customer-level models for Monthly Residential bill-cycle energy usage ("Monthly Residential Model"), Monthly Small C&I bill-cycle energy usage ("Monthly Small C&I Model") and Monthly Street Lighting bill-cycle energy usage (Monthly Street Lighting Model").

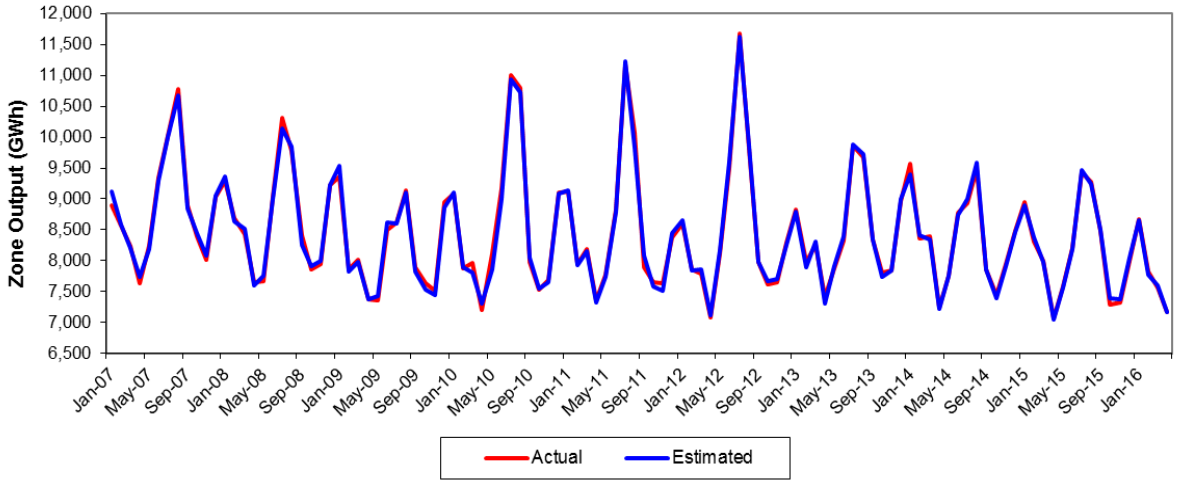
(ii) ComEd Monthly Zone Model

The Monthly Zone Model forecasts energy usage in gigawatt hours (GWh) for the entire ComEd service territory. The following chart shows the performance of the ComEd Monthly Zone Model by comparing actual zone output to the estimates[8] from that model for each calendar month from January 2006 through April 2016.

[7] Technical information about the model coefficients and regression statistics are included in Appendix A-2 and A-3.

[8] Once again, for purposes of this Forecast, the estimates used in Charts II-7, II-8 and II-9 are based on actual weather.

Chart II-7
ComEd Monthly Zone Model: Estimated vs. Actual

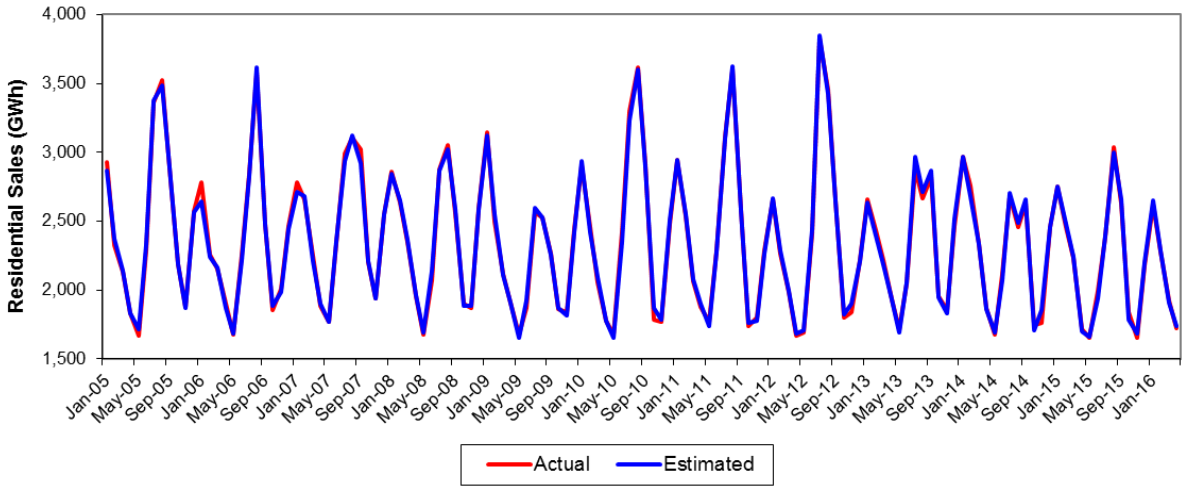


The graph line depicting the Monthly Zone Model's estimated usage (based on actual weather) and the line showing actual usage for the period are nearly identical.

(iii) ComEd Monthly Residential Model

The Monthly Residential Model forecasts monthly residential bill-cycle usage expressed in kWh per customer per day. The Monthly Residential Model is also very useful in understanding energy usage for this customer segment. The following chart compares the monthly energy usage for residential customers estimated by the Monthly Residential Model to the actual residential usage for the time period of January 2005 to April 2016. The graph line depicting the model's estimated usage and the line with actual usage for the period are highly correlated.

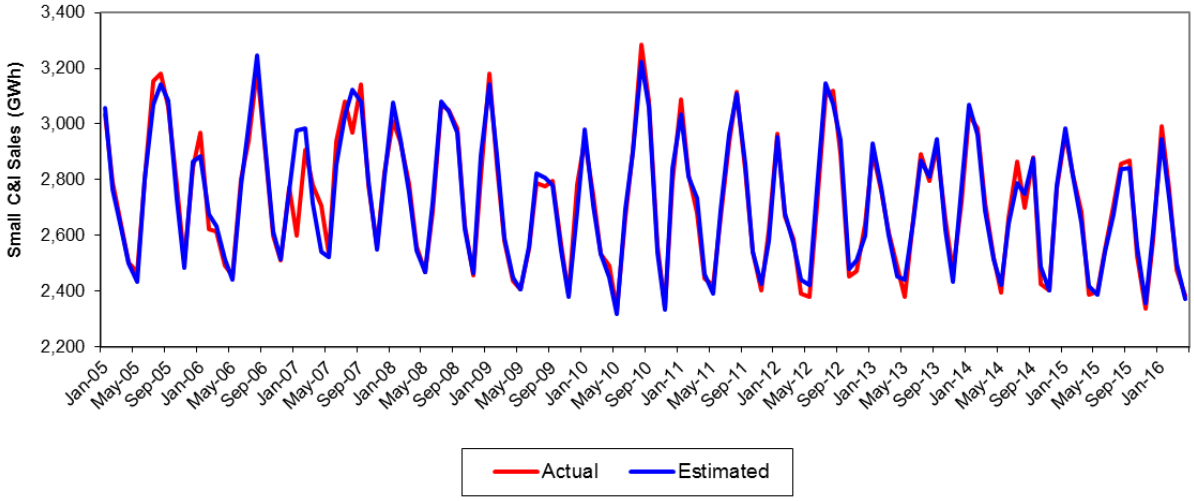
Chart II-8
ComEd Monthly Residential Model: Estimated vs. Actual



(iv) ComEd Monthly Small C&I Model

The Monthly Small C&I Model forecasts monthly Small C&I bill-cycle usage. Chart II-9 shows an estimated versus actual comparison demonstrating the model's effectiveness.

Chart II-9
ComEd Monthly Small C&I Model: Estimated vs. Actual



(v) ComEd Monthly Street Light Model

The Monthly Street Lighting Model forecasts monthly bill-cycle usage related to street lighting. This final model estimates use per day in GWh.

(vi) Growth Forecast

ComEd's historical and forecasted weather-adjusted energy usage for the Residential and Small C&I customer classes are shown in Table II-7.

Table II-7

ComEd Weather Adjusted Annual Energy Usage				
	Residential		Small C&I	
Year	Usage (GWh)	Percent Growth	Usage (GWh)	Percent Growth
2006	28,516		32,958	
2007	28,459	(0.2%)	33,508	1.7%
2008	28,599	0.5%	33,391	(0.3%)
2009	28,202	(1.4%)	32,644	(2.2%)
2010	27,865	(1.2%)	32,445	(0.6%)
2011	27,514	(1.3%)	32,182	(0.8%)
2012	27,360	(0.6%)	32,264	0.3%
2013	27,345	(0.1%)	32,115	(0.5%)
2014	27,447	0.3%	32,046	(0.3%)
2015	27,038	(1.5%)	31,771	(0.9%)
2016	26,719	(1.2%)	31,623	(0.5%)
2017	26,812	0.3%	31,437	(0.6%)
2018	27,031	0.8%	31,329	(0.3%)
2019	27,151	0.4%	31,140	(0.6%)
2020	27,323	0.6%	31,062	(0.3%)
2021	27,180	(0.5%)	30,874	(0.6%)
2022	27,321	0.5%	30,904	0.1%

Residential customer class usage declined by a total of 5.5% from 2008 to 2015 or an average of 0.8% per year. This decline is attributed to a combination of the 2009 recession with a slow recovery (average of 1.4% annual real GMP growth from 2011 to 2015) and growing energy efficiency programs. The year 2009 was the first time since 1954 (which is the extent of our records) that ComEd experienced a decline in the average number of residential customers from the prior year. The implementation of ComEd-related energy efficiency programs beginning in 2008 has reduced residential usage over time. Likewise, changes to national lighting standards in recent years have contributed to a decline in usage. Looking to the future, economic conditions are expected to improve and signs are found in recent data. Single-family home prices increased approximately 26% from April 2012 (the low for home prices since the

recession) to March 2016 (per the Chicago-area Case-Shiller index) and have increase 1.7% in the past year (March 2016 vs. March 2015). Yet, the local housing market has not completely recovered from the severe recession. "More homeowners in the Chicago area are trapped in underwater mortgages than in almost any other major metropolitan area in the country, according to two new studies released this week." (Chicago Tribune dated 6/10/16). Overall, moderate economic growth is expected in the future, which are expected to be offset by energy efficiency efforts to produce an essentially flat load growth. The Residential average annual growth is forecasted to decline by 0.1% from 2015 to 2021. Residential usage does not exceed the usage levels of 2008 in the Forecast period.

Small C&I usage declined by a total of 4.9% from 2008 to 2015 or an average of 0.7% per year. Small C&I is ComEd's revenue class related to commercial and industrial customers below 1,000 kW in size. As in the case of Residential, the Small C&I has been affected by the recession and energy efficiency programs. The forecasted usage from 2015 to 2021 is expected to decline 0.3% per year from growing energy efficiency programs. Small C&I usage also does not exceed pre-recession levels during the Forecast period.

2. Impact of Demand Side and Energy Efficiency Initiatives

The PUA sets out annual targets for the implementation of cost-effective demand side and energy efficiency measures. The most recent, ICC-approved energy efficiency and demand response plan covered the Planning Years 2014-2016 ("2014-2016 EE/DR Plan").[9] This Order approved energy savings goals that are below the statutory percentage targets due to rate impact limitations.

The demand-side and energy efficiency plan for Planning Years 2017-2019 is being developed by ComEd for submittal to the ICC on September 1, 2016. Approval of this plan is expected on or before February 1, 2017. While Planning Year targets have not been finalized for Planning Years 2017-2020, it is expected that spending screen limits will affect the total amounts of energy efficiency that can be achieved in a manner similar to how the screens limited the amount for Planning Years 2014-16.

a. Impact of demand response programs, current and projected

(i) Background

ComEd is a strong supporter of the use of demand response to actively manage peak demands. Use of demand response resources grew in the mid to late 1990s, and ComEd has maintained a large portfolio of demand response resources, with participation from residential, commercial, and industrial customers. ComEd is a leader in the development and management of demand response resources, and will increase participation in appropriate programs to meet the requirements of the PUA.

[9] See Order of January 28, 2014 in Docket No. 13-0495.

The 2016-2017 (i.e., 6/1/16 to 5/31/17) portfolio of ComEd programs includes the following:

- **Direct Load Control ("DLC"):** ComEd's residential central air conditioning cycling program is a DLC program with 73,000 customers with a load reduction potential of 87 MW (ComEd Rider AC).

- **Voluntary Load Reduction ("VLR") Program:** VLR is an energy-based demand response program, providing compensation based on the value of energy as determined by the real-time hourly market run by PJM. This program also provides for transmission and distribution ("T&D") compensation based on the local conditions of the T&D network. This portion of the portfolio has 1,163 MW of potential load reduction (ComEd Rider VLR).

- **Residential Real-Time Pricing (RRTP) Program:** All of ComEd's residential customers have an option to elect an hourly, wholesale market-based rate. The program uses ComEd's Rate BESH to determine the monthly electricity bills for each RRTP participant. This program has roughly 5 MW of price response potential.

- **Peak Time Savings (PTS) Program:** This program is required by Section 16-108.6(g) of the PUA and was approved by the ICC in Docket No. 12-0484. The PTS program is an opt-in, market-based demand response program for customers with smart meters. Under the program, customers receive bill credits for kWh usage reduction during curtailment periods. The program commenced with the 2015 Planning Year with over 56,000 customers enrolled. Peak Time Savings has since tripled in size with over 158,000 customers enrolled for participation during the 2016 summer season, offering 20 MW of capacity in the wholesale market. ComEd sold 48 MW of capacity from the program into the PJM capacity auction for the 2017 Planning Year increasing to 85 MW in the 2019 Planning Year.

(ii) Legislative Requirement

Section 8-103(c) of the PUA establishes a goal to implement demand response measures, providing that:

> (c) Electric utilities shall implement cost-effective demand response measures to reduce peak demand by 0.1% over the prior year for eligible retail customers, as defined in Section 16-111.5 of this Act, and for customers that elect hourly service from the utility pursuant to Section 16-107 of this Act, provided those customers have not been declared competitive. This requirement commences June 1, 2008 and continues for 10 years.

Section 1-10 of the Illinois Power Agency Act defines demand response as "measures that decrease peak demand or shifts demand from peak to off-peak periods."

Table II-8 shows the estimated annual MWs of demand response measures that will need to be implemented over the Five-year Forecast period to meet the goals set forth in the PUA for the one year that remains for this requirement:

Table II-8
Estimated Annual Level of Demand Response Measures[10]

Planning Year	Peak Load at Meter (Prior Year) (MW)	Annual Goal (0.1%) (MW)	Cumulative Goal (MW)
2017	6,386	6.4	80.0

(iii) Impact of Demand Response Programs

Demand response programs do not impact ComEd's load forecasts. Load forecasts are made on a weather normalized, unrestricted basis. Since demand response measures are called on days when the temperature is hotter than "normal", the avoided capacity and energy associated with these resources is incremental to the weather normal forecast, and thus is not factored into the load forecasts. In fact, when developing forecasts, any impact on energy usage from actually implementing a demand response measure in a prior year is added back into that prior year's usage data and then weather normalized before being used to assist in the forecasting process. This assures that the forecast represents a complete picture of the unrestricted demands on the system.

b. Impact of Energy Efficiency Programs

The PUA has a number of provisions regarding various types of energy efficiency programs. This section discusses the impact of each on these programs on the Forecast.

(i) Section 8-103 Energy Efficiency Measures

Section 8-103 of the PUA requires ComEd to implement cost-effective energy efficiency measures beginning June 1, 2008. This provision provides annual kWh targets based on a projection of the upcoming years' energy usage for all delivery service customers. Additionally, there is a spending cap that limits the amount of expenditures on energy efficiency measures in any year.

(A) kWh Targets

The kWh target for energy efficiency is based on a projection of the amount of energy to be delivered by ComEd to all of its delivery service customers in the upcoming

[10] Per Section 8-103(c) the demand response goal expires at the end of the 2017 Planning Year (10 year requirement).

Planning Year. This percentage increases annually through the year 2015, subject to specified rate impact criteria. The table below shows the target percentages.

Table II-9
Target Incremental Percentages to Meet Energy Efficiency Goals

Year	Annual Percent Reduction in Energy Delivered
2008	0.2%
2009	0.4%
2010	0.6%
2011	0.8%
2012	1.0%
2013	1.4%
2014	1.8%
2015 and each year thereafter	2.0%

(B) Projected Overall Goals

The annual energy efficiency goals were determined based on the kWh targets and the rate impact criteria. As noted above, ComEd's 2014-2016 EE/DR Plan was approved in early 2014. The ICC approved annual goals of 1.2% due to the impacts of the spending screen limitations in the PUA.[11] Also, for purposes of this Forecast only,[12] the allocation of the energy (kWh) targets to the various customer classes (as shown in Table II-7) was based on several years of historical data and judgment.

The above percentages represent the incremental goal to be achieved by the end of each Planning Year for all delivery services customers. Since the various energy efficiency measures will be implemented and phased in over the course of each Planning Year and since Eligible Retail Customers are only a subset of delivery services customers, the actual amount of GWh for Eligible Retail Customers that is impacted in each Planning Year will be somewhat less (as shown in Table II-10, below).

[11] The approved goals are 1.17% for 2014, 1.24% for 2015 and 1.26% for 2016.

[12] The PUA does not prescribe how the kWh targets are to be apportioned among the customer classes, and the energy efficiency plan did not set goals on a customer class basis.

(C) Impact on Forecasts

Energy efficiency measures directly impact the amount of energy used by customers throughout the year. As such, they will directly impact the forecasts of future load. The following chart depicts the cumulative impacts of these measures on the Forecast:

Table II-10
Cumulative Impacts of EE on Load Forecast by Customer Type[13]

Planning Year	Residential Allocation (GWh)	Watt-Hour Allocation (GWh)	0-100 kW Allocation (GWh)
2017	2,023	26	470
2018	2,101	30	543
2019	2,228	34	612
2020	2,308	37	677
2021	2,395	41	743

(ii) Energy Efficiency Building Codes and Appliance Standards

Section 16-111.5B(a)(1) of the PUA requires procurement plans to include a discussion of the impact of energy efficiency building codes and appliance standards on the Forecast. This section describes generally how building codes and appliance standards are considered in and impact the Forecast.

The load forecasting models and process described herein takes into account all current and projected building codes and appliance standards. This is accomplished by making energy efficiency adjustments to the forecast beyond what is entailed in the mandated energy efficiency adjustments described herein. Also, the econometric models use actual historical usage data and that data, in turn, reflects the changes to these standards over time.

(iii) Section 16-111.5B Energy Efficiency Procurement

Section 16-111.5B of the PUA requires procurement plans to include an assessment of opportunities to expand the section 8-103 energy efficiency measures or to implement additional cost-effective energy efficiency measures. This assessment is to include a wide range of information for consideration by the IPA and the ICC. This section provides that information. A short summary of the selection process follows.

During development of its upcoming three-year Section 8-103 EE/DR plan, ComEd reviewed all of its programs and determined that five of those programs are more appropriately suited for submission to the IPA under section 16-111.5B:

[13] These amounts are cumulative from 2008, when the statutory program began.

- Home Energy Reports
- Residential Lighting
- Upstream Pumping
- Small Business Energy Services
- LED Streetlighting – Non-competitive customers

The decision to submit these programs to the IPA is intended to align with the Commissions prior determination from the last plan filing, as well as to satisfy various stakeholder recommendations that ComEd initiate an upstream program via the IPA.

In addition, for this year's analysis, ComEd solicited proposals from third party vendors to provide additional energy efficiency programs. Twenty-seven proposals were received and reviewed by ComEd and stakeholders. One proposal was subsequently withdrawn by the vendor and two proposals were found to duplicate programs that are already being included in ComEd's 8-103 plan. Concurrent with this threshold screening, the twenty-six proposals under review were analyzed in accordance with the requirements of Section 16-111.5B(a)(3)(C, D), which requires ComEd to:

- Identify new or expanded cost-effective measures or programs
- Show that the new or expanded measures or programs would lead to a reduction in the overall cost of electric service.

The first criteria is evaluated by performing a Total Resource Cost (TRC) test on each program. Consistent with last year's process, ComEd's TRC analysis incorporates certain costs in addition to those in the vendors' proposal, for administration and evaluation of programs. For the administrative adder, ComEd tracked actual costs over the past two years and determined that administrative costs would add 6.6% to the typical third party program costs. In addition, stakeholders agreed that programs approved and run pursuant to 16-111.5B would incur an evaluation budget equal to 3% of approved program budgets. In total, ComEd increased each bidder's budget by 9.6% to accommodate estimated administrative and evaluation costs.

ComEd conducts its TRC and other cost-effectiveness analyses using DSMore, which it licenses from Integral Analytics. At the request of the IPA, ComEd is including Appendix C-5, which provides a description of the avoided cost inputs into the DSMore software tool.

ComEd is providing TRC results with and without these adders, so that the impacts of these adders can be reviewed by IPA and stakeholders.

Twenty-one of the remaining proposals satisfied the TRC test threshold with a result greater than 1.0, not including administrative or evaluation adders. Of these twenty-one proposals, only one became non-cost effective when including the adders.

The second criterion is evaluated by conducting a Utility Cost Test (which compares the total avoided costs of electric service to the program administrator's total cost to

deliver the program). Three proposals that satisfied the TRC criterion failed to meet this criterion, with a Utility Cost Test result less than 1.0. All of the test results are provided in Appendix C-2.

Program-level details for each program that ComEd is submitting to the IPA in compliance with Section 16-111.5B of the PUA is provided in Appendix C-3. Note that all cost-effective metrics within Appendix C-3 do not include the aforementioned administrative and evaluation adders.

The total three year program-level budget estimate for the ComEd programs and all third-party program proposals is $487,105,157. This estimate does not include certain overarching costs related to vendor administration, evaluation, reporting and tracking. All of these costs will be flowed through to customers pursuant to ComEd's Rider EDA.

All of the programs identified by ComEd are three-year programs. The budget for each program is provided in Appendix C-4, and the anticipated annual kWh savings for each program is provided in Appendices C-2 and C-4.

One of the outcomes from prior years' workshops was agreement by parties that proposals approved by the ICC pursuant to this process may be subject to certain adjustments during contract negotiations to reflect adjustments in TRM measure savings, net-to-gross adjustments or unexpected market changes. For PY9 (i.e., Planning Year 2016), several previously approved proposals require adjustments. Appendix C-3 outlines all the changes.

(A) Energy Efficiency Potential Study

Section 16-111.5B(a)(3)(A) requires the inclusion of a comprehensive energy efficiency potential study for the utility's service territory that was completed within the past 3 years. Such a study is attached to this Forecast as Appendix C-1. The study identifies technical, economic and achievable energy efficiency potential. Technical potential assumes that all energy efficiency measures are implemented by all of ComEd's customers, irrespective of cost or other barriers. Economic potential screens the technical potential to include only those measures that pass the statutory Total Resource Cost ("TRC") test. Achievable potential further filters these measures to reflect a variety of non-cost, or market barriers, that cause customers to not implement energy-saving measures.

(B) Most recent 8-103A Study

Section 16-111.5B(a)(3)(B) requires the inclusion of the most recent analysis submitted pursuant to Section 8-103A of this Act and approved by the Commission under subsection (f) of Section 8-103 of this Act. This study is effectively the same as the study required under item (A) above.

(C) Identification of New or Expanded Measures

Section 16-111.5B(a)(3)(C) requires the listing of new or expanded cost-effective energy efficiency programs or measures that could be offered to eligible retail customers. Such a listing

is provided in Appendix C-2 - Energy Efficiency Analysis Summary. The programs or vendor names are listed in column A of Appendix C-2. Greater detail regarding each program is provided in Appendix C-3.

(D) Cost Analysis

Section 16-111.5B(a)(3)(D) requires an analysis showing that the new or expanded cost-effective energy efficiency programs or measures would lead to a reduction in the overall cost of electric service. Such an analysis is included in Appendix C-2. "Cost-effective", as used in Section 16-111.5B, has the same meaning as set forth in Section 8-103(a) of the PUA.[14] As defined in that section, "cost-effective" is determined using the Total Resource Cost ("TRC") test, with a TRC result greater than 1.0 being considered cost-effective. In addition, ComEd conducted an analysis of each program to show that the programs would each lead to a reduction in the overall cost of electric service. ComEd used the Utility Cost Test ("UCT"), as defined by the California Standard Practice Manual[15]. The UCT compares the avoided costs realized by implementing energy efficient measures to the utility's costs to acquire those measures. The TRC and UCT results are listed in columns I, J, K and L of Appendix C-2.

(E) Comparison to Cost of Comparable Supply

Section 16-111.5B(a)(3)(E) requires an analysis of how the cost of procuring additional energy efficiency measures compares over the life of the measures to the cost of comparable supply. This analysis is provided in Appendix C-2. Column M in that appendix shows the Cost to Conserve Energy ("CCE"), which is expressed in dollars per lifetime kWh saved. The CCE is determined by dividing the total cost of each program by the lifetime energy savings associated with that program. It provides a useful comparison between the cost of saving a kWh of energy to supply alternatives.

(F) Energy Savings Goal

Section 16-111.5B(a)(3)(F) requires the determination of an energy savings goal for each of the measures or programs to be implemented. Appendix C-2, Columns D(*i*) and F(*i*) show the annualized MWh savings at the busbar and the meter, respectively, for each year and for each program.

(G) Reduction in Supply

Section 16-111.5 (G) requires an estimation of the amount that the program may reduce the IPA's need to procure supply. That information is provided for each year in Columns E(*i*) of Appendix C-2.

---

[14] See section 16-111.5B(b)

[15] http://www.calmac.org/events/SPM_9_20_02.pdf; Referred to as the Program Administrator Cost ("PAC") test in California

C. Impact of Renewable Energy Resources

Section 1-75(c) of the IPA Act (20 ILCS 3855/1-75(c)) establishes the following goals and cost thresholds for cost effective renewable energy resources:

Table II-11
Renewable Energy Resource Requirements

Delivery Period	Minimum Percentage	Maximum Cost
2017-2018	13% of June 1, 2015 through May 31, 2016 Eligible Retail Customer Load	No more than the greater of 2.015% of the amount paid per kilowatt hour by those customers during the year ending May 31, 2007 or the incremental amount per kilowatt hour paid for these resources in 2011.
2018-2019	14.5% of June 1, 2016 through May 31, 2017 Eligible Retail Customer Load	No more than the greater of 2.015% of the amount paid per kilowatt hour by those customers during the year ending May 31, 2007 or the incremental amount per kilowatt hour paid for these resources in 2011.
2019-2020	16% of June 1, 2017 through May 31, 2018 Eligible Retail Customer Load	No more than the greater of 2.015% of the amount paid per kilowatt hour by those customers during the year ending May 31, 2007 or the incremental amount per kilowatt hour paid for these resources in 2011.
2020-2021	17.5% of June 1, 2018 through May 31, 2019 Eligible Retail Customer Load	No more than the greater of 2.015% of the amount of paid per kilowatt hour by those customers during the year ending May 31, 2007 or the incremental amount per kilowatt hour paid for these resources in 2011.
2021-2022	19.0% of June 1, 2019 through May 31, 2020 Eligible Retail Customer Load	No more than the greater of 2.015% of the amount of paid per kilowatt hour by those customers during the year ending May 31, 2007 or the incremental amount per kilowatt hour paid for these resources in 2011.

Based on the above, Table II-12 shows the amount of renewable energy resources that need to be procured for Planning Years 2017-2021, while Table II-13 shows the maximum amount, i.e., the budget amount, that may be spent acquiring such resources:

Table II-12
Targeted Renewable Energy Resources

Planning Year	Reference Year	Reference Year Delivered Volume (MWH)	Planning Year RPS Target (%)	Planning Year RPS Target (RECs)	Plan Year Contracted Quantity (RECs)	Plan Year Projected Purchases (RECs)
2017-18	2015-16	17,782,307	13.0%	2,311,700	1,536,177	775,523
2018-19	2016-17	19,953,999	14.5%	2,893,330	1,264,704	1,628,626
2019-20	2017-18	22,236,467	16.0%	3,557,835	1,264,704	2,293,131
2020-21	2018-19	22,314,527	17.5%	3,905,042	1,262,768	2,642,274
2021-22	2019-20	22,422,448	19.0%	4,260,265	1,261,725	2,998,540

Table II-13
Renewable Energy Resources Budgets

Plan Year	Plan Year Delivered Volume (MWH)	RPS 2.015% Cost Cap ($/MWH)	RPS Budget ($)	Contracted Spend ($)	Remaining Budget ($)
2017-18	22,236,467	1.8917	42,064,725	23,804,638	18,260,087
2018-19	22,314,527	1.8917	42,212,391	23,446,480	18,756,911
2019-20	22,422,448	1.8917	42,416,545	23,576,285	18,840,260
2020-21	22,392,223	1.8917	42,359,368	23,188,923	19,170,445
2021-22	22,387,643	1.8917	42,350,704	18,683,296	23,667,408

Pursuant to previous Commission orders, ComEd currently has existing contracts to procure renewable energy resources that will be in effect over the period covered by the Forecast. In Docket No. 09-0373, the Commission directed ComEd to procure up to 1,400,000 MWh of renewable energy resources each year for twenty years pursuant to long-term contracts ("LT Renewables"). In Docket No. 11-0660, the Commission directed ComEd to procure the statutorily-prescribed amount[16] of RECs over the period June 1, 2013 through December 31, 2017 ("Rate Stability RECs").

Since the contracted spend for RECs is less than the projected RPS budget, there should be no need to curtail the purchases of RECs under existing contracts for 2017-18.

As noted above, ComEd will keep the IPA informed of the potential movement of Muni Agg Communities to Blended Service during the remainder of PY 2016 and PY 2017. ComEd will continue to monitor the situation and present updated data when ComEd submits its updated forecasts in March. At that time, ComEd will also indicate how these Muni Agg programs will impact its Expected Load Forecast and any necessary reduction in purchases under the existing

[16] See Section 16-111.5(k-5) of the PUA.

LT Renewable contracts if the expected usage were to drop significantly to trigger such a reduction.

In addition, the Expected Load Forecast does not include the full impact on the load of the Eligible Retail Customers that would result from the procurement of the additional energy efficiency measures that are discussed in section II(B)(2)(b)(iii) of this Forecast.

In accordance with Section 1-75(c)(5) of the IPA Act, ComEd has been collecting Alternative Compliance Payments ("ACP") from its Hourly Service Customers. Beginning in 2011, ComEd began including in its Forecast the amount of hourly ACP that is collected in the prior year ending May 31. For the period June 1, 2015 through May 31, 2016, ComEd has collected $8,427,070 in hourly ACP funds for a total balance as of May 31, 2016 of $27,467,027. The available hourly ACP funds need to be reduced by the $1,632,967 dollars committed to be spent in the previous 5-year DG procurements conducted by the IPA.

3. Five-Year Monthly Load Forecast

Based on all of the factors discussed in this section, ComEd has developed the following forecast of projected energy usage of Eligible Retail Customers for the period from June 1, 2017 through May 31, 2018:

Table II-14

ComEd Procurement Period Load Forecast (Expected Load)
Projected Energy Usage and Average Demand For Eligible Retail Customers
(Weather Normal, Line Loss and DSM Adjusted)

Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2017	6	1,167,749	964,084	3,317	2,620
2017	7	1,262,488	1,357,751	3,945	3,202
2017	8	1,364,588	1,108,286	3,708	2,948
2017	9	885,849	933,517	2,768	2,334
2017	10	848,585	788,009	2,411	2,010
2017	11	904,174	892,208	2,691	2,323
2017	12	976,948	1,139,488	3,053	2,687
2018	1	1,101,363	1,089,073	3,129	2,778
2018	2	936,569	922,902	2,927	2,622
2018	3	907,354	902,435	2,578	2,302
2018	4	779,496	776,089	2,320	2,021
2018	5	867,751	811,245	2,465	2,070
Totals		**12,002,914**	**11,685,087**		

The forecast set forth above shows ComEd's expected load for the 2017 Planning Year.[17] The PUA requires that the forecast cover a 5-year planning period. The forecast for ComEd's expected load for the 5-year planning period is set forth in Appendix B-1. The PUA also requires ComEd to provide low-load and high-load scenarios. That information for the 2017 Planning Year is set forth in Tables II-15 and II-16. The low-load and high-load scenarios for the 5-year planning period are set forth in Appendix B-2 and Appendix B-3, respectively. In all of the forecasted usage tables, "line loss" refers only to distribution losses.

Table II-15

ComEd Procurement Period Load Forecast (Low Load)
Projected Energy Usage and Average Demand For Eligible Retail Customers
(Line Loss and DSM Adjusted)

Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2017	6	978,617	768,603	2,780	2,089
2017	7	966,739	1,035,713	3,021	2,443
2017	8	1,025,377	828,047	2,786	2,202
2017	9	814,226	846,505	2,544	2,116
2017	10	748,103	690,696	2,125	1,762
2017	11	786,617	769,917	2,341	2,005
2017	12	881,851	1,021,425	2,756	2,409
2018	1	1,021,204	1,018,067	2,901	2,597
2018	2	836,616	833,204	2,614	2,367
2018	3	789,423	782,202	2,243	1,995
2018	4	704,038	686,251	2,095	1,787
2018	5	751,124	737,982	2,134	1,883
Totals		**10,303,935**	**10,018,612**		

[17] The forecasts in Tables II-13, 14 and 15 and in Appendices B-1, 2 and 3 do not include the impact of the Section 16-111.5B energy efficiency procurement. The impact on the Forecast of those measures is depicted in Appendix C-3.

Table II-16

ComEd Procurement Period Load Forecast (High Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Line Loss and DSM Adjusted)					
Year	**Month**	**Total Load (MWh)**		**Average Load (MW)**	
		On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2017	6	1,405,590	1,163,513	3,993	3,162
2017	7	1,643,699	1,675,329	5,137	3,951
2017	8	1,981,352	1,674,545	5,384	4,454
2017	9	946,422	1,009,910	2,958	2,525
2017	10	924,844	874,172	2,627	2,230
2017	11	1,060,651	1,071,394	3,157	2,790
2017	12	1,112,757	1,299,529	3,477	3,065
2018	1	1,203,470	1,177,811	3,419	3,005
2018	2	1,054,415	1,020,270	3,295	2,898
2018	3	981,398	986,472	2,788	2,517
2018	4	876,520	878,053	2,609	2,287
2018	5	902,235	837,846	2,563	2,137
Totals		**14,093,353**	**13,668,844**		

The low-load and the high-load scenarios are based upon a change to three of the main variables impacting load: weather, switching and load growth.

The Low-Load Forecast assumes that the summer weather is cooler than normal, that load growth occurs at a rate 2% less than the Expected Load Forecast and higher RES service relative to the Expected Load Forecast shown in Table II-14. In this scenario the Muni Agg renewal rate is assumed to be 85% (vs. the 60% base case assumption) in the years 2016 and 2017 for Communities with Muni Agg contracts expiring in those years. This decreases the Blended usage for both the Residential and Watt-hour groups. In addition, the 0 to 100 kW switching increases by 1.2% initially and grows another 2.4 percentage points over the next two years. This scenario reflects less Blended usage because of greater than anticipated savings opportunity. The percentage of Eligible Retail Customers taking Blended Service in this switching scenario is 53.5% (based on usage) as of December 2018 compared to 57.3% in the Expected Load Forecast.

The High-Load Forecast assumes that the summer weather is hotter than normal, that load growth occurs at a rate 2% more than is expected, and lower RES service. In this scenario the Muni Agg renewal rate is assumed to be 35% in the years 2016 and 2017 for Communities with Muni Agg contracts expiring in those years. This increases the Blended usage for both the Residential and Watt-hour groups. In addition, the 0 to 100 kW switching decreases by 1.2% initially and declines another 2.4 percentage points over the next two years. This scenario reflects more Blended usage because of limited savings opportunity. The percentage of Eligible Retail Customers taking Blended Service in this switching scenario is 61.2% as of December 2018 compared to 57.3% in the Expected Load Forecast.

The +/- 2% load growth assumption in both scenarios reflects, in part, the current economic uncertainty. That uncertainty is described by IHS-Economics in its U.S. Executive Summary dated June 2016:

> "Mild Recession" Scenario: In the pessimistic scenario, the U.S. economy suffers a two-quarter recession in the middle of 2017, caused by faltering productivity and stumbling global growth, and featuring a stock market crash that devastates business and consumer confidence. Productivity weakens as businesses uncertain about the future of the economy do not invest in productivity-enhancing technology and equipment. Economic conditions outside the U.S. worsen. The problems in emerging markets become more pervasive, and the dollars soars, worsening the trade deficit. Between all of these headwinds, both consumers and business confidence sour, and the stock market plunges during 2017. The net-result is that the U.S. economy contracts in the second and third quarters of 2017. The Federal Reserve initial reacts by briefly moving interest rates to rock-bottom levels; however, with inflation failing to come completely under control, the Fed begins raising interest rates through 2023, to a peak of 4.0%. In this scenario, real GDP grows 0.1% in 2017 and 1.2% in 2018 (versus 2.6% and 2.6% in the baseline, respectively).
>
> "Recovery Gains Momentum" Scenario: In the optimistic scenario, demand-side growth matches supply-side growth, with little upward inflation pressure. The U.S. economy gains momentum as the explosion in new technologies encourages more investment, leading to stronger productivity growth. Low oil prices and low wage growth keep core inflation below the Fed's 2.0% target until 2021. Accordingly, the Fed takes an even more gradual approach to raising interest rates. Growth in the rest of the world begins to improve with the help of structural reforms implemented by some struggling economics and the European Central Bank's quantitative easing. Thanks to stronger foreign growth and lower U.S. interest-rate expectations, the dollar slides initially, and moves above its baseline level only by the end of 2017. Both consumer and business confidence improve and the stock market experiences strong gains. Housing remains an engine of growth, thanks to healthy income gains. Housing starts climb rapidly, reaching 1.66 million (annual rate) by the end of 2018, compared with 1.52 million in the baseline. In this scenario, real GDP grows 3.5% in 2017 and 3.2% in 2018.

ComEd's intention is to keep the IPA informed of significant changes in its forecast during the procurement proceeding.

III. CONCLUSION

For all of the reasons described here, ComEd believes that its Forecast for the period June 1, 2017 through May 31, 2022 is consistent with the requirements of the PUA and provides an appropriate approach to develop the procurement plan to acquire supply for the Eligible Retail Customers.

Appendices

A. Load Forecast Models

1. Residential Single Family Model (Hour 16)
2. ComEd Model Coefficients
3. ComEd Model Regression Statistics
4. Detailed Description of Variables Used In Forecast Models

B. Five-Year Load Forecast

1. Expected load
2. Low Load
3. High Load

C. Energy Efficiency

1. Potential Study
2. Analysis Summary
3. Program Year 9 Budget Shifts
4. Program Details
5. DSMore Model Inputs

D. Renewables

Appendix A-1

Residential Single Family Model (Hour 16)			
Variable	**Coefficient**	**T-Stat**	**Notes**
Constant	1.1820	36.54	Constant term
Monday Binary	-0.0720	-5.30	Daily Binary - Monday
Tuesday Binary	-0.0870	-6.43	Daily Binary - Tuesday
Wednesday Binary	-0.1010	-7.52	Daily Binary - Wednesday
Thursday Binary	-0.0980	-7.26	Daily Binary - Thursday
Friday Binary	-0.0920	-6.77	Daily Binary - Friday
Saturday Binary	-0.0440	-4.03	Daily Binary - Saturday
MLK Binary	0.0520	0.93	Martin Luther King's Day
Presidents Day Binary	0.0680	1.23	President's Day
GoodFriday Binary	0.0080	0.14	Good Friday
Memorial Day Binary	0.0630	1.08	Memorial Day
July4th Binary	0.1340	2.13	July 4th.
LaborDay Binary	0.0510	0.87	Labor Day
Thanksgiving Binary	0.1480	2.37	Thanksgiving Day
FriAThanks Binary	0.0720	1.15	Friday after Thanksgiving Day
XMasWeek Before Binary	0.1320	2.11	Week before Christmas
XMasEve Binary	0.3280	4.35	Christmas Eve
XMasDay Binary	0.1700	2.38	Christmas Day
XMasLights Binary	0.0000	0.12	Christmas Lights
XMasWeek Binary	0.0870	1.15	Christmas Week
New Years Eve Binary	0.1630	1.93	New Year's Eve Day
New Years Day Binary	0.0900	1.33	New Year's Day
Feb Binary	-0.0930	-3.04	Monthly Binary - February
Mar Binary	-0.1580	-5.17	Monthly Binary - March
MarDLS Binary	0.0230	0.41	Day That Daylight Savings Begins In March
Apr Binary	-0.2160	-6.57	Monthly Binary – April
May Binary	-0.2530	-7.16	Monthly Binary - May
Jun Binary	-0.0080	-0.23	Monthly Binary - June
Jul Binary	0.0880	2.30	Monthly Binary - July
Aug Binary	0.2400	6.55	Monthly Binary - August
Sep Binary	0.0700	1.86	Monthly Binary - September
Oct Binary	-0.0730	-1.97	Monthly Binary - October
NovDLS Binary	-0.0400	-0.64	Day That Daylight Savings Ends In November
Nov Binary	-0.1160	-3.25	Monthly Binary - November
Dec Binary	-0.0620	-1.71	Monthly Binary - December
JanWalk	-0.0030	-2.59	Monthly Time Trend - January - January
FebWalk	-0.0020	-1.96	Monthly Time Trend - February
MarWalk	-0.0020	-1.80	Monthly Time Trend - March
AprWalk	0.0000	-0.37	Monthly Time Trend - April

MayWalk	0.0100	8.53	Monthly Time Trend - May
JunWalk	0.0080	6.60	Monthly Time Trend - June
JulWalk	0.0030	2.49	Monthly Time Trend - July
AugWalk	-0.0040	-3.22	Monthly Time Trend - August
SepWalk	-0.0040	-3.62	Monthly Time Trend - September
OctWalk	0.0040	3.04	Monthly Time Trend - October
NovWalk	0.0020	1.40	Monthly Time Trend - November
DecWalk	0.0030	1.63	Monthly Time Trend - December
Shift2010	-0.0230	-2.14	An End Shift to describe usage for 2010 and beyond
Shift2011	0.0440	4.10	An End Shift to describe usage for 2011 and beyond
Shift2012	0.0090	0.80	An End Shift to describe usage for 2012 and beyond
Shift2013	0.0260	2.21	An End Shift to describe usage for 2013 and beyond
Shift2014	0.0630	5.50	An End Shift to describe usage for 2014 and beyond
Shift2015	-0.3650	-32.77	An End Shift to describe usage for 2015 and beyond
SeasonHDD	0.0090	11.49	Seasonal Heating Degree Days Spline
LagHDD	-0.0010	-1.30	1 Day Lag Seasonal Heating Degree Days Spline
Lag2HDD	0.0010	2.22	2 Day Lag Seasonal Heating Degree Days Spline
SeasonTDD	0.1610	47.83	Seasonal Cooling Degree Days Spline
LagTDD	0.0050	1.63	1 Day Lag Seasonal Cooling Degree Days Spline
Lag2TDD	0.0150	6.60	2 Day Lag Seasonal Cooling Degree Days Spline
HDDWkEnd	0.0010	1.37	Weekend Seasonal Heating Degree Days Spline
TDDWkEnd	0.0080	2.97	Weekend Seasonal Cooling Degree Days Spline
HDDTrend	0.0000	-3.39	Time Trend Seasonal Heating Degree Days Spline
TDDTrend	0.0010	0.76	Time Trend Seasonal Cooling Degree Days Spline

The coefficients provide the effect that each variable has on the hourly usage for a single hour (Hour 16 which includes the load from 3 p.m. to 4 p.m. in the afternoon). The "T-Stat" provides the statistical significance of the variable, with a value generally greater than +/- two (2) indicating that the coefficient is significantly different from zero. The hourly model for Hour 16 has an adjusted R-squared of 0.94, which means that 94% of the variance in the hourly data is being explained by the model.

At the daily level, the mean average percent error ("MAPE") for the summation of the hourly models is 4.4%. The 4.4% daily MAPE means that the average percentage difference on a daily basis between the usage predicted by the model and the actual usage for that period was very small. In other words, the model can explain usage with almost a 96% accuracy rate. Such a high accuracy rate is particularly noteworthy because the model is dealing with very short time frames in which many factors may come into play. The high accuracy rate, the low MAPE and the high R-squared indicate that the model captures the vast majority of factors that affect electrical usage.

Appendix A-2

ComEd Model Coefficients

ComEd Zone Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
CONST	1679.026	686.79	2.445
CalVars.Jan	2.666	36.173	0.074
CalVars.Feb	-246.092	65.535	-3.755
CalVars.Mar	-415.78	77.465	-5.367
CalVars.Apr	-480.875	68.671	-7.003
CalVars.May	-397.565	85.854	-4.631
CalVars.Jun	-232.19	76.593	-3.031
CalVars.Jul	-138.712	87.118	-1.592
CalVars.Aug	-8.594	80.133	-0.107
CalVars.Sep	-248.976	72.037	-3.456
CalVars.Oct	-304.215	67.69	-4.494
CalVars.Nov	-273.584	85.899	-3.185
CalHDD.HDD_Spring	2.414	0.177	13.646
CalHDD.HDD_Fall	2.217	0.246	9.001
CalHDD.HDD_Winter	1.893	0.101	18.683
CalCDD.SpringTDD	11.527	1.196	9.642
CalCDD.SummerTDD	13.53	0.308	43.867
CalCDD.FallTDD	15.345	2.562	5.991
Monthly.EconIndex15	6229.703	686.07	9.08
CalVars.Oct14Plus	-109.032	48.388	-2.253
EE_Savings.Total	-0.627	0.079	-7.894
AR(1)	0.495	0.09	5.499

Residential Customer Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	18.878	2.041	9.249
Monthly.Feb	17.655	2.045	8.634
Monthly.Mar	16.975	2.02	8.404
Monthly.Apr	16.107	2.014	7.997
Monthly.May	15.997	1.977	8.091
Monthly.Jun	17.076	1.968	8.679
Monthly.Jul	19.365	1.962	9.871
Monthly.Aug	19.256	1.958	9.837
Monthly.Sep	18.867	1.982	9.517
Monthly.Oct	17.403	1.967	8.848
Monthly.Nov	16.786	2.015	8.331
Monthly.Dec	18.054	2.014	8.964
CycVars.IncPerHH_Index	1.778	1.906	0.933
CycWthrT.ResHDD_Spring	0.266	0.033	7.964
CycWthrT.ResHDD_Fall	0.285	0.06	4.755
CycWthrT.ResHDD_Winter	0.238	0.013	18.36
CycWthrT.ResCDD_Spring	2.699	0.575	4.69
CycWthrT.ResCDD_Jun	2.848	0.173	16.42
CycWthrT.ResCDD_Jul	2.566	0.072	35.51
CycWthrT.ResCDD_Aug	2.772	0.072	38.5
CycWthrT.ResCDD_Sep	2.777	0.128	21.77
CycWthrT.ResCDD_Fall	3.087	0.207	14.93
CycWthrT.Yr06Plus_ResCDDShift	-0.314	0.05	-6.273
CycVars.ResBill_MA_Index	-2.108	0.46	-4.584
CycVars.ResEE_PerDay	-0.577	0.038	-15.18
AR(1)	0.293	0.097	3.027

Small C&I Customer Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	31.395	6.473	4.85
Monthly.Feb	34.206	6.489	5.271
Monthly.Mar	33.751	6.443	5.239
Monthly.Apr	33.533	6.399	5.241
Monthly.May	32.508	6.404	5.076
Monthly.Jun	32.629	6.425	5.078
Monthly.Jul	33.223	6.481	5.126
Monthly.Aug	35.731	6.488	5.507
Monthly.Sep	36.084	6.461	5.585
Monthly.Oct	36.009	6.419	5.609
Monthly.Nov	33.223	6.425	5.171
Monthly.Dec	30.227	6.471	4.671
CycWthrT.SCI_HDD	0.553	0.042	13.315
CycWthrT.SCI_CDD	2.594	0.144	18.026
CycWthrT.SCI_CDDTrend	-0.053	0.011	-4.795
CycVars.SCI_Econ_Index3	48.658	6.611	7.36
SCI.DelayedBill2	-0.027	0.003	-9.293
CycVars.SCI_EEPerDay	-0.612	0.065	-9.489
AR(1)	0.099	0.095	1.035

StreetLighting Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	-3.804	2.229	-1.707
Monthly.Feb	-3.839	2.227	-1.724
Monthly.Mar	-4.183	2.226	-1.879
Monthly.Apr	-4.286	2.228	-1.924
Monthly.May	-4.441	2.228	-1.993
Monthly.Jun	-4.47	2.228	-2.006
Monthly.Jul	-4.519	2.23	-2.027
Monthly.Aug	-4.455	2.229	-1.998
Monthly.Sep	-4.292	2.23	-1.924
Monthly.Oct	-4.216	2.229	-1.891
Monthly.Nov	-4.012	2.229	-1.8
Monthly.Dec	-3.905	2.231	-1.75
XVars.HH	0.002	0.001	2.746
Monthly.Oct09Plus	0.076	0.037	2.024
Monthly.Yr2013Plus	0.09	0.041	2.182
AR(1)	0.327	0.09	3.637

Appendix A-3

ComEd Model Regression Statistics

Regression Statistics	Zone	Residential	Small C&I	Street Lighting
Iterations	24	15	13	13
Adjusted Observations	123	130	130	121
Deg. of Freedom for Error	101	104	111	105
R-Squared	0.993	0.996	0.973	0.891
Adjusted R-Squared	0.992	0.995	0.968	0.875
AIC	9.035	-2.092	0.51	-4.315
BIC	9.538	-1.519	0.929	-3.946
Log-Likelihood	-708.18	-22.46	-198.61	105.39
Model Sum of Squares	108,829,823	2,775.92	5,741.34	10.12
Sum of Squared Errors	721,708.69	10.75	161.61	1.24
Mean Squared Error	7,145.63	0.1	1.46	0.01
Std. Error of Regression	84.53	0.32	1.21	0.11
Mean Abs. Dev. (MAD)	57.69	0.22	0.92	0.08
Mean Abs. % Err. (MAPE)	0.68%	1.02%	1.03%	3.83%
Durbin-Watson Statistic	2.197	1.898	1.939	1.942
Ljung-Box Statistic	45.66	20.52	25.53	58.08
Prob (Ljung-Box)	0.0049	0.6666	0.3773	0.0001
Prob (Jarque-Bera)	0.0005	0.1225	0.5661	0.57

Appendix A-4
Detailed Description Of Variables
Used In Forecast Models

The econometric models are statistical multi-variant regressions that determine the correlation between electrical usage (dependent variable) and weather, economic and monthly factors (independent variables). ComEd's weather normals are based on the 30-year time period of 1986 to 2015 for the forecast years of 2017 to 2022. The following models are used in producing the energy usage forecast (GWh) for the eligible customers:

Monthly Zone energy usage for the ComEd zone
Monthly Residential bill-cycle energy usage
Monthly Small C&I bill-cycle energy usage
Monthly Street Lighting bill-cycle energy usage

ComEd's Load Forecasting group with the input of industry experts developed the models. The following sections describe each model and its specifications. Appendices A-2 and A-3 contain the coefficients and other regression statistics for the models.

ComEd's Monthly Zone Model

The dependent variable in the Monthly Zone Model is monthly zone energy usage for the ComEd service territory. The monthly zone usage is in GWh units.

The independent variables within the model are:

- The monthly binary variables reflect monthly usage patterns. Customer electrical usage is a function of other items besides cooling and heating (e.g., lighting). This other usage is not constant per month and the monthly binary variables are used to account for this variability. December is excluded from the monthly binaries, as the constant term establishes December as the base from which the monthly binary variables are adjusted.

- The EconIndex15 variable is a composite economic variable that weights the contributions of GMP, US Gross Domestic Product ("GDP"), households, manufacturing employment and non-manufacturing employment in the ComEd service territory. GMP is the gross metropolitan product for the Chicago metropolitan area and also includes other metropolitan areas within ComEd's service territory. This variable measures economic activity for the ComEd service territory. Both the GMP and GDP are adjusted for inflation and obtained from IHS Economics. Further, the variables are adjusted for the number of weekends (and holidays) and weekdays within a calendar month because overall energy usage for a given month is a function of those daily influences. The variables' units are billions of dollars. The households component is the total number of households within the ComEd service territory. This economic variable reflects the effect of a growing customer base on energy usage. This variable is also

adjusted for the number of weekends, holidays and weekdays within a calendar month. Both manufacturing and non-manufacturing employment are measured for the ComEd service territory and are also adjusted for the number of weekdays, weekends and holidays. The five economic variables are each indexed to January 2008 and then weighted based on an exponential formula with each of these economic variables receiving a roughly one-fifth weighting.

- The EE_Savings.Total variable is composed of estimated monthly cumulative gross energy efficiency savings across ComEd's Residential, Small C&I and Large C&I customer class programs. This variable is intended to capture the overall trend of energy efficiency activity in the ComEd service territory by ComEd sponsored programs (e.g., lightbulbs, home energy reports).

- The temperature and humidity degree day ("TDD") variables are weather variables designed to capture the effect on usage from cooling equipment. The TDD variable is similar in design to a cooling degree day ("CDD") variable. A CDD weather variable is often used in energy models. The standard CDD measures the difference in the average daily temperature above a specific threshold (typically 65 degrees as that is a common point at which cooling activity begins). The TDD variable provides several enhancements to the typical CDD variable as delineated below:

  The average daily temperature is the 24-hour average instead of the average of the maximum and minimum temperatures for the day. This captures frontal movements within the day.

  Humidity is included in the TDD variable as humidity does influence electrical usage.

  The TDD variable uses multiple degree bases instead of just a 65 degree-base. This captures the change in the rate at which customers use electricity at different temperature levels.

  The TDD variable is interacted with seasonal binary variables (i.e., Spring, Summer and Fall) to reflect the seasonal usage pattern related to cooling equipment.

  The TDD variable is in degree-day units.

- The HDD Spline variable is a weather variable that measures the relationship on electrical usage from space heating equipment (e.g., natural gas furnace fans and electrical space-heating equipment). The HDD Spline variable is similar in concept to the industry-standard heating degree day ("HDD") weather variable.

The HDD Spline provides a couple of enhancements to the HDD weather variable:

The average daily temperature is the 24-hour average instead of the average of the maximum and minimum temperatures for the day. This captures frontal movements within the day.

The HDD Spline uses multiple degree bases instead of just a 65 degree-base. This captures the change in the rate at which customers use electricity at different temperature levels.

The HDD Spline variable is in degree-day units.

- The Year October 2014 Shift Plus variable is a binary variable designed to capture very recent usage activity within the model. It is a binary variable with the unit one for all months beginning with October 2014 and thereafter. By forcing all of the residuals to sum to zero for the months October 2014 to present, the variable is causing the model to be closely aligned with recent usage activity. This variable is useful for forecasting purposes as it ensures that the forecasted usage is also closely aligned with the most recent pattern of electrical usage.

The coefficient values and the standard measurements of significance within the model (e.g., t-stats) and the overall model performance (e.g., R-squared and MAPE) are contained in Appendices A-2 and A-3.

ComEd Residential Model

The dependent variable in the Residential Model is residential use per customer per day and the units are kWh per customer per day.

The independent variables are noted below. (Because many of the variables follow the same purpose and logic as in the Monthly Zone model, please see the Monthly Zone Model description for additional information.)

- The monthly binary variables reflect monthly usage patterns.

- The Real Income per Household Index variable is the disposable personal income for the Chicago metropolitan area and other metropolitan areas within the ComEd service territory (adjusted for inflation) divided by the number of households for the same area. The data is obtained from IHS. This variable captures the rising household incomes within ComEd's service territory and the correlation it has with consumer purchases of electronic equipment and housing stock. The variable is in dollars per household units indexed to January 2008.

- The Monthly Bill (Moving Average) Index variable is a typical monthly residential electricity bill assuming historical tariff charges and weather normal customer usage for the year 2002 (adjusted for inflation). Specifically, the historical tariff charges for a single-family and multi-family (both non-space heat) were multiplied by the weather adjusted billing units from the year 2002 for both residential groups. The monthly bills for both residential groups were weighted, based on energy usage, to form a single monthly bill. The monthly bill was also adjusted for the Chicago CPI-U. A 12 month moving average is calculated for each month (average of the current month and the 11 preceding months). Lastly, this variable is indexed to January 2008. This variable reflects the influence of electricity charges/prices over time related to consumer behavior.

- See EE_Savings.Total variable in the Zone Model section above for description. The ResEE_PerDay variable is a measure of gross energy efficiency savings on a per customer per day basis for the Residential customer class.

- Weather variables used in the residential model are similar in concept to the weather variables described in the Monthly Zone Model section and will not be repeated here.

ComEd Small C&I Model

The dependent variable in the Small C&I Model is Small C&I use per day and the units are GWh per day. The independent variables within the model are:

- The monthly binary variables, weather variables and shift variables are similar in concept to the Monthly Zone Model and will not be repeated here.

- The Small C&I Economic Index variable is a composite economic variable that weights the contributions of GMP and non-manufacturing employment in the ComEd service territory. These economic variables are each indexed to January 2008 and then weighted based on an exponential formula with a weighting of employment (80%) and GMP (20%). The GMP variable is defined in the Zone model description above and the employment variable is an economic variable that measures the total non-manufacturing employment in the Chicago area. Job growth is correlated to Small C&I development and growth

- See EE_Savings.Total variable in the Zone Model section above for description. The SCI_EEPerDay variable is a measure of gross energy efficiency savings on a per day basis for the Small C&I customer class

- The Delayed Bill variable is the month over month (current vs. one month prior) variance in the Small C&I's estimated usage (GWh) of bills that are delayed beginning in October 2009. This variable is used to inform the model about an increase in delayed bill activity primarily in 2010.

ComEd Street Light Model

The dependent variable in the Street Lighting Model is Street Lighting use per day and the units are GWh per day. The independent variables are:

- Monthly binary variables and a shift variable are similar in concept to the Monthly Zone Model.

- The households variable is a measure of the total number of households in the Chicago area. This economic variable reflects the relationship of a growing service territory and street lighting usage.

- The October 2009 and Year 2013 Plus binary variables are similar in concept to the Monthly Zone model.

Appendix B-1

ComEd Procurement Period Load Forecast (Expected Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Weather Normal, Line Loss and DSM Adjusted)					
Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2017	6	1,167,749	964,084	3,317	2,620
2017	7	1,262,488	1,357,751	3,945	3,202
2017	8	1,364,588	1,108,286	3,708	2,948
2017	9	885,849	933,517	2,768	2,334
2017	10	848,585	788,009	2,411	2,010
2017	11	904,174	892,208	2,691	2,323
2017	12	976,948	1,139,488	3,053	2,687
2018	1	1,101,363	1,089,073	3,129	2,778
2018	2	936,569	922,902	2,927	2,622
2018	3	907,354	902,435	2,578	2,302
2018	4	779,496	776,089	2,320	2,021
2018	5	867,751	811,245	2,465	2,070
2018	6	1,114,167	1,021,337	3,316	2,660
2018	7	1,332,061	1,311,529	3,964	3,215
2018	8	1,367,761	1,118,769	3,717	2,975
2018	9	844,315	974,750	2,777	2,343
2018	10	892,396	759,718	2,425	2,021
2018	11	910,194	896,112	2,709	2,334
2018	12	983,428	1,144,613	3,073	2,700
2019	1	1,101,776	1,091,046	3,130	2,783
2019	2	936,054	925,573	2,925	2,629
2019	3	865,954	938,354	2,577	2,300
2019	4	819,861	743,859	2,329	2,021
2019	5	869,367	808,191	2,470	2,062
2019	6	1,056,424	1,073,901	3,301	2,685
2019	7	1,397,749	1,261,088	3,971	3,217
2019	8	1,311,633	1,173,568	3,726	2,994
2019	9	896,199	933,831	2,801	2,335
2019	10	896,767	762,129	2,437	2,027
2019	11	865,262	941,322	2,704	2,353
2019	12	1,038,003	1,108,696	3,089	2,717
2020	1	1,103,456	1,094,310	3,135	2,792
2020	2	933,196	986,863	2,916	2,625
2020	3	911,527	905,790	2,590	2,311
2020	4	820,959	749,915	2,332	2,038
2020	5	780,164	883,469	2,438	2,084

ComEd Procurement Period Load Forecast (Expected Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Weather Normal, Line Loss and DSM Adjusted)					
Year	**Month**	**Total Load (MWh)**		**Average Load (MW)**	
		On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2020	6	1,157,677	988,784	3,289	2,687
2020	7	1,458,287	1,199,358	3,963	3,190
2020	8	1,246,355	1,229,945	3,709	3,015
2020	9	946,268	892,149	2,816	2,323
2020	10	858,959	800,745	2,440	2,043
2020	11	867,107	946,003	2,710	2,365
2020	12	1,094,166	1,067,065	3,108	2,722
2021	1	998,171	1,182,208	3,119	2,788
2021	2	942,817	923,846	2,946	2,625
2021	3	957,321	868,750	2,601	2,311
2021	4	820,548	752,562	2,331	2,045
2021	5	777,457	877,505	2,430	2,070
2021	6	1,157,192	977,948	3,287	2,657
2021	7	1,324,773	1,307,360	3,943	3,204
2021	8	1,303,998	1,166,039	3,705	2,975
2021	9	936,103	892,334	2,786	2,324
2021	10	816,526	836,097	2,430	2,049
2021	11	911,494	907,746	2,713	2,364
2021	12	1,143,594	1,013,776	3,108	2,696
2022	1	1,054,115	1,139,597	3,137	2,793
2022	2	947,229	931,747	2,960	2,647
2022	3	961,907	876,551	2,614	2,331
2022	4	787,187	790,697	2,343	2,059
2022	5	819,950	845,292	2,440	2,072
Totals		**60,340,788**	**58,707,924**		

Appendix B-2

ComEd Procurement Period Load Forecast (Low Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Line Loss and DSM Adjusted)					
Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2017	6	978,617	768,603	2,780	2,089
2017	7	966,739	1,035,713	3,021	2,443
2017	8	1,025,377	828,047	2,786	2,202
2017	9	814,226	846,505	2,544	2,116
2017	10	748,103	690,696	2,125	1,762
2017	11	786,617	769,917	2,341	2,005
2017	12	881,851	1,021,425	2,756	2,409
2018	1	1,021,204	1,018,067	2,901	2,597
2018	2	836,616	833,204	2,614	2,367
2018	3	789,423	782,202	2,243	1,995
2018	4	704,038	686,251	2,095	1,787
2018	5	751,124	737,982	2,134	1,883
2018	6	872,223	820,903	2,596	2,138
2018	7	955,975	1,000,100	2,845	2,451
2018	8	998,802	806,334	2,714	2,145
2018	9	754,281	864,702	2,481	2,079
2018	10	770,748	646,269	2,094	1,719
2018	11	776,413	752,153	2,311	1,959
2018	12	861,695	1,008,169	2,693	2,378
2019	1	1,002,753	991,948	2,849	2,530
2019	2	820,609	814,244	2,564	2,313
2019	3	736,706	796,706	2,193	1,953
2019	4	721,502	646,861	2,050	1,758
2019	5	760,139	697,195	2,159	1,779
2019	6	780,068	874,158	2,438	2,185
2019	7	964,836	961,947	2,741	2,454
2019	8	914,898	851,245	2,599	2,172
2019	9	778,769	817,844	2,434	2,045
2019	10	757,154	637,666	2,057	1,696
2019	11	725,193	773,536	2,266	1,934
2019	12	887,775	961,162	2,642	2,356
2020	1	993,192	965,162	2,822	2,462
2020	2	798,415	848,656	2,495	2,257
2020	3	761,402	752,004	2,163	1,918
2020	4	698,544	648,874	1,985	1,763
2020	5	670,870	744,991	2,096	1,757

ComEd Procurement Period Load Forecast (Low Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Line Loss and DSM Adjusted)					
Year	**Month**	**Total Load (MWh)**		**Average Load (MW)**	
		On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2020	6	875,936	757,165	2,488	2,058
2020	7	1,036,283	849,822	2,816	2,260
2020	8	852,533	870,943	2,537	2,135
2020	9	805,911	766,178	2,399	1,995
2020	10	708,239	659,735	2,012	1,683
2020	11	703,339	771,751	2,198	1,929
2020	12	911,906	912,720	2,591	2,328
2021	1	877,206	1,025,766	2,741	2,419
2021	2	801,507	773,100	2,505	2,196
2021	3	787,524	704,557	2,140	1,874
2021	4	687,218	635,296	1,952	1,726
2021	5	663,896	716,437	2,075	1,690
2021	6	883,571	707,958	2,510	1,924
2021	7	940,409	889,076	2,799	2,179
2021	8	913,119	771,120	2,594	1,967
2021	9	779,963	752,338	2,321	1,959
2021	10	659,974	675,034	1,964	1,654
2021	11	727,141	724,264	2,164	1,886
2021	12	941,012	843,855	2,557	2,244
2022	1	948,465	1,036,877	2,823	2,541
2022	2	830,228	811,497	2,594	2,305
2022	3	818,756	735,915	2,225	1,957
2022	4	685,051	687,067	2,039	1,789
2022	5	726,594	712,127	2,162	1,745
Totals		**49,632,678**	**48,492,039**		

Appendix B-3

ComEd Procurement Period Load Forecast (High Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Line Loss and DSM Adjusted)					
Year	Month	Total Load (MWh)		Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2017	6	1,405,590	1,163,513	3,993	3,162
2017	7	1,643,699	1,675,329	5,137	3,951
2017	8	1,981,352	1,674,545	5,384	4,454
2017	9	946,422	1,009,910	2,958	2,525
2017	10	924,844	874,172	2,627	2,230
2017	11	1,060,651	1,071,394	3,157	2,790
2017	12	1,112,757	1,299,529	3,477	3,065
2018	1	1,203,470	1,177,811	3,419	3,005
2018	2	1,054,415	1,020,270	3,295	2,898
2018	3	981,398	986,472	2,788	2,517
2018	4	876,520	878,053	2,609	2,287
2018	5	902,235	837,846	2,563	2,137
2018	6	1,400,230	1,253,231	4,167	3,264
2018	7	1,746,117	1,703,293	5,197	4,175
2018	8	2,052,394	1,734,089	5,577	4,612
2018	9	927,418	1,076,270	3,051	2,587
2018	10	1,000,871	859,426	2,720	2,286
2018	11	1,092,921	1,098,822	3,253	2,862
2018	12	1,143,668	1,336,063	3,574	3,151
2019	1	1,228,831	1,208,836	3,491	3,084
2019	2	1,082,677	1,039,669	3,383	2,954
2019	3	945,744	1,059,294	2,815	2,596
2019	4	943,057	856,946	2,679	2,329
2019	5	923,240	850,683	2,623	2,170
2019	6	1,356,888	1,344,188	4,240	3,360
2019	7	1,836,586	1,703,494	5,218	4,346
2019	8	2,048,688	1,815,840	5,820	4,632
2019	9	1,028,269	1,027,392	3,213	2,568
2019	10	1,031,439	873,367	2,803	2,323
2019	11	1,063,404	1,170,701	3,323	2,927
2019	12	1,232,604	1,317,728	3,668	3,230
2020	1	1,251,727	1,240,759	3,556	3,165
2020	2	1,094,578	1,140,646	3,421	3,034
2020	3	1,034,760	1,026,938	2,940	2,620
2020	4	957,121	886,381	2,719	2,409
2020	5	835,309	958,690	2,610	2,261

ComEd Procurement Period Load Forecast (High Load) Projected Energy Usage and Average Demand For Eligible Retail Customers (Line Loss and DSM Adjusted)					
Year	**Month**	**Total Load (MWh)**		**Load (MW)**	
		On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2020	6	1,488,650	1,287,411	4,229	3,498
2020	7	1,996,112	1,614,994	5,424	4,295
2020	8	2,041,633	1,889,341	6,076	4,631
2020	9	1,062,447	1,042,942	3,162	2,716
2020	10	1,012,076	932,553	2,875	2,379
2020	11	1,081,717	1,202,778	3,380	3,007
2020	12	1,317,673	1,300,302	3,743	3,317
2021	1	1,152,758	1,370,126	3,602	3,231
2021	2	1,103,749	1,110,066	3,449	3,154
2021	3	1,122,743	988,435	3,051	2,629
2021	4	980,289	901,866	2,785	2,451
2021	5	847,419	972,494	2,648	2,294
2021	6	1,522,039	1,295,724	4,324	3,521
2021	7	1,877,716	1,772,063	5,588	4,343
2021	8	2,136,444	1,865,411	6,069	4,759
2021	9	1,071,955	1,063,852	3,190	2,770
2021	10	977,656	997,800	2,910	2,446
2021	11	1,164,006	1,171,222	3,464	3,050
2021	12	1,404,374	1,260,271	3,816	3,352
2022	1	1,177,411	1,279,755	3,504	3,137
2022	2	1,077,075	1,082,495	3,366	3,075
2022	3	1,098,734	963,823	2,986	2,563
2022	4	912,986	917,518	2,717	2,389
2022	5	875,945	899,601	2,607	2,205
Totals		**73,855,501**	**71,434,433**		

Appendix D

ComEd RPS Contract Quantities and Costs

Plan Year	LT Renewables (RECs)	Rate Stability (RECs)	DG (RECs)	Total (RECs)	LT Renewables ($)	Rate Stability ($)	Total* ($)
2017-2018	1,261,725	271,473	2,979	1,536,177	23,137,231	581,034	23,804,638
2018-2019	1,261,725	0	2,979	1,264,704	23,357,415	0	23,446,480
2019-2020	1,261,725	0	2,979	1,264,704	23,484,084	0	23,576,285
2020-2021	1,261,725	0	1,043	1,262,768	23,095,360	0	23,188,923
2021-2022	1,261,725	0	0	1,261,725	18,588,255	0	18,683,296

*Includes applicable REC registry fees but excludes DG REC costs which were paid for by hourly ACP funds collected from customers served under Rate BESH.

LT Renewables Contract Quantity Reductions

Plan Year	Contract Quantity REC Cost* ($)	RPS Budget ($)	LT Renewables Contract Quantity REC Cost Reduction ($)	Uncurtailed LT Renewables Contract Quantity REC Cost ($)	LT Renewables Quantity Reduction (%)
2017-2018	23,804,638	42,064,725	0	23,137,231	0.0%
2018-2019	23,446,480	42,212,391	0	23,357,415	0.0%
2019-2020	23,576,285	42,416,545	0	23,484,084	0.0%
2020-2021	23,188,923	42,359,368	0	23,095,360	0.0%
2021-2022	18,683,296	42,350,704	0	18,588,255	0.0%

*Includes applicable REC registry fees but excludes DG REC costs which were paid for by hourly ACP funds collected from customers served under Rate BESH.