COMMONWEALTH EDISON COMPANY

Load Forecast for Five-Year Planning Period
June 2016 – May 2021

July 15, 2015

TABLE OF CONTENTS

Page

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 2016 through May 2021.

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, 2016. 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, 2016 – May 31, 2021)

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 2015 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 2014 data and reviewed with subsequent enhancements. The models continue to perform well.

The 2015 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 2014. 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. These samples provide the basis for an analysis of actual historical hourly usage of Eligible Retail Customers because the standard meters currently used by the majority of these customers do not record usage on an hourly basis. (Over time the deployment of AMI meters to these customers may enhance this sample.) As discussed in greater detail below, the profiles show clear 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 2012 to December 2014.

Table II-1

Load Forecast Table (Historical Detail 2012-2014)

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
2012	1	1,113,049	1,268,557	19,952	17,352	286,014	251,024	719	1,546	1,419,733	1,538,479
2012	2	1,002,918	1,003,895	19,713	15,157	268,264	207,063	695	1,563	1,291,591	1,227,679
2012	3	889,193	908,161	16,770	12,791	266,940	205,048	587	1,568	1,173,491	1,127,569
2012	4	749,478	794,980	15,897	12,059	236,245	185,297	506	1,733	1,002,126	994,068
2012	5	892,511	1,014,805	18,038	13,007	260,396	197,408	345	1,720	1,171,289	1,226,939
2012	6	1,395,995	1,383,541	17,240	12,161	285,354	214,818	341	1,764	1,698,930	1,612,284
2012	7	1,881,588	1,841,516	15,450	11,351	336,523	271,884	332	1,664	2,233,893	2,126,415
2012	8	1,253,985	1,004,126	13,383	8,312	296,859	197,258	379	1,736	1,564,607	1,211,433
2012	9	620,240	758,566	8,980	7,952	207,444	188,892	463	1,464	837,127	956,875
2012	10	556,985	514,144	10,551	7,219	239,305	164,207	668	1,634	807,509	687,204
2012	11	631,591	636,484	9,523	7,299	201,907	161,673	681	1,500	843,702	806,956
2012	12	596,983	713,900	9,752	9,114	206,257	198,004	772	1,432	813,765	922,451
Totals		**11,584,517**	**11,842,675**	**175,250**	**133,776**	**3,091,507**	**2,442,577**	**6,488**	**19,324**	**14,857,762**	**14,438,351**
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**

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 2012-2014)

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

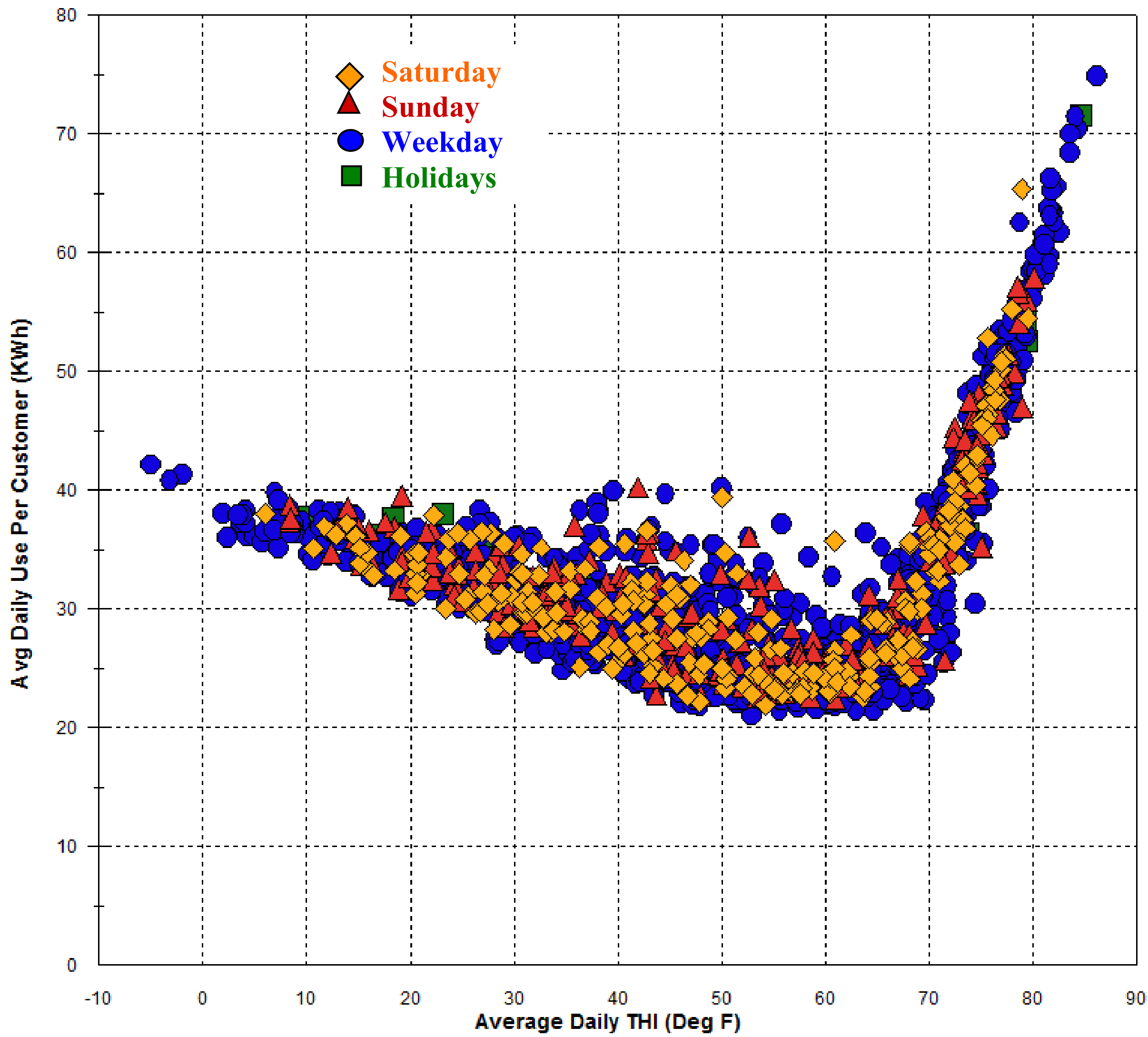
Year	Month	Total Load (MWh)		Average Load (MW)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
2012	1	1,419,733	1,538,479	4,225	3,771
2012	2	1,291,591	1,227,679	3,844	3,410
2012	3	1,173,491	1,127,569	3,334	2,876
2012	4	1,002,126	994,068	2,983	2,589
2012	5	1,171,289	1,226,939	3,328	3,130
2012	6	1,698,930	1,612,284	5,056	4,199
2012	7	2,233,893	2,126,415	6,648	5,212
2012	8	1,564,607	1,211,433	4,252	3,222
2012	9	837,127	956,875	2,754	2,300
2012	10	807,509	687,204	2,194	1,828
2012	11	843,702	806,956	2,511	2,101
2012	12	813,765	922,451	2,543	2,176
Totals		**14,857,762**	**14,438,351**		
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**		

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 2014 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.

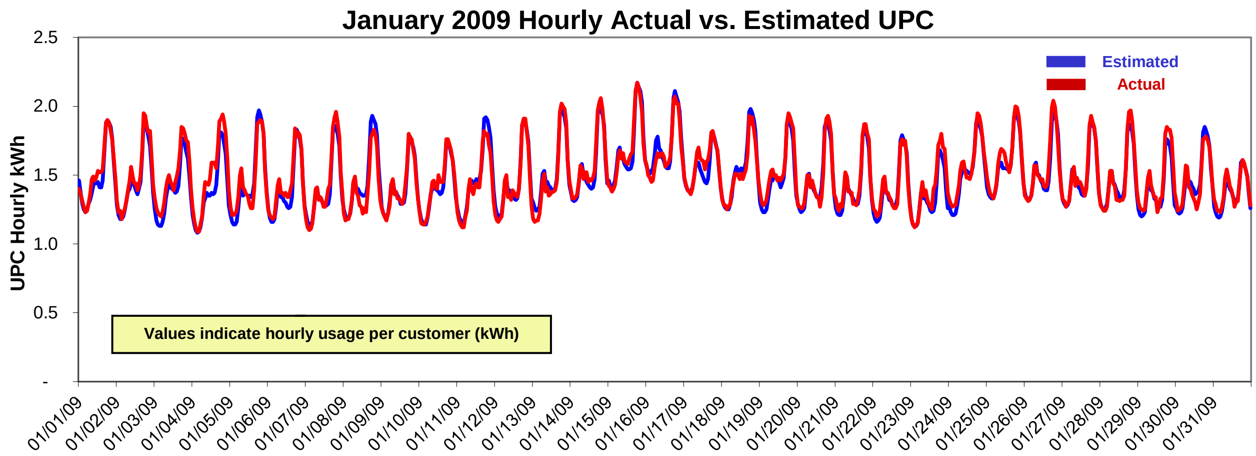
The scatter plot is very useful in understanding the relationship between customer usage and weather. If there were no relationship between usage and weather, then the graph would not display a clear pattern. However, it is apparent that there is a clear pattern. The right side of the graph at the high end of the horizontal axis shows the days on which THI was the highest. The points at that end of 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.

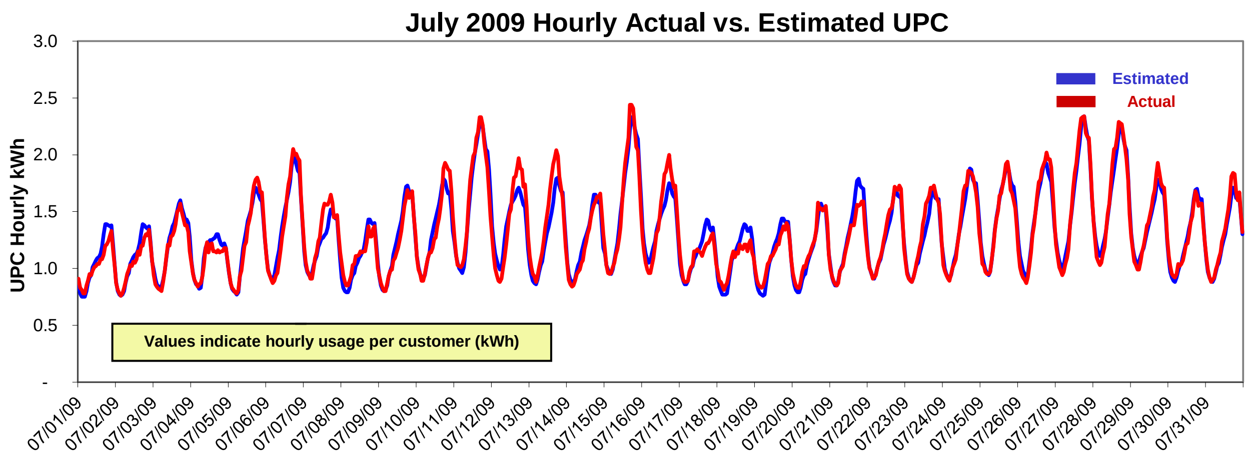
Hourly models were developed to account for the strong weather relationship shown in the graph and to account for numerous other factors that influence residential usage. The models explicitly account for the differing effects of energy use at various temperatures. Variables are included to allow for 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.

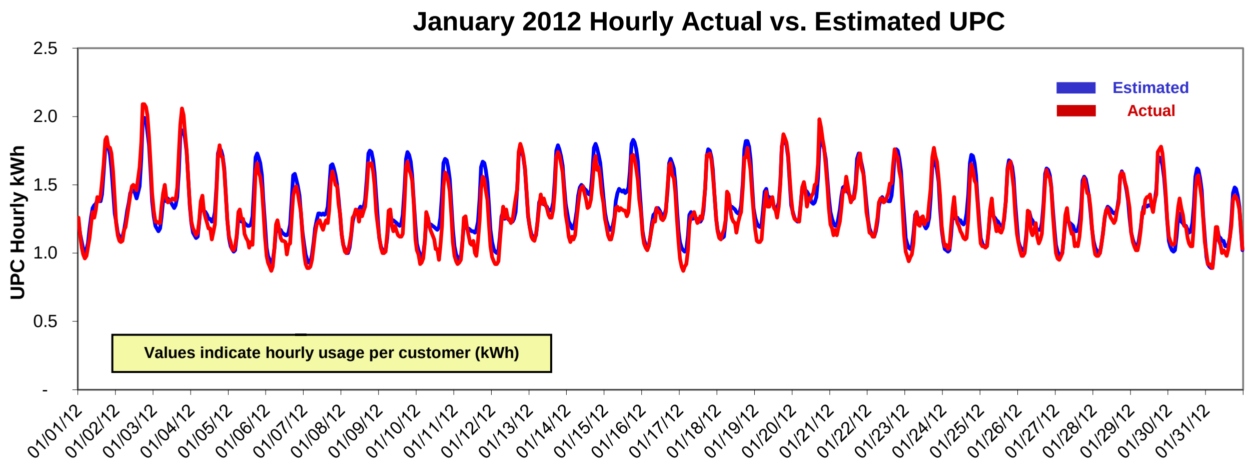
One way to visualize the model's performance is to look at plots of actual and estimated[2] values for the historical estimation period. The following charts demonstrate the performance of the model over four time periods at the hourly level for January and July of 2009 and January and July of 2012. 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.

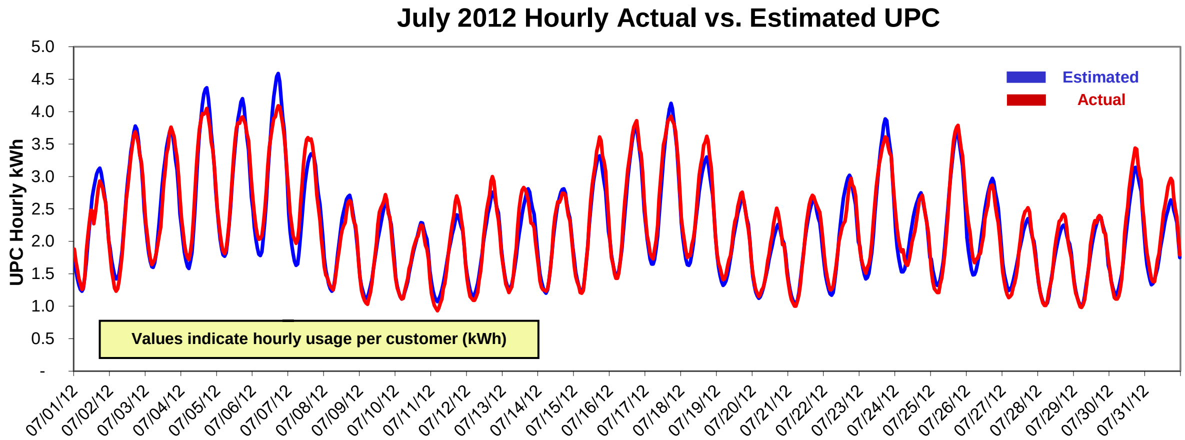
[2] The estimated data in Chart II-2 is based on the actual weather experienced over the relevant period.

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 2.2 million residential customers in the ComEd service territory were taking RES supply as of April 2015. In assessing retail development a more meaningful statistic is the 2.4 million that were taking RES supply in the latter part of 2013, which equates to approximately 70% of the total number of residential customers. Because customer choice is not stagnant it is more relevant to consider the 70% of residential customers that have implemented their choice and opted for RES supply. Further, it is not difficult to conceive that the percentage of residential customers that considered customer choice is greater than 70% as some

customers likely reviewed their alternatives and for whatever reason did not select RES supply. In summary, a very large number of residential customers have been involved in customer choice the past several years.

2. Municipal Aggregation ("Muni Agg") has been a major factor in the rapid expansion of residential RES supply over time. In total there are approximately 357 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 2015. That is an increase from the 345 Muni Agg Communities reported last year. The sheer number of 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. Approximately 92% of ComEd's entire non-residential usage is supplied through either RES or Hourly service as of April 2015. Approximately 72% of the usage for the smallest sized non-residential customers (i.e., the watt-hour only delivery class) is RES supplied. Suffice to say, non-residential customers of various sizes are actively participating in customer choice 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

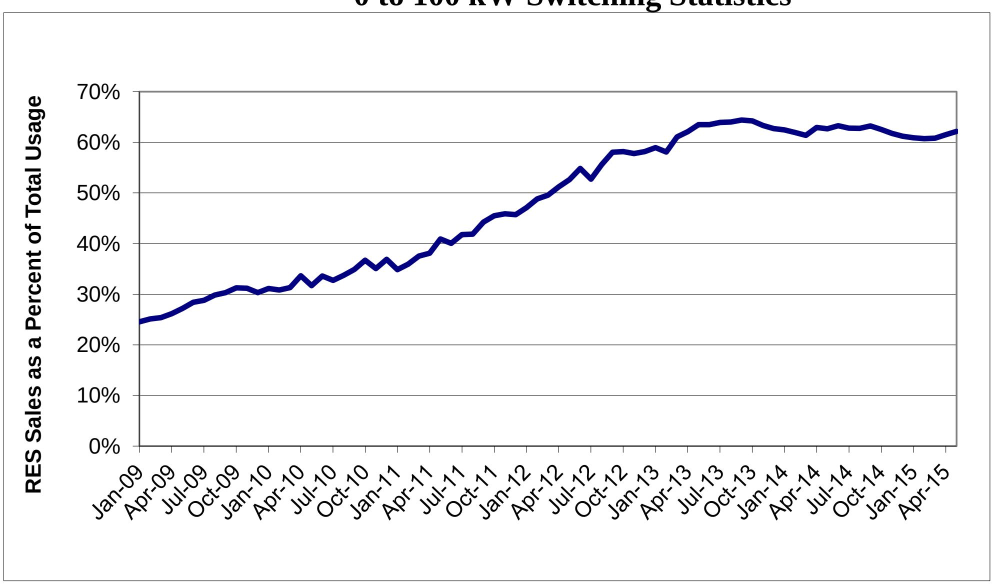
RES Category	May 2010	May 2011	May 2012	May 2013	May 2014	May 2015
Number of Active RESs[3]	26	31	48	66	70	71
Number of RESs approved to serve Residential customers	9	16	32	49	55	56
Number of entities in the RES certification process as of May 2015	N.A.	N.A.	N.A.	N.A.	N.A.	4

From May 2010 to May 2015 there has been an over 170% 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 more than 500% since 2010. 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 2015. RES usage has more than doubled in the past five years: RES usage was approximately 30% in May 2010 and grew to over 60% by May 2015. The percentage of RES usage within this group has been relatively steady over the past two years.

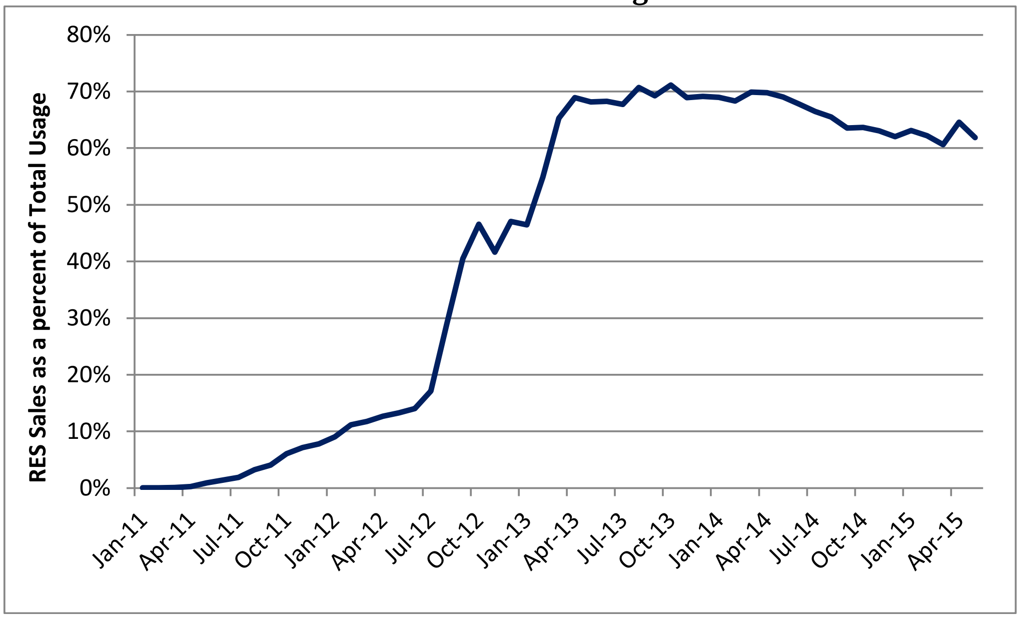
Chart II-3
0 to 100 kW Switching Statistics



[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 acceptability in the past few years. Chart II-4 contains the monthly percentage of usage by RES customers from January 2011 to May 2015. In just over four years, residential RES usage has gone from essentially zero usage in May 2011 to approximately 70% of total residential usage by late 2013 and declined to currently around 60%. The decline will be addressed in more detail below. 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 357 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%
May-15	37.2%	25.0%	34.8%
Jun-16	55.2%	46.4%	37.1%
Jun-17	61.6%	51.2%	37.7%
Jun-18	61.6%	51.2%	37.7%
Jun-19	61.6%	51.2%	37.7%
Jun-20	61.6%	51.2%	37.7%

The main drivers of this forecast are:

1. Residential Blended supply is expected to increase from the approximately 37% currently to approximately 54% by the end of 2015 as the City of Chicago is suspending its Muni Agg program in August 2015. This movement is the main reason for the increase in Blended supply in the near term. The City of Chicago is not unique in suspending its Muni Agg program as numerous other Communities have also suspended their Muni Agg programs in the past year and a half. Additional historical context is useful in understanding how the current level of Blended usage came about and how it plays into the forecast. That history and insight are as follows:

    a. As noted earlier, residential switching grew rapidly in the past several years. Significant savings opportunities fueled that rapid growth. The significant savings were related to legacy contracts in the IPA portfolio that largely expired in May 2014. It was effectively a one-way street of Communities opting for Muni Agg. Plus, thousands of residential customers were selecting RES supply outside of the Muni Agg programs given the savings opportunity. This growth peaked in late 2013 as the savings opportunity diminished with approximately 70% of the residential usage being RES supplied.

b. Given the reduced savings opportunity, the dynamics shifted in 2014. During 2014 over 200 Communities had RES contracts that were set to expire (or provided for a re-evaluation of the contract). Clearly, this is a very large number of Communities from which to judge the durability of Muni Agg programs. Approximately three-quarters of the suburban Communities (based on the number of residential customers in a Community) renewed their Muni Agg program in 2014. The City of Chicago also renewed its Muni Agg program in 2014, which results in an even higher renewal rate. The Communities typically decided to continue their Muni Agg programs because of savings opportunities, but also for other reasons such as price certainty and “100% green” products. Nonetheless, there were approximately 50 Communities that suspended their Muni Agg program during 2014. Generally, based on media reports, these Communities suspended their Muni Agg programs as they found insufficient savings. It is important to note that these Communities are suspending their Muni Agg program and may reconsider their options at a future date. The movement of Communities to ComEd supply during 2014 does not represent dissatisfaction with Muni Agg, but a reflection of consumer choice.

c. It is estimated that approximately 60% of the suburban Communities that renewed in 2014 were for a three year term. This highlights another attribute that contributes to the popularity of Muni Agg and that is price certainty for a number of years. As an aside, this large pool of Communities with a renewal date in 2017 is factored into the forecast as is noted below.

d. Suburban Muni Agg decisions during the first several months of 2015 have generally followed the pattern of 2014 of most renewing, but at a lower renewal rate. First, approximately two-thirds of the suburban Muni Agg Communities that have contracts expiring in 2015 and did not go through a renewal process in 2014 are continuing with their Muni Agg program. Second, approximately 60% of the suburban Communities that renewed in 2014 with a one-year contract are again renewing in 2015. These percentages are based on the number of residential customers in the Community. Again, Muni Agg continues to be popular, but the renewal rate is trending downward over time.

2. Looking to the Planning Year ("Planning Year")[4] 2016 and beyond, the savings opportunity will continue to be an important factor. The Blended Service supply price will likely be a little 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 the recent history of not all Muni Agg Communities renewing 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 more than half renewing in the past approximately 18 months. Yet, other considerations have caused some Communities not to renew and that trend of some Muni Agg Communities suspending their programs is expected to continue in 2016 and 2017 as additional Muni Agg contracts expire. Given the recent experience, it is assumed that 60% of Muni Agg Communities with contracts expiring in 2016 and 2017 will renew. There have been very few additional Muni Agg referendums being proposed in the past couple of years (and the few were generally for smaller communities). Thus, no new Muni Agg Communities are expected in the future. For the years 2018 and thereafter a status-quo environment of Muni Agg activity is anticipated. Given the general popularity of Muni Agg with an anticipated savings opportunity the number of Muni Agg Communities is expected to stabilize. While there is the potential for some Communities that suspended their programs to restart their programs at a future date there has been little evidence of that occurring to date. For example, approximately 5 out of 50 Communities that suspended in 2014 have restarted their Muni Agg program and those Communities have been reflected in the Forecast. The best available information and 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 2016 and July 2016; subject to any meaningful development related to switching activity during 2015 that will be communicated to the IPA.

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

4. Regarding the non-residential customer forecast there are two rather distinct groups. The 0 to 100 kW customer group is not greatly influenced by Muni Agg activity. The 0 to 100 kW group has held rather steady at approximately 35% for the past two years. Given no meaningful change in the savings opportunity this group is expected to stay fairly steady at 35% Blended Service in the future with a small increase related to the Muni Agg activity being less into the future. 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. Thus, the Watt-hour Blended Service percentage is expected to increase going forward.

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 35% to 37% during the forecast period.

2. The Blended Service portion of the Watthour customer class is expected to increase from 25% (May 2015) to approximately 51% by June 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 37% (May 2015) to approximately 61% by June 2017 for the reasons noted above. This increase is driven by the Muni Agg activity previously noted above. ComEd continues to utilize individual Muni Agg Community data in preparing its forecast. This granular level data of tracking over 800 Communities enhances the forecast precision given the variety of Communities involved in Muni Agg.

c. Known or Projected Changes to Future Load

Typically, when ComEd forecasts future loads, it considers whether there are any known major customer decisions, such as the relocation of part or all of a business, that would impact load. 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

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

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 10,000 in mid-2015 to approximately 29,000 by the end of the year 2020. This forecasted increase is reasonable given the program administrator's marketing plan. The expected 29,000 RRTP customers are a very small percent of the existing 3.5 million residential customers.

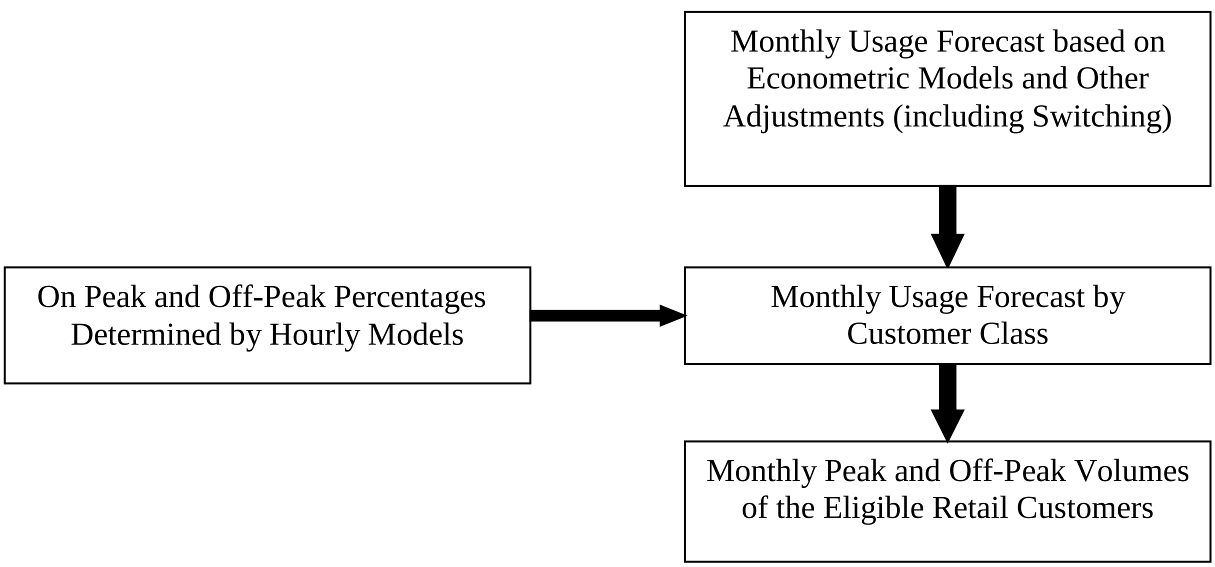
d. Growth Forecast by Customer Class

(i) Introduction

This section describes ComEd's growth forecast by customer class for the 5-year procurement planning period beginning on June 1, 2016. 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.

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

Chart II-5
ComEd Energy Usage Forecast Process

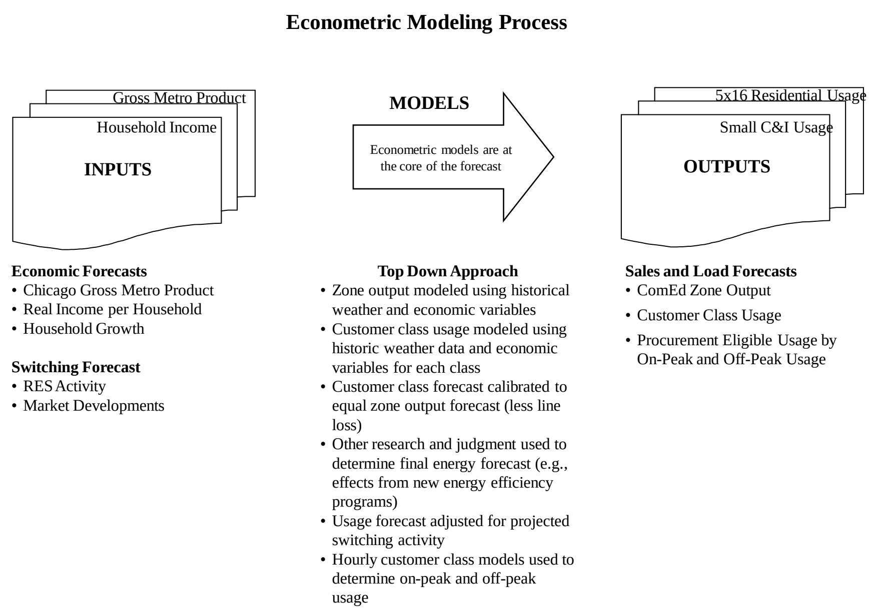


[6] See ICC Order of May 29, 2012 in Docket No. 11-0546. The RRTP program is again up for review in the Fall of 2015. While ComEd anticipates that the program will continue in a similar fashion as it currently operates, it is possible that certain changes to the program will come from this review that could impact the forecasted customer growth for the program. ComEd will address any such changes in the updated forecast it will present in March 2016.

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



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 (e.g., the weather and economy). 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. In addition, economic variables are also included. The gross metropolitan product ("GMP") for the Chicago and other metropolitan areas within ComEd's service territory is a good 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 (April 2015)										
Economic Variables	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Gross Metro Product (Billions)	$ 519	$ 529	$ 536	$ 546	$ 558	$ 572	$ 585	$ 596	$ 612	$ 628
Real Disposable Income (Millions)	$359,489	$367,876	$365,934	$368,904	$378,649	$385,989	$397,129	$407,496	$ 419,273	$431,492
# of Households (Thousands)	3,316	3,339	3,357	3,362	3,373	3,390	3,413	3,439	3,466	3,497
Real Income/HH	$108,404	$110,163	$109,005	$109,735	$112,267	$113,863	$116,365	$118,503	$ 120,979	$123,392
Total Employment (Thousands)	4,170	4,239	4,305	4,365	4,425	4,485	4,532	4,563	4,610	4,664
Non-Manufacturing	3,768	3,833	3,901	3,962	4,022	4,079	4,125	4,154	4,200	4,253
Manufacturing	403	406	405	403	402	405	407	408	411	411
Housing Starts	6,077	7,891	10,155	13,502	11,930	15,588	21,098	23,105	25,621	28,436
U.S. GDP	15,021	15,369	15,710	16,086	16,419	16,920	17,368	17,803	18,263	18,753
Growth Rate	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Gross Metro Product	13.9%	1.9%	1.4%	2.0%	2.2%	2.4%	2.3%	1.9%	2.6%	2.6%
Real Disposable Income	8.8%	2.3%	(0.5%)	0.8%	2.6%	1.9%	2.9%	2.6%	2.9%	2.9%
# of Households	(0.1%)	0.7%	0.5%	0.1%	0.3%	0.5%	0.7%	0.8%	0.8%	0.9%
Real Income/HH	8.8%	1.6%	(1.1%)	0.7%	2.3%	1.4%	2.2%	1.8%	2.1%	2.0%
Total Employment	1.3%	1.7%	1.6%	1.4%	1.4%	1.4%	1.1%	0.7%	1.0%	1.2%
Non-Manufacturing	1.2%	1.7%	1.8%	1.6%	1.5%	1.4%	1.1%	0.7%	1.1%	1.3%
Manufacturing	1.9%	1.0%	(0.4%)	(0.3%)	(0.2%)	0.7%	0.4%	0.4%	0.6%	(0.0%)
Housing Starts	11.6%	29.9%	28.7%	33.0%	(11.6%)	30.7%	35.3%	9.5%	10.9%	11.0%
U.S. GDP	1.6%	2.3%	2.2%	2.4%	2.1%	3.1%	2.6%	2.5%	2.6%	2.7%
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").

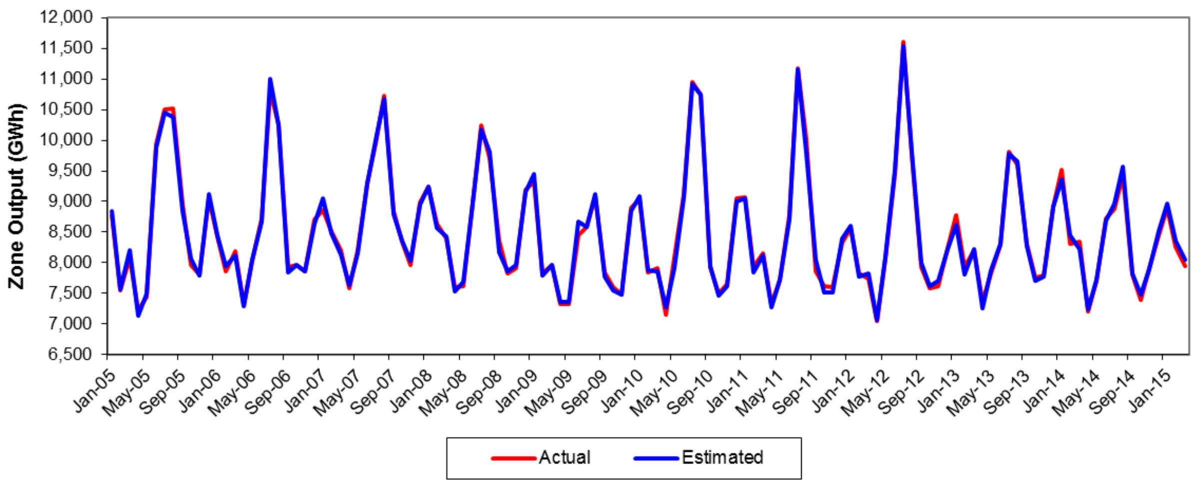
(ii) ComEd Monthly Zone Model

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

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

Monthly Zone Model by comparing actual zone output to the estimates[8] from that model for each calendar month from January 2005 through March 2015.

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



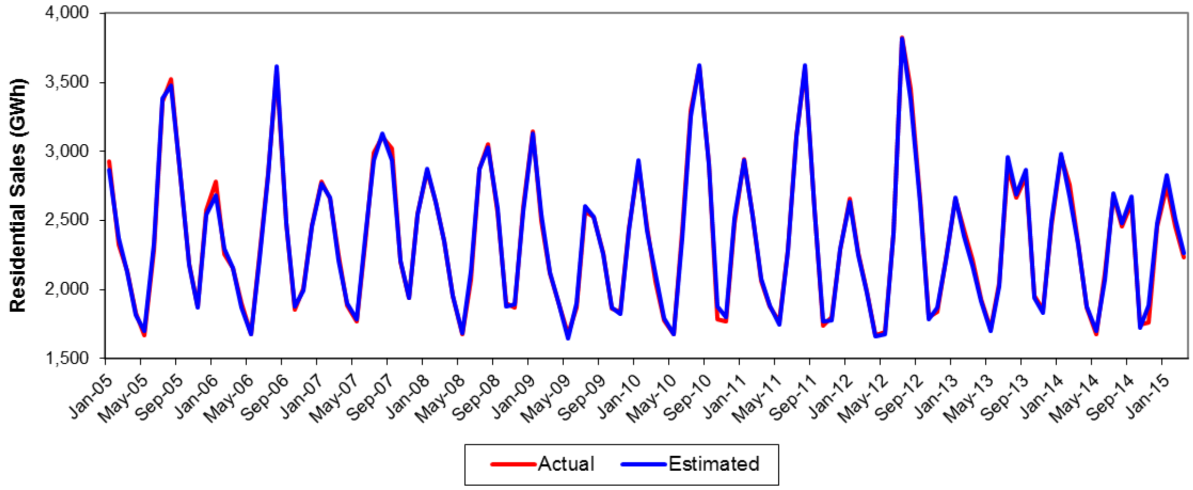
As with customer-level models discussed in Section II(B)(i)(a), the Monthly Zone Model is highly useful in understanding energy usage. The graph line depicting the model's estimated usage (based on actual weather) and the line showing actual usage for the period are nearly identical.

(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 March 2015. The graph line depicting the model's estimated usage and the line with actual usage for the period are highly correlated.

[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.

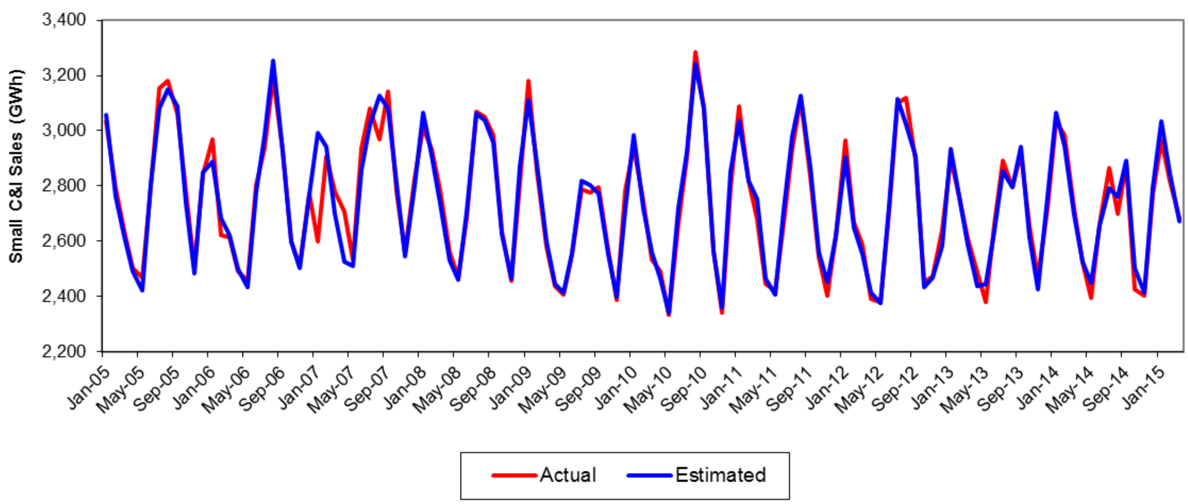
Chart II-8
ComEd Monthly Residential Model: Estimated vs. Actual



(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	27,133	(1.1%)	31,959	(0.3%)
2016	27,254	0.4%	32,003	0.1%
2017	27,316	0.2%	31,665	(1.1%)
2018	27,658	1.3%	31,371	(0.9%)
2019	27,896	0.9%	31,126	(0.8%)
2020	28,131	0.8%	31,008	(0.4%)
2021	28,175	0.2%	30,710	(1.0%)

Residential customer class usage declined by an average of 0.5% per year from 2007 to 2014. This decline is attributed to a combination of the 2009 recession 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. In addition, the implementation of energy efficiency programs has worked to reduce residential usage. Progressively conditions have improved over time with positive growth being achieved in 2014. The improving economic conditions, a better housing market and relatively low energy prices are viewed as the important contributors to the growth in 2014. Single-family home prices increased approximately 21% from April 2012 (the low for home prices since the recession) to April 2014 (per the Chicago-area Case-Shiller index). The year 2015 reflects a decline in usage related to electricity price increases (mostly from a June 2014 capacity price increase) and greater energy efficiency impacts (both internal programs and national lighting standard changes). Looking to the future, the average annual growth is forecasted to be 0.4% from 2014 to 2020 or just below the rate of residential customer growth during that time period. Residential usage does not exceed the usage levels of 2007 in the Forecast period.

Small C&I usage declined 0.6% per year from 2007 to 2014. 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 2014 to 2020 is expected to decline 0.5% 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 plans for subsequent years have not yet been developed by ComEd or approved by the ICC. While Planning Year targets have not been established 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 2015-16.

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.

The 2014 portfolio of ComEd programs includes the following:

- **Direct Load Control ("DLC"):** ComEd's residential central air conditioning cycling program is a DLC program with 72,900 customers with a load reduction potential of 88 MW (ComEd Rider AC).

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

- **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 1,171 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 commences with the 2015 Planning Year. ComEd sold 48 MW of capacity from the program into the PJM capacity auction for the 2017 Planning Year and 10 MW for the summer of 2015.

(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 two years that remain 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)
2016	5,552	5.6	77.5
2017	6,103	6.1	83.7

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

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

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).

(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:

[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.

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)
2016	1,309	19	339
2017	1,524	25	407
2018	1,544	28	468
2019	1,580	32	528
2020	1,436	35	573

(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 three-year Section 8-103 EE/DR plan in 2013, ComEd reviewed all of its programs and determined that two of those programs are more appropriately suited for submission to the IPA under section 16-111.5B:

- Home Energy Reports
- Small Business Energy Services

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

ComEd filed its plan with the ICC on August 30, 2013. On January 28, 2014 the Commission approved the plan; however, that approval was conditioned on ComEd removing the Residential Lighting program from the 8-103 portfolio for the latter two years of the plan and submitting it to the IPA. Both last year's and this year's 16-111.5B analysis reflects this change.

In addition, for this year's analysis, ComEd solicited proposals from third party vendors to provide additional energy efficiency programs. Seventeen proposals were received and reviewed by ComEd and stakeholders. One proposal was subsequently withdrawn by the vendor and four proposals were found to duplicate existing and continuing programs that were already being offered. Concurrent with this threshold screening, the sixteen 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. In prior years, ComEd's TRC analyses of third-party programs did not include administrative or evaluation costs; during last year's IPA Procurement docket and subsequent workshops it was determined that utilities should track administrative costs associated with third party programs implementation and incorporate these findings into its cost-effectiveness evaluations on a going-forward basis. ComEd tracked costs over the past year and determined that administrative costs would add 8.5% 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 11.5% 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.

Since this is the first time that these adders are being incorporated, ComEd is providing TRC results with and without these adders, so that the impacts of these adders can be reviewed by IPA and stakeholders.

Eleven of the remaining proposals satisfied the TRC test threshold with a result greater than 1.0. Interestingly, the inclusion or exclusion of the aforementioned cost adders did not affect the TRC outcome for any proposal. 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). All of the proposals that satisfied the TRC criteria also met this criterion with a Utility Cost Test result greater than 1.0.

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-4. Note that all cost-effective metrics within Appendix C-4 do not include the aforementioned administrative and evaluation adders.

The total program-level budget estimate for the ComEd programs and the third-party program proposals is $20,055,842. 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 one-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, C-3 and C-4. Appendix C-2 also contains, for reference only, those programs that were approved in the previous two IPA procurement dockets. Since these programs have previously been approved, ComEd is not requesting re-approval of those programs.

One of the outcomes from last year's 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 PY8 (i.e., Planning Year 2015), two previously approved proposals require adjustments as shown below. Both programs remain cost-effective as modified.[14]

CLEAResult Private School DI

Original	PY8	PY9	Total
Budget	$1,075,939	$1,072,354	$2,148,293
Gross kWh goal	4,097,029	4,310,423	8,407,452
NTG	1.0	1.0	N/A
Net kWh goal	4,097,029	4,310,423	8,407,452
Price, $/kWh	$0.2626	$0.2488	$0.2555

New (Vendor Request)	PY8	PY9	Total
Budget	$1,075,939	$1,072,354	$2,148,293
Gross kWh goal	4,097,029	4,310,423	8,407,452
NTG (deemed by Navigant)	0.95	1.00	N/A
Net kWh goal	3,892,178	4,310,423	8,202,601
Price, $/kWh	$0.2764	$0.2488	$0.2619
TRC @ proposed price & goal	N/A	N/A	1.05

Difference	PY8	PY9	Total
Budget	$0	$0	$0
NTG (deemed by Navigant)	-0.05	0.00	N/A
Net kWh goal	-204,851	0	-204,851
Price, $/kWh	$0.0138	$0.0000	$0.0064

Matrix Energy DCV

Original (Commission-Approved)	PY8	PY9	Total
Budget	$1,290,536	$1,240,536	$2,531,072
Gross kWh goal	6,491,056	6,491,056	12,982,112
NTG	0.85	0.85	N/A
Net kWh goal	5,517,398	5,517,398	11,034,795
Price, $/kWh	$0.2339	$0.2248	$0.2294

New (Vendor Request)	PY8	PY9	Total
Budget	$1,290,536	$1,240,536	$2,531,072
Gross kWh goal	6,491,056	6,491,056	12,982,112
NTG (deemed by Navigant)	0.80	0.85	N/A
Net kWh goal	5,192,845	5,517,398	10,710,242
Price, $/kWh	$0.2485	$0.2248	$0.2363
TRC @ proposed price & goal	N/A	N/A	2.75

Difference	PY8	PY9	Total
Budget	$0	$0	$0
NTG (deemed by Navigant)	-0.05	0.00	N/A
Net kWh goal	-324,553	0	-324,553
Price, $/kWh	$0.0146	$0.0000	$0.0070

[14] Additionally, two vendors with multi-year programs approved in the 2014 Procurement Plan are shifting budgets from the 2014-15 year to the 2015-16 year. Accelerate Group is shifting $80,000 (20% of its budget), while Elevate Energy is shifting $90,000 from 2015-16 to 2016-17.

(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-4.

(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.[15] 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[16]. The UCT compares the avoided costs realized by implementing energy efficient measures to the utility's costs to acquire those measures. Since the language in 16-111.5B(a)(3)(D) does not address the time value of money, ComEd has adopted a position preferred by the Stakeholder Advisory Group which adopts a discount rate of zero for this test only. The TRC and UCT results are listed in columns G and H of Appendix C-2.

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

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

(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 I 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-3 shows the amount of energy that each of the new or expanded cost-effective energy efficiency programs or measures is expected to save each month over the five-year Forecast period. Appendix C-2, Columns D and E show the annualized MWh savings at the busbar and the meter, respectively, for each of the measures.

(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 also provided in Appendix C-3.

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
2016-2017	11.5% of June 1, 2014 through May 31, 2015 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.
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.

Based on the above, Table II-12 shows the amount of renewable energy resources that need to be procured for Planning Years 2016-2020, 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)
2016-17	2014-15	14,168,322	11.5%	1,629,357	1,561,397	67,960
2017-18	2015-16	18,161,027	13.0%	2,360,934	1,533,198	827,736
2018-19	2016-17	19,850,316	14.5%	2,878,296	1,261,725	1,616,571
2019-20	2017-18	21,525,729	16.0%	3,444,117	1,261,725	2,182,392
2020-21	2018-19	21,654,130	17.5%	3,789,473	1,261,725	2,527,748

Table II-13

Renewable Energy Resources Budgets

Plan Year	Plan Year Delivered Volume (MWH)	RPS 2.015% Cost Cap ($/MWH)	RPS Budget ($)	Contracted Spend ($)	Remaining Budget ($)
2016-17	19,850,316	1.8917	37,550,843	23,502,192	14,048,651
2017-18	21,525,729	1.8917	40,720,222	23,803,641	16,916,581
2018-19	21,654,130	1.8917	40,963,118	23,438,590	17,524,528
2019-20	21,808,169	1.8917	41,254,513	23,566,909	17,687,604
2020-21	21,821,682	1.8917	41,280,076	23,178,932	18,101,144

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[17] 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 2016-17.

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 2015 and PY 2016. 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 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, 2014 through May 31, 2015, ComEd has collected $8,985,277 in hourly ACP funds for a total balance as of May 31, 2015 of $19,039,957.

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

The available hourly ACP funds will be reduced by the dollars committed to be spent in the Fall 2015 DG procurement that will be 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, 2016 through May 31, 2017:

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
2016	6	1,028,134	857,690	2,921	2,331
2016	7	1,106,828	1,197,828	3,459	2,825
2016	8	1,213,850	984,989	3,299	2,620
2016	9	834,231	790,234	2,483	2,058
2016	10	742,323	744,480	2,209	1,825
2016	11	840,908	817,990	2,503	2,130
2016	12	955,486	1,003,198	2,844	2,459
2017	1	960,774	1,022,311	2,859	2,506
2017	2	850,758	817,484	2,659	2,322
2017	3	874,868	776,671	2,377	2,066
2017	4	685,040	732,362	2,141	1,831
2017	5	776,176	717,090	2,205	1,829
Totals		**10,869,376**	**10,462,327**		

The forecast set forth above shows ComEd's expected load for the 2016 Planning Year.[18] 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 2016 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.

[18] 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-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
2016	6	892,742	763,772	2,536	2,075
2016	7	1,049,971	864,320	3,281	2,038
2016	8	886,777	898,367	2,410	2,389
2016	9	795,855	748,450	2,369	1,949
2016	10	712,237	651,537	2,120	1,597
2016	11	723,946	779,130	2,155	2,029
2016	12	916,618	894,364	2,728	2,192
2017	1	886,298	1,015,437	2,638	2,489
2017	2	814,513	749,045	2,545	2,128
2017	3	800,011	694,318	2,174	1,847
2017	4	665,964	646,815	2,081	1,617
2017	5	704,036	687,287	2,000	1,753
Totals		**9,848,968**	**9,392,842**		

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
2016	6	1,184,745	992,151	3,366	2,696
2016	7	1,364,052	1,416,791	4,263	3,341
2016	8	1,625,391	1,355,168	4,417	3,604
2016	9	875,572	828,179	2,606	2,157
2016	10	786,888	792,862	2,342	1,943
2016	11	948,220	928,968	2,822	2,419
2016	12	1,033,344	1,086,104	3,075	2,662
2017	1	1,000,246	1,071,747	2,977	2,627
2017	2	914,376	889,253	2,857	2,526
2017	3	932,684	807,249	2,534	2,147
2017	4	740,246	793,990	2,313	1,985
2017	5	804,148	735,678	2,285	1,877
Totals		**12,209,912**	**11,698,140**		

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 51.1% (based on usage) as of December 2017 compared to 54.6% 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 58.1% as of December 2017 compared to 54.6% 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-Global Insight in its U.S. Executive Summary dated June 2015:

> "Recovery Derails" Scenario: In the pessimistic scenario, subpar global growth prevails throughout the forecast period. In the short run, the dollar appreciates and dampened foreign demand cuts into corporate profits. Meanwhile, consumers focus on deleveraging in the near term, but their excessive caution restrains domestic growth. In an effort to tighten budgets, and in light of the lack of meaningful productivity growth in nonfarm business, wage growth slows in the private sector. With the average household budget reduced by 3.4% relative to the baseline by early 2017, consumers are forced to tighten their belts. The housing recovery proceeds at a more moderate pace than in the baseline. In this scenario, real GDP grows 1.6% in 2015 and 1.3% in 2016 (versus 2.1% and 3.1% in the baseline, respectively).
>
> "Stronger Productivity Growth" Scenario: In the optimistic scenario, a permanent jump in total factor productivity ("TFP") growth shifts the economy into a higher gear, and improves labor market conditions. Higher TFP growth leads to a virtuous cycle in which production and technology gains lead to employment gains, which lead to income gains, and then further production and technology gains. Solid employment and wage growth encourages people to form families, and household formation breaks out of the recent weak trend. Housing starts climb as demand goes up and real consumption climbs to 4.0% in 2016 (versus 2.9% in the baseline). In addition, foreign growth strengthens more than in the baseline. In this scenario, real GDP grows 2.4% in 2015 and 4.0% in 2016.

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, 2016 through May 31, 2021 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. Monthly Savings Curve
4. Program Details

D. Renewables

E. Municipal Aggregation

Appendix A-1

Residential Single Family Model (Hour 16)			
Variable	**Coefficient**	**T-Stat**	**Notes**
Constant	1.1873	33.96	Constant term
Monday Binary	-0.0681	-4.64	Daily Binary - Monday
Tuesday Binary	-0.0840	-5.75	Daily Binary - Tuesday
Wednesday Binary	-0.1011	-6.96	Daily Binary - Wednesday
Thursday Binary	-0.0986	-6.73	Daily Binary - Thursday
Friday Binary	-0.0896	-6.10	Daily Binary - Friday
Saturday Binary	-0.0487	-4.08	Daily Binary - Saturday
MLK Binary	0.0560	0.93	Martin Luther King's Day
Presidents Day Binary	0.0721	1.19	President's Day
GoodFriday Binary	0.0015	0.02	Good Friday
Memorial Day Binary	0.0769	1.21	Memorial Day
July4th Binary	0.0860	1.27	July 4th.
LaborDay Binary	0.0748	1.18	Labor Day
Thanksgiving Binary	0.1286	1.86	Thanksgiving Day
FriAThanks Binary	0.0541	0.79	Friday after Thanksgiving Day
XMasWeek Before Binary	0.1203	1.81	Week before Christmas
XMasEve Binary	0.3375	4.20	Christmas Eve
XMasDay Binary	0.1944	2.43	Christmas Day
XMasLights Binary	0.0006	0.38	Christmas Lights
XMasWeek Binary	0.0994	1.21	Christmas Week
New Years Eve Binary	0.1869	2.02	New Year's Eve Day
New Years Day Binary	0.0953	1.26	New Year's Day
Feb Binary	-0.0918	-2.75	Monthly Binary - February
Mar Binary	-0.1530	-4.59	Monthly Binary - March
MarDLS Binary	0.0240	0.39	Day That Daylight Savings Begins In March
Apr Binary	-0.2249	-6.34	Monthly Binary - April
May Binary	-0.2735	-7.13	Monthly Binary - May
Jun Binary	-0.0198	-0.51	Monthly Binary - June
Jul Binary	0.0846	2.01	Monthly Binary - July
Aug Binary	0.1939	4.88	Monthly Binary - August
Sep Binary	0.0609	1.50	Monthly Binary - September
Oct Binary	-0.0805	-2.08	Monthly Binary - October
NovDLS Binary	-0.0463	-0.67	Day That Daylight Savings Ends In November
Nov Binary	-0.0945	-2.44	Monthly Binary - November
Dec Binary	-0.0535	-1.35	Monthly Binary - December
JanWalk	-0.0028	-2.15	Monthly Time Trend - January - January
FebWalk	-0.0025	-1.82	Monthly Time Trend - February
MarWalk	-0.0023	-1.90	Monthly Time Trend - March
AprWalk	-0.0003	-0.24	Monthly Time Trend - April

MayWalk	0.0105	8.39	Monthly Time Trend - May
JunWalk	0.0078	6.05	Monthly Time Trend - June
JulWalk	0.0021	1.65	Monthly Time Trend - July
AugWalk	-0.0017	-1.41	Monthly Time Trend - August
SepWalk	-0.0048	-3.56	Monthly Time Trend - September
OctWalk	0.0040	3.05	Monthly Time Trend - October
NovWalk	0.0012	0.78	Monthly Time Trend - November
DecWalk	0.0020	1.15	Monthly Time Trend - December
Shift2010	-0.0250	-2.26	An End Shift to describe usage for 2010 and beyond
Shift2011	0.0488	4.42	An End Shift to describe usage for 2011 and beyond
Shift2012	0.0121	1.09	An End Shift to describe usage for 2012 and beyond
Shift2013	0.0324	2.70	An End Shift to describe usage for 2013 and beyond
Shift2014	0.0618	5.32	An End Shift to describe usage for 2014 and beyond
SeasonHDD	0.0086	10.49	Seasonal Heating Degree Days Spline
LagHDD	-0.0014	-1.53	1 Day Lag Seasonal Heating Degree Days Spline
Lag2HDD	0.0014	1.99	2 Day Lag Seasonal Heating Degree Days Spline
SeasonTDD	0.1685	44.46	Seasonal Cooling Degree Days Spline
LagTDD	0.0039	1.27	1 Day Lag Seasonal Cooling Degree Days Spline
Lag2TDD	0.0149	6.24	2 Day Lag Seasonal Cooling Degree Days Spline
HDDWkEnd	0.0007	1.27	Weekend Seasonal Heating Degree Days Spline
TDDWkEnd	0.0090	3.19	Weekend Seasonal Cooling Degree Days Spline
HDDTrend	-0.0004	-2.77	Time Trend Seasonal Heating Degree Days Spline
TDDTrend	-0.0022	-2.40	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 3.9%. The 3.9% 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	1326.348	923.05	1.437
CalVars.Jan	-16.675	33.152	-0.503
CalVars.Feb	-235.637	89.756	-2.625
CalVars.Mar	-247.612	47.063	-5.261
CalVars.Apr	-368.616	72.523	-5.083
CalVars.May	-260.814	87.121	-2.994
CalVars.Jun	2.483	91.419	0.027
CalVars.Jul	106.083	101.18	1.048
CalVars.Aug	232.111	92.727	2.503
CalVars.Sep	11.032	84.332	0.131
CalVars.Oct	-158.893	69.98	-2.271
CalVars.Nov	-128.707	57.559	-2.236
CalVars.Jul10Plus	-153.021	42.981	-3.56
CalVars.Jan13Plus	-213.644	50.77	-4.208
CalHDD.HDDSpline	2.194	0.107	20.598
CalCDD.SpringTDD	12.116	1.093	11.089
CalCDD.SummerTDD	13.009	0.352	36.946
CalCDD.FallTDD	15.999	2.463	6.496
CalCDD.Yr11Plus_TDDShift	-0.672	0.268	-2.509
Monthly.EconIndex4	3.09	0.45	6.874
AR(1)	0.585	0.086	6.786

Residential Customer Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	16.617	3.325	4.997
Monthly.Feb	15.301	3.324	4.604
Monthly.Mar	14.331	3.313	4.326
Monthly.Apr	12.717	3.312	3.84
Monthly.May	12.414	3.289	3.775
Monthly.Jun	13.121	3.297	3.98
Monthly.Jul	15.619	3.288	4.751
Monthly.Aug	15.562	3.277	4.749
Monthly.Sep	15.36	3.297	4.658
Monthly.Oct	13.773	3.294	4.181
Monthly.Nov	13.092	3.308	3.957
Monthly.Dec	15.338	3.314	4.628
Monthly.Yr2011Plus	-0.385	0.162	-2.386
Monthly.Yr2012Plus	-0.836	0.167	-5.001
CycVars.IncPerHH	0.046	0.029	1.599
CycWthrT.ResHDD_Spring	0.253	0.036	6.972
CycWthrT.ResHDD_Fall	0.316	0.07	4.485
CycWthrT.ResHDD_Winter	0.2	0.014	13.85
CycWthrT.ResCDD_Spring	3.385	0.589	5.747
CycWthrT.ResCDD_Jun	2.965	0.183	16.17
CycWthrT.ResCDD_Jul	2.51	0.078	32.38
CycWthrT.ResCDD_Aug	2.682	0.074	36.17
CycWthrT.ResCDD_Sep	2.663	0.129	20.58
CycWthrT.ResCDD_Fall	2.986	0.212	14.1
CycWthrT.Yr06Plus_ResCDDShift	-0.29	0.052	-5.575
CycVars.ResBill_MA	-0.057	0.016	-3.453
AR(1)	0.278	0.105	2.64

Small C&I Customer Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	32.996	9.802	3.366
Monthly.Feb	35.977	9.796	3.673
Monthly.Mar	35.007	9.829	3.562
Monthly.Apr	33.528	9.911	3.383
Monthly.May	31.901	9.968	3.2
Monthly.Jun	31.216	10.023	3.114
Monthly.Jul	30.911	10.118	3.055
Monthly.Aug	33.353	10.118	3.296
Monthly.Sep	34.148	10.075	3.389
Monthly.Oct	35.224	9.995	3.524
Monthly.Nov	33.231	9.952	3.339
Monthly.Dec	31.426	9.878	3.181
Monthly.Yr2012Plus	-2.655	0.432	-6.15
CycWthrT.SCI_HDD	0.439	0.051	8.672
CycWthrT.SCI_CDD	2.722	0.162	16.806
CycWthrT.SCI_CDDTrend	-0.06	0.014	-4.367
CycVars.SCI_Econ_Index	0.019	0.004	4.771
SCI.DelayedBill2	-0.026	0.003	-7.939
AR(1)	0.184	0.103	1.789

StreetLighting Class Model			
Variable	**Coefficient**	**StdErr**	**T-Stat**
Monthly.Jan	-3.146	1.927	-1.633
Monthly.Feb	-3.191	1.926	-1.657
Monthly.Mar	-3.52	1.927	-1.827
Monthly.Apr	-3.626	1.928	-1.881
Monthly.May	-3.759	1.926	-1.952
Monthly.Jun	-3.779	1.921	-1.967
Monthly.Jul	-3.81	1.92	-1.984
Monthly.Aug	-3.742	1.918	-1.951
Monthly.Sep	-3.578	1.919	-1.865
Monthly.Oct	-3.518	1.919	-1.833
Monthly.Nov	-3.344	1.922	-1.74
Monthly.Dec	-3.207	1.926	-1.665
CycVars.ResCust	0.002	0.001	2.827
Monthly.Oct09Plus	0.113	0.058	1.968
Monthly.July10Plus	-0.062	0.061	-1.008
Monthly.Yr2013Plus	0.102	0.045	2.264
AR(1)	0.395	0.091	4.351

Appendix A-3

ComEd Model Regression Statistics

Regression Statistics	Zone	Residential	Small C&I	Street Lighting
Iterations	26	22	14	11
Adjusted Observations	123	119	118	110
Deg. of Freedom for Error	102	92	99	93
R-Squared	0.993	0.996	0.967	0.897
Adjusted R-Squared	0.992	0.995	0.961	0.879
AIC	9.065	-1.953	0.725	-4.394
BIC	9.545	-1.323	1.171	-3.977
Log-Likelihood	-711.01	-25.64	-191.22	102.61
Model Sum of Squares	114,873,021	2,550.26	5,189.40	8.66
Sum of Squared Errors	755,776.88	10.72	176.58	1
Mean Squared Error	7,409.58	0.12	1.78	0.01
Std. Error of Regression	86.08	0.34	1.34	0.1
Mean Abs. Dev. (MAD)	61.34	0.23	0.98	0.07
Mean Abs. % Err. (MAPE)	0.73%	1.03%	1.10%	3.66%
Durbin-Watson Statistic	2.345	1.882	1.907	1.941
Ljung-Box Statistic	36.23	18.75	24.52	39.65
Prob (Ljung-Box)	0.0522	0.765	0.4321	0.0233
Prob (Jarque-Bera)	0.6014	0.1202	0.6992	0.3724

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). Consistent with its recent delivery services rate case filing, ComEd's weather normals are based on the 30-year time period of 1981 to 2010. 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 EconIndex4 variable is a composite economic variable that weights the contributions of GMP, total number of residential customers, 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. The GMP is adjusted for inflation and is obtained from Global Insight. Further, the variable is 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 variable's units are billions of dollars. The residential customer's component is the total number of residential customers within the ComEd service territory. This economic variable reflects the effect of a growing customer base on energy usage and is driven by household formations. This variable is also adjusted for the number of weekends, holidays and weekdays within a calendar month. The non-manufacturing employment is defined below in the Small C&I model. The three economic variables are weighted based on an exponential formula with each of the economic variable roughly receiving a one-third weighting.

- 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 TDD shift variable is a weather variable that captures the changing relationship of cooling equipment over time. Simply put, the effect of a TDD changes over time as customer's usage patterns change over time. The TDD variable is interacted with a binary variable for all years greater than or equal to 2011. The negative sign in the variable's coefficient acknowledges the reduction in cooling effect beginning in 2011. The TDD shift 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 HDD Spline trend variable is a weather variable that reflects the changing relationship of heating equipment over time. This variable is conceptually similar to the TDD trend variable. The HDD spline trend variable is in degree-day units.

- The Year July 2010 and July 2012 Shift Plus variables are binary variables designed to capture very recent usage activity within the model. For example, the July 2012 Shift Plus variable is a binary variable with the unit one for all months beginning with July 2012 and thereafter. By forcing all of the residuals to sum to zero for the months July 2012 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 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 Global Insight. 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.

- The Monthly Bill (Moving Average) 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. Lastly, a 12 month moving average is calculated for each month (average of the current month and the 11 preceding months). This variable reflects the influence of electricity charges/prices over time related to consumer behavior.

- 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.

- The Year 2012 Plus binary variable is similar in concept to the same variables used in the Monthly Zone Model.

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, total number of residential customers, and non-manufacturing employment in the ComEd service territory. The three economic variables are weighted based on an exponential formula with a weighting of employment (55%), residential customers (25%) and GMP (20%). The GMP and residential customer variables are 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

- The July 2007 and Year 2012 Shift Plus binary variable is similar in concept to the Monthly Zone model.

- 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 residential customer variable is the total number of residential customers within the ComEd service territory. This economic variable reflects the relationship of a growing service territory (measured by the number of residential customers) and street lighting usage.

- The October 2009 and July 2010 Shift Plus binary variable is 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
2016	6	1,028,134	857,690	2,921	2,331
2016	7	1,106,828	1,197,828	3,459	2,825
2016	8	1,213,850	984,989	3,299	2,620
2016	9	834,231	790,234	2,483	2,058
2016	10	742,323	744,480	2,209	1,825
2016	11	840,908	817,990	2,503	2,130
2016	12	955,486	1,003,198	2,844	2,459
2017	1	960,774	1,022,311	2,859	2,506
2017	2	850,758	817,484	2,659	2,322
2017	3	874,868	776,671	2,377	2,066
2017	4	685,040	732,362	2,141	1,831
2017	5	776,176	717,090	2,205	1,829
2017	6	1,119,889	929,786	3,182	2,527
2017	7	1,205,023	1,305,345	3,766	3,079
2017	8	1,315,771	1,074,639	3,575	2,858
2017	9	859,570	896,714	2,686	2,242
2017	10	837,900	771,405	2,380	1,968
2017	11	909,812	885,651	2,708	2,306
2017	12	976,810	1,128,375	3,053	2,661
2018	1	1,094,258	1,068,563	3,109	2,726
2018	2	919,602	890,075	2,874	2,529
2018	3	902,405	878,043	2,564	2,240
2018	4	780,701	762,168	2,324	1,985
2018	5	841,860	777,858	2,392	1,984
2018	6	1,069,043	984,620	3,182	2,564
2018	7	1,272,054	1,261,261	3,786	3,091
2018	8	1,319,757	1,084,523	3,586	2,884
2018	9	824,259	944,556	2,711	2,271
2018	10	883,486	744,735	2,401	1,981
2018	11	920,001	894,669	2,738	2,330
2018	12	983,968	1,135,477	3,075	2,678
2019	1	1,096,443	1,073,155	3,115	2,738
2019	2	920,802	895,000	2,878	2,543
2019	3	862,902	916,643	2,568	2,247
2019	4	823,971	732,775	2,341	1,991
2019	5	846,406	779,999	2,405	1,990

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
2019	6	1,017,031	1,037,761	3,178	2,594
2019	7	1,339,433	1,215,565	3,805	3,101
2019	8	1,267,394	1,141,307	3,601	2,911
2019	9	877,120	909,567	2,741	2,274
2019	10	890,353	749,827	2,419	1,994
2019	11	876,601	942,606	2,739	2,357
2019	12	1,040,253	1,101,958	3,096	2,701
2020	1	1,099,765	1,078,455	3,124	2,751
2020	2	919,179	956,863	2,872	2,545
2020	3	909,467	885,186	2,584	2,258
2020	4	825,574	738,391	2,345	2,006
2020	5	762,618	854,045	2,383	2,014
2020	6	1,120,841	956,856	3,184	2,600
2020	7	1,402,385	1,161,301	3,811	3,089
2020	8	1,208,318	1,198,845	3,596	2,938
2020	9	926,242	871,125	2,757	2,269
2020	10	850,782	786,482	2,417	2,006
2020	11	877,174	945,955	2,741	2,365
2020	12	1,094,916	1,059,819	3,111	2,704
2021	1	998,196	1,172,001	3,119	2,764
2021	2	930,421	897,425	2,908	2,550
2021	3	957,264	850,805	2,601	2,263
2021	4	825,929	741,437	2,346	2,015
2021	5	763,111	853,400	2,385	2,013
Totals		**58,236,436**	**56,385,344**		

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
2016	6	892,742	763,772	2,536	2,075
2016	7	1,049,971	864,320	3,281	2,038
2016	8	886,777	898,367	2,410	2,389
2016	9	795,855	748,450	2,369	1,949
2016	10	712,237	651,537	2,120	1,597
2016	11	723,946	779,130	2,155	2,029
2016	12	916,618	894,364	2,728	2,192
2017	1	886,298	1,015,437	2,638	2,489
2017	2	814,513	749,045	2,545	2,128
2017	3	800,011	694,318	2,174	1,847
2017	4	665,964	646,815	2,081	1,617
2017	5	704,036	687,287	2,000	1,753
2017	6	943,411	748,636	2,680	2,034
2017	7	960,625	998,087	3,002	2,354
2017	8	1,017,845	805,631	2,766	2,143
2017	9	800,083	771,366	2,500	1,928
2017	10	692,003	696,718	1,966	1,777
2017	11	776,683	754,642	2,312	1,965
2017	12	892,836	939,606	2,790	2,216
2018	1	946,491	1,008,298	2,689	2,572
2018	2	813,644	785,502	2,543	2,232
2018	3	807,366	711,824	2,294	1,816
2018	4	652,396	695,033	1,942	1,810
2018	5	729,244	692,048	2,072	1,765
2018	6	915,351	735,106	2,724	1,914
2018	7	923,055	1,004,240	2,747	2,461
2018	8	983,660	804,786	2,673	2,140
2018	9	755,198	787,785	2,484	1,894
2018	10	714,784	655,531	1,942	1,743
2018	11	766,801	744,280	2,282	1,938
2018	12	839,682	962,810	2,624	2,271
2019	1	967,122	949,810	2,748	2,423
2019	2	794,412	774,761	2,483	2,201
2019	3	755,236	730,225	2,248	1,790
2019	4	678,283	652,857	1,927	1,774
2019	5	712,561	685,604	2,024	1,749

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
2019	6	832,272	786,465	2,601	1,966
2019	7	930,678	975,494	2,644	2,489
2019	8	966,251	790,411	2,745	2,016
2019	9	710,905	816,973	2,222	2,042
2019	10	738,803	614,252	2,008	1,634
2019	11	756,765	728,004	2,365	1,820
2019	12	828,770	957,163	2,467	2,346
2020	1	954,572	931,753	2,712	2,377
2020	2	803,563	780,821	2,511	2,077
2020	3	675,093	745,689	1,918	1,902
2020	4	634,855	539,736	1,804	1,467
2020	5	651,414	531,060	2,036	1,253
2020	6	862,159	877,711	2,449	2,385
2020	7	1,060,182	1,017,012	2,881	2,705
2020	8	995,947	935,535	2,964	2,293
2020	9	707,685	761,388	2,106	1,983
2020	10	699,013	681,137	1,986	1,738
2020	11	700,420	805,847	2,189	2,015
2020	12	894,178	829,348	2,540	2,116
2021	1	1,014,092	892,544	3,169	2,105
2021	2	816,839	803,233	2,553	2,282
2021	3	758,837	744,467	2,062	1,980
2021	4	692,557	545,757	1,967	1,483
2021	5	615,204	631,060	1,923	1,488
Totals		**48,988,794**	**47,210,888**		

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
2016	6	1,184,745	992,151	3,366	2,696
2016	7	1,364,052	1,416,791	4,263	3,341
2016	8	1,625,391	1,355,168	4,417	3,604
2016	9	875,572	828,179	2,606	2,157
2016	10	786,888	792,862	2,342	1,943
2016	11	948,220	928,968	2,822	2,419
2016	12	1,033,344	1,086,104	3,075	2,662
2017	1	1,000,246	1,071,747	2,977	2,627
2017	2	914,376	889,253	2,857	2,526
2017	3	932,684	807,249	2,534	2,147
2017	4	740,246	793,990	2,313	1,985
2017	5	804,148	735,678	2,285	1,877
2017	6	1,369,556	1,138,395	3,891	3,093
2017	7	1,577,360	1,634,625	4,929	3,855
2017	8	1,863,168	1,573,706	5,063	4,185
2017	9	950,513	998,738	2,970	2,497
2017	10	936,793	872,950	2,661	2,227
2017	11	1,079,006	1,071,560	3,211	2,791
2017	12	1,119,561	1,290,819	3,499	3,044
2018	1	1,215,926	1,172,771	3,454	2,992
2018	2	1,058,754	1,008,723	3,309	2,866
2018	3	1,001,340	979,322	2,845	2,498
2018	4	891,674	873,074	2,654	2,274
2018	5	921,022	844,267	2,617	2,154
2018	6	1,353,265	1,223,028	4,028	3,185
2018	7	1,672,858	1,645,402	4,979	4,033
2018	8	1,918,042	1,619,380	5,212	4,307
2018	9	935,506	1,075,853	3,077	2,586
2018	10	1,015,422	859,989	2,759	2,287
2018	11	1,117,211	1,106,655	3,325	2,882
2018	12	1,151,907	1,329,747	3,600	3,136
2019	1	1,243,662	1,205,893	3,533	3,076
2019	2	1,089,132	1,030,720	3,404	2,928
2019	3	967,898	1,054,509	2,881	2,585
2019	4	962,580	855,136	2,735	2,324
2019	5	946,340	862,838	2,688	2,201

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
2019	6	1,314,182	1,314,060	4,107	3,285
2019	7	1,769,827	1,641,518	5,028	4,188
2019	8	1,907,427	1,704,693	5,419	4,349
2019	9	1,031,947	1,040,124	3,225	2,600
2019	10	1,048,530	877,779	2,849	2,335
2019	11	1,090,055	1,183,712	3,406	2,959
2019	12	1,244,053	1,313,770	3,703	3,220
2020	1	1,268,954	1,239,270	3,605	3,161
2020	2	1,104,016	1,132,370	3,450	3,012
2020	3	1,056,141	1,025,080	3,000	2,615
2020	4	978,450	883,691	2,780	2,401
2020	5	863,005	971,387	2,697	2,291
2020	6	1,455,056	1,253,667	4,134	3,407
2020	7	1,920,883	1,568,569	5,220	4,172
2020	8	1,892,194	1,786,225	5,632	4,378
2020	9	1,081,355	1,044,186	3,218	2,719
2020	10	1,025,144	936,593	2,912	2,389
2020	11	1,108,215	1,215,457	3,463	3,039
2020	12	1,328,751	1,294,999	3,775	3,304
2021	1	1,098,836	1,291,046	3,434	3,045
2021	2	1,046,602	1,035,490	3,271	2,942
2021	3	1,074,767	929,579	2,921	2,472
2021	4	938,723	844,555	2,667	2,295
2021	5	821,789	928,132	2,568	2,189
Totals		**70,037,310**	**67,482,192**		

Appendix D

ComEd RPS Contract Quantities and Costs

Plan Year	LT Renewables (RECs)	Rate Stability (RECs)	Total (RECs)	LT Renewables ($)	Rate Stability ($)	Total* ($)
2016-17	1,261,725	299,672	1,561,397	22,673,813	751,324	23,502,192
2017-18	1,261,725	271,473	1,533,198	23,137,231	581,034	23,803,641
2018-19	1,261,725	-	1,261,725	23,357,415	-	23,438,590
2019-20	1,261,725	-	1,261,725	23,484,084	-	23,566,909
2020-21	1,261,725	-	1,261,725	23,095,360	-	23,178,932

*Total Cost Includes REC retirement fees

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 (%)
2016-17	23,502,192	37,550,843	-	22,673,813	0.0%
2017-18	23,803,641	40,720,222	-	23,137,231	0.0%
2018-19	23,438,590	40,963,118	-	23,357,415	0.0%
2019-20	23,566,909	41,254,513	-	23,484,084	0.0%
2020-21	23,178,932	41,280,076	-	23,095,360	0.0%

*Total Cost Includes REC retirement fees