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Issues:	Residential Rate Design; Energy Efficiency
Witness:	Martin Hyman
Sponsoring Party:	Missouri Department of Economic Development – Division of Energy
Type of Exhibit:	Direct Testimony
Case Nos.:	ER-2016-0023

MISSOURI PUBLIC SERVICE COMMISSION

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2016-0023

DIRECT TESTIMONY

OF

MARTIN R. HYMAN

ON

BEHALF OF

MISSOURI DEPARTMENT OF ECONOMIC DEVELOPMENT

DVISION OF ENERGY

Jefferson City, Missouri
April 8, 2016

(Rate Design)

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of The Empire	)	
District Electric Company's Request	)	ER-2016-0023
for Authority to Implement a General Rate	)	
Rate Increase for Electric Service	)	

AFFIDAVIT OF MARTIN HYMAN

STATE OF MISSOURI	)	
	)	**ss**
COUNTY OF COLE	)	

Martin R. Hyman, of lawful age, being duly sworn on his oath, deposes and states:

1. My name is Martin R. Hyman. I work in the City of Jefferson, Missouri, and I am employed by the Missouri Department of Economic Development as a Planner III, Division of Energy.
2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of the Missouri Department of Economic Development – Division of Energy.
3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge.

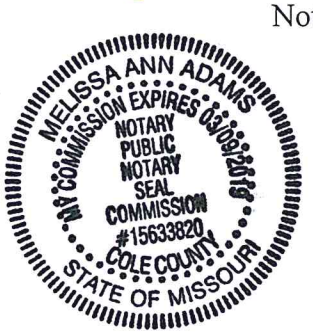
Martin R. Hyman

Subscribed and sworn to before me this 8th day of April, 2016.

Melissa Ann Adams
Notary Public

My commission expires:

MELISSA ANN ADAMS
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: March 09, 2019
Commission Number: 15633820



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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Martin R. Hyman. My business address is 301 West High Street, Suite 720, PO Box 1766, Jefferson City, Missouri 65102.

Q. By whom and in what capacity are you employed?

A. I am employed by the Missouri Department of Economic Development – Division of Energy ("DE") as a Planner III.

Q. Please describe your educational background and employment experience.

A. In 2011, I graduated from the School of Public and Environmental Affairs at Indiana University in Bloomington with a Master of Public Affairs and a Master of Science in Environmental Science. There, I worked as a graduate assistant, primarily investigating issues surrounding energy-related funding under the American Recovery and Reinvestment Act of 2009. I also worked as a teaching assistant in graduate school and interned at the White House Council on Environmental Quality in the summer of 2011. I began employment with DE in September, 2014. Prior to that, I worked as a contractor for the U.S. Environmental Protection Agency to coordinate intra-agency modeling discussions.

Q. Have you previously filed testimony before the Missouri Public Service Commission ("Commission") on behalf of DE or any other party?

A. Yes. I submitted testimony in EO-2015-0055 on behalf of DE regarding Union Electric Company d/b/a Ameren Missouri's ("Ameren Missouri") proposed Cycle II portfolio under the Missouri Energy Efficiency Investment Act. I also submitted testimony on behalf of DE in ER-2014-0370 regarding Kansas City Power & Light Company's

("KCP&L") proposed changes to its customer charges and time-differentiated rates, as well as testimony regarding that company's proposals for the Clean Charge Network. In WR-2015-0301 and SR-2015-0302, I submitted testimony on behalf of DE regarding Missouri-American Water Company's and the Commission Staff's ("Staff") rate design proposals and in order to propose a demand-side efficiency mechanism. I provided "live" testimony on behalf of DE in EA-2015-0256 in support of KCP&L Greater Missouri Operations Company's ("GMO") application for a Certificate of Convenience and Necessity to construct its Greenwood solar facility.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your Direct Testimony (Rate Design) in this proceeding?

A. The purpose of my Direct Rate Design Testimony is to express DE's opposition to the residential rate design proposal of The Empire District Electric Company ("Empire" or "Company"), since the proposal is neither grounded in a demonstration of cost causation nor based on principles of equity, efficiency, gradualism, or the avoidance of "rate shock." DE proposes that the Commission reject the Company's request to increase the residential customer charge. I affirm DE's position with residential bill frequency and bill impact analyses.

Additionally, DE recommends that the Commission order a working docket in which the parties to this case can discuss the implementation of revised block rate designs for Empire's residential customers. Should the Commission wish to move towards the reduction of the differential between the residential winter tail and first blocks, DE could support an adjustment of the tail block rate of up to 10 percent of the way towards the initial block. Finally, DE recommends that the Company be encouraged to file an

application for a demand-side management ("DSM") program portfolio under the Missouri Energy Efficiency Investment Act ("MEEIA"). If the Company does not have a MEEIA approved prior to the conclusion of this rate case, Empire should be required to continue its current DSM portfolio at current funding levels until the Company receives approval for a MEEIA portfolio. Although Empire has not indicated in its revised tariffs that it wishes to discontinue its DSM programs in this case, it has made such an indication in its recently filed triennial Integrated Resource Plan ("IRP") (EO-2016-0223); DE therefore offers its DSM recommendation to ensure the availability of programs which benefit customers. DE also supports requiring Empire to correct the outdated and incorrect information identified by Staff in the Company's DSM tariffs.

III. RESPONSE TO COMPANY'S RATE DESIGN PROPOSAL

A. EMPIRE PROPOSAL

Q. What principles should be considered when evaluating the Company's residential rate design proposal?

A. Rate design should take into consideration the cost to serve a particular class, the causation of costs, the promotion of efficient energy use, gradualism, and the avoidance of "rate shock." In general, cost of service and cost causation should be used as guidelines in determining rates, but should not override the other considerations mentioned. Additionally, it should be noted that "fixed costs" for a regulated utility in a cost-of-service jurisdiction do not correspond perfectly to fixed accounting costs. Consequently, customer charges should only include dedicated customer-related costs – i.e., those costs incremental to serving an additional customer and not to providing an additional kilowatt-hour ("kWh") of electricity.

Q. How does the Company propose to allocate revenues between classes in this general rate case (ER-2016-0023)?

A. Empire starts with the Commission's allocations from the prior general rate case (ER-2014-0351) but makes several significant modifications, including a shift from its special service customer to the residential class.[1] This shift is partly responsible for the 9.57 percent revenue increase[2] to the residential class, a change which is well above the overall request of 7.3 percent.[3]

Q. How does Empire propose to collect revenues from its residential customers?

A. Except for the small commercial class, the Company proposes to focus its rate increase on fixed billing components, such as the residential customer charge.[4]

Q. Why did the Company propose this shift in rate design?

A. Empire witness Scott W. Keith states that the shift:

> … will move Empire's rates toward cost of service, which includes a substantial portion of costs that are fixed, not variable; improve the price signal to the customers, which will enable our customers to make more efficient decisions concerning usage and energy efficiency; and lessen the impact on Empire's lower

[1] Missouri Public Service Commission Case No. ER-2016-0023, *In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service*, Direct Testimony of Nathaniel W. Hackney on Behalf of The Empire District Electric Company, Direct Testimony of W. Scott Keith on Behalf of The Empire District Electric Company, October 16, 2015, page 8, lines 3-14.
[2] *Ibid*, unlabeled table.
[3] *Ibid*, page 4, lines 13-15.
[4] *Ibid*, page 9, lines 1-8.

income consumers, who on the average use more than the average customer during the winter months.[5]

He also indicates that this type of rate design, "… moves toward the decoupling of sales volume and revenue production," even if it is not decoupling *per se*.[6]

Q. How did Empire determine the residential customer charge?

A. The Company not only increased the residential customer charge by the revenue request previously described, but added the 6.02 percent increase granted in the previous rate case (ER-2014-0351).[7] This would raise the residential customer charge from $12.52 to $14.47.[8] Mr. Keith claims that this adjustment is appropriate because the Stipulation in ER-2014-0351 – to which the Company agreed – contradicted class cost of service ("CCOS") studies; the costs in the present case (ER-2016-0023) are "fixed;" and residential customers with large usage (including his definition of low income customers) will benefit from the increase.

Q. Did the Company also propose decreases to its residential energy charges?

A. No. In comparing Empire's current[9] and proposed[10] residential tariffs, it is evident that the Company increased its residential energy charges between approximately 8.97 and 8.98 percent. This is below the proposed increase to the residential customer charge and, on a revenue-neutral basis, indicates a shift towards revenue collection through the customer charge for the residential class.

[5] *Ibid*, lines 8-13.
[6] *Ibid*, page 10, lines 1-7.
[7] *Ibid*, lines 8-13.
[8] *Ibid*, page 9, unlabeled table.
[9] Missouri Public Service Commission Tariff No. YE-2016-0008, The Empire District Electric Company, Schedule RG, July 26, 2015, Sec. 1, Sheet No. 1.
[10] Missouri Public Service Commission Case No. ER-2016-0023, *In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service*, Schedule RG, October 16, 2015, Sec. 1, Sheet No. 1.

Q. How high is Empire's residential customer charge in comparison to other investor-owned utilities in Missouri?

A. Empire already has the highest customer charge of Missouri's investor-owned electric utilities. Ameren Missouri's residential customer charges stand at $8.00,[11] KCP&L's customer charge recently reached $11.88,[12] and the customer charges of GMO are, as of the time of filing, $9.54 for L&P territory customers[13] and $10.43 for MPS customers.[14]

Q. Please summarize the residential rate design proposal of the Company.

A. The Company's residential rate design proposal is summarized in Tables 1a through 1c below.

Table 1a. Current residential rates for Empire customers.[15]

Charge Type	Winter	Summer
Customer Charge	$12.52	
Volumetric Charge (Block 1)	$0.12254	$0.12254
Volumetric Charge (Block 2)	$0.09961	$0.12254

[11] Missouri Public Service Commission Tariff No. YE-2015-0325, Union Electric Company d/b/a Ameren Missouri, Service Classification No. 1(M) – Residential Service Rate, May 30, 2015, Sheet No. 54.
[12] Missouri Public Service Commission Tariff No. YE-2016-0078, Kansas City Power & Light Company, Schedule R, September 29, 2015, Sheet No. 5A.
[13] Missouri Public Service Commission Tariff No. YE-2015-0204, KCP&L Greater Missouri Operations Company, Residential Service – General Use (Electric), December 1, 2014, Sheet No. 18.
[14] Missouri Public Service Commission Tariff No. YE-2013-0326, KCP&L Greater Missouri Operations Company, Residential Service (Electric), January 26, 2013, Sheet No. 51.
[15] Missouri Public Service Commission Tariff No. YE-2016-0008, The Empire District Electric Company, Schedule RG, July 26, 2015, Sec. 1, Sheet No. 1.

Table 1b. Company's proposed residential rates.[16]

Charge Type	Winter	Summer
Customer Charge	$14.47	
Volumetric Charge (Block 1)	$0.13353	$0.13353
Volumetric Charge (Block 2)	$0.10855	$0.13353

Table 1c. Company's proposed change in residential rates.

Charge Type	Winter	Summer
Customer Charge	15.58%	
Volumetric Charge (Block 1)	8.97%	8.97%
Volumetric Charge (Block 2)	8.98%	8.97%

B. DIVISION OF ENERGY RESPONSE

Q. Do you agree with Mr. Keith that the proposed residential rate design will move rates toward cost of service?

A. No. A CCOS study was not conducted by the Company specifically for this case. [17] Absent such a study tying the costs and expenses in this case to the particular cost causers, it is inappropriate for Empire to propose a new rate design which shifts revenue collection towards the customer charge. Such a shift allocates the energy- and capacity-related costs underlying this case out of the Company's volumetric charges despite cost allocation principles. The main driver behind Empire's case filing – the conversion of the Riverton 12 electric generating unit to a combined cycle plant[18] – does not represent a dedicated customer-related cost, so the associated costs and expenses should not be allocated to the customer charges. The conversion relates to costs best allocated on energy- and demand-related factors, which, as a result, are most appropriately recovered

[16] Missouri Public Service Commission Case No. ER-2016-0023, *In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service*, Schedule RG, October 16, 2015, Sheet No. 1.
[17] Company Response to Office of the Public Counsel Data Request DR 5045, Part b.
[18] Keith, page 4, lines 7-8.

through the Company's volumetric rates; customers should pay for capacity-related costs through variable, not fixed, billing components.

Q. What are examples of the customer-related costs which should be included in the customer charge?

A. The types of dedicated customer-related costs which should be included in the customer charge include postage, meters, meter reading, line drops, and the portion of operations and maintenance expenses associated with maintaining meters and line drops; some analysts choose to include sales-related expenses as well, although there is value in minimizing the customer charge by not including these items.[19] Customer costs should not include generation or transmission plant, nor should they generally include distribution plant. In short, customer charges should only include those dedicated customer-related costs which vary incrementally and directly with the number of customers in a class.

Q. Should "joint and common costs" be allocated to customer charges?

A. Generally, no. The National Association of Regulatory Utility Commissioners' Electric Utility Cost Allocation Manual defines joint and common costs as the following:

> Joint costs occur when the provision of one service is an automatic by-product of the production of another service. Common costs are incurred when an entity produces several services using the same facilities or inputs. … In the electric industry, the most common occurrence of joint costs is the time jointness of the costs of production where the capacity installed to serve peak demands is also

[19] See National Association of Regulatory Utility Commissioners (1992), Electric Utility Cost Allocation Manual, Washington, D.C., pages 103-104.

> available to serve demands at other times of the day or year. Overhead expenses such as the president's salary or the accounting and legal expenses are examples of costs that are common to all of the separate services offered by the utility.[20]

The manual further states:

> In an embedded cost study the joint and common costs identified in the test year are allocated either on the basis of the overall ratios of those costs that have been directly assigned, or by a series of allocators that best reflect cost causation principles such as labor, wages or plant ratios, or by a detailed analysis of each account to determine beneficiality.[21]

Joint and common costs are not directly related to dedicated customer-related facilities and should not be allocated to customer charges.

Q. Does setting a customer charge only at the level needed to recover those dedicated customer-related costs mentioned above follow the principle of cost causation?

A. Yes. A customer that uses more electricity places more demands on a utility's generation, transmission and distribution systems; based on the principle of cost causation, such a customer should pay more for their service. By the same logic, a customer that uses electricity efficiently should pay less for their service. Setting the customer charge at a level above that needed to recover dedicated customer-related costs erodes the price signal which a volumetric (i.e., energy) charge would otherwise send.

[20] *Ibid*, page 15.
[21] *Ibid*.

Q. Is the Company's use of the rate increase from the Commission's decision in the prior rate case (ER-2014-0351) an adequate alternative for determining the residential customer charge increase in this case?

A. No. The increase granted by the Commission in that prior case resulted from negotiations among the Signatories to the Stipulation previously mentioned. Evidence on the customer charge was not vetted through cross-examination or presented for decision by the Commission. The revenue increase considered in that case is not necessarily applicable to the increase under the present circumstances, particularly when the Company has determined a new revenue requirement based largely on cost increases best recovered through volumetric rates. The use of the Commission's approved residential rate increase from ER-2014-0351 is thus an inappropriate proxy for a cost of service adjustment in this context, and would likely result in the over-collection of revenues from residential customers if approved. This is because the revenue increase from any particular case is based on the revenue requirement in that case, so using a revenue increase outside of the context of the appropriate case could result in over-collection.

Q. What was the Commission's specific decision regarding residential rate design in the Company's previous rate case (ER-2014-0351)?

A. Following a Stipulation and Agreement,[22] the Commission ordered an "across the board" increase to all rate components for all classes on an equal percentage basis[23] based on a

[22] Missouri Public Service Commission Case No. ER-2014-0351, *In the Matter of The Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area*, Revised Stipulation and Agreement and List of Issues, April 8, 2015.
[23] Missouri Public Service Commission Case No. ER-2014-0351, *In the Matter of The Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area*, Report and Order, June 24, 2015, page 21.

3.9 percent revenue increase.[24] However, the Commission also increased residential volumetric rates by approximately two percent on a revenue-neutral basis, "**in order to send a more accurate pricing signal to all of Empire's customers and take a significant step towards moving the residential class closer to its cost of service**" (emphasis added).[25]

Q. Did all parties to ER-2014-0351 support substantially higher residential customer charge increases?

A. No. The Commission Staff only recommended a $0.27 increase in the residential customer charge in its CCOS report.[26] Office of the Public Counsel ("OPC") witness Dr. David E. Dismukes, despite finding in his CCOS study that Empire's residential customer charges should have been higher, recommended against any increase because a) Empire's customer charge was higher than all but five Midwestern utilities which he analyzed, and b) the Company already recovered the majority of its customer-related costs at the time through the customer charge.[27]

[24] *Ibid*, page 14.
[25] *Ibid*, page 20.
[26] Missouri Public Service Commission Case No. ER-2014-0351, *In the Matter of The Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area*, Missouri Public Service Commission Staff's Rate Design and Class Cost-of Service Report, February 11, 2015, Page 41, lines 15-17.
[27] Missouri Public Service Commission Case No. ER-2014-0351, *In the Matter of The Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area*, Direct Testimony of David E. Dismukes on behalf of the Office of the Public Counsel, February 11, 2015, page 40, lines 1-19.

Q. Did the Commission order any increase to the Company's residential customer charge in that case?

A. No.[28] The Commission approved no increase to the residential customer charge; in doing so, it mentioned considerations of efficiency and conservation:

> Shifting customer costs from variable volumetric rates—that a customer can reduce through energy efficiency—to fixed customer charge will reduce incentive efforts to conserve energy. While Staff's CCOS study supports an increase to residential and all other customer charges by the average increase for each applicable class, the Signatories agreed in the Revised Agreement to not increase the residential customer charge. (Citations omitted.)[29]

The Commission should make a finding in the current case consistent with this past decision.

Q. Would the proposed residential rate design in this case correct the price signal to customers and better encourage efficiency, as claimed by Mr. Keith?

A. No. The proposed rate design would, as previously noted, shift cost recovery towards customer charges, which do not vary each month with the amount of energy used. Such a shift sends an incorrect price signal with respect to encouraging efficient energy use. An appropriate signal is sent through a greater emphasis on variable energy charges.

[28] ER-2014-0351, Report and Order, page 20, footnote 51.
[29] *Ibid*, page 16.

Q. In what way does a shift towards revenue recovery through customer charges discourage customer efficiency?

A. Since the customer charge must be paid, changes in consumption do not alter this portion of a customer's bill. Increases to the customer charge relative to the volumetric charge would increase the amount of the bill which customers cannot avoid through more efficient energy consumption. Consequently, low use customers would receive disproportionate bill increases, while higher use customers would receive lower than average bill increases. A rate design which more properly encourages efficient consumption would place higher emphasis on the volumetric charge, since customers who use less energy would receive relatively lower bills than with an emphasis on a customer charge increase.

Q. Could an increased customer charge also decrease the Company's incentive to pursue operational efficiencies?

A. Yes, it is possible. Increased revenue recovery through the customer charge would guarantee the recovery of a greater amount of revenue for the Company, since ratepayers cannot avoid paying customer charges. Decreases in Empire's revenues naturally incent attempts by the Company to decrease costs to maintain its profits, while a steady level of revenue recovery provides no such signal. With a guarantee of recovering revenues regardless of use (i.e., via the customer charge), Empire would have a smaller incentive to control costs.

Q. Does the Company recognize these economic principles?

A. No. In its response to part of a Data Request by OPC, Empire claims:

> The current Empire rate design includes the recovery of a substantial portion of fixed costs through the variable charges. When a customer is evaluating investments in energy efficient appliances, this inaccurate pricing will overstate the cost savings the customer will see over the life of the investment.[30]

The Company asserts that customers should make decisions about energy efficiency based on cost savings resulting from the Company's cost of service. The principles of rate design do not require customers to consider the Company's cost allocation in their efficiency and consumption decisions; in fact, the exact opposite is true, since rate design should encourage more efficient consumption.

Q. Do you agree with Mr. Keith that low-income customers would benefit under the Company's residential rate design proposal?

A. No. This assertion is based on the faulty conclusion that low-income customers tend to use more energy than other residential customers. In turn, this conclusion seems to be based on Mr. Keith's equally inappropriate implication that Low Income Home Energy Assistance Program customers are representative of low-income customers as a whole.[31]

Q. Is the Company's residential rate design proposal equitable?

A. No. The proposal shifts the risk of revenue recovery towards residential customers through an emphasis on customer charges, over which customers have virtually no control. Since the emphasis on increased customer charges disproportionately impacts low use customers, the Company's proposal would not lead to an equitable outcome, particularly when the Company has not provided a supporting CCOS study.

[30] Company Response to OPC Data Request DR 5049, Part a.
[31] Keith, page 11, lines 9-16.

Q. Would lower customer charges, in fact, promote the retention of customers?

A. Yes. Given that customer charges must be paid regardless of the amount of electricity used, low-use customers are, as noted above, effectively penalized by higher customer charges. This can increase the risk that such customers, particularly if they are low-income customers, will disconnect from the utility's system due to an inability to pay their bills. Lower customer charges alleviate this risk, allowing more customers to maintain their service and providing the Company with economies of scale through increased numbers of customers using electricity.

Q. If lower customer charges are generally beneficial, should there be customer charges at all?

A. Yes. Rate design principles suggest that there is an inherent value in the ability to access electricity services. The most basic level of service still requires utilities to incur certain dedicated customer-related costs; thus, it is reasonable that customers should pay for these types of costs regardless of use. However, the joint and common nature of many utility costs, with the exception of non-dedicated plant costs, strongly supports the recovery of most utility costs through a volumetric charge. A dual rate structure with relatively low customer charges thus recognizes the principles commonly accepted in the fields of economics, rate design, and public policy. There may even be a public interest exception which would favor particularly low customer charges for low-income customers in order to assure access to affordable electricity.

Q. Does the Company's residential rate design proposal represent a gradual increase which would avoid rate shock?

A. No. A 9.57 percent class revenue increase with such a heavy emphasis on unavoidable customer charges would be difficult for some customers, particularly following the Company's previous residential rate increase in ER-2014-0351. Even the addition of a small absolute dollar amount to the residential customer charge represents a significant burden for some customers, particularly when the Company's residential customer charge is already relatively high.

Q. Did the Commission consider "rate shock" in the Company's previous general rate case?

Yes. Even though the Commission chose a greater revenue-neutral adjustment to residential rates in the prior case than proposed by the Stipulation's Signatories, the Report and Order in ER-2014-0351 specifically considers rate shock:

> The Signatories … recommend a neutral adjustment recommended by the Signatories (a 0.75% increase for the residential class) to address the recognized 8.1% residential rate class discrepancy. MECG recommends an increase to residential rates by 25% of the needed 8.1% revenue neutral adjustment …. **The difference between the two is not of such a significant amount as to cause "rate shock."** (Emphasis added.)[32]

[32] ER-2014-0351, Report and Order, page 20.

Q. Did the Commission recognize other rate design considerations besides cost causation, efficiency, and rate shock in that Report and Order?

A. Yes. A mention of gradualism is made when considering an instant adjustment towards cost of service for the residential rate class: "Attempting to completely eradicate the 8.1% residential rate class discrepancy in this rate case would be too punitive to the customers in that class."[33] Empire's residential rate design proposal in the current case is not gradual.

Q. In light of these considerations, does DE support Empire's residential rate design proposal?

A. No. DE recommends that the Commission reject the Company's rate design proposal, since it is not supported by cost of service, cost causation, efficiency, gradualism, or rate shock considerations. Instead, DE recommends that the Commission only approve an increase to the residential energy charges, in keeping with its decision in the prior rate case (ER-2014-0351) and general rate design considerations. Such considerations are particularly important given Empire's already high residential customer charge compared to other investor-owned utilities in Missouri.

IV. BILL FREQUENCY AND BILL IMPACT ANALYSES

A. BILL FREQUENCY ANALYSIS

Q. What is the purpose of a bill frequency analysis?

A. The purpose of a bill frequency analysis is to determine the average (mean), minimum, and maximum amount of use for various groups of customers. This analysis can serve as the basis for other calculations, such as a bill impact analysis.

[33] *Ibid*, page 18.

Q. What is the basis of your analysis?

A. My analysis is based on highly confidential, non-weather-normalized data provided by the Company in response to DE Data Request No. 407.

Q. How did you conduct your analysis?

A. I used the "Data Analysis" function in Excel to create summary statistics by billing month. Based on the Company's residential tariff, I began each separate billing month analysis on the 16th day of a given month; for example, I started the June billing month analysis with billing dates of June 16th.

Q. Why did you use a billing month rather than a calendar month?

A. Using the billing month allows for a more accurate bill impact analysis and also provides better information about customer usage, since customers are not billed based on the calendar month.

Q. Did you independently conduct your statistical analysis?

A. Yes.

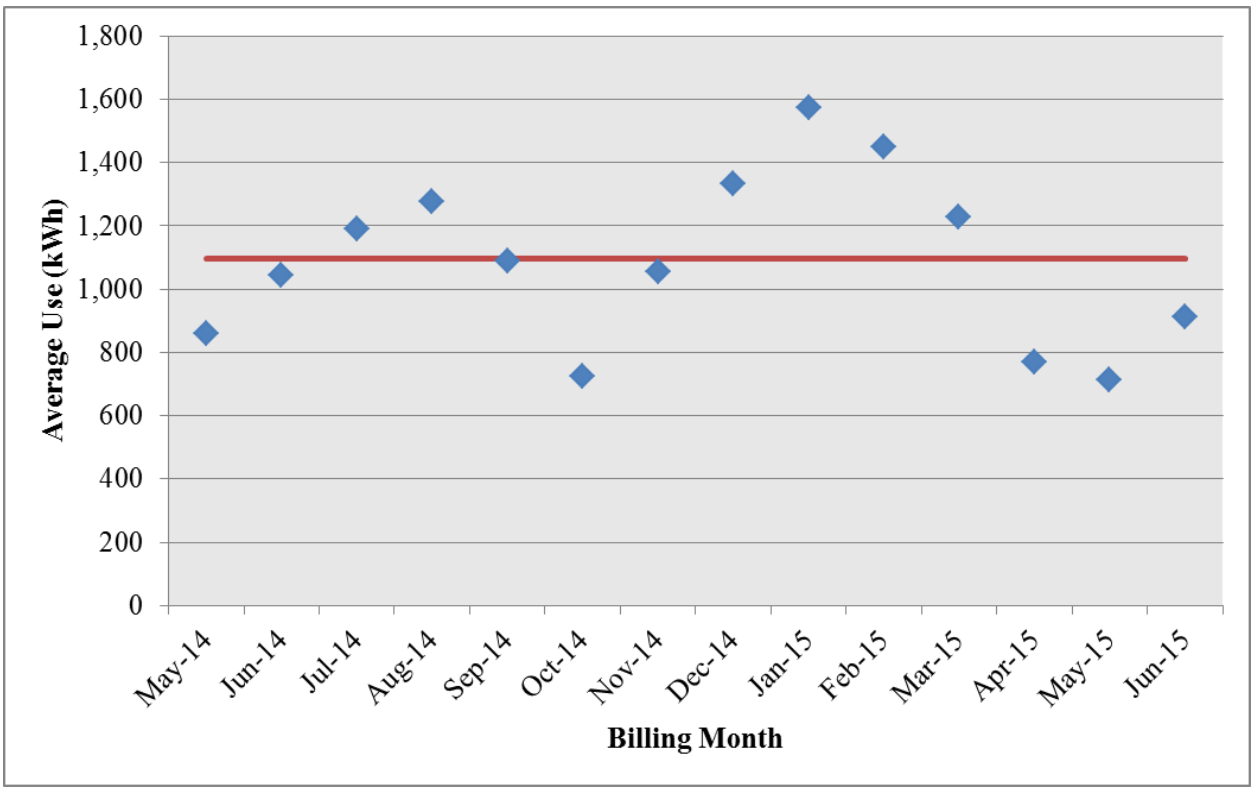
Q. What were your results?

A. My results are shown below in Table 2 and Figure 1.

Table 2. Bill frequency results for Empire residential customers in kWh.

Billing Month	Mean	Minimum	Maximum	Standard Deviation	Sample Size
May-14	858.0	0.0	6,979	635.9	2,302
Jun-14	1,042.7	0.0	18,000	779.4	4,923
Jul-14	1,189.5	0.0	18,480	848.7	5,801
Aug-14	1,275.0	0.0	18,240	890.9	5,065
Sep-14	1,087.1	0.0	22,080	818.2	5,120
Oct-14	724.6	0.0	17,040	554.2	6,010
Nov-14	1,054.0	0.0	15,520	868.6	5,524
Dec-14	1,334.5	0.0	20,240	1,115.6	5,335
Jan-15	1,571.9	0.0	25,200	1,370.1	5,667
Feb-15	1,447.8	0.0	18,800	1,259.8	5,705
Mar-15	1,229.1	0.0	25,040	1,124.6	5,804
Apr-15	767.6	0.0	16,320	598.3	6,491
May-15	713.3	0.0	14,080	561.4	5,676
Jun-15	913.1	0.0	19,680	723.6	3,075
Overall	**1,096.2**	**0.0**	**25,200.0**	**955.4**	**72,498**

Figure 1. Average residential usage amounts by billing month; average use for the entire data set shown in red.



Q. What can you conclude from these results?

A. The average use of Empire's residential customers varies considerably from billing month to billing month, with "peaks" in both the mid- to late summer and winter billing months. This pattern reflects a significant electric space heating load in Empire's service territory.

B. BILL IMPACT ANALYSIS OF COMPANY'S PROPOSAL

Q. What is the purpose of a bill impact analysis?

A. The purpose of a bill impact analysis is to determine the changes to customer bills as the result of changes in rates. While such an analysis is often based on the "average" customer's use, it should also take into account customers who use more or less amounts of a given commodity to determine equity and efficiency impacts.

Q. What is the basis of your analysis?

A. My analysis is based on the bill frequency analysis described above, along with the Company's current and proposed rates.

Q. How did you conduct your analysis?

A. I used the averages derived from the bill frequency analysis, in addition to usage amounts 50 percent below and 100 percent above these averages. I selected these lower and higher usage amounts to illustrate the bill impacts of the Company's proposal based on variations in residential customer usage, without using the extreme minima and maxima from the analysis. The usage amounts which I have described are shown below in Table 3.

Table 3. Empire residential customer usage amounts used in bill impact analysis (kWh).

Billing Month	Average Use	50% Less Use	100% More Use
May-14	858.0	429.0	1,715.9
Jun-14	1,042.7	521.4	2,085.4
Jul-14	1,189.5	594.7	2,378.9
Aug-14	1,275.0	637.5	2,550.0
Sep-14	1,087.1	543.5	2,174.2
Oct-14	724.6	362.3	1,449.1
Nov-14	1,054.0	527.0	2,108.1
Dec-14	1,334.5	667.3	2,669.0
Jan-15	1,571.9	786.0	3,143.8
Feb-15	1,447.8	723.9	2,895.6
Mar-15	1,229.1	614.6	2,458.3
Apr-15	767.6	383.8	1,535.3
May-15	713.3	356.6	1,426.6
Jun-15	913.1	456.5	1,826.2

Additionally, it should be noted that my analysis evaluated the Company's rates based on the seasons indicated in its tariffs.

Q. What were your results?

A. My results are shown below in Tables 4a through 4c, as well as Figure 2.

Table 4a. Empire residential bill impacts under current rates.

Billing Month	Average Use	50% Less Use	100% More Use
May-14	$111.74	$65.09	$197.20
Jun-14	$140.29	$76.41	$268.07
Jul-14	$158.28	$85.40	$304.04
Aug-14	$168.76	$90.64	$325.00
Sep-14	$145.73	$79.13	$278.94
Oct-14	$98.45	$56.91	$170.62
Nov-14	$131.27	$77.10	$236.26
Dec-14	$159.21	$92.74	$292.14
Jan-15	$182.86	$104.57	$339.43
Feb-15	$170.49	$98.39	$314.71
Mar-15	$148.71	$87.49	$271.15
Apr-15	$102.74	$59.55	$179.21
May-15	$97.33	$56.22	$168.38
Jun-15	$124.41	$68.46	$236.30

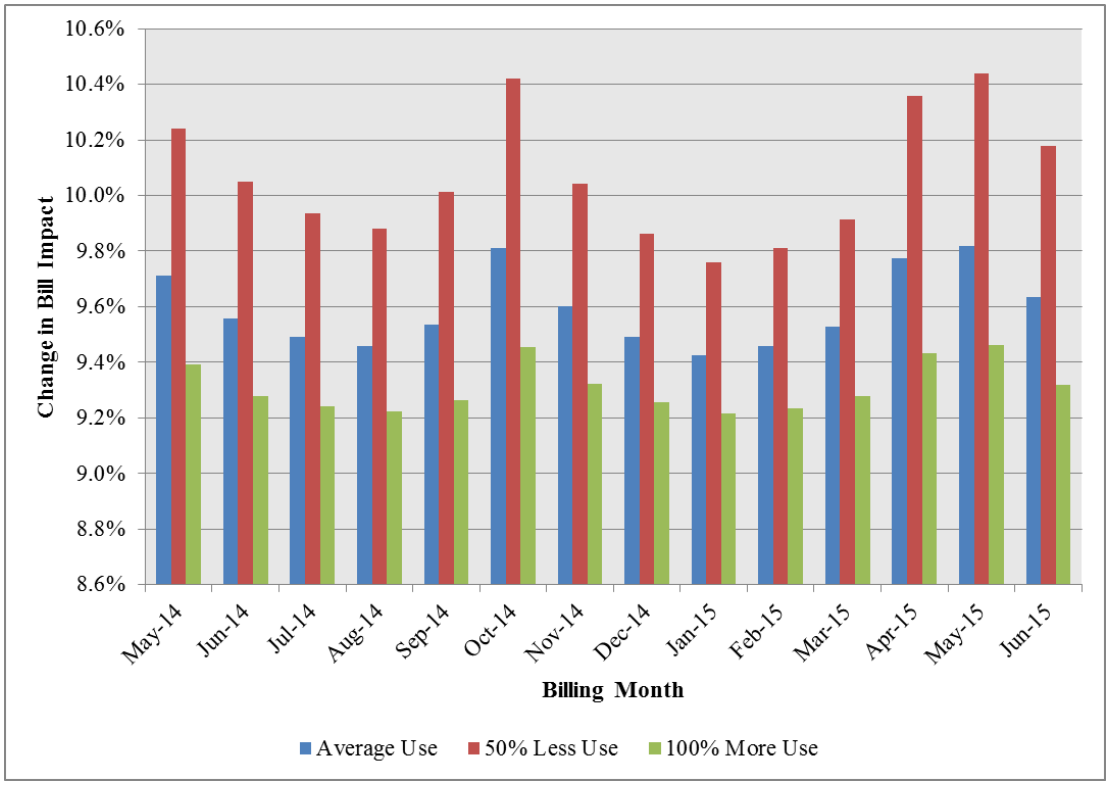
Table 4b. Empire residential bill impacts under the Company's proposed rates.

Billing Month	Average Use	50% Less Use	100% More Use
May-14	$122.59	$71.75	$215.72
Jun-14	$153.70	$84.09	$292.93
Jul-14	$173.30	$93.89	$332.13
Aug-14	$184.72	$99.60	$354.98
Sep-14	$159.63	$87.05	$304.79
Oct-14	$108.11	$62.85	$186.76
Nov-14	$143.87	$84.84	$258.29
Dec-14	$174.32	$101.89	$319.18
Jan-15	$200.09	$114.77	$370.72
Feb-15	$186.62	$108.04	$343.77
Mar-15	$162.88	$96.17	$296.30
Apr-15	$112.79	$65.72	$196.11
May-15	$106.88	$62.09	$184.31
Jun-15	$136.39	$75.43	$258.32

Table 4c. Change in residential bill impacts between current and Company's proposed rates.

Billing Month	Average Use	50% Less Use	100% More Use
May-14	9.7%	10.2%	9.4%
Jun-14	9.6%	10.1%	9.3%
Jul-14	9.5%	9.9%	9.2%
Aug-14	9.5%	9.9%	9.2%
Sep-14	9.5%	10.0%	9.3%
Oct-14	9.8%	10.4%	9.5%
Nov-14	9.6%	10.0%	9.3%
Dec-14	9.5%	9.9%	9.3%
Jan-15	9.4%	9.8%	9.2%
Feb-15	9.5%	9.8%	9.2%
Mar-15	9.5%	9.9%	9.3%
Apr-15	9.8%	10.4%	9.4%
May-15	9.8%	10.4%	9.5%
Jun-15	9.6%	10.2%	9.3%

Figure 2. Empire residential bill impact changes between current and proposed rates.



Q. What do you observe from these results?

A. Across all months, residential customers with higher usage would experience a smaller percentage bill impact than customers with average usage. Additionally, customers with average usage would experience lower percentage bill impacts than customers with lower usage.

Q. Do your bill frequency and bill impact analyses support your previous conclusions regarding the Company's rate design proposals?

A. Yes. As is clear from Table 4c and Figure 2, residential customers with higher usage would experience smaller percentage bill impacts under the Company's proposal than those with average and lower usages. This is true regardless of the time of year. The analysis shows that the Company's proposal does not incent efficient usage.

V. RESIDENTIAL VOLUMETRIC RATE DESIGN

Q. What is Empire's current residential volumetric rate structure?

A. Empire's residential customers pay for the electricity which they use under "declining block rates" in the winter and "uniform volumetric rates" in the summer. Under declining block rates, usage past a certain "block" (i.e., number of kWh) is charged at a lower rate per kWh; with uniform volumetric rates, all usage is charged the same rate per kWh.

Q. Can volumetric rates be redesigned to better encourage efficient use?

A. Yes. In general, customers receive a better price signal under uniform volumetric rates than with declining block rates, since higher usage under the latter incurs a lower charge per kWh. This lower charge essentially provides a discount to higher use customers, providing a weaker encouragement for efficiency past the initial rate block or blocks.

"Uniform volumetric" rate structures, by contrast, reward customers on an even basis for efficiency efforts at all levels of use.

An "inclining block rate" provides the best price signal when properly designed. Under inclining block rates, customers are charged more per kWh for use past a certain rate block or blocks. This indicates to customers that higher use incurs higher charges, and provides greater rewards for customers who undertake efficiency efforts within the higher block or blocks.

Q. Should the Commission require Empire to gradually move towards residential uniform volumetric or inclining block rates?

A. Yes. Customer rates should be transitioned in a gradual and considerate manner for several reasons. Customers with a low income could face an even greater energy burden by being charged more if they use electricity above the initial block of an inclining block rate; consequently, it is important from an equity perspective to determine an average amount of "basic" residential electricity use in setting this first block's usage level and the associated volumetric charge. Similarly, impacts on customers using electric space heating should also be considered, since they may more easily pass the initial block of use under an inclining block rate. It is also important to determine the amount of "discretionary" residential electricity use in setting the higher block levels and associated volumetric charges of inclining block rates; discretionary use can vary by customer, particularly based on whether or not customers use electricity for space heating.

A sudden transition to uniform volumetric rates, and more so to inclining block rates, would create rate shock, particularly for customers using electric heat and for low-income customers. The degree to which this rate shock would occur – and to which efficiency

signals would be sent – would vary based on the actual rate design. This is an indication that designing volumetric rates, particularly inclining block rates, can be challenging due to the need to determine how billing units and revenue requirements should be adjusted at the various rate blocks. The price elasticity of demand, or how much customers adjust consumption based on price changes, complicates these decisions, since customer shifts in usage resulting from price signals can lead to deviations in projected revenue recovery and efficiency gains.

Q. Can you illustrate the potential impacts on residential electric heating space customers of moving towards uniform volumetric rates?

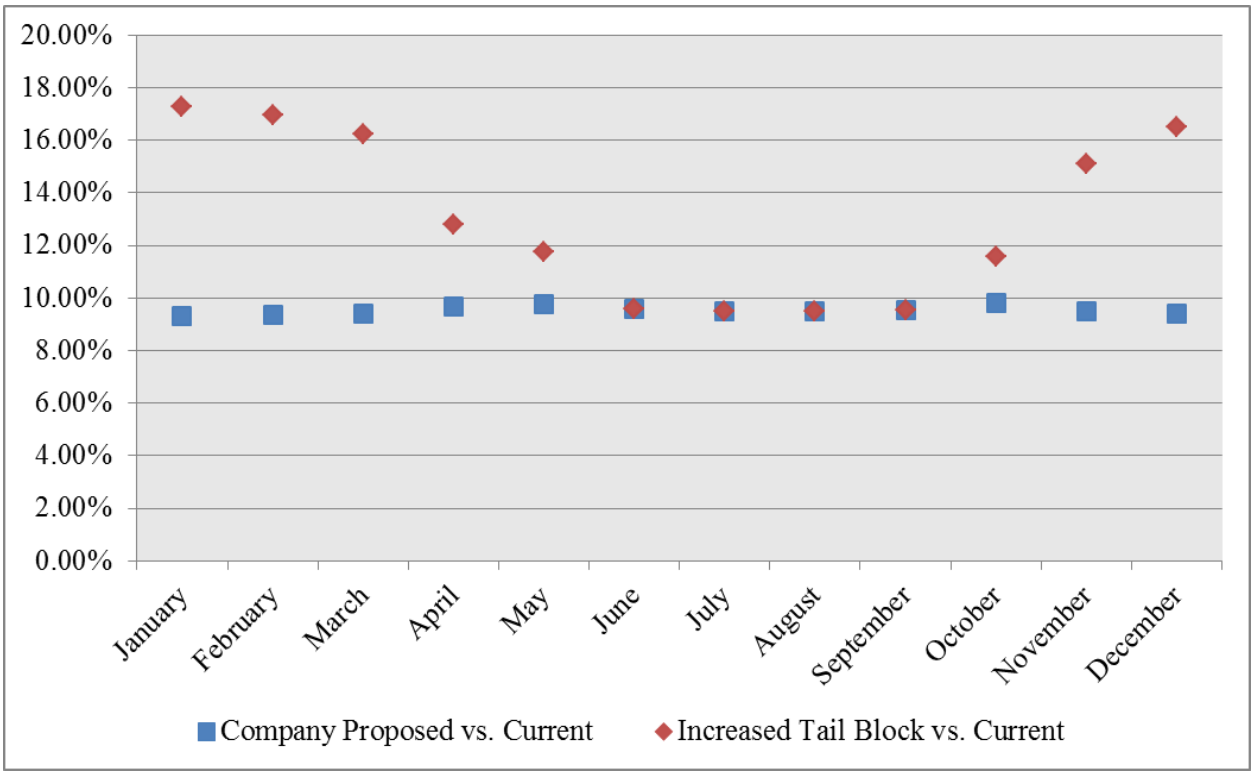
A. Yes. The Company could not identify which customers were electric space heating customers in the data set used in the bill impact analysis above. Therefore, I performed another analysis on the data to determine which customers in the sample could be electric space heating customers. To do so, I assumed that customers with an average winter use more than 25 percent above their average use in the "shoulder" months (i.e., the month before and the month after the winter billing season) might be electric space heating customers. Although there could be electric space heating customers with a smaller usage differential, it is likely that there are many with an even greater differential.

I then compared the average usages by month of this set of customers to a hypothetical winter rate design. This rate design moves the tail block of the Company's proposed residential winter rate halfway towards the first block (see Table 5 below). As shown in Figure 3, the bill impact for these customers can be up to 7.28 percent higher than the bill impact under the Company's proposal; this results in an annual bill increase for these customers of $78.32 over the bill impact under the Company's proposal.

Table 5. Residential rates with increased winter tail block – 50 percent movement towards first block.

Charge Type	Winter	Summer
Customer Charge	$14.47	
Volumetric Charge (Block 1)	$0.13353	$0.13353
Volumetric Charge (Block 2)	$0.12104	$0.13353

Figure 3. Change in bill impacts on potential electric space heating customers of moving residential winter tail block 50 percent towards initial block.



Q. What is your recommendation with respect to residential volumetric rate design in this case?

A. Given the complexity of properly designing residential volumetric rates, I recommend that the Commission open a working docket in which parties to this case can explore how to design these rates. Such a working docket should be concluded prior to the Company's

next general rate case filing in order to provide timely results; in view of this consideration, the Commission could order that the docket be concluded within 12 months following the effective date of rates in this case. Although implementing residential inclining block rates (or even uniform winter volumetric rates) immediately following this case could cause rate shock, such a gradual implementation should be considered for a future rate case. A working docket would provide parties to this case the opportunity to fully examine the issues surrounding residential volumetric rate design prior to the implementation of new rate types. Any fundamental redesign of residential rates should consider efficiency, gradualism, and rate shock concerns, along with equity concerns related to factors such as temperature, income, electric space heating use, and household size.

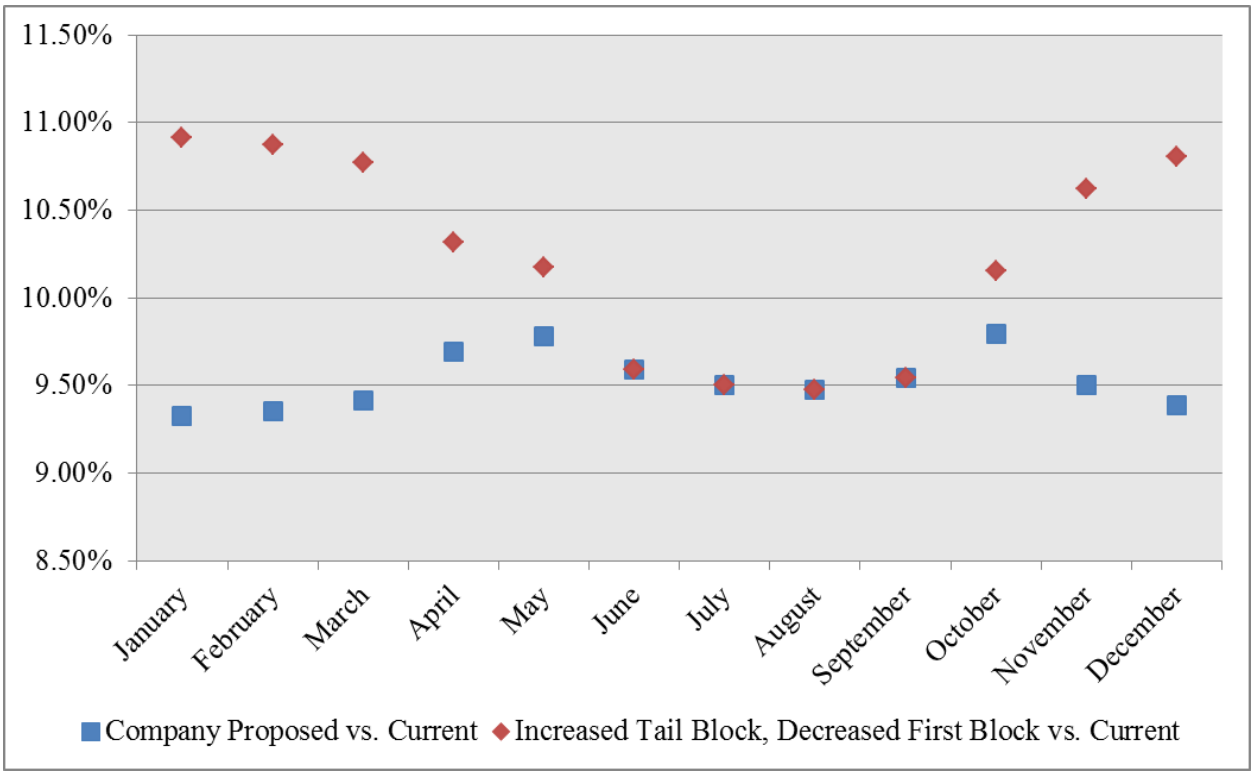
Q. If the Commission is interested in moving towards the reduction of the differential between the residential winter initial and tail blocks in this case, what would you recommend?

A. In such an event, DE could support moving the winter tail block up to 10 percent of the way towards the initial block; this would result in the rates shown in Table 6 based on the Company's proposal. At this increase, the group of potential electric space heating customers which I identified would experience a relatively small annual increase over the Company's proposal of $15.66. The comparison of the change in bill impacts between these two rate designs is shown in Figure 4.

Table 6. Residential rates with increased winter tail block – 10 percent movement towards first block.

Charge Type	Winter	Summer
Customer Charge	$14.47	
Volumetric Charge (Block 1)	$0.13353	$0.13353
Volumetric Charge (Block 2)	$0.11105	$0.13353

Figure 4. Change in bill impacts on potential electric space heating customers of moving residential winter tail block 10 percent towards initial block.



VI. DEMAND-SIDE MANAGEMENT

Q. Does Empire currently have a portfolio of DSM programs?

A. Yes. These programs are specified under the Company's Promotional Practices tariffs (Missouri Public Service Commission Tariff Nos. YE-2011-0615 and JE-2010-0061, The

Empire District Electric Company, Schedule PRO, various dates, Sec. 4, Sheet Nos. 8a and 8d-8j).

Q. Are these programs offered under MEEIA?

A. No.

Q. Until when must Empire offer its current DSM programs?

A. Under the Revised Stipulation and Agreement in Empire's last rate case (ER-2014-0351), the Company is required to continue its DSM programs (aside from its low-income weatherization program, or "LIWAP"), "…at current funding levels and with the current recovery mechanism, until Empire has an approved MEEIA or until the effective date of rates in Empire's next general rate case."[34] The Company is separately required to continue its LIWAP offering without a specified end date.[35]

Q. Might the Company terminate many of its DSM programs at the conclusion of this case?

A. Yes. Without direction from the Commission to continue offering existing DSM programs, the Company could terminate its DSM portfolio entirely following the effective date of rates in this rate case.

[34] ER-2014-0351, Revised Stipulation and Agreement and List of Issues, page 4.
[35] *Ibid*.

Q. Has the Company indicated that it wishes to terminate any of its current DSM programs?

A. Empire has not made such an indication through its revised tariff filing;[36] however, the Company has indicated its intent to discontinue its DSM programs in its recent triennial IRP filing (EO-2016-0223).[37]

Q. Is the Company required to file a MEEIA portfolio application?

A. No. Under §393.1075.4, RSMo., "The commission shall **permit** electric corporations to implement commission-approved demand-side programs proposed pursuant to this section with a goal of achieving all cost-effective demand-side savings" (emphasis added).

Q. Notwithstanding this language, is it the statutory policy that the state values DSM programs?

A. Yes. §393.1075.3 RSMo. states in part, "It **shall be the policy** of the state to **value demand-side investments equal to traditional investments in supply and delivery infrastructure** and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs" (emphases added).

Q. Do other investor-owned utilities in Missouri offer DSM programs under MEEIA?

A. Yes. Ameren Missouri's MEEIA Cycle II portfolio was approved on February 10, 2016,[38] and the MEEIA Cycle II portfolios of both KCP&L and GMO were approved on

[36] Missouri Public Service Commission Case No. ER-2016-0023, *In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service*, Kelly Walters, Filing Letter, October 16, 2015, page 1.
[37] Missouri Public Service Commission Case No. EO-2016-0223, *In the Matter of The Empire District Electric Company's 2016 Triennial Compliance Filing Pursuant to 4 CSR 240-22*, The Empire District Electric Company, Volume 7 – Resource Acquisition Strategy Selection, April 1, 2016, pages 34-35.

March 2, 2016.[39] Empire is thus the only investor-owned electric utility in the state which lacks a MEEIA portfolio. If the Company is allowed to discontinue its DSM programs entirely, then it will be the only investor-owned electric utility in the state without DSM programs.

Q. Is it important for the Company to offer DSM programs in light of its rate increase request?

A. Yes. DSM programs better enable customers to use energy efficiently, reduce demand, or shift demand to off-peak periods, thereby mitigating the impacts of rate increases. Empire's discontinuation of these programs, combined with its proposed residential customer charge increase, would severely reduce the ability of residential customers to control their bills while increasing the Company's guarantee of recovering its revenue requirement. Even if it were true that the discontinuation of the Company's DSM programs produced the lowest net present value revenue requirement for Empire, this shift in control over customer bills should be of enough to concern to lend support to continuing Empire's current DSM programs.

Q. Have any other parties to this case addressed Empire's DSM programs?

A. Yes. Staff witness Mr. Brad J. Fortson indicates in Staff's revenue requirement report that there is, "… outdated and incorrect information within Empire's DSM programs tariff

[38] Missouri Public Service Commission Case No. EO-2015-0055, *In the Matter of Union Electric Company d/b/a Ameren Missouri's 2nd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA*, Order Approving Non-Unanimous Stipulation and Agreement, February 10, 2016, page 6.
[39] Missouri Public Service Commission Case Nos. EO-2015-0240 and EO-2015-0241, *In the Matter of Kansas City Power & Light Company's Filing for Approval of Demand-Side Programs and for Authority to Establish a Demand-Side Programs Investment Mechanism* and *In the Matter of KCP&L Greater Missouri Operations Company's Filing for Approval of Demand-Side Programs and for Authority to Establish a Demand-Side Programs Investment Mechanism*, Report and Order, March 2, 2016, pages 16-17.

sheets …,"[40] and that Empire's current DSM programs may be addressed by Staff in its Rebuttal Testimony.[41]

Q. In view of these circumstances, what do you recommend?

A. DE encourages the Company to file a MEEIA portfolio application in order to fulfill the policy goal set forth in the MEEIA statute and to assist the Company's customers with the rate impacts resulting from this case. However, since a MEEIA application is not required by statute, DE recommends that, at the very least, the Commission order Empire to continue its DSM program offerings at current funding levels until the Company receives approval for a MEEIA portfolio. Additionally, DE supports requiring the Company to correct the outdated and erroneous information in its DSM tariffs. DE offers these recommendations in order to ensure the continued availability of DSM programs in Empire's service territory.

VII. CONCLUSIONS

Q. Please summarize your conclusions and the positions of DE.

A. DE is opposed to Empire's proposed residential rate design in this case, since it is not cost-based and does not follow principles of efficiency, equity, gradualism, or avoidance of rate shock. Consequently, the Commission should maintain the residential customer charge at its current level.

Additionally, DE recommends the formation of a working docket to explore the design of block rates for Empire's residential customers. Should the Commission wish to move towards the reduction of the differential between the residential winter tail and initial

[40] Missouri Public Service Commission Case No. ER-2016-0023, *In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service*, Staff Report – Revenue Requirement, March 25, 2016, page 110, lines 21-26.
[41] *Ibid*, page 111, lines 19-20.

block rates, DE could support an adjustment of the tail block of up to 10 percent of the way towards the initial block. Finally, DE recommends that the Company be encouraged to file a MEEIA portfolio application; the Commission should, at the least, require Empire to continue its current DSM portfolio at current funding levels until such an application is approved so that there is a continued availability of programs which benefit customers. DE also supports requiring Empire to correct the outdated and incorrect information identified by Staff in the Company's DSM tariffs.

Q. Does this conclude your Direct Testimony (Rate Design) in this case?

A. Yes.