Exhibit No.:	
Issues:	Load Forecast
Witness:	John P. Davulis
Sponsoring Party:	Missouri Department of Natural Resources – Division of Energy
Type of Exhibit:	Rebuttal Testimony
Case No.:	EO-2011-0271

REBUTTAL TESTIMONY
OF
JOHN P. DAVULIS

GDS ASSOCIATES, INC.
On behalf of the Missouri Department of Natural Resources
Division of Energy

OCTOBER 28, 2011

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

UNION ELECTRIC COMPANY, d/b/a AMEREN MISSOURI

2011 UTILITY RESOURCE FILING
PURSUANT TO 4 CSR 240 – CHAPTER 22

CASE NO. EO-2011-0271

I. INTRODUCTION

Q. Please state your name, position and business address.

A. My name is John P. Davulis. I am a Senior Project Manager at GDS Associates, Inc. (GDS). My business address is GDS Associates, Inc., 323 State Street, Suite 2, Augusta, Maine 04330.

Q. Please describe GDS Associates.

A. GDS Associates Inc. is a multi-service consulting and engineering firm formed in 1986 that now employs a staff of over 170 in five locations across the U.S. Our consultants are recognized leaders in their respective fields, dedicated to their clients and innovative in their approach to meeting unique challenges. Our broad range of expertise focuses on clients associated with, or affected by, electric, gas, water and wastewater utilities. The services that GDS offers include:

- energy efficiency, renewable energy and demand response planning, program design, implementation and evaluation;
- integrated resource planning;
- electric transmission and distribution system planning;
- wholesale and retail rate studies;
- and other planning and implementation projects for the electric and natural gas industries.

In addition, we offer information technology, market research, and statistical services to a diverse client base.

Q. Please describe your educational background and professional experience.

A. I hold a B.A. in Philosophy from the University of New Hampshire, an M.A. in Philosophy from the University of Cincinnati, an M.S. in Resource Economics from the University of New Hampshire, and a Graduate Certificate in International Business from the University of Maine.

I have more than 30 years of experience in economic modeling, short and long-term forecasting, economic analysis and DSM program management. While at GDS, I have provided consulting services related to forecasting energy sales and peak load, assessment of maximum achievable cost-effective electric & gas conservation potential, energy conservation planning, and analysis o the green economy. Prior to joining GDS in 2008, I was Chief Economist at Central Maine Power Company (CMP) where I directed staff activities related to the development of economic, electric sales and peak load forecasts including both short- and long-term projections, monthly analysis of sales variance, special economic studies, competitive intelligence, testimony before regulatory bodies, maintenance and enhancement of econometric and end-use simulation models. My complete resume is provided in Schedule A which is attached to this testimony.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Missouri Department of Natural Resources (MDNR), an intervenor in these proceedings.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to address the following load forecast issues discussed Ameren Missouri's "Response to Comment's of the Parties" (Response).[1]

- Ameren Missouri's choice of economic drivers for its residential kWh usage per customer forecast is suspect, and it is possible that the Company's residential sales forecast is biased upwards.[2]
- Ameren Missouri has not provided convincing evidence that the end-use load profiles it uses are appropriate for its service territory. For example, the Company appears to have overstated its residential cooling load and understated the contribution of other end-uses to summer peak load.[3]

[1] Ameren Missouri 2011 Integrated Resource Plan, EO-2011-0271, Response to Comments of the Parties.
[2] Ibid., p. 79.
[3] Ibid. pp. 80-82.

Q: What issues have you identified with regard to Ameren Missouri's choice of economic drivers?

A: The primary concern is with the economic drivers that Ameren Missouri has used in developing its forecast of residential kWh use per customer. The basis for Ameren Missouri's residential sales forecast is problematic. In Chapter 3 of the 2011 Integrated Resource Plan, Ameren Missouri remarks: "In the SAE model framework for residential sales, household income and the number of people per household in the service territory act as drivers for use per customer, and the number of households."[4]

The functional framework of the SAE model used to develop Ameren Missouri's residential kWh use per customer forecast incorporates both "index" and "use" variables. The index variable captures trends in appliance saturation and efficiency. The use variable is a composite of variables that represent the utilization of the appliances, including income per household, the number of persons per household, heating & cooling degree days, price of electricity and the relevant elasticities. Average household size is inversely related to average kWh use per customer, and average household income is positively related to customer usage. In this framework it is essential that Ameren Missouri correctly represents the number of households, both in the past and the future. GSD is not confident that the Company has done this.

Consider the household and residential customer forecasts that Ameren Missouri has provided.[5] The number of residential customers in Ameren Missouri's service territory has been, and is expected to continue, grow faster than the number of households, as projected by Moody's Analytics. Two key variables used in the SAE model framework are household size and household income, and it would make a difference if one used the number of residential customers rather than households in the estimation process.

[4] Ameren Missouri's 2011 Integrated Resource Plan, Chapter 3, p. 13.

[5] Moody's Autumn 2009 forecast of households was used as Ameren Missouri's base forecast for the IRP; it was provided in response to DNR-0001. The Company's residential customer forecast was provided in Ameren Missouri's 2011 Integrated Resource Plan, Chapter 3, Appendix A, pp. 35 and 56.

For example, Moody's Analytics projects that the total population in Ameren Missouri's service territory in 2030 will be [redacted] and that the number of households will be [redacted] – with an average household size of [redacted] persons.[6] On the other hand, Ameren Missouri's forecast for the number of residential customers in 2030 is 1,197,195 –which implies [redacted] persons per residential billing unit based on Moody's population forecast. This amounts to about a 10% difference in household size, which should result in a significant difference in kWh usage per customer. Further, Moody's Analytics projects that total personal income in Ameren Missouri's service territory will reach [redacted] billion in 2030 and that the average household income will be [redacted].[7] However, if one used the number of residential customers as the denominator in the calculation of average income, you would get an estimate of [redacted]. Again, this amounts to about a 10% difference in household income, which should result in a significant difference in kWh usage per customer.

The point is that in forecasting kWh per customer, one should consider using customer-centric variables in the forecasting equation (e.g., income per residential customer and number of persons per residential customer). The estimation process that Ameren Missouri has adopted may result in an upward bias in its forecast of residential kWh.

Q. What is Ameren Missouri's response to these concerns?

A. Ameren Missouri dismisses these concerns. It responds: "First, Moody's provides the county level income data that is the numerator of the income per household variable as well as household variable that becomes the denominator. Whatever methods they are using to synthesize the county level economic data, they are certainly more likely to be internally consistent than using a Moody's synthesis of income and matching it up with Ameren Missouri's customer count."[8]

[6] See the Company's response to DNR-0001.
[7] Ibid.
[8] Ameren Missouri's Response to Comments of Parties, p. 80.

Further, the Company argues "… to the extent that there is bias in the Moody's synthesis of households relative to Ameren Missouri's customer counts, as long as that bias is systematic in both the history and forecast, the regression equation will compensate."[9] However, while this is technically true, Ameren Missouri has not provided any evidence that the bias is systematic in both the history and forecast. Lastly, it states: "If Ameren Missouri had used its customer count as the denominator of the income per household calculation, it would have done so in both the historical and forecast time periods. Therefore the regression coefficients would have been estimated at a different level and most likely produced a similar energy forecast in 2030."[10] While this may be true, Ameren Missouri has not provided any evidence that it is. The Company assumes that the residential energy forecast would be similar to what it has presented in its 2011 Integrated Resource Plan, but it has not shown us that it is.

Q: What issues have you identified with regard to Ameren Missouri's end-use load profiles?

A: Ameren Missouri has not provided convincing evidence that the end-use load profiles it uses are appropriate for its service territory. The Company appears to have overstated its residential cooling load and understated the contribution of other end-uses to summer peak load. Further, Ameren Missouri's allocation of its commercial load to cooling and lighting is less than what would be expected based upon other available studies.

In turn, these peak load estimates have important implications for demand-side resource analysis. For example, Ameren Missouri's DSM assessment may undervalue residential non-cooling efficiency measures, because it has underestimated their contribution to peak load. Further, Ameren Missouri's demand-side resource analysis may undervalue commercial cooling and lighting efficiency measures, because it has underestimated their contribution to peak load.

Q: What issues have you identified with regard to Ameren Missouri's residential end-use load profiles?

[9] Ibid.
[10] Ibid.

A: Ameren Missouri estimates that 80% of its residential load at the time of the 2010 summer peak was cooling. The Company calculates that its residential cooling load is on the order of 3,115 MW while that for all other residential end-uses is only 774 MW.[11] These estimates are not credible.

Dividing the hypothesized residential cooling load in that year by the number of customers yields a coincident peak demand of 3.03 kW per customer.[12] This estimate of peak demand for cooling is significantly higher than other available estimates reported in a recent Electric Power Research Institute (EPRI) report.[13] EPRI's kW per customer cooling demand estimates range from a low of 1.43 kW per customer for the Northeast region to a high of 2.42 kW for the South. Their estimate for the Midwest region is 2.04 kW -- compared to Ameren Missouri's estimate of 3.03 kW. This suggests that Ameren Missouri's kW per customer estimate may be overstated by as much as 33%, or by roughly 1,019 MW in 2010. As a counterpoint to this, the peak demand associated with other residential end uses would appear to be significantly understated.

While Ameren Missouri estimates that 80% of its residential peak load is cooling and that 20% is associated with all other end uses, EPRI's report suggests that cooling load represents about 58% of the residential sector's summer peak demand with all other end uses accounting for 42%. If EPRI is right, then Ameren Missouri's allocation of residential load to its various components is very much askew.[14]

Q. What is Ameren Missouri's response to these concerns?

[11] Ameren Missouri's 2011 Integrated Resource Plan, Chapter 3, p. 49.

[12] Ameren Missouri does not dispute this calculation. However, it notes: "This is true, if you include transmission and distribution losses in the customer loads. The end-use peak values in the load analysis appendix are reported at the system level, meaning they have all been adjusted for line losses that will be incurred serving the load." Ameren Missouri's Response to Comments of Parties, pp. 81-82.

[13] Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.: (2010–2030). EPRI, Palo Alto, CA: 2009. 1016987. See pp. 3-17.

[14] Ibid.

A. In its Response, Ameren Missouri indicates that it has performed an additional analysis to support the reasonableness of its estimate of the contribution of residential air conditioning to peak demand. The Company describes its approach as follows:

> The actual 2009 and 2010 residential class peaks were analyzed to determine an estimate of the air conditioning load at those times. The air conditioning load was isolated by comparing the peak residential load to the residential load at the same hour of the day at its lowest point in the year. The lowest residential loads occur on mild days in the spring and fall, when neither air conditioning nor heating equipment is typically needed…. So by comparing the lowest level of residential load that occurs on during the year (*sic*) in the hour between 4 and 5 pm (normal system peak load time) and comparing it with the residential load at the time of system peak, one can attribute an overwhelming majority of the difference in load to air conditioning.[15]

The result of this analysis suggests that residential air conditioning load was in the neighborhood of 3,235 MW in 2010 and 2,907 MW in 2009.

Q. Have you reviewed Ameren Missouri's additional analysis?

A. In MDNR's Data Request No. 0183[16], we requested that Ameren Missouri provide the analyses that it performed for 2009 and 2010. However, the Company's reply did not make available to us any additional information beyond what was filed in its Response. Thus, no analysis was available for review.

In short, Ameren Missouri has not provided sufficient evidence to support its position. Its ballpark estimate of 2,907 to 3,235 MW of residential air conditioning load (based upon the difference between the peak residential load and the residential load at the same hour of the day at its lowest point in 2009 and 2010) is subject to error.

[15] Ameren Missouri's Response to Comments of Parties, p. 82.

[16] All data requests and their responses cited in this document are presented in Schedule B.

On the one hand, Ameren Missouri does not really know what its actual 2009 and 2010 residential class peaks were. The "actual" values that are cited are in fact estimates based on the Company's load research data. In Company's response to MDNR-0183, it is noted that: "The residential class peak load and residential minimum load hour were calculated using results from Ameren Missouri's load research analysis.[17]" No further description of the Company's load research data is provided. No mention of the sample size is indicated. The margin of error for the load research analysis is identified.

On the other hand, it is not correct to assume that all of the difference between the estimated peak residential load and the estimated residential load at the same hour of the day at its lowest point is residential air conditioning load. There are many other weather sensitive contributors to summer peak load, like humidifiers, pool pumps, fans and refrigerators.

Finally, it should be recognized that Ameren Missouri has performed no studies or analyses to determine the average size of residential air conditioners in its service territory. Neither has the Company conducted any studies or analyses to identify how customers utilize their air conditioners on peak days. See Ameren Missouri's response to MDNR-0184.

Q: What issues have you identified with regard to Ameren Missouri's commercial end-use load profiles?

A: Ameren Missouri estimates that 36% of its commercial load at the time of the 2010 summer peak was cooling and that 19% was associated with lighting. In GDS's Review of Ameren Missouri's 2011 Utility Resource Filing Pursuant to 4 CSR 240 – Chapter 22, Figure 3-6 compares Ameren Missouri's estimates with those reported in the previously referenced EPRI report and with KEMA's estimate for the State of Missouri.[18] We considered three end-use components of commercial demand at the time of the summer peak: cooling, lighting and all other end-uses. Ameren Missouri's allocation of its commercial load to cooling (36%) is less than what would be

[17] Schedule B, p. B-4.
[18] KEMA, Inc., Missouri Statewide DSM Market Potential Study, Final Report, Burlington, MA. March 4, 2011 rev. 4/14/11. See p. 4-23.

expected based upon the EPRI and KEMA studies (i.e., 41-42%). Further, Ameren Missouri's allocation of its commercial load to lighting (19%) is less than what would be expected based upon the EPRI and KEMA studies (i.e., 25-30%). This raises a concern that Ameren Missouri's demand-side resource analysis may undervalue cooling and lighting efficiency measures, because it has underestimated their contribution to peak load.

Q. What is Ameren Missouri's response to these concerns?

A. Ameren Missouri claims that its methodology is very robust and there is no reason to think that the EPRI or KEMA references are more valid for the commercial class than its assessment. However, Ameren Missouri has provided very little evidence in support of the load shape analysis it is using.

Q. What then are your recommendations?

A. Related to the Company's load forecast, Ameren Missouri should identify what difference it would make if residential customers were used to prepare its residential sales forecast instead of Moody's household forecast.

Related to its load profile analysis, Ameren Missouri should commit to the following action: In the interim period prior to its next regularly scheduled compliance filing, Ameren Missouri should identify the extent to which its DSM analysis is affected by its assumptions related to residential and commercial end-use contributions to peak load. If the demand-side resource analysis is sensitive to these assumptions, Ameren Missouri should consider conducting a load research study related to residential air conditioning use in its service territory. This study would provide an empirical basis for its cooling load shape assumptions.

Q. Does this complete your rebuttal testimony?

A. Yes, it does.

EDUCATION:

Graduate Certificate in International Business, University of Maine, 2002.

M.S., Resource Economics, University of New Hampshire, 1973.

M.A., Philosophy, University of Cincinnati, 1970.

B.A., Philosophy, University of New Hampshire, 1967.

EXPERIENCE:

GDS Associates, Inc., Augusta, ME

- **Senior Project Manager**, June 2008 to date.

Provides consulting services related to forecasting energy sales and peak load, assessment of maximum achievable cost-effective electric & gas conservation potential, energy conservation planning, and analysis related to the green economy.

Central Maine Power Company, Augusta, ME

- **Chief Economist**, February 2001 to June 2008.

Directed staff activities related to the development of economic, electric sales and peak load forecasts for the Company including both short- and long-term projections, monthly analysis of sales variance, special economic studies, competitive intelligence, testimony before regulatory bodies, maintenance and enhancement of econometric and end-use simulation models.

- **Manager, Sales Forecasting & Program Operations**, 1999-2001.

Coordinated activities related to the development of economic, electric sales and peak load forecasts. Managed CMP's delivery of energy conservation programs which exceeded $13 million in 2000.

- **Manager, Economic and Sales Forecasting**, 1991-1999.

Coordinated staff activities related to the development of economic, sales and peak load forecasts. Led the Company's effort in implementing the ENERGY 2020 Model for long-range load forecasting and energy management planning. Worked with CMP International to provide training and consulting services to Nationalna Elektricheska Kompania related to its development of an end-use energy forecasting model for Bulgaria, 1995-1997.

• **Principal Load Forecaster/Supervisor**, 1986-1991.

New England Power Planning, West Springfield, MA

• **Supervisor, Load Forecasting**, 1981-86. Supervised staff activities related to the preparation of long-term economic, electric sales and peak load forecasts for New England, developed documentation and reports, and maintained NEPLAN's end-use simulation model, which was among the first such models developed.

• **Load Analyst**, 1978-81.

• **Associate Load Analyst**, 1976-78.

Institute of Natural and Environmental Resources,

University of New Hampshire, Durham, NH

• **Resource Economist**, 1973-76. Applied economic research in a variety of resource areas. Twice taught a course in Statistical Methods. Testified before the Subcommittee on Dairy and Poultry, Committee on Agriculture, U.S. House of Representatives.

• **Graduate Research Assistant**, 1971-73.

Canaan College, Canaan, NH

• **Lecturer in Philosophy**, 1970-71. Taught courses in Basic Philosophical Issues, Epistemology, and Introduction to Philosophy.

University of Cincinnati, Cincinnati, OH

• **Graduate Teaching Assistant**, 1967-70. Assisted faculty in the teaching of undergraduate philosophy courses in Logic and Man & Ideas.

PROFESSIONAL AND CIVIC ASSOCIATIONS:

Member, **Consensus Economic Forecasting Commission**, State of Maine, 1993-2010.

Member, **NEPOOL Load Forecasting Committee**, 1987-2008; Chair, 1998-2000.

Board of Directors, **Maine Energy Education Program**, 1999-2008.

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TESTIMONY (State of Maine, Public Utility Commission):

Docket No. 2009-217, **Petition Requesting that the Commission Issue an Order to Modify CMP's Service Quality Indicators by Eliminating or Changing the Current MPUC Complaint Ratio and to Waive Penalties**

- Part B. Rebuttal Testimony of John Davulis and Patricia Hart, May 7, 2010

Docket No. 2008-255, Request for Certificate of Public Convenience and Necessity for the Maine Power Reliability Program Consisting of the Construction of Approximately 350 Miles of 345 kV and 115 kV Transmission Lines ("MPRP")

- Volume V, Exhibit B-2 (Load Information), July 1, 2008

- Rebuttal Testimony of John P. Davulis, 2009 CMP Sales Forecast, March 19, 2009
- Rebuttal Testimony of John P. Davulis and Paul A. Dumais, Peak Load Forecast, December 4, 2009

Docket No. 2007-215, Request for New Alternative Rate Plan ("ARP 2008")

- Prefiled Testimony of John P. Davulis, Volume II, Sales Forecast, May 1, 2007.
- Prefiled Testimony of John P. Davulis, Volume III, Economic Outlook, Methodology and Sales Forecast, May 1, 2007.
- Rebuttal Testimony of John P. Davulis, Volume II, Economic Outlook, Methodology and Sales Forecast, November 9, 2007.

Docket No. 2006-487, **Request for Certificate of Public Convenience and Necessity to Build a 115 kV Transmission Lines between Saco and Old Orchard Beach**

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Docket No. 2004-339 Phase II, Investigation of Central Maine Power Company's Stranded Cost Revenue Requirement and Rate Design

- Volume II, Sales Forecast, October 8, 2004.
- Volume III, Economic Outlook, Methodology & Sales Forecast, October 8, 2004.

Docket No. 2002-770, Investigation of Central Maine Power Company's Stranded Cost Rates and Request for Accounting Order

- Narrative and Exhibits, February 7, 2003.
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- Prefiled Direct Testimony of John P. Davulis, Volume III-A, Sales Forecast, October 3, 2001.
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- Rebuttal Testimony of John P. Davulis, Volume III, Sales Forecast, December 10, 2001.

Docket No. 97-580 Phase II, Investigation of Stranded Costs, Transmission and Distribution Utility Revenue Requirements, and Rate Design

- Description, Volume I, Part Two, Sales Forecast, July 1, 1999.
- Volume III-A and III-B, Sales Forecast, July 1, 1999.

Docket No. 97-580, Investigation of Stranded Costs, Transmission and Distribution Utility Revenue Requirements, and Rate Design

- Testimony and Exhibits of John P. Davulis, Sales Forecast, December 5, 1997.
- Updated and Rebuttal Testimony and Exhibits of John P. Davulis, Sales Forecast, June 26, 1998.

- Surrebuttal Testimony and Exhibits and Response to the Bench Analysis of John P. Davulis, Sales Forecast, August 31, 1998.

Docket No. 95-598, Annual DSM Targets Proceeding

Docket No. 92-315, Investigation of Central Maine Power Company's Resource Planning, Rate Structures, and Long-Term Avoided Costs

Docket No. 92-102, Application for Fuel Cost Adjustment Pursuant to Chapter 34 and Establishment of Short-Term Energy-Only Rates for Small Power Producers Less Than 1 MW Pursuant to Chapter 36 (Investigation of QF Contracts)

Docket No. 88-111, Petition for Certificate of Public Convenience and Necessity for Purchase of Generating Capacity and Energy from Hydro Quebec

Docket No. 87-268, Petition for Certificate of Public Convenience and Necessity for Purchase of Generating Capacity and Energy from Hydro-Quebec

Docket No. 87-261, Estimated 1987 Long-Term Avoided Costs Filed Pursuant to Section 3(C) of Chapter 36 of the Commission's Rules

Schedule B

DATA RESPONSES CITED:

- MDNR-0001
- MDNR-0183
- MDNR-0184

Ameren Missouri

Response to DNR Data Request

MPSC Case No. EO-2011-0271

Union Electric Company

d/b/a Ameren Missouri's 2011 Utility Resource Filing pursuant to 4 CSR 240 - Chapter 22

Data Request No.: DNR 0001 – Adam Bickford

The following data requests relate to the various economic driver forecast series obtained from Moody's Analytics that were used to prepare Ameren's sales and load forecast as documented in Chapter 3. a. For each forecast series that was used, please provide: i. Moody's Analytics name or other designation of the forecast series. ii. If Moody's Analytics does not update the forecast series monthly, please provide the frequency with which the forecast series is updated. iii. The issue date (vintage) for the forecast that was used when preparing the Ameren sales and load forecast. iv. The Moody's Analytics economic driver forecasts annually for both the U.S. and Ameren Missouri's service territory. v. The issue date (vintage) for Moody's Analytic's most recent update of the forecast series. For each forecast series that Moody's Analytics has updated since it was used in preparation of Ameren's sales and load forecast, please compare the forecast that Ameren used for the filing to the forecast provided in Moody's Analytics most recent update.

RESPONSE

Prepared By: Bryan Bezold

Title: Senior Economist

Date: April 26, 2011

Ameren Missouri receives data deliveries from Moody's analytics twice a year, in the Autumn and Spring. The forecast data used to produce the IRP forecast was delivered to Ameren in Autumn of 2009. Since then we have received two updates, one in the Spring of 2010, and a second in Autumn of 2010. It is therefore the case that the entire set of economic forecast data has been updated two times by Moody's Analytics since the IRP forecast process began.

The data used in the IRP forecast, from the Autumn 2009 data delivery, is included in the attached spreadsheet (DNR-001_UE-MO_Monthly_Elec_base_forecast.xlsx), along with data from the two subsequent data deliveries.

The frequency of data we receive from Moody's analytics is quarterly. Ameren interpolates that quarterly data into monthly data with a cubic spline process executed in SAS.

The forecast used in the preparation of the IRP is included on the "IRP Forecast" tab of the attached spreadsheet. The later deliveries are on the other tabs of the same spreadsheet, where the name of the tab is the delivery date. Included in the spreadsheet are a series of graphs that allow visual comparisons of the growth rates of the corresponding data series for the three different data deliveries.

Moody's analytics is regularly revising and benchmarking their data sets, so the levels of the various series move up and down with each release. The latest data delivery reflects a significantly bigger impact of the recent recession on the service territory, especially compared to the forecast used to develop the IRP. That has big implications from a modeling perspective, but smaller implications of the forecast.

If the IRP forecast process were repeated today with the latest available economic data from Moody's analytics, then the model statistics, the numbers that show how well our models explain past behavior of electricity sales, would look considerably better. The sales forecast would not be very different, however, because the forecast growth rates of the key variables used in the forecast didn't change by as big an extent as the levels of historical data did.

When the data are used as an independent variable in a regression model of energy sales, the slope of the data, rather than the level, is the important characteristic. Generally, the slopes of the various data series are similar. Although a forecast prepared with the latest data delivery would differ slightly from the IRP base case forecast, it would not differ enough to change the forecast to result in the selection of a different preferred resource plan.

Note: A voluminous spreadsheet "DNR-001_UE-MO_Monthly_Elec_base_forecast.xlsx" was provided with Ameren Missouri's response to this data request.

Ameren Missouri

Response to MDNR Data Request

MPSC Case No. EO-2011-0271

Union Electric Company d/b/a Ameren Missouri's 2011 Utility Resource Filing pursuant to 4 CSR 240 - Chapter 22

Data Request No.: DNR 0183– Sarah Mangelsdorf

Data Request re p. 82: Please provide the analyses that Ameren Missouri has performed for 2009 and 2010 related to the contribution of residential cooling to system peak. Please describe how "actual" 2009 and 2010 residential class peak load by hour was developed?

RESPONSE

Prepared By: Steven M. Wills

Title: Managing Supervisor, Quantitative Analytics

Date: October 17, 2011

Please see the attached file, "AC peak contribution analysis.xlsx". The residential class peak load and the residential minimum hour load were calculated using results from Ameren Missouri's load research analysis.

Note: The extent of information provided in the spreadsheet "AC peak contribution analysis.xlsx" is shown below:

Residential	1000	
	2009	2010
Class Peak Load	3,946	4,268

Minimum HE 17 load	1,038	1,033
Difference (Implied A/C contribution)	2,908	3,235
IRP A/C Peak Contribution (2010)	3115	
Demand loss rate - meter to generator	1.0917	
IRP @ Meter	2,853	
Corrected customer count	1,027,660	
Implied A/C per customer	2.78	
EPRI Midwest A/C per customer	2.04	
EPRI South A/C per customer	2.42	
Implied Res A/C Load @ Gen		
EPRI Midwest	2,289	
EPRI South	2,715	

Ameren Missouri

Response to MDNR Data Request

MPSC Case No. EO-2011-0271

Union Electric Company d/b/a Ameren Missouri's 2011 Utility Resource Filing pursuant to 4 CSR 240 - Chapter 22

Data Request No.: DNR 0184– Sarah Mangelsdorf

Data Request re p. 83: Has Ameren Missouri performed any studies or analyses related to the average size of residential air conditioners in its service territory? Has Ameren Missouri performed any studies or analyses related to customer utilization of air conditioners on peak days? If so, please provide the analyses.

RESPONSE

Prepared By: Steven M. Wills

Title: Managing Supervisor, Quantitative Analytics

Date: October 14, 2011

No such studies or analysis have been performed.