MidAmerican Energy
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July 14, 2017

Mr. Anthony Star
Director
Illinois Power Agency
160 North LaSalle Street, Suite C-504
Chicago, Illinois 60601

Dear Mr. Star:

MidAmerican hereby submits its forecasted hourly load and generation data for the Illinois Power Agency's (IPA) 2018 Procurement Plan.

The following information is supplied with this filing.

1. Forecast Documentation_IL_07152017.pdf – This file contains a discussion of load forecast methodology for all MEC Illinois scenarios and supporting data for the base scenario forecast.

2. IL_Base_Hourly_Forecast_EST_07152017.xlsx – This file contains the required base scenario MidAmerican Illinois hourly load forecast from June 1, 2018 through May 31, 2023.

3. IL_High_Hourly_Forecast_EST_07152017.xlsx – This file contains the required high scenario MidAmerican Illinois hourly load forecast from June 1, 2018 through May 31, 2023.

4. IL_Low_Hourly_Forecast_EST_07152017.xlsx – This file contains the required low scenario MidAmerican Illinois hourly load forecast from June 1, 2018 through May 31, 2023.

5. IL_NCP_Forecast_07152017.xlsx – This file contains the non-coincident peak demand forecast supporting the base hourly forecast scenario.

6. MWh_Sales_and_NCP_MW_High_Scenario.xlsx – This file contains the MWh sales forecast and the non-coincident peak demand forecast supporting the high hourly forecast scenario.

7. MWH_Sales_and_NCP_MW_Low_Scenario.xlsx – This file contains the MWh sales forecast and the non-coincident peak demand forecast supporting the low hourly forecast scenario.

8. Forecasted Load and Capability.xlsx – this file contains MidAmerican's forecast load and capability forecast utilizing unforced capacity ratings.

9. Historical ICAP and UCAP Summary.xlsx – this file shows historical installed capacity (ICAP) and unforced capacity (UCAP) values for the Illinois historical resources. Forecasts of ICAP and UCAP quantities are included, although these quantities are not finalized with MISO until just prior to each year's MISO Planning Resource Auction.

10. IPA Generation and Load Data – MidAmerican Energy 7-15-2017.xlsx – This file contains the hourly MWh generation and sales forecast, including a summary tab computing the on and off peak short energy position.

Please let me know if there are any questions or concerns with this information.

Sincerely,

/s/ Naomi G. Czachura

Naomi G. Czachura
Regulatory Strategy Director

Enclosures

Methodology for the 2018-2027 Illinois Electric Customers and Sales Forecasts

In December 2014, an electric rate case was finalized in MEC's Illinois service territory. As a result of the implementation of new electric rates, a number of customers were switched to a different revenue class. This switching will cause noticeable changes in the forecast, as compared to historical values.

The 2018-2027 electric customer and sales forecasts were produced using econometric models on a monthly basis and are carried out in three steps using a top-down approach:

Step 1: The aggregate customer numbers were forecasted directly by revenue class:

- Residential
- Commercial
- Industrial
- Public authority.

Industrial kWh sales were forecast directly. The street lighting forecasts were forecast using trending. In this class, the current customer numbers were assumed to remain constant while the corresponding energy sales were projected to grow approximately 0.10% annually in IL. Similar to the peak demand forecast, the Quad Cities' economic and demographic drivers are assumed to be a good proxy for MidAmerican Illinois service territory electric sales and customers in these forecasts.

Step 2: For residential, commercial and public authority, econometric models were built to forecast kWh per customer. The resulting kWh per customer forecasts were multiplied by the appropriate customer forecasts to arrive at a kWh sales forecast. For industrial, the kWh per customer values for each revenue class were calculated using customer and sales forecasts, and employed to check the presence of any discontinuity between the historical and forecasted values.

Step 3: The projected customers and sales numbers were modeled using data specific to the area being forecast. Economic data for the Quad Cities' metropolitan statistical area was used in building the models.

Economic and demographic variables

Some variables, such as customer numbers, price, sales, revenue class, jurisdiction, etc., were obtained internally from the company database while other data, such as economic, demographic and weather, were received from external sources.

The economic and demographic data for the models were obtained from the IHS Global Insight, Inc. database. The economic and demographic data forecast was performed by IHS Global Insight, Inc. in March 2017. The list of variables considered for the electric sales and customer forecasts is shown in Table 1. For MEC's Illinois service territory, economic and demographic variables specific to the Quad Cities metropolitan area were used in the forecasting process. The Quad Cities area encompasses MEC's Illinois service territory.

Table 1: List of economic and demographic variables considered for the 2018-2027 forecasts

	Quad Cities MSA
1	Real Gross Metropolitan Area Product (Millions 2009$)
2	Real Gross Metropolitan Area Product, Government, State and Local (Millions 2009$)
3	Real Gross Metropolitan Area Product, Manufacturing (Millions 2009$)
4	Population (Thousands)
5	Households, Family and Non-Family (Thousands)
6	Employment (NAICS), Total Non-Farm (Thousands)
7	Employment (NAICS), State and Local Government (Thousands)

Weather variables

The weather variables (derived from conditions at the Moline International Airport) used in the present forecast are:

Current month and previous month cooling degree days (CDD)
Current month and previous month heating degree days (HDD)

The present energy forecasts are based on billed data. This means that the sales numbers reflect, in part, the weather conditions from the previous month as well as the weather conditions for the current month, depending on the meter read date. To take this into account, both current month and previous month degree days are used in the modeling process. The forecasts used actual weather values for the historical period and normal weather values for the forecast period. In the 2018-2027 forecast, normal weather was defined as the average monthly degree days from 1981-2010.

To compare the growth rates the historical sales figures were "weather normalized" using average (normal) weather values. The normalization process consists of three steps. First, the historic predicted numbers were obtained from a regression model using the actual weather values. Second, the sales were re-calculated using average weather results.[1] Third, the difference between them, which defines the weather impact, was subtracted from the corresponding actual sales to arrive the normalized sales. In mathematical terms, the weather normalization can be written as follows:

$$NormalizedSales = ActualSales - [\Pr edictedSales_{ActualWeather} - \Pr edictedSales_{NormalWeather}]$$

[1] The same equation obtained in the first step was used.

Modeling

The econometric forecasting method used in this study assumes that the relationship between the dependent and independent variables is linear (additive) and defined as follows:

$$y = r + \alpha X + \beta Y + \gamma Z$$

where X, Y and Z are the variables, α, β and γ are the coefficients and r is the constant.

The forecasts were prepared using MetrixND software, version 4.5.1, developed by Itron, Inc. The forecasts typically involve finding a mathematical relationship between the dependent and independent variables. The steps taken in this forecast were as follows: The historical numbers since 2000 and the forecast numbers for economic variables until 2046 were obtained. These values were then exported into MetrixND and the analysis was carried out.

The primary criterion in selecting the variables was the relevance to the dependent variable being forecasted. Other considerations were the sign (the direction of change) and impact (the magnitude of elasticity coefficients) of variables on the forecasted dependent variable. Some of the statistical parameters important to the econometric model are:

Adjusted R-Square: It indicates the fraction of total variation explained by the independent variables in the regression. Its value ranges between 0 and 1, 1 being a perfect fit.

$$R^2 = \frac{ExplainedVariation}{TotalVariation}$$

Adjusted R^2 takes into account the number of variables (k) with a constant sample size (n) as this leads to a decrease in the degree of freedom (n-k). Thus, adjusted R^2 is more conservative.

$$\text{Adjusted } R^2 = 1 - (1 - R^2)\left(\frac{n-1}{n-k}\right)$$

F-Statistics (Probability): This is an alternative measure of goodness of the fit. F-statistics number indicates the probability that the estimated regression fit is purely accidental. This number is preferred to be as low as possible as compared to a critical number of 5%.

Mean Absolute Percentage Error (MAPE): MAPE defines the magnitude of errors in the model. It is the average of absolute values of the residual error percentages measured at each data point. The lower the MAPE number the better the model is considered to be.

Durbin-Watson Statistic: It tests the hypothesis that the errors from a model do not exhibit first order autocorrelation. In the absence of autocorrelation, the statistic has a value of 2. While it

varies between 0 and 4, a value above 2 indicates negative autocorrelation, while a value below 2 indicates positive autocorrelation.

Test parameters for statistical significance

The t-statistics and P-values show the statistical significance of independent variables in 95% confidence interval (or 5% significance level). Most of the variables presented in this document are within the 95% confidence interval based on the t-statistics and P-values.

To evaluate the reasonableness of the model, the residual patterns and model fit statistics were studied. The residuals indicate the difference between the predicted and actual values. Any pattern associated with residuals suggests a missing variable(s). The residuals were studied through the autocorrelation factor and partial autocorrelation diagrams.

Customer forecasts

Variables and model statistics

The customer forecasts in general were straight-forward and involved fewer variables. The customer variables used in the models of different revenue classes are:

- Residential: Number of households in the Quad Cities Metropolitan Statistical Area (MSA), binary variable for the Illinois rate case impact and monthly binary variables
- Commercial: Number of households in the Quad Cities MSA, binary variables for the Illinois rate case impact and monthly binary variables
- Industrials: Non-farm employment for the Quad Cities MSA, binary variable for the Illinois rate case impact and monthly binary variables
- Public authority: Economic variable weighted between state and local government employment in the Quad Cities MSA and non-farm employment in the Quad Cities MSA, binary variable for the Illinois rate case impact and monthly binary variables

The statistics for the customer forecasts are tabulated in Table 2.

Table 2: Adjusted R^2 and MAPE values for the customer forecasts

Revenue Class	MAPE
Residential	0.04%
Commercial	0.11%
Industrial	1.04%
Public Authority	0.39%

Customer forecast results

The monthly customer numbers are shown below at an average annual level for each revenue class.

Table 3: Summary of the historical and forecast average annual customer numbers in different classes

	Residential	Commercial	Industrial	Public Authority	Street Lighting	Total
2009	75,497	7,774	91	1,333	48	84,743
2010	75,437	7,727	101	1,363	48	84,675
2011	75,516	7,721	104	1,427	44	84,813
2012	75,693	7,716	107	1,376	44	84,936
2013	75,765	7,709	105	1,389	44	85,012
2014	75,814	7,782	99	1,392	44	85,131
2015	74,455	8,998	56	1,302	42	84,852
2016	74,298	9,209	49	1,288	42	84,886
2017	74,227	9,284	39	1,341	44	84,934
2018	74,244	9,305	38	1,360	44	84,992
2019	74,288	9,316	38	1,359	44	85,045
2020	74,335	9,326	38	1,359	44	85,101
2021	74,381	9,336	37	1,358	44	85,157
2022	74,420	9,348	37	1,358	44	85,207
2023	74,454	9,362	37	1,357	44	85,254
2024	74,486	9,376	37	1,357	44	85,300
2025	74,513	9,392	36	1,356	44	85,342
2026	74,546	9,407	36	1,356	44	85,389
2027	74,593	9,416	36	1,355	44	85,444

Sales forecasts

Variables and model statistics

The energy forecasts are more complicated and involve more variables than do the customer forecasts. For the residential, commercial and public authority classes, sales are determined by multiplying customers by use per customer. For the industrial class, sales are modeled directly. For the street lighting class, sales are forecast using trending. The sales forecast variables used in the industrial class model are:

- Industrial: An weighted index made up of the real gross metropolitan area product for the Quad Cities MSA, the non-farm employment in the Quad Cities MSA and the population of the Quad Cities MSA, the number of billing days in each month, current month cooling degree days, industrial retail average revenue lagged twelve months, and monthly binaries.

The statistics for the sales forecasts are tabulated in Table 4.

Table 4: Adjusted R^2 and MAPE values for the sales forecasts

Revenue Class	MAPE
Industrial	9.83%

The comparison of tables (Tables 2 and 4) clearly indicates that better statistics were obtained for the customer models than sales models. The reason is that there is more uncertainty in the sales forecasts due to the presence of multiple drivers and their possible interactions. For example, a relatively small change in the historical usage pattern of a large industrial customer could have a measureable impact on the total energy usage in this class. Similarly, the changes in billing cycle could have significant effect on the billed sales.

Sales forecast results

The monthly billed sales numbers were forecasted at an aggregate level for each revenue class. The annual historical data and 10-year forecast values are summarized in Table 5.

Table 5: Summary of the historical and forecast annual billed sales of different revenue classes (MWh)

	Residential	Commercial	Industrial	Public Authority	Street Lighting	Total
2009	642,453	438,115	643,796	191,417	13,257	1,929,038
2010	664,574	439,390	691,456	201,216	13,319	2,009,955
2011	661,451	436,720	714,016	203,850	12,911	2,028,948
2012	668,265	438,307	712,702	191,446	12,647	2,023,366
2013	665,762	435,113	686,082	185,062	12,599	1,984,618
2014	665,362	430,923	681,658	177,018	12,595	1,967,556
2015	627,826	461,907	641,935	163,747	10,129	1,905,544
2016	646,439	466,908	634,925	169,402	9,949	1,927,623
2017	616,130	495,103	639,425	175,781	9,925	1,936,364
2018	626,468	494,407	646,847	172,675	9,934	1,950,332
2019	627,846	499,159	651,290	173,276	9,944	1,961,515
2020	628,162	502,375	655,999	173,072	9,954	1,969,561
2021	627,989	502,955	661,750	172,152	9,964	1,974,810
2022	629,185	503,321	668,022	170,905	9,974	1,981,407
2023	629,296	503,946	673,512	169,714	9,984	1,986,452
2024	629,171	504,897	678,767	168,582	9,994	1,991,411
2025	628,789	504,699	683,880	167,002	10,004	1,994,373
2026	628,227	504,082	688,620	165,471	10,014	1,996,414
2027	628,271	504,038	694,063	163,691	10,024	2,000,087
The figures in the table above are retail billed MWh sales.						

Usage per customer (UPC) forecasts
For the residential, commercial and public authority classes, kWh per customer values was forecast using econometric models. For the industrial and street lighting classes, the kWh per customer forecast values were calculated using the forecast sales and customer numbers data.

UPC forecast results:
Residential model – Non-farm employment in the Quad Cities MSA, billing days, cooling degree days (current month), heating degree days (current month and one month lag), current month heating degree days interacted with a time trend, binary variable for the Illinois rate case impact and monthly binaries
Commercial model – State and local government employment for the Quad Cities MSA, cooling degree days (current month), heating degree days (current and lagged month), a time trend variable interacted with current month heating degree days, commercial average revenue, billing days, hours of light, binary variable for the Illinois rate case impact and monthly binaries
Public Authority model – State and local government employment in the Quad Cities MSA, billing days, heating degree days (current month), cooling degree days (current month), hours of light, a time trend variable interacted with current month heating degree days, binary variable for the Illinois rate case impact and monthly binaries

Table 6: Model Statistics

Revenue Class	MAPE
Residential	1.85%
Commercial	2.75%
Public Authority	4.51%

Methodology for the 2018-2027 Monthly Illinois Non-Coincident Electric Gross Peak Demand Forecast

2016 Electric Gross Peak Demand

The gross peak numbers used in the analysis are the historical gross peaks, which take into account demand side management impacts. Since there are planned large load additions, using the model results alone for the peak demand forecast would result in a forecast that is too low. Therefore, the planned large load additions are added to the model results to achieve the final peak demand forecast.

The gross peak load value was calculated according to the following equation:

Gross Peak = Native Peak Load + Residential Direct Load Control + Curtailment

Native Peak Load: For MEC's Illinois service territory, the 2016 native system peak load of 448 MW occurred on July 21, 2016 in the hour ending at 4:00 p.m. Central Daylight Time.

SummerSaver Program: SummerSaver is MEC's residential direct load control program. Load displaced due to the energy saving program which aims to curtail energy usage of on-peak hours was also received from the energy efficiency group. At the time of gross system peak, the SummerSaver program was in effect in the amount of 2 MW.

Curtailment: Load displaced due to curtailment of customers on an interruptible rate. There was no curtailment event in effect at the time of gross system peak.

Source Data and Model
The historical hourly data underlying the model is load research data by class for MEC's Illinois service territory. The data was divided into the following classes: residential, small commercial, large commercial, small industrial and large industrial. This data was at the meter level. MEC used data from January 1, 2008 through December 31, 2016 to build a monthly non-coincident electric gross peak demand model for its Illinois service territory.

The class data was added together to derive the total Illinois load. Next, the monthly peak dates and times were calculated. Weather data, taken from the weather station at the Quad City International Airport in Moline, IL, associated with the peak dates were compiled for use in the model.

The forecasting model consists of an economic driver variable, a number of weather variables and monthly indicator variables.

Economic variables
Net Energy for Load multiplied by a Time Trend Variable

For the 2018-2027 forecast, MEC used the area's net energy for load multiplied by a time trend variable as the economic driver. This variable was constructed in the following manner:

Net Energy for Load*Time Trend

Weather variables
Five weather variables were used:

1. Summer peak day maximum temperature (summer = May through September)
2. Summer peak day average daily dew point
3. Winter peak day minimum temperature (winter = November through March)
4. Winter peak day three day build up (the sum of the average temperatures of the three days prior to the winter peak day)
5. Shoulder peak day HDD65 (shoulder = April and October; HDD65 = 65 less the peak day average temperature, if the average temperature is less than 65; = 0 if the average temperature is greater than 65)

The forecast weather was calculated using the rank and average method for 2008 through 2016. First, the weather variables, as measured on the monthly peak days, were averaged for each month across the years. This revealed the monthly order for each weather variable throughout the year. For each year, the peak day weather variables were then ranked. Next, the ranked results were averaged: the highest values averaged, the second highest values averaged, and so on. The average of the highest values was then assigned to the month with the highest value, the average of the second highest values was then assigned to the month with the second highest value and so on.

Table 7: MEC Illinois monthly non-coincident peak demand forecast

Year	Month	Peak MW at Generator (MEC served)
2018	6	411.18
2018	7	458.37
2018	8	449.20
2018	9	395.73
2018	10	288.48
2018	11	277.43
2018	12	298.08
2019	1	325.17
2019	2	306.76
2019	3	280.04
2019	4	273.24
2019	5	323.96
2019	6	407.46
2019	7	459.61
2019	8	450.42
2019	9	400.79
2019	10	288.11
2019	11	271.59
2019	12	303.55
2020	1	326.62
2020	2	307.33
2020	3	280.36
2020	4	273.23
2020	5	323.72
2020	6	407.62
2020	7	461.45
2020	8	452.23
2020	9	401.56
2020	10	288.33
2020	11	271.04
2020	12	304.13
2021	1	327.89
2021	2	307.98
2021	3	280.75
2021	4	273.17
2021	5	323.42
2021	6	407.58
2021	7	463.16
2021	8	453.90
2021	9	402.10
2021	10	288.36
2021	11	270.24
2021	12	304.48
2022	1	329.23
2022	2	308.62
2022	3	281.17
2022	4	273.19
2022	5	323.26
2022	6	407.79
2022	7	465.01
2022	8	455.71
2022	9	402.79
2022	10	288.50
2022	11	269.63
2022	12	305.03
2023	1	330.50
2023	2	309.25
2023	3	281.51
2023	4	273.17
2023	5	323.05
2023	6	407.89
2023	7	466.81
2023	8	457.47
2023	9	403.40
2023	10	288.61
2023	11	268.91
2023	12	305.46
2024	1	331.89
2024	2	309.94
2024	3	281.92
2024	4	273.17
2024	5	322.80

Weather in the Hourly Model
Using average daily temperature as an example, this is how a chaotic normal weather pattern (weather pattern used to create a realistic 8760 for dispatch simulations) is created:

1. Sort the Order variable (a ranking of the days in the month by average temperature, determined over the 1987-2016 time period) and the associated dates from highest to lowest within each month.
2. Sort the average temperature variable from highest to lowest within each month.
3. Assign the highest average temperature value to the date that corresponds to the highest value in the Order variable within the month.
4. Sort the Order variable by date for each month.
5. Create the average temperature output variable for the reference year.
6. Rotate the average temperature output variable to multiple years for forecasting purposes.

Hourly Loadshape Models by Class
Hourly models by class (residential, commercial, industrial, public authority and street lighting) were developed in MetrixND. The source data was hourly load research data by class for MEC's service territory. The classes of load research data were residential, small commercial, large commercial, small industrial and large industrial. The residential class load shape was developed using the residential load research data. The commercial class loadshape was developed by combining the small and large commercial load research data. The industrial class loadshape was developed using the small and large industrial load research data. The street lighting loadshape was a lighting loadshape from MEC's load research library. The public authority class loadshape was developed by using a weighted average of the residential, commercial, industrial and street lighting class loadshapes, based on the rate codes that made up the public authority class. Making use of linear regression, the models were estimated on data from January 1, 2013 through December 31, 2016. The models contain weather, binary and trend explanatory variables. There were twenty four models for each class. A forecast was developed through May 31, 2024, using the weather forecast developed as described above.

Long-Term Hourly Modeling
The long-term hourly forecast was developed in MetrixLT. The hourly profiles by class were calibrated to existing calendar month sales forecasts by class and an overall monthly non-coincident peak demand forecast.

Energy Efficiency in the Load Forecast
MEC has energy efficiency programs operating in its Illinois service territory. Estimated past energy savings are implicit in the historical data used to derive the electric sales forecast models. Without adjustment, this method implies that the level of future estimated program savings will be similar to past estimated program savings. Estimated program impacts in the forecast period are not projected to deviate measurably from estimated historical levels, so no adjustment was made to the forecasting models.

Load Forecast for the Retail Choice Switching

MEC has one active alternative retail supplier in its Illinois service territory. The retail choice switching forecast was derived by reviewing recent switching activity and projecting forward recent trends. Switched load is expected to grow from 13.7 MW in 2018 to 13.9 MW in 2024.

Table 8: Retail Switching: Monthly Peak Demand and Energy Forecasts

	Residential kWh	Commercial kWh	Industrial kWh	Public Authority kWh	Street Lighting kWh	Total kWh	MW Demand
Jan-18	52,223	3,394,559	525,263	482,745	-	4,454,790	11.22
Feb-18	54,231	3,420,431	525,263	512,637	-	4,512,562	10.80
Mar-18	45,425	3,410,505	525,263	704,905	-	4,686,097	11.93
Apr-18	40,199	2,072,580	525,263	415,432	-	3,053,474	10.27
May-18	38,285	2,279,595	525,263	430,466	-	3,273,608	11.05
Jun-18	35,951	2,982,021	525,263	528,323	-	4,071,557	12.19
Jul-18	33,345	3,113,712	525,263	473,689	-	4,146,009	12.50
Aug-18	34,191	3,502,614	525,263	584,217	-	4,646,285	13.73
Sep-18	47,953	3,513,738	525,263	637,376	-	4,724,328	13.25
Oct-18	56,594	3,574,933	525,263	564,039	-	4,720,830	13.00
Nov-18	41,840	3,537,699	525,263	594,160	-	4,698,962	11.59
Dec-18	44,685	3,497,995	525,263	576,430	-	4,644,372	12.12
Jan-19	52,302	3,404,747	525,525	483,227	-	4,465,801	11.25
Feb-19	54,313	3,430,696	525,525	513,150	-	4,523,684	10.82
Mar-19	45,493	3,420,741	525,525	705,610	-	4,697,369	11.96
Apr-19	40,260	2,078,800	525,525	415,848	-	3,060,433	10.30
May-19	38,342	2,286,437	525,525	430,896	-	3,281,200	11.08
Jun-19	36,005	2,990,971	525,525	528,851	-	4,081,352	12.22
Jul-19	33,395	3,123,057	525,525	474,163	-	4,156,140	12.53
Aug-19	34,243	3,513,126	525,525	584,802	-	4,657,696	13.76
Sep-19	48,025	3,524,283	525,525	638,013	-	4,735,846	13.29
Oct-19	56,679	3,585,663	525,525	564,604	-	4,732,471	13.03
Nov-19	41,903	3,548,316	525,525	594,755	-	4,710,499	11.62
Dec-19	44,752	3,508,493	525,525	577,007	-	4,655,777	12.15
Jan-20	52,380	3,414,966	525,788	483,711	-	4,476,845	11.27
Feb-20	54,394	3,440,993	525,788	513,663	-	4,534,838	10.85
Mar-20	45,561	3,431,007	525,788	706,316	-	4,708,672	11.99
Apr-20	40,320	2,085,039	525,788	416,264	-	3,067,411	10.32
May-20	38,400	2,293,299	525,788	431,327	-	3,288,814	11.11
Jun-20	36,059	2,999,948	525,788	529,380	-	4,091,175	12.25
Jul-20	33,445	3,132,430	525,788	474,637	-	4,166,300	12.57
Aug-20	34,294	3,523,670	525,788	585,387	-	4,669,139	13.79
Sep-20	48,097	3,534,860	525,788	638,651	-	4,747,396	13.32
Oct-20	56,764	3,596,424	525,788	565,168	-	4,744,145	13.07
Nov-20	41,966	3,558,966	525,788	595,350	-	4,722,069	11.65
Dec-20	44,819	3,519,023	525,788	577,584	-	4,667,213	12.18
Jan-21	52,459	3,425,215	526,051	484,195	-	4,487,919	11.30
Feb-21	54,476	3,451,320	526,051	514,177	-	4,546,024	10.88
Mar-21	45,630	3,441,305	526,051	707,022	-	4,720,007	12.02
Apr-21	40,381	2,091,297	526,051	416,680	-	3,074,408	10.35
May-21	38,457	2,300,181	526,051	431,759	-	3,296,448	11.14
Jun-21	36,113	3,008,951	526,051	529,910	-	4,101,025	12.28
Jul-21	33,495	3,141,832	526,051	475,112	-	4,176,489	12.60
Aug-21	34,346	3,534,246	526,051	585,972	-	4,680,614	13.83
Sep-21	48,169	3,545,469	526,051	639,290	-	4,758,979	13.35
Oct-21	56,850	3,607,218	526,051	565,734	-	4,755,852	13.10
Nov-21	42,029	3,569,647	526,051	595,945	-	4,733,672	11.68
Dec-21	44,886	3,529,584	526,051	578,162	-	4,678,683	12.21
Jan-22	52,537	3,435,495	526,314	484,679	-	4,499,025	11.33
Feb-22	54,557	3,461,678	526,314	514,691	-	4,557,241	10.90
Mar-22	45,698	3,451,633	526,314	707,729	-	4,731,374	12.05
Apr-22	40,441	2,097,573	526,314	417,097	-	3,081,425	10.37
May-22	38,515	2,307,085	526,314	432,191	-	3,304,104	11.16
Jun-22	36,167	3,017,982	526,314	530,440	-	4,110,903	12.31
Jul-22	33,545	3,151,261	526,314	475,587	-	4,186,707	12.63
Aug-22	34,397	3,544,853	526,314	586,558	-	4,692,122	13.86
Sep-22	48,241	3,556,110	526,314	639,930	-	4,770,595	13.39
Oct-22	56,935	3,618,044	526,314	566,300	-	4,767,592	13.13
Nov-22	42,092	3,580,360	526,314	596,541	-	4,745,308	11.70
Dec-22	44,954	3,540,177	526,314	578,740	-	4,690,185	12.25
Jan-23	52,616	3,445,806	526,577	485,164	-	4,510,163	11.36
Feb-23	54,639	3,472,068	526,577	515,206	-	4,568,490	10.93
Mar-23	45,767	3,461,992	526,577	708,437	-	4,742,773	12.08
Apr-23	40,502	2,103,869	526,577	417,514	-	3,088,461	10.40
May-23	38,573	2,314,009	526,577	432,623	-	3,311,782	11.19
Jun-23	36,221	3,027,040	526,577	530,970	-	4,120,808	12.34
Jul-23	33,596	3,160,719	526,577	476,063	-	4,196,954	12.66
Aug-23	34,449	3,555,492	526,577	587,145	-	4,703,662	13.90
Sep-23	48,313	3,566,783	526,577	640,570	-	4,782,243	13.42
Oct-23	57,020	3,628,903	526,577	566,866	-	4,779,366	13.16
Nov-23	42,155	3,591,106	526,577	597,138	-	4,756,976	11.73
Dec-23	45,021	3,550,802	526,577	579,319	-	4,701,719	12.28
Jan-24	52,695	3,456,147	526,840	485,649	-	4,521,332	11.39
Feb-24	54,721	3,482,488	526,840	515,722	-	4,579,771	10.96
Mar-24	45,836	3,472,382	526,840	709,146	-	4,754,204	12.11
Apr-24	40,563	2,110,183	526,840	417,932	-	3,095,517	10.43
May-24	38,631	2,320,954	526,840	433,056	-	3,319,480	11.22

Table 9: Retail Switching: Monthly Customer Count Forecasts

	Residential	Commercial	Industrial	Public Authority	Street Lighting	Total
Jan-18	98	190	1	57	-	347
Feb-18	98	190	1	57	-	347
Mar-18	98	189	1	57	-	346
Apr-18	98	187	1	57	-	344
May-18	98	189	1	57	-	345
Jun-18	98	188	1	57	-	344
Jul-18	98	188	1	57	-	344
Aug-18	98	186	1	57	-	342
Sep-18	98	187	1	57	-	343
Oct-18	98	187	1	57	-	343
Nov-18	98	190	1	57	-	346
Dec-18	98	190	1	57	-	346
Jan-19	98	191	1	57	-	347
Feb-19	98	191	1	57	-	347
Mar-19	98	190	1	57	-	346
Apr-19	98	188	1	57	-	344
May-19	98	189	1	57	-	346
Jun-19	98	188	1	57	-	345
Jul-19	98	188	1	57	-	345
Aug-19	98	186	1	57	-	343
Sep-19	98	187	1	57	-	344
Oct-19	98	187	1	57	-	344
Nov-19	98	190	1	57	-	347
Dec-19	98	190	1	57	-	347
Jan-20	98	191	1	57	-	348
Feb-20	98	191	1	57	-	348
Mar-20	98	190	1	57	-	347
Apr-20	98	188	1	57	-	345
May-20	98	190	1	57	-	346
Jun-20	98	189	1	57	-	345
Jul-20	98	189	1	57	-	345
Aug-20	98	187	1	57	-	343
Sep-20	98	188	1	57	-	344
Oct-20	98	188	1	57	-	344
Nov-20	98	191	1	57	-	347
Dec-20	98	191	1	57	-	347
Jan-21	98	192	1	57	-	348
Feb-21	98	192	1	57	-	348
Mar-21	98	191	1	57	-	347
Apr-21	98	189	1	57	-	345
May-21	98	190	1	57	-	347
Jun-21	98	189	1	57	-	346
Jul-21	98	189	1	57	-	346
Aug-21	98	187	1	57	-	344
Sep-21	98	188	1	57	-	345
Oct-21	98	188	1	57	-	345
Nov-21	98	191	1	57	-	348
Dec-21	98	191	1	57	-	348
Jan-22	98	192	1	57	-	349
Feb-22	98	192	1	57	-	349
Mar-22	98	191	1	57	-	348
Apr-22	98	189	1	57	-	346
May-22	99	191	1	57	-	348
Jun-22	99	190	1	57	-	347
Jul-22	99	190	1	57	-	347
Aug-22	99	188	1	57	-	345
Sep-22	99	189	1	57	-	346
Oct-22	99	189	1	57	-	346
Nov-22	99	192	1	57	-	349
Dec-22	99	192	1	57	-	349
Jan-23	99	193	1	57	-	350
Feb-23	99	193	1	57	-	350
Mar-23	99	192	1	57	-	349
Apr-23	99	190	1	57	-	347
May-23	99	191	1	57	-	348
Jun-23	99	190	1	57	-	347
Jul-23	99	190	1	57	-	347
Aug-23	99	188	1	57	-	345
Sep-23	99	189	1	57	-	346
Oct-23	99	189	1	57	-	346
Nov-23	99	192	1	57	-	349
Dec-23	99	192	1	57	-	349
Jan-24	99	193	1	57	-	350
Feb-24	99	193	1	57	-	350
Mar-24	99	192	1	57	-	349
Apr-24	99	190	1	57	-	347
May-24	99	192	1	57	-	349

Table 10: Multi-Year Historical Load Detail

	Small Industrial		Residential		Large Commercial		Small Commercial		Large Industrial		Lighting		Total	
	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand
Jan-12	27,265,619	49,536	56,326,628	118,087	31,768,168	57,164	11,931,584	27,961	35,071,099	57,853			162,363,099	279,133
Feb-12	25,807,835	48,001	49,912,934	108,123	29,950,714	55,848	10,888,440	27,254	32,369,737	55,528			148,929,661	261,495
Mar-12	28,004,862	50,959	43,561,072	100,119	31,067,096	58,370	10,257,627	25,938	33,738,961	56,232			146,629,619	245,178
Apr-12	25,852,800	52,904	39,904,905	103,648	28,924,482	59,010	9,616,023	24,672	39,947,919	66,878			144,246,129	266,199
May-12	28,711,036	54,861	52,154,588	177,777	32,966,930	64,207	10,917,565	28,372	41,198,083	69,253			165,948,202	326,474
Jun-12	29,129,914	58,369	71,496,282	214,118	34,916,155	75,781	11,922,001	35,245	37,189,526	67,518			184,653,879	399,777
Jul-12	31,095,788	57,696	103,006,717	243,087	40,823,126	78,473	14,923,361	36,093	36,865,588	58,977			226,714,579	447,545
Aug-12	29,809,952	56,996	70,528,438	212,327	37,080,494	74,287	13,227,171	36,328	28,700,133	57,065			179,346,189	410,147
Sep-12	26,034,008	57,552	48,351,307	201,253	31,312,000	75,386	12,226,491	37,025	33,618,677	56,722			151,542,483	403,705
Oct-12	26,579,723	53,023	42,833,452	90,444	30,319,509	57,773	11,166,817	27,750	34,929,027	58,846			145,828,529	252,700
Nov-12	24,546,296	46,399	46,626,192	113,914	28,824,052	53,455	10,682,298	27,595	35,868,680	62,130			146,547,518	270,614
Dec-12	24,215,212	45,799	57,157,810	124,168	30,201,155	54,224	11,165,576	26,718	35,344,824	61,322			158,084,576	281,537
Jan-13	27,106,687	48,212	57,763,721	124,593	32,578,799	58,191	12,537,949	28,309	37,185,801	62,758			167,172,957	286,899
Feb-13	24,688,194	47,337	50,829,345	114,607	29,072,834	57,810	11,073,990	29,779	33,299,724	62,913			148,964,087	282,749
Mar-13	26,220,003	48,722	52,219,135	106,153	30,848,837	55,793	11,328,641	26,392	36,819,306	64,886			157,435,923	263,666
Apr-13	27,352,493	54,403	45,390,111	96,600	30,305,138	60,356	10,797,868	25,534	34,620,740	65,819			148,466,351	270,360
May-13	27,976,866	55,049	48,796,017	140,837	32,014,005	66,279	10,789,410	27,032	41,520,639	68,153			161,096,938	318,503
Jun-13	29,178,358	58,961	62,501,897	184,372	33,569,066	71,614	11,631,006	32,626	40,972,297	69,950			177,852,624	386,962
Jul-13	31,117,029	59,693	78,822,779	224,668	37,662,758	78,155	14,095,610	37,186	39,814,333	67,279			201,512,509	436,092
Aug-13	31,414,517	61,036	78,082,784	227,917	38,475,007	80,461	13,638,301	37,881	34,962,043	62,248			196,572,654	444,241
Sep-13	29,040,366	60,154	58,446,603	219,971	33,903,038	78,166	11,860,091	35,628	35,488,202	64,578			168,738,301	432,925
Oct-13	27,394,695	54,323	44,269,216	110,032	31,188,327	64,473	12,294,198	30,325	34,883,662	64,474			150,030,099	291,762
Nov-13	25,482,946	47,586	49,123,124	108,863	29,739,595	54,731	12,363,551	30,086	33,439,182	61,136			150,148,398	272,247
Dec-13	25,698,844	48,122	62,485,047	126,836	32,650,338	58,737	13,047,739	30,739	36,368,544	63,762			170,250,512	285,865
Jan-14	28,171,730	49,761	67,104,249	142,274	33,701,323	57,619	13,840,010	30,258	35,536,920	58,882			178,354,231	313,262
Feb-14	26,197,668	49,481	59,481,578	126,833	29,869,294	56,943	11,983,787	29,046	33,939,937	61,217			161,472,263	289,748
Mar-14	27,752,047	49,916	54,363,062	131,121	30,800,211	55,959	12,109,374	28,836	37,830,750	67,578			162,855,445	285,736
Apr-14	26,526,608	50,315	43,469,025	101,202	28,915,683	54,235	10,919,129	29,247	39,219,975	68,305			149,050,420	257,303
May-14	28,286,776	55,643	48,835,372	154,314	31,865,409	67,748	11,477,521	32,747	32,332,205	66,670			152,797,283	341,478
Jun-14	30,045,397	57,414	64,873,449	174,811	34,236,736	69,378	12,330,543	32,529	38,088,101	67,490			179,574,226	364,197
Jul-14	30,645,548	59,062	65,347,076	197,861	35,113,643	71,742	13,681,986	36,669	37,653,960	67,431			182,442,213	401,834
Aug-14	29,819,076	55,948	68,153,454	212,432	35,856,060	73,995	12,940,389	35,004	35,887,061	64,955			182,656,040	381,118
Sep-14	26,999,392	52,546	48,937,711	192,787	30,378,554	74,398	10,950,399	33,005	32,598,186	60,788			149,864,243	380,154
Oct-14	26,299,447	48,267	43,411,551	94,285	27,994,689	54,415	11,676,485	29,159	34,688,635	60,088			144,070,806	248,016
Nov-14	24,794,827	46,047	51,704,310	118,879	28,994,074	56,065	12,822,913	32,370	37,233,621	69,459			155,549,744	283,871
Dec-14	25,889,580	46,470	57,086,294	123,407	30,865,350	55,300	12,862,509	32,401	34,888,914	63,493			161,592,648	275,167
Jan-15	23,082,533	40,129	53,796,551	122,682	31,587,487	59,298	16,527,816	39,432	38,535,453	66,824	1,757,228	3,929	165,287,066	298,525
Feb-15	21,350,307	40,119	49,855,826	110,346	29,312,362	56,665	15,298,966	40,460	34,801,640	68,531	1,476,341	3,929	152,095,441	274,273
Mar-15	23,060,882	39,898	43,915,206	98,952	28,554,546	55,282	14,932,529	38,138	38,191,489	62,873	1,468,286	3,929	150,122,938	261,893
Apr-15	21,628,894	41,037	37,368,479	89,586	26,225,378	53,007	13,382,509	35,362	37,569,752	64,943	1,258,980	3,929	137,433,992	236,626
May-15	23,552,990	44,593	42,664,820	109,069	28,287,187	58,738	13,220,888	36,672	38,563,411	67,583	1,158,256	3,929	147,447,553	285,712
Jun-15	25,103,490	47,623	61,284,244	180,673	31,856,580	68,503	15,358,917	42,236	42,017,393	70,714	1,051,376	3,929	176,672,001	382,043
Jul-15	26,899,977	48,804	74,223,189	205,728	34,838,869	73,693	16,891,119	46,053	42,599,298	70,929	1,117,783	3,929	196,570,235	412,481
Aug-15	26,824,918	49,175	66,426,087	196,257	33,465,146	68,753	15,930,888	40,493	40,458,702	68,055	1,237,303	3,929	184,343,044	363,968
Sep-15	25,416,257	50,271	60,162,321	194,554	32,009,481	73,963	15,560,593	47,054	27,318,817	71,402	1,354,137	3,929	161,821,607	400,665
Oct-15	22,952,773	44,531	40,807,245	102,629	27,346,760	57,045	16,016,337	41,908	35,123,855	62,973	1,570,057	3,929	143,817,027	252,989
Nov-15	21,158,547	44,222	44,047,527	104,121	26,682,217	50,546	14,657,926	38,274	25,370,639	60,481	1,661,940	3,929	133,578,796	238,785
Dec-15	21,062,194	38,667	53,088,386	111,192	28,739,821	51,288	15,062,674	37,907	33,630,402	63,486	1,793,116	3,929	153,376,594	264,108
Jan-16	21,168,803	35,857	55,821,714	121,179	26,601,397	48,002	22,661,733	47,084	40,620,290	69,100	1,734,512	3,879	168,608,448	289,003
Feb-16	19,520,513	35,265	48,283,197	114,934	24,181,413	46,491	19,657,565	43,641	38,251,196	69,962	1,506,902	3,879	151,400,787	274,902
Mar-16	20,302,200	34,826	42,835,667	94,914	23,785,437	43,444	17,966,766	41,978	44,577,120	71,950	1,443,616	3,879	150,910,806	260,743
Apr-16	19,680,897	35,397	40,005,602	89,700	23,018,637	45,778	16,366,787	38,587	39,494,089	70,510	1,237,598	3,879	139,803,609	241,241
May-16	20,932,855	38,885	43,969,041	148,257	24,894,368	55,349	16,836,165	42,626	40,750,360	71,076	1,139,598	3,879	148,522,388	309,038
Jun-16	22,743,794	40,798	74,994,261	195,055	30,274,051	63,401	20,734,836	49,430	39,024,949	70,671	1,037,139	3,879	188,809,030	386,918
Jul-16	23,307,675	42,096	77,506,472	211,441	30,920,639	67,477	21,069,087	54,092	41,873,228	72,152	1,106,048	3,879	195,783,150	424,506
Aug-16	24,031,429	43,009	71,719,002	190,571	30,754,170	64,323	21,615,362	55,112	42,922,767	74,666	1,226,027	3,879	192,268,756	401,024
Sep-16	22,050,541	42,149	54,535,194	181,490	26,990,902	62,551	18,759,543	50,939	32,890,070	69,655	1,342,061	3,879	156,568,312	390,039
Oct-16	20,961,586	38,762	40,358,936	111,883	23,888,541	51,219	20,323,690	47,867	29,516,400	55,902	1,555,061	3,879	136,604,215	270,049
Nov-16	19,912,679	35,871	41,730,315	97,613	22,397,890	42,661	19,909,739	42,891	35,169,591	70,350	1,644,205	3,879	140,764,419	265,753
Dec-16	20,762,354	35,924	57,938,860	133,863	25,818,971	46,242	23,675,009	52,739	44,794,868	73,332	1,770,647	3,879	174,760,709	300,137

Low and High Load Forecast Scenarios

The required low and high hourly load forecast scenarios were created by taking the 95% confidence interval around each class-level sales, customer and use per customer forecast and the 95% confidence interval around the non-coincident gross peak demand forecast. MetrixND, the load forecasting software used for the sales, customers use per customer and non-coincident peak demand forecasts, provided the upper and lower bounds of a 95% confidence interval around each monthly forecast value. This software feature allowed the construction of upper and lower bound forecasts for the residential, commercial, industrial and public authority sales forecasts. The street lighting sales forecast was multiplied by 0.99 and 1.01 to generate, respectively, a lower and upper bound street lighting sales forecast. As mentioned above, the monthly residential, commercial and public authority sales forecasts were calculated by multiplying together a class-level customer forecast and a class-level use per customer forecast. For each month in the forecast period, the lower bound of each class-level sales forecast was found by multiplying the lower bound of the class-level customer count forecast by the lower bound of the class-level use per customer forecast. The same procedure was followed to arrive at the upper bound of the class-level sales forecasts. The industrial sales forecast was generated by a class-level total sales model. The lower and upper bounds of the 95% confidence interval were an output of the modeling process.

The lower bound forecasts of each class' 95% confidence interval were summed to arrive at the lower bound for the total sales forecast, while the upper bound forecasts of each class' 95% confidence interval were summed to arrive at the upper bound for the total sales forecast. The lower bound class-level sales forecasts were then applied to the appropriate load profile and, along with the lower bound non-coincident gross peak demand forecast, was run through MetrixLT to generate the lower bound of the hourly forecast. The same procedure was undertaken with the upper bound sales forecasts and non-coincident peak demand forecast to generate the upper bound of the hourly forecast.

The reference case temperature assumptions in the hourly load forecast model were not changed for the scenarios. The reference case weather-related assumptions in the sales, the use per customer and the non-coincident peak demand forecast models for MEC's Illinois service territory were not changed in the scenarios. The reference case forecasts for retail switching sales, customers and demand in MEC's Illinois service territory were not changed in the scenarios.