MidAmerican
ENERGY
OBSESSIVELY, RELENTLESSLY ***AT YOUR SERVICE.***

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BARRY CAMPBELL
Vice President, Energy Supply Management

July 1, 2015

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

Dear Mr. Star:

MidAmerican is submitting its final hourly load and generation data on July 1, 2015 in advance of the July 15, 2015 deadline per the IPA's request. 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.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_Hourly_Load_Forecast_05112015_Base_Scenario.xlsx – This file contains the required base scenario MidAmerican Illinois hourly load forecast from June 1, 2016 through May 31, 2021.
3. IL_Hourly_Load_Forecast_06122015_High_Scenario.xlsx – This file contains the required high scenario MidAmerican Illinois hourly load forecast from June 1, 2016 through May 31, 2021.
4. IL_Hourly_Load_Forecast_06122015_Low_Scenario.xlsx – This file contains the required low scenario MidAmerican Illinois hourly load forecast from June 1, 2016 through May 31, 2021.
5. MidAmerican RPS Worksheet.xlsx – This file contains the completed data request received from the IPA on June 19, 2015 in an email from Mario Bohorquez to Mike Fehr.
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 load 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 load forecast scenario.

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8. Forecasted Load and Capability.xls – this file contains MidAmerican's forecast load and capability forecast utilizing unforced capacity ratings.
9. Historical and Forecasted ICAP and UCAP.xlsx – this file shows historical installed capacity (ICAP) and unforced capacity (UCAP) values for the Illinois historical resources. The resources shown in the 2015-16 column are the resources that MidAmerican expects to register with MISO for the 2016-17 through 2020-21 planning resource auctions. 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. Generation and Load Data – MidAmerican Energy Co.xlsx – This file contains the hourly MWh generation and sales forecast, including a summary tab computing the on and off peak short energy position.

Per the IPA's request, MidAmerican will also provide information regarding the renewable portfolio and its applicability to the incremental load by July 15, 2015. Likewise, MidAmerican will provide information regarding its exemption from the IPA's energy efficiency programs by July 15, 2015.

Sincerely,

Barry Campbell
Vice President, Energy Supply Management

Methodology For Illinois Electric Customers and Sales Forecasts: 2016-2025

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 2016-2025 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.

Base industrial kWh sales were forecast directly with assumed large customer additions added on to arrive at a total industrial class kWh sales forecast. 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 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 2015. 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 2016-2025 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 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 weather data was obtained from the NOAA (National Oceanic and Atmospheric Administration) and are based on 65 degrees Fahrenheit. The weather data was taken from the weather station at the Moline International Airport.

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 2016-2025 forecast, normal weather was defined as the average monthly degree days from 1985-2014.

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 4.5, 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 2044 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: Non-farm employment in the Quad Cities MSA, binary variable for the Illinois rate case impact and monthly binary variables
- Industrials: Economic variable weighted between population in the Quad Cities MSA and real gross metropolitan area product 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	0.10%
Industrial	0.94%
Public Authority	0.54%

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
2008	75,394	7,796	90	1,303	48	84,631
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	74,744	9,015	56	1,312	42	85,168
2016	74,762	9,038	56	1,303	41	85,200
2017	74,802	9,045	56	1,303	40	85,246
2018	74,851	9,050	57	1,303	40	85,301
2019	74,903	9,054	58	1,304	40	85,359
2020	74,962	9,058	59	1,305	40	85,424
2021	75,010	9,061	60	1,307	40	85,477
2022	75,060	9,063	60	1,308	40	85,530
2023	75,108	9,065	60	1,309	40	85,581
2024	75,155	9,066	61	1,309	40	85,631
2025	75,199	9,067	61	1,310	40	85,677

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, current month cooling degree days, industrial retail average revenue lagged twelve months, the number of monthly billing 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	4.18%

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
2008	634,396	444,459	679,629	192,841	13,332	1,964,657
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	658,276	472,333	685,891	164,225	9,832	1,990,557
2016	658,390	460,271	699,838	164,434	9,203	1,992,137
2017	660,795	457,430	706,791	166,369	9,041	2,000,427
2018	662,124	455,599	711,552	168,566	9,031	2,006,871
2019	663,201	455,295	718,014	170,767	9,021	2,016,297
2020	664,406	455,177	723,016	172,738	9,053	2,024,389
2021	665,232	454,828	731,596	174,776	8,999	2,035,431
2022	666,228	454,505	737,632	176,599	8,988	2,043,953
2023	667,357	454,179	743,144	178,204	8,977	2,051,862
2024	668,750	453,828	746,604	179,784	9,009	2,057,975
2025	670,114	453,459	754,562	180,973	8,955	2,068,064

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 – Economic variable (weighted between members per household in the Quad Cities metropolitan area and real per capita income in the Quad Cities metropolitan area), billing days, cooling degree days (current and previous month), heating degree days (current and lagged month), binary variable for the Illinois rate case impact and monthly binaries
Commercial model – Economic variable (MEC total commercial use per customer (history and forecast)), cooling degree days (lagged), heating degree days (lagged), hours of light, billing days, hours of light, binary variable for the Illinois rate case impact and monthly binaries
Public Authority model – State and local government employment, billing days, heating degree days (current month and previous month), cooling degree days (previous month), hours of light, a time trend variable, an indicator variable for the winter of 2012, binary variable for the Illinois rate case impact and monthly binaries

Table 6: Model Statistics

Revenue Class	MAPE
Residential	4.04%
Commercial	2.82%
Public Authority	5.16%

Methodology for the Monthly Illinois Non-Coincident Electric Gross Peak Demand Forecast: 2016-2025

2014 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 2014 native system peak load of 437 MW occurred on August 25, 2014 in the hour ending at 3:00 p.m.

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, 2014 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

Weighted Economic Variable: Real gross metropolitan area product and number of households

Economic data was obtained from the IHS Global Insight, Inc. (GI) database and included the gross domestic product (GDP) deflator, the Quad Cities' MSA real gross metropolitan area product (RGMP) and the Quad Cities' MSA number of households.

For the 2016-2025 forecast, MEC used a weighted economic variable weighted equally between the Quad Cities' MSA real gross metropolitan area product and the Quad Cities' MSA number of households. As the relationship between electricity demand and real gross state product continues to change, the economic driver weighted between the number of households and output will better portray the expected electricity demand growth. This variable was constructed in the following manner:

Real gross MSA product^0.25*Number of households^0.75*Time Trend

RGMP, which is reported by Bureau of Economic Analysis (BEA) of the Department of Commerce, is the MSA counterpart to the national GDP and is defined as the sum of the gross metropolitan area product originating in all industries in the MSA. An industry's GMP is its gross output minus its intermediate inputs. Real GMP, used in the current forecast, is derived by applying national price deflators to the current-dollar GMP estimates for the detailed industry groups.

The Bureau of Economic Analysis releases GMP data annually and does not provide any forecasts. GDP, however, is reported quarterly and reflects the current state of the economic environment. IHS Global Insight (GI) generates the quarterly GMP values and forecast values used in this forecast. These numbers are based on GDP and the relationship between the annual GMP and other macroeconomic variables available. Moreover, there is usually a lag of 12 to 18 months between the data and the actual year involved. For example, GMP data reported in 2015 may correspond to 2013 or 2014. GI fills the missing data during the lag period through interpolation of the current GDP data.

Number of households is the measure of the number of households in the Quad Cities MSA. The time trend multiplier was added to capture the change over time in the relationship between the economic driver and the peak electricity demand.

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 CDD65 (shoulder = April and October; CDD65 = the peak day average temperature less 65, if the average temperature is greater than 65; = 0 if the average temperature is less than 65)

The forecast weather was calculated using the rank and average method for 2008 through 2014. 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.

Impact of large load addition

The 3M plant located in Cordova, IL added 10 MW of load in 2015 Q1. Since this load addition was not picked up in the data used to estimate the model, using the model results alone for the peak demand forecast would result in a forecast that is too low. Therefore, the 10 MW load addition was added to the model results to achieve the final peak demand forecast.

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

Year	Month	Peak
2015	6	419.680
2015	7	463.672
2015	8	446.600
2015	9	387.851
2015	10	284.124
2015	11	291.239
2015	12	310.839
2016	1	320.751
2016	2	305.699
2016	3	286.221
2016	4	280.820
2016	5	322.168
2016	6	420.166
2016	7	463.829
2016	8	446.877
2016	9	388.546
2016	10	285.571
2016	11	292.627
2016	12	312.081
2017	1	318.204
2017	2	303.261
2017	3	283.919
2017	4	278.555
2017	5	322.103
2017	6	422.781
2017	7	466.741
2017	8	449.674
2017	9	390.946
2017	10	287.271
2017	11	294.375
2017	12	313.962
2018	1	320.303
2018	2	305.258
2018	3	285.784
2018	4	280.384
2018	5	324.228
2018	6	425.590
2018	7	469.849
2018	8	452.666
2018	9	393.538
2018	10	289.158
2018	11	296.311
2018	12	316.031
2019	1	322.415
2019	2	307.268
2019	3	287.662
2019	4	282.225
2019	5	326.367
2019	6	428.418
2019	7	472.978
2019	8	455.678
2019	9	396.149
2019	10	291.059
2019	11	298.261
2019	12	318.114
2020	1	324.542
2020	2	309.292
2020	3	289.553
2020	4	284.079
2020	5	328.520
2020	6	431.265
2020	7	476.128
2020	8	458.711
2020	9	398.777
2020	10	292.972
2020	11	300.223
2020	12	320.212
2021	1	326.683
2021	2	311.329
2021	3	291.457
2021	4	285.946
2021	5	330.688
2021	6	434.131
2021	7	479.300
2021	8	461.764
2021	9	401.422
2021	10	294.899
2021	11	302.199
2021	12	322.324

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 1985-2014 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 an Illinois street lighting loadshape from Itron's loadshape 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, 2008 through December 31, 2014. The models contain weather, binary and trend explanatory variables. There were twenty four models for each class. A forecast was developed through December 31, 2021, 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 11 MW in 2015 to 14 MW in 2021.

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

Year	Month	MW Peak	Residential MWh	Commercial MWh	Industrial MWh	Public Authority MWh	Street Lighting MWh	Total MWh
2015	6	8.91	74.60	3,182.93	1,464.64	2.49	248.67	4,973
2015	7	10.67	89.33	3,811.45	1,753.86	2.98	297.77	5,955
2015	8	10.55	88.27	3,766.01	1,732.95	2.94	294.22	5,884
2015	9	9.85	82.46	3,518.42	1,619.02	2.75	274.88	5,498
2015	10	6.80	56.92	2,428.42	1,117.45	1.90	189.72	3,794
2015	11	7.10	59.43	2,535.55	1,166.75	1.98	198.09	3,962
2015	12	7.83	65.54	2,796.25	1,286.71	2.18	218.46	4,369
2016	1	8.00	66.96	2,856.96	1,314.65	2.23	223.20	4,464
2016	2	7.98	68.32	2,915.14	1,341.42	2.28	227.75	4,555
2016	3	7.99	68.52	2,923.35	1,345.20	2.28	228.39	4,568
2016	4	7.90	67.81	2,893.12	1,331.29	2.26	226.03	4,521
2016	5	8.89	74.43	3,175.60	1,461.27	2.48	248.09	4,962
2016	6	11.91	99.71	4,254.29	1,957.64	3.32	332.37	6,647
2016	7	13.67	114.44	4,882.81	2,246.86	3.81	381.47	7,629
2016	8	13.30	111.32	4,749.70	2,185.60	3.71	371.07	7,421
2016	9	12.00	100.44	4,285.44	1,971.97	3.35	334.80	6,696
2016	10	8.51	71.22	3,038.85	1,398.35	2.37	237.41	4,748
2016	11	8.74	73.14	3,120.43	1,435.89	2.44	243.78	4,876
2016	12	9.33	78.10	3,332.42	1,533.44	2.60	260.35	5,207
2017	1	9.54	79.83	3,406.26	1,567.41	2.66	266.11	5,322
2017	2	9.09	76.09	3,246.49	1,493.89	2.54	253.63	5,073
2017	3	8.52	71.31	3,042.48	1,400.02	2.38	237.69	4,754
2017	4	8.36	69.99	2,986.08	1,374.06	2.33	233.29	4,666
2017	5	9.63	80.57	3,437.59	1,581.83	2.69	268.56	5,371
2017	6	12.59	105.42	4,497.87	2,069.72	3.51	351.40	7,028
2017	7	13.94	116.68	4,978.16	2,290.73	3.89	388.92	7,778
2017	8	13.43	112.44	4,797.61	2,207.65	3.75	374.81	7,496
2017	9	11.69	97.82	4,173.60	1,920.51	3.26	326.06	6,521
2017	10	8.57	71.69	3,058.81	1,407.53	2.39	238.97	4,779
2017	11	8.80	73.62	3,140.95	1,445.33	2.45	245.39	4,908
2017	12	9.39	78.62	3,354.38	1,543.54	2.62	262.06	5,241
2018	1	9.60	80.36	3,428.72	1,577.75	2.68	267.87	5,357
2018	2	9.15	76.59	3,267.86	1,503.73	2.55	255.30	5,106
2018	3	8.58	71.78	3,062.47	1,409.21	2.39	239.26	4,785
2018	4	8.42	70.45	3,005.68	1,383.08	2.35	234.82	4,696
2018	5	9.69	81.10	3,460.26	1,592.26	2.70	270.33	5,407
2018	6	12.68	106.12	4,527.75	2,083.47	3.54	353.73	7,075
2018	7	14.03	117.45	5,011.31	2,305.99	3.92	391.51	7,830
2018	8	13.52	113.19	4,829.53	2,222.34	3.77	377.31	7,546
2018	9	11.76	98.47	4,201.28	1,933.24	3.28	328.22	6,564
2018	10	8.62	72.16	3,078.91	1,416.78	2.41	240.54	4,811
2018	11	8.85	74.10	3,161.60	1,454.83	2.47	247.00	4,940
2018	12	9.45	79.14	3,376.49	1,553.71	2.64	263.79	5,276
2019	1	9.66	80.89	3,451.33	1,588.15	2.70	269.64	5,393
2019	2	9.21	77.09	3,289.38	1,513.63	2.57	256.98	5,140
2019	3	8.63	72.25	3,082.59	1,418.47	2.41	240.83	4,817
2019	4	8.47	70.91	3,025.41	1,392.16	2.36	236.36	4,727
2019	5	9.75	81.63	3,483.09	1,602.77	2.72	272.12	5,442
2019	6	12.76	106.82	4,557.83	2,097.31	3.56	356.08	7,122
2019	7	14.13	118.23	5,044.68	2,321.34	3.94	394.12	7,882
2019	8	13.61	113.95	4,861.66	2,237.13	3.80	379.82	7,596
2019	9	11.84	99.12	4,229.14	1,946.07	3.30	330.40	6,608
2019	10	8.68	72.64	3,099.14	1,426.09	2.42	242.12	4,842
2019	11	8.91	74.59	3,182.40	1,464.40	2.49	248.62	4,972
2019	12	9.52	79.66	3,398.74	1,563.95	2.66	265.53	5,311
2020	1	9.73	81.42	3,474.10	1,598.63	2.71	271.41	5,428
2020	2	9.27	77.60	3,311.04	1,523.60	2.59	258.67	5,173
2020	3	8.69	72.72	3,102.84	1,427.79	2.42	242.41	4,848
2020	4	8.53	71.37	3,045.28	1,401.30	2.38	237.91	4,758
2020	5	9.82	82.17	3,506.07	1,613.34	2.74	273.91	5,478
2020	6	12.85	107.53	4,588.12	2,111.25	3.58	358.45	7,169
2020	7	14.22	119.02	5,078.28	2,336.80	3.97	396.74	7,935
2020	8	13.70	114.70	4,894.02	2,252.01	3.82	382.35	7,647
2020	9	11.92	99.78	4,257.20	1,958.98	3.33	332.59	6,652
2020	10	8.74	73.11	3,119.51	1,435.46	2.44	243.71	4,874
2020	11	8.97	75.08	3,203.33	1,474.03	2.50	250.26	5,005
2020	12	9.58	80.18	3,421.15	1,574.26	2.67	267.28	5,346
2021	1	9.79	81.96	3,497.02	1,609.18	2.73	273.20	5,464
2021	2	9.33	78.11	3,332.85	1,533.63	2.60	260.38	5,208
2021	3	8.75	73.20	3,123.24	1,437.18	2.44	244.00	4,880
2021	4	8.58	71.84	3,065.28	1,410.51	2.39	239.48	4,790
2021	5	9.88	82.72	3,529.21	1,623.99	2.76	275.72	5,514
2021	6	12.93	108.25	4,618.62	2,125.28	3.61	360.83	7,217
2021	7	14.31	119.82	5,112.11	2,352.37	3.99	399.38	7,988
2021	8	13.80	115.47	4,926.59	2,267.00	3.85	384.89	7,698
2021	9	12.00	100.44	4,285.44	1,971.97	3.35	334.80	6,696
2021	10	8.79	73.59	3,140.02	1,444.90	2.45	245.31	4,906
2021	11	9.03	75.57	3,224.41	1,483.73	2.52	251.91	5,038
2021	12	9.64	80.71	3,443.71	1,584.64	2.69	269.04	5,381

Table 9: Retail Switching: Monthly Customer Count Forecasts

Year	Month	Residential Customers	Commercial Customers	Industrial Customers	Public Authority Customers	Street Lighting Customers	Total Customers
2015	6	111	202	4	5	1	323
2015	7	116	212	4	5	1	338
2015	8	121	221	4	5	1	354
2015	9	127	231	5	6	2	369
2015	10	132	241	5	6	2	385
2015	11	139	255	5	6	2	407
2015	12	141	257	5	6	2	411
2016	1	142	259	6	6	2	415
2016	2	143	261	6	6	2	418
2016	3	144	262	6	5	2	419
2016	4	145	264	6	6	2	423
2016	5	149	271	6	6	2	434
2016	6	153	278	6	6	2	445
2016	7	157	285	6	6	2	456
2016	8	160	292	6	7	2	467
2016	9	164	299	6	7	2	478
2016	10	168	306	6	7	2	490
2016	11	172	313	6	7	2	501
2016	12	183	335	8	8	3	537
2017	1	184	336	8	8	3	539
2017	2	184	337	8	8	3	541
2017	3	185	338	8	8	3	542
2017	4	185	339	8	8	3	544
2017	5	186	341	8	8	3	546
2017	6	187	342	8	8	3	548
2017	7	187	343	8	8	3	549
2017	8	188	344	8	8	3	551
2017	9	188	345	8	8	3	553
2017	10	189	346	8	8	3	555
2017	11	190	347	8	8	3	557
2017	12	190	348	8	8	3	558
2018	1	190	349	8	8	3	559
2018	2	191	349	8	8	3	559
2018	3	191	349	8	8	3	559
2018	4	191	349	8	8	3	560
2018	5	191	349	8	8	3	560
2018	6	191	350	8	8	3	560
2018	7	191	350	8	8	3	561
2018	8	191	350	8	8	3	561
2018	9	191	350	8	8	3	561
2018	10	191	350	8	8	3	561
2018	11	191	350	8	8	3	562
2018	12	192	351	8	8	3	562
2019	1	192	351	8	8	3	563
2019	2	192	351	8	8	3	563
2019	3	192	351	8	8	3	563
2019	4	192	352	8	8	3	564
2019	5	192	352	8	8	3	564
2019	6	192	352	8	8	3	564
2019	7	192	352	8	8	3	565
2019	8	193	352	8	8	3	565
2019	9	193	353	8	8	3	565
2019	10	193	353	8	8	3	566
2019	11	193	353	8	8	3	566
2019	12	193	353	8	8	3	566
2020	1	193	354	8	8	3	567
2020	2	193	354	8	8	3	567
2020	3	193	354	8	8	3	567
2020	4	193	354	8	8	3	568
2020	5	194	354	8	8	3	568
2020	6	194	355	8	8	3	568
2020	7	194	355	8	8	3	569
2020	8	194	355	8	8	3	569
2020	9	194	355	8	8	3	569
2020	10	194	355	8	8	3	570
2020	11	194	356	8	8	3	570
2020	12	194	356	8	8	3	571
2021	1	195	356	9	9	3	571
2021	2	195	356	9	9	3	571
2021	3	195	356	9	9	3	571
2021	4	195	357	9	9	3	572
2021	5	195	357	9	9	3	572
2021	6	195	357	9	9	3	572
2021	7	195	357	9	9	3	573
2021	8	195	357	9	9	3	573
2021	9	195	358	9	9	3	573
2021	10	196	358	9	9	3	574
2021	11	196	358	9	9	3	574
2021	12	196	358	9	9	3	575

Table 10: Multi-Year Historical Load Detail

	Small Industrial		Residential		Large Commercial		Small Commercial		Large Industrial		Total	
	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand	kWh	kW Demand
Jan-11	33,587,021	60,356	63,558,584	124,371	32,858,995	56,840	12,484,292	27,735	33,879,249	57,029	176,368,143	289,856
Feb-11	31,445,510	60,714	52,030,571	126,883	28,822,745	57,878	11,076,756	27,440	31,139,566	58,186	154,515,148	291,431
Mar-11	34,844,777	60,334	49,152,078	105,401	30,354,610	53,584	11,355,730	26,701	34,278,541	57,323	159,985,735	267,011
Apr-11	32,610,537	60,588	41,640,708	96,738	28,470,191	53,247	9,880,182	25,309	34,174,198	58,549	146,775,816	250,181
May-11	35,113,848	69,582	46,862,781	160,491	31,122,614	69,536	10,383,130	30,770	35,735,431	60,008	159,217,805	364,995
Jun-11	37,474,697	72,438	61,707,542	210,173	34,258,347	74,936	11,748,507	33,844	33,709,916	58,939	178,899,009	418,441
Jul-11	39,881,255	73,962	97,050,843	239,760	40,471,586	80,816	14,686,219	37,551	35,443,610	61,491	227,533,512	463,907
Aug-11	40,135,259	75,518	74,286,910	231,505	38,623,277	79,935	13,971,404	37,706	37,675,522	61,262	204,692,372	451,016
Sep-11	33,238,277	73,560	47,674,452	213,450	31,112,096	76,274	11,030,661	33,909	29,323,684	58,009	152,379,169	427,155
Oct-11	32,045,488	60,561	44,080,574	100,955	30,441,798	61,991	12,039,433	27,931	36,316,260	56,773	154,923,553	268,812
Nov-11	30,558,435	59,306	47,139,843	107,664	28,932,103	53,415	10,427,821	26,879	32,823,272	54,774	149,881,474	263,609
Dec-11	30,248,661	57,049	56,930,876	114,861	30,782,254	55,425	11,688,773	27,331	34,558,204	55,704	164,208,767	273,734
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	143,125,535	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

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.