MISSOURI PUBLIC SERVICE COMMISSION

STAFF

REBUTTAL REPORT

UNION ELECTRIC COMPANY, d/b/a AMEREN MISSOURI

CASE NO. EO-2018-0211

Jefferson City, Missouri
August 30, 2018

** Denotes Confidential Information **

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I. Executive Summary

On June 4, 2018, Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri") filed its *Application to Approve DSIM and Demand-Side Management Portfolio and Plan, Request for Variances, and Motion to Adopt Procedural Schedule* ("Application"), seeking approval of a Demand-Side Investment Mechanism ("DSIM") and a Demand-Side Management Portfolio and Plan, to be effective March 1, 2019 through December 31, 2024 ("Plan"); variances from various Commission rules; and approval of a proposed procedural schedule. As will be discussed more fully throughout this Report, the Application identifies four key elements of the plan: 1) A six-year term; 2) Expansion of the Demand-Side Portfolio; 3) New Demand Response Programs; and 4) A revised DSIM. In this Report, Staff not only reviews the Application, but also provides a comparison of the Application to Ameren Missouri's Missouri Energy Efficiency Investment Act ("MEEIA") Cycle 1 and Cycle 2.

MEEIA states, "It shall be the policy of the state to value demand-side investments equal to traditional investments in supply and delivery infrastructure and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs." [1] MEEIA also states, "[r]ecovery for such programs shall not be permitted unless the programs…are beneficial to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers"[2]. In response to these 2 key policy directives, Staff provides analysis on Ameren Missouri's calculations of avoided costs and avoided cost benefits; the cost-effectiveness of the various Cycle 3 proposed programs, energy and demand savings targets and customer participation; the various financial components, including program costs, the throughput disincentive ("TD") and the earnings opportunity ("EO"); and the proposal to extend MEEIA Cycle 3 to a 6-year cycle with mid-cycle review. Staff acknowledges there are public policy reasons to support continuation of MEEIA, but based on its analysis, and upon

[1] Section 393.1075.3.
[2] Section 393.1075.4.

advisement of Staff Counsel, suggests the Application does not comply with the statutory requirements of MEEIA. Therefore, Staff recommends the Commission reject the Application. Staff further recommends the Commission authorize Ameren Missouri to continue MEEIA Cycle 2 for up to one additional year to allow Ameren Missouri, Staff and other interested parties, the opportunity to develop a MEEIA Cycle 3 plan that meets the MEEIA statutory requirements or consider other options that may be available.

Should the Commission approve the Application, Staff recommends the Commission only approve a three-year Plan and incorporate the additional recommendations contained in Section VI of this Report.

Staff Expert Witness: Natelle Dietrich

II. Background

A. The Missouri Energy Efficiency Investment Act

The Missouri Energy Efficiency Investment Act ("MEEIA"), Section 393.1075 RSMo, became law in August, 2009. While most states with significant investments in DSM programs have energy efficiency resource standards which include mandatory annual energy savings targets,[3] MEEIA is voluntary and has no mandatory annual energy savings targets. MEEIA does, however, include mandatory requirements which a MEEIA application must meet before the Commission can approve the application including the following which are of central importance in this case:

- It shall be the policy of the state to value demand-side investments equal to traditional investments in supply and delivery infrastructure and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs;[4] and
- Recovery of such programs shall not be permitted unless the programs are approved by the [C]ommission, result in energy and demand savings and are beneficial to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers. The [C]ommission shall consider the total resource cost test a preferred cost-effectiveness test.[5]

[3] Appendix 2, Schedule JAR-r1 is the January 2017 ACEEE Policy Brief on State Energy Efficiency Resource Standards (EERS) for 24 states with standalone EERS policy and 2 states that allow energy efficiency to count toward renewable energy standards.

[4] 393.1075. 3.

[5] 393.1075. 4.

Rules to implement MEEIA became effective May 30, 2011[6] and were revised effective October 30, 2017.[7] MEEIA rules provide procedures for filing and processing applications for approval, modification and discontinuance of electric utility demand-side programs and for the establishment and operation of demand-side programs investment mechanisms ("DSIM"), and also allow for periodic adjustments in customers rates between general rate cases related to the recovery of: 1) DSM program costs; 2) throughput disincentive for recovery of lost fixed operating costs due to the programs; 3) an earnings opportunity based on after-the-fact measured and verified energy and demand savings;[8] and 4) adjustments ordered by the Commission, e.g., disallowance due to imprudence.

Following is a summary and comparison of Ameren Missouri's MEEIA Cycles, starting with the current Application then summarizing Ameren Missouri Cycle 1 and Cycle 2.

Staff Expert Witness: John A. Rogers

B. Summary of Ameren Missouri's MEEIA Cycle 3 Application

On June 4, 2018, Ameren Missouri filed its MEEIA 3 Application. At the targeted budget and cumulative annual energy and demand savings targets, Cycle 3 would increase Ameren Missouri's revenues by $839,771,049.[9]

[6] 4 CSR 240-3.163 Filing Requirements for Demand-Side Programs Investment Mechanisms; 4 CSR 240-3.164 Filing Requirements for Demand-Side Programs; 4 CSR 240-20.093 Demand-Side Programs Investment Mechanisms; and 4 CSR 240-20.094 Demand-Side Programs.

[7] 4 CSR 240-20.092 Definitions for Demand-Side Programs and Demand-Side Programs Investment Mechanisms; 4 CSR 240-20.093 Demand-Side Programs Investment Mechanisms; and 4 CSR 240-20.094 Demand-Side Programs.

[8] 393.1075.3.(3) Provide timely earnings opportunities associated with cost-effective measurable and verifiable efficiency savings.

[9] The actual Cycle 3 revenue increase could be much more. For instance, at an assumed 120% of targeted budget, assumed 120% of targeted cumulative annual energy and demand savings and maximum EO payout, Cycle 3 is estimated to increase Ameren Missouri's revenues by $1,037,209,043.

The Plan's reported highlights are on the inside cover of the Plan.

Additional Cycle 3 highlights include:

- A total of twenty (20) Cycle 3 programs, in the Plan's Appendix A, including three (3) low-income programs, nine (9) residential programs and eight (8) business programs, with all programs beginning March 1, 2019 and ending December 31, 2024,[10] portfolio level 1,958,132 MWh cumulative annual energy savings target, and 985 MW cumulative annual demand savings target;
- Total 6-year programs budget of $550,770,000;
- Technical reference manual ("TRM") including first year deemed annual gross energy and demand savings;
- Evaluation, measurement and verification ("EM&V") plan;
- Throughput disincentive ("TD") of $174,000,000 at the target 1,958,132 MWh cumulative energy savings;
- Earnings opportunity ("EO") payout of $115,001,049 at the target level of performance and $167,485,043 payout at the maximum or capped level of performance. Appendix 2, Schedule JAR-r2; and
- Mid-cycle check as a result of October, 2020 IRP.

Staff Expert Witness: John A. Rogers

[10] From page 33 of the Plan: With the longer 6-year term in MEEIA 2019-24 and the need to obtain additional knowledge on the effectiveness of the MEEIA 2016-18 transition plan, the Company will lead discussions with interested regulatory stakeholders about implementing a MEEIA 2019-24 transition plan [for long lead time business energy efficiency projects] by the end of the third program year.

C. Summary of Ameren Missouri's MEEIA Cycle 1 and MEEIA Cycle 2

After two years of experience with pre-MEEIA energy efficiency programs, on January 20, 2011, Ameren Missouri filed its MEEIA Cycle 1 application in Case No. EO-2012-0142. On August 1, 2012, the Commission issued its *Order Approving Unanimous Stipulation And Agreement Resolving Ameren Missouri's MEEIA Filing And Approving Stipulation And Agreement Between Ameren Missouri And Laclede Gas Company*, which approved Missouri's first MEEIA programs and DSIM including:

- Eleven (11) DSM programs for a 3-year period, beginning January 2, 2013 and ending December 31, 2015, and portfolio level 793,100 MWh cumulative annual energy savings target and 174 MW cumulative annual demand savings target;
- Total 3-year budget of $154,426,291;
- TRM including first year deemed[11] annual gross energy and demand savings;
- EM&V plan;
- TD component of a DSIM which provided 26.34% of deemed net shared benefits to Ameren Missouri to compensate Ameren Missouri for estimated lost fixed cost recovery due to DSM programs; and
- Performance incentive ("PI") component of a DSIM which provided Ameren Missouri with a percentage of net shared benefits as a result of Cycle 1 final EM&V. In its November 2, 2016 *Order Approving Stipulation And Agreement Regarding Performance Incentive Award* in Case EO-2012-0142, the Commission approved a Cycle 1 PI of $28,246,579.[12]

With the exception of the PI, Cycle 1 results are summarized on Appendix 2, Confidential Schedule JAR-r3, which is page 6 of Ameren Missouri's Surveillance Monitoring Report for the Quarter Ended, 12 Months Ended and Cumulative Ended December 31, 2015. Also see Table 1 below for Cycle 1 actual results.

On December 22, 2014, Ameren Missouri filed, in Case No. EO-2015-0055, its MEEIA Cycle 2 application, which included a DSIM modeled after its Cycle 1 DSIM. On October 22, 2015, the Commission issued its *Report and Order* rejecting the Utility Stipulation.[13]

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[11] Deemed Savings are pre-determined, validated estimates of annual energy and demand savings attributable to energy efficiency measures contained in the utility's TRM.

[12] Performance incentive will increase as a result of the July 3, 2018 Opinion of the Supreme Court of Missouri in Case No. APSC96222.

[13] Amended Non-Unanimous Stipulation and Agreement Regarding Ameren Missouri's MEEIA Cycle 2 is Item No. 119 filed on July 8, 2015 in Case No. EO-2015-0055.

The Commission cited the following reasons for rejection of Ameren Missouri's Cycle 2 proposed plan:

- [T]he Commission would approve a MEEIA plan if non-participating ratepayers would be better off paying to help some ratepayers reduce usage than they would be paying a utility to build a power plant. Unfortunately, that is not the case here.
- [T]he Utility Stipulation lacks retrospective EM&V. Without it, Ameren Missouri would have the perverse incentive to implement programs with high deemed energy reductions, but low actual energy reductions. Perhaps more importantly, it is clear Ameren Missouri has been over-compensated under Cycle 1, and it is almost certain the over-compensation would be exacerbated under the Utility Plan.
- Finally, the performance incentive in the Utility Stipulation lacks a component relating to a reduction of supply-side investment. Without such a component, ratepayers could continue to pay depreciation and rate of return on supply side investments, and then pay again for performance incentives on demand-side programs. … the Commission cannot approve a plan that rewards the company for reductions in demand without requiring the company to show it has foregone supply-side earnings related to that reduction in demand.

After extensive settlement discussions, several parties filed a Non-Unanimous Stipulation and Agreement on February 5, 2016, that resulted in full and final resolution of all issues in the case. On February 10, 2016, the Commission issued its *Order Approving Non-Unanimous Stipulation* approving Ameren Missouri's MEEIA Cycle 2. MEEIA Cycle 2 includes:

- Thirteen (13) DSM programs for a 3-year period, beginning March 1, 2016 and ending February 28, 2019, and portfolio level 614,980 MWh cumulative annual energy savings target and 167 MW cumulative annual demand savings targets for each program;
- Total 3-year programs budget of $163,190,000;
- TRM including first year deemed annual gross energy and demand savings;
- EM&V plan;
- TD which compensates Ameren Missouri for estimated lost fixed cost recovery due to DSM programs based upon final EM&V first year energy savings for each installed efficiency measure times the margin revenue for each rate class approved in the last general rate case; and
- EO as a result of Cycle 2 final EM&V and the Cycle Earnings Opportunity Matrix which has a 100% of target payout of $27,801,935 and a capped maximum payout of $39,212,516. Appendix 2, Schedule JAR-r4.

Results for the first 25 months of MEEIA Cycle 2 are summarized on Appendix 2, Confidential Schedule JAR-r5 which is page 6 of Ameren Missouri's Surveillance Monitoring Report for the

Quarter Ended, 12 Months Ended and Cumulative Ended March 31, 2018. Also see Table 1 below for Cycle 2 actual results for first 25 months and for the 36 month Cycle 2 plan.

Staff Expert Witness: John A. Rogers

D. Comparison of Ameren Missouri's MEEIA Cycle 1, Cycle 2 and Cycle 3

The following table summarizes the costs for MEEIA charges on customers' bills for Cycle 1, Cycle 2 and proposed Cycle 3 as well as the gross deemed first year annual energy and demand savings of each cycle.

Table 1

Summary of Ameren Missouri MEEIA Cycles 1, 2, and 3

	Cycle 1 Actual	Cycle 2 Actual	Cycle 2 Approved Plan	Cycle 3 Proposed Plan
Months	36	25	36	70
Cycle Programs Cost ($ Millions)	$ 133.9	$ 84.9	$ 163.2	$ 550.0
Cycle TD Cost ($ Millions) (3)	$ 159.7	$ 17.9	$ 33.0	$ 174.0
Cycle PI or EO Cost ($ Millions)	$ 28.2	$ 19.3	$ 27.8	$ 115.0
Total Cost ($ Millions)	$ 321.8	$ 122.1	$ 224.0	$ 839.0
Annualized Programs Cost ($ Millions)	$ 44.6	$ 40.8	$ 54.4	$ 94.3
Annualized TD Cost ($ Millions)	$ 53.2	$ 8.6	$ 11.0	$ 29.8
Annualized PI or EO Cost ($ Millions)	$ 9.4	$ 9.3	$ 9.3	$ 19.7
Annualized Total Cost ($ Millions)	$ 107.3	$ 58.6	$ 74.7	$ 143.8
Cycle Energy Savings (MWh)	1,156,630	536,491	614,980	1,958,132
Cycle EE Demand Saving (MW) (1)	144	180	167	605
Cycle DR Demand Saving (MW) (2)	0	0	0	380
Cycle Demand Saving (MW)	144	180	167	985
Annualized Energy Savings (MWh)	385,543	257,516	204,993	335,680
Annualized EE Demand Savings (MW) (1)	48	87	56	104
Annualized DR Demand Savings (MW) (2)	0	0	0	65
Annualized Demand Savings (MW)	48	87	56	169

(1) EE means Energy Efficiency Programs
(2) DR means Demand Response Programs
(3) Cycle 2 TD for Approved Plan is estimated to be $33 Million.

Staff Expert Witness: John A. Rogers

E. Current Adopted Preferred Resource Plan

Ameren Missouri's 2017 IRP, Case No. EO-2018-0038, is vitally important to Staff's review of the Plan.[14] Staff's analysis of and recommendations concerning the Plan are most significantly impacted by the 2017 IRP's confidential 20-year capacity balance sheets for Ameren Missouri's adopted preferred resource plan, Plan A (RAP DSM),[15] and a plan with no new demand-side programs after Cycle 2, Plan G (No DSM).[16] (*See* Appendix 2, Confidential Schedule JAR-r6.)

The shortened versions[17] of the confidential capacity balance sheets for Plan A (RAP DSM) and Plan G (No DSM) show that the only differences between the two plans are the amounts of capacity savings from energy efficiency and demand response programs (highlighted in green) and the new combined cycle generators (highlighted in yellow).

Table 2

Capacity Balance Comparison: Plan A (RAP EE &DR) and Plan G (No DSM)

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[14] Near the bottom of page 11 of the Plan, Mr. Davis states: "MEEIA's underlying policy is to allow the implementation of programs that reflect valuing demand-side investments equal to supply-side investments with the goal of achieving all cost-effective demand-side savings. Ameren Missouri's 2017 IRP is the most relevant tool to define all cost-effective demand-side savings."

[15] Plan A is also referred to as Plan 2 in the 2017 IRP.

[16] Plan G is also referred to as Plan 8 in the 2017 IRP.

[17] Existing Sales and Load on shortened version of capacity balance sheet = Ameren Missouri Forecasted Peak X (100% + % Reserve Margin) on Appendix 2, Confidential Schedule JAR-r6.

Plan A (RAP DSM) assumes that ongoing MEEIA cycles will be approved by the Commission, has ** ________________ ** excess capacity in 2018[18] and increases to a maximum of ** ______________ ** excess capacity in 2033 prior to the planned retirement of the 970 MW Sioux generating station. See confidential Chart 1 and confidential Chart 2.

Chart 1 **Chart 2**

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The 2017 IRP states:

> If the capacity shortfall in a given year met or exceeded the build threshold, then supply side resources would be added to eliminate the shortfall. The build threshold is determined to be 300 MW (based on half the size of a combined cycle) regardless of the type of supply side resource under consideration. … Ameren Missouri has assumed reliance on short-term capacity purchases to cover shortfalls that are less than the build threshold and has assumed that any long capacity position would be sold into the market.[19]

Staff interprets the 300 MW threshold to mean the capacity balance would have to be minus 300 MW before a 600 MW CC would be built. Thus, from 2024 – 2033 Ameren Missouri effectively has excess capacity of ** _______ ** MW before the "build threshold" is hit.

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[18] Excess capacity is the amount or percentage of Ameren Missouri supply-side resources which are in excess of 1) Ameren Missouri's coincident peak hour load less demand savings from energy efficiency and demand response programs and 2) a reserve margin of 15.7%.

[19] Ameren Missouri 2017 IRP, Chapter 9 Integrated Resource Plan and Risk Analysis, page 6.

Ameren Missouri is long on capacity, even with no new demand-side resources, until 2034 when the 970 MW Sioux generating station is retired. This analysis shows that 2034 is the first time Ameren Missouri would have the opportunity to “avoid” an investment in supply-side resources; thus valuing demand-side investments equal to traditional investments in supply and delivery infrastructure.

Staff Expert Witness: John A. Rogers

F. Missouri Renewable Energy Standard Compliance Plan

The Missouri Renewable Energy Standard ("RES")[20] was enacted as a voter initiative petition in November 2008. Provisions of the resulting statute and Commission rule[21] require Ameren Missouri (and the other investor-owned utilities) to meet certain requirements regarding the use of renewable energy while not exceeding the one percent (1%) retail rate impact limit (RRI). However, the RES requirements are a baseline for renewable investment, nothing in the rule prohibits the utilities from prudently investing in renewable energy above the rule and statute.[22]

Annually, the investor-owned utilities file a RES compliance plan,[23] which provides information regarding the utility’s plan for RES compliance for the current calendar year and the subsequent two (2) calendar years. In its most recent plan, filed April 15, 2018, Ameren Missouri generally describes its planned RES compliance activities. These activities include finalizing several wind projects, totaling at least 700 MW and anticipated to be operational by the end of 2020 and REC purchases in the 2019-2020 timeframe.

The table below summarizes the Company’s planned RES compliance and RRI over the past three years:

[20] Mo. Rev. Stat. § 393.1020 (2000).
[21] 4 CSR 240-20.100.
[22] See Comment #12 in the Order of Rulemaking, EX-2010-0169.
[23] Rule 4 CSR 240-20.100(8), Electric Utility Renewable Energy Standard Requirements, Annual RES Compliance Report and RES Compliance Plan.

Table 3

File Number	RRI Calculation Period	Planned Wind Additions (MW)	Planned Solar Compliance (MW)	RRI
EO-2016-0286	2016-2025	385	35	** ____________________ ____________________ **
EO-2017-0268	2017-2026	234	35	** ____________________ ____________________ **
EO-2018-0287	2018-2027	739	37	** __________ **

As shown in the table above, a major change occurred in the 2018 RES compliance plan filing compared to previous years. In accordance with 4 CSR 240-20.100(5)(D), the electric utilities scale down planned RES compliance activities such that planned additions do not exceed the 1% RRI. The significant increase in planned wind investment in the 2018 RES Compliance Plan is due to assumptions regarding ** ____ _____________ . **

Staff Expert Witness: Claire M. Eubanks, PE

III. Staff Analysis

A. Overarching Issues

a. Customer Perspective

i. Customer Experience

Ameren Missouri, through its customer surveys, has not demonstrated that offerings are beneficial to ***all*** of its customers or even desired by its customers. In response to Staff Data Request No. 0031 Ameren Missouri originally indicated that "Ameren Missouri does not receive specific customer responses from the evaluators." Staff attempted to understand what customers experience as participants and non-participants during the survey and through the existing programs by looking at the types of questions and responses from various customer surveys. Accordingly, Staff requested to see a sample of surveys conducted by Ameren Missouri's Evaluators to determine what motivates Ameren Missouri customers to participate in energy efficiency programs. Ameren Missouri obtained the surveys from the implementer per Staff's request in response to Staff Data Request No. 0031.1 and provided a sample of evaluation, measurement, and verification surveys that were collected during the required evaluation[24]. The information provided by Ameren Missouri did not demonstrate that customers want energy efficiency programs or offerings either in the Application or in the surveys. The survey questions reviewed did not ask questions about customer preferences or about any programs in which customers may be interested in participating in the future.

In a news article published June 5, 2018 by St. Louis Public Radio, Ameren Missouri Vice President of Customer Experience Tara Oglesby states, '"We are going to have a number of different programs that's going to help [customers] that's new and different than in the past," Oglesby said. "And we're also bringing back a program or two that we found they really favored."[25] In Staff Data Request No. 0030, Staff inquired about which programs Ameren Missouri was bringing back due to its belief that customers favored the programs and requested any supporting documentation and available data that demonstrates programs favored by customers are included in the MEEIA Cycle 3 Portfolio. Ameren Missouri responded that the Appliance Recycling program would return in the proposed portfolio and is the program which customers favored. Ameren Missouri responded the program is returning based on customer preference. In addition, Ameren Missouri stated, "Descriptions and estimated participation can be found in Appendix B – Program Templates." Appendix B – Program Templates[26] includes an estimated participation section; however, Staff cannot clearly determine customers' preferences based on Appendix B information. As discussed in Section III.A.a.iii. – Customer Participation, Staff is concerned with the lack of supporting documentation provided to support program participation estimates. According to Ameren Missouri, 8% of customer inquiries during 2017 and 2018 on energy efficiency (directed to the Ameren Missouri Energy Advisor group[27]) inquired about recycling their old refrigerator or other appliance. Staff analyzed call center notes

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[24] 4 CSR 240-20.093(8) Demand-Side Programs Investment Mechanisms.

[25] Eli Chen, Ameren Missouri proposed a six-year program to cut customers' energy costs, St. Louis Public Radio, http://news.stlpublicradio.org/post/ameren-missouri-proposes-six-year-program-cut-customers-energy-costs, June 5, 2018, p. 2.

[26] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan.

[27] The Ameren Missouri Energy Advisor group is a division of the contact center in which calls related to energy efficiency and other topics are routed. There are nine employees in this group which have additional training to help better answer specific questions.

and “Summaries of the Energy Advisor calls”. Staff was unable to determine if the inquires demonstrated that customers wanted this program to return. The notes did not clearly indicate Ameren Missouri customers wanted the program to return and only appear to be inquiries about what programs were available or when programs expired that were previously offered.

It appears Ameren Missouri relied more on its potential studies to identify possible energy efficiency programs and not on customer surveys. In response to Staff Data Request No. 0033.1, Ameren Missouri indicated that the potential study was a starting point for determining its future offerings. As discussed in Section III.A.a.ii. – Primary Research, there is concern that the primary research data used in Ameren Missouri’s potential studies is from 2013. Ameren Missouri further responded that request for proposals to implementation contractors provided proposals based on what can be achieved in addition to program designs. Ameren Missouri also relied on feedback about potential programs received by regulatory stakeholders and did not perform customer preference surveys, focus groups or questionnaires. Ameren Missouri stated that relying on concrete implementation proposals from a competitive procurement process would bring executable program designs for consideration. Although Staff agrees these criteria should all be considered, Staff recommends that Ameren Missouri begin working with the evaluators and program implementers to collect additional data on customer participation and preferences through survey results or topic groups to help gauge what customers want and in what programs they may be willing to participate. Ameren Missouri should analyze and track survey information and work with the evaluators and implementers to continually improve survey instruments. Ameren Missouri should continue educating customers of all income levels on what programs are available to them. Program effectiveness will benefit from research that captures customer preference and experiences.

Staff Recommendations Regarding Data Collection

Staff recommends Ameren Missouri work with the evaluators and implementers to collect information on customer preferences, desired programs or measures and barriers that may keep customers from participating in programs. Data that could be collected through program evaluation should include income level, rental versus owner status, multifamily versus single family and zip code. Demographic information can help with program design and marketing and outreach strategies.

Data should be collected on participants and non-participants. The data collection would enable Ameren Missouri to assess which programs are beneficial to different segments of customers and especially to customers that may be experiencing high energy burdens[28]. "The median energy burden is 3.3% for all U.S. households, 3.1% for metropolitan households, and 4.4% for rural households."[29] Including and tracking this data would be helpful to determine which programs most customers would prefer and would help determine their eligibility in programs. The data collection and tracking would help with marketing and development of programs designed to benefit all customers and hopefully increase participation in all segments.

Discussion of Societal Benefits and Customer Attitudes toward Energy Efficiency Programs

In general, customers appear to want energy efficiency programs. Research indicates there are benefits attributed to energy efficiency. Societal benefits include improved health and safety, investment in the local economy and local job creation. Participant benefits include reduced risk of utility rate increases and reduced costs associated with arrearages and shutoffs. "Energy efficiency not only impacts energy affordability through lower bills but can also lead to improvements in household health. Energy efficiency upgrades in homes can reduce triggers of respiratory illnesses, such as mold exposure to cold air or sudden temperature changes, air pollution, and pollen (May Clinic 2018)."[30] Although Staff is not an expert on all benefits associated with energy efficiency programs, and those benefits are difficult to quantify, studies recognize there are societal benefits to energy efficiency. However, these benefits are not demonstrated in the Application and supporting work papers as Staff discusses in this Report.

According to American Council for an Energy-Efficient Economy, ". . . participants are likely to benefit most from energy efficiency programs. They receive the immediate benefits of

[28] Energy burden as defined by Energy Efficiency For All and American Council for an Energy Efficient Economy, the percentage of gross household income spent on energy bills. Ariel Drehobl and Lauren Ross, Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities, April 2016, p.7.

[29] Lauren Ross, Ariel Drehobl, and Briand Stickles, The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency, Energy Efficiency for All and American Council for an Energy Efficient Economy, July 2018, p. 15.

[30] Lauren Ross, Ariel Drehobl, and Briand Stickles, The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency, Energy Efficiency for All and American Council for an Energy Efficient Economy, July 2018, p. 10.

bill reductions, improved comfort, higher home or business value, and others." [31] Participants must also invest time and take full advantage of financial incentives or technical assistance and they must incur the often costly out-of-pocket expenses.[32] "Energy efficiency's multiple benefits are large and varied. Efficiency program stakeholders almost always concede that multiple benefits exist, but problems remain with detection measurement, and documentation of those benefits."[33] There are opportunities for additional data development regarding benefits and participation.

While most customers recognize the benefits to investing in energy efficiency, their willingness and ability to pay for benefits varies. According to a survey conducted by Greentech Media[34], a large percentage of consumers expressed interest in some type of smart-grid offering. The survey revealed there is a lot of interest in programs; however, actual participation rates are low. In all the segments that were surveyed, one in five customers participated in at least one utility program and thirteen percent have used at least one smart-grid enabled product. The highest participation occurred in online billing and payment (40 percent), energy use comparison tools (9 percent), and smart thermostats (9 percent). The biggest obstacle in trying to increase participation is that technologies can be complex and expensive. Further, a large portion of those who may wish to participate are unable to do so without additional disposable income to afford the upfront investment. "Millennials represent one of the biggest opportunities for electricity-sector stakeholders."[35] The survey found the cost to participate in energy efficiency for a large number of millennials along with the fact many are renters can be a large barrier in adopting energy efficiency. Customer education and the ability to offer attractive programs may be more easily accomplished if more in-depth surveys are conducted and data is collected to determine what customers want and the programs they are willing to participate.

[31] Brendon Baatz, Everyone Benefits: Practices and Recommendations for Utility System Benefits of Energy Efficiency, American Council for an Energy Efficient Economy, June 2015, p. 1

[32] Brendon Baatz, Everyone Benefits: Practices and Recommendations for Utility System Benefits of Energy Efficiency, American Council for an Energy Efficient Economy, June 2015, p. 1

[33] Christopher Russell, Brendon Baatz, Rachel Cluett and Jennifer Amann, Recognizing the Value of Energy Efficiency's Multiple Benefits, American Council for an Energy Efficient Economy, December 2015, p. 41.

[34] Julia Pyper, Survey: What Electricity Customers Really Want, Greentech Media, https://www.greentechmedia.com/articles/read/survey-what-electricity-customers-really-want#gs krzU9mU, June 09, 2017, pp. 3-4.

[35] Julia Pyper, Survey: What Electricity Customers Really Want, Greentech Media, https://www.greentechmedia.com/articles/read/survey-what-electricity-customers-really-want#gs krzU9mU, June 09, 2017, pp. 3-4.

There is an opportunity for industry stakeholders to educate consumers and provide incentives that help encourage participation.

Customer satisfaction may improve with energy efficiency offerings. "Survey data suggests that energy efficiency programs contribute significantly toward customer satisfaction. The desire to improve customer satisfaction can motivate utilities to offer or expand energy efficiency programs. Utilities should increase customer awareness of existing energy efficiency programs. Utilities can expand energy efficiency programs to increase customer satisfaction."[36] "Customers who understand that they have access to tools to help them manage their overall bills would logically be more satisfied than customers who don't know how or where to find help. In a time of increases upward pressure on utility rates, giving people assistance in managing bill through energy efficiency should be an important motivation to regulators and utilities." [37]

Staff Expert Witness: Tammy Huber

ii. Primary Research

Ameren Missouri contracted with GDS Associates, Inc. ("GDS") to perform a Demand-Side Management Market Potential Study. GDS's final report was concluded at the end of 2016. GDS subcontracted with EMI Consulting to review and update the market research content provided in EnerNOC Utility Solutions Consulting's *Demand-Side Management Market Potential Study, Volume 2: Market Research* published December 20, 2013.[38] The market research task consisted of a comprehensive review and analysis of all relevant existing data (primary and secondary) without the development of new data generated through primary research with Ameren customers—the method used in previous studies. The market research approach: 1) leveraged existing data from Ameren Missouri on the results of three years of energy efficiency program implementation (2013, 2014, and 2015); 2) relied upon secondary research and analysis rather than primary data collection and survey research; and 3) considered the energy efficiency program implementation results of leading utilities with similar customers

[36] Katrina Pielli, Larry Mansueti, Joe Bryson, Impacts of Energy Efficiency Programs on Customer Satisfaction, Technical Brief State & Local Energy Efficiency Action Network, www.seeaction.energy-gov , October 2011, p. 1.
[37] Katrina Pielli, Larry Mansueti, Joe Bryson, Impacts of Energy Efficiency Programs on Customer Satisfaction, Technical Brief State & Local Energy Efficiency Action Network, www.seeaction.energy-gov , October 2011, p. 2.
[38] Case No. EO-2015-0084, EFIS Item No. 1 Electric Utility Resource Filing of Union Electric Company d/b/a Ameren Missouri (NP and HC), chapter 8-appendix b-vol 2.pdf.

and characteristics.[39] Ameren Missouri's proposed Cycle 3 energy efficiency programs would run from March 1, 2019 – December 31, 2024. The proposed Cycle 3 6-year period of energy efficiency programs through 2024 are based on primary research data from 2013, in other words, primary research done 6 years prior to the commencement of the proposed Cycle 3 and eleven years prior to the conclusion of the proposed Cycle 3.

iii. **Customer Participation** (Section 393.1075.4 – beneficial to all customers)

Ameren Missouri estimates that there will be 650,000 "unique" participants participating in its MEEIA programs over the 6-year period of MEEIA Cycle 3. Staff's understanding of "unique" is that it takes into account customers participating in multiple programs so as to only count each customer once. This estimate is based on subjective assumptions made by Ameren Missouri. In response to Staff Data Request No. 0076.1, Ameren Missouri states that measure counts from the Residential Workpapers – Residential Submittal Tool were the starting point to determine participation for the Residential programs. This seems to imply that Ameren Missouri subjectively determined the measure counts for each program and then subjectively determined the participation numbers. The assumptions Ameren Missouri provided in response to Staff Data Request No. 0076.1 for residential program participation is provided in Appendix 2, Schedule BJR-r1 and summarized below from response to Staff Data Request No. 0076:

Residential	**Measure count***	**Unique participants**
Lighting	7,756,188	242,381
HVAC	47,838	47,838
Efficient Products	35,142	17,571
Energy Efficient Kits	120,000	60,000
**Home Energy Report	235,000	216,200
Multifamily Market Rate	31,685	15,843
Appliance Recycling	34,120	17,060
Total	**8,259,973**	**616,893**

[39] Case No. EO-2018-0038, EFIS Item No. 2 Request for Waiver of 60-Day Requirement (Attachments Public and Confidential), chapter 8 – appendix a.pdf.

assumed 8 bulbs per household and 75% participated in other MEEIA programs
total HVAC measures less ECMs
assumed 50% participated in other MEEIA programs
assumed 50% of kits go into homes that participated in other MEEIA programs
assumed 7% participated in other MEEIA programs per EM&V trends
assumes non kit measures were as a result of an upsell from the kit install. Also assumes that 50% participated in other MEEIA programs
assumed total measure count for fridge and freezer, excluded room AC and dehumidifier as joint pickup, also 50% participated on other MEEIA programs

Residential Income Eligible	
Multifamily	6,000
Single detached housing	12,000
Mobile Home	5,000
Efficiency Housing Grants	8,000
Total	**31,000**

Participant counts are based on RFP responses and discussions with potential implementation contractors.

Business Participants

Projects

	MEEIA II (36 Months)				MEEIA III (70 Months)			
	11M	2M	3M	4M	11M	2M	3M	4M
Custom	58	883	1,312	231	842	573	3,643	2,273
NC	7	51	55	11	4	17	88	122
RCx	9	1	12	12	107		36	62
SBDI		876				6,468		
Standard	24	1,764	1,674	184	271	4,215	6,273	1,558
SEM					12			4
Sub-Total (Completions)	98	3,575	3,053	438	1,236	11,273	10,040	4,019
Sub-Total (Forecast)	58	1,196	1,190	223				
Grand Total	156	4,771	4,243	661	1,236	11,273	10,040	4,019
GRAND TOTAL				9,831				26,568

Participants (Accounts)

	MEEIA II (36 Months)				MEEIA III (70 Months)			
	11M	2M	3M	4M	11M	2M	3M	4M
Custom	15	758	925	117	15	510	2,437	186
NC	2	45	49	5	2	17	88	122
RCx	1	1	12	10	1		15	32
SBDI		817				6,378		
Standard	3	1,538	875	53	3	3,621	3,385	122
SEM					12			4
Sub-Total (Completions)	21	3,159	1,861	185	33	10,526	5,925	466
Sub-Total (Forecast)	4	3,042	914	61				
Grand Total	25	6,201	2,775	246	33	10,526	5,925	466
GRAND TOTAL	9,247							16,950

The Business Program participation counts were supplied by the preferred business Program Administrator. No additional analysis was provided beyond this summary data.

Staff is concerned with the lack of supporting documentation and information provided in response to Staff Data Request Nos. 0076 and 0076.1 to support Ameren Missouri's program participation estimates. One concern of note is that the 235,000 participants assumed for the Home Energy Report ("HER") program are not participants by choice. In response to Staff Data Request No. 0071 Ameren Missouri states, "Customers will not be able to sign up or volunteer to be a participant in the Home Energy Report in order to maintain separation of the control group and treatment group for the study." This means that of the approximately 617,000 "unique" residential program participants, 35% are forced participants through the HER program, skewing the program participant estimates.

Staff Expert Witness: Brad J. Fortson

b. Technical Resource Manual

Ameren Missouri filed a Technical Resource Manual[40] ("TRM") with its MEEIA Cycle 3 Application. Ameren Missouri chose to use the statewide Technical Reference Manual ("statewide TRM")[41] as the foundation for its TRM. Further, Ameren Missouri states in its proposed TRM that, "To create a transparent and clear path from Ameren Missouri-TRM-2019-24 to the actual savings calculations for prescriptive measures, Ameren Missouri created Excel-based workbooks that detail the algorithms and associated input values with formulas intact."[42] Staff has reviewed Ameren Missouri's proposed TRM. As a result of Staff's limited review, Staff's only concern at this time is that the measures offered in the Application that are not cost-effective should not be included in Ameren Missouri's TRM or the excel-based workbooks.

Staff Expert Witness: Brad J. Fortson

c. Evaluation, Measurement and Verification (Section 393.1075.3.(3))

Staff recently raised a concern with Ameren Missouri as a result of Ameren Missouri (and not Ameren Missouri's independent EM&V contractors, Cadmus Group, Inc. and ADM Associates, Inc.) performing cost-effectiveness analyses using the DSMore model for PY2017. Ameren Missouri responded that this is not a new approach, but rather it was identified as the approach to be followed within the original MEEIA Cycle 2 plan, and was documented within the PY2016 Residential EM&V reports with the following language:

> Ameren Missouri determined the program's cost-effectiveness using DSMore (a financial analysis tool designed to evaluate the costs, benefits, and risks of demand-side management [DSM] programs and services).

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[40] EFIS Item No. 4, appendix g – trm-vol1_overview_and_user guide, appendix h – trm-vol2_bus.pdf, and appendix i – trm-vol3_res.pdf.

[41] https://energy.mo.gov/sites/energy/files/MOTRM2017Volume3.pdf.

[42] EFIS Item No. 4, appendix g – trm-vol1_overview_and_user guide, page 4.

In MEEIA Cycle 1, Ameren Missouri paid approximately $95,000 (which doesn't include PY2015 residential fees because the statement-of-work ("SOW") budget cap was reached) for EM&V directed cost-effectiveness analyses that were performed by a third party, Morgan Marketing Partners, for the 3-year period.

While Staff appreciates Ameren Missouri's interest in reducing the cost of conducting EM&V, Staff is concerned about the removal of an independent third party from calculating the program level annual net energy and demand savings and cost-effectiveness for EM&V. Staff is concerned about a potential conflict of interest arising from the utility performing its own savings calculations for its programs. The utility should not be responsible for determining financial rewards for the programs that it runs. To preserve the independence of Ameren Missouri's EM&V contractors, Staff recommends that in Cycle 3 and all future MEEIA cycles Ameren Missouri's independent EM&V contractors run the DSMore model to determine incremental annual energy and demand savings and program cost-effectiveness results.

Staff Expert Witness: John A. Rogers

d. Avoided Costs (Section 393.1075.3 – value demand-side investments equal to traditional investments in supply and delivery infrastructure)

i. Definition of Avoided Cost

By definition, an "avoided cost" presumes that absent an investment, a cost would actually be incurred by the utility. Ameren Missouri's proposed MEEIA Cycle 3 is based upon the assumption that avoided costs will provide customer savings through a decrease in the revenue required to provide safe, reliable and efficient electric service at just and reasonable prices. The avoided cost assumptions drive the benefits for all of the cost-effectiveness tests for all of the programs that have been proposed in the Application. Ameren Missouri's basis for these decreases to the revenue requirement contain several fundamental flaws that attempt to artificially attribute avoided cost savings for all demand-side measures even when there will not be actual avoided cost savings for many years. Ameren Missouri is not applying avoided costs correctly in its Application. According to 4 CSR 20.092 (1)(C) avoided costs are defined as:

> (C) Avoided costs or avoided utility costs means the **cost savings obtained by substituting demand-side programs for existing and new supply-side resources**. Avoided costs include avoided utility costs resulting from demand side programs' **energy savings and demand savings associated with generation, transmission, and distribution**

> **facilities including avoided probable environmental compliance costs**. The utility shall use the integrated resource plan and risk analysis used in its most recently adopted preferred resource plan to calculate its avoided costs; [Emphasis added.]

This rule[43] hinges on the presumption that absent demand-side programs the utility would have to invest in a new supply-side resource or continue to invest in existing supply-side resources in order to adequately serve customer needs. Thus, it is presumed the utility is able to avoid costs, through MEEIA, that would have to be incurred absent demand-side investments, which could provide value as a reduction in the revenue requirement. Ameren Missouri does not need to invest in additional supply-side resources until 2034. Therefore, Ameren Missouri does not avoid any supply-side investment prior to 2034 through implementation of MEEIA Cycle 3 or any demand-side resource investment. Under the Plan's currently proposed substantial investment in demand-side resources, Ameren Missouri will only defer the future investment in one 600 MW CC from 2034 to 2036. Said another way, no investment is needed until 2034, and then, if all assumptions in the Plan hold true for the next 16 years, Ameren Missouri will defer its investment in a 600 MW CC by two years. This deferral is demonstrated in the highlighted portions of the abbreviated capacity balances in the Confidential Table 4 below. As discussed in Section III.C. regarding benefits to all customers, the benefits that occur in later years are variable and difficult to predict accurately.

The following confidential charts compare the simplified capacity balance sheets for the adopted preferred resource plan with MEEIA Cycle 3 and no subsequent MEEIA cycles and Plan G (No DSM).

continued on next page

[43] 4 CSR 20.092 (1)(C).

Table 4

** ____

**

The rule[44] establishes three fundamental avoided utility costs that may result from demand-side programs' energy and demand savings: 1) avoided energy and demand savings associated with supply-side investment, 2) avoided investment in transmission and distribution facilities, and 3) avoided probable environmental costs. Ameren Missouri produced data sets for avoided energy costs, avoided capacity costs, avoided transmission costs, and avoided distribution costs. Except for avoided energy costs savings, Ameren Missouri has overstated and inappropriately applied each of the remaining types of avoided costs as benefits attributable to demand-side resources. Staff explains why Ameren Missouri's proposed avoided costs should not be monetized benefits in the following Avoided Capacity Costs Section and the Avoided Transmission and Distribution Costs Section.

[44] 4 CSR 20.092 (1)(C).

ii. Capacity Avoided Cost

Ameren contends that there is an avoided capacity cost associated with each kW saved by MEEIA Programs. However, a cost cannot be avoided if an investment is not necessary. Ameren should not have included any avoided capacity costs associated with demand side resources prior to 2034 when the utility would actually need additional capacity to meet the needs of its customers' and the MISO capacity reserve margin requirement. Ameren Missouri is not substituting demand-side programs for existing and new supply side resources to meet its current capacity needs. Rather, Ameren Missouri proposes to add demand-side resources regardless of need, which in the near term only creates more opportunity to make increased off-system sales prior to the planned future deferral of a supply-side resource.

While it is possible for a utility to realize avoided capacity costs whenever it needs capacity to meet its customers' needs or to meet RTO resource planning requirements, Ameren Missouri has no current capacity needs for either and will not need capacity for 16 years. An avoided cost under the Plan assumes that absent an investment, a cost would actually be incurred by the utility. Ameren Missouri's current capacity position greatly exceeds the needs of its customers, and if Ameren Missouri continues to invest in demand-side resources at the currently proposed levels, Ameren Missouri will continue to remain long on its capacity balance sheet[45] for the entire 20 year planning horizon required by 4 CSR 240-22. In some years within the planning horizon, Ameren Missouri will exceed the capacity needs of its customers by more than ** __ **, as discussed further in Section II.E. - Current Adopted Preferred Resource Plan.

Ameren Missouri is a member of Midcontinent Independent Service Operator (MISO). Each member utility within MISO is required to meet planning reserve margin requirement which requires the utility to be able to meet the needs of its customers' coincident peak load plus about 15%.[46] According to Ameren Missouri's integrated resource modeling and load forecasts, Ameren Missouri will not need any additional capacity to meet either its customers' needs or the MISO capacity margin requirement until after 2033 when the 970 MW Sioux Energy Center is retired. Thus, Ameren Missouri will not avoid any cost of capacity until 2034. The table below

[45] The capacity balance sheet is a measure of a utility's ability to meet the capacity needs of its customers including RTO planning reserve margin requirements. Capacity balance sheets are required for each alternative resource plan by 4 CSR 22.060(4)(B)9.

[46] This required value varies slightly between 15.3% and 15.7% through 2026. Ameren Missouri assumed 15.7% for the remaining years of the planning horizon in its latest Integrated Resource Plan.

contains the avoided capacity costs that Ameren Missouri utilized to estimate the benefits associated with each kW saved from demand-side programs throughout the measure lives[47].

Table 5

Avoided Capacity Cost

Year	$/kW-year	Year	$/kW-year
2019	19.883	2029	95.197
2020	25.144	2030	97.665
2021	30.67	2031	99.093
2022	41.479	2032	99.768
2023	52.29	2033	99.981
2024	62.225	2034	99.997
2025	70.745	2035	100.048
2026	79.253	2036	100.316
2027	86.153	2037	100.924
2028	91.429		

Ameren Missouri uses the projected market price of capacity that results from modeling software called MIDAS. While this method of estimating avoided capacity costs may be appropriate if Ameren Missouri was in balance or short on its respective capacity balance sheet, it is not appropriate to do so when the utility has no capacity shortfalls and has much more than enough capacity to serve its customers with safe, reliable and efficient electric service at just and reasonable prices. 4 CSR 20.092 (1)(C) explicitly states that only those savings that are attributed to "substituting demand-side programs for existing and new supply-side resources" can be attributed as avoided costs.

Ameren Missouri is not substituting demand-side programs for existing and new supply-side resources to meet its current capacity needs. Rather, Ameren Missouri proposes to add demand-side resources regardless of need, which in the near term only creates more opportunity to make increased off-system sales prior to the planned future deferral of a supply-side resource.

As part of its Application, Ameren did not supply analysis that demonstrates the savings from substituting demand-side programs for existing and new supply-side resources. Instead, Ameren Missouri has relied upon analysis that grossly overstates what the potential savings could be which violates the fundamental objective of long-term resource planning as required by

[47] Measure lives are the length of time that measures are expected and assumed to provide energy or demand savings.

4 CSR Chapter 22. Ameren Missouri did not evaluate demand-side resources equal to supply-side resources as required by 4 CSR 22.010 (2)(A). The fundamental objective of this rule requires the utility to,

> (A) Consider and analyze demand-side resources, renewable energy, and supply-side resources **on an equivalent basis**, subject to compliance with all legal mandates that may affect the selection of utility electric energy resources, in the resource planning process;
> [Emphasis added.]

There are several reasons that the language within this rule is vital to appropriate long-term planning. First and foremost is the statutory requirement as written in Section 393.1075.3, which states:

> 3. It shall be the policy of the state to **value demand-side investments equal to traditional investments in supply and delivery infrastructure** and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs. In support of this policy, the commission shall:
> (1) Provide timely cost recovery for utilities;
> (2) Ensure that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains or enhances utility customers' incentives to use energy more efficiently; and
> (3) Provide timely earnings opportunities associated with cost-effective measurable and verifiable efficiency savings.
> [Emphasis added.]

By its own account, Ameren Missouri has not valued demand-side investments equal to traditional investments in supply and delivery infrastructure. In its responses to Staff data requests, Ameren Missouri states that it "allowed demand-side management to be implemented prior to the Company needing capacity to meet RTO requirements." [48] Ameren also stated that the company "did not consider delaying implementation of demand-side resources until the capacity balance equaled zero."[49] Meanwhile, for supply side resources Ameren "assumed implementation in the year that its capacity balance would be -300MW or less."[50]

[48] Response to Staff Data Request No. 0004.
[49] Response to Staff Data Request No. 0005.
[50] Response to Staff Data Request No. 0004.

Further to the point, Ameren Missouri failed to consider modeling alternative resource plans, including additional supply-side resources[51] prior to needing supply-side resources to meet MISO capacity requirement or nearing a zero capacity balance:

> Ameren Missouri does not engage in speculative generation business activities; therefore, it has not analyzed a combined cycle power plant built in 2019-2020 timeframe when it does not have a capacity need to meet load and reserve requirements[52].

In the Application, demand-side investments are not being treated on an equivalent basis to traditional supply-side investments. Ameren Missouri has indicated it will not invest in supply-side resources unless it has a 300 MW deficit to service its customers or meet MISO planning reserve margin requirements. Ameren Missouri's statement that it "does not engage in speculative generation business activities" directly conflicts with its treatment of demand-side resources. Ameren Missouri will not consider building a supply-side resource if it is not necessary to meet resource adequacy standards; yet, Ameren Missouri proposed a six year demand-side portfolio at a point in time when the utility does not need any capacity to meet the needs of its customers or MISO resource adequacy requirements for more than 16 years. These two vastly different approaches to resource implementation are in direct conflict and do not comply with MEEIA statutory requirements. The Plan hinges on large known and verifiable costs but depends on highly variable and very uncertain purported benefits in later years to justify the programs. While Staff is not suggesting Ameren Missouri embark on speculative generation business activities, generally speaking, if a company built a supply-side resource in excess of need based on analysis that the resource would be cost effective, all customers would potentially benefit from the increased off-system sales revenues through lower base factor rates and the sharing mechanism of the Fuel Adjustment Clause. However, implementing demand-side resources well in excess of need leads to a reduction in participant cost while increasing non-participant costs. Creating a detriment to non-participants is in direct conflict of the statutory requirement further discussed in Section III.C. regarding benefits to all customers.

[51] Natural gas combined cycle combustion turbines or additional wind turbines.

[52] Response to Staff Data Request Nos. 0006 and 0024.

Section 393.1075.3 states:

> 3. It shall be the policy of the state to **value demand-side investments equal to traditional investments in supply and delivery infrastructure** and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs. In support of this policy, the commission shall:
>
> (1) Provide timely cost recovery for utilities;
>
> (2) Ensure that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains or enhances utility customers' incentives to use energy more efficiently; and
>
> (3) Provide timely earnings opportunities associated with cost-effective measurable and verifiable efficiency savings.
>
> [Emphasis added.]

Throughout its Application, Ameren Missouri failed to comply with the statutory requirements of Section 393.1075.3 in that Ameren has not treated or valued demand side resources in an equivalent manner to supply side resources. Ameren Missouri has requested that the Commission allow it to recover all of its program costs, all potential missed earnings opportunities, and the revenue that could have been received, by Ameren Missouri's calculation, absent any capacity need for implementing demand-side measures. Ameren Missouri has failed to demonstrate that it has met the first requirement of the statute which is to value demand-side investments equal to traditional investments in supply and delivery infrastructure. The approach taken by Ameren in its treatment of demand-side investments and supply-side investments does not allow the utility, Staff, other intervenors, or the Commission to evaluate the appropriateness of the proposed programs. Due to Ameren Missouri's failure to meet the requirements of the Commission's rule and the MEEIA statutory requirement to treat demand-side investments equal to traditional supply and delivery infrastructure investments, Staff recommends that the Commission reject Ameren Missouri's Application.

iii. Transmission and Distribution Avoided Cost

Ameren Missouri contends that there are avoided transmission and distribution ("T&D") costs associated with each kW saved by the proposed MEEIA Programs. While it is possible for a utility to realize avoided transmission and distribution costs whenever it needs to invest in additional transmission infrastructure or distribution infrastructure to serve its customers' needs, Ameren Missouri does not currently need to invest in transmission infrastructure or distribution infrastructure to meets its customers' needs.

The need for transmission infrastructure and distribution infrastructure investments are common for a utility that has load growth because the transmission and distribution systems as built may not be adequate to provide safe, reliable and efficient electric service at just and reasonable prices. However, Ameren Missouri has experienced little load growth and little growth in customers in recent years. The table below titled Previous IRP Peak Demand Forecasts and Actual Historical Peaks (MW)[53] demonstrates that Ameren Missouri does not expect a sharp increase in peak load.

continued on next page

[53] The data utilized for this table is from a table titled Previous IRP Peak Demand Forecasts and Actual Historical Peaks (GWh). Pages 232 and 233 of Chapter 3 Appendix A from Ameren Missouri IRP filing in Case No. EO-2018-0038. Staff corrected the labeling from GWh to MW. This information is also included in graphical format on page 3 of Appendix 2, Schedule JAR-r7.

Table 6

Previous IRP Peak Demand Forecasts and Actual Historical Peaks (MW)

Year	Actual	2017 IRP	2014 IRP	2013 Update	2012 Update	2011 IRP	2008 IRP	2005 IRP
2006	8,446							8,396
2007	8,638						8,553	8,489
2008	8,228						8,643	8,582
2009	7,688						8,619	8,543
2010	8,353						8,724	8,636
2011	8,384						8,831	8,729
2012	8,423			7,999	8,056	8,501	8,932	8,822
2013	7,736			8,039	8,165	8,565	9,043	8,915
2014	7,775		8,004	8,078	8,227	8,610	9,149	9,008
2015	7,648		8,015	8,111	8,280	8,668	9,258	9,101
2016	7,329	7,329	8,030	8,138	8,322	8,728	9,360	9,194
2017		7,404	8,029	8,181	8,388	8,785	9,483	9,287
2018		7,381	8,046	8,237	8,484	8,855	9,602	9,380
2019		7,362	8,072	8,291	8,570	8,943	9,722	9,473
2020		7,359	8,074	8,311	8,608	9,018	9,833	9,566
2021		7,367	8,105	8,380	8,691	9,098	9,959	9,659
2022		7,393	8,152	8,447	8,765	9,181	10,080	9,752
2023		7,411	8,191	8,507	8,843	9,265	10,203	9,845
2024		7,437	8,243	8,574	8,926	9,352	10,320	9,944
2025		7,450	8,267	8,629	8,981	9,436	10,461	
2026		7,467	8,322	8,701	9,043	9,527	10,595	
2027		7,490	8,401	8,790	9,127	9,621	10,731	
2028		7,514	8,466	8,857	9,203	9,720	10,863	
2029		7,559	8,499	8,902	9,245	9,820	11,015	
2030		7,604	8,537	8,959	9,291	9,923	11,150	
2031		7,652	8,580					
2032		7,684	8,627					
2033		7,726	8,661					
2034		7,770	8,706					
2035		7,805						
2036		7,848						
2037		7,877						

Ameren Missouri's actual peak in 2012 of 8,423 MW is not forecasted to be exceeded for the entire planning period which ends in 2037. When Ameren Missouri conducts modeling for its Integrated Resource Plans, it assumes an economic life of transmission infrastructure equal to 55 years and an economic life of distribution infrastructure equal to 45 years. The chart above demonstrates that as of 2012, the infrastructure that Ameren Missouri had already invested in will continue to be adequate to serve its existing customers' needs. Absent an actual need for transmission infrastructure and distribution infrastructure investment caused by load growth, there are no transmission costs or distribution costs that are actually avoided by investments in demand-side resources.

Ameren Missouri demonstrates the relationship between load growth and distribution costs within the calculation of avoided distribution costs. In order to estimate the avoided distribution costs in its most recent triennial compliance filing,[54] Ameren Missouri utilized data for load growth between years of 2005 and 2014 as well as the distribution system investment amount for that time period. Ameren Missouri then applies a 2% annual escalation rate for each subsequent year of planning horizon. This calculation methodology demonstrates that distribution system investment is largely dependent on load growth of which Ameren Missouri has very minimal amounts within its current load forecast in its most recent integrated resource plan.[55] The avoided distribution costs calculated using the aforementioned methodology are the same avoided distribution costs that Ameren Missouri relied upon within the MEEIA Cycle 3 filing. In contrast to the current load forecast, the load forecasts conducted by Ameren Missouri between the 2005 and 2014 time frames estimated expected load growth that far exceeds Ameren Missouri's current forecast and actual historical energy sales and peak demand as demonstrated in Figure 3.2[56] and Figure 3.3[57] from Ameren Missouri's most recent triennial compliance filing.[58] As previously stated, the infrastructure that Ameren Missouri already invested in will continue for many years to be adequate to serve its existing customers' needs. A cost cannot be avoided if an investment is not necessary.

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[54] EO-2018-0038

[55] Case No. EO-2018-0038

[56] Page 5 of Chapter 3 from Ameren Missouri's triennial compliance filing in Case No. EO-2018-0038, which is page 2 of Appendix 2, Schedule JAR-r7.

[57] Page 6 of Chapter 3 from Ameren Missouri's triennial compliance filing in Case No. EO-2018-0038, which is page 3 of Appendix 2, Schedule JAR-r7.

[58] Case No. EO-2018-0038

Potential near term additional distribution investment costs will likely be attributed to new customers. It is unlikely that investment in demand side resources throughout the Ameren Missouri footprint will lead to avoided distribution system investments of this type. However, if Ameren were to apply the avoided distribution costs to any kW savings that result from MEEIA Cycle 3 programs, it should only apply the incremental cost savings that are based on equipment sizing differences due to kW savings attributed to new customers or replacement of equipment that is at the end of its useful lives. Ameren Missouri has not provided Staff any analysis that demonstrates an estimation of this type of savings. When asked for specific transmission and distribution upgrades that would be necessary absent MEEIA Cycle 3 programs, Ameren Missouri responded that, "*The requested information does not exist.*[59]" Therefore, Staff can only presume that there are no avoided transmission and distribution costs that are appropriate to apply as benefits due to the proposed demand side programs. The results of cost effectiveness tests for each program absent the overinflated avoided transmission and distribution costs are further discussed in Section III.D.a – Cost Effectiveness.

Ameren Missouri typically performs detailed transmission and distribution system planning for the following 3-5 years,[60] yet it states it cannot identify specific system upgrades that may be avoided due to implementation of demand-side programs. Additionally, in response to Staff Data Request No. 0077 Ameren Missouri confirms its programs are not designed in a manner to actually avoid identifiable transmission investment costs or distribution investment costs:

> Because demand side programs are voluntary on the part of customers, it is impractical to attempt to predict the specific locations of load reductions resulting from implementation of demand side programs. Detailed planning for specific locations would be speculative.

This response is concerning to Staff for two reasons. First, Ameren Missouri is unable to identify areas where distribution infrastructure upgrades can be avoided by utilizing demand-side resources. This inability to defer distribution infrastructure upgrades adds to Staff's reasoning that there are not any avoided distribution costs that will result from MEEIA Cycle 3. Second, Ameren Missouri does not appear to be designing its demand-side programs in a manner that

[59] Ameren Missouri Response to Staff Data Request No. 0079.
[60] Ameren Missouri Response to Staff Data Request No. 0077.

will actually defer system upgrades or, at least, minimize the upgrades necessary. This topic will be more thoroughly discussed in Section III.D.c.iv. – Demand Response Program Design.

Ameren Missouri utilized data from the 2005 through 2014 time frame for the estimation of avoided distribution costs. Very similar data was likely utilized to estimate the avoided distribution costs for the 2014 triennial compliance filing.[61] The resulting estimation is nearly identical to the results from the most recent triennial compliance filing[62] with costs simply being shifted forward by three years. The assumed avoided distribution costs for the 2014 integrated resource plan (IRP) and 2017 IRP can be found in Table 7 below.

Table 7

Avoided Distribution Costs from 2014 IRP and 2017 IRP

2014 IRP		2017 IRP	
Year	$/kW-year	Year	$/kW-year
2016	$ 17	2019	$ 17
2017	$ 18	2020	$ 17
2018	$ 18	2021	$ 18
2019	$ 18	2022	$ 18
2020	$ 19	2023	$ 18
2021	$ 19	2024	$ 19
2022	$ 19	2025	$ 19
2023	$ 20	2026	$ 20
2024	$ 20	2027	$ 20
2025	$ 21	2028	$ 20
2026	$ 21	2029	$ 21
2027	$ 21	2030	$ 21
2028	$ 22	2031	$ 22
2029	$ 22	2032	$ 22
2030	$ 23	2033	$ 22
2031	$ 23	2034	$ 23
2032	$ 24	2035	$ 23
2033	$ 24	2036	$ 24
2034	$ 25	2037	$ 24

[61] Case No. EO-2015-0084

[62] Case No. EO-2018-0038

Similar to avoided distribution costs, avoided transmission costs are heavily dependent on overall system load growth. Absent system load growth or changes to supply-side resource portfolios, there simply are not transmission projects that will be avoided by implementing demand-side programs. If designed correctly, demand-side programs could reduce the costs of transmission system upgrades. However, Ameren Missouri has not designed the programs included as part of the of MEEIA Cycle 3 Application to have site-specific incentives that would drive the costs of upgrades down and Ameren Missouri does not forecast load growth in excess of peak demand from 2012. Ameren Missouri's calculation of avoided transmission costs utilizes an assumption that there is load growth over a period of time. However, Ameren Missouri's load forecast assumes very little load growth over the planning horizon[63]. In fact during the planning horizon, Ameren Missouri's peak load forecast never exceeds the actual peak observed in 2012.

Given the long economic lives of transmission system equipment, Ameren Missouri already has infrastructure in place that is necessary to serve its customers' needs. The assumed avoided transmission costs for the 2017 IRP can be found in Table 8 below.

Table 8

2017 IRP Avoided Transmission Costs

$/kW-yr	Avoided Transmission
2016	$6
2017	$6
2018	$6
2019	$6
2020	$6
2021	$6
2022	$6
2023	$6
2024	$6
2025	$7
2026	$7
2027	$7
2028	$7

[63] 2018 through 2037.

$/kW-yr	Avoided Transmission
2029	$7
2030	$7
2031	$7
2032	$8
2033	$8
2034	$8
2035	$8
2036	$8
2037	$8

iv. Load Building Programs and Avoided Cost

In addition to the programs proposed within the MEEIA Cycle 3 Application, Ameren Missouri has also proposed additional load building programs[64] stating that through the implementation of the programs, customers would better utilize the system that is in place and provide benefits to customers. Ameren Missouri is requesting approval of its Application based on inappropriate avoided transmission and distribution costs concurrently with its request to implement a load building program to better utilize the distribution system as built. These programs' supposed benefits are in direct conflict with each other.

v. Summary of Avoided Cost Section

Ameren Missouri has overestimated the value of demand-side resources by applying avoided transmission and distribution costs to each kW saved by demand-side resources despite a lack of actual need to upgrade the system. Without an actual need to build transmission infrastructure or distribution infrastructure absent demand-side management, there are no avoided costs and, therefore, Ameren Missouri should not claim those "avoided costs" as benefits to customers when evaluating demand-side resources.

Further, the inclusion of avoided costs prior to Ameren Missouri actually needing capacity or needing to invest in infrastructure severely inflates the value of demand side resources and does not allow Ameren Missouri, the Commission, or Staff to properly analyze the reasonableness of the proposed programs. Exclusion of these avoided costs results in far fewer

[64] Electric Vehicle Charging Infrastructure Incentive Program and Efficient Electrification Program as part of Case No. ET-2018-0132

programs being cost effective as further discussed in Section III.D.a. – Cost Effectiveness and Section III.D.c.iv. – Demand Response Program Design.

Staff Expert Witness: J Luebbert

B. Analysis of 6-year cycle with mid-cycle IRP review

Under 393.1075 3 "It shall be the policy of the state to value demand-side investments equal to traditional investments in supply and delivery infrastructure and allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs."

Under 393.1075 4 "The commission shall permit electric corporations to implement commission-approved demand-side programs proposed pursuant to this section with a goal of achieving all cost-effective demand-side savings. Recovery for such programs shall not be permitted unless the programs are approved by the commission, result in energy or demand savings and are beneficial to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers."

Ameren Missouri witness, Bill Davis, testifies that Ameren Missouri's 2017 IRP is the most relevant tool to define all cost-effective demand-side savings. Staff agrees. However, when compared to a 3-year cycle, the "6-year Cycle 3 with mid-cycle IRP check" greatly increases risk for customers while decreasing risk to Ameren Missouri. Comparison of the annual required capacity, annual actual capacity, and annual capacity balance for Ameren Missouri's 2011 IRP and 2017 IRP illustrates that very dramatic changes have occurred in Ameren Missouri's IRP capacity positions in just six years.

The 2011 IRP included forecasted excess capacity to peak in 2017 at ** ____________ **. Ameren Missouri now expects to be from ** __________ ** long on capacity for much of the next 16 years until the 970 MW Sioux generating station is retired in 2034. Because demand response has no persistence from year-to-year and because Ameren Missouri's adopted preferred resource plan is expected to be from ** __________ ** long on capacity for the next 16 years, there are no avoided capacity costs[65] benefits from Cycle 3 demand response programs. Because Cycle 3 energy efficiency measures all have useful lives which mostly end prior to 2034 and because Ameren Missouri's adopted preferred resource plan

[65] http://www.businessdictionary.com/definition/avoided-cost html

is expected to be from ** __________ ** long on capacity prior to 2034, there are expected to be little, if any, avoided capacity costs benefits from Cycle 3 energy efficiency programs.

Chart 3

******

Chart 4

**

Staff concludes that the Cycle 3 energy efficiency and demand response programs will only produce avoided capacity costs benefits for customers if Ameren Missouri is able to sell capacity in the competitive marketplace (MISO) and such capacity sales are the direct result of the Cycle 3 programs. The timing of and revenue from such capacity sales are very uncertain and speculative over the next 16 years. The Cycle 3 energy efficiency programs are based on primary research data from Ameren Missouri's 2013 market potential study. Staff is concerned that primary research performed six years prior to the commencement of the proposed Cycle 3 Plan and eleven years prior to the end of the proposed Cycle 3 Plan may be outdated – especially during the last three years of the six year Cycle 3 - given the dynamic nature of the electricity marketplace, discussed below.

The value of MEEIA in the future is very uncertain as Missouri's electric utility regulatory model and electricity marketplace for Ameren Missouri (MISO) are expected to change significantly in upcoming years due to, but not limited to:

- Demonstrated economic advantages of wind resources;[66]
- Beneficial electrification (conversion of fuel powered equipment to electric charge powered);
- Distributed energy resources (primarily customer owned);
- Green tariff (allows company to build out 250 MW wind resources);
- Smart grid, AMI deployment, demand-side rate (for which Ameren Missouri currently has no plan for deployment in its IRPs or its Cycle 3 application);
- Cybersecurity;
- MISO energy prices;
- Changes to MISO's tariff; and
- Naturally occurring DSM including future changes to industry-driven efficiency standards.

Finally, in recent years demand-side resources have been losing their clear standing as the lowest cost resource, and may soon be replaced by renewable resources (wind and solar) as the lowest cost resources.[67]

Staff recommends that if the Commission approves a Cycle 3 plan, it be only 3 years in length.

Staff Expert Witness: John A. Rogers

C. Programs are not expected to provide benefits to all customers (Section 393.1075.4 – beneficial to all customers)

The Plan's Section **5.4 Impact on Customers** provides Ameren Missouri's assessment of the Plan's impact on: 1) annual revenue requirements (Figure 35), 2) DSIM annual bill impacts (Figure 36) and 3) DSIM annual rate impacts (Figure 37) for the period 2019 through 2044.

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[66] During its Agenda meeting on July 11, 2018, the Commission found Empire's Customer Savings Plan (CSP) to be reasonable in Case No. EO-2018-0092 and praised Empire for its vision and aggressiveness and encouraged other utilities to investigate this business strategy. Empire's CSP retires 198 MW Asbury coal generating station 16 years early, invests in 600 MW wind resources which have a 30-year life and are: 1) not needed to serve Empire's retail customers, and 2) expected to reduce all customers' bills over 20 – 30 years through added off-system sales revenues in the competitive electricity market place. On the other hand, Ameren Missouri has not included such a CSP-type resource plan in any of its Chapter 22 compliance filings, but should do so in light of the Commission's July 11, 2018, Report and Order in Case No. EO-2018-0092.

[67] http://www.raponline.org/blog/energy-efficiency-2-0-new-questions-same-answer/?utm_source=ZohoCampaigns&utm_campaign=US+RAPPORT+February+2018_2018-02-14_1&utm_medium=email

The Plan's Figure 35 "shows the annual cumulative costs and benefits of MEEIA 2019-24. It is apparent from the figure below that **the costs of the programs are borne by customers up front**, consistent with MEEIA's requirement for timely cost recovery, **but benefits continue to accrue for a long period of time following the end of the program implementation**. The benefits surpass the costs in total magnitude in 2026, and continue to grow for the useful lives of the installed measures."[68] [Emphasis added.]

Program costs, TD and EO are accounted for in the Rider EEIC and will be collected from customers with certainty. On the other hand, program benefits are uncertain and difficult to quantify even through best practices utilized by independent EM&V contractors. When benefits occur further and further in the future, as is the case with the Plan, they become more and more uncertain.

The Plan's Figure 35 proposes that cumulative net customer costs[69] are expected to: 1) reach their highest level at $229 Million of cost in 2023, 2) reach their breakeven at $0 in 2026, and 3) reach their lowest level at $(920 Million) of net cost[70] in 2044. Ameren Missouri touts "$920 Million Net Benefits" on the inside cover of the Plan.

In contrast, Staff's review of the Plan finds that: 1) avoided capacity cost benefits are overstated and should not be claimed until 2034 when new supply-side resources are first deferred as a result of the Plan, and 2) avoided T&D cost benefits should be assumed to be zero until Ameren Missouri demonstrates a direct impact of its MEEIA programs on avoided T&D expenditures. Staff revised Plan Figure 35 to more properly reflect avoided capacity cost benefits and the removal of avoided T&D cost benefits. The Revised Figure 35 illustrates that cumulative net customer costs are expected to: 1) reach their highest level at $417 Million of net cost in 2024, 2) reach their breakeven at $0 of net cost in 2034, and 3) reach their lowest level at $(145 Million) of net cost in 2044.

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[68] Plan bottom of page 66.

[69] Net customer costs are equal to the net present value of Plan costs less the net present value of Plan benefits. Negative net customer costs are an overall benefit for customers.

[70] A negative net cost is a net benefit for customers, which is why the $920 Million on the inside cover of the Plan is positive and the $(920 Million) on the Plan Figure 35 is negative.

Chart 5

Plan Figure 35

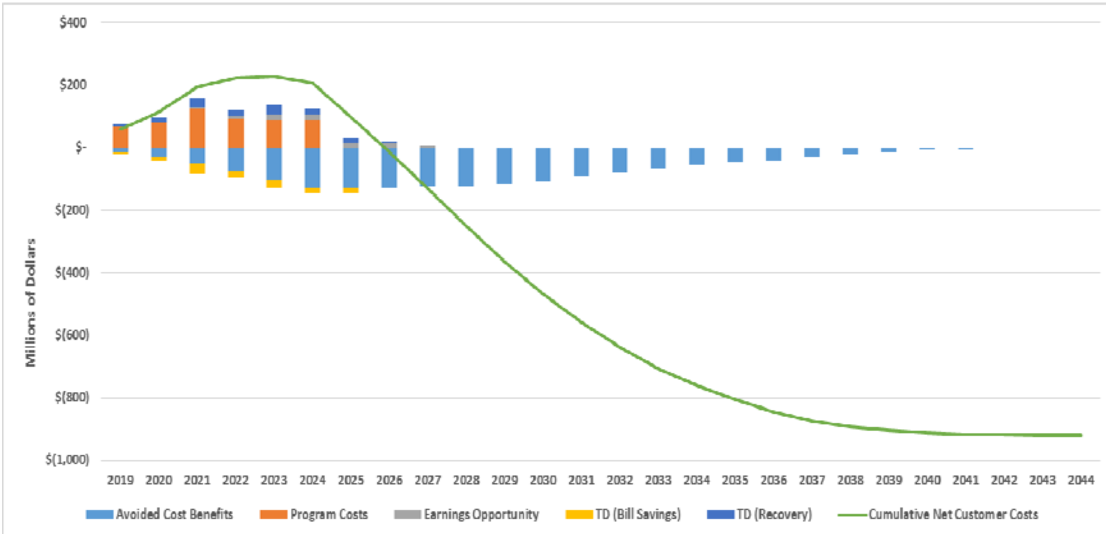
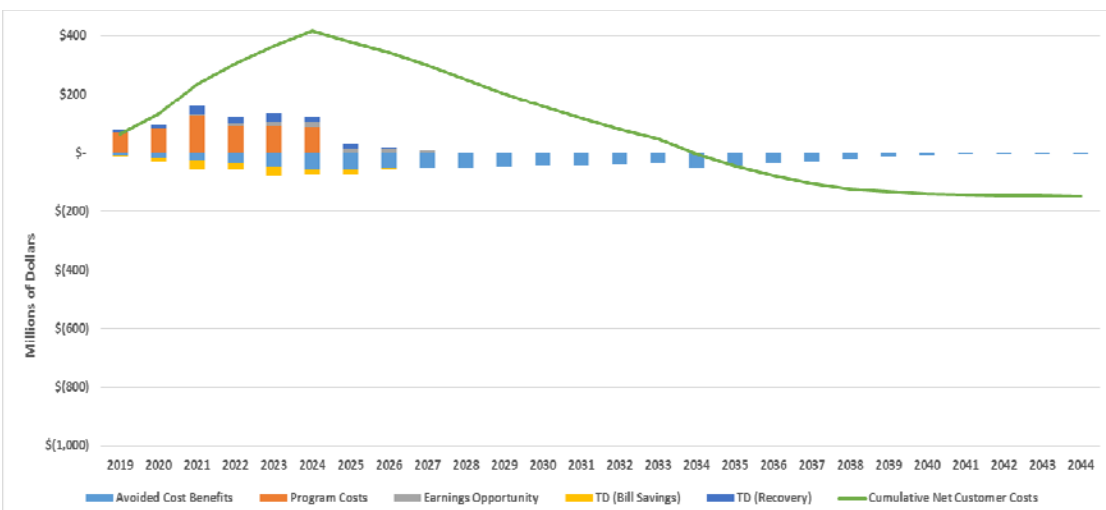


Chart 6

Staff's Revised Figure 35



Staff concludes that Ameren Missouri's proposed Plan drastically overstates net benefits for customers. Further, when properly quantifying avoided capacity cost benefits and removing avoided T&D cost benefits, all customers[71] who pay the MEEIA charge each month

[71] All customers include both program participants and non-participants who have not opted-out of participation.

during 2019 – 2024, for an investment of $478 Million,[72] will have to wait until 2034 to break even and will only receive a return of $145 Million in overall net benefits from 2034 to 2044. It makes little sense for all customers to pay $478 Million during the Plan's implementation (2019 – 2024) with the hope of receiving only $145 Million of net benefits during 2034 -2044.

While the Plan is expected to result in $145 Million of net benefits for all customers from 2034 - 2044, the Plan fails to deliver benefits to customers who do not participate in the Plan's programs, failing to meet the requirement of the MEEIA statute.[73] Importantly, the vast majority of customers are not expected to participate in the Plan's programs in any meaningful way. These non-participants pay their monthly bills' Energy Efficiency Investment Charge amount, but will not benefit from the Plan until 2034 when the Plan defers the startup of a 600 MW CC from 2034 to 2036, a 2-year delay. Any bill reductions received by non-participants are expected to be far less than the Energy Efficiency Investment Charge amounts paid.

In Staff's view, the Plan's Figure 36 – DSIM Bill Impacts and Figure 37 – MEEIA Portfolio and DSIM Rate Impacts present an overly optimistic view of the Plan for two reasons. First, both Figure 36 and Figure 37 are built on data which dramatically inflates the avoided cost benefits of the Plan. Second, both Figure 36 and Figure 37 reflect only Cycle 3. While Ameren Missouri may correctly assert for all customers that "As soon as the [Cycle 3] implementation period concludes and the costs are paid, bills are immediately lower beginning in 2024 than they would otherwise have been absent the programs," this is simply not true for the non-participant who must wait until 2034, when the Plan is expected to defer the startup of a 600 MW CC, to receive a lower bill.

Ameren Missouri's 2017 IRP includes data which allowed Staff to calculate the bill (revenue requirement) impacts and rate impacts of the Company's adopted preferred resource plan, Plan A (RAP DSM) relative to Plan G (No DSM). This was done over a 20-year planning horizon that included Cycle 3 and future MEEIA cycles. The following charts illustrate that cumulative annual discounted rates are 4.7 percent higher at the end of the 20-year planning horizon of the 2017 IRP while cumulative annual discounted revenue requirements (bills) are only 3.5 percent lower over the same period.

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[72] Net present value of Cycle 3 program costs and Cycle 3 earnings opportunity, both at the target level of performance.

[73] Section 393.1075.4. Recovery of such programs shall not be permitted unless the programs are approved by the commission, result in energy and demand savings and are beneficial to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers.

Chart 7

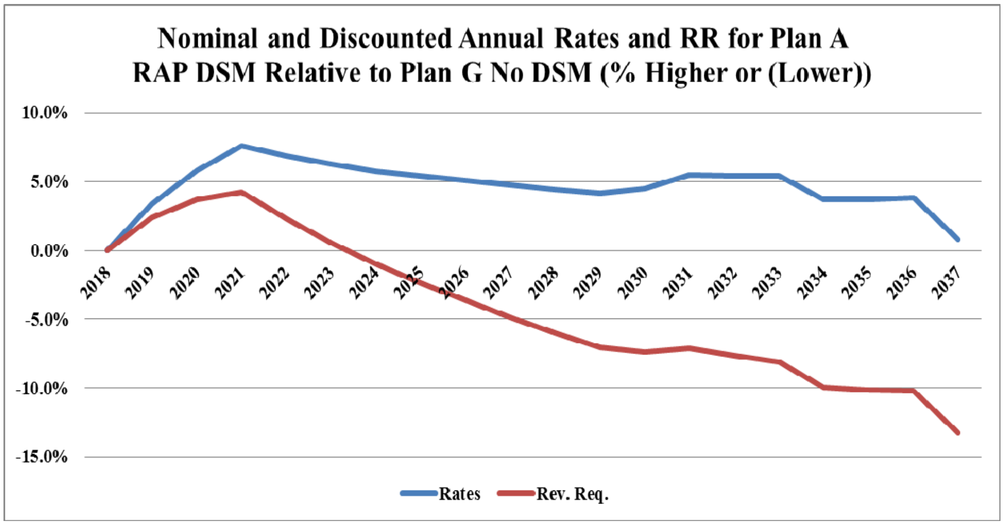
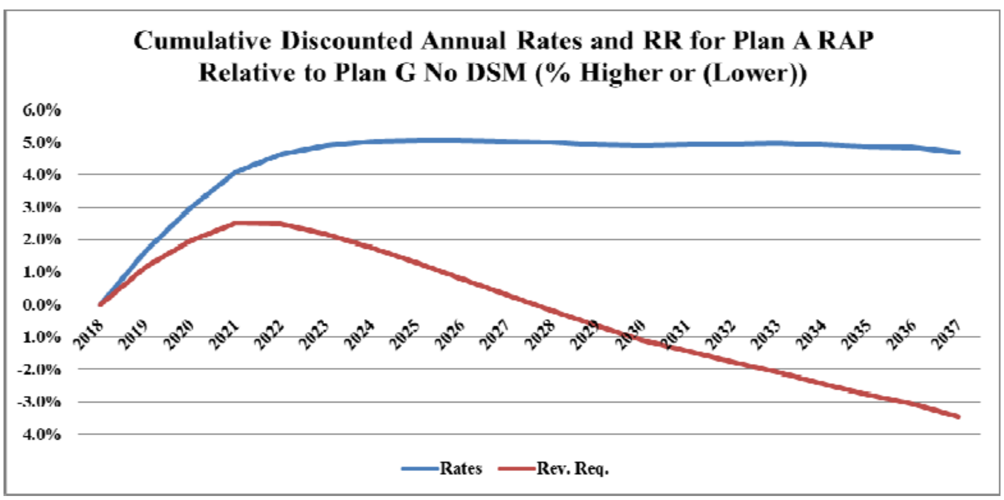


Chart 8



Staff Expert Witness: John A. Rogers

D. Demand-Side Programs

a. Cost-Effectiveness (Section 393.1075.3 and .4 – cost-effective demand-side programs and savings)

The Plan's Appendix A includes 9 Residential programs, 8 Business programs, and 3 low-income programs. The total proposed budget for all programs, excluding throughput disincentive ("TD") and earnings opportunity ("EO"), is $550.8M over a 6-year period. This is an aggressive expansion of programs, budget, and cycle length as compared to the previous two Ameren Missouri MEEIA Cycles. Ameren Missouri's MEEIA Cycle 1 consisted of 6 Residential programs, 4 Business programs, and 1 low-income program budgeted at roughly $154.43M for a 3-year period. Ameren Missouri's MEEIA Cycle 2 consisted of 6 Residential programs, 5 Business programs, and 1 low-income program budgeted at $163.19M for a 3-year period. If approved, the Application will result in all customers (excluding low-income exempt and opt-out customers) paying 380% more in program costs than in Cycle 1 and 338% more in program costs than in Cycle 2 for twice the length of Cycle time as Cycle 1 and Cycle 2 and for programs that do not provide benefits to all customers in the customer class in which the programs are proposed.

As proposed, Cycle 3 programs only contribute to supply-side investment deferral of one 600MW combined cycle plant for two years, 2034 to 2036. There are no avoided transmission and distribution costs associated with Ameren Missouri's Application and only avoided capacity costs after 2034, as further discussed in Section III.A.d.ii. - Capacity Avoided Costs and Section III.A.d.iii. - Transmission and Distribution Avoided Costs. By excluding avoided transmission and distribution cost benefits, including avoided energy cost benefits, and including avoided capacity cost benefits after 2033 in evaluating the cost-effectiveness of Cycle 3 Residential and Business programs, the Total Resource Cost ("TRC") tests decrease significantly as shown in the following Table:

continued on next page

Table 9

[illegible]			
[illegible]			
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.86	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.94	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.63	[illegible]
[illegible]	[illegible]	0.69	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.96	[illegible]
[illegible]			
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

4 CSR 240-20.094(4)(I) states:

> The commission shall consider the TRC test a preferred cost-effectiveness test. For demand-side programs and program plans that have a TRC test ratio greater than one (1), the commission shall approve demand-side programs or program plans, budgets, and demand and energy savings targets for each demand-side program it approves, provided it finds that the utility has met the filing and submission requirements of this rule and the demand-side programs—…

As shown in Table 9, four of the Residential programs TRC tests, excluding low-income programs, fall below 1.00 when only avoided energy cost benefits and avoided capacity cost benefits after 2033 are used in the calculation of the TRC tests. Further, this leads to the Residential portfolio TRC test as a whole to drop below 1.00, demonstrating that the Residential portfolio is not beneficial to all customers within the Residential class.

While Staff recognizes that most[74] of the Business Programs are still cost effective utilizing more appropriate avoided cost benefits[75] the programs still fail to provide benefits to all customers as discussed in Section III.C. of this Report, Programs are not expected to provide benefits to all customers.

Staff Expert Witness: Brad J. Fortson

b. Measure-Level TRC

Staff also has a concern with the measure-level TRC for certain measures. Ameren Missouri has included in its portfolio of programs, certain measures that are not cost-effective. Staff inquired about this issue in Staff Data Request No. 0070. Several of the measures that are not cost-effective are measures offered in low-income programs which are exempt from the requirement of being cost-effective. However, there are several measures that are not cost-effective that are being offered in the Residential HVAC and Multifamily Market Rate programs along with one measure in the Energy Efficiency Kits program. In response to Staff Data Request No. 0070, Ameren Missouri provided a list of the measures that are not cost-effective and offered its reasoning for offering those measures. Staff disagrees with Ameren Missouri's reasoning since incentivizing a measure, outside of a low income program, that is not cost-effective is contradictory to "a goal of achieving all cost-effective demand-side savings."[76] The most prudently incurred costs are those costs that maximize the benefits to customers through these programs. To the extent that measures that are not cost-effective are included within programs, Ameren Missouri is minimizing potential benefits of the overall portfolio. Because the potential benefits from demand-side programs are uncertain and difficult to quantify

[74] The Business Social Services program has a TRC below 1.00. Ameren Missouri proposes this program as a low-income program. Staff does not believe this program is a low-income program as further discussed in the Low-Income Programs section.

[75] Excluding transmission and distribution costs benefits but including avoided energy cost benefits and avoided capacity cost benefits after 2033

[76] 393.1075.4

and the costs are certain and tangible, each program should be designed to be as cost-effective as possible in order to maximize the probability that actual benefits outweigh the actual costs.

Staff Expert Witness: Brad J. Fortson

c. Demand-Side Program Design

Staff has numerous concerns with many aspects of the proposed energy efficiency programs. Ameren Missouri has had energy efficiency programs for many years, but specifically they have had energy efficiency programs under MEEIA since 2013. Energy efficiency is not a new thing. Energy efficiency technology has transformed the market, and continues to further transform the market. This has led to customers inherently becoming more aware of energy efficiency and ways to save energy, and in turn, save money. Staff is concerned that these naturally occurring energy savings skew the energy and demand savings Ameren Missouri has deemed for the next 6 years for their energy efficiency programs. Also of concern to Staff is that several of the proposed demand-side programs have details yet to be finalized.

Incentive Ranges

Staff has a concern with the incentives and incentive ranges Ameren Missouri uses for modelling of certain measures. Some of the initial incentives used for modelling in DSMore[77] for certain measures are slightly less, equal to, or even exceed the incremental cost[78] for those measures. This also leads to some of the maximum incentives of the incentive ranges for certain measures exceeding the incremental cost for those measures. Incentivizing measures at these levels is counterintuitive to optimizing cost-effectiveness and ultimately makes these measures less cost-effective. Ameren Missouri faces no risk of penalty for not achieving the energy and demand saving goals set in their Application. Therefore, it would seem much more logical to set the incentive at a lower level and let the market determine whether they need to be increased to provide for more participation.

Ameren Missouri has modelled the Programs utilizing the assumed incentive level cost.[79] However, Ameren Missouri also included within its application a range of incentives that may be utilized throughout the 6-year cycle. In its Application Ameren Missouri did not provide any

[77] DSMore is the software Ameren Missouri uses to model demand-side programs to determine cost-effectiveness.
[78] In this case, the difference in costs between the baseline measure and a more efficient measure.
[79] Incentive level varies by measure

modelled results for any of its proposed Programs utilizing the minimum incentive level or the maximum incentive level. Furthermore, when Staff requested this analysis, Ameren objected to the request stating that the analysis requested "have not been performed and therefore do not exist[80]." This analysis is crucial to understanding whether or not each program would be cost effective at the incentive range that is selected. Furthermore, Ameren Missouri has requested the ability to change incentive ranges with a limited review process. Staff agrees that Ameren Missouri needs to have the ability to change incentive levels in short order to adapt to market conditions when necessary. However, absent modelling that demonstrates that programs would be cost effective at the maximum incentive level, Staff is extremely concerned that the Programs, if approved, could potentially not be cost-effective at the maximum incentive level.

If the Commission approves any of the Programs, Staff recommends that the Commission order:

1. Ameren Missouri to provide modelled analysis that demonstrates that each Program is cost effective at the maximum incentive level proposed in Appendix D of the Application.
2. If any of the modelled analysis demonstrates that a program would not be cost effective at the maximum incentive level, that Ameren Missouri shall amend Appendix D with a maximum incentive level that Ameren Missouri has demonstrated could be cost effective.

i. Residential EE Programs

Ameren Missouri is proposing a Residential LED Lighting program as part of its Application. Staff has a concern with including a Residential LED Lighting program for a 6-year period. This concern is exemplified in language included in the statewide TRM and also included in the Ameren Missouri TRM that states:

> … Federal legislation stemming from the Energy Independence and Security Act of 2007 (EISA) requires all general-purpose light bulbs between 40W and 100W to be approximately 30% more energy efficient than standard incandescent bulbs. Production of 100W, standard efficiency incandescent lamps ended in 2012, followed by restrictions on 75W lamps in 2013 and 60W and 40W lamps in 2014. The baseline for this measure has therefore become bulbs (improved incandescent or

[80] Ameren Missouri Response to Staff Data Request No. 0050.

> halogen) that meet the new standard. A provision in the EISA regulations requires that by January 1, 2020, all lamps meet efficiency criteria of at least 45 lumens per watt, in effect making the baseline equivalent to a current day CFL…

Furthermore, it is not illogical to think that the baseline for residential lighting could be LED lighting by the end of a 6-year period given the way the market continues to transform due to LED technology. Ameren Missouri has not accounted for a baseline increase in their modelling. Therefore, due to near future lighting standard changes and the lighting market transforming due to naturally occurring savings based on customer behavior, it is impractical for Ameren Missouri to include a Residential LED lighting program.

Ameren Missouri is proposing a Residential Home Energy Report ("HER") program as part of its Application. Staff has a concern with including a Residential HER program for a 6-year period since continued naturally occurring energy savings diminishes the need of the HER program. There is no persistence in the HER program since the savings of the program have only a one-year estimated life. This implies that customers need to continually receive a HER report to continue to reduce savings. However, as stated by Ameren Missouri's Residential Evaluation, Measurement, and Verification ("EM&V") Evaluator, Cadmus, in its Home Energy Report Impact and Process Evaluation ("HER EM&V"):[81] "

> These results show that energy consumption decreased in PY16 and PY17 compared to 2015 among customers that did not receive HER reports. There were no rate changes during this time period and no known phenomenon that occurred to explain the general decline… One effect of this is a reduction in the potential of behavior-based programs to save energy at previously expected levels on top of decreasing baseline usage.

This could be attributed to naturally occurring savings driving down energy consumption resulting in the reduced need for a behavior-based program such as the HER program. Also, the HER EM&V determined the TRC for the HER program for PY17 to be 0.59. In other words, an estimated TRC of 0.59 means that residential customers only receive $0.59 worth of estimated benefits from the HER program for every $1.00 of HER program costs spent. Ameren Missouri proposes to offer the HER program to 235,000 customers annually, at a cost of nearly $12 million over the 6-year cycle. Staff is of the opinion that a link on the customer's bill to the

[81] Case No. EO-2015-0055, EFIS Item No. 518, ameren missouri py17 home energy reports evaluation final.pdf.

Ameren Missouri energy efficiency programs website page would prove to be just as valuable as the HER program at a much lower cost.

Ameren Missouri is proposing a Small Business Energy Report ("SBER") program as part of its Application. Staff has the same concern with including a SBER program as it does with including a Residential HER program for a 6-year period. Staff is concerned that continued naturally occurring energy savings diminishes the need of the SBER program. Staff assumes that, like the HER program, there will be no persistence in the SBER program. Similar to the HER program, this would imply that customers need to continually receive a SBER report to continue to reduce savings. Staff is of the same opinion for the SBER program as it is for the HER program that a link on the customer's bill to the Ameren Missouri energy efficiency programs website page would prove to be just as valuable as the SBER program at a much lower cost.

Ameren Missouri is proposing a Heating, Ventilation, and Air Conditioning ("HVAC") program as part of its 6-year MEEIA Cycle 3 Application. Staff has a concern with the seasonal energy efficiency ratio ("SEER") level at which Ameren Missouri begins incentivizing some measures. In Missouri, central air conditioners ("CAC") have a minimum SEER baseline of 13[82] and air source heat pumps ("ASHP") have a minimum SEER baseline of 14.[83] Ameren Missouri begins incentivizing CAC and ASHP units at one SEER level up from the baseline at SEER 14 and SEER 15, respectively. Incentivizing such low SEER levels is counterintuitive to achieving greater levels of energy and demand savings. Furthermore, due to the changing market it is likely that baselines for CAC and ASHP in the residential HVAC program could be SEER 14 and SEER 15, respectively, or higher, by the end of a 6-year period. Ameren Missouri has not accounted for a baseline increase in their modelling. In Staff's limited review of HVAC measure incremental cost and incentive levels, it appears in many instances the incentive levels, especially in relation to incremental cost, are not set at levels to encourage customers to purchase the more energy efficient HVAC measures. This design is counterintuitive to the goals of the MEEIA statute, rules, and goals. Shifting the HVAC program budget from the lower SEERs to the higher SEERs intuitively increases the program TRC and provides a greater opportunity of achieving benefits for all customers within the residential class.

[82] https://www.amana-hac.com/resources/faq/hvac-101/what-is-the-minimum-energy-efficiency-standard-for-air-conditioners-in-my-state.

[83] Ibid.

Ameren Missouri is proposing a Residential Appliance Recycling ("RAR") program as part of its Application. Ameren Missouri proposed a RAR program as part of its MEEIA Cycle 2 Application but eventually abandoned the program as part of its final approved MEEIA Cycle 2 program portfolio. It is Staff's understanding that the program was abandoned due to the high rate of free-ridership[84] that led to the program ultimately not being cost-effective. Staff is concerned that the free-ridership issue will arise again and lead to the program not being cost-effective again. In response to Staff Data Request No. 0030, Ameren Missouri states that the program is being proposed in its MEEIA Cycle 3 filing due to customer preference being demonstrated in that 8% of customer inquiries for energy efficiency to the Ameren Missouri Energy Advisor group during 2017 and 2018 were to inquire about recycling their old refrigerator or other appliance. This fact alone does not account for how many of those customers inquiring about the program would have recycled or disposed of their appliance absent a rebate from the RAR program.

Staff Expert Witness: Brad J. Fortson

ii. Residential and Business Energy Efficiency Education Channels

Ameren Missouri is proposing Residential and Business Energy Efficiency Education Channels ("Education Channels") as part of its Application. Ameren Missouri states that the Residential Energy Efficiency Education Channels may include, but are not limited to: 1) Science, Technology, Engineering, and Mathematics ("STEM") Education; 2) Code Compliance; 3) Community Engagement and Rewards; 4) Smart Home Energy Management; 5) Real Estate Audits; and 6) Employee Education and that the Business Energy Efficiency Education Channels may include, but are not limited to: 1) Building Operator Certification; and 2) Small Business Energy Reports. Staff has an overall concern with the lack of information that was provided for the Education Channels in the Application.

One concern that Staff has with the STEM Education Channel, is that in Data Request OPC 2010 when asked, "Please explain how Ameren Missouri will ensure the implementation of its high school curriculum generated for the STEM Education portion of MEEIA 2019-24. What school boards and/or districts have agreed to incorporate Ameren's curriculum in their schools'

[84] In the case of the RAR program, a free rider is a customer who would have recycled or disposed of their appliance absent the rebate from the RAR program.

teaching?" Ameren Missouri responded, "Ameren Missouri is currently working on final program designs with implementation contractor. Implementation contractors have experience in implementing STEM and other educational programs in secondary education school system throughout the country." Staff is concerned with Ameren Missouri requesting approval of an Education Channel when the program design is not finalized.

Staff has a concern with the Code Compliance Education Channel. As proposed in Ameren Missouri's Application, the Code Compliance Education Channel will focus on targeting high-energy impact measures that are commonly missed in residential code compliance. The implementation contractor will develop and facilitate a territory-wide energy codes collaborative with building industry stakeholders to discuss barriers of code compliance and develop methods and resources required to improve code compliance. The program will include an energy code expert to serve as a circuit rider across the Ameren Missouri service territory to provide information on non-compliance typically found and offer practical solutions for improvement. Targeted in-person training sessions will be held based on findings and outcomes of collaborative sessions and circuit rider feedback. Examples of measures targeted in the Code Compliance Education Channel include: 1) basement insulation; 2) window U-factor; 3) duct leakage; 4) high-efficacy lighting; 5) ceiling insulation; and 6) wall insulation installation. The City of St. Louis recently adopted the 2018 International Building code, replacing the 2009 International Building code.[85] Updates to the amount of building insulation, requirements for energy efficient windows, and programmable thermostats were also included in the new codes.[86] According to Ms. Gretchen Waddell Barwick, grassroots organizer for the Missouri Sierra Club, "Residential and new home buyers will save over $500 per year on utility bills. Homes will be more than 25 percent more energy efficient than if they were built to the code today… We're going to have certified energy auditors coming into homes now when they're first built to make sure that the building is performing the way it's supposed to and that we're doing what we're promising people who are building homes."[87] Staff is concerned that Ameren Missouri is committing residential ratepayers to pay almost $2M for a program that

[85] https://www.stlouis-mo.gov/government/city-laws/ordinances/ordinance.cfm?ord=70794.
[86] http://news.stlpublicradio.org/post/st-louis-adopts-building-codes-designed-boost-energy-efficiency-new-homes#stream/0.
[87] Ibid.

deals with issues that should be, or currently are being, addressed at the city, municipal, or county level.

Staff has a concern with the Community Engagement and Rewards Education Channel, again, the issue being the lack of program information provided in the Application. According to Ameren Missouri, the objective of this program "is to increase education and awareness of energy efficiency by rewarding customers for implementing energy efficient measures and encouraging efficient behavior."[88] Staff is unclear what is meant by "rewarding customers" since there was no further discussion on what this means. It is further stated that, "Communities and organizations will be targeted as a group to register and participate through an interactive web platform. The platform and gamification will be used to engage and educate customers on energy efficiency and benefits."[89] Staff is unclear what communities and organizations will be targeted, what the interactive web platform will consist of, or what gamification implies since there was no further discussion on what this means.

The Employee Education Education Channel, as proposed by Ameren Missouri, is intended to leverage the energy savings successes of local businesses that have participated in Ameren Missouri's MEEIA programs. The initiative will inform the local business employees about the businesses energy savings success of current and future energy efficiency efforts within their workplace and place an emphasis on making it easy for employees to take action under the residential programs to save energy within their homes. Staff is of the opinion that this awareness is already taking place through the MEEIA Cycle 1 and current MEEIA Cycle 2 marketing avenues, in which a large amount of the MEEIA budget is consumed. As previously stated for other programs, a link on the customer's bill to the Ameren Missouri energy efficiency programs website page could prove to be just as valuable as the Employee Education program at a much lower cost.

Staff is not opposed to the inclusion of additional Education Channels in Ameren Missouri's Application. However, Staff is concerned with, 1) the lack of information provided by Ameren Missouri in its Application, 2) the amount of budget for the Education Channels as proposed by Ameren Missouri given the lack of information provided by Ameren Missouri in its Application, and 3) Ameren Missouri seeking approval of these Education Channels without

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[88] EFIS Item No. 4, appendix b – program templates.pdf, page 42.
[89] Ibid.

program design finalized. Finally, a link on the customer's bill to the Ameren Missouri energy efficiency programs website could prove to be just as valuable as some of the proposed Education Channels.

Staff Expert Witness: Brad J. Fortson

iii. Low Income Program Design

Ameren Missouri's Application includes three proposed low-income programs. This is an aggressive expansion of the previous programs approved by the Commission in Ameren Missouri's MEEIA Cycle 1 and Cycle 2, which included one low-income program in each cycle.

The three[90] proposed expanded programs for low income customers and social service agencies result in Cycle 3 low-income programs' costs in excess of $50,000,000[91], which is a significant increase in spending and market reach for the hard to reach low-income market segment. The programs proposed for low-income customers are: Residential Multifamily Low Income ("MFLI"); Residential Single Family Low Income ("RSFLI") and Business Social Services ("BSS").

The Residential Multifamily Low Income Program proposal is an expansion of the current multifamily low income program approved in MEEIA Cycle**s** 1 and 2. Ameren Missouri proposes to expand participation and increase long-term energy and demand savings along with bill reduction opportunities to low-income customers residing in multifamily low-income properties. The company proposes to achieve this through education, a variety of directly installed measures, and comprehensive retrofits. Ameren Missouri states "the program will provide a one-stop-shop approach to increase program participation and provide for more extensive retrofits and larger energy savings per property. This results in further benefits to low-income multifamily property managers and tenants by improving the value of the property, reducing utility bills and O&M costs, and making the property healthier, more comfortable and safe."[92]

The proposal for the Residential Single Family Low Income Program ("RSFLI") is to expand participation and increase long-term energy savings and bill reduction opportunities

[90] Staff's opinion is that the BSS Program is not a low-income program.
[91] This cost estimate includes BSS Program costs.
[92] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan , page 2.

to low-income Ameren Missouri customers by delivering energy efficiency services through multiple channels to overcome the specific hurdles of each property type. Multiple delivery channels will ensure a diversity of participants and equitable delivery across Ameren's service territory.

The proposal for RSFLI program includes two delivery channel options: Single Family Low-Income ("SFLI") and Low-Income Efficiency Housing Grant ("Grant"). The SFLI program is for residential customers residing in single-family detached housing, duplexes, or mobile homes. Ameren Missouri states "the program will use a neighborhood approach to identify income-eligible areas with the greatest need, such as those with high energy usage or high incidence of arrearages or payment delinquencies, to group participants and focus on a single geographic area at a time. The program will also work with assistance agencies to account for referrals when possible. The program will seek to partner with familiar community-based organizations to stage cooperative recruitment drives and/or education events. This approach of utilizing trusted, familiar organizations generates enthusiasm and momentum behind the effort."[93]

The third party program implementer will perform energy assessments and/or diagnostic testing and direct installation of energy saving measures with the possibility of providing incentives for whole house measures.

The Grant delivery channel is proposed to "further develop the social marketing distribution approach utilized for lighting in past MEEIA portfolios. In addition to providing free energy saving LED bulbs for distribution through organizations such as foodbanks, this channel will make energy saving measure packages or incentives directly available to organizations that can provide qualified installation of measures to income eligible residential end users. The participants will apply for grants and receive assistance to ensure measure installation meets program requirements."[94] Ameren Missouri states, where possible, it will seek to partner with the natural gas and water companies for co-delivery.[95] While Ameren Missouri has provided some of the qualifications for Approved Grants,[96] Staff is concerned with the lack of information that was provided in the Application.

[93] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan , page 8.
[94] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan , page 7.
[95] *Ibid.*
[96] Page 16 of The Ameren Missouri 2019-24 MEEIA Energy Efficiency Plan.

The proposed Business Social Services Program ("BSS") is designed to promote the installation of energy efficient technologies in social service businesses by removing participation barriers such as:

- Lack of time/resources to investigate and review energy efficiency improvement;
- Skepticism that participating will actually be of value;
- Lack of financing;
- Belief that energy conservation is not integral to their business strategy; and
- Belief that adopting energy conservation measures is a complicated, time-consuming and potentially a costly process.

The BSS Program will provide lighting measures and installation at no cost and HVAC, smart thermostats, motors, water heating, refrigeration and HVAC tune-up measures at low-cost and/or no-cost to social services business customers with qualifying facilities. Program providers will supply, install, and finalize paperwork for eligible participants and identify additional energy efficiency opportunities not covered under the BSS Program.

Ameren Missouri states "the BSS Program will play an important role in market transformation by training and educating social services businesses with direct outreach and through low-income associations."[97]

Staff recognizes and appreciates Ameren Missouri's efforts to expand funding and outreach of the existing low-income program. However, in Staff's opinion, the BSS program, as proposed, is not a low-income program. 4 CSR 240-20.094(3)(A)4. states that the market potential study shall:

> 4. Include an estimate of the achievable potential, regardless of cost-effectiveness, of energy savings from low-income demand-side programs. Energy savings from multifamily buildings that house low-income households may count toward this target.

The BSS targets Commercial, nonprofit, and tax-exempt business customers in the Small General Service (2M) and Large General Service (3M) rate classes.[98] While the BSS targets business customers that may provide assistance to low income populations, the assistance is not related to demand-side programs, cost-effectiveness or energy savings as anticipated by MEEIA. Further, while some of the businesses the BSS targets may provide health and safety benefits, those benefits are not directly related to the BSS.

[97] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan, page 12.
[98] Ameren Missouri Appendix B – Program Templates from the 2019-24 MEEIA Plan, page 11.

If the Commission approves the Application, Staff proposes the program be moved out of the Low-Income Program section to a stand-alone business program. Staff is not opposed to the inclusion of the BSS program as a part of the Business Portfolio, so long as it meets the requirements set forth by the MEEIA statute and Commission rules.

Staff proposes four recommendations to expand on the proposed portfolio.

Staff's recommends Ameren Missouri:

(1) Work with stakeholders in the Missouri Energy Efficiency Advisory Council ("MEEAC") Low-Income Customer's Working Group[99] [100] to expand the reach of the proposed low-income programs by including hard to reach customers who fall under the demographic of working class poor and lower middle class poor in an existing program or design a new program that targets those types of customers and exploring other suggestions of the working group;

(2) Work with the Keeping Current Collaborative to analyze customers who have defaulted off the Keeping Current pilot program, and design a program to help them lower their utility bills;

(3) Expand on the scope of the Business Social Service agencies program, as part of the Business Portfolio, to include non-profit centers such as: homeless shelters not run by Community Action Agencies (including the residential single and multifamily buildings they own), half-way homes and recovery facilities and other types of non-profit business that provides a service to the community, located within the Ameren Missouri service territory; and

(4) Continue to include the local natural gas companies in discussions for inclusion of programs to co-deliver and to invite other energy providers to engage in discussions of working together to enhance and expand co-delivery relationships with investor owned, member owned and municipally owned/publicly owned utilities whose service territories overlap with Ameren Missouri's service territories.

[99] The Low-Income Working Group was established to meet one of the requirements of *Commission Rule 4 CSR 240-20.094(9)(B)2. "The state-wide advisory collaborative shall: b. Establish individual working groups to address the creation of the specific deliverables of the collaborative; and 3. The MEEAC consists of the following organizations and organizations groups ("members"): g. Low-Income Customer's Group.*

[100] Low-Income Customer's Working Group consists of, but is not limited to: National Housing Trust, Tower Grove Neighborhoods Community Development Corporation, and Consumers Council Missouri.

Staff recommends that if the Commission approves this application that the Commission orders the BSS program to be a part of the Business Portfolio, outside of the Low-Income Programs.

Staff Expert Witness: Kory J. Boustead

iv. Demand Response Program Design

Ameren Missouri has proposed two demand response programs in its Application. The programs are Business Demand Response and Residential Demand Response. Both programs are designed to incentivize participating customers to reduce or shift their respective loads during events that Ameren Missouri calls. There are several areas of the program design for the demand response programs that, in Staff's opinion, are well designed. However, there are also many flaws in the program design and in the assumptions used to evaluate the programs. Staff discusses these flaws and assumptions throughout this section of the Report. In short, the flaws in the assumptions, including a lack of support for many of those assumptions, make it impossible for the utility, the Commission, or Staff to properly analyze the reasonableness of the proposed programs.

Ameren Missouri has utilized avoided cost data to evaluate the cost-effectiveness of these programs. In addition to fundamental flaws[101] that Staff identified in Section III.A.d. – Avoided Costs, there are additional issues with Ameren Missouri's methodology for evaluating the cost-effectiveness of the Demand Response Programs as proposed. These additional flaws include, but are not limited to, evaluation assuming effective lives of programs equal to 10 years, lack of persistence of programs, non-compliance with MEEIA statute, lack of support documentation for assumptions, and lack of location specific incentives.

All of the evaluations for the Demand Response programs proposed by Ameren Missouri assume effective lives of the programs equal to 10 years[102]. The 10-year effective life assumption is accounted for in the costs and benefits that are modeled for the programs. However, some of the benefits that Ameren Missouri has estimated occur as late as 2034. These benefits are unrealistic because the programs lack persistence absent continuous monetary incentives. Ameren Missouri does not plan to contractually require participants in the Demand

[101] Assumption that a cost may be avoided absent any need for investment.
[102] Work papers provided by Ameren Missouri in support of their application.

Response programs to agree to a minimum participation term.[103] Ameren Missouri's Application requests the programs be approved for 5 years and 10 months. The demand response programs are designed in a manner that monetarily incentivizes customers to modify load during periods that Ameren Missouri predicts may be near its system peak and, therefore, it calls a demand response event. Absent incentives to participate in load modification during a peak event, a customer is highly unlikely to participate by modifying their load during an event.

Additionally, Ameren Missouri has not proposed a mechanism to recover costs associated with demand response beyond 2024. Therefore, it is inappropriate to include assumed costs and benefits attributable to the demand response programs beyond 2024 because the programs do not provide any persistent energy or demand savings. Inclusion of potential benefits from the Demand Response programs in the years subsequent to the end of the MEEIA cycle artificially inflate the savings that should be attributed to the programs because the avoided costs[104] that Ameren Missouri used to evaluate the programs are projected to be higher in the subsequent years.

As discussed in previous sections of this Report, Ameren Missouri does not have a need for additional supply-side resources until 2034 when the Sioux power plant is scheduled to be retired. The Demand Response programs as designed will not defer any supply-side resources. As discussed earlier in this Report, if there is no substantial deferral of supply-side resources, customers that do not participate in programs realize little, if any, benefits.

Accordingly, the Demand Response programs do not meet the statutory requirement[105] to provide benefits to all customers regardless of whether the programs are utilized by all customers. If these programs are approved as proposed, participating customers would receive benefits in the form of bill credits. But the entirety of the customer class pays the costs of the incentives and the costs to implement the program without realizing any benefits that would come from avoiding supply-side resource investment or avoiding distribution system upgrades. Because there are no avoided capacity costs, avoided transmission costs, and avoided distribution costs, the Demand Response programs are not cost-effective. Therefore these programs should not be approved.

[103] Ameren Missouri response to Staff Data Request No. 0063.
[104] Avoided energy, avoided capacity costs, avoided transmission costs, and avoided distribution costs.
[105] MO Revised statute 393.1075.4.

Ameren Missouri incorrectly assumes there are avoided transmission costs and avoided distribution costs attributed to each MW of demand reduction associated with the Demand Response programs. While it is possible for a utility to avoid transmission system upgrades or distribution system upgrades, it is not clear that Ameren Missouri has a need for transmission and distribution upgrades. Ameren Missouri has not identified or quantified specific transmission and distribution system upgrades that would be necessary if MEEIA Cycle 3 is not approved.[106] One of the major benefits of well-designed demand response programs is the potential to target areas of congestion on the distribution system. If the utility can avoid distribution upgrades through utilization of demand response, there is a potential benefit to all customers including customers that do not participate in the program. This is an example of an actual avoided distribution cost. Demand response programs have the unique ability to target these areas of congestion. If there is an area that is especially congested, an implementer could increase the incentive to customers to drive participation and avoid system upgrade costs. Ameren Missouri has not designed the programs in this manner and therefore cannot avoid costs associated with system upgrades through the implementation of the program. Ameren has not identified any potential projects that may be avoided through implementation of MEEIA Cycle 3 programs. Therefore, Staff must assume a zero value for avoided transmission and distribution costs.

There are several areas of Ameren Missouri's proposed Residential Demand Response Program that were well-designed. Ameren Missouri has approached the design of the Residential Demand Response Program in a stepwise manner that can maximize demand reductions while minimizing program administration cost. ** ______________________

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[106] Ameren Missouri response to Staff Data Request No. 0079.
[107] Ameren Missouri work paper titled TRC Analysis_HC.xlsx.

____________________ ** The approach allows the market to drive the decision making to increased program costs while maximizing demand reductions and allowing the company to meet savings targets. Additionally, ** ____ ____ ____ **[108] Again, this approach allows the market to drive increased program costs when targets may not be met. While Staff's overall recommendation is that the Application ultimately be rejected by the Commission because the resources are not necessary, Staff recognizes that this planning approach is reasonable and well designed.

Ameren Missouri has designed the Business Demand Response Program around the utilization of an aggregator to administer the program and drive program participation[109]. Use of an aggregator has several qualities that make it an attractive design for demand response programs. First, this design will allow Ameren Missouri to issue a request for proposal to ensure there is a competitive bid process and keep program costs low. Second, this design will allow Ameren Missouri to utilize a company that has experience with implementing demand response programs and a fundamental understanding of which approaches can drive participation rates. Finally, this design allows Ameren Missouri to contractually require realization rates during events. One downfall of the program as designed is the lack of location specific events to defer investments in the distribution system. Since Ameren Missouri does not need any additional capacity, a program that focuses on location specific demand response to defer investment would be preferred. While Staff's overall recommendation is that the Application ultimately be rejected by the Commission because the resources are unnecessary, Staff recognizes that this planning approach is well-designed if the utility were in need of capacity to meet the needs of its customers or requirements set forth by the RTO.

Staff Expert Witness: J Luebbert

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[108] Ibid.

[109] Appendix B of Ameren Missouri's Application To Approve DSIM And Demand-Side Management Portfolio And Plan, Request For Variances, And Motion To Adopt Procedural Schedule.

v. Program Tariff Sheets

Staff reviewed the proposed Rider EEIC tariff sheets, Original Sheet Nos. 91.12 through Original Sheet Nos. 91.21 and the Energy Efficiency and Demand Side Management Program tariff sheets, Original Sheet Nos. 174 through Original Sheet Nos. 249.1 filed in Appendix J – Exemplar Tariffs of Ameren's MEEIA Cycle 3 Application.

In reviewing the proposed tariff sheets, Staff found multiple sheets where the customer is advised additional information can be found at AmerenMissouri.com, which is the Ameren Missouri Official Company website, where the customer is taken to navigate their way to the referred to information instead of a direct link to the additional information referenced. The official website, AmerenMissouri.com, is given to find program application forms and additional information such as; definitions, program specific details (i.e. changes in measures or incentives), and program deadline changes. Staff followed the link multiple times and found it difficult to locate the information referred to within the tariff sheets and in most instances unable to locate the information in a timely manner if at all. Staff recommends the Company's tariff sheets contain detailed program information such as what is included in the program templates filed in this case. The tariff should include all of the Commission approved program information, as it is what is upheld if any clarification needed or question in regards to the programs. The tariff should also include any direct program links when directing a customer to the Company website for additional program information, refrain from directing the customer to the main page of the official company website. This will keep customers from having to navigate through the Company's website to find the programs they were looking for and possible frustration resulting in no longer wanting to participate.

Staff Expert Witness: Kory J. Boustead

E. Rider EEIC

i. Program Cost Component

Ameren Missouri is proposing a similar cost recovery mechanism as was used in its MEEIA Cycle 2 Rider. Staff accepts Ameren Missouri's proposed cost recovery mechanism in this Application.

Staff Expert Witness: Dana E. Eaves

ii. Throughput Disincentive Component

As part of Ameren Missouri's Application it is proposing a TD in the amount of $174 million over 8 years. In its Application Ameren Missouri states:

> Throughput disincentive starts impacting the utility the moment an energy efficient measure is installed, so absent an appropriate solution the negative earnings impact is immediate, cumulative, and continuous until base rates are updated to reflect the reduction in billing units. Therefore, in order to align utility incentives with helping customers use energy more efficiently, the reduction in revenues associated with helping customers use energy more efficiently, the reduction in revenues associated with covering fixed cost must be offset by allowing throughput disincentive recovery.[110]

Ameren Missouri's proposed TD is similar to its MEEIA Cycle 2 TD; however, the Cycle 3 TD includes additional components in the calculation that Staff finds troubling. These components are the addition of energy savings from demand response programs, the calculation of measured energy, the creation of program year specific throughput disincentives in order to prospectively account for EM&V and opt-out customer provisions. See Section III.A.d. – Avoided Costs of this Report for Staff's concerns on each component.

Based on a margin rate analysis (that analyzed all customer bills for 12 months) and rate class level energy and demand savings estimates by end use categories, Ameren Missouri has estimated the total throughput disincentive for MEEIA 2019-24 of $174 million over 8 years (throughput disincentive continues until the first rate case with a true-up period that covers the last month of MEEIA 2019-24).

The TD is designed to make Ameren Missouri whole for any negative earnings impact due to lost sales from Cycle 3 energy savings.

Staff Expert Witness: Dana E. Eaves

Although, the mechanics of Ameren Missouri's proposed throughput disincentive (TD) are similar to the mechanics of its current MEEIA Cycle 2 TD, Ameren Missouri has requested additional features for its MEEIA Cycle 3 TD. Staff recommends rejection of: the addition of the "DRENE", the revision of the calculation of Measure Energy, and the creation of program year-specific throughput disincentives.

[110] Top of page 47 of the 2019-24 Plan.

Ameren Missouri included an additional variable in its TD calculation to address demand response programs. Below is the tariff definition.

$DRENE_{CM}$= Demand Response Event Net Energy for the Current Month.

> $DRENE_{CM}$ is the net energy savings resulting from demand response events during the month as reported by the program administrator. $DRENE_{CM}$ incurred during the time period used for establishing billing determinants in general rate proceedings will be added back to those billing determinants and will not be included in the Rebasing Adjustment.

Ameren Missouri has not provided a reasonable method for calculating or estimating the net energy savings amount and timing. Per the definition, the net energy savings are reported by the program administrator but there is no defined process as to how they are calculated or estimated. Staff cannot recommend inclusion of this term or estimate its impact on the TD given the vagueness of Ameren Missouri's proposed definition.

Secondly, the TD calculation includes a provision to measure energy savings and is provided below.

ME = Measure Energy. ME will be determined as follows, for each Measure:

a. For Measures in the Deemed Savings Table (including Residential Demand Response energy savings not included in $DRENE_{CM}$), the ME is the annual total of normalized savings for each Measure at customer meter per Measure defined in the Company's current Deemed Savings Table.

b. For Measures not in the Deemed Savings Table, the ME will be the annual value attributable to the installations reported monthly by the Program administrator.

Ameren Missouri has not provided a reasonable method for calculating or estimating the net energy savings amount and timing under sub part b. Like the DRENE, the subpart b. determination of Measure Energy relies on an undefined extra-tariff process solely determined, executed, and reported by the program administrator to provide an annual value of savings. Again, Staff cannot recommend inclusion of this tariff provision or estimate its impact on the TD given the vagueness of Ameren Missouri's proposed definition.

Third, the Company requests incorporation of a process that would essentially create annual TD vintages or program year--specific TDs. This process adds several layers of complexity to the TD that did not previously exist in the MEEIA Cycle 2 TD calculation. Since the TD is rebased in a rate case there is concern as to how this process would operate in the context of rate case timing and how the rebasing process would "line up" with the separate TD vintages.

Additionally, it is unclear how these provisions would interact with non-residential customers having the ability to opt-out of a six-year cycle after only half way through the six-year cycle. For example, if a non-residential customer participates in a MEEIA Cycle 3 program in year 1, that customer can opt-out of paying the MEEIA charges in year 5 of MEEIA Cycle 3. However because of the different TD vintages there could be costs related to that customer's participation left unrecovered.[111] Staff cannot recommend inclusion of this tariff provision or estimate its impact on the TD given the uncertainty of Ameren Missouri's intended operation or without inclusion of reasonable safeguards and processes.

Lastly, as requested by Ameren Missouri the TD continues after the end of the six-year cycle until its next rate case. Under Ameren Missouri's request it is unknown how long the TD will continue beyond the six-year requested MEEIA cycle. Staff recommends that, if the Commission approves the TD and a six-year cycle, a cut-off date for TD recovery be set in the tariff such that the TD will end either with the cut-off date or Ameren Missouri's next rate case, whichever is sooner.

Staff Expert Witness: Robin Kliethermes

iii. Earnings Opportunity Component

In its Application, Ameren Missouri is proposing an EO. Ameren Missouri's proposed EO Calculator is contained in Appendix N of the Application and will result in a pre-tax EO of $115 million if the Plan performs to the targeted energy and demand savings and targeted budget level for six years (2019 – 2024) and a pre-tax EO of $167 million if the Plan performs to its maximum "capped" performance levels. The following table represents the proposed EO at target and maximum levels. A complete chart is contained as Appendix 2, Schedule JAR-r2.

[111] Currently, in MEEIA Cycle 2 non-residential customers who participate in the program can opt-out after three years, however, the MEEIA Cycle is only 3 years.

Table 10

Staff Cycle 3 EO Summary ($ Thousands)

	Total Cycle 3 Target	Total Cycle 3 Max.
Low-Income Multifamily	$ 2,833	$ 3,683
Low-Income Single Family (Excluding Efficiency Home Grants)	$ 2,000	$ 2,600
Home Energy Report	$ 1,586	$ 2,062
Residential Lighting	$ 523	$ 680
EE MWh	$ 50,087	$ 75,130
EE Coincident MW <10 Year EUL	$ 1,042	$ 1,355
EE Coincident MW >=10 Year EUL	$ 39,832	$ 59,748
DR Cumulative Enrolled MW	$ 17,098	$ 22,227
Total	**$ 115,001**	**$ 167,485**
Annual Average	**$ 19,167**	**$ 27,914**

Staff recommends the Commission reject Ameren Missouri's Application as filed, in part because the EO calculation and its underlying assumptions made by Ameren Missouri are flawed and do not meet the statutory requirements of MEEIA (i.e. no forgone supply-side investment). The Commission addressed this issue in Ameren's Cycle 2 case.

On pages 11 – 13 of its October 22, 2015 *Report and Order* in Case No. EO-2015-0055, the Commission provided its guidance requiring a foregone supply-side investment for there to be utility earnings opportunities associated with cost-effective measurable and verifiable efficiency savings as a result of MEEIA programs:

> The sole purpose of [an earnings opportunity] under MEEIA is to give the company an earnings opportunity to place shareholders in a financial position comparable to the earnings opportunity they would have had if those shareholders made a future supply-side investment.

> A successfully implemented performance incentive would accomplish the policy goal of valuing equally supply-side and demand-side investments.
>
> Utility capacity requirements are driven chiefly by the maximum amount of usage in a single hour during the year, known as "peak demand." Even if thousands of kWh were saved, if the summer peak demands are the same with and without a MEEIA Cycle 2, then Ameren Missouri would likely require the same capacity. Thus, it would not forego a future supply-side investment opportunity.
>
> In other words, such a performance incentive would compensate Ameren Missouri for foregone earnings opportunities that are not actually foregone. For example, **unless Ameren Missouri's MEEIA portfolio results in energy and demand reductions such that construction of a power plant would be cancelled or materially postponed, the shareholders will not have experienced a foregone supply-side earnings opportunity.**
>
> The kWh-based approach proposed in the Utility Stipulation would assume the same supply-side impact from a kWh saved under a nighttime lighting program as from a kWh saved under an air-conditioner recycling program. The distortions possible under this assumption would result in customers providing Ameren Missouri with a MEEIA earnings opportunity (under the guise of reducing future supply-side investment opportunities) without Ameren Missouri actually reducing any future supply-side investment opportunities.
>
> **This is not a matter of Ameren Missouri's ability to predict the future; this is a matter of building in a double-recovery windfall for Ameren Missouri. That double-recovery comes from ratepayers paying depreciation and return on equity on supply supply-side investments and then paying again for performance incentives on demand-side programs.**
>
> But, if an electric utility successfully reduces its future capacity requirements by reducing customer electricity usage, it may be able to avoid or postpone installation of additional costly generation. It is those demand savings that actually reduce investments necessary for the utility to meet its peak demand requirements. That, in turn, reduces future revenue requirements paid by customers, as well as future earnings opportunities made available to investors. [Emphasis added.]

Ameren Missouri's Application is deficient in that Ameren Missouri failed to conduct appropriate modeling for evaluating a supply-side investment on an equal basis in its Application as discussed in Section III.A.d. – Avoided Costs.

As modeled Ameren Missouri's Application does not materially postpone the construction of a supply-side resource, it delays the construction of one 600 MW combined cycle unit 2 years from 2034 to 2036.

Based upon Ameren Missouri's answer to Staff's data requests it is clear that Ameren Missouri did not provide the necessary modeling that values supply-side on an equivalent basis with its proposed MEEIA Application that Staff and other parties could use in determining such equivalence.

Staff's concern is that Ameren Missouri's Application does not postpone any new supply-side resource until a minimum of 16 years in the future. Approving Ameren Missouri's Application could allow a double-recovery because there is no assurance the postponement will happen. If Ameren Missouri's Application is approved all estimates and recovery of estimated avoided costs will occur absent any postponement of a supply-side resource.

In other words, the level of EO calculated by Ameren Missouri is not supported by facts and relies entirely on highly subjective estimates. Ameren Missouri has provided an EO Calculator that is designed to calculate the lost earnings associated with not building additional supply-side resources, but as demonstrated, no supply-side resources are needed until 2034 at which time the planned Cycle 3 demand savings are enough to postpone the 600 MW CC from 2034 to 2036, two years. In fact, it appears Ameren Missouri's EO calculator is designed in such a way to back into Ameren Missouri's proposed $115 million EO request.

The following table[112] was included in Ameren Missouri's Application[113] and is used by Ameren Missouri as foundational support to explain its earnings opportunity. However, the table is results-oriented driven to hit a desired level of EO based on unsupported assumptions.

continued on next page

[112] Staff removed the PY totals from the original workpaper provided by Ameren Missouri. The Earning Opportunity Calculator EO Matrix Summary is included in its entirety as Appendix 2, Schedule JAR-r2.
[113] Ameren Missouri filed workpapers; Earnings Opportunity Calculator-EO Matrix view 5 22 2018.

Table 11

Earnings Opportunity Summary

Ameren Missouri - MEEIA 2019-24 Earnings Opportunity Summary					
Performance Metric	**Payout Rate**	**Payout Unit**	**100% payout**	**% of Target EO**	**Cap % Multiplier**
Low Income Multi Family: criteria will be Average Percent Energy Savings Per Property; 85% Spend Threshold (admin. + incentive)	$33,333	$ / Basis Point	$ 2,833,333	2.5%	130%
Low Income Single Family Incl. Mobile Homes: criteria will be Average Percent Energy Savings Per Property; 85% Spend Threshold (admin. + incentive; excludes energy efficiency grants)	$33,333	$ / Basis Point	$ 2,000,000	1.7%	130%
Home Energy Report: criteria will be the evaluated MWh savings	$7.50	$/MWh	$ 1,586,250	1.4%	130%
Residential Lighting: criteria will be the evaluated 1st year MWh savings	$7.50	$/MWh	$ 523,034	50.0%	130%
EE MWh: criteria will be the evaluated 1st yr incremental MWh savings excluding HER, RES Low Income, RES lighting program, and DR programs.	$28 83	$/MWh	$ 50,085,613	43.6%	150%
EE Coincident MW: criteria will be the evaluated 1st yr incremental MW reduction, coincident with system peak with **less than 10yr life** excluding HER, RES Low Income, RES lighting program, and DR programs.	$45,000	$/MW	$ 1,042,029	90.0%	130%
EE Coincident MW: criteria will be the evaluated 1st yr incremental MW reduction, coincident with system peak with **10 years and greater life** excluding HER, RES Low Income, RES lighting program, and DR programs.	$75,000	$/MW	$ 39,837,731	34.6%	150%
Demand Response: criteria will be cumulative evaluated MW enrolled, coincident with system peak @ design criteria	$13,193	$/MW	$ 17,098,010	14.9%	130%
Total			**$ 115,000,000**	**100%**	

During discussions at the technical conference that was held on June 26, 2018, Ameren Missouri described the assumptions that went into the design of the EO calculator. Staff learned that Ameren Missouri had pre-determined what it deemed a reasonable EO payout ($115 million at target level), and then entered numbers into the "Pay Out" field until the desired result was achieved.

For this reason, Staff cannot determine the validity of Ameren Missouri's proposed EO, and therefore, cannot recommend the approval of the level of EO proposed by Ameren Missouri in its Application. As Ameren Missouri has proposed its EO in this Application, the EO could be considered a performance incentive rather than an EO especially for those programs with less than a 16-year life[114]. Such programs will not postpone any supply-side investment as described in Section III.A.d. – Avoided Costs. Ameren Missouri's request requires additional MEEIA cycles to be approved in order to achieve the level of savings that Ameren Missouri has

[114] When a supply-side investment could actually be deferred.

requested in its Application. It is inappropriate to award an EO of $115 million at target level as requested in this Application when additional MEEIA cycles would be required to achieve the level savings that supports Ameren Missouri's proposed target level EO.

Ameren Missouri did provide additional workpapers[115] which show a proposed $21 million EO as a result of the effect of just a MEEIA Cycle 3 with no following MEEIA Cycles and its possible 2-year postponement of one 600 MW combined cycle unit from 2034 to 2036. Staff has concerns with at least one of the components of this calculation because it does not account for the 2018 Federal corporate tax reduction.

Ameren Missouri's proposed EO is excessive because it claims the Company incurs a lost earnings opportunity from building additional renewable generation facilities to comply with RES requirements as a direct result of its proposed energy efficiency plan.[116] Staff disagrees that Ameren is limited in its ability to build renewable generation facilities because of proposed energy savings afforded to it by its Application. Ameren Missouri may decide to build additional renewable generation facilities and is not constrained by its Application. RES requirements are a baseline for renewable investment, nothing in the rule[117] prohibits the utilities from prudently investing in renewable energy above the rule and statute.[118] Therefore, the earnings opportunity of additional renewable resource investment still exists for the utility. However, if these fictitious lost earnings are included in an earnings opportunity associated with demand-side programs, Ameren Missouri would have an opportunity to double recover these costs.

In the event the Commission approves Ameren Missouri's Application or any variation of the Application, there should be no EO component of the DSIM resulting from measured and verified energy savings because there is no foregone supply-side investment.

Staff Expert Witness: Dana E. Eaves

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[115] Ameren Missouri's work-paper; EO EE DR Cycle 3 Only deferral.

[116] Ameren Missouri's revised its work-paper related to forgone RES earning opportunity in response to Staff Data Request No. 0020.1. Resulting in a lower forgone RES earnings opportunity, ** __________________________ . **

[117] RSMo 4 CSR 240-20.100.

[118] See Comment #12 in the Order of Rulemaking, EX-2010-0169.

iv. Rate Impact Analysis/Rate Design

Marginal Rate Analysis

For the residential and small general service (SGS) rate classes, Ameren Missouri's marginal rate analysis calculates each customer's bill given a reduction in kWh of 1%, 5% or 10% and then compares the change in revenue, net of fuel,[119] to the change in kWh to develop a margin rate. For rate classes that do not have a demand charge component, this method is not an unreasonable calculation of a margin rate for this MEEIA cycle.

For the large general service (LGS), small primary service (SPS), and large primary service (LPS) rate classes that have a demand charge component Ameren Missouri calculated the margin rate differently. The margin rate was calculated by applying the usage reduction scenarios (1%, 5%, and 10% savings) to every customer's monthly kWh and an imputed demand savings ratio was applied to every customer's monthly billed kW. The change in demand revenue and energy revenue was compared to the change in kWh to develop a per kWh margin rate.

How Ameren Missouri calculated its proposed margin rates for the LGS, SPS and LPS rate classes can be explained by the below steps:

1) End use hourly load shapes for each measure were used to determine a monthly load factor of that measure.
2) The deemed kWh savings for installed MEEIA Cycle 2 measures from April 2017 through March 2018 were summed and each measure's load shape was used to spread the savings to each of the 12 months.
3) kW savings were imputed by calculating average demand (monthly kWh from Step 2 / hours in the month) and then multiplied by the average demand of the monthly load factors for each measure from Step 1.[120]
4) The sum of monthly kW savings from Step 3 and the sum of monthly kWh savings from Step 2 for each measure for each class were used to develop a kWh to kW savings ratio.
5) The savings ratio from Step 4 and the usage reduction scenarios (1%, 5%, and 10% savings) per non-residential rate class were applied to each customer's monthly billed demand and billed kWh.

Ameren Missouri represents that the result of the calculation produces a reasonable estimate of the monthly margin rate for each non-residential rate class. In Staff's opinion, the result of this

[119] The FAC base factor from the most recent rate case is used as an estimate for fuel.

[120] The result of this step is that it essentially increases average demand up to a measure's peak demand.

calculation is not a reasonable estimate of monthly margin rates. Staff will address its concern with each Step below.

For Step 1, the end use hourly load shapes used by Ameren Missouri to develop a measure's load factor for each month of the year contains some unreasonable estimates of hourly usage for that measure in certain instances. For example, the end use hourly load shape used by Ameren Missouri for the cooling measure shows a random level of usage for January but only at 3:00 in the morning. Therefore, Ameren Missouri's load factor analysis shows that the measure's peak for January occurred at 3:00 in the morning. [121] Another measure that Staff is reviewing is the hourly load shape for exterior lighting, which shows maximum usage at 9:00 and10:00 in the morning, where Staff would expect the maximum to occur closer to the evening hours. These unexplained hourly usages cause concern, since these factors are being used to determine a measure's impact on a customers billed demand that occurs at 15-minute interval in time.

For Step 2, the unreliability of the end use hourly load shapes produced from Step 1 render Ameren Missouri's calculation of the monthly load shapes unreliable. However, at this time Staff does not have a specific concern with the mechanics of this step for purposes of this MEEIA cycle.

For Step 3, Ameren Missouri's method relies on an unsupported and unreasonable assumption that an energy efficiency measure is running at the measure's peak level of operation regardless of the time of year, which greatly overestimates the demand savings that will occur. For example, for a cooling measure such as an air conditioner, it would be reasonable that the air conditioner would have a low load factor in the winter months and higher load factor in the summer months. This essentially means that, all else being equal, a customer would receive the greatest benefit from the cooling measure in the summer months rather than the winter months. However, Ameren Missouri makes the inappropriate assumption that even in the month of January a customer's air conditioner would run at a peak operation level which leads to a level of estimated kW demand savings that is disproportionate to the amount of energy savings.

For Step 4, a misuse of averages renders Ameren Missouri's results unreasonable. Ameren Missouri aggregated the measure kW and kWh savings for each class before calculating the relationship between kWh and kW savings. The resulting factor does not accurately reflect the impact any measure may have on a customer's non-coincident demand. The flaw in this

[121] It is not unusual for some non-residential customers to have a small amount of cooling usage in the winter.

methodology is that averaging the impact of a measure with high kW impact but low kWh impact with a different measure that has a low kW impact but a high kWh impact does not reflect actual impacts. The result is not an estimate that is equally applicable to either measure; it is a result that is equally unreasonable as an estimate to each measure. For this reason, Staff recommends developing separate measure margin rates for each measure, or for small groups of measures that have similar impacts.

For example, the table below shows a cumulative monthly kW to kWh savings ratio for the SPS class of all measures lumped together with an equal weighting, as Ameren Missouri did in its calculation.[122] Ameren Missouri uses a simple average of the monthly savings ratio for each class in the calculation of the margin rate.[123] Therefore, if kWh is decreased by 1%, 5% or 10% a customer's non-coincident demand is decreased by 1.12 times more in Ameren Missouri's calculation. This result assumes that all measures were installed to exactly the same level for exactly the same number of customers for exactly the same impact across all measures and across all months.

Table 12

TOTAL 4M	April 2017-March 2018									
Row Labels	kWh Savings	KW Savings		Class Energy	Class Demand	Energy After EE	Demand after EE	% reduction (energy)	% reduction (demand)	kw -kwh ratio
January	2,786,122	6,284	4M	313,799,795	640,358	311,013,673	634,075	0.8879%	0.9813%	1.105193904
February	2,199,891	5,224	4M	291,669,633	642,009	289,469,742	636,785	0.7542%	0.8137%	1.078845004
March	2,354,283	5,648	4M	314,375,711	668,927	312,021,428	663,279	0.7489%	0.8443%	1.127447847
April	2,289,781	5,720	4M	301,506,792	658,057	299,217,011	652,337	0.7594%	0.8692%	1.144502986
May	2,892,506	7,402	4M	316,271,914	672,632	313,379,408	665,230	0.9146%	1.1004%	1.203186649
June	3,037,585	7,685	4M	347,259,657	730,770	344,222,072	723,085	0.8747%	1.0517%	1.202267883
July	3,881,279	9,452	4M	366,889,225	774,045	363,007,946	764,593	1.0579%	1.2212%	1.154349071
August	3,322,650	8,190	4M	359,917,271	756,897	356,594,621	748,707	0.9232%	1.0820%	1.172087731
September	2,756,645	7,148	4M	340,223,897	752,897	337,467,252	745,748	0.8102%	0.9494%	1.171783058
October	2,748,794	6,848	4M	315,121,935	690,564	312,373,141	683,717	0.8723%	0.9916%	1.136780784
November	2,302,831	5,814	4M	289,117,999	664,916	286,815,168	659,102	0.7965%	0.8744%	1.097794129
December	2,543,878	5,229	4M	294,444,113	646,122	291,900,235	640,893	0.8640%	0.8093%	0.936714713
Grand Total	33,116,245	9,452	4M	3,850,597,941	774,045	3,817,481,696	764,593	0.8600%	1.2212%	1.419920894

However, if you use Ameren Missouri's methodology but develop a kW to kWh savings ratio for each measure the ratios would be very different. The tables below show the ratios for the cooling measure and the lighting measure for the SPS class.

[122] The table is the cumulative deemed savings and the overestimated demand savings for the number of actual measures installed for the Air Comp, Cooling, Ext. Lighting, HVAC, Lighting and Misc. programs. Savings for the Motors, Process and Refrigeration measures were excluded from this calculation.

[123] Ameren Missouri calculated an average of 1.1275.

Table 13

Cooling	April 2017-March 2018									
Row Labels	kWh Savings	KW Savings		Class Energy	Class Demand	Energy After EE	Demand after EE	% reduction (energy)	% reduction (demand)	kw -kwh ratio
January	22	4	4M	313,799,795	640,358	313,799,773	640,354	7.01084E-08	6.96355E-06	99.32553
February	854	24	4M	291,669,633	642,009	291,668,779	641,985	2.92797E-06	3.76297E-05	12.85182
March	24,969	909	4M	314,375,711	668,927	314,350,742	668,017	7.94241E-05	0.001359633	17.11865
April	74,844	899	4M	301,506,792	658,057	301,431,948	657,157	0.000248233	0.001366486	5.50485
May	217,310	1,364	4M	316,271,914	672,632	316,054,604	671,268	0.000687099	0.002027263	2.95047
June	735,531	2,551	4M	347,259,657	730,770	346,524,126	728,219	0.002118101	0.003490479	1.64793
July	1,000,730	3,153	4M	366,889,225	774,045	365,888,495	770,892	0.002727608	0.004073399	1.49340
August	932,332	3,002	4M	359,917,271	756,897	358,984,939	753,895	0.002590406	0.003966508	1.53123
September	375,046	1,969	4M	340,223,897	752,897	339,848,851	750,928	0.001102351	0.00261473	2.37196
October	67,778	728	4M	315,121,935	690,564	315,054,157	689,837	0.000215085	0.001053683	4.89892
November	20,806	728	4M	289,117,999	664,916	289,097,193	664,188	7.19637E-05	0.001094697	15.21179
December	221	9	4M	294,444,113	646,122	294,443,892	646,114	7.50567E-07	1.32315E-05	17.62871
Grand Total	3,450,443	3,153.0	4M							

Lighting	April 2017-March 2018									
Row Labels	kWh Savings	KW Savings		Class Energy	Class Demand	Energy After EE	Demand after E	reduction (energ	eduction (dema	kw -kwh ratio
11M January	2,234,019	5,005	4M	313,799,795	640,358	311,565,776	635,354	0.007119249	0.007815191	1.09775488
11M Februar	1,723,005	4,006	4M	291,669,633	642,009	289,946,628	638,003	0.005907386	0.006240162	1.05633228
11M March	1,871,320	3,645	4M	314,375,711	668,927	312,504,391	665,282	0.005952495	0.005449384	0.91547897
11M April	1,827,413	3,788	4M	301,506,792	658,057	299,679,379	654,268	0.006060935	0.0057566	0.94978747
11M May	2,250,340	4,958	4M	316,271,914	672,632	314,021,574	667,673	0.007115207	0.007371707	1.03604966
11M June	1,805,090	3,857	4M	347,259,657	730,770	345,454,567	726,913	0.005198099	0.005278036	1.01537807
11M July	2,296,963	4,824	4M	366,889,225	774,045	364,592,262	769,221	0.006260644	0.006232104	0.99544124
11M August	1,840,382	3,806	4M	359,917,271	756,897	358,076,889	753,091	0.005113347	0.005027882	0.98328585
11M Septem	1,942,965	3,968	4M	340,223,897	752,897	338,280,932	748,928	0.005710842	0.005270941	0.92297080
11M October	2,246,170	5,032	4M	315,121,935	690,564	312,875,765	685,533	0.007127939	0.007286422	1.02223402
11M Novemt	1,831,543	3,975	4M	289,117,999	664,916	287,286,456	660,941	0.006334932	0.00597775	0.94361696
11M Decemb	2,007,817	3,969	4M	294,444,113	646,122	292,436,296	642,154	0.006819009	0.006142251	0.90075423
Grand Total	23,877,027	5,031.7	4M							

The average ratio or the cooling measure is 15.21, as compared to the average lighting measure ratio of 0.9865.[124] Using Ameren Missouri's method these individual measure kW to kWh relationships are ignored and only an average of all class measures is used to determine the margin rate of the class, even though Ameren Missouri's demand estimates create different impacts for different measures. The high cooling ratio is due to Ameren Missouri's method of estimating demand savings in the months where the measure has the lowest load factor and is less likely to even be used as addressed in Step 3.[125]

Using Ameren Missouri's margin rate calculation, the impact of the kW to kWh savings ratio on the SPS margin rates is shown below using a 1% usage reduction scenario.

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[124] These values can be interpreted as for a 1% decrease in kWh a customer's demand decreases by 15.21 times more for a cooling measure and only 0.9865 times more or less than 1% for a lighting measure.

[125] All measures that have a fluctuating load factor from month to month, such as HVAC, heating and cooling measures will have the same disproportionate amount of kW to kWh savings in months where the measure's load factor is the lowest, because the Company is scaling every month up to a measure's peak operation level even though it is unlikely to be run at its peak operation level.

Table 14

	kW to kWh Ratio		
	1.1275	15.21	0.9865
Month	Cumulative Margin Rate	Cooling Margin Rate	Lighting Margin Rate
1	0.03298	0.22205	0.03191
2	0.03431	0.23914	0.03316
3	0.03471	0.24443	0.03352
4	0.03546	0.25171	0.03415
5	0.03578	0.25578	0.03446
6	0.07264	0.56491	0.06869
7	0.07142	0.54807	0.06759
8	0.07143	0.54921	0.06755
9	0.07207	0.55648	0.06816
10	0.03452	0.23953	0.03325
11	0.03517	0.24801	0.03390
12	0.03442	0.24068	0.03328

Currently, Ameren Missouri is requesting one margin rate per month per rate class be applied to all deemed kWh savings regardless of the measures installed. Given that Ameren Missouri's demand impact estimation for the non-residential MEEIA programs impact demand differently, Ameren Missouri's margin rate calculation is not a reasonable approach.

For Step 5, Staff's concern is that Ameren Missouri applies the usage reduction scenarios (1%, 5%, and 10% savings) and the kW to kWh savings ratio to each customer's bill in the rate class without adjusting for customers that take service at or near the class minimum demand, and without adjusting for opt-out customers .[126] For example, in Case No. ER-2016-0179, 42% of the LPS customers had opted out of MEEIA. These customers accounted for approximately 54% of the total LPS class usage. Approximately 16 LPS customers participated in MEEIA programs from April 2017 to March 2018. Of these 16 customers, 6 were at or below the minimum demand requirements of the LPS class. The minimum billed demand for a customer in the LPS class is 5,000 kW, which means regardless of the customer's metered demand for that month Ameren Missouri will receive revenues for 5,000 kW. Given Ameren Missouri's LPS rate schedule, if a customer is served at minimum demand, the margin rate is $0.0314 in the winter

[126] Non-residential customers who meet certain criteria have the option to opt-out of the MEEIA program and do not have to pay the MEEIA charges.

and $0.0354[127] in the summer. Although customers served at the minimum demand level only represent approximately 13% of the total LPS class, minimum demand customers represent approximately 37% of the LPS customers participating in MEEIA.

The table below provides the difference between the margin rates for a customer served at minimum demand on the LPS rate schedule compared to Ameren Missouri's proposed margin rate. [128]

Table 15

Month	Proposed LPS Margin	Margin for Minimum Demand	% Difference
1	0.03166	0.01646	92.348%
2	0.03516	0.01646	113.626%
3	0.03350	0.01646	103.515%
4	0.03434	0.01646	108.633%
5	0.03241	0.01646	96.866%
6	0.06481	0.02018	221.190%
7	0.06609	0.02018	227.523%
8	0.06626	0.02018	228.362%
9	0.06781	0.02018	236.027%
10	0.03411	0.01646	107.241%
11	0.03414	0.01646	107.386%
12	0.03317	0.01646	101.539%

Staff cannot recommend reliance on Ameren Missouri's proposed MEEIA Cycle 3 margin rate calculation for the LGS, SPS and LPS rate classes. While there is no perfect method to calculate lost revenues, Ameren's method is over-simplified and produces unreasonable results that assume average impacts in a way that has not been validated with how the program has been executed. Even if calculated on a customer-specific, measure-specific basis, any lost revenue calculation still requires estimates and assumptions. To make MEEIA Cycle 3 administratively possible, it is necessary to do some level of simplification and estimation of average impacts. Staff cannot support the procedures as proposed because results would lead to unreliable estimates of TD. If the Commission approves Ameren Missouri's calculation of MEEIA margin rates, Staff recommends incorporation of reasonable procedures and methods to produce reasonably reliable estimates.

[127] The LPS rate schedule consists of a customer charge, demand charge and a flat volumetric rate.
[128] Adjusted for the Tax reduction.

If measure-specific margin rates are not utilized, one way that could be used to calculate one margin rate for each class that removes some of the assumptions, especially that of the relationship between a customer's billed kW and kWh, is to convert the tariffed demand charge for each class to essentially a kWh charge by dividing the demand charge on the tariff by the hours in the month. This value would then be added to the margin variable rate net of fuel.

For example, the LPS class' rate schedule summer demand charge is $21.16 per billed kW and the non-summer demand charge is $9.61 per billed kW. On average there is approximately 730 hours in a month, therefore $21.16 / 730 = $0.0290 and $9.61 / 730 = $0.0132. The LPS rate schedule has a flat volumetric rate of 0.0354 in the summer and 0.0314 in the winter. Once the volumetric rate is adjusted for the removal of the FAC base factor and the recent tax reduction[129] the volumetric rate becomes $0.01298 in the winter and $0.01670 in the summer. Lastly, the demand rate on a per kWh basis is added to the margin volumetric rate to develop the margin rate. This calculation removes the unreasonable magnitude of demand savings that Ameren Missouri has predicted; however, customers served at the class minimum demand would still need to be taken into consideration. Staff is not recommending that this is the best way to calculate margin rates, but given the information available in this case it is a way to calculate margin rates. The table below provides a comparison between Ameren Missouri's proposed margin rate adjusted for the tax reduction and the alternative method mentioned above.

Table 16

Month	Proposed LPS Margin	Alternative Margin	% Difference
1	0.03166	0.02615	21.078%
2	0.03516	0.02615	34.472%
3	0.03350	0.02615	28.107%
4	0.03434	0.02615	31.329%
5	0.03241	0.02615	23.921%
6	0.06481	0.04568	41.882%
7	0.06609	0.04568	44.680%
8	0.06626	0.04568	45.051%
9	0.06781	0.04568	48.437%
10	0.03411	0.02615	30.452%
11	0.03414	0.02615	30.544%
12	0.03317	0.02615	26.864%

[129] The FAC base factor is used as an estimate for fuel. Since the FAC mechanism captures changes in the FAC base factor, the FAC base factor is removed from the tariff rate in order to only capture the margin lost revenue. Also, since Ameren Missouri's tax reduction is a separate line item on the tariff, the tariffed rates need to be reduced by the tax reduction rate in order to calculate the correct margin rate.

MEEIA Rate Design

Currently, customers who have not opted out of MEEIA pay a flat volumetric rate that is specific to the rate class but the same year-around to recover the costs associated with the MEEIA program. Staff's concern with this rate design is that residential all-electric customers who use more kWh in the winter months than a residential customer with gas heating incur an overall higher MEEIA bill regardless of whether or not they have caused higher MEEIA costs to be incurred.

Staff Expert Witness: Robin Kliethermes

IV. Staff's Analysis - Conclusions

Ameren Missouri's Application for MEEIA Cycle 3 fails to comply with the statutory requirement in Section 393.1075, namely 393.1075.3 and 393.1075.4 as discussed throughout this Report.

Ameren Missouri has not valued demand-side investments equal to traditional investments in supply and delivery infrastructure. Further, since Cycle 3 programs only contribute to supply-side investment deferral, from 2034 to 2036, of one 600 MW combined cycle plant, the adjusted residential TRCs decrease significantly. Thus, many of the residential programs, and the residential portfolio as a whole, are not cost effective. Finally, once Ameren Missouri's cumulative net customer costs analysis is adjusted to reflect Staff's avoided costs and avoided benefit analyses, Staff's analysis demonstrates that the Application is not beneficial to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers.

Upon consultation with Staff Counsel, it is Staff's opinion that these flaws of the Application are contrary to the statutory requirements set forth in Sections 393.1075.3 and 393.1075.4.

Staff Expert Witness: Natelle Dietrich

V. Request for Waivers

Ameren Missouri's Application includes requests for approval of four waivers from Commission's rules. Should the Application be approved, Staff recommends approval of all four waiver requests for the good cause described:

- Waiver/Variance Related to IRP Integration: Rule 4 CSR 240-20.094(4)(I)3;
- Waiver/Variance Related to Annual Energy and Demand Savings Goals: Rule 4 CSR 240-20.094(2);
- Waiver/Variance Related to Promotional Practices: Rule 4 CSR 240-14.030(3); and
- Waiver/Variance of Triennial and Annual Update Filing Dates: Under 4 CSR 240-22.080(1).

Staff Expert Witness: John A. Rogers

VI. Recommendations

For the reasons stated throughout this Report, Staff recommends the Commission reject the Application as proposed. Staff further recommends the Commission authorize Ameren Missouri to continue MEEIA Cycle 2 for up to one additional year to allow Ameren Missouri, Staff and other interested parties, the opportunity to develop a MEEIA Cycle 3 plan that meets the MEEIA statutory requirements or consider other options that may be available.

However, if the Commission approves the Application, Staff recommends the Commission approve the waivers requested in the Application. Further, if the Commission approves the Application, or as part of any MEEIA Cycle 3 development process, Staff recommends:

- The Commission only approve a Cycle 3 Application that is 3 years in length.
- The Commission direct the BSS program be moved out of the Low-Income Program section to a stand-alone business program.
- There be no EO component of the DSIM resulting from measured and verified energy savings.
- The Rider EEIC include a cut-off date for the TD recovery such that the TD will either end with the cut-off date in the tariff or Ameren Missouri's next rate case, whichever is sooner.
- The Commission reject the "DRENE" proposal, direct Ameren Missouri to revise the calculation of Measure Energy, and reject the creation of program year-specific throughput disincentives.
- The Commission direct Ameren Missouri to develop separate measure margin rates for each measure, or for small groups of measures that have similar impacts,

and direct Ameren Missouri to incorporate reasonable procedures and methods to produce reasonably reliable estimates for margin rates.

- The Commission direct Ameren Missouri to provide modeled analysis that demonstrates that each Program is cost effective at the maximum incentive level proposed in Appendix D of the Application.
    - If any of the modeled analysis demonstrates that a program would not be cost effective at the maximum incentive level, Ameren Missouri shall amend Appendix D with a maximum incentive level that Ameren Missouri has demonstrated could be cost effective.
- Ameren Missouri create a process to begin working with the EM&V independent evaluator(s) or another process to collect additional data on customer participation and preferences to help gauge customer interest in programs and to explore the types of programs in which customers would participate, especially hard to reach customers.
- Ameren Missouri create a process to educate customers of all income levels as to the programs that are available.
- Ameren Missouri work with stakeholders in the MEEAC to expand the reach of low-income programs.
- Ameren Missouri work with the Keeping Current Collaborative to analyze customers who have defaulted off the program, and design a program to help them lower their utility bills.
- Ameren Missouri expand its Business Social Service Agencies Program to include non-profit centers.
- Ameren Missouri continue discussions with other utilities on co-delivered programs.
- Ameren Missouri modify its tariff sheets to contain detailed program information with direct links to its website as opposed to referring the customer to Ameren Missouri's home webpage.
- Ameren Missouri's independent EM&V contractors run the DSMore model to determine incremental annual energy and demand savings and program cost-effectiveness results.

Staff Expert Witness: Natelle Dietrich

Appendix 1 - Staff Credentials

Appendix 2 - Staff Schedules

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF KORY J. BOUSTEAD

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW KORY J. BOUSTEAD and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Kory J. Boustead
KORY J. BOUSTEAD

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF NATELLE DIETRICH

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW NATELLE DIETRICH and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Natelle Dietrich
NATELLE DIETRICH

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF CLAIRE M. EUBANKS, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CLAIRE M. EUBANKS, PE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Claire M Eubanks

CLAIRE M. EUBANKS, PE

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 28th day of August 2018.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
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Commission Number: 12412070

D Suzie Mankin

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 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF DANA E. EAVES

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW DANA E. EAVES and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing Rebuttal Testimony in Report form form; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Dana E. Eaves

DANA E. EAVES

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF BRAD J. FORTSON

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW BRAD J. FORTSON and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Brad J Fortson

BRAD J. FORTSON

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF TAMMY HUBER

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW TAMMY HUBER and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Tammy Huber
TAMMY HUBER

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

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 Rebuttal Testimony in Report form; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Robin Kliethermes

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 29th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA	)))))	Case No. EO-2018-0211

AFFIDAVIT OF J LUEBBERT

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW J LUEBBERT and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

J Luebbert

J LUEBBERT

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 28th day of August 2018.

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

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company	)	
d/b/a Ameren Missouri's 3rd Filing to	)	Case No. EO-2018-0211
Implement Regulatory Changes in	)	
Furtherance of Energy Efficiency as	)	
Allowed by MEEIA	)	

AFFIDAVIT OF JOHN A. ROGERS

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW JOHN A. ROGERS and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing Rebuttal Testimony in Report form; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

John A Rogers

JOHN A. ROGERS

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 28th day of August 2018.

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