MidAmerican
ENERGY
OBSESSIVELY, RELENTLESSLY *AT YOUR SERVICE*.

July 13, 2018

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

Dear Mr. Star:

MidAmerican is providing the following information to meet the July 15, 2018 deadline for submission of generation and load data to the Illinois Power Agency.

MidAmerican is submitting capacity-related data utilizing the same methodology as used in recent biennial data submittals. MidAmerican is submitting energy-related data modifying its methodology for generation production values, but retaining load data utilizing the same methodology as used in recent biennial data submittals. MidAmerican initially presented this new concept to the Illinois Power Agency and the Illinois Commerce Commission in April of 2018.

MidAmerican's prior method for submitting data for block energy data requests utilized production cost models that contained five year forecasts of fuel prices and MISO energy market prices to determine generation production. The resulting generaton production forecasts were then used to develop monthly on-peak and off-peak block energy requirements by netting production volumes with forecasted load requirements using spreadsheet algorithms coordinated with the Illinois Power Agency. Recent volatility in those forecasts prompted a review of other possible methods that would meet Illinois Power Agency requirements.

The new method utilizes the full capability of each baseload generation asset, represented by the MISO Unforced Capacity (UCAP) MW values which are already a part of MidAmerican's data submittal to the Illinois Power Agency. MISO determines UCAP values for each year's Planning Resource Auction. The UCAP values de-rate generating unit capabilities by considering historical forced outage rates and operating conditions under summer peak conditions. There are no changes to the spreadsheet utilized to determine monthly on-peak and off-peak block energy requirements, other than the replacement of generation production values with the UCAP values summed for each of the following baseload resources:

- Coal Resources - Neal Unit #3, Neal Unit #4, Walter Scott Unit #3, Louisa Generating Station, Ottumwa Generating Station
- Nuclear Resources: Quad Cities Nuclear Power Station

The new method recognizes that a portion of the above existing baseload resources can be available to meet Illinois load requirements, thus reducing the amount of Illinois Power Agency block energy purchases required. Should market prices fall below the production costs for MidAmerican's baseload resources, MidAmerican's Illinois retail customers can continue to benefit from MISO day-ahead or real-time market purchases in lieu of energy production from the baseload resources.

Please review the data and let me know if there are any questions or concerns with this information.

The following information is being supplied with this filing.

1. Forecast Documentation_IL_07152018.pdf – This file contains a discussion of load forecast methodology.
2. IL_Base_Fcst_EST_07152018.xlsx and IL_Base_Retail_Sales_Forecast_07152018 – These files contain the required base scenario MidAmerican Illinois sales and hourly load forecasts from June 1, 2018 through May 31, 2025.
3. IL_NCP_Forecast_07152018.xlsx – This file contains the noncoincident peak demand forecast.
4. Forecasted Load and Capability_07152018.xlsx – This file contains MidAmerican's forecasted load and capability utilizing unforced capacity ratings.
5. Historical and Forecasted ICAP and UCAP 07152018.xlsx – this file shows historical installed capacity (ICAP) and unforced capacity (UCAP) values for the Illinois historical resources.
6. Generation and Load Data MidAmerican Energy Projection 07152018.xlsx. This file contains the hourly MWh generation as described in the paragraphs above and sales forecast, including a summary tab computing the on and off peak short energy positions and a tab summarizing the resources required, the resources already under contract and the quantities to be procured.
7. IL_High_Fcst_EST_07152018 - This file contains the required high scenario MidAmerican Illinois hourly load forecast from June 1, 2018 through May 31, 2025.
8. IL_Low_Fcst_EST_07152018 - This file contains the required low scenario MidAmerican Illinois hourly load forecast from June 1, 2018 through May 31, 2025.
9. MWh_Sales_and_NCP_MW_High_Scenario - This file contains the MWh sales forecast and the non-coincident peak demand forecast supporting the high hourly forecast scenario.
10. MWh_Sales_and_NCP_MW_Low_Scenario - This file contains the MWh sales forecast and the non-coincident peak demand forecast supporting the low hourly forecast scenario.

Sincerely,

Neil D. Hammer

Neil D. Hammer
Director, Market Assessment, Compliance/Stds
1-515-252-6407

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Methodology for the 2019-2028 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 2019-2028 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 2018. 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 2019-2028 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 2019-2028 forecast, normal weather was defined as the average monthly degree days from 1988-2017.

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:

$$NormalizedSales = ActualSales - [PredictedSales_{ActualWeather} - PredictedSales_{NormalWeather}]$$

[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 4.7, 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 2047 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.

$$R^2 = \frac{Explained Variation}{Total Variation}$$

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: Real per Capita Income in the Quad Cities MSA multiplied by a time trend, 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	0.03%
Commercial	0.12%
Industrial	1.04%
Public Authority	0.27%

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
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	74,159	9,401	39	1,371	43	85,014
2018	74,012	9,572	37	1,406	44	85,072
2019	74,604	9,642	38	1,406	44	85,733
2020	75,201	9,704	38	1,405	44	86,392
2021	75,803	9,763	39	1,404	44	87,052
2022	76,409	9,822	39	1,403	44	87,718
2023	77,020	9,882	39	1,403	44	88,389
2024	77,637	9,943	40	1,402	44	89,065
2025	78,258	10,003	40	1,401	44	89,747
2026	78,884	10,064	40	1,401	44	90,433
2027	79,515	10,126	41	1,400	44	91,126
2028	80,151	10,188	41	1,399	44	91,824

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, current monthly heating degree days 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	9.64%

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
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	606,492	465,721	637,991	163,514	10,487	1,884,204
2018	624,437	457,404	642,846	170,090	10,613	1,905,390
2019	627,216	460,402	662,190	169,832	9,944	1,929,584
2020	631,292	462,256	669,856	169,563	9,954	1,942,922
2021	635,394	463,975	677,191	169,295	9,964	1,955,820
2022	639,523	465,667	686,328	169,028	9,974	1,970,520
2023	643,679	467,402	694,533	168,761	9,984	1,984,360
2024	647,862	469,135	702,761	168,494	9,994	1,998,247
2025	652,072	470,972	710,389	168,228	10,004	2,011,665
2026	656,310	472,817	717,519	167,962	10,014	2,024,622
2027	660,574	474,683	724,701	167,696	10,024	2,037,679
2028	664,867	476,572	732,609	167,431	10,034	2,051,514

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 – Number of members per household in the Quad Cities MSA, billing days, cooling degree days (current month), heating degree days (current month), current month heating degree days interacted with a time trend, binary variable for the Illinois rate case impact and monthly binaries
Commercial model – Time trend variable, cooling degree days (current month), heating degree days (lagged month), 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	0.03%
Commercial	0.12%
Industrial	1.04%
Public Authority	0.27%

Methodology for the 2019-2028 Monthly Illinois Non-Coincident Electric Gross Peak Demand Forecast

2017 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 2017 native system peak load of 442 MW occurred on June 13, 2017 in the hour ending at 5:00 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 not in effect.

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, 2017 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

<u>A weighted economic variable and Net Energy for Load</u>

For the 2019-2028 forecast, MEC used the area's net energy for load as the economic driver. Also used was an economic variable weighted between real gross metro area product for the Quad Cities MSA and the number of households in the Quad Cities MSA. This variable was constructed in the following manner:

Real GMP^0.15*Number of households^0.85

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 2017. 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.

The remaining explanatory variables in the model were monthly binary variables and a binary variable indicating whether or not the gross peak demand occurred on a Friday.

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

Year	Month	Peak MW at Generator (MEC served)
2019	6	400.62
2019	7	449.40
2019	8	455.74
2019	9	405.22
2019	10	292.96
2019	11	280.47
2019	12	300.35
2020	1	330.48
2020	2	314.58
2020	3	298.07
2020	4	277.24
2020	5	333.63
2020	6	402.35
2020	7	451.24
2020	8	457.61
2020	9	406.99
2020	10	294.88
2020	11	282.51
2020	12	302.64
2021	1	332.83
2021	2	316.78
2021	3	300.10
2021	4	279.20
2021	5	335.45
2021	6	404.15
2021	7	453.07
2021	8	459.48
2021	9	408.78
2021	10	296.85
2021	11	284.57
2021	12	305.01
2022	1	335.44
2022	2	319.27
2022	3	302.53
2022	4	281.37
2022	5	337.39
2022	6	405.97
2022	7	454.98
2022	8	461.41
2022	9	410.62
2022	10	298.83
2022	11	286.59
2022	12	307.22
2023	1	338.08
2023	2	321.73
2023	3	304.85
2023	4	283.46
2023	5	339.25
2023	6	407.82
2023	7	456.91
2023	8	463.34
2023	9	412.41
2023	10	300.77
2023	11	288.62
2023	12	309.58
2024	1	340.47
2024	2	324.00
2024	3	307.03
2024	4	285.52
2024	5	341.17
2024	6	409.70
2024	7	458.82
2024	8	465.29
2024	9	414.27
2024	10	302.65
2024	11	290.48
2024	12	311.58
2025	1	343.10
2025	2	326.54
2025	3	309.47
2025	4	287.53
2025	5	342.88

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 1988-2017 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 Load Shape 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 load shape was developed by combining the small and large commercial load research data. The industrial class load shape was developed using the small and large industrial load research data. The street lighting load shape was a lighting load shape from MEC's load research library. The public authority class load shape was developed by using a weighted average of the residential, commercial, industrial and street lighting class load shapes, 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, 2014 through December 31, 2017. The models contain weather, binary and trend explanatory variables. There were twenty four models for each class. A forecast was developed through May 31, 2025, 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 13.8 MW in 2019 to 14.0 MW in 2025.

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-19	44,465	4,859,204	853,936	420,000	-	6,177,604	12.50
Feb-19	42,078	3,683,102	900,740	420,210	-	5,046,130	12.10
Mar-19	35,245	3,701,075	750,000	392,392	-	4,878,712	11.96
Apr-19	33,372	3,400,730	734,247	371,371	-	4,539,720	12.30
May-19	29,559	5,771,922	716,830	490,490	-	7,008,801	13.35
Jun-19	27,103	5,087,720	818,393	683,437	-	6,616,653	13.13
Jul-19	38,057	4,194,305	807,291	654,402	-	5,694,055	13.21
Aug-19	45,668	8,042,757	746,998	613,979	-	9,449,403	13.76
Sep-19	41,863	4,750,607	812,238	560,560	-	6,165,268	13.53
Oct-19	38,057	6,621,999	804,522	490,490	-	7,955,068	12.54
Nov-19	32,729	4,659,578	792,117	504,504	-	5,988,928	12.03
Dec-19	38,566	5,075,392	911,830	525,525	-	6,551,313	12.33
Jan-20	44,531	4,873,788	854,363	420,420	-	6,193,102	12.53
Feb-20	42,141	3,694,156	901,190	420,630	-	5,058,118	12.13
Mar-20	35,298	3,712,182	750,375	392,785	-	4,890,640	11.99
Apr-20	33,423	3,410,936	734,614	371,743	-	4,550,716	12.33
May-20	29,604	5,789,245	717,188	490,981	-	7,027,017	13.38
Jun-20	27,144	5,102,989	818,802	684,121	-	6,633,056	13.16
Jul-20	38,114	4,206,894	807,694	655,057	-	5,707,759	13.24
Aug-20	45,737	8,066,895	747,371	614,593	-	9,474,597	13.79
Sep-20	41,926	4,764,865	812,644	561,121	-	6,180,555	13.57
Oct-20	38,114	6,641,873	804,924	490,981	-	7,975,893	12.57
Nov-20	32,778	4,673,563	792,513	505,009	-	6,003,862	12.06
Dec-20	38,624	5,090,624	912,286	526,051	-	6,567,585	12.36
Jan-21	44,598	4,888,415	854,790	420,841	-	6,208,644	12.56
Feb-21	42,204	3,705,243	901,641	421,051	-	5,070,139	12.16
Mar-21	35,351	3,723,324	750,750	393,177	-	4,902,602	12.02
Apr-21	33,473	3,421,173	734,982	372,114	-	4,561,742	12.36
May-21	29,648	5,806,620	717,547	491,472	-	7,045,286	13.41
Jun-21	27,185	5,118,305	819,211	684,805	-	6,649,505	13.19
Jul-21	38,171	4,219,519	808,098	655,712	-	5,721,501	13.27
Aug-21	45,806	8,091,106	747,745	615,208	-	9,499,865	13.83
Sep-21	41,988	4,779,165	813,051	561,682	-	6,195,886	13.60
Oct-21	38,171	6,661,807	805,327	491,472	-	7,996,777	12.60
Nov-21	32,827	4,687,589	792,909	505,514	-	6,018,839	12.09
Dec-21	38,682	5,105,903	912,742	526,577	-	6,583,903	12.39
Jan-22	44,665	4,903,087	855,217	421,262	-	6,224,231	12.59
Feb-22	42,268	3,716,364	902,091	421,472	-	5,082,195	12.19
Mar-22	35,404	3,734,498	751,126	393,571	-	4,914,599	12.05
Apr-22	33,523	3,431,441	735,349	372,487	-	4,572,800	12.39
May-22	29,693	5,824,047	717,906	491,963	-	7,063,608	13.45
Jun-22	27,225	5,133,666	819,621	685,490	-	6,666,002	13.22
Jul-22	38,229	4,232,183	808,502	656,368	-	5,735,282	13.30
Aug-22	45,874	8,115,390	748,119	615,824	-	9,525,207	13.86
Sep-22	42,051	4,793,509	813,457	562,244	-	6,211,261	13.64
Oct-22	38,229	6,681,801	805,729	491,963	-	8,017,722	12.63
Nov-22	32,877	4,701,658	793,305	506,020	-	6,033,859	12.12
Dec-22	38,740	5,121,227	913,198	527,104	-	6,600,269	12.42
Jan-23	44,732	4,917,802	855,645	421,683	-	6,239,862	12.63
Feb-23	42,331	3,727,517	902,542	421,894	-	5,094,285	12.22
Mar-23	35,457	3,745,706	751,501	393,964	-	4,926,629	12.08
Apr-23	33,573	3,441,740	735,717	372,859	-	4,583,889	12.42
May-23	29,737	5,841,526	718,265	492,456	-	7,081,983	13.48
Jun-23	27,266	5,149,073	820,031	686,176	-	6,682,546	13.26
Jul-23	38,286	4,244,885	808,906	657,024	-	5,749,102	13.34
Aug-23	45,943	8,139,746	748,493	616,440	-	9,550,622	13.90
Sep-23	42,115	4,807,895	813,864	562,806	-	6,226,680	13.67
Oct-23	38,286	6,701,855	806,132	492,456	-	8,038,729	12.66
Nov-23	32,926	4,715,769	793,702	506,526	-	6,048,922	12.15
Dec-23	38,798	5,136,597	913,655	527,631	-	6,616,681	12.45
Jan-24	44,799	4,932,562	856,073	422,105	-	6,255,538	12.66
Feb-24	42,395	3,738,705	902,994	422,316	-	5,106,409	12.25
Mar-24	35,510	3,756,948	751,877	394,358	-	4,938,694	12.11
Apr-24	33,624	3,452,069	736,085	373,232	-	4,595,010	12.45
May-24	29,782	5,859,058	718,624	492,948	-	7,100,412	13.52
Jun-24	27,307	5,164,527	820,441	686,862	-	6,699,137	13.29
Jul-24	38,343	4,257,625	809,311	657,682	-	5,762,961	13.37
Aug-24	46,012	8,164,175	748,867	617,056	-	9,576,111	13.93
Sep-24	42,178	4,822,325	814,271	563,369	-	6,242,143	13.70
Oct-24	38,343	6,721,969	806,535	492,948	-	8,059,796	12.69
Nov-24	32,975	4,729,922	794,099	507,032	-	6,064,028	12.18
Dec-24	38,857	5,152,013	914,112	528,159	-	6,633,140	12.49
Jan-25	44,866	4,947,365	856,501	422,527	-	6,271,260	12.69
Feb-25	42,458	3,749,925	903,445	422,738	-	5,118,567	12.28
Mar-25	35,564	3,768,224	752,253	394,753	-	4,950,793	12.14
Apr-25	33,674	3,462,430	736,453	373,605	-	4,606,162	12.48
May-25	29,827	5,876,643	718,983	493,441	-	7,118,893	13.55
Jun-25	27,348	5,180,027	820,851	687,549	-	6,715,775	13.32
Jul-25	38,401	4,270,403	809,716	658,339	-	5,776,859	13.40
Aug-25	46,081	8,188,678	749,242	617,673	-	9,601,674	13.97
Sep-25	42,241	4,836,798	814,678	563,933	-	6,257,650	13.74
Oct-25	38,401	6,742,143	806,939	493,441	-	8,080,924	12.73
Nov-25	33,025	4,744,118	794,496	507,539	-	6,079,178	12.21
Dec-25	38,915	5,167,475	914,569	528,687	-	6,649,646	12.52

Table 9: Retail Switching: Monthly Customer Count Forecasts

	Residential	Commercial	Industrial	Public Authority	Street Lighting	Total
Jan-19	76	205	2	14	-	297
Feb-19	76	205	2	14	-	297
Mar-19	76	206	2	14	-	298
Apr-19	76	206	2	14	-	298
May-19	76	206	2	14	-	298
Jun-19	76	206	2	14	-	298
Jul-19	76	206	2	14	-	298
Aug-19	76	206	2	14	-	298
Sep-19	76	206	2	14	-	298
Oct-19	76	206	2	14	-	298
Nov-19	76	206	2	14	-	298
Dec-19	76	206	2	14	-	298
Jan-20	76	206	2	14	-	298
Feb-20	76	206	2	14	-	298
Mar-20	76	206	2	14	-	298
Apr-20	76	206	2	14	-	298
May-20	76	206	2	14	-	298
Jun-20	76	206	2	14	-	298
Jul-20	76	206	2	14	-	298
Aug-20	76	206	2	14	-	298
Sep-20	76	206	2	14	-	298
Oct-20	76	206	2	14	-	298
Nov-20	76	206	2	14	-	298
Dec-20	76	206	2	14	-	298
Jan-21	76	206	2	14	-	298
Feb-21	76	206	2	14	-	298
Mar-21	76	207	2	14	-	299
Apr-21	76	207	2	14	-	299
May-21	76	207	2	14	-	299
Jun-21	76	207	2	14	-	299
Jul-21	76	207	2	14	-	299
Aug-21	76	207	2	14	-	299
Sep-21	76	207	2	14	-	299
Oct-21	76	207	2	14	-	299
Nov-21	76	207	2	14	-	299
Dec-21	76	207	2	14	-	299
Jan-22	76	207	2	14	-	299
Feb-22	76	207	2	14	-	299
Mar-22	76	207	2	14	-	299
Apr-22	76	207	2	14	-	299
May-22	76	207	2	14	-	299
Jun-22	76	207	2	14	-	299
Jul-22	76	207	2	14	-	299
Aug-22	76	207	2	14	-	299
Sep-22	76	207	2	14	-	299
Oct-22	76	207	2	14	-	299
Nov-22	76	207	2	14	-	299
Dec-22	76	207	2	14	-	299
Jan-23	76	207	2	14	-	299
Feb-23	76	207	2	14	-	299
Mar-23	76	208	2	14	-	300
Apr-23	76	208	2	14	-	300
May-23	76	208	2	14	-	300
Jun-23	76	208	2	14	-	300
Jul-23	76	208	2	14	-	300
Aug-23	76	208	2	14	-	300
Sep-23	76	208	2	14	-	300
Oct-23	76	208	2	14	-	300
Nov-23	76	208	2	14	-	300
Dec-23	76	208	2	14	-	300
Jan-24	76	208	2	14	-	300
Feb-24	76	208	2	14	-	300
Mar-24	76	208	2	14	-	301
Apr-24	76	208	2	14	-	301
May-24	76	208	2	14	-	301
Jun-24	76	208	2	14	-	301
Jul-24	76	208	2	14	-	301
Aug-24	76	208	2	14	-	301
Sep-24	76	208	2	14	-	301
Oct-24	76	208	2	14	-	301
Nov-24	76	208	2	14	-	301
Dec-24	76	208	2	14	-	301
Jan-25	76	208	2	14	-	301
Feb-25	77	208	2	14	-	301
Mar-25	77	209	2	14	-	301
Apr-25	77	209	2	14	-	301
May-25	77	209	2	14	-	301
Jun-25	77	209	2	14	-	301
Jul-25	77	209	2	14	-	301
Aug-25	77	209	2	14	-	301
Sep-25	77	209	2	14	-	301
Oct-25	77	209	2	14	-	301
Nov-25	77	209	2	14	-	301
Dec-25	77	209	2	14	-	301

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-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
Jan-17	17,643,075	29,769	57,977,890	117,589	20,385,857	35,826	30,420,713	66,064	41,994,393	71,152	1,734,512	3,879	170,156,440	296,942
Feb-17	15,756,617	29,462	44,021,650	106,654	17,287,706	33,990	24,262,955	61,208	37,197,836	70,011	1,457,256	3,879	139,984,021	268,951
Mar-17	17,280,745	29,180	45,605,028	91,439	18,901,840	33,169	26,010,158	57,160	44,233,569	72,242	1,443,616	3,879	153,474,956	257,166
Apr-17	16,283,695	29,096	37,404,411	81,857	17,209,645	32,876	21,844,958	51,842	37,253,573	64,808	1,237,598	3,879	131,233,880	224,477
May-17	17,770,081	33,320	40,409,445	129,352	18,635,395	42,498	22,585,265	58,269	43,296,459	73,617	1,139,598	3,879	143,836,244	303,334
Jun-17	18,905,124	35,256	59,570,771	169,806	22,132,809	48,273	26,629,776	69,779	44,361,827	75,071	1,037,139	3,879	172,637,446	373,755
Jul-17	19,975,106	36,077	74,492,245	179,789	24,423,954	50,700	29,493,396	75,994	33,469,146	70,913	1,106,048	3,879	182,959,896	371,881
Aug-17	19,298,369	33,375	53,880,710	143,099	21,736,650	45,152	26,592,946	63,066	43,539,287	72,918	1,226,027	3,879	166,273,989	338,195
Sep-17	18,157,551	34,651	50,680,626	160,565	20,241,510	46,811	24,688,069	67,089	41,884,820	69,945	1,342,061	3,879	156,994,638	354,368
Oct-17	17,728,362	31,737	41,595,585	100,631	18,195,001	38,461	27,198,973	68,520	44,249,008	71,340	1,555,061	3,879	150,521,990	253,516
Nov-17	16,558,923	29,426	47,417,055	96,504	17,623,034	31,673	30,994,744	72,586	39,123,520	67,903	1,644,205	3,879	153,361,481	267,234
Dec-17	17,098,024	29,079	59,350,639	138,883	19,482,390	34,996	30,470,912	65,697	40,418,303	69,139	1,770,647	3,879	168,590,915	302,752

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.