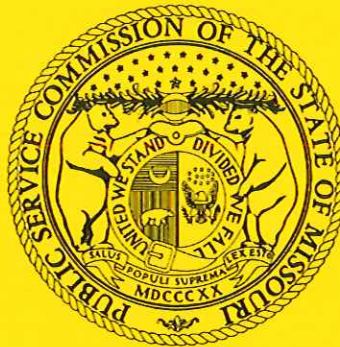


MISSOURI PUBLIC SERVICE COMMISSION

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Missouri Public
Service Commission

STAFF REPORT

CLASS COST OF SERVICE



UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri

CASE NO. ER-2019-0335

*Jefferson City, Missouri
December 18, 2019*

** Denotes Confidential Information **

Staff Exhibit No. 106P
Date 3/4/20 Reporter JNB
File No. ER-2019-0335

1 CLASS COST OF SERVICE REPORT

2 UNION ELECTRIC COMPANY,
3 d/b/a Ameren Missouri

4 CASE NO. ER-2019-0335

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1 **CLASS COST OF SERVICE REPORT**

2 **UNION ELECTRIC COMPANY,**
3 **d/b/a Ameren Missouri**

4 **CASE NO. ER-2019-0335**

5 **I. Executive Summary**

6 In Staff's *Cost-of-Service Report* ("COS Report") filed December 4, 2019, Staff
7 recommended a revenue requirement for Union Electric Company, d/b/a Ameren Missouri
8 ("Ameren Missouri") of approximately \$2.525 billion, at its recommended rate of return of
9 6.921%, based on Ameren Missouri's actual costs through June 30, 2019, net of other revenue of
10 approximately \$400 million, a decrease of approximately \$65 million from its current retail rate
11 revenues of approximately \$2.59 billion, a decrease of approximately 2.5%. Please note that this
12 decrease is applicable to the currently tariffed rate schedules for each class. Because the temporary
13 tax rider is being eliminated as part of this case, but the recommended decrease does not exceed
14 the magnitude of the temporary tax rider, customers will experience a slight increase in bills.

15 Staff's class cost-of-service ("CCOS") study is designed to determine what rate of return
16 is produced by each customer class on that class's currently tariffed rates, for recovery of any
17 calculated revenue requirement amount. Typically, Staff's recommended interclass revenue
18 responsibility shifts, as applicable, are designed to reasonably bring each class closer to producing
19 the system-average rate of return used in determining Staff's recommended revenue requirement.
20 Staff's recommended intra-class shifts will, where appropriate, redesign the rates that collect a
21 particular class's revenues to better align that class's method of recovering revenue with the
22 cost-causation for that class that was indicated by the class cost of-service study.¹

23 **A. CCOS Results and Recommended Decrease Implementation Summary**

24 The results of a CCOS study can be presented either in terms of (1) the rate of return
25 realized for providing service to each class or (2) in terms of the revenue responsibility shifts that

¹ Staff studied Ameren Missouri's rate schedules under the classes indicated: 1M Residential ("Res."), 2M Small General Service ("SGS"), 3M Large General Service ("LGS") and 4M Small Primary Service ("SPS"), 11M Large Primary Service ("LPS"), and Street & Outdoor Area Lighting schedules 5M and 6M ("Combined Lighting").

1 are required to equalize the utility's rate of return from each class. So long as a class's revenue
2 exceeds the expense portion of its cost of service, the class will be providing some level of return
3 on the capital associated with the net ratebase providing service to that class. Based on Staff's
4 Capacity-Assigned CCOS, all classes are contributing revenues in excess of the expenses
5 associated with providing service, and are contributing to the Company's overall return, satisfying
6 the first metric. However, Staff also evaluated the classes' revenues as a percent of the total
7 assigned and allocated cost of serving that class, including the system average rate of return on net
8 ratebase. The Residential, SGS, and Combined Lighting classes are at a greater than 5% positive
9 variance to their calculated cost to serve and the LPS class is at a greater than 5% negative variance
10 to its cost to serve.

11 For the reasons that will be discussed below related to the interrelationship of this case with
12 the temporary tax rider and expected Ameren Missouri capital build-out, Staff does not
13 recommend that revenue responsibility be realigned at this time.²

14 If the Commission determines that it is appropriate at this time to realign revenue
15 responsibility consistent with class cost of service and an overall revenue decrease of
16 approximately \$65 million is ordered for Ameren Missouri, Staff recommends a decrease of
17 approximately \$5 million be implemented to the Lighting Classes, a decrease of approximately
18 \$15 million be implement to the Small General Service class, and the remaining decrease of
19 approximately \$45 million be implemented to the Residential class. If a smaller decrease is
20 awarded and the Commission determines that it is appropriate at this time to realign revenue
21 responsibility consistent with class cost of service, Staff recommends these amounts be prorated
22 to the indicated classes consistent with the described amounts.

23 **B. Rate Design Recommendation Summary**

24 Staff recommends these cases be used as an opportunity to begin the process of
25 implementing default company-wide Time of Use ("ToU") rates. Because Ameren will not
26 complete deployment of AMI meters for some time, and in the interest of using these introductory
27 ToU rates to educate customers about ToU with minimal customer impact, Staff's recommended

² On December 18th Staff became aware that Ameren Missouri was redoing its load research process for approximately half of its test period apparently prompted by Staff DR 517. As indicated on page 49 of the Staff CoS Report, Staff was concerned that anomalies existed for certain months of data. The December 18th discussion further undermines Staff's confidence in the reliability of this data. Reliable load research data is integral to a reasonable CCoS.

1 ToU design focused on minimizing customer impact, and applying a gradual rollout of the rates.
2 Specifically, Staff recommends that when a customer's AMI meter is installed, the customer
3 begins receiving a "shadow bill" indicating the usage in each interval, and what the customer's
4 energy charges would have been under Staff's recommended ToU rate. Then, approximately
5 6 months to 1 year after the AMI installation, Staff recommends Ameren Missouri interact directly
6 with that customer to educate the customer as to what that customer's bill would have been during
7 the prior period on the recommended default ToU rate schedule, as well as any of the alternative
8 Ameren ToU schedules that may be approved at that time. Staff recommends that for new
9 customers or new accounts, if an AMI is in place at that premise, new customers be placed on the
10 default ToU rate schedule unless they specifically request otherwise.

11 For the non-residential classes Staff recommends that the rate reduction be applied as an
12 equal percentage reduction to the demand charges associated with each rate schedule.

13 **C. Tariff and Other Recommendations**

- 14 1) Paperless Billing
- 15 2) Staff recommends revisions to Ameren Missouri's application of "Billing Period."
- 16 3) Staff recommends a number of data retention measures be implemented:
 - 17 a) Implement more thorough record keeping or data accessibility practices to better
18 associate distribution system costs with the voltage of energy distributed;
 - 19 b) Take steps necessary in its AMI deployment process to provide accurate load
20 research data at a high level of precision, by implementing practices to leverage
21 AMI meter data for load research purposes;
 - 22 c) On an ongoing basis, Ameren Missouri should retain interval data for customers
23 with AMI meters be retained for a minimum of a rolling 12 month time period so
24 that customers may compare ToU options;
 - 25 d) Study and retain determinants associated with the creation of a coincident peak
26 demand charge for all classes.
- 27 4) Staff recommends certain tariffs be updated as part of the compliance process in this
28 case consistent with processes identified within those tariffs:
 - 29 a) Update the Facilities Charge on Tariff Sheet 158 (Community Solar Pilot Program)
30 to reflect the changes made to the related energy charges, if applicable;
 - 31 b) Update the Renewable Energy Standard Rate Adjustment Mechanism
32 ("RESRAM") Tariff Sheet No. 93.4 to reflect the RESRAM base amount
33 determined in this case;
 - 34 c) Update the MEEIA margin rates used for calculating the throughput disincentive
35 within the MEEIA mechanism.

- 1 5) Staff recommends this case be taken as an opportunity to implement solutions to
- 2 certain issues that have arisen in other contexts:
- 3 a) Clarify the billing process for ToU customers;
- 4 b) Revenue Treatment for Potential Customer Renewable Energy Credit Program;
- 5 c) Stipulation and Agreement in ET-2018-0132 concerning line extension record
- 6 retention.
- 7 6) Staff recommends establishment of a ToU rate schedule to be applicable to
- 8 separately-metered EV charging equipment, on an opt-in basis.³
- 9 7) Staff recommends modifications to the Fuel Adjustment Clause (“FAC”) base factor
- 10 and transmission percentage.

11 **D. Summary of Bundled and Functionalized Cost Categories**

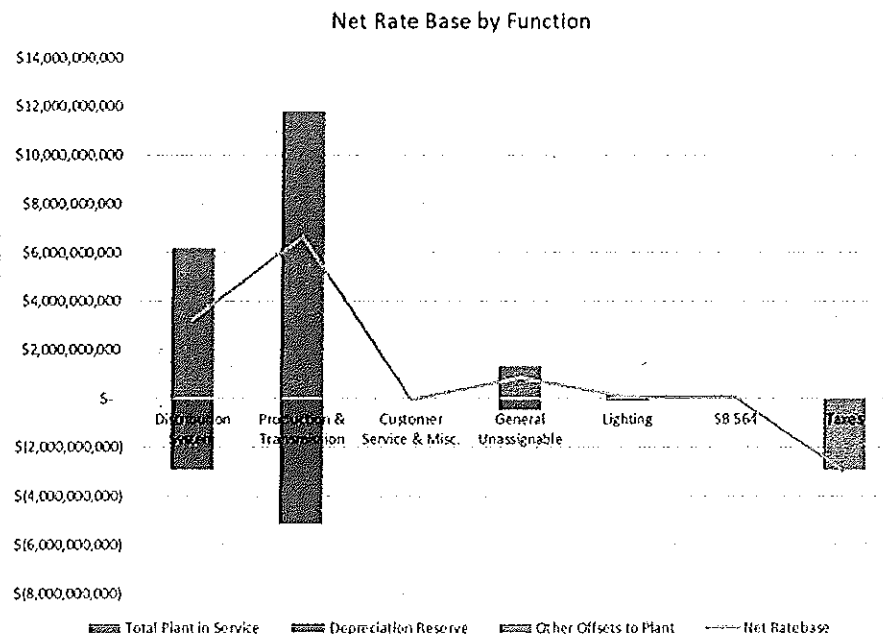
12 Staff has calculated that the appropriate retail revenue requirement for Ameren Missouri is

13 \$2.525 billion, which includes \$548 million in return on ratebase, and \$578 million in depreciation

14 expense.

15 The total plant in service, associated depreciation reserve, other offsets to ratebase (such

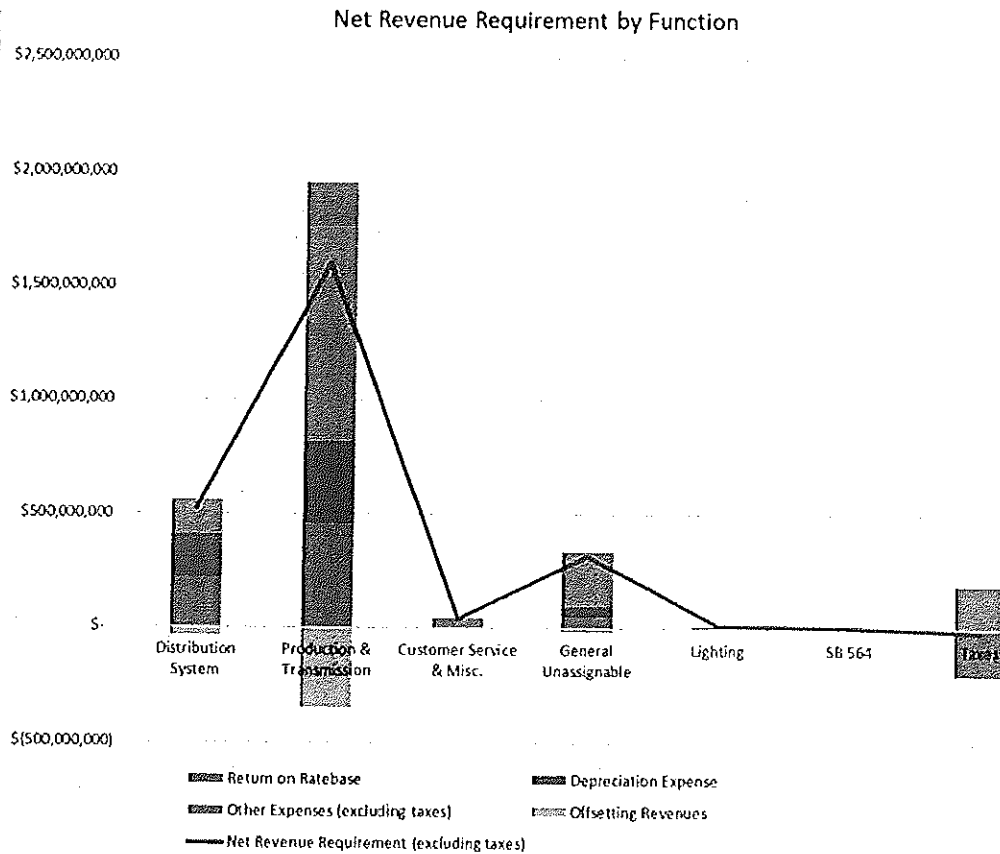
16 as deferred taxes), and resulting net plant are depicted below, by function.⁴



³ At this time, Staff does not object to the general design proposed by Ameren Missouri for this purpose. Final design of this rate is dependent on the revenue requirement established in this matter.

⁴ At this time, minimal spending associated with the various statutory provisions encompassed in SB 564 has occurred. As discussed below, Ameren Missouri has announced significant expenditures in its five year capital plan.

1 The functionalized return on ratebase, depreciation expense, other expenses, and offsetting
 2 revenues are depicted below, with the resulting net revenue requirement, by function. This
 3 depiction is useful to observe the magnitude of costs that do not vary with the level of energy sold
 4 to retail customers, such as depreciation expense and return on investment, as components of the
 5 overall revenue requirement.
 6

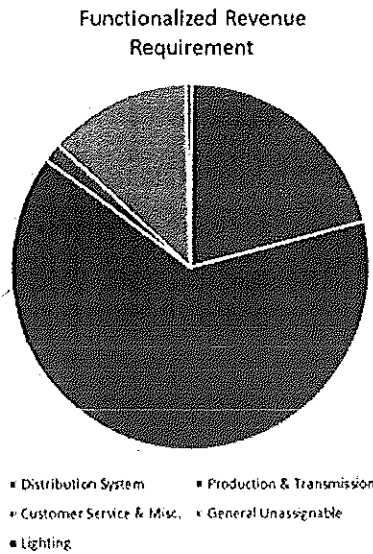


7
 8 The Production & Transmission function includes all of Ameren Missouri's company-owned
 9 generating facilities, capacity transactions, fuel purchases, and energy purchases and sales.⁵
 10 As readily depicted in the graphs above and below, this function constitutes roughly two-thirds of
 11 Ameren Missouri's net revenue requirement.⁶ The Distribution System also constitutes a
 12 significant portion of the net revenue requirement.

⁵ For purposes of this initial discussion, the intra-interval energy purchases and sales transacted through the MISO integrated marketplace are treated as the annual cumulative net recorded sales proceeds and purchased power expenses.

⁶ At this time, the net tax function results in an offset to revenue requirement. It is excluded from this pie-chart.

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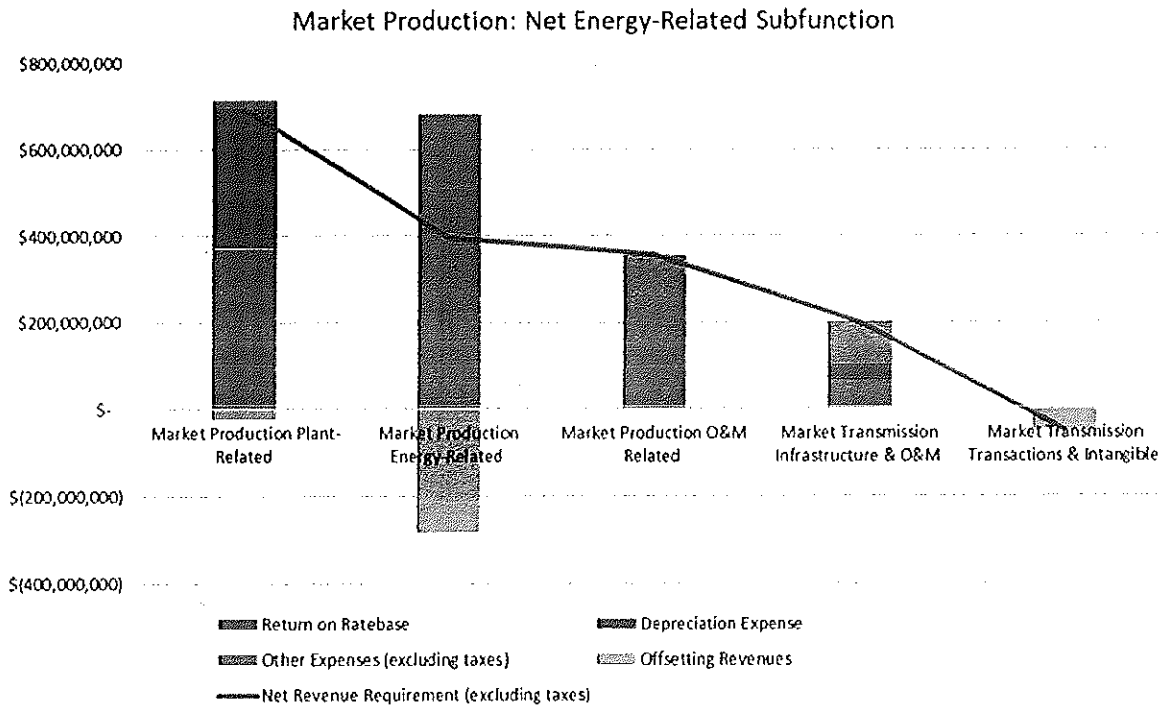


General familiarity with the above magnitudes is helpful for at least three reasons. First, many of the contested issues that arise around cost of service relate to the allocation of generation-related costs and revenues, so it is helpful to observe the relative magnitude of this functionalized cost. Second, Ameren Missouri is embarking on significant capital expenditures, largely in the areas of distribution (smart grid) and generation (wind), so it is useful to be aware of the starting points of each at the outset of this build-out program. Finally, it is useful to be aware of the makeup of the revenue requirement as depicted above prior to contemplating the scale of the actual integrated market transactions through which Ameren Missouri buys and sells roughly a billion dollars of energy every year, which is beginning to render traditionally executed embedded cost of service studies less meaningful.

In the graph below, the Energy-Related portion of the Market-Production subfunction is netted – the fuel, revenue from energy sales, and expenses of purchasing energy to serve load have offset to a net revenue requirement of approximately \$400 million.

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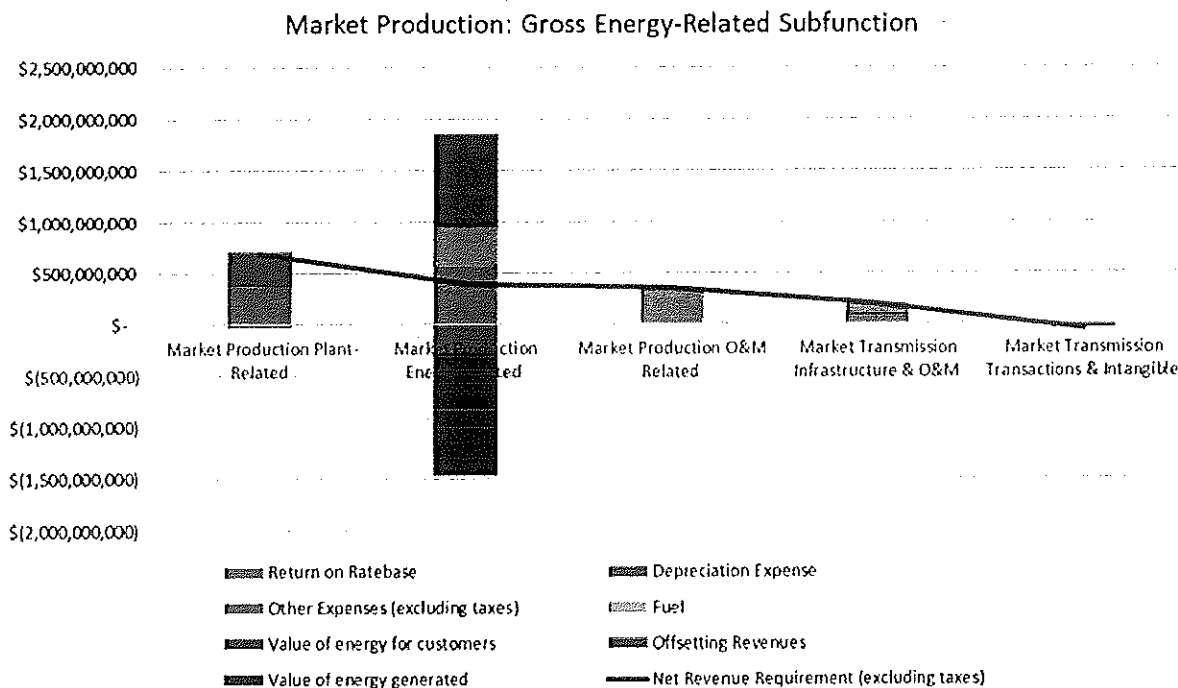
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Typically in an embedded cost study, the net revenue requirement of the Plant-Related subfunction would be allocated to customer classes based on a capacity-related allocator, such as Staff's detailed BIP, or one of the several Average & Excess variations; while the net revenue requirement of the Energy-Related subfunction would be allocated to the classes based on an energy-related allocator, such as sales at generation by class, or market-weighted average energy cost. As depicted above, the gross costs of service of the Plant-Related and Energy-Related subfunctions are very similar, and the net revenue requirement of the Energy-Related subfunction is just over half of the magnitude of the net revenue requirement of the Plant-Related subfunction. However, as Ameren Missouri actually operates in the MISO integrated market, the gross Energy-Related subfunction dwarfs the remaining subfunctions within the Market Production function, as is depicted below.

continued on next page

1



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3 As is depicted above, the value of the energy purchased for customers is approximately
 4 \$900 million, which is directly assignable to the classes – and customers within the class – causing
 5 the purchase of energy. The fuel expenditures of approximately \$400 million dollars were
 6 modeled to produce energy worth approximately \$1.2 billion. Because that production required
 7 use of the generating facilities, employees, maintenance costs, and transmission costs including
 8 access to the MISO IM, the net proceeds of the generated energy are more reasonably treated as
 9 an offset to the costs of production than to the expense of obtaining energy. The possible
 10 treatments of the Market Production functionalized revenue requirement will be discussed below.

11 *Staff Expert/Witness: Sarah L.K. Lange*

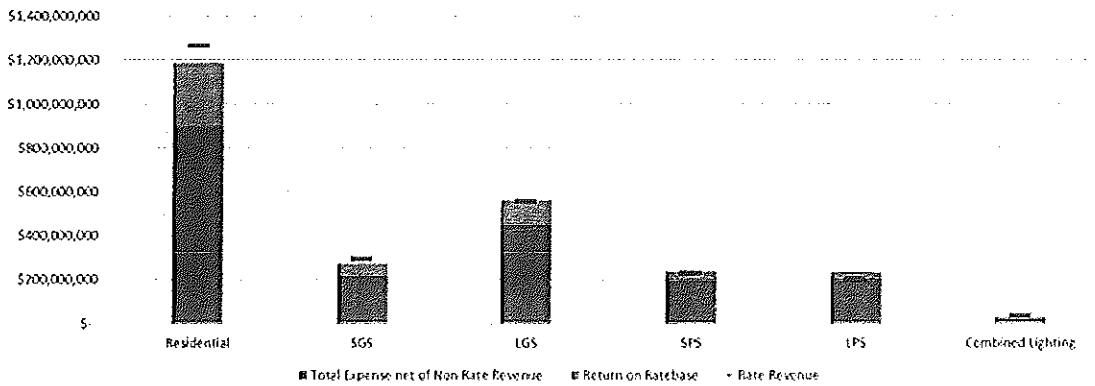
12 **II. Bundled Class Cost of Service Results and Recommended Decrease**
 13 **Implementation**

14 Staff performed its class cost of service study in a manner to facilitate comparison of the
 15 impact of selection of allocator on the study results. Specifically, Staff assigned and allocated
 16 costs not only to the rate classes Residential, Small General Service, Large General Service, Small
 17 Primary Service, and a combined Lighting Class, but also to the functional classes “Market
 18 Production & Transmission,” “Taxes,” “SB 564,” and “General Unassignable for Allocation.”

1 Staff bases its recommendations on the Capacity-Assigned Class Cost of Service Study,
 2 Version B,⁷ the results of which are summarized below:

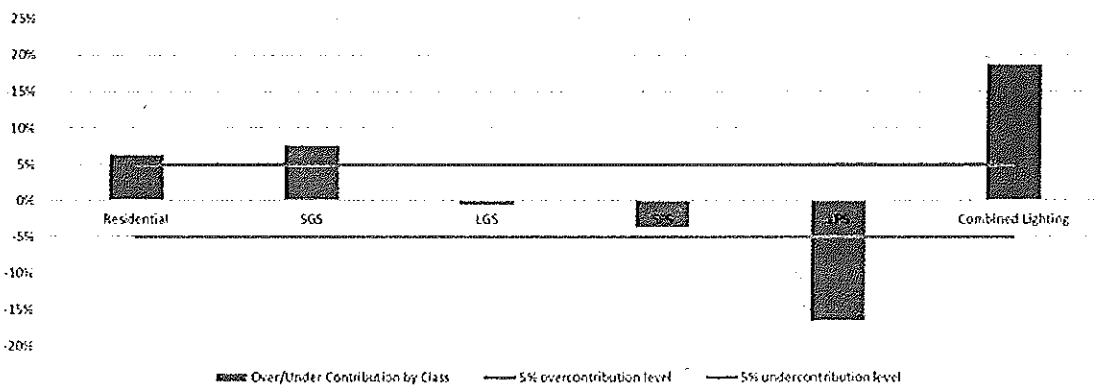
	Residential	SGS	LGS	SPS	LPS	Combined Lighting
Total Ratebase	\$ 4,156,839,847	\$ 883,013,497	\$ 1,600,160,969	\$ 618,671,776	\$ 514,632,763	\$ 147,002,280
Total Expense net of Non-Rate Revenue	\$ 898,940,866	\$ 211,110,903	\$ 450,112,960	\$ 196,596,900	\$ 198,864,485	\$ 21,497,316
Return on Ratebase	\$ 287,694,886	\$ 61,113,364	\$ 110,747,141	\$ 42,818,274	\$ 35,617,734	\$ 10,174,028
Class Cost of Service at System Average RoR	\$ 1,186,635,752	\$ 272,224,267	\$ 560,860,101	\$ 239,415,174	\$ 234,482,219	\$ 31,671,344
Rate Revenue	\$ 1,266,985,066	\$ 294,771,201	\$ 557,524,661	\$ 230,999,514	\$ 201,128,512	\$ 38,931,311
Current Rate of Return	8.85%	9.47%	6.71%	5.56%	0.44%	11.86%
Decrease to Current Tariff Rates to Exactly Match Calculated Class Cost of Service	\$ 80,349,314	\$ 22,546,934	\$ (3,335,440)	\$ (8,415,660)	\$ (33,353,707)	\$ 7,259,967
% Decrease to Current Tariff Rates to Exactly Match Calculated Class Cost of Service	6.34%	7.65%	-0.60%	-3.64%	-16.58%	18.65%

Capacity-Assigned Class Cost of Service Study Results



6 These results indicate that all classes are providing a contribution to rate of return, although some
 7 classes are providing a higher return than others.

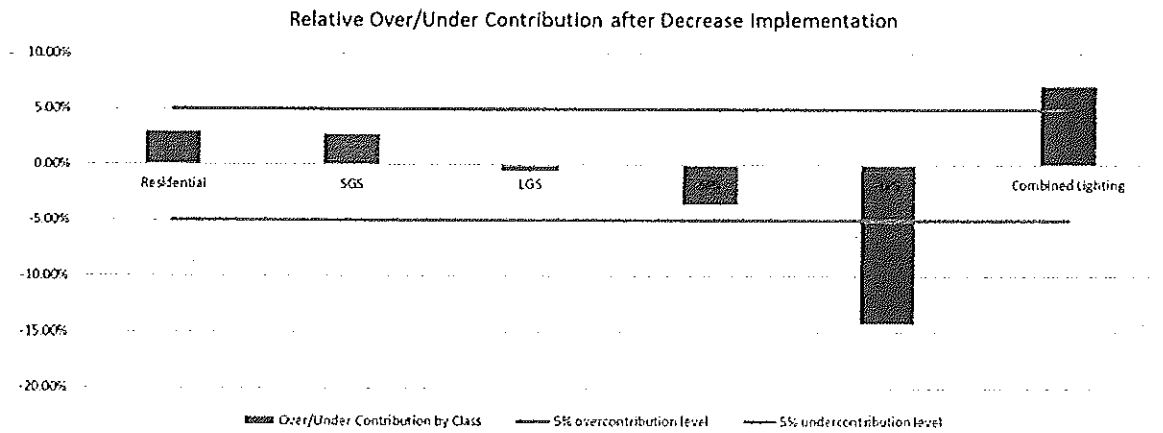
Initial Study Results as Relative Over/Under Contribution



⁷ Staff's studies are referred to as Assigned Capacity - Version A, Assigned Capacity - Version B, A&E 4NCP - Version A, A&E 4NCP - Version B, Assigned Capacity - Plug for Capital Plan A, Assigned Capacity - Plug for Capital Plan B.

1 As depicted above, the Residential, SGS, and Combined Lighting classes are at a greater than 5%
 2 positive variance to their calculated cost to serve at a system average rate of return, while the LPS
 3 class is at a greater than 5% negative variance to its cost to serve.

4 If the Commission chooses to move classes towards the calculated cost of service at this
 5 time, and if an overall revenue decrease of approximately \$65 million is ordered for Ameren
 6 Missouri, Staff recommends a decrease of approximately \$5 million be implemented to the
 7 Lighting Classes, a decrease of approximately \$15 million be implement to the Small General
 8 Service class, and the remaining decrease of approximately \$45 million be implemented to the
 9 Residential class.⁸ The resulting variances to the calculated cost to serve at a system-average rate
 10 of return are depicted below.



12
 13 Staff bases its recommendations for implementing a decrease to tariffed rates in this case
 14 on its CCOS study results, Staff's review of Ameren Missouri's revenue-neutral adjustments in
 15 previous general rate increases, the impact of the temporary tax rider, and anticipated future
 16 revenue requirements related to Ameren Missouri's publicly announced capital plans in File No.
 17 EO-2019-0044, *In the Matter of the Compliance of Union Electric Company d/b/a Ameren*
 18 *Missouri with Certain Requirements Related to SB 564 and Related Matters*, and Staff's expert
 19 judgment regarding the impact of revenue shifts for all classes. As will be discussed later in this
 20 Report, primarily for the reason of anticipated future revenue requirements related to Ameren

⁸ If a smaller decrease is awarded, Staff recommends these amounts be prorated to the indicated classes. If there is no change in revenue requirement or an increase in revenue requirement is ordered, Staff recommends that no revenue neutral shifts be made.

1 Missouri's publicly announced capital plans and the impact of the temporary tax rider's removal,
2 Staff does not recommend realigning classes' revenue responsibilities at this time.

3 **A. Distribution Costs**

4 **1. Classification**

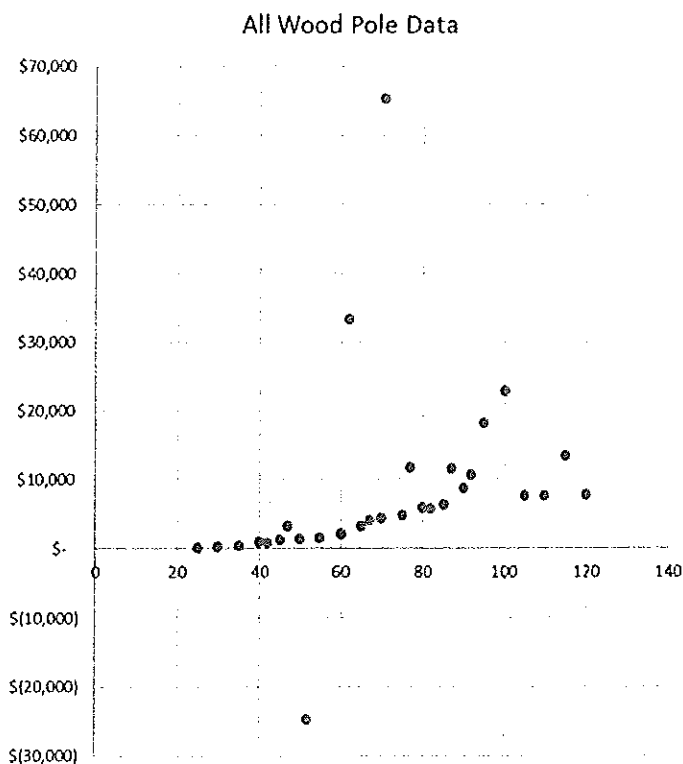
5 The distribution system converts high voltage power from the transmission system into
6 lower primary voltage and delivers it to large industrial complexes, and further converts it into
7 even lower secondary voltage power that can be delivered into homes for lights and appliances.
8 Ameren Missouri's distribution plant accounts reflect the costs and expenses associated with the
9 non-transmission high voltage system, distribution substations, poles, wires, and transformers, as
10 well as service and labor expenses incurred for the operation and maintenance of these distribution
11 facilities. Distribution plant Accounts 364 through 370 involve both demand-related and
12 customer-related costs. The customer-related component of distribution facilities is that portion
13 of costs which varies with the total number of customers served. Generally, the number of poles,
14 transformers, meters, and miles of conductor are directly related to the number of customers on
15 the utility's system, but the size of each of these items are related to the level of energy that they
16 deliver over time. The dollars recorded in distribution system accounts need to be apportioned
17 between the customer- and demand-related classifications to facilitate the most reasonable
18 allocation for each portion, and allocated to the various voltages for proper allocation to the classes.
19 This classification relies on a determination of how much of the distribution system is needed to
20 make service available to all customers regardless of the level of any customer's demand versus
21 how much of the distribution system is needed to meet the maximum demand requirements of the
22 customers served, by class.

23 **Account 364**

24 For the Pole account, Account 364, Staff classified the customer-related portion of costs
25 associated with the poles comprising Ameren Missouri's distribution system using the
26 Zero-Intercept Cost Minimum System method. The remaining classification of Account 364 relied
27 on Ameren Missouri's "Vandas" study provided within its workpapers. The concept behind a
28 Zero-Intercept Cost study is to seek to identify that portion of plant related to a hypothetical

1 no-load or zero-intercept situation.⁹ The technique is to relate installed cost to current carrying
2 capacity or demand rating, create a curve for various sizes of the equipment involved, using
3 regression techniques, and extend the curve to a no-load intercept. The cost related to the
4 zero-intercept is the customer component. In other words, the Zero-Intercept cost would be the
5 cost that would be recorded in the studied account if, for example, the entire distribution system
6 were operated at zero volts and linemen had been installing 0" tall poles for the last hundred and
7 twenty years. Those are the costs that strictly relate to the number of customers served.

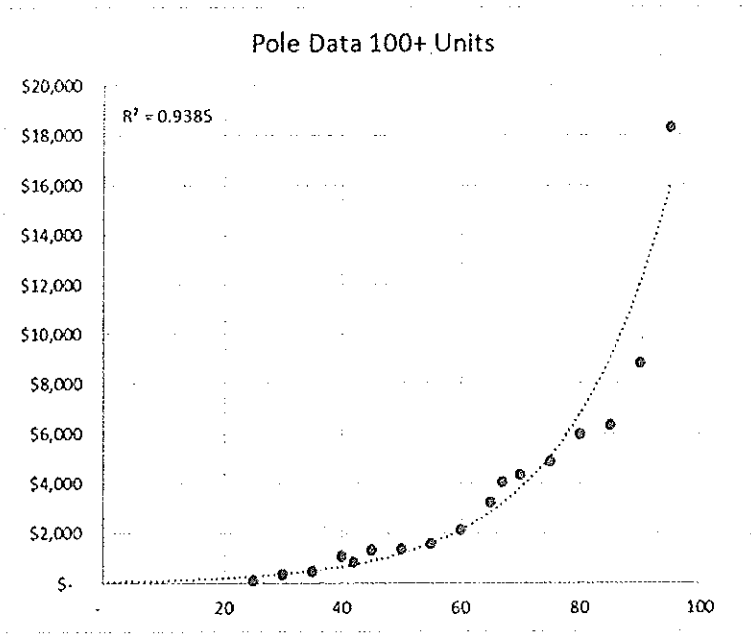
8 Staff first reviewed the data to determine whether it exhibited trends that would be
9 conducive to producing a reliable Zero Intercept result. This process consists of first graphing all
10 available data to determine whether to expend the resources to proceed. The data to be plotted is
11 the height of the pole along the X axis, by the average cost per unit recorded in Account 364.
12



13
14 Because the plotted results appear to reflect a graphable pattern, Staff then proceeded to
15 identify pole heights where less than 100 poles of that height were installed. Staff removed the

⁹ The NARUC Manual says of the Zero-Intercept Method that this method "requires considerably more data and calculation than the minimum-size method. In most instances, it is more accurate, although the differences may be relatively small."

1 data associated with pole-types that were not commonly installed because, (1) it is likely that
2 atypical poles were installed to do circumstance unique to that pole's installation, and (2) because
3 higher-volume unit recordings are more likely to average out unique installation circumstances or
4 recording errors. The plotted data for cost-per unit of wood poles from 25' – 95' tall, and an
5 Excel-generated exponential trendline are provided on the graph below:

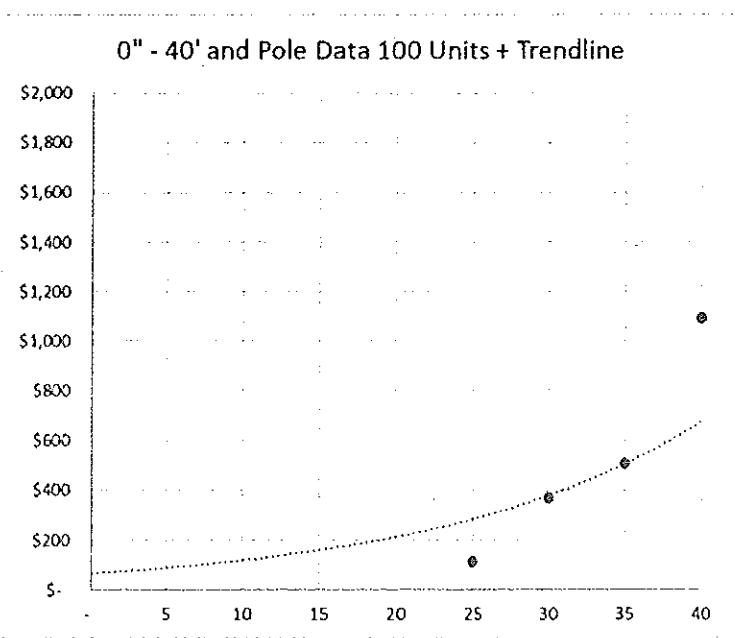


7
8 This dataset reflects the average cost per unit of 893,851 poles, of 17 heights, with a gross cost of
9 \$833,062,796, and regresses to a line that is visually reasonable, generating an R² value of 0.9385.
10 Based on these factors, it is not unreasonable to proceed with a Zero Intercept study of for the Pole
11 account, Account 364.

12 Literally "zooming in" on the portion of the plot that shows the average cost of poles 40'
13 and below, and includes the regression line described above, we can begin to see where the
14 regression line will cross the Y axis, which extrapolates the historic cost per unit of a 0" tall pole.

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20 *continued on next page*

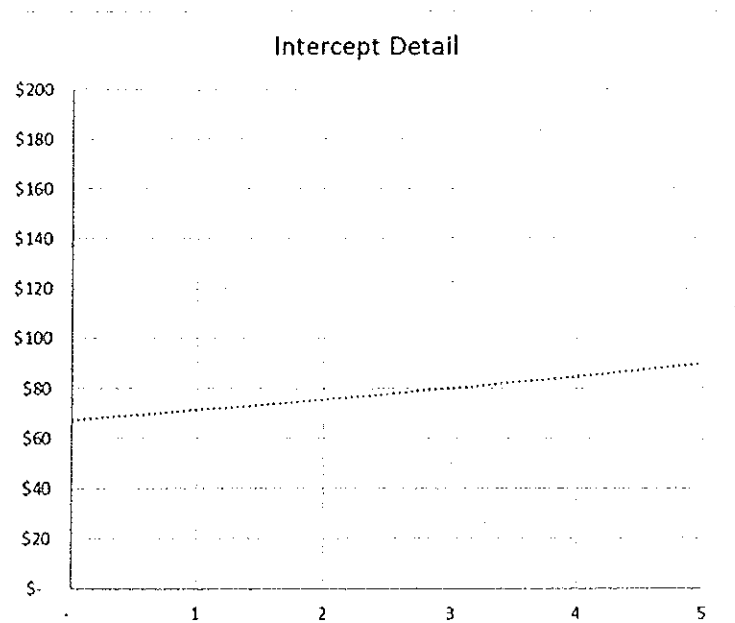
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3 In the interest of providing a conservative result, Staff estimates the visual Y intercept at a historic
 4 cost per unit of \$70, observed from the detail of the 0'' – 5' portion of the Pole Data 100+ Units
 5 plot and regression, provided below.

6

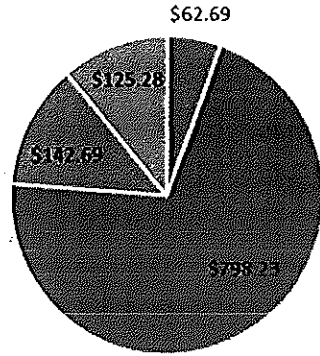


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8 Relying on a \$70 per pole estimate, the Customer -related portion of Account 364 is approximately
 9 \$62 million dollars, or approximately 7% of the portion of account 364 related to poles, towers,
 10 and similar structures. Staff classified the remainder of Account 364 relying on Ameren
 11 Missouri's presentation of the Vandas study in its workpapers.

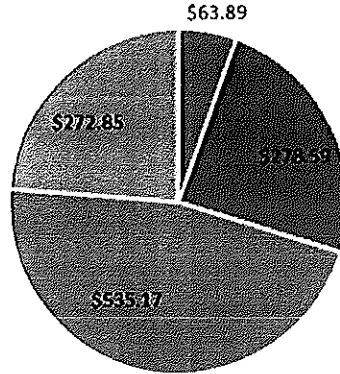
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Account 364 Plant Type
(\$ millions)



- Customer-Related Portion of Poles
- Non-Customer Related Portion of Poles
- Crossarms
- Other

Account 364 Plant Classification
(\$ millions)



- Customer
- High Voltage
- Primary
- Secondary

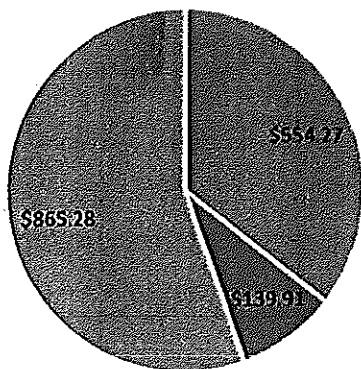
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3 **Account 365**

4 For Account 365, Overhead Wires and Devices, Staff used the average cost of conductor
5 to establish the customer-related classification, and classified the remainder of Account 365
6 relying on Ameren Missouri's presentation of the Vandas study in its workpapers.

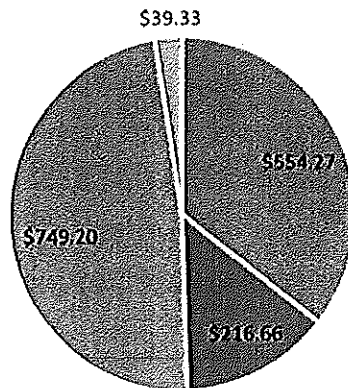
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Account 365 Plant Type
(\$ millions)



- Customer-Related Portion of Conductors
- Non-Customer Related Portion of Conductors
- Devices & Other

Account 365 Plant Classification
(\$ millions)

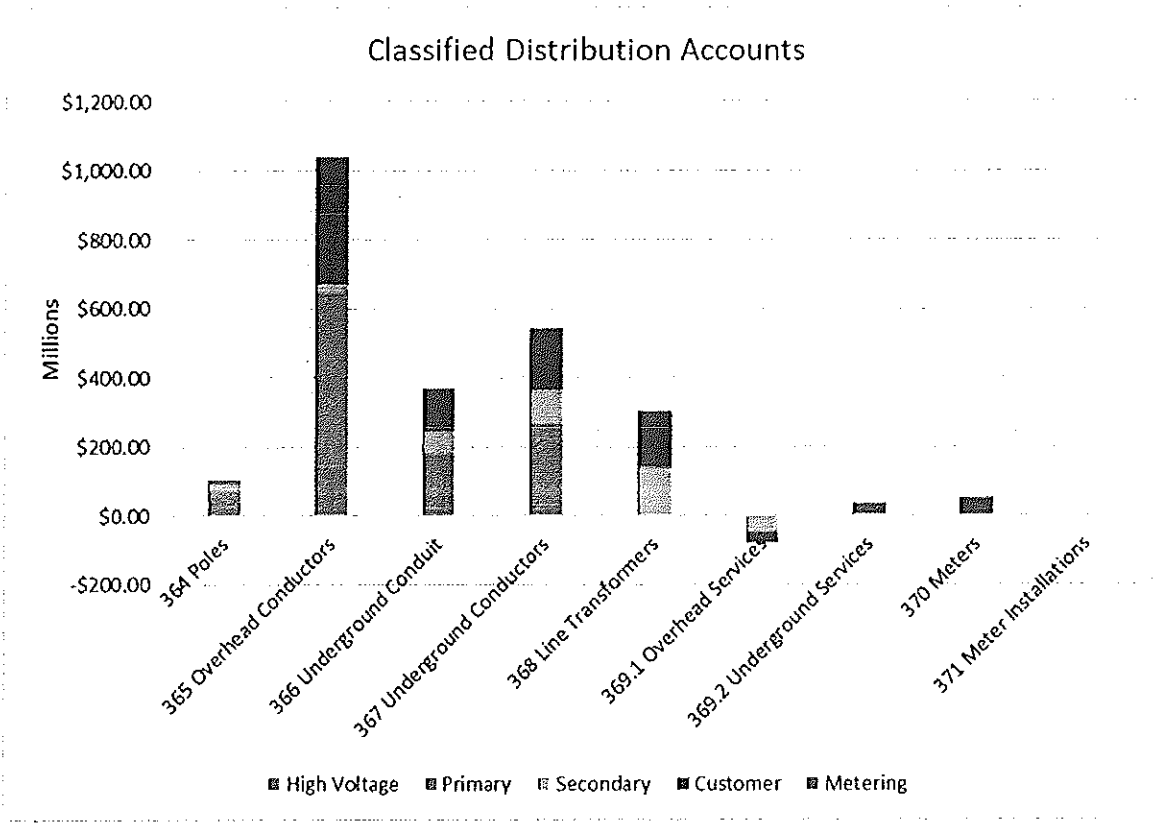


- Customer
- High Voltage
- Primary
- Secondary

8

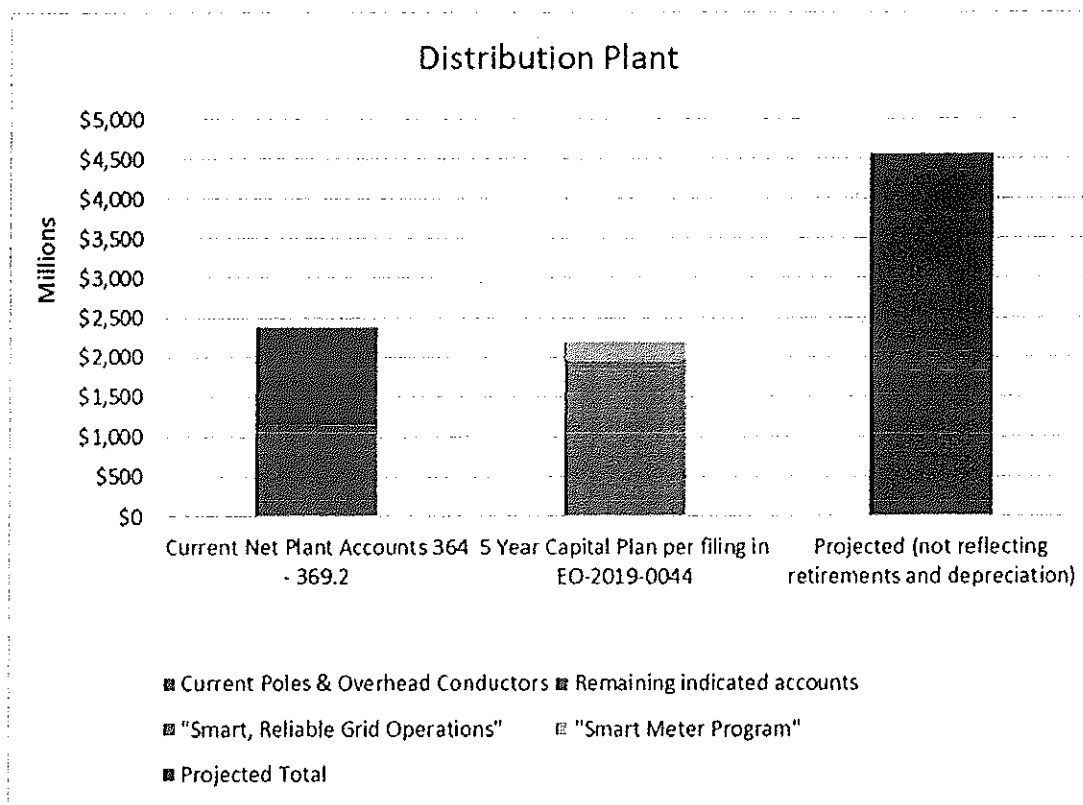
Other Distribution Accounts

Staff relied on Ameren Missouri’s classification of Accounts 360 – 362. For Accounts 367 through the 371 accounts, for purposes of its studies in this case, Staff utilized Ameren Missouri’s classifications. Those classifications, as well as those discussed above, are depicted in the chart below:



In general, Ameren Missouri was unable to provide information concerning which types of meters, transformers, and other items of distribution equipment were used for serving customers by rate schedule or by service voltage. That information is critical to development of distribution classifications. As depicted in the graph below, based on information provided publicly in File No. EO-2019-0044, the distribution plant account balances will roughly double over the next five years. This means that the information to better classify these accounts will become more critical, and it means that the opportunity exists for Ameren Missouri to record the data associated with these planned expenditures to facilitate future classification studies.

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2. Allocation of Distribution Costs and Customer Service and Related Costs

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Voltage level is considered when allocating distribution costs to customer classes. A customer’s use or non-use of specific utility-owned equipment is directly related to the voltage level needs of the customer. All residential, SGS, LGS, and lighting customers are served at secondary voltage; SPS and LPS customers are served at primary voltages. Load diversity exists when the peak demands of customers do not occur at the same time. The spread of individual customer peaks over time within a customer class reflects the diversity of the class load. Therefore, when allocating demand-related distribution costs that are shared by groups of customers, it is important to choose a measure of demand that corresponds to the proper level of diversity. A summary of Staff’s allocator use and derivation is provided below.

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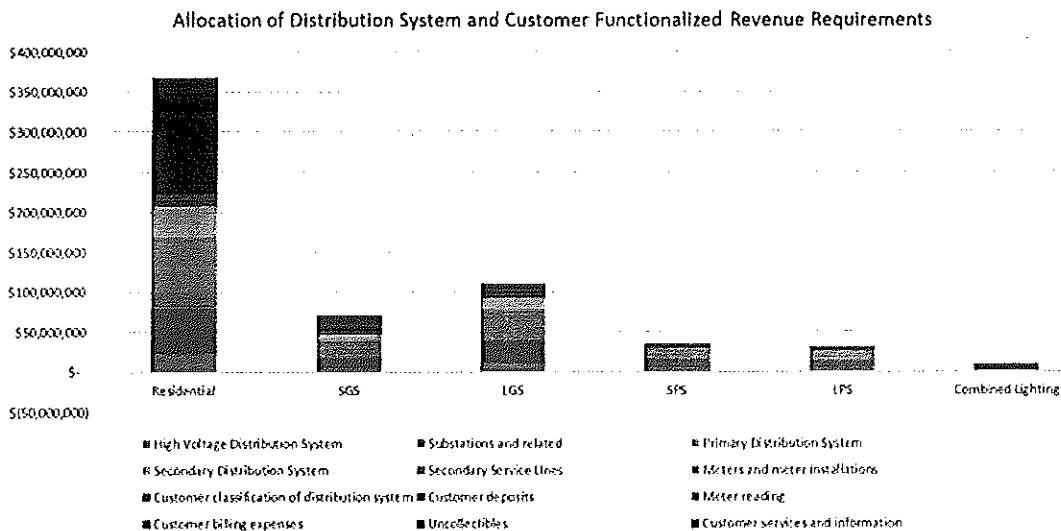
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In several instances Staff relied on Ameren Missouri’s allocators for purposes of the Staff study in this case. As referenced above, Staff recommends Ameren Missouri retain and organize information related to the service schedule and voltage level of infrastructure to enable more robust

1 study of these accounts as the net plant balances grow over the planned horizon. The allocations
 2 of these costs to the classes are depicted in the graph below.¹⁰

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5 **B. Production and Transmission Related Costs - Assigned Capacity Study**

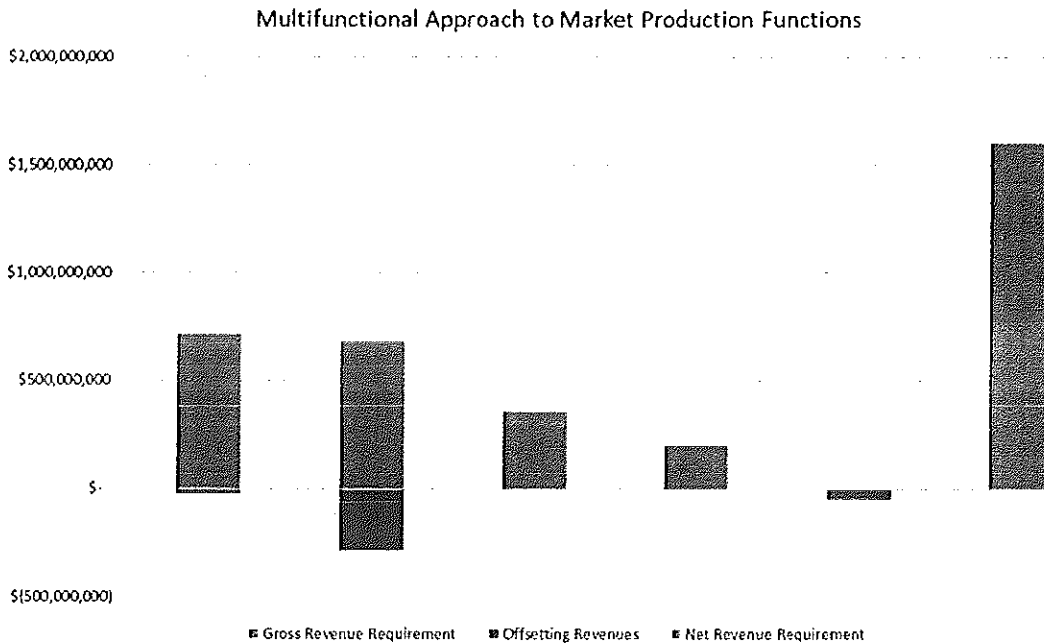
6 A Service Agreement between Ameren Missouri and MISO was approved by the FERC
 7 on March 25, 2004. The MISO IM became operational in 2005. MISO operates markets to ensure
 8 that its participants establish resource adequacy. Ameren Missouri’s currently owned and operated
 9 capacity exceeds its resource adequacy requirements, and Ameren Missouri has committed to
 10 develop additional generating resources, which Ameren Missouri represents will be largely related
 11 to its intended means of compliance with the Missouri Renewable Energy Standard.

12 For decades class cost of service studies have relied on the relative capacity demands of
 13 the various classes as the most reasonable significant or sole determinant for allocating the
 14 embedded cost revenue requirement of the studied utility. This is no longer the most reasonable
 15 determinant. Staff recommends collapsing the historic functions of Production Capacity,
 16 Production Energy, Production O&M, and Transmission¹¹ into a single Production and
 17 Transmission Function.¹²

¹⁰ The allocation of several Customer Service related accounts is simplified in this depiction. These accounts do not reflect the allocation or assignment of taxes or the general and miscellaneous accounts that are discussed as assigned to the indicated functionalized classes.

¹¹ Naming conventions and the precise number of functions used have varied over time.

¹² These accounts do not reflect the allocation or assignment of taxes or the general and miscellaneous accounts that are discussed as assigned to the indicated functionalized classes.



For its recommended Assigned Capacity Study, Version B, Staff determined the value of the capacity to be assigned as the system usage of approximately 7.1 GW, multiplied by a reserve margin of 15.3%, multiplied by the current MISO Cost of New Entry of \$756/kW. Staff assigned the resulting net costs and related depreciation expense to the classes based on each classes' maximum usage in the hour of a system coincident peak, or the hour before or after.¹³

Market Production and Transmission Assignments	Amount to be Assigned	Residential	SGS	LGS	SPS	LPS	Combined Lighting
Assigned Capacity Rate Base	\$ 3,295,122,079	\$ 1,657,621,043	\$ 378,811,341	\$ 710,860,826	\$ 282,775,806	\$ 244,952,527	\$ 20,100,537
Assigned Capacity Expenses	\$ 195,892,657	\$ 98,544,389	\$ 22,520,064	\$ 42,260,169	\$ 16,810,820	\$ 14,562,253	\$ 1,194,963

Staff assigned the approximate \$904 million of the cost of energy purchased to serve load to the classes using each class's load-weighted¹⁴ contribution to the total.

Market Production and Transmission Assignments	Amount to be Assigned	Residential	SGS	LGS	SPS	LPS	Combined Lighting
Assigned Energy Expenses	\$ 904,991,372	\$ 379,915,719	\$ 95,545,427	\$ 223,341,008	\$ 102,113,646	\$ 99,568,363	\$ 4,507,209

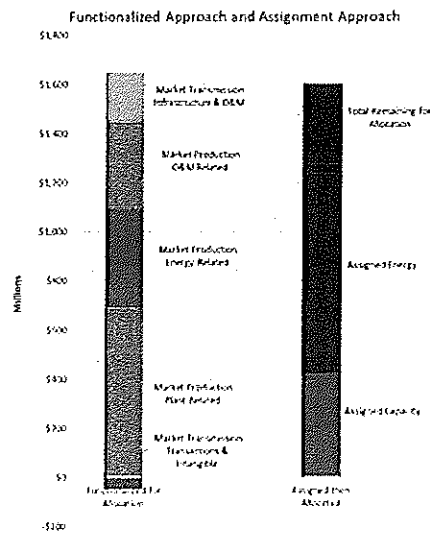
¹³ This expansion of use of a single hour is intended to provide some recognition for the load diversity that occurs across the MISO system. The Ameren Missouri CP will not necessarily coincide with the CP of the MISO system – which spans significant distances east to west, north to south, and across time zones. This method also results in some allocation of production costs to the combined lighting class, due to the timing of winter month CPs.

¹⁴ Staff was unable to incorporate the impact of all normalization adjustments, such as the impact of net-metered solar and MEEIA rebasing into the loads used for this purpose. The impact of these adjustments on the assignment is expected to be minimal at this time.

The interaction of these ratebase and expense assignments results in a net market and transmission revenue requirement of approximately \$194 million remaining for allocation.

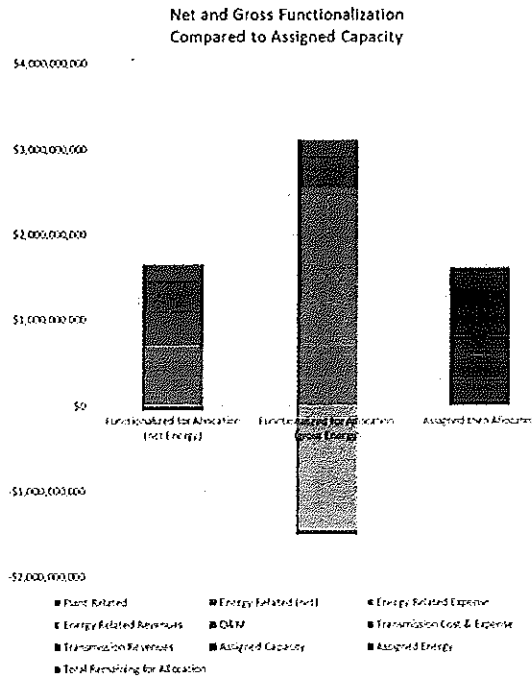
Market Production and Transmission Assignments	Totals	Amount to be Assigned
Market Production and Transmission Rate Base	\$ 6,668,943,168	
Assigned Capacity Rate Base		\$ 3,295,122,079
Net Market Production and Transmission Rate Base	\$ 3,373,821,089	
Market Production and Transmission Expenses	\$ 1,141,258,459	
Assigned Capacity Expenses		\$ 195,892,657
Assigned Energy Expenses		\$ 904,991,372
Net Market Production and Transmission Expenses	\$ 40,374,430	
Gross Market Production and Transmission Revenue Requirement	1,602,816,016	
Assigned Market Production and Transmission Revenue Requirement	\$ 1,328,939,428	
Net Market and Transmission Revenue Requirement to be allocated	\$ 273,876,588	

The graph below compares the historic functionalized approach with Staff's assignment approach, which is designed to more reasonably represent a utility's participation in integrated energy markets.¹⁵



¹⁵ As discussed throughout this section and depicted in these graphs, taxes and general and miscellaneous accounts are excluded from amounts provided, and net energy-related amounts are used unless otherwise noted.

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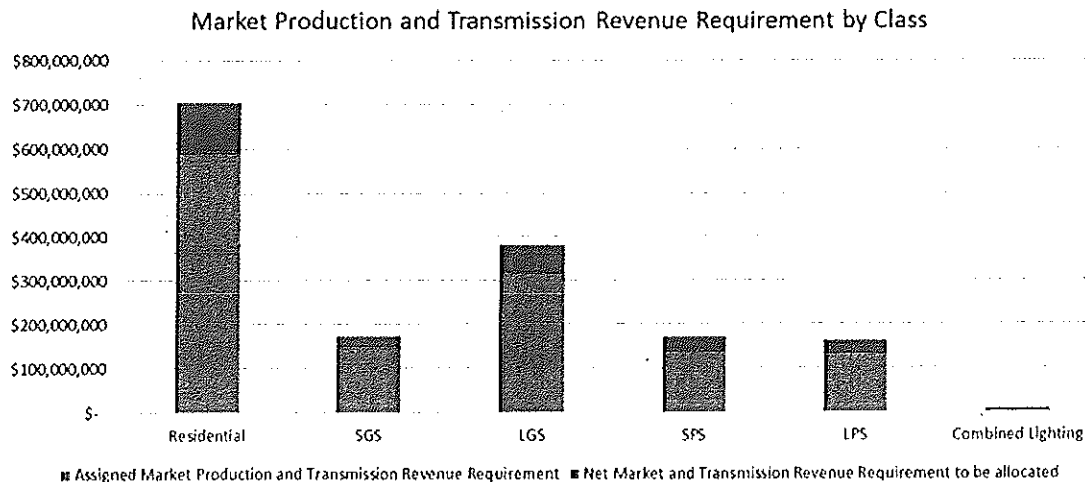
3 For its primary study, Staff allocated the unassignable remainder based on class energy
 4 requirements. The results of this series of assignments and allocations are provided below:

5

Market Production and Transmission Assignments	Totals	Residential	SGS	LGS	SPS	LPS	Combined Lighting
Net Market Production and Transmission Expenses	\$ 40,374,430						
Gross Market Production and Transmission Revenue Requirement	1,602,816,016						
Assigned Market Production and Transmission Revenue Requirement	\$ 1,328,939,428	\$ 593,184,060	\$ 144,283,023	\$ 314,799,855	\$ 138,495,380	\$ 131,083,780	\$ 7,093,330
Net Market and Transmission Revenue Requirement to be allocated	\$ 273,876,588	\$ 112,972,744	\$ 28,536,890	\$ 67,943,116	\$ 31,661,988	\$ 31,176,211	\$ 1,585,639
Market Production and Transmission Revenue Requirement	\$ 706,156,804	\$ 172,819,914	\$ 382,742,970	\$ 170,157,368	\$ 162,259,991	\$ 8,678,968	

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1 **C. Remaining Functions for Allocation**

2 Staff assigned and allocated costs not only to the studied rate classes, but also to
3 functionalized classes. This facilitates the comparison of the impact of the selected allocators on
4 the study results. Specifically, Staff assigned and allocated costs to the rate classes Residential,
5 Small General Service, Large General Service, Small Primary Service, and a combined Lighting
6 Class, and to the functional classes “Market Production & Transmission,” “Taxes,” “SB 564,”
7 and “General Unassignable for Allocation.” The revenue requirements of the functionalized
8 classes were then reallocated to the rate classes, using the allocators indicated for each “version”
9 of study.¹⁶

10 Staff compared a variety of allocation methods such as sales at generation, revenue related,
11 and composite taxes concerning these functionalized class revenue requirements.

12 The typical allocation of the accounts functionalized into these categories is highly
13 subjective. For example, the revenue requirement of the employee cafeteria at the Ameren General
14 Office Building is not reasonably related to any determinate typically used in a CCOS. On the
15 other hand, the property taxes associated with utility plant in a given county are readily
16 determinable, but Ameren Missouri’s record keeping does not facilitate matching that property tax
17 level to the portion of its mass-asset recorded plant and reserve with which it is associated, nor
18 with the class to which that plant and reserve was allocated.¹⁷ Therefore, for simplicity and to
19 minimize impact on similarly situated customers in different classes, at this time for its
20 recommended study, Staff has allocated the functionalized classes to the rate classes on the basis
21 of class sale at generation. Alternative allocators are discussed in the CCOS Results section.

22 **D. CCOS Results and Interclass Cost Responsibility Recommendations**

23 **1. Study Results**

24 Staff performed multiple versions of its CCOS Study by reallocating the functionalized
25 classes described above. The allocators used, by version, are described below:

¹⁶ As discussed above, the Market Production & Transmission functional class was reassigned separately as rate base and expense to the extent possible.

¹⁷ This is not intended to imply that this exercise would be worth the time and effort associated with such a calculation if the data were available to do so.

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<u>Assigned Capacity - Version B</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>
Assigned Capacity	Max CP w Adjacent Usage	Max CP w Adjacent Usage
Assigned Energy	Market weighted energy	Market weighted energy
Net Market Production and Transmission	Sales at Generation	Sales at Generation
Taxes	Sales at Generation	Sales at Generation
SB 564	Sales at Generation	Sales at Generation
General Unassignable for Allocation	Sales at Generation	Sales at Generation

<u>Assigned Capacity - Version A</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>
Assigned Capacity	Max CP w Adjacent Usage	Max CP w Adjacent Usage
Assigned Energy	Market weighted energy	Market weighted energy
Net Market Production and Transmission	Sales at Generation	Sales at Generation
Taxes	Gross Plant	Composite Tax
SB 564	Sales at Meter	Sales at Meter
General Unassignable for Allocation	Sales at Generation	Sales at Generation

<u>A&E 4NCP - Version A</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>
Capacity	A&E 4 NCP	A&E 4 NCP
Energy	Sales at Generation	Sales at Generation
Taxes	Gross Plant	Composite Tax
SB 564	Gross Plant	Gross Plant
General Unassignable for Allocation	Gross Plant	Gross Plant

<u>A&E 4NCP - Version A</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>
Capacity	A&E 4 NCP	A&E 4 NCP
Energy	Sales at Generation	Sales at Generation
Taxes	Sales at Generation	Sales at Generation
SB 564	Sales at Generation	Sales at Generation
General Unassignable for Allocation	Sales at Generation	Sales at Generation

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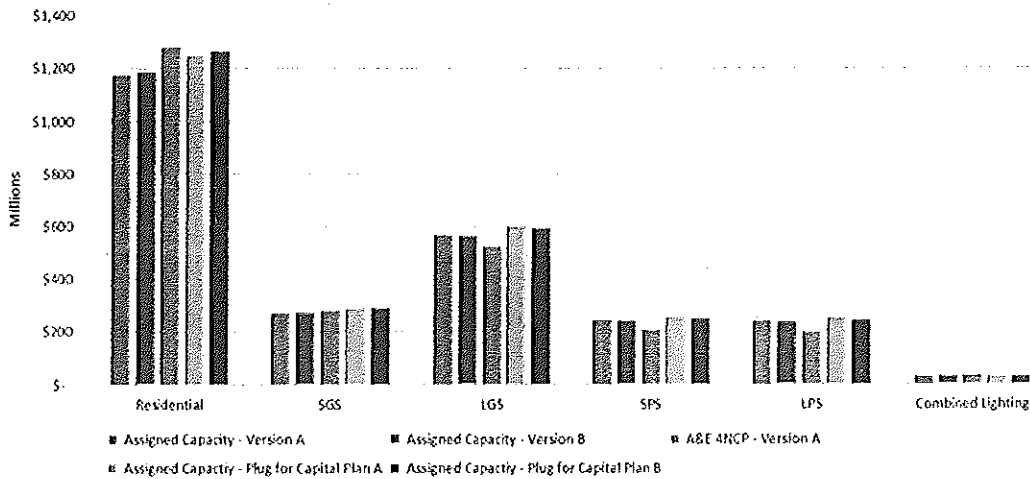
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<u>Assigned Capacity - Plug for Capital Plan A</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>	<u>Projected Distribution & Meters</u>
Assigned Capacity	Max CP w Adjacent Usage	Max CP w Adjacent Usage	
Assigned Energy	Market weighted energy	Market weighted energy	
Net Market Production and Transmission	Sales at Generation	Sales at Generation	
Taxes	Sales at Generation	Sales at Generation	
SB 564	Sales at Generation	Sales at Generation	Sales at Generation
General Unassignable for Allocation	Sales at Generation	Sales at Generation	
<u>Assigned Capacity - Plug for Capital Plan B</u>	<u>Rate Base Allocator</u>	<u>Expense Allocator</u>	
Assigned Capacity	Max CP w Adjacent Usage	Max CP w Adjacent Usage	
Assigned Energy	Market weighted energy	Market weighted energy	
Net Market Production and Transmission	Sales at Generation	Sales at Generation	
Taxes	Sales at Generation	Sales at Generation	
SB 564	Sales at Generation	Sales at Generation	Meters & Distribution Primary
General Unassignable for Allocation	Sales at Generation	Sales at Generation	

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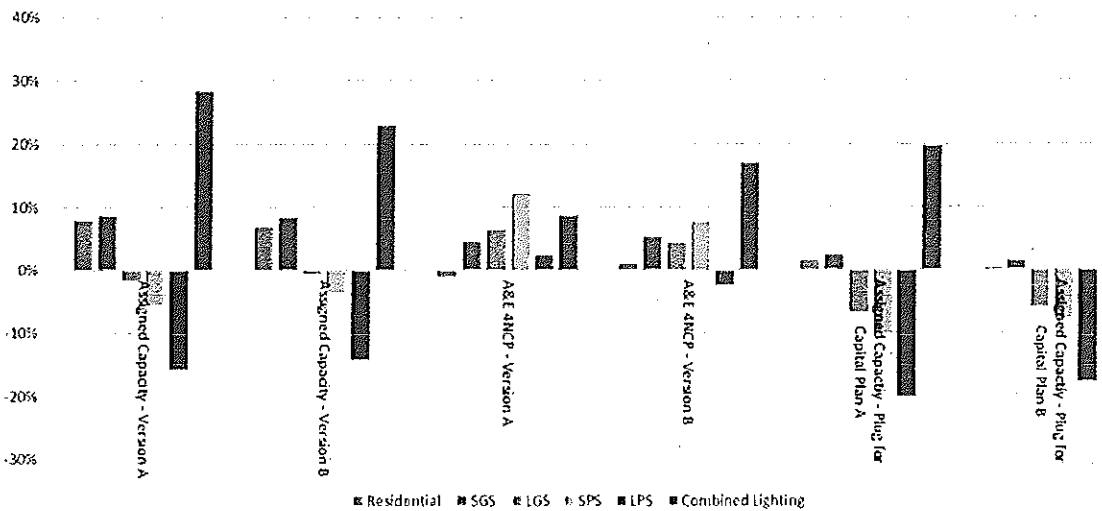
\$ Cost of Service by Class - Various Studies



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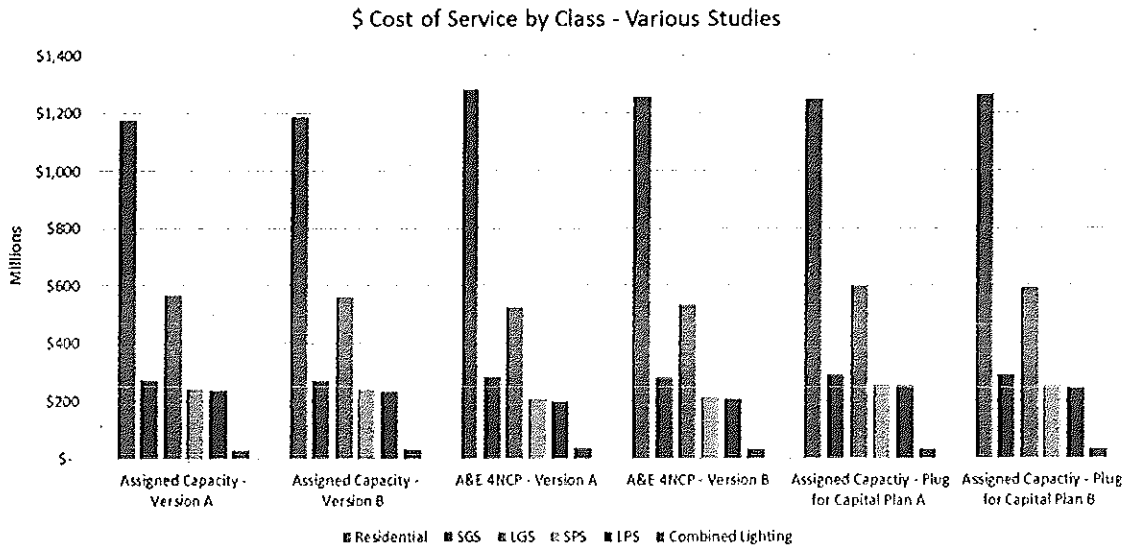
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% Over / Under Contribution to RoR - Various Studies



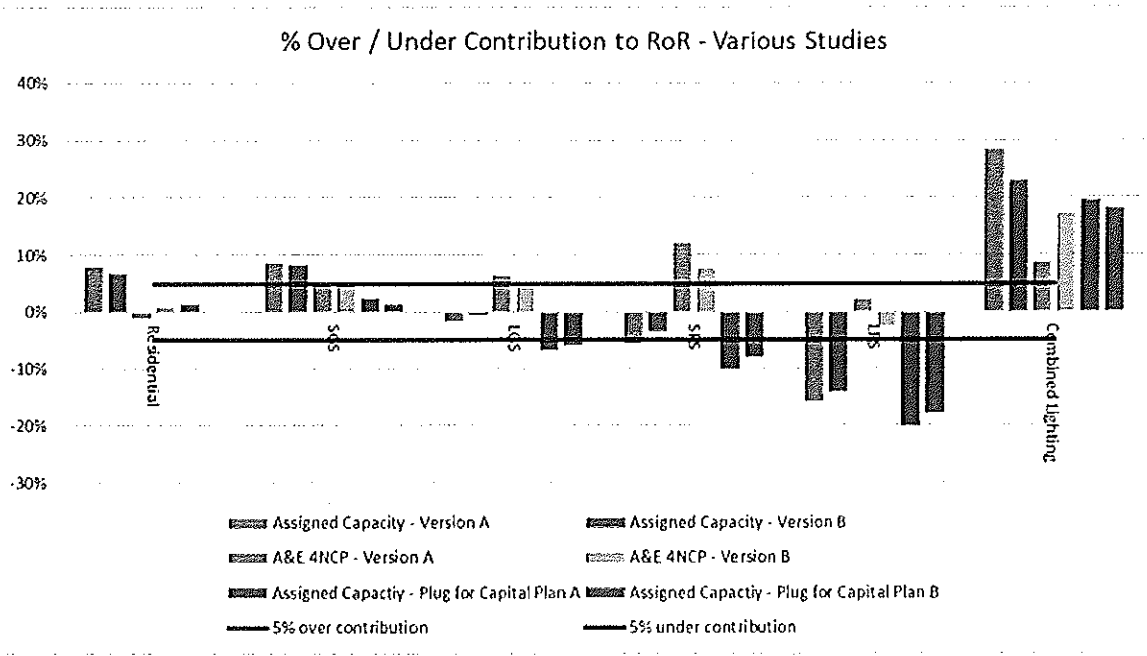
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2. Interaction of Tariffed Rates and Temporary Tax Rider

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Pursuant to tariff sheets promulgated in File No. ER-2018-0362, each Ameren Missouri customer currently experiences a bill discount per kWh from existing rates of the amounts indicated below:

	Temporary Tax Rider		Temporary Tax Rider
	<u>\$/kWh</u>		<u>% of Class Revenue</u>
Residential	\$	0.00621	6.05%
SGS	\$	0.00581	6.06%
LGS	\$	0.00462	6.06%
SPS	\$	0.00404	6.11%
LPS	\$	0.00348	6.09%

For purposes of comparison, were the Commission to order an equal 2.5% decrease to all classes, and apply the decrease to the energy charges within a class evenly, the resulting decreases per kWh would be quantified approximately as provided below:

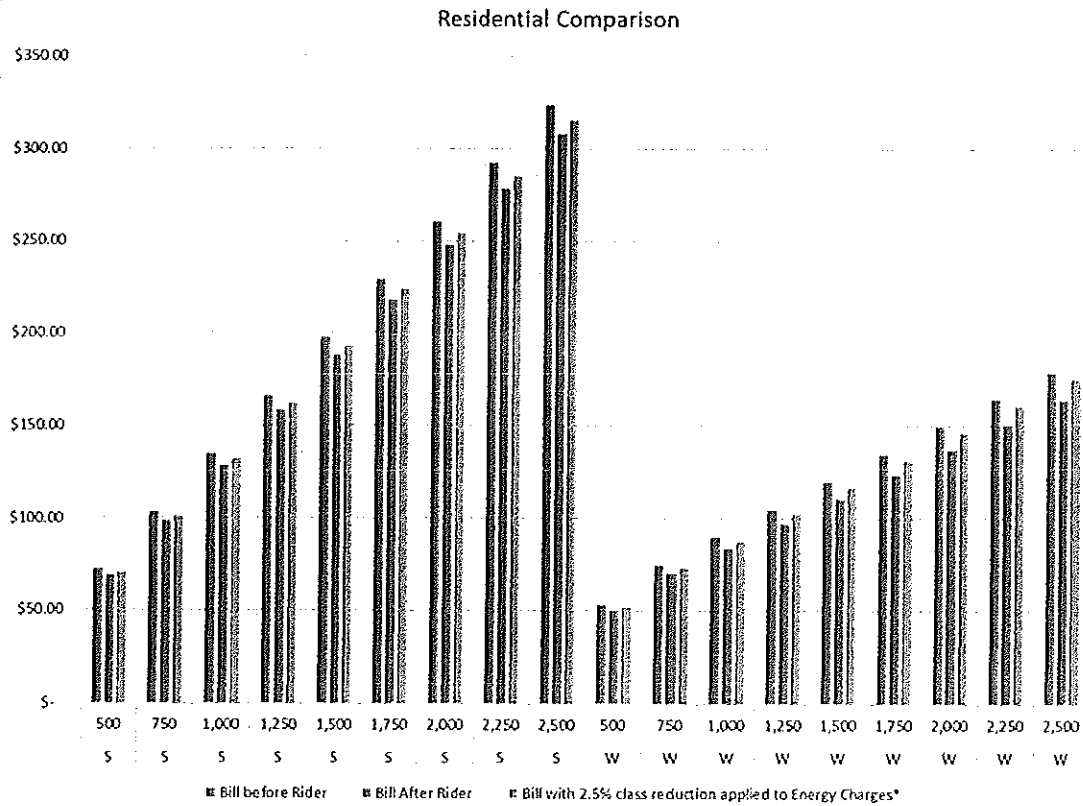
	Temporary Tax Rider		2.5% equal decrease to all rate classes, applied to energy charges only*	
	<u>\$/kWh</u>		<u>\$/kWh</u>	
Residential	\$	0.00621	\$	0.00257
SGS	\$	0.00581	\$	0.00240
LGS	\$	0.00462	\$	0.00191
SPS	\$	0.00404	\$	0.00165
LPS	\$	0.00348	\$	0.00143

*Staff recommends Residential reduction be applied to first blocks of energy charge only. Staff recommends non-residential reductions be applied to demand charges only.

In other words, prior to any rate design changes that will result in differences in revenue responsibility among customers within a class, the rate decrease recommended by Staff will reduce class revenues by approximately 2.5% per class; the existing temporary tax rider reduces class revenues by an average of approximately 6.1% per class. Customers will therefore experience this reduction in Ameren Missouri's revenue requirement, net of the elimination of the temporary tax rider, as an increase of approximately 3.6%, prior to changes in rate design that will impact customer bills. Example Residential Customer bill calculations are provided below, at various levels of usage, by season:¹⁸

¹⁸ Staff recommends Residential reduction be applied to first blocks of energy charge only. Staff recommends non-residential reductions be applied to demand charges only. Customer charge is included, but FAC, MEEIA and RESRAM are not reflected in these bill calculations.

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3. Recommendations

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Staff recommends modernizing the allocation of the revenue requirement associated with Ameren Missouri’s participation in the MISO IM by moving to the capacity assignment method discussed in the preceding sections. One drawback of any method of allocation that relies on coincident peak is the potential freeridership of lighting classes, for this reason Staff conducted the 4NCP A&E studies referenced above.¹⁹ Staff will continue to investigate and refine this approach with the intent to apply it to all Missouri-regulated utilities as warranted by the facts and circumstances surrounding each utility’s level of market participation and capacity position.

Overall, Staff concludes that given Ameren Missouri’s participation in the MISO Integrated Market, its current tax position, the legislative causation of the spending occurring

¹⁹ A&E studies are less reliable than Staff’s BIP, however, much less data and time is required to conduct an A&E study than Staff’s BIP; therefore Staff used the 4NCP A&E allocator for this comparison study rather than a detailed BIP. Staff applied the A&E in a manner most beneficial to high load factor classes for purposes of this comparison study as it relates to revenues from energy sales.

1 pursuant to SB 564, Ameren Missouri's assertions that its capacity build-out is related to its
2 intended means of compliance with the Missouri Renewable Energy Standard, and the lack of a
3 definitively reasonable allocation method for the elements of the General Unassignable
4 functionalization, Staff recommends reliance on its "Assigned Capacity – Version B." However,
5 as a whole and incorporating the results of the studies that reflect a plug for Ameren Missouri's
6 anticipated 5 Year Capital Plan, the CCOS studies indicate that the most reasonable course of
7 action is to moderate the interclass shifts indicated by the Assigned Capacity – Version B study,
8 and instead implement the reduction in revenue requirement on an equal percentage basis, relative
9 to current tariff rates, and irrespective of the temporary tax rider.

10 *Staff Experts/Witnesses: Sarah L.K. Lange, Robin Kliethermes*

11 **III. Rate Design**

12 **A. Residential Time of Use**

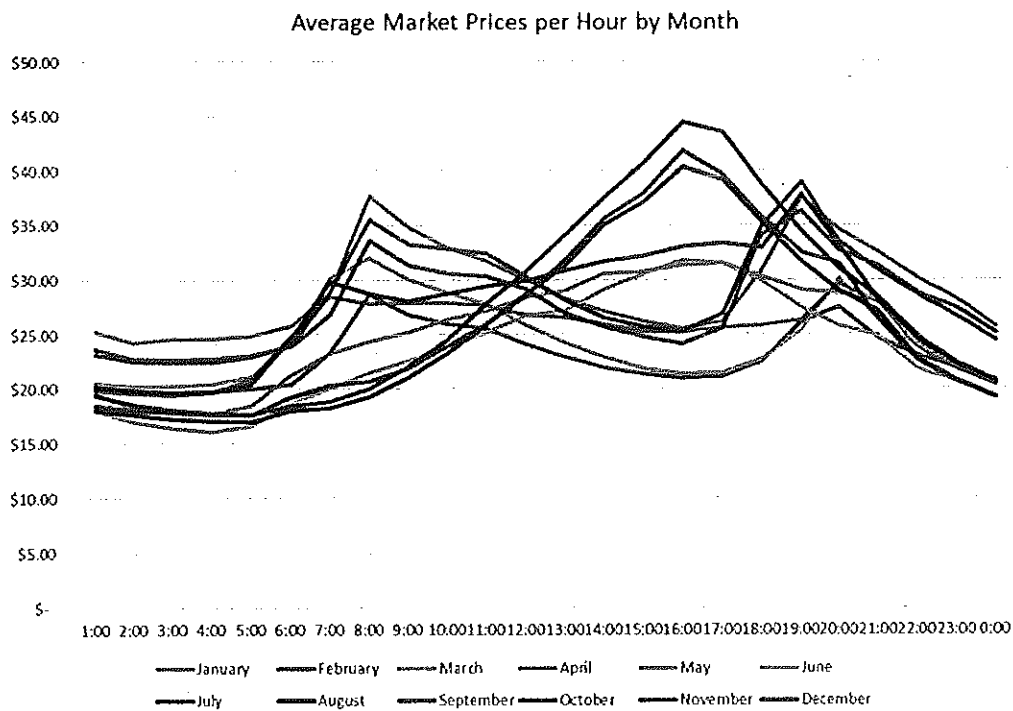
13 Considerations in defining reasonable bounds for a ToU rate design include: (1) the cost
14 of energy across time; (2) the cost of system transmission and distribution capacity, and
15 identification of the times driving those costs; (3) the cost of production or RTO capacity, and
16 identification of the times driving those costs; (4) understandability of rates to all impacted
17 customers; and (5) for purposes of this initial case, mitigation of rate impacts to all impacted
18 customers in recognition of the intent of these rates as customer education. In the interest of
19 understandability, impact mitigation, and in recognition of the unfamiliarity of customers with
20 ToU rates, Staff selected a relatively long on-peak period as the basis for its recommended ToU
21 rates. This enables consistency of the on-peak definition across the year and across classes, and
22 lays the groundwork for future implementation of seasonally-appropriate super-peak rates and
23 super-off-peak discounts.

24 The ToU rates designed and studied below are based on Ameren Missouri's residential
25 revenue recovery embedded in current rates, including the current residential customer charges.
26 Any changes to class revenue responsibility and customer charges would necessarily be
27 incorporated in the rates resulting from this case. Decreases to class revenue responsibility and
28 increases to customer charges would tend to decrease the rate impact of a switch to ToU rates.

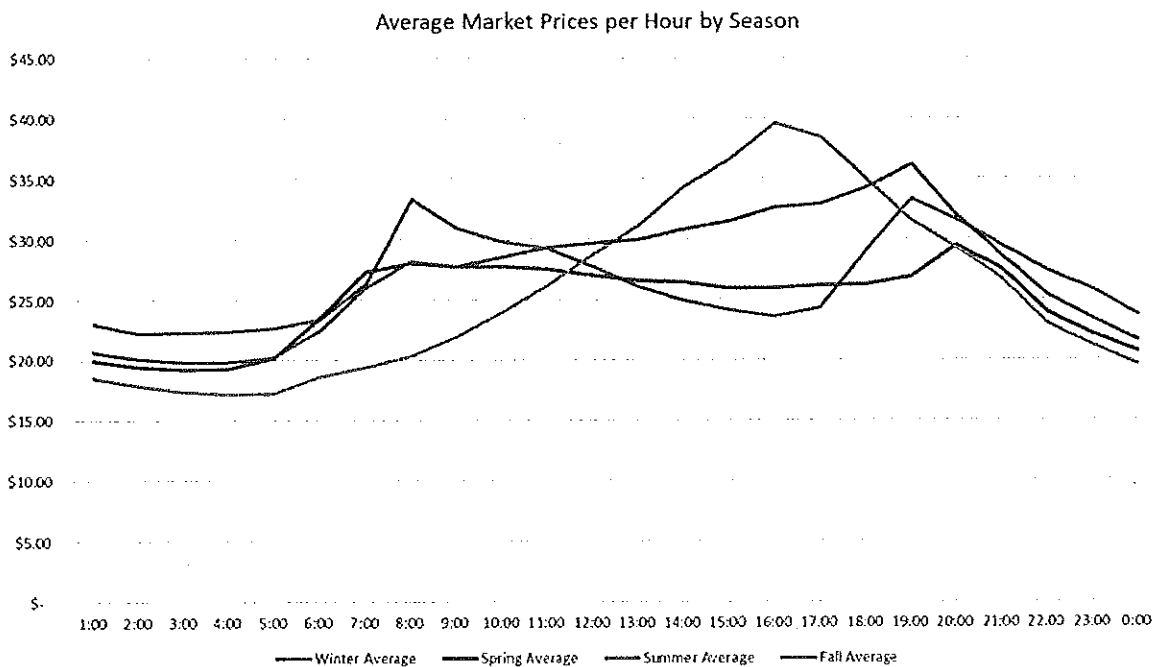
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1. Energy Cost Considerations

The average price of energy to serve Ameren Missouri's load varies by time of day and by time of year. This variability is summarized in the graphs below, by month and by season:



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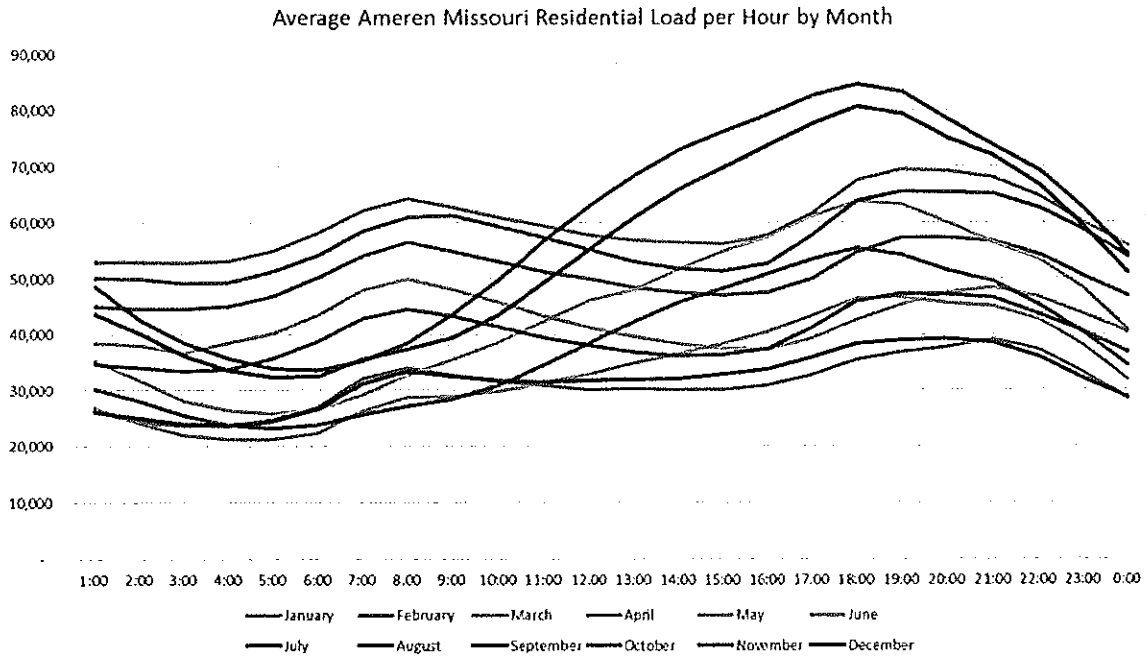
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1 Energy costs demonstrate that the highest valued energy is the energy used during summer late
2 afternoon and early evening hours.²⁰ This also demonstrates that fall and winter late evening hour
3 energy is high-valued, and that a peak is experienced during winter mornings.

4 **2. Distribution System Considerations**

5 Staff also reviewed system utilization across hours of the day, at both the residential class
6 and system levels to determine hours of the day associated with fuller utilization of the distribution
7 system and local elements of the transmission system.

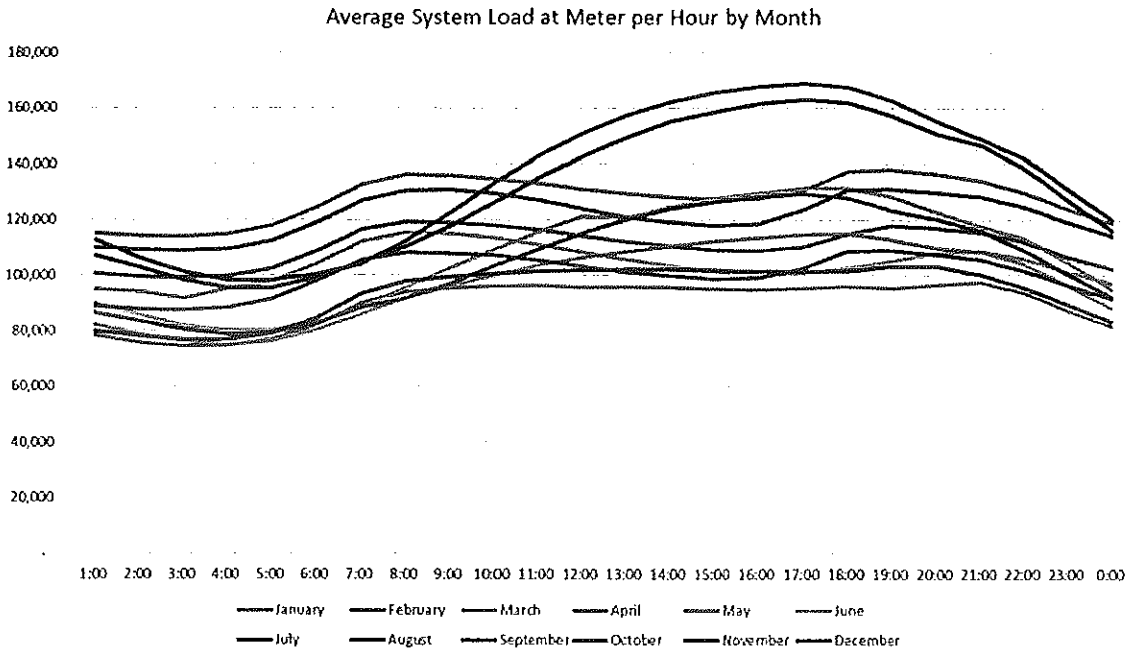
8 The graphs below demonstrate the average residential load and total system load by hour
9 and month, and by hour and season:



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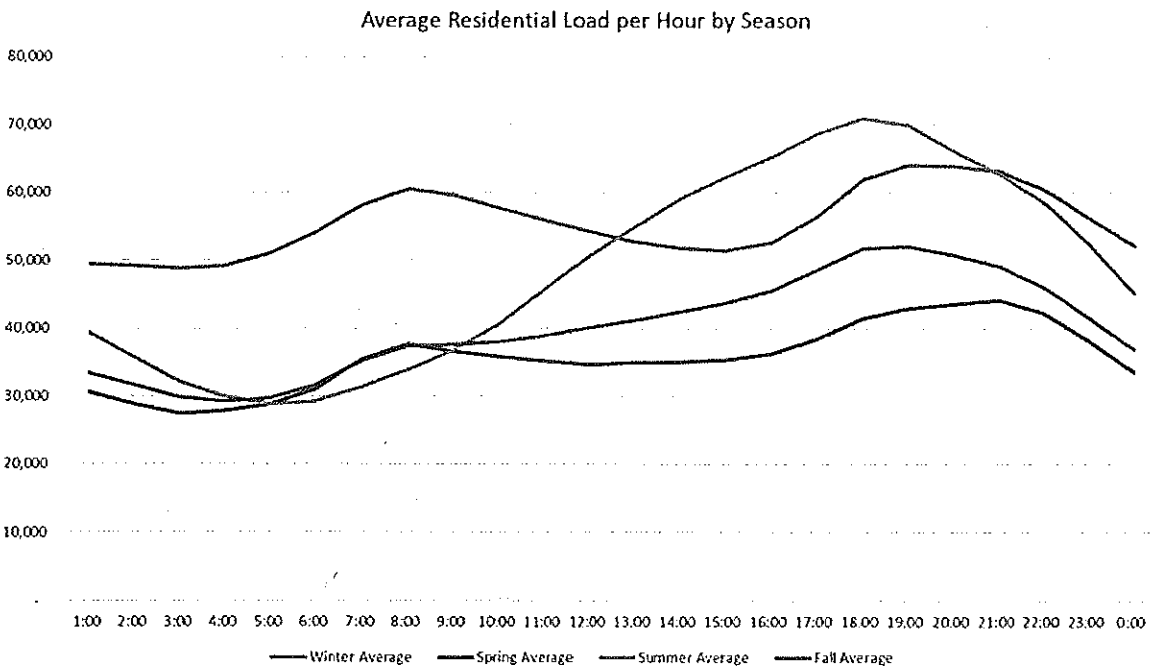
²⁰ This is also the time associated with MISO peaks used for resource adequacy purposes.

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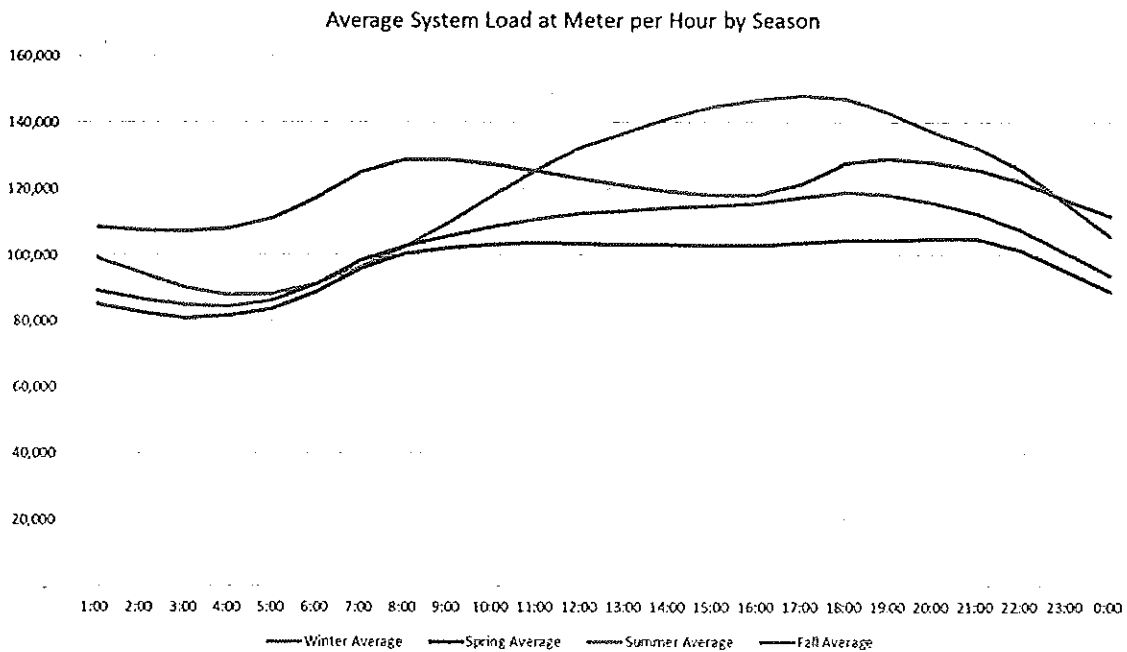
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The graphed loads indicate that the time of the most usage is summer late afternoon and evening, with nearly dual winter peaks in morning and late evening. While a small peak occurs in spring mornings and fall evenings, usage is less variable in spring and fall months than summer and winter months. When total system load is compared to residential load, the daytime hours are significantly smoothed.

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3. ToU Rate Design

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In selecting on peak and off peak periods for a time of use rate design, price signals should be sent that reflect that system costs are driven by times of high system utilization. Price signals should not be sent to increase use of the system during times of high system utilization. Selection of reasonable on-peak and off-peak time periods is complicated by two factors, (1) utilization patterns vary by season, and (2) the residential class itself has a different utilization pattern than the total system. In the interest of having one pricing period in place throughout the year, and in the interest of not incenting the residential class to consume additional energy during times when residential class utilization is not high, but total system utilization is high, it is most reasonable for this initial implementation of ToU rates to utilize a longer on-peak period that (1) encompasses the times of high system utilization across various seasons and (2) encompasses high levels of system utilization by both the residential class and the total system.

iv. Implement a 12 month demand charge for recovery associated with local distribution facilities.

c. Utility-wide

- i. Study distribution locational pricing determinants for locational rate designs; study location-dependent compensation schemes.
- ii. Revenue Decoupling.
- iii. Based on outcomes of studies of beneficial DER location, locate DER or incent the location of DER using reasonably designed compensation designs.

Anticipated goals (approximately 2030 time frame, will vary by utility and rate case timing):

a. Residential:

- i. Continued and increased customer education regarding cost composition and energy cost differences over time of day and season.
- ii. Implement on-peak demand charge to nearly fully recover generation capacity costs on peak, not already included in on-peak and super on-peak elements.
- iii. Consider and implement, if appropriate, distribution locational rates or rate elements.

c. Utility-wide

- i. Study distribution locational pricing determinants.
- ii. Based on outcomes of studies of beneficial DER location, locate DER or incent the location of DER using reasonably designed compensation designs.

A low-impact, low-differential, long time period time-of-use rate design is an excellent customer education opportunity. As provided below, Staff's rate design recommendation is intended to produce little to no bill variation to customers. However, this rate design will impart to customers the concept that, in general, energy used during the daytime is more cost-intensive, and energy used during the night time is less cost-intensive.

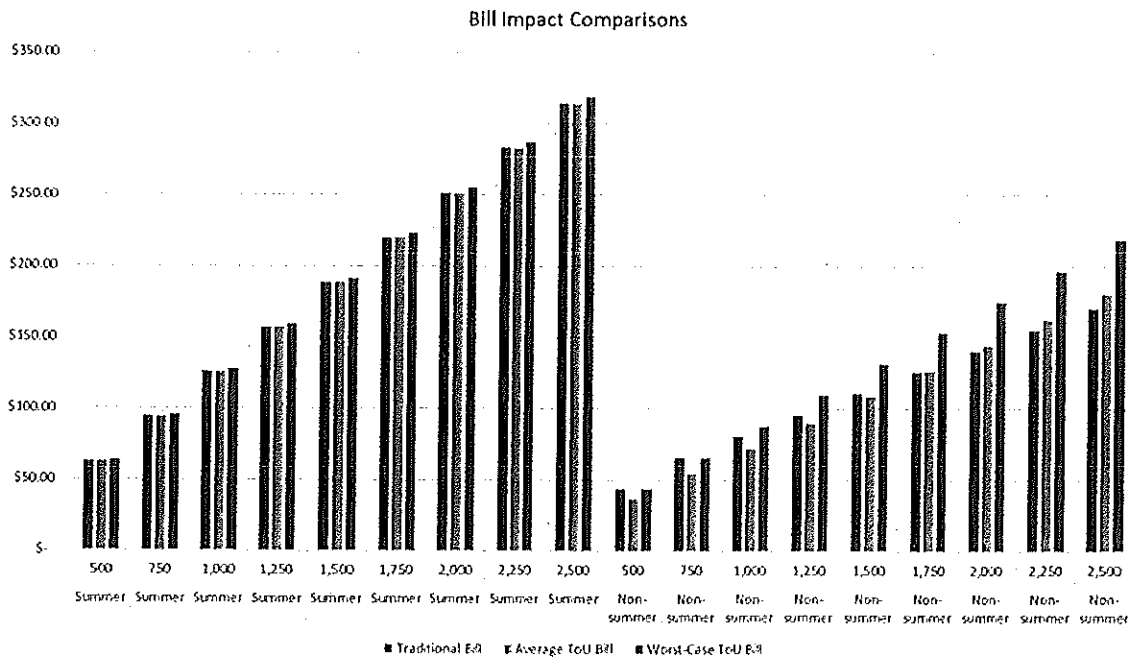
ii. ToU Rates and Bill Impacts

Staff's proposed ToU rate design, on a revenue neutral basis, designed based on current customer charges is provided below²¹:

	Off Peak	On Peak
Summer	\$ 0.1245	\$ 0.1277
Non-summer	\$ 0.0600	\$ 0.0876

²¹ These bill calculations do not include the customer charge, MEEIA, FAC, or RESRAM.

1 These rates will be subject to change based on the overall revenue to be collected
 2 from Ameren Missouri’s residential class, and subject to any change in the residential
 3 customer charge.²² The estimated impact of this design is depicted below across a range of
 4 monthly kWh consumptions:
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 7 The intent of this ToU design is to establish a “Time of Use Training Wheel” framework that is
 8 consistent across the year, but upon which more complex elements that will vary by season can
 9 be established. For example, in future cases, it is likely that Staff will recommend
 10 implementation of:

- 11 (1) an additional summer on-peak charge priced consistent with pricing signals
 12 associated with RTO capacity costs or production capacity costs, for
 13 example, an additional approximate \$0.02-5 / kWh during summer
 14 afternoon hours of approximately 2:00 pm – 6:00 pm; and
- 15 (2) an additional spring/fall (and possibly summer) super-off-peak charge
 16 associated with times of very low energy prices and capacity costs, for
 17 example, a discount of approximately \$0.02-5 / kWh during shoulder
 18 months during approximately the hours of 11:00 pm – 5:00 am.

²² Any increase in customer charge would tend to decrease these energy rates in a manner that is generally consistent with mitigating customer impact to above-average use customers.

1 Rate elements to encourage pre-cooling thermal storage during the summer mornings or
2 system-coincident demand charges to recover capacity costs associated with summer afternoons
3 are also possibilities that, while ideal from a pure cost-recovery perspective, cannot be expected
4 to be understandable to customers at this time.

5 **iii. ToU Implementation**

6 Because Ameren will not complete deployment of AMI meters for some time, and in the
7 interest of using these introductory ToU rates to educate customers about ToU with minimal
8 customer impact, Staff's recommended ToU design focused on minimizing customer impact, and
9 applying a gradual rollout of the rates. Specifically, Staff recommends that when a customer's
10 AMI meter is installed, the customer begins receiving a "shadow bill" indicating the usage in each
11 interval, and what the customer's energy charges would have been on the Staff-designed ToU
12 rate. Then, approximately 6 months to 1 year after the AMI installation, Staff recommends that
13 Ameren Missouri interact directly with that customer to educate the customer as to what that
14 customer's bill would have been during the prior period on the recommended default ToU rate
15 schedule, as well as any of the alternative Ameren ToU schedules that may be approved at that
16 time. Staff recommends that for new customers or new accounts, if an AMI is in place at that
17 premise, that new customers be placed on the default ToU rate schedule unless they specifically
18 request otherwise.

19 *Staff Expert/Witness: Sarah L.K. Lange*

20 **iv. ToU Pilot Costs and Tracker**

21 For its proposed TOU pilot program, Ameren Missouri anticipates incurring costs
22 for conducting focus groups, recruiting and retaining participants, developing educational
23 materials, developing tools to communicate usage information back to participants, conducting
24 participant surveys, and analyzing and reporting results of participant load impacts. Ameren
25 Missouri estimates that the costs incurred will be \$1 million per year. Ameren Missouri proposes
26 to include an annual amount of \$1 million in base rates each year for a two year period. In addition,
27 Ameren Missouri recommends use of a one-way tracker for TOU pilot program costs during this
28 two year period.²³

²³ Case No. ER-2019-0335 Steven M. Wills Direct Testimony, pages 61- 62.

Staff is opposed to inclusion of an estimated annual amount in base rates for the pilot program costs in this proceeding. Instead, Staff recommends that Ameren Missouri defer, beginning with the effective date of rates in this current rate proceeding, the TOU pilot program costs that include but are not limited to marketing, education, evaluations and administration costs, for potential recovery of prudently incurred costs in a subsequent general rate case through an amortization. Staff's recommendation is consistent with the terms of the Stipulation and Agreement²⁴ approved by the Commission on October 31, 2018 for Kansas City Power & Light Company and KCPL Greater Missouri Operations Company in their last general rate cases, Case Nos. ER-2018-0145 and ER-2018-0146.²⁵

Staff Expert/Witness: Karen Lyons

B. Residential General Service

Staff recommends that any decreases ordered in this case for the residential general service class be applied to the first energy blocks for both summer and winter. This will result in a slight incline design for the summer, and a reduction of the decline design for the winter. The approximate rates under this design are provided below:

	<u>Current</u>	<u>Staff Recommended</u>
Summer first 750	\$ 0.12580	\$ 0.11992
Summer over 750	\$ 0.12580	\$ 0.12580
Winter first 750	\$ 0.08760	\$ 0.08387
Winter over 750	\$ 0.06000	\$ 0.06000

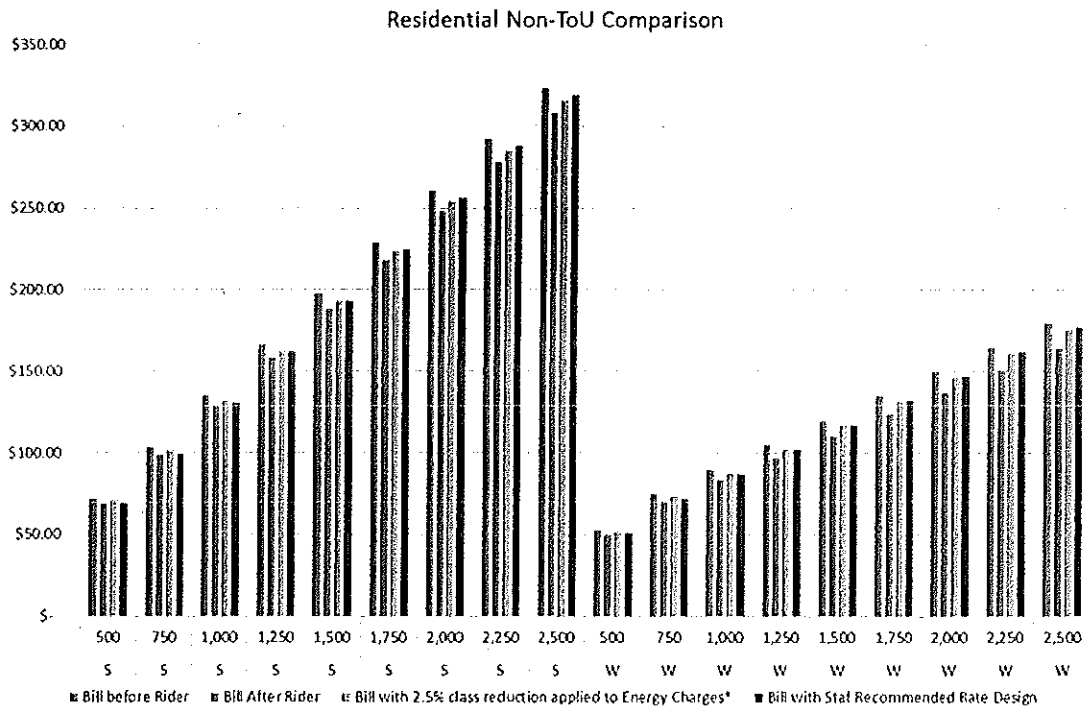
The approximate bill impact, compared to existing bills without the temporary tax rider, existing bills with the temporary tax rider, and bills with an equal percent adjustment to the energy charges are provided below:²⁶

²⁴ Case No. ER-2018-0145 and ER-2018-0146, *Non-Unanimous Partial Stipulation and Agreement concerning Rate Design Issues*, approved October 31, 2018.

²⁵ Kansas City Power & Light Company is now known as Evergy Missouri Metro and KCPL Greater Missouri Operations is now known as Evergy Missouri West.

²⁶ This includes customer charge, but not FAC, MEEIA and RESRAM charges.

1



2

3 *Staff Experts/Witnesses: Robin Kliethermes, Sarah L.K. Lange*

4 **C. Non Residential Rate Design**

5 Pursuant to the Commission Approved Unanimous Stipulation and Agreement in
 6 ER-2016-0179, Ameren Missouri’s non-residential demand-related rates were increased
 7 disproportionately to the non-residential energy rates. Staff recommends that any decreases
 8 ordered for non-residential non-lighting classes in this case be applied to the demand-related rates.

9 *Staff Experts/Witnesses: Robin Kliethermes, Sarah L.K. Lange*

10 **IV. Tariff and Other Recommendations**

11 **A. Paperless Billing**

12 In an effort to increase customer participation in paperless billing, Ameren Missouri
 13 is proposing a \$0.50 credit incentive per bill to each new enrollee in Ameren Missouri’s
 14 paperless billing program. The proposed \$0.50 incentive, over a one-year period, will total \$6.00
 15 for each new paperless billing enrollee. Existing paperless billing participants will not qualify for
 16 the incentive.

1 According to Ameren Missouri, the total cost of issuing a paper bill per customer is \$0.4707
2 and approximately \$0.007 for paperless.²⁷ The \$0.04 difference between the incentive offered
3 (\$0.50) and the Company's savings per customer (\$0.46) would be absorbed by the Company.²⁸
4 The incentive is intended to reasonably approximate the amount of cost savings resulting from
5 customers converting from a paper bill to paperless billing. Ameren Missouri is not seeking
6 recovery in rates in this proceeding of the cost associated with the bill credit incentives. Given no
7 customers will bear the cost of the incentives, Ameren Missouri's request is that the Commission
8 approve the tariff²⁹ change as filed to initiate the incentives.

9 Staff is opposed to Ameren's paperless billing credit proposal and will address this issue
10 as part of its rebuttal testimony scheduled to be filed on January 21, 2020.

11 *Staff Experts/Witnesses: Contessa King, Karen Lyons*

12 **B. Ameren Missouri's Application of "Billing Period"**

13 Ameren Missouri has 21 billing cycles. Customers are distributed amongst the billing
14 cycles so that not all customers' meters are read and billed on the same day. For example, 50,000
15 residential customers' meters may be read in the first billing cycle on the first day of the month
16 and another 55,000 residential customers' meters may be read in the second billing cycle on the
17 second day of the month. The use of billing cycles allow for customers to be billed throughout the
18 month instead of all at one time. Ameren Missouri also uses a three-day billing window, which
19 means the Company has three days to read all the meters in a billing cycle.

20 Staff found that Ameren Missouri's current billing cycles have been staggered over the
21 years to avoid meters being read on weekends and holidays to the point where customers are
22 receiving their appropriate billing month bill before the first of the billing month. For example, in
23 2019 customers in the first billing cycle for the billing month of October 2019, could have had
24 their meter read as early as September 24, 2019 or as late as September 26, 2019. All customers in
25 the first billing cycle would have received their October bill no later than September 30, 2019.
26 Since a billing cycle, on average, includes 30 days of usage, these customer's bills would have
27 included some usage that occurred in August 2019. However, because it is the customer's October

²⁷ ER-2019-0335, Direct Testimony of Mark C. Birk, p. 4.

²⁸ ER-2019-0335, Direct Testimony of Mark C. Birk, p. 4-5.

²⁹ 3rd Revised Tariff Sheet No. 63.

1 bill all the usage on the bill, including the customer's usage that occurred in August, would be
2 charged a winter rate. This is problematic in that it mutes the price signals sent by seasonal pricing.
3 For example, customers will be billed for "summer usage" for usage occurring in April, and
4 "winter usage" for usage occurring in August. This does not align cost causation with revenue
5 responsibility, and does not send appropriate price signals to customers regarding the differential
6 cost of energy from a high-cost summer month and a low-cost shoulder month.

7 As AMI technology and compatible billing systems are deployed, Ameren Missouri could
8 update its tariffs and use end-of-month calendar reads to accurately prorate the rates in effect – by
9 calendar month – on each customer's bill.³⁰ In the meantime, to align a customer's bill with the
10 appropriate billing month, Staff recommends that Ameren Missouri adjust its billing cycle read
11 dates so that no customer's meter is read prior to the first day of the customer's appropriate billing
12 month and no later than three days before the end of the billing month. Lastly, Staff recommends
13 that Ameren Missouri read each customer's meter on the same day each month. The revenue
14 impact associated with these updated billing determinants should be incorporated through the
15 true-up revenue adjustment.

16 **C. Staff recommends a number of data retention measures be implemented**

17 **1. Tracking meter installations by service classification and voltage level;**

18 Staff recommends the Commission order Ameren Missouri to track meter installations by
19 service classification and by voltage level, and integrate the ability to identify the general
20 characteristics of the premise meter within its customer information systems to be deployed to
21 utilize AMI metering. For example, Ameren Missouri is currently unable to identify which meters
22 are utilized by customers in which classes.³¹ The difference in the costs of meters capable of
23 handling higher voltages from a typical residential or SGS meter are significant. Apportioning the
24 cost of meters among classes will become more important with the \$245 million in additional
25 capital due to the "Smart Meter" program announced in File No. EO-2019-0044.

³⁰ This would also facilitate the use of shoulder rates to more accurately reflect the disparity in cost-causation between peak-winter months of December, January, and February, and the shoulder months that are currently included in the "winter" billing season.

³¹ See response to Staff Data Request No. 0244, attached as Schedule SLKL-d2.

1 **2. Implement more thorough record keeping or data accessibility practices to**
2 **better associate distribution system costs with the voltage of energy distributed;**

3 Ameren Missouri has announced approximately \$4.6 billion in planned infrastructure
4 spending in File No. EO-2019-0044. Staff recommends that Ameren Missouri develop tracking
5 systems to assign the associated plant balances to distribution classifications high voltage,
6 substation, primary, and secondary, as appropriate. Staff further recommends that Ameren
7 Missouri take steps to identify the portions of the primary distribution system that are used to
8 serve primary customers only, and do not provide service or redundant interconnection to the
9 secondary system.

10 **3. Take steps necessary in its AMI deployment process to provide accurate load**
11 **research data at a high level of precision, by implementing practices to leverage**
12 **AMI meter data for load research purposes;**

13 Staff is aware of other utilities that have deployed AMI and have deployed new customer
14 information systems in a manner that does not facilitate the collection of interval data by class or
15 by customer aggregations. Staff recommends that Ameren Missouri include elements in its
16 customer information systems to leverage AMI meter data with customer data – such as voltage,
17 rate schedule, applicable rider B adjustments, net metering customer, etc, in order to produce
18 accurate load research data in a variety of configurations when sufficient AMI meters have been
19 deployed. Class-level or sub-class level hourly load information is necessary for weather
20 normalization studies, and to produce class-level coincident and non-coincident peak information
21 which is used for allocations, among other things.

22 **4. On an ongoing basis, Ameren Missouri should retain interval data for**
23 **customers with AMI meters be retained for a minimum of a rolling 12 month**
24 **time period so that customers may compare ToU options;**

25 Staff has recommended implementation of a low-differential residential ToU rate in this
26 case. Ameren Missouri has requested approval of a variety of time-varying rates.³² To facilitate
27 customer selection of rate options, Staff recommends that Ameren Missouri retain the data
28 necessary to develop a minimum of the 12 most recent months' comparison bills. Until the point
29 that a full 12 months of data becoming available, Ameren Missouri should facilitate the number

³² Staff will address Ameren Missouri's requested ToU options in rebuttal.

1 of comparison bills that are available, but include an explanation of the variability of bills over
2 the months of the year.³³ Also, the comparison bills should accurately reflect the subject
3 customer's bill cycle, for example, if a customer's September usage is billed on the winter rate due
4 to the customer's billing cycle, all bill comparisons should be based on the winter rate for the
5 customer's bill.

6 **5. Study and retain determinants associated with the creation of a coincident peak**
7 **demand charge for all classes.**

8 In the Staff Report on Distributed Energy Resources, filed April 5, 2018, in File No.
9 EW-2017-0245, concerning residential and utility-wide rate design, Staff recommended progress
10 towards a rate design that would incorporate an on-peak demand charge to reflect the revenue
11 requirement associated with resource adequacy and capacity costs. Staff recommends Ameren
12 Missouri begin retaining data associated with the potential determinant associated with the creation
13 of a coincident peak demand charge for all classes. An example of the data to be retained would
14 include the highest 15 minute level of usage at any time between 12:01 pm and 6:00 pm on
15 weekdays during the calendar months of June – September, leveraging AMI data as available.³⁴

16 **D. Staff recommends certain tariffs be updated as part of the compliance process in**
17 **this case consistent with processes identified within those tariffs:**

18 **1. Update the Facilities Charge on Tariff Sheet 158 (Community Solar Pilot**
19 **Program) to reflect the changes made to the related energy charges, if**
20 **applicable;**

21 Tariffs for Ameren Missouri's Community Solar Pilot Program became effective on
22 October 13, 2018.

23 Per the Amended Unanimous Stipulation and Agreement filed in EA-2016-0207 on
24 May 14, 2018, the Facilities Charge portion of the total solar block charge will be adjusted when
25 rates are reset in future rate cases. The Stipulation further provides that the Facilities Charge rate
26 will be adjusted by the percentage change to volumetric rates in future rate cases, unless a party

³³ For example, if 6 months of bills are available, but those bills are for September through February the explanation should mention that during summer months energy usage associated with cooling will tend to fall during the "on peak" period.

³⁴ Billing determinants are the quantity of each charge type to be billed to collect an allowed revenue requirement. Every charge type that appears in a company's rate structure must have an associated billing determinant.

1 provides a cost study demonstrating that it would be unreasonable to adjust the Total Facilities
2 Charge rate by percentage change to volumetric rates in future rate cases post-File No.
3 ER-2016-0179. Ameren Missouri did not request that the Facilities Charge be adjusted as part of
4 this case nor did Ameren Missouri provide a cost study demonstrating that the Facilities Charge
5 should not be adjusted as part of this case. Based on the rate reduction contemplated in this case
6 at this time Staff recommends the Facilities Charge rate be adjusted by the percentage change to
7 the relevant residential and SGS volumetric rates.

8 **2. Update the Renewable Energy Standard Rate Adjustment Mechanism**
9 **("RESRAM") Tariff Sheet No. 93.4 to reflect the RESRAM base amount**
10 **determined in this case;**

11 **3. Update the MEEIA margin rates used for calculating the throughput**
12 **disincentive within the MEEIA mechanism.**

13 **E. Staff recommends this case be taken as an opportunity to implement solutions to**
14 **certain issues that have arisen in other contexts**

15 **1. Clarify the billing process for ToU customers**

16 Staff has become aware that a difference may result - due at least in part to the decimals of precision
17 used – between the sum of the on-peak kWh and off-peak kWh used in ToU billing, and the total
18 kWh used in a billing period as indicated by the first and last meter reads.³⁵ Staff recommends
19 that the Commission clarify that beginning and end meter reads are the appropriate determinant of
20 kWh consumed; in the alternative Staff would not object to a provision in Ameren Missouri's ToU
21 tariff schedules stating that if it is necessary to adjust interval usage for purposes of bill
22 calculations, that the total usage as determined by beginning and ending meter reads should be
23 prorated based on the interval usage recorded for that billing period.

24 **i. Revenue Treatment for Potential Customer Renewable Energy**
25 **Credit Program**

26 On November 8, 2019, Ameren Missouri filed to extend its Pure Power Program through
27 June 30, 2020. Based, on Ameren Missouri's filing letter in JE-2020-0077, discussions with other

³⁵ Tariff Sheet No. 63 was filed with the tariffs initiating this case, as well as in EE-2019-0382. The ToU billing issue appears to be related to the existing ToU rate, Ameren Missouri's proposed ToU rates, and Staff's recommended ToU rates.

1 parties are ongoing to discuss and consider changes that Ameren Missouri has proposed in
2 conjunction with eliminating the pilot status of the program. Depending on the outcome of those
3 discussions, Ameren Missouri's current REC purchase and retirement facilitation program may
4 expire on June 30, 2020. Should this program, or a revised program continue, Staff will likely
5 recommend that revenues should offset the capital cost of the investment with which the related
6 RECs are associated. Staff will further explore this proposal with Ameren Missouri during the
7 Pure Power Program discussions, but wanted to tee it up in the rate case to establish the framework
8 to potentially record the revenue as an offset to rate base.

9 **ii. Stipulation and Agreement in ET-2018-0132 concerning line**
10 **extension record retention**

11 In the October 4, 2018 Stipulation and Agreement in ET-2018-0132 Ameren Missouri
12 committed to record customer contribution values by voltage and service classification. Ameren
13 Missouri was unable to produce records consistent with this commitment when requested in this
14 case. See Data Request No. 0470 and Response, attached in its entirety as Schedule SLKL-d1.
15 Staff is pursuing additional discovery concerning Ameren Missouri's compliance with this matter.

16 **F. Staff recommends establishment of a ToU rate schedule to be applicable to**
17 **separately-metered EV charging equipment, on an opt-in basis.³⁶**

18 *Staff Experts/Witnesses: Robin Kliethermes, Sarah L.K. Lange*

19 **V. FAC Tariff Issues**

20 Staff provides its recommendations for the issues that have an impact on Ameren
21 Missouri's FAC and FAC tariff sheets, as listed below.

22 **Revised Base Factors**

23 Staff recommends the Base Factor ("BF") rates be rebased as follows: summer BF \$2.087
24 and winter BF \$0.761 cents/kWh³⁷ based upon an analysis of data compiled during the 12 months

³⁶ At this time, Staff does not object to the general design proposed by Ameren Missouri for this purpose. Final design of this rate is dependent on the revenue requirement established in this matter.

³⁷ Months included in each corresponding BF: Summer (June – September); Winter (October – May).

1 ending December 2018 (see Confidential Schedule LMW-d1³⁸). Staff will true-up its
2 recommended BF summer and winter rates in its True-up surrebuttal testimony to be filed on
3 February 14, 2020.

4 **Revised Transmission Percentage**

5 Staff calculated the percentage of MISO-related transmission services costs and revenues
6 arising from sales and purchases for load to be 1.35%.³⁹

7 *Staff Expert/Witness: Lisa Wildhaber*

8 **VI. Appendices**

9 Appendix 1 - Staff Credentials

10 Appendix 2 - Other Staff Schedules

³⁸ Confidential Schedule LMW-d1 information is included in the work papers of Staff witness Lisa M. Ferguson.

³⁹ See Work paper titled "C_ER-2019-0335_MISO Rev Exp_Ferguson".

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

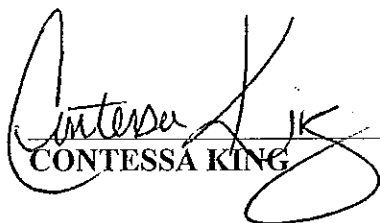
In the Matter of Union Electric Company)
d/b/a Ameren Missouri's Tariffs to Decrease)
Its Revenues for Electric Service) Case No. ER-2019-0335

AFFIDAVIT OF CONTESSA KING

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CONTESSA KING and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Staff's Direct Class Cost of Service Report*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

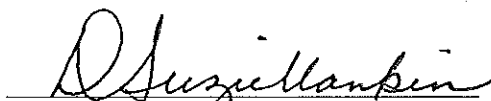


CONTESSA KING

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 17th day of December, 2019.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: December 12, 2020
Commission Number: 12412070



Notary Public

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company)
d/b/a Ameren Missouri's Tariffs to Decrease)
Its Revenues for Electric Service) Case No. ER-2019-0335

AFFIDAVIT OF ROBIN KLIETHERMES

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW ROBIN KLIETHERMES and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Staff's Direct Class Cost of Service Report*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

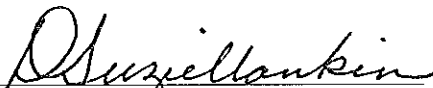


ROBIN KLIETHERMES

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 18th day of December, 2019.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: December 12, 2020
Commission Number: 12412070



Notary Public

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company)
d/b/a Ameren Missouri's Tariffs to Decrease)
Its Revenues for Electric Service) Case No. ER-2019-0335

AFFIDAVIT OF SARAH L.K. LANGE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW SARAH L.K. LANGE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Staff's Direct Class Cost of Service Report*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Sarah L.K. Lange
SARAH L.K. LANGE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 18th day of December, 2019.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: December 12, 2020
Commission Number: 12412070

D. Suzie Mankin
Notary Public

MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT

CLASS COST OF SERVICE

APPENDIX 1

Staff Credentials

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2019-0374

*Jefferson City, Missouri
January 29, 2020*

Staff Exhibit No. 106 P
Date 3/4/20 Reporter JMB
File No. ER-2019-0335

APPENDIX 1
STAFF CREDENTIALS
TABLE OF CONTENTS

Mark Kiesling 1
Robin Kliethermes 2
Sarah L.K. Lange 6
Brooke Mastrogiannis 12
Krishna Poudel 15

Mark Kiesling

Present Position

I am a Utility Management Analysis III in the Energy Resources Department, Industry Analysis Division of the Missouri Public Service Commission. I have been in my current position since January 18th, 2018. I have been employed by the Commission since October, 2014.

Educational Background and Work Experience

I have a Bachelor of Science degree in Marketing from Lincoln University, Jefferson City, MO in 2001. Prior to joining the Commission, I was employed by the Missouri Department of Economic Development as a Project Manager, working to help communities attract business to their communities and help existing business expand.

Previous Testimony of Mark Kiesling

Case No.	Company	Type of Filing	Issue
WR-2017-0343	Gascony Water	Staff Report	Customer Service

Robin Kliethermes

Present Position:

I am the Rate and Tariff Examination Manager of the Tariff and Rate Design Department, Industry Analysis Division, of the Missouri Public Service Commission ("Commission"). I have held this position since July 16th, 2016. I have been employed by the Commission since March of 2012. In May of 2013, I presented on Class Cost of Service and Cost Allocation to the National Agency for Energy Regulation of Moldova ("ANRE") as part of the National Association of Regulatory Utility Commissioners ("NARUC") Energy Regulatory Partnership Program. I am also a member of the Electric Meter Variance Committee.

Educational Background and Work Experience:

I have a Bachelor of Science degree in Parks, Recreation and Tourism with a minor in Agricultural Economics from the University of Missouri – Columbia in 2008, and a Master of Science degree in Agricultural Economics from the same institution in 2010. Prior to joining the Commission, I was employed by the University of Missouri Extension as a 4-H Youth Development Specialist and County Program Director in Gasconade County.

Additionally, I completed two online classes through Bismarck State College: Energy Markets and Structures (ENRG 420) in December, 2014 and Energy Economics and Finance (ENRG 412) in May, 2015.

Previous Testimony of Robin Kliethermes

Case No.	Company	Type of Filing	Issue
ER-2012-0166	Ameren Missouri	Staff Report	Economic Considerations
ER-2012-0174	Kansas City Power & Light Company	Staff Report	Economic Considerations
ER-2012-0175	KCP&L Greater Missouri Operations Company	Staff Report	Economic Considerations & Large Power Revenues
ER-2012-0345	Empire District Electric Company	Staff Report	Economic Considerations, Non-Weather Sensitive Classes & Energy Efficiency
HR-2014-0066	Veolia Kansas City	Staff Report	Revenue by Class and Class Cost of Service
GR-2014-0086	Summit Natural Gas	Staff Report	Large Customer Revenues
GR-2014-0086	Summit Natural Gas	Rebuttal	Large Customer Revenues
EC-2014-0316	City of O'Fallon Missouri and City of Ballwin, Missouri v. Union Electric Company d/b/a Ameren Missouri	Staff Memorandum	Overview of Case
EO-2014-0151	KCP&L Greater Missouri Operations Company	Staff Recommendation	Renewable Energy Standard Rate Adjustment Mechanism (RESRAM)
ER-2014-0258	Ameren Missouri	Staff Report	Rate Revenue by Class, Class Cost of Service study, Residential Customer Charge
ER-2014-0258	Ameren Missouri	Rebuttal	Weather normalization adjustment to class billing units
ER-2014-0258	Ameren Missouri	Surrebuttal	Residential Customer Charge and Class allocations
ER-2014-0351	Empire District Electric Company	Staff Report	Rate Revenue by Class, Class Cost of Service study, Residential Customer Charge

cont'd Previous Testimony of
Robin Kliethermes

Case No.	Company	Type of Filing	Issue
ER-2014-0351	Empire District Electric Company	Rebuttal & Surrebuttal	Residential Customer, Interruptible Customers
ER-2014-0370	Kansas City Power & Light Company	Staff Report	Rate Revenue by Class, Class Cost of Service study, Residential Customer Charge
ER-2014-0370	Kansas City Power & Light Company	Rebuttal & Surrebuttal	Class Cost of Service, Rate Design, Residential Customer Charge
ER-2014-0370	Kansas City Power & Light Company	True-Up Direct & True-Up Rebuttal	Customer Growth & Rate Switching
EE-2015-0177	Kansas City Power & Light Company	Staff Recommendation	Electric Meter Variance Request
EE-2016-0090	Ameren Missouri	Staff Recommendation	Tariff Variance Request
EO-2016-0100	KCP&L Greater Missouri Operations Company	Staff Recommendation	RESRAM Annual Rate Adjustment Filing
ET-2016-0185	Kansas City Power & Light Company	Staff Recommendation	Solar Rebate Tariff Change
ER-2016-0023	Empire District Electric Company	Staff Report	Rate Revenue by Class, CCOS and Residential Customer Charge
ER-2016-0023	Empire District Electric Company	Rebuttal & Surrebuttal	Residential Customer Charge and CCOS
ER-2016-0156	KCP&L Greater Missouri Operations	Staff Report	Rate Revenue by Class, CCOS and Residential Customer Charge
ER-2016-0156	KCP&L Greater Missouri Operations	Rebuttal & Surrebuttal	Data Availability, Energy Efficiency Revenue Adj., Residential Customer Charge
ER-2016-0179	Ameren Missouri	Rebuttal	Blocked Usage
ER-2016-0285	Kansas City Power & Light Company	Rebuttal & Surrebuttal	Clean Charge Network Tariff, Rate Design
GR-2017-0215	Spire (Laclede Gas Company)	Staff Report, Rebuttal & Surrebuttal	Tariff Issues, Rate Design and Class Cost of Service

cont'd Previous Testimony of
Robin Kliethermes

Case No.	Company	Type of Filing	Issue
GR-2017-0216	Spire (Missouri Gas Energy)	Staff Report, Rebuttal & Surrebuttal	Tariff Issues, Rate Design and Class Cost of Service
EC-2018-0103	Kansas City Power & Light	Staff Report	Customer Complaint
EO-2015-0055	Ameren Missouri	Rebuttal	Flex-Pay Program
GR-2018-0013	Liberty	Staff Report	Class Cost of Service and Rate Design Report
ER-2018-0145	Kansas City Power & Light	Staff Report & Rebuttal & Surrebuttal	Tariff Issues, Rate Design, Revenue, Class Cost of Service
ER-2018-0146	KCP&L Greater Missouri Operations	Staff Report & Rebuttal & Surrebuttal	Tariff Issues, Rate Design, Revenue, Class Cost of Service
EO-2018-0211	Ameren Missouri	Staff Rebuttal Report	MEEIA Margin Rates
GO-2019-0059	Spire Missouri West	Staff Recommendation & Rebuttal	Weather Normalization Adjustment Rider (WNAR)
GO-2019-0058	Spire Missouri East	Staff Recommendation & Rebuttal	Weather Normalization Adjustment Rider (WNAR)
ET-2018-0132	Ameren Missouri	Surrebuttal	Risk Sharing Mechanism
ER-2019-0291	Ameren Missouri	Staff Recommendation	MEEIA EEIC rates
GR-2019-0077	Ameren Missouri	Staff Report, Rebuttal & Surrebuttal	Tariff Issues, Rate Design, Revenue, Class Cost of Service
EO-2019-0132	KCPL and GMO	Staff Rebuttal Report	MEEIA DSIM mechanism, Tariff Issues
ER-2019-0335	Ameren Missouri	Staff Report	Cost of Service and Class Cost of Service

Sarah L.K. Lange

I received my J.D. from the University of Missouri, Columbia, in 2007, and am licensed to practice law in the State of Missouri. I received my B.S. in Historic Preservation from Southeast Missouri State University, and took courses in architecture and literature at Drury University. Since beginning my employment with the MoPSC I have taken courses in economics through Columbia College and courses in energy transmission through Bismarck State College, and have attended various trainings and seminars, indicated below.

I began my employment with the Commission in May 2006 as an intern in what was then known as the General Counsel's Office. I was hired as a Legal Counsel in September 2007, and was promoted to Associate Counsel in 2009, and Senior Counsel in 2011. During that time my duties consisted of leading major rate case litigation and settlement, and presenting Staff's position to the Commission, and providing legal advice and assistance primarily in the areas of depreciation, cost of service, class cost of service, rate design, tariff issues, resource planning, accounting authority orders, construction audits, rulemakings and workshops, fuel adjustment clauses, document management and retention, and customer complaints.

In July 2013 I was hired as a Regulatory Economist III in what is now known as the Tariff / Rate Design Department. In this position my duties include providing analysis and recommendations in the areas of RTO and ISO transmission, rate design, class cost of service, tariff compliance and design, and regulatory adjustment mechanisms and tariff design. I also continue to provide legal advice and assistance regarding generating station and environmental control construction audits and electric utility regulatory depreciation. I have also participated before the Commission under the name Sarah L. Kliethermes.

Presentations

Billing Determinants Lunch and Learn (March 27, 2019)

Support for Low Income and Income Eligible Customers, Cost-Reflective Tariff Training, in cooperation with U.S.A.I.D. and NARUC, Addis Ababa, Ethiopia (February 23 - 26, 2016)

Fundamentals of Ratemaking at the MoPSC (October 8, 2014)

Ratemaking Basics (Sept. 14, 2012)

Participant in Missouri's Comprehensive Statewide Energy Plan working group on Energy Pricing and Rate Setting Processes.

Relevant Trainings and Seminars

"Fundamentals of Utility Law" Scott Hempling lecture series (January – April, 2019)

Today's U.S. Electric Power Industry, the Smart Grid, ISO Markets & Wholesale Power Transactions (July 29-30, 2014)

MISO Markets & Settlements training for OMS and ERSC Commissioners & Staff (Jan. 27 – 28, 2014)

Validating Settlement Charges in New SPP Integrated Marketplace (July 22, 2013)

PSC Transmission Training (May 14 – 16, 2013)

Grid School (March 4 – 7, 2013)

Specialized Technical Training - Electric Transmission (April 18 – 19, 2012)

Renewable Energy Finance Forum (Sept. 29 – Oct 3, 2010)

The New Energy Markets: Technologies, Differentials and Dependencies (June 16, 2011)

Mid-American Regulatory Conference Annual Meeting (June 5 – 8, 2011)

Utility Basics (Oct. 14 – 19, 2007)

Testimony and Staff Memoranda

<u>Company</u>	<u>Case No.</u>
Union Electric Company d/b/a Ameren Missouri In the Matter of of Union Electric Company d/b/a Ameren Missouri's Tariffs to Decrease Its Revenues for Electric Service	ER-2019-0335
KCP&L Greater Missouri Operations Company In the Matter of KCP&L Greater Missouri Operations Company Request for Authority to Implement Rate Adjustments Required by 4 CSR 240-20.090(8) And the Company's Approved Fuel and Purchased Power Cost Recovery Mechanism	ER-2019-0413
Union Electric Company d/b/a Ameren Missouri In the Matter of of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its Revenues for Natural Gas Service	GR-2019-0077
Union Electric Company d/b/a Ameren Missouri In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri Revised Tariff Sheets	ET-2019-0149

<u>Company</u>	<u>Case No.</u>
The Empire District Electric Company In the Matter of The Empire District Electric Company's Revised Economic Development Rider Tariff Sheets	ET-2019-0029
The Empire District Electric Company In the Matter of a Proceeding Under Section 393.137 (SB 564) to Adjust the Electric Rates of The Empire District Electric Company	ER-2018-0366
Union Electric Company d/b/a Ameren Missouri In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Authorizing it to Construct a Wind Generation Facility	EA-2018-0202
Kansas City Power & Light Company KCP&L Greater Missouri Operations Company In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service	ER-2018-0145 ER-2018-0146
Union Electric Company d/b/a Ameren Missouri In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Approval of Efficient Electrification Program	ET-2018-0132
Union Electric Company d/b/a Ameren Missouri In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Approval of 2017 Green Tariff	ET-2018-0063
Laclede Gas Company Laclede Gas Company d/b/a Missouri Gas Energy In the Matter of Laclede Gas Company's Request to Increase Its Revenue for Gas Service, In the Matter of Laclede Gas Company d/b/a Missouri Gas Energy's Request to Increase Its Revenue for Gas Service.	GR-2017-0215 GR-2017-0216
Kansas City Power & Light Company In the Matter of Kansas City Power & Light Company's Demand Side Investment Rider Rate Adjustment And True-Up Required by 4 CSR 240-3.163(8)	ER-2017-0316
Kansas City Power & Light Company In the Matter of Kansas City Power & Light Company's Demand Side Investment Rider Rate Adjustment And True-Up Required by 4 CSR 240-3.163(8)	ER-2017-0167
KCP&L Great Missouri Operations Company In the Matter of KCP&L Greater Missouri Operations Company's Annual RESRAM Tariff Filing	ET-2017-0097

<u>Company</u>	<u>Case No.</u>
Grain Belt Express Clean Line, LLC In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing It to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood - Montgomery 345 kV Transmission Line	EA-2016-0358
Kansas City Power & Light Company In the Matter of Kansas City Power & Light Company's Demand Side Investment Rider Rate Adjustment And True-Up Required by 4 CSR 240-3.163(8)	ER-2016-0325
Kansas City Power & Light Company In the Matter of Kansas City Power & Light Company's Request for Authority to Implement A General Rate Increase for Electric Service	ER-2016-0285
Union Electric Company d/b/a Ameren Missouri In the Matter of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Authorizing it to Offer a Pilot Subscriber Solar Program and File Associated Tariff	EA-2016-0207
Union Electric Company d/b/a Ameren Missouri In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service	ER-2016-0179
KCP&L Great Missouri Operations Company In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority to Implement a General Rate Increase for Electric Service	ER-2016-0156
Empire District Electric Company In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service	ER-2016-0023
Ameren Transmission Company of Illinois In the Matter of the Application of Ameren Transmission Company of Illinois for Other Relief or, in the Alternative, a Certificate of Public Convenience and Necessity Authorizing it to Construct, Install, Own, Operate, Maintain and Otherwise Control and Manage a 345,000-volt Electric Transmission Line from Palmyra, Missouri to the Iowa Border and an Associated Substation Near Kirksville, Missouri	EA-2015-0146

<u>Company</u>	<u>Case No.</u>
Ameren Transmission Company of Illinois In the Matter of the Application of Ameren Transmission Company of Illinois for Other Relief or, in the Alternative, a Certificate of Public Convenience and Necessity Authorizing it to Construct, Install, Own, Operate, Maintain and Otherwise Control and Manage a 345,000-volt Electric Transmission Line in Marion County, Missouri and an Associated Switching Station Near Palmyra, Missouri	EA-2015-0145
Union Electric Company d/b/a Ameren Missouri 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	EO-2015-0055
Kansas City Power & Light Company In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service	ER-2014-0370
Empire District Electric Company 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	ER-2014-0351
Union Electric Company d/b/a Ameren Missouri City of O'Fallon, Missouri, and City of Ballwin, Missouri, Complainants v. Union Electric Company d/b/a Ameren Missouri, Respondent	EC-2014-0316
Union Electric Company d/b/a Ameren Missouri In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service	ER-2014-0258
Union Electric Company d/b/a Ameren Missouri Noranda Aluminum, Inc., et al., Complainants, v. Union Electric Company d/b/a Ameren Missouri, Respondent	EC-2014-0224
Grain Belt Express Clean Line, LLC In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing It to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood - Montgomery 345 kV Transmission Line	EA-2014-0207
KCP&L Great Missouri Operations Company In the Matter of KCP&L Greater Missouri Operations Company's Application for Authority to Establish a Renewable Energy Standard Rate Adjustment Mechanism	EO-2014-0151

<u>Company</u>	<u>Case No.</u>
Kansas City Power & Light Company 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	EO-2014-0095
Veolia Energy Kansas City, Inc. In the Matter of Veolia Energy Kansas City, Inc. for Authority to File Tariffs to Increase Rates	HR-2014-0066

Case Participation

Brooke Mastrogiannis

Utility Regulatory Auditor

Present Position:

I am a Utility Regulatory Auditor in the Energy Resources Department of the Missouri Public Service Commission. I have been employed by the Missouri Public Service Commission since May 2014. I previously was a Utility Regulatory Auditor in the Auditing Unit of the Utility Services Department, and a Utility Management Analyst in the Consumer and Management Analysis Unit.

Education Background and Work Experience:

I received a Bachelor of Science degree in Accounting from Lincoln University, in Jefferson City, MO in May of 2012. I then continued to further my education and received my Masters of Business Administration with an emphasis in Accounting in December 2013. In earning these degree's I completed numerous core Accounting and Business classes. Prior to joining the Commission, I was employed by the State of Missouri - Department of Natural Resources from June 2013 to May 2014 as an Account Specialist. My duties entailed: reviewing and monitoring expense account forms to ensure employees followed correct procedures, prepared and set up project and job codes so they could be coded correctly on employee's time sheets, analyzed and prepared necessary cash draws, and also prepared financial information or reports to facilitate budget information and execution.

Company Name	Case Number	Testimony/Issues
The Empire District Electric Company	ER-2014-0351	January 2015 Cost of Service Report- Plant in Service, Depreciation Reserve, Prepayments, Materials and Supplies, Customer Deposits, Customer Deposit Interest, Customer Advances, Amortization of Electric Plant, Amortization of PeopleSoft Intangible Asset, Corporate Franchise Taxes, Depreciation Expense, Amortization Expense, Dues and Donations, EEI Dues, Advertising Expense, Outside Services, and Postage.
Seges Partners Mobile Home Park L.L.C.	SR-2015-0106	January 2015 Staff Report- Rate Base, Revenues, Purchased Sewer Costs, Payroll and Payroll Taxes, Management Fee, Postage, Telephone Expense, Maintenance Expense, Insurance, Outside Services, PSC Assessment, and Rate Case Expense
The Empire District Electric Company	ER-2014-0351	March 2015 Surrebuttal Testimony- Advertising Expense, Customer Advances, and EEI Dues.

Company Name	Case Number	Testimony/Issues
Ozark International, Inc.	WR-2015-0192	September 2015 Staff Report- Payroll, Telephone and Cell Phone Expense, Auto Expense, Insurance Expense, Bank Service Charges, Customer Deposits, Customer Deposit Interest, PSC Assessment, Revenues, Miscellaneous Income, Contract Labor, General Maintenance Expense, Electric Expense, Returned Check Fees, Outside Services, Dues and Subscriptions, and Credit Card Fees
Hillcrest Utility Operating Company, Inc.	WR-2016-0064	March 2016 Staff Report- Customer Service and Business Operations Review
Cannon Home Association	SR-2016-0112	April 2016 Staff Report- Customer Service and Business Operations Review
Roy-L Utilities, Inc.	WR-2016-0109	May 2016 Staff Report- Customer Service and Business Operations Review
Raccoon Creek Utility Operating Company, Inc.	SR-2016-0202	August 2016 Staff Report- Customer Service and Business Operations Review
Raccoon Creek Utility Operating Company, Inc.	SR-2016-0202	October 2016 Rebuttal Testimony- Collection of Bad Debt
Kansas City Power and Light Company	EO-2016-0124	January 2017 Management Audit Report- Employee Expense Account Process and Internal Audit Activities
Terre Du Lac Utilities Corporation	WR-2017-0110	April 2017 Staff Report- Customer Service and Business Operations Review
Indian Hills Utility Operating Company, Inc.	WR-2017-0259	July 2017 Staff Report- Customer Service and Business Operations Review
Spire Missouri, Inc.	GR-2017-0215	December 2017 Rebuttal Testimony- Performance Metrics Incentive Proposal
Ameren Missouri	EO-2018-0155	April 2018 Staff Report- First MEEIA Cycle 2 Prudence Review
Liberty Utilities LLC	WR-2018-0170	April 2018 Staff Report- Normalized and Annualized Revenues, Miscellaneous Revenues, Bad Debt Expense, Outside Services/Contract Maintenance, DNR Fees, Meter Reading Expense, Transportation Expense, and Property Taxes

continued, Brooke Mastrogiannis

Company Name	Case Number	Testimony/Issues
KCPL Greater Missouri Operations	ER-2018-0146	June 2018 Direct Testimony- Fuel Adjustment Clause Rebuttal Testimony- Fuel Adjustment Clause and Renewable Energy Rider Surrebuttal Testimony- Fuel Adjustment Clause
The Empire District Electric Company	EO-2018-0244	September 2018 Staff Report- Fuel Adjustment Clause Prudence Review
KCPL	EO-2018-0363	November 2018 Staff Report- First MEEIA Cycle 2 Prudence Review
KCPL Greater Missouri Operations	EO-2018-0364	November 2018 Staff Report- First MEEIA Cycle 2 Prudence Review
KCPL	EO-2019-0068	February 2019 Staff Report- Fuel Adjustment Clause Prudence Review
KCPL Greater Missouri Operations	EO-2019-0067	February 2019 Staff Report- Fuel Adjustment Clause Prudence Review
Ameren Missouri	EO-2019-0257	August 2019 Staff Report- Fuel Adjustment Clause Prudence Review
Ameren Missouri	EO-2019-0376	October 2019 Staff Report- Second MEEIA Cycle 2 Prudence Review

Krishna Poudel

Present Position

I am Regulatory Economist III in the Energy Resources Department, Industry Analysis Division of the Missouri Public Service Commission. I have been employed by the Commission since May 20th, 2019.

Educational Background and Work Experience

I have a Bachelor of Science degree in Agriculture, and Master of Science degree in Agricultural Economics from Tribhuvan University, Nepal in 1999 and 2002 respectively. I completed PhD in Applied Economics from the University of Missouri – Columbia in 2017. Prior to joining the Commission, I was employed by the Missouri Department of Natural Resources as an Economist in the Water Protection Program to carry out cost-benefit analysis of water quality rule making and other water protection projects and programs.

MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT

CLASS COST OF SERVICE

APPENDIX 2

Other Staff Schedules

**UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri**

CASE NO. ER-2019-0335

*Jefferson City, Missouri
December 2019*

**** Denotes Confidential Information ****

Staff Exhibit No. 106P
Date 3/4/20 Reporter Jmb
File No. ER-2019-0335

Ameren Missouri's
Response to MPSC Data Request - MPSC
ER-2019-0335

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its
Revenues for Electric Service.

No.: MPSC 0470

For each month for which the requested information is available, please provide, by month each of the following: 1) The company's gross expenditures for "Extension Costs" as defined at tariff sheet 111, by rate classification and by voltage, for line extension projects as completed in each month. 2) The sum of "Extension Allowances," as defined at tariff sheet 111, by rate classification and by voltage, for line extension projects as reflected by month in response to part 1, above. 3) The sum of "Extension Charges," as defined at tariff sheet 111, by rate classification and by voltage, for line extension projects as reflected by month in response to part 1, above. 4) If the values requested above are retained by the Company in a different format (ie, recorded by project, but not by month) please provide all such information in the format in which it is retained. DR requested by Sarah Lange (sarah.lange@psc.mo.gov).

RESPONSE

Prepared By: Michael Harding
Title: Manager, Rates and Analysis
Date: November 22, 2019

See attached.

DTE_TKN_WR = the date the distribution extension was initiated
CHARGES = the project sub-total before Allowance is applied
CRCY_REV_OFFSET = the Extension Allowance

The voltage and rate classes are not available through the DOJM system report query, however additional data can be gathered by looking at individual projects through DOJM and looking at the attached spreadsheet associated with the job if one is available.

CDE_CMPIDTE_TKN_WR	CHARGES	CRCY_REV_OFFSET	
UEC	20190220	11998.6	2072
UEC	20190321	11999.71	4590
UEC	20190330	992.12	0
UEC	20190125	789.88	0
UEC	20190215	15076.23	1537
UEC	20190206	19202.78	0
UEC	20180724	3000.69	0
UEC	20190403	2967.32	1608
UEC	20170907	2698.36	2115
UEC	20190410	2808.27	1608
UEC	20190411	3236.63	2618
UEC	20190412	503.36	410
UEC	20190412	3986.49	0
UEC	20181023	20342.73	2179
UEC	20190227	20379.64	0
UEC	20190418	15299.52	493
UEC	20190410	1864.77	0
UEC	20190408	3549.67	2537
UEC	20190312	25319.35	0
UEC	20190329	789.88	0
UEC	20190426	3071.65	1667
UEC	20180720	301546.44	155280.02
UEC	20180614	116004.7	0
UEC	20190207	17608.45	0
UEC	20181003	2699.17	0
UEC	20181029	4856.94	3278.1
UEC	20181106	5401.03	0
UEC	20190507	1048.78	134.28
UEC	20190516	120948.71	19325
UEC	20190520	13111	5975
UEC	20190506	11369.8	8751
UEC	20190430	7965.48	0
UEC	20190524	858.02	0
UEC	20180824	32205.32	0
UEC	20190424	36365.32	5196
UEC	20190529	11571.37	10583
UEC	20180116	124943.55	67941.62
UEC	20171130	893.76	0
UEC	20190602	13326.03	2656
UEC	20190604	2943.22	0
UEC	20190604	2943.22	0
UEC	20190604	2943.22	0
UEC	20190604	2943.22	0
UEC	20190604	2942.38	0
UEC	20190604	2943.22	0
UEC	20190604	2943.22	0

UEC	20190604	1372.39	0
UEC	20180620	3561.48	800
UEC	20190604	2943.22	0
UEC	20190604	3753.37	0
UEC	20190604	2943.22	0
UEC	20190618	644.01	410
UEC	20190618	17887.57	17197.57
UEC	20190611	27250.82	8010
UEC	20190621	644.22	410
UEC	20190620	3929.24	1699
UEC	20190702	2929.76	400
UEC	20190708	5498.31	400
UEC	20190710	3032.44	1800
UEC	20170803	17280.16	0
UEC	20181221	138689.87	63689.87
UEC	20190620	3417.62	2135
UEC	20190607	23696.9	17751
UEC	20190813	1295.04	0
UEC	20190710	44159.22	0
UEC	20190814	734.37	0
UEC	20190813	11333.99	8500
UEC	20190820	651.03	0
UEC	20190227	1763.31	0
UEC	20190829	651.03	0
UEC	20190829	651.03	0
UEC	20190627	10135.26	2550
UEC	20190916	23605.77	0
UEC	20190826	3269.17	0
UEC	20190827	1527	0
UEC	20190906	41983.17	0
UEC	20190930	3258.06	1667
UEC	20191001	3138.25	803
UEC	20190930	4424.01	0
UEC	20191003	100023.82	0
UEC	20191010	3372.99	803
UEC	20191002	5122.87	0
UEC	20191021	3479.35	0
UEC	20191001	15980.1	4759
UEC	20191021	18822.33	0
UEC	20191023	30383.45	15833
UEC	20191029	5411.42	0
UEC	20191030	4159.44	0
UEC	20170703	783077.84	708866.15
UEC	20191009	7765.04	0
UEC	20191023	670.46	0
UEC	20190401	3563.94	1303
UEC	20190502	17735.06	28851

UEC	20190508	55896.15	204211
UEC	20190509	15001	0
UEC	20190516	408.8	1020
UEC	20190517	10363.75	0
UEC	20190517	7086.02	60839
UEC	20190530	12964.02	12984
UEC	20190603	275.39	1779
UEC	20190610	3181.67	4151
UEC	20190610	132.99	812
UEC	20190612	47059.34	79067.5
UEC	20190614	4790.44	0
UEC	20190619	9922.33	0
UEC	20190620	7561.89	0
UEC	20190621	0	0
UEC	20190626	53137.21	0
UEC	20190627	19693.02	0
UEC	20190701	-59256.3	461722
UEC	20190701	165.85	4270
UEC	20190701	15413.49	35089
UEC	20190708	0	0
UEC	20190710	7285.56	0
UEC	20190712	7912.75	19164
UEC	20190715	0	0
UEC	20190726	11684.67	11834
UEC	20190731	0	0
UEC	20190807	5791.07	10982
UEC	20190816	9444.25	17419
UEC	20190819	6026.29	2500
UEC	20190820	11247.57	0
UEC	20190820	129.15	1667
UEC	20190821	22474.11	0
UEC	20190822	3609	2443
UEC	20190826	11810.31	0
UEC	20190827	60046.34	0
UEC	20190827	4911.93	0
UEC	20190829	16869.81	14893
UEC	20190830	30378.45	84708
UEC	20190830	63.72	4448
UEC	20190903	25205.17	7661
UEC	20190905	23235.17	66939
UEC	20190909	2763.6	0
UEC	20190912	99711.47	18328
UEC	20190912	3118.76	4524
UEC	20190917	24662.3	0
UEC	20190923	1333.93	803
UEC	20190927	336.35	0
UEC	20190930	15722.62	0

UEC	20191001	5601.86	113591
UEC	20191001	437.04	1667
UEC	20191002	3772.63	18645
UEC	20191003	4353.55	2589
UEC	20191003	1327.66	0
UEC	20191007	7071.27	31425
UEC	20191008	5844.58	0
UEC	20191008	5415.82	2485
UEC	20191009	4524.5	4881
UEC	20191010	12026.41	52444
UEC	20191015	40131.37	0
UEC	20191015	3444.79	8654
UEC	20191015	357.84	1779
UEC	20191016	575.39	1667
UEC	20191023	4579.34	14779
UEC	20191029	3681.69	4755
UEC	20191112	3672.78	0
		3,141,216	2,584,810

Ameren Missouri's
Response to MPSC Data Request - MPSC
ER-2019-0335

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its
Revenues for Electric Service.

No.: MPSC 0244

In regard to the worksheet labelled "Meter Costs" in Ameren Missouri witness Thomas Hickman's workpaper labelled "MO ECCOS_2018 Final": 1. Please provide the number of meters per each type of meter listed in the worksheet that is currently in service and separately list the number of meters per type of meter that are not currently in service; 2. Please provide all workpapers used and information relied on to calculate the per meter cost provided in Column E. Data Request submitted by Robin Kliethermes

RESPONSE

Prepared By: Tom Hickman
Title: Regulatory Rate Specialist
Date: 08-21-2019

1. See tables on following pages. Please note, the Form and Class correspond with the entry in Column F of the "Meter Costs" Tab of Ameren Missouri witness Thomas Hickman's workpaper labelled "MO ECCOS_2018 Final". Further note, that the Transformer-rated meters (Form 4S, 5S, and 9S) have multiple costs listed, but those costs are based on the specific customer service (size of CT, whether the CT & PT are located Indoor or Outdoor, etc.). We do not have a specific meter count per customer service type.

Also, please note, that the "Unaccounted For" total of 13,801 meters required to tie out to the Cost of Service file are predominantly meters which are no longer being installed by Ameren Missouri (such as Class 10 Transformer-rated meters). Because these are no longer being installed, they do not have a current installation cost, which is the basis for the meter cost in the Cost of Service file. There are also meters of a form or class that appear in such immaterial quantities that we did not develop a current installation cost for them. We also deemed the total ungrouped meters to be an immaterial count compared to total meters for the development of a class allocation factor.

Class information for meters not in service was not available.

2. Please see attachment "MPSC 0244 Attachment -2019_Marginal_Cost."

Breakdown of In Service Meters (As of Date Ran, 3-25-2019)

Form	Class	Count
2S	CL200	1091200
2S	CL320	36595
12S	CL200	44808
16S	CL320	1262
2K	CL480	1803
16S	CL200	21684
16K	CL480	6835
12K	CL480	919
4S	CL20	3758
9S	CL20	15645
5S	CL20	2869
	Total	<u>1227378</u>
	Unaccounted For	<u>13801</u>
	Total per "A.F.7" Tab of "MO ECCOS_2018 Final"	1241179

Breakdown of Meters Not In Service (As of Date Ran, 8-16-2019)

Form	Count
12K	408
12S	3517
14K	1
14S	9
15S	7
16K	1142
16S	3692
1A	1
1S	381
2K	393
2S	26285
3S	401
4S	1395
5A	1
5S	2333
5SB	7
6S	399
6W	2
8A	1
9A	3
9S	4128
9SB	11
Total:	44517

APPENDIX 2
SCHEDULE LMW-d1

HAS BEEN DEEMED

CONFIDENTIAL

IN ITS ENTIRETY