MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT ON

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

ELECTRIC UTILITY RESOURCE PLANNING
COMPLIANCE FILING

FILE NO. EO-2015-0084

February 27, 2015

JEFFERSON CITY, MISSOURI

**** Denotes Highly Confidential Information ****

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Schedule MM-S1

Table of Contents

Executive Summary

On October 1, 2015, Union Electric Company, d/b/a Ameren Missouri ("Ameren Missouri" or "Company"), filed its 2014 Integrated Resource Plan ("IRP") triennial compliance filing ("Filing") in File No. EO-2015-0084, as required by 4 CSR 240-22 Electric Utility Resource Planning. This is Ameren Missouri's first Chapter 22 triennial compliance filing under the Commission's revised Chapter 22 rules.[1] As more fully discussed throughout this report ("Report"), Staff identifies no deficiencies, but identifies the following concerns and suggested remedies:

A. The incremental annual energy savings expected from Ameren Missouri's realistic achievable potential ("RAP") portfolio for its MEEIA[2] Cycle 2[3] (2016 – 2018) may be vastly underestimated, since the kWh and kWh per $ savings are less than half the actual achieved levels of kWh and of kWh per $ during Ameren Missouri's pre-MEEIA programs (2009 – 2011) and MEEIA Cycle 1 programs to date (2013 – 2014).

B. The incremental and cumulative annual energy savings expected from Ameren Missouri's RAP portfolio during the long-term planning horizon may be vastly underestimated, since the Ameren Missouri savings are approximately one-half the incremental and cumulative annual energy savings of the IRP RAP portfolios[4] of Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company.

To remedy these concerns, Ameren Missouri should work with parties to its 2014 IRP case and with parties to its MEEIA Cycle 2 case (File No. EO-2015-0055) during joint agreement[5] discussions and during technical conferences, respectively, to help parties understand Staff's concerns and, if necessary, to resolve those concerns.

[1] Chapter 22 Electric Utility Resource Planning rules 4 CSR 240-22.010, .020, .030, .040, .050, .060, .070 and .080 were all revised effective May 31, 2011. Rule 4 CSR 240-22.045 Transmission and Distribution Analysis became a new rule effective May 31, 2011.

[2] MEEIA is the Missouri Energy Efficiency Investment Act of 2009, Section 393.1075, RSMo, Supp. 2013. The Commission's MEEIA rules include: 4 CSR 240-3.163, 4 CSR 240-3.164, 4 CSR 240-20.093 and 4 CSR 240-20.094.

[3] Ameren Missouri's MEEIA Cycle 2 application was filed in File No. EO-2015-0055 on December 22, 2014.

[4] Presented by Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company to their IRP stakeholder group on January 21, 2015 in a meeting required by 4 CSR 240-22.080(5)(A) for each utility's 2015 IRP to be filed on April 1, 2015.

[5] 4 CSR 240-22.080(9) If the staff, public counsel, or any intervenor finds deficiencies in or concerns with a triennial compliance filing, it shall work with the electric utility and the other parties to reach, within sixty (60) days of the date that the report or comments were submitted, a joint agreement on a plan to remedy the identified deficiencies and concerns. If full agreement cannot be reached, this should be reported to the commission through a joint filing as soon as possible but no later than sixty (60) days after the date on which the report or comments were submitted. The joint filing should set out in a brief narrative description those areas on which agreement cannot be reached. The resolution of any deficiencies and concerns shall also be noted in the joint filing.

Summary of Plan and Staff's Analysis

The policy objectives for electric utility resource planning are contained in:

4 CSR 240-22.010(2) The fundamental objective of the resource planning process at electric utilities shall be to provide the public with energy services that are safe, reliable, and efficient, at just and reasonable rates, in compliance with all legal mandates, and in a manner that serves the public interest and is consistent with state energy and environmental policies. The fundamental objective requires that the utility shall—

(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;

(B) Use minimization of the present worth of long-run utility costs[6] as the primary selection criterion in choosing the preferred resource plan, subject to the constraints in subsection (2)(C); and

(C) Explicitly identify and, where possible, quantitatively analyze any other considerations which are critical to meeting the fundamental objective of the resource planning process, but which may constrain or limit the minimization of the present worth of expected utility costs. The utility shall describe and document the process and rationale used by decision-makers to assess the tradeoffs and determine the appropriate balance between minimization of expected utility costs and these other considerations in selecting the preferred resource plan and developing the resource acquisition strategy. These considerations shall include, but are not necessarily limited to, mitigation of:

1. Risks associated with critical uncertain factors that will affect the actual costs associated with alternative resource plans;
2. Risks associated with new or more stringent legal mandates that may be imposed at some point within the planning horizon; and
3. Rate increases associated with alternative resource plans.

Staff provides this Report as required by Commission Rule 4 CSR 240-22.080(7):

(7) The staff shall conduct a limited review of each triennial compliance filing required by this rule and shall file a report not later than one hundred fifty (150) days after each utility's scheduled triennial compliance filing date. The report shall identify any deficiencies in the electric utility's compliance with the provisions of this chapter, any major deficiencies in the methodologies or analyses required to be performed by this chapter, and any other deficiencies and shall provide at least one (1) suggested remedy for each identified deficiency. Staff may also identify concerns with the utility's triennial compliance filing, may identify concerns related to the substantive reasonableness of the preferred resource plan or resource acquisition strategy, and shall provide at least one (1) suggested remedy for each identified concern.

[6] The term utilities costs is synonymous with revenue requirements.

As a result of its review, Staff finds that Ameren Missouri's analysis gave its decision-makers[7] a diverse and comprehensive set of nineteen (19) candidate resource plans, and risk analyses for each candidate resource plan, for use during the decision-makers' resource acquisition strategy selection process. For its risk analysis of each candidate resource plan, Ameren Missouri constructed a probability tree which contains four (4) critical dependent uncertain factors[8] (Eastern Interconnection's coal plant retirements, carbon prices, load growth and natural gas prices) and four (4) critical independent uncertain factors (DSM cost and load impact, long-term interest rates and return on equity, project capital cost, and coal prices). Ameren Missouri's final probability tree is included as Addendum A to this Report. The final probability tree has 1,215 branches with each branch representing a unique combination of the critical uncertain factors. Once the risk adjusted present value of revenue requirements ("PVRR") of all the combinations are calculated, the sum of the individual branch probabilities equals 100%.

The risk adjusted PVRR over 29 years[9] for the nineteen (19) candidate resource plans[10] varies from a low of $60.84 billion (for a plan with maximum achievable potential ("MAP") demand-side management ("DSM") resources (Plan G)) to a high of $66.97 billion (for a plan with no DSM and only new wind supply-side resources (Plan L)) for a PVRR range of $6.13 billion or approximately 9% for the nineteen candidate resource plans.

Ameren Missouri's decision makers used a decision scorecard to inform its resource acquisition strategy selection process.[11] Ameren Missouri's Preferred Plan Selection Scorecard

[7] Chapter 10, Appendix B, of Ameren Missouri's filing indicates that Ameren Missouri decision-makers present at the September 15, 2014 Ameren Missouri Board of Directors Meeting who adopted the 2014 IRP resource acquisition strategy included: Michael Moehn, President and Chief Executive Officer of Ameren Missouri; Dan F. Cole, President and Chief Executive Officer of Ameren Services; Greg L. Nelson, Senior Vice President General Counsel & Secretary; and Chuck D. Naslund, Executive Vice President Corporate Operations Oversight.

[8] Uncertain factor means any event, circumstance, situation, relationship, causal linkage, price, cost, value, response, or other relevant quantity which can materially affect the outcome of resource planning decisions, about which utility planners and decision-makers have incomplete or inadequate information at the time a decision must be made. Critical uncertain factor is any uncertain factor that is likely to materially affect the outcome of the resource planning decision.

[9] Integration, sensitivity and risk analyses for the evaluation of alternative resource plans were done assuming that rates would be adjusted annually for the 20-year planning horizon and 10 additional years for end effects, and by treating both supply-side and demand-side resources on an equivalent basis.

[10] Section 9.5 of the IRP describes each of the nineteen (19) alternative resource plans and the process used to determine the plans.

[11] The scorecard was used to comply with 4 CSR 240-22.010(2)(C); 4 CSR 240-22.010(2)(C)1 through 3; 4 CSR 240-22.070(1); and 4 CSR 240-22.070(1)(A) through (D).

("Scorecard") is included as Addendum B to this Report and reflects the following performance measures and assigned weights for each performance measure:

1. Environmental and resource diversity with a focus on transitioning to a cleaner and more fuel diverse portfolio (20%);
2. Financial and regulatory measures the expected financial performance and creditworthiness and potential risks (20%);
3. Customer satisfaction with a focus on rate impacts (average rates and maximum single-year rate increase) and customer preferences for cleaner energy sources and DSM (20%);
4. Economic development measured by potential for primary job growth (10%); and
5. Cost to customers as measured through PVRR (30%).[12]

The Scorecard for the top tier plans identified through scoring include combinations of RAP and MAP DSM portfolios as well as renewables, gas-fired resources and nuclear. Table 10.2 of the IRP contains the Alternative Resource Plan Scoring Results. The entire Scorecard is included as Addendum E to this Report.

[12] In its *Report and Order* issued on March 28, 2012, in Case No. EO-2011-0271, the Commission determined that compliance with 4 CSR 240-22.020(2)(B) "Use minimization of the present worth of long-run utility costs as the primary selection criterion in choosing the preferred resource plan," means to give the PVRR performance measure the highest weights when complying with 4 CSR 240-22.070(1) "The utility shall select a preferred resource plan from among the alternative resource plans that have been analyzed pursuant to the requirements of 4 CSR 240-22.060. The utility shall describe and document the process used to select the preferred resource plan, including the relative weights given to the various performance measures and the rationale used by utility decision-makers to judge the appropriate tradeoffs between competing planning objectives and between expected performance and risk."

Table 10.2

Plan	Description	Overall Assessment
R	600MW CC in 2034, MAP, Balanced	4.10
I	600MW CC in 2034, RAP, Balanced	4.00
E	800MW Wind in 2034, 352MW SC in 2034, 600MW CC in 2034, RAP	3.80
G	600MW CC in 2034, MAP	3.80
A	600MW CC in 2034, RAP	3.60
C	704MW SC in 2034, RAP	3.60
S	600MW CC in 2034, MAP EE Only	3.60
H	169MW Nuke in 2034, 600MW CC in 2034, RAP, Balanced	3.40
F	1200MW CC in 2034,RAP EE Only	3.20
D	600MW Pumped Hydro in 2034, RAP	3.10
Q	169MW Nuke in 2034, MAP, Balanced	3.10
P	169MW Nuke in 2025, 600MW CC in 2025, 1200MW CC in 2034, RAP, Balanced, RI Ret 12/31/2024	3.00
B	450MW Nuke in 2034, 600MW CC in 2034, RAP	2.80
O	169MW Nuke in 2025, 1800MW CC in 2024, 1200MW CC in 2034, RAP, Balanced, LAB Ret 12/31/2023	2.50
N	600MW CC in 2025, 1200MW CC in 2034, MAP, RI Ret 12/31/2024	2.40
K	600MW CC in 2023, 600MW CC in 2031, 600MW CC in 2034, MEEIA1, Balanced	2.10
M	1800MW CC in 2024, 1200MW CC in 2034, MAP, LAB Ret 12/31/2023	2.10
J	169MW Nuke in 2031, 600MW CC in 2023, 1200MW CC in 2034, MEEIA1, Balanced	2.00
L	3300MW Wind in 2023, 3300MW Wind in 2027, 6600MW Wind in 2034, MEEIA1	1.60

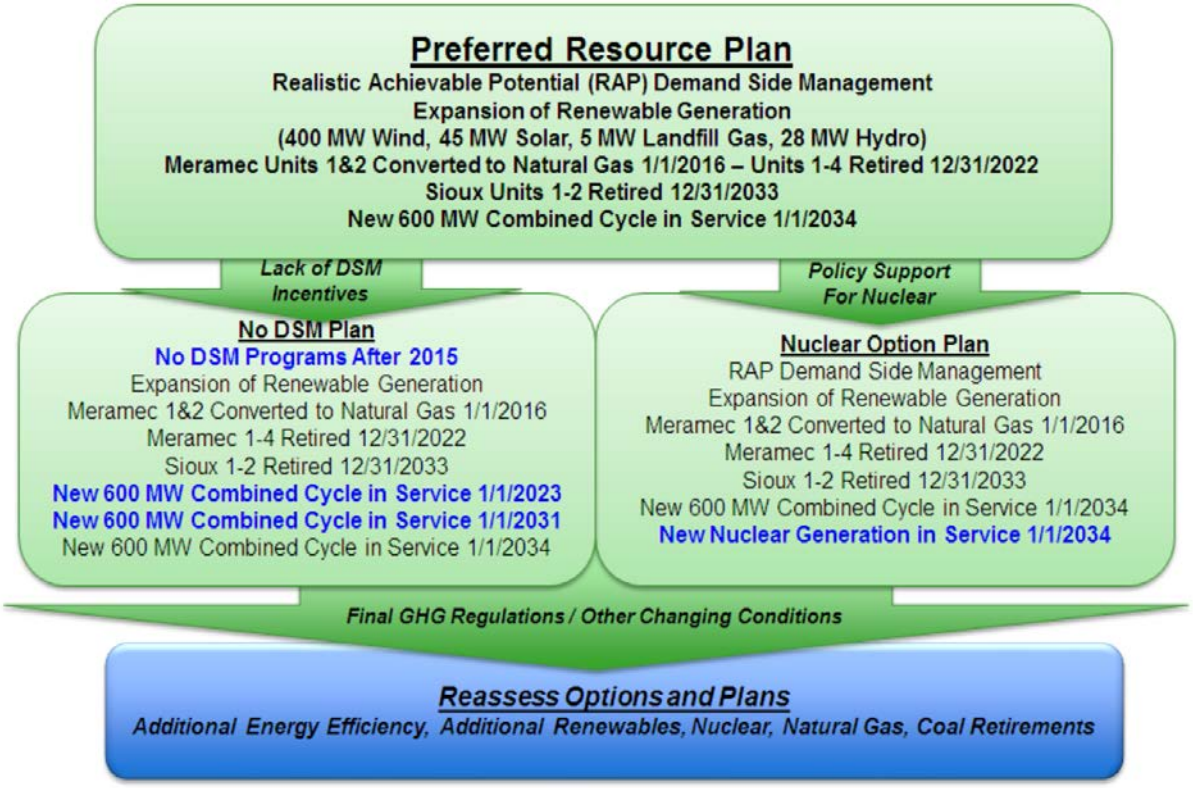
Ameren Missouri's adopted resource acquisition strategy includes its preferred resource plan (Plan A), which has a 29-year PVRR of $61.11 million and consists of realistic achievable potential ("RAP") energy efficiency and demand response programs, roughly 500 MW of new renewable generation, and a new 600 MW combined cycle energy center in 2034 along with conversion of Meramec Units 1 & 2 to natural gas-fired operation in 2016, retirement of all Meramec units by the end of 2022, and retirement of Sioux Energy Center at the end of 2033. Ameren Missouri's IRP discussion of its decision to choose a RAP plan even though similar MAP plans received higher overall scores on the Scorecard includes the following:

> **DSM Portfolio** – RAP and MAP DSM portfolios both performed well in the scoring and, importantly, both result in reduced total costs to customers. The decision between the two must involve a consideration of risk and reward from the perspective of both customers and Ameren Missouri. Based on our analysis of the year-by-year cost differences between RAP and MAP, and an understanding of the increased level of risk in achieving MAP relative to RAP, Ameren Missouri has chosen to include the RAP portfolio in its preferred resource plan.
>
> This is not to say that there couldn't be additional potential energy savings that can be realized. Indeed our uncertainty range for the RAP portfolio includes some significant amount of upside. However, we must consider the immediate cost impact to all customers of a large increase in DSM expenditures (the 2016-2018 budget would be nearly double for MAP) and the uncertainty of the relative

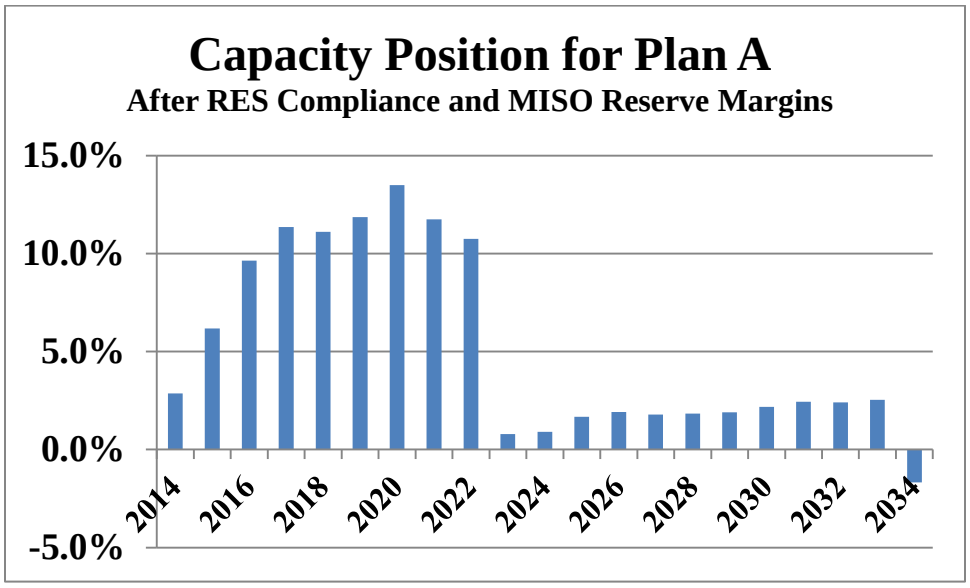
long-term benefits. We must also consider that the path for demand-side programs is not "locked in" for twenty years.

Including RAP DSM in our preferred resource plan allows us to continue to offer highly cost-effective programs to customers at roughly the same level of annual spending budgeted for our first cycle of MEEIA programs while also allowing the potential for increased savings if our experience and expectations indicate they could be achieved in a cost-effective manner. Identifying such opportunities will depend on the results of program implementation and periodic updates of our market research.

Ameren Missouri's resource acquisition strategy includes the adopted preferred resource plan as well as several contingency resource plan options and the events that could lead to a change in preferred resource plan and is shown in the following diagram:



Ameren Missouri's highly confidential capacity balance sheet for the adopted preferred resource plan (Plan A) is included as Addendum C to this Report. Ameren Missouri is expecting to be long on capacity through 2033 under Plan A after compliance with the Renewable Energy Standard ("RES") and with the Midcontinent Independent System Operator ("MISO") planning reserve margin requirements as reflected in the following chart.



As a result of its limited review, Staff identified no deficiencies and two (2) concerns regarding Ameren Missouri's 2014 IRP:

4 CSR 240-22.030 Load Analysis and Forecasting

Summary

4 CSR 240-22.030, Load Analysis and Forecasting, has a stated purpose of setting the "minimum standards for the maintenance and updating of historical data, the level of detail required in analyzing loads, and the purposes to be accomplished by load analysis and by load forecast models. The load analysis discussed in this rule is intended to support both demand-side management efforts of 4 CSR 240-22.050 and the load forecast models of this rule. This rule also sets the minimum standards for the documentation of the inputs, components, and methods used to derive the load forecasts." The Load Analysis and Load Forecasting Rule allows the utility to use multiple analytical methods for performing its load analysis and develop its forecasts, leaving it to the utility's discretion to choose the methods by which it achieves the stated purpose of the rule. Ameren Missouri did not request any waivers from specific provisions of this rule.

In Staff's limited review of Ameren Missouri's load analysis and energy and demand forecasts, Staff found no deficiencies concerning compliance with this rule and Staff has not identified any additional concerns. In Staff's opinion, the Integrated Resource Analysis filing meets the Load Analysis and Forecasting requirements of 4 CSR 240-22.030.

4 CSR 240-22.040 Supply-Side Resource Analysis

Summary

Rule 4 CSR 240-22.040, Supply-Side Resource Analysis**,** requires Ameren Missouri to review existing resources for opportunities to upgrade or retire them, and also to review a wide variety of supply-side resource options to determine cost estimates for each. Resource options are to be ranked based upon their relative levelized annual utility costs,[13] as well as based upon their probable environmental costs. Resources which do not have significant disadvantages pass this pre-screening process and are to be included in the integrated resource analysis process used to select the preferred resource plan. Ameren Missouri reviewed fossil fuel, renewable energy, and nuclear resource options, as well as its transmission and distribution system options.

Ameren Missouri retained the services of Burns & McDonnell to complete a Condition Assessment of the Meramec Energy Center to determine ongoing costs necessary to keep the plant operating safely and reliably through the planning horizon. Ameren Missouri is scheduled to complete two unit upgrades at Keokuk Energy Center (Units 5 and 6) in 2016. In addition, upgrades of Units 14 and 15 at Keokuk Energy Center are scheduled to be complete in 2018. Ameren Missouri is also considering options for Meramec Energy Center including combinations of unit retirements and gas conversion, with all units retired by the end of 2022.

Ameren Missouri engaged Black & Veatch to conduct a supply-side screening analysis of various coal and gas power generation technologies in support of Ameren Missouri's 2011 IRP. This analysis was reviewed by Ameren Missouri subject matter experts and updated as needed for use in this filing. One of the more significant criteria utilized in the scoring was the levelized cost of energy (LCOE)[14]. The LCOE included financial factors, such as fuel costs, tax life, economic life, escalation rates, present worth discount rate, levelized fixed charge rate that were used in the LCOE estimates in the candidate resource screening[15]. Wind energy resources exhibited the lowest cost on an LCOE basis among all candidate resource options[16]. Ameren Missouri has evaluated options for development of wind resources both within Missouri and across the broader region.

[13] 4 CSR 240-22.040(A) Cost rankings of each potential supply-side resource option shall be based on estimates of the installed capital costs plus fixed and variable operation and maintenance costs levelized over the useful life of the potential supply-side resource option using the utility discount rate. The utility shall include the costs of ancillary and/or back-up sources of supply required to achieve necessary reliability levels in connection with intermittent and/or uncontrollable sources of generation (i.e., wind and solar).
[14] Ameren Missouri IRP Chapter 6 Appendix 6, page 19.
[15] Ibid
[16] Ameren Missouri IRP Chapter 6 page 1

Three options were selected as final candidate resource options to represent fossil fuel resource options – gas combined cycle, gas simple cycle combustion turbine, and ultra-super-critical pulverized coal. Gas combined cycle technology exhibits the lowest cost on a levelized cost basis among conventional generation resources. Ameren Missouri ranked these options to obtain a high, base and low range of costs based on a broad range of technology development, probable environmental regulations and cost uncertainties. Ameren Missouri excluded some technologies from its further review because the technologies are in the developmental stage, resource inadequacy, or absence of geological features required for their implementation or use by Ameren Missouri.

Ameren Missouri's supply-side resource screening analysis identified potential cost-effective options that it passed on to consider further in its integrated resource analysis. Ameren Missouri evaluated the efficiency, life extension, environmental enhancements and retirement scenarios of the existing facilities it relies upon for capacity and power.

With respect to rule 4 CSR 240-22.040 Supply-Side Resource Analysis, Ameren Missouri requested, and the Commission granted, in Docket No. EE-2014-0089, one waiver of the following specific provision of that rule:

4 CSR 240-22.040(3)(A)	The analysis shall include the identification of transmission constraints, as estimated pursuant to 4 CSR 240-22.045(3), whether within the Regional Transmission Organization's (RTO's) footprint, on an interconnected RTO, or a transmission system that is not part of an RTO.

Based on its limited review, Staff concludes Ameren Missouri's Supply-Side Resource Analysis filing meets the requirements of rule 4 CSR 240-22.040, and Staff has identified no concerns or deficiencies.

4 CSR 240-22.045 Transmission and Distribution Analysis

Summary

Rule 4 CSR 240-22.045 Transmission and Distribution Analysis specifies the minimum standards for the scope and level of detail required for transmission and distribution network analysis and reporting. Rule 4 CSR 240-22.045 is prompted, in part, by the changes in federal law that can affect electric utility resource planning and resource viability, e.g., policies of Regional Transmission Organizations ("RTO"), development of regional power markets, and

implementation of Smart Grid technologies. Rule 4 CSR 240-22.045 does not prescribe how analyses are to be done, but rather allows a utility to conduct its own analysis or adopt the RTO or Independent Transmission System Operator ("ISO") transmission plans. Rule 4 CSR 240-22.045 requires analysis and documentation of the RTO/ISO transmission projects and requires the electric utility to review transmission and distribution for the reduction of power losses, interconnection of new generation facilities, facilitation of sales and purchases and incorporation of advance technologies for the optimization of investment in transmission and distribution resources.

With respect to Rule 4 CSR 240-22.045 Ameren Missouri requested, and the Commission granted, in Docket No. EE-2014-0089, two (2) waivers of the following specific provisions of that rule:

4 CSR 240-22.045 (1)(B)	Interconnect new generation facilities. The utility shall assess the need to construct transmission facilities to interconnect any new generation pursuant to 4 CSR 240-22.040(3) and shall reflect those transmission facilities in the cost benefit analyses of the resource options;
4 CSR 240-22.045 (3)(C)	The utility shall provide copies of the RTO expansion plans, its assessment of the plans, and any supplemental information developed by the utility plans, its assessment of the plans, and any supplemental information developed by the utility to fulfill the requirements in subsection (3)(B) of this rule.

Ameren Missouri will construct eight (8) of the eleven (11) transmission projects in Missouri that have been approved by the MISO Board of Directors for completion before 2019.[17]

Based on its limited review, Staff concludes Ameren Missouri's Transmission and Distribution Analysis filing meets the requirements of rule 4 CSR 240-22.045, and Staff has identified no concerns or deficiencies.

4 CSR 240-22.050 Demand-Side Resource Analysis

Summary

Rule 4 CSR 240-22.050, Demand-Side Resource Analysis, specifies the methods by which end-use measures and demand-side programs shall be developed and screened for cost-

[17] Page 1 of Chapter 7 of the IRP Filing.

effectiveness. It also requires the ongoing evaluation of end-use measures and programs, and the use of program evaluation, measurement and verification ("EM&V") to improve program design and cost-effectiveness analysis.

The current Ameren Missouri 2014 IRP filing improves and expands Ameren Missouri's overall consideration and evaluation of demand-side resources from its previous 2011 IRP filing. Ameren Missouri utilizes the knowledge gained from: 1) the actual program implementation and evaluation experience from its previous and current demand-side programs; 2) the incorporation of the 2013 Ameren Missouri DSM Potential Study found within Chapter 8-Appendix B with the supporting documentation found within the work papers; 3) substantial input received as a result of multiple stakeholder workshops and meetings; and 4) Ameren Missouri's active participation in the Electric Power Research Institute's (EPRI) Industrial Center of Excellence (ICOE). The 2014 IRP filing also reflects a demand-side energy efficiency portfolio that includes:

- The addition of formal project management processes and procedures;
- The addition of a DSM data collection and tracking system;
- The addition of a Marketing Manager;
- The development of market segmentation strategies to tailor specific DSM messages to specific market segments;
- The addition of a web-based Technical Reference Manual; and
- The implementation of EM&V processes and procedures.

Ameren Missouri's 2016 - 2018 DSM programs consist of six residential programs and four business programs. The programs are similar to the programs Ameren Missouri successfully implemented during its 2013-2015 MEEIA program. The exceptions are:

- The residential New Construction program originally included in the 2013 - 2015 plan was discontinued, because EM&V demonstrated it was no longer cost effective;
- The residential Home Energy Audit program does not pass the cost effectiveness test for MEEIA 2016 - 2018 and has been eliminated;
- One new residential program, the Energy Efficiency Kits program, has been added for MEEIA 2016 - 2018. This program is an extension of kits included in the Energy Efficient Products program from MEEIA 2013 - 2015 but using a new distribution channel; and
- The residential Lighting and Appliance program no longer includes upstream discounting of CFLs, since CFLs are no longer cost effective due to federal legislation requiring higher levels of lighting efficiency beginning in 2020.

For the 2016 – 2018 programs, 60% of the program-level energy savings are expected to come from business customers and the remaining 40% from residential customers, which is the inverse of what was planned for 2013 – 2015 when 61% of energy savings were to come from residential customers due to the large upstream promotion of CFL bulbs.

Ameren Missouri reports that MISO capacity markets indicate that demand response opportunities have little market capacity value for the immediate future. Since Ameren Missouri is not projecting a need for demand response for reliability purposes, the business case for demand response for Ameren Missouri customers is dependent on the MISO capacity market. Although Ameren Missouri determined that Demand Response (DR) programs are not cost effective for 2016-2018, Ameren Missouri is considering a pilot DR program to better understand the tolerance customers have for various frequencies and durations of DR events.

Ameren Missouri was unable to identify any opportunities for cost-effective combined heat and power applications for their industrial customers.

Ameren Missouri applied for and received from the Commission variances from five (5) provisions of this rule related to the following:

4 CSR 240-22.050(4)(D)2	An assessment of how the interactions between multiple potential demand-side rates, if offered simultaneously, would affect the impact estimates;
4 CSR 240-22.050(4)(D)(3)	An assessment of how the interactions between potential demand-side rates and potential demand-side programs would affect the impact estimates of the potential demand side programs and potential demand-side rates;
4 CSR 240-22.050(5)(B)(3)	For purposes of this test, the costs of potential demand-side programs and potential demand-side rates shall not include lost revenues or utility incentive payments to customers.
4 CSR 240-22.050(B)(E)	The utility shall provide results of the total resource cost test and the utility cost test for each potential demand-side program evaluated pursuant to subsection (5)(B) and for each potential demand–side rate evaluated pursuant to subsection (5)(C) of this rule, including a tabulation of the benefits (avoided costs), demand-side resource costs, and net benefits or costs.

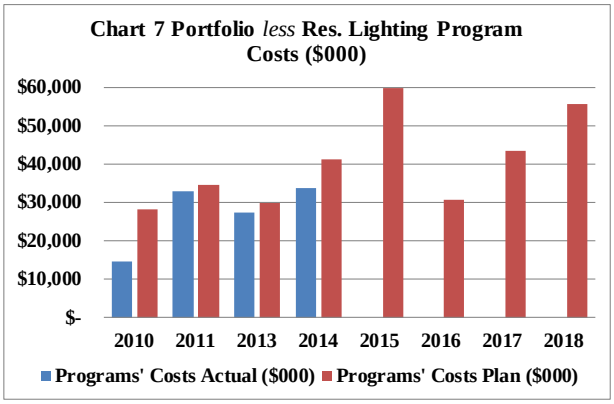
Based on its limited review, Staff concludes Ameren Missouri's Demand-Side Resource Analysis filing meets the requirements of rule 4 CSR 240-22.050 and there are no deficiencies. However, Staff has several concerns regarding the level of annual energy and demand savings expected from Ameren Missouri’s RAP portfolio in its 20-year adopted preferred resource plan

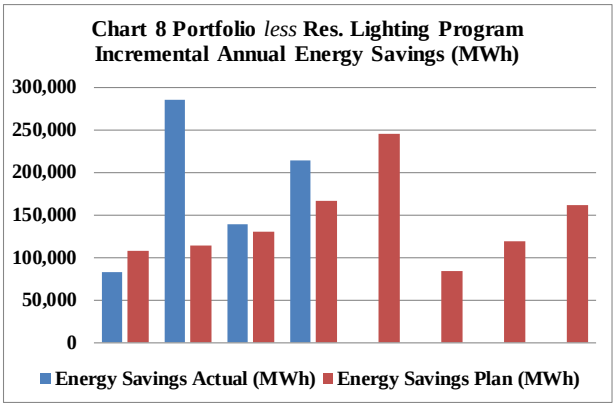
(Plan A) and in the Company's 3-year implementation plan for its RAP portfolio which is also the DSM plan contained in the Company's MEEIA Cycle 2 Plan[18] filed on October 1, 2014 in File No. EO-2015-0055.

Staff performed an analysis of the actual vs. planned programs' costs, deemed annual energy savings and deemed energy savings per dollar of programs' costs for Ameren Missouri's pre-MEEIA programs (program years 2009, 2010 and 2011) and for the Company's MEEIA Cycle 1 (program years 2013 and 2014) and for the planned programs' cost and planned deemed annual energy savings for program years 2015, 2016, 2017 and 2018. Note that 2015 is the last year of MEEIA Cycle 1, while MEEIA Cycle 2 spans 2016 – 2018.

Residential Lighting program will have much less impact on the portfolio's overall performance in the future due in particular to the elimination of energy savings from the CFL bulbs beginning in 2015. Thus, Staff's analysis focuses on total portfolio *less* Residential Lighting program actual and planned programs' costs, deemed annual energy savings and deemed energy savings per dollar of programs' costs. Details of Staff's analysis are included in the tables of data and Charts 1 - 18 in Addendum D, which is best summarized in Charts 7, 8 and 9 of Addendum D as presented below.

[18] MEEIA is the Missouri Energy Efficiency Investment Act of 2009, Section 393.1075, RSMo, Supp. 2013. The Commission's MEEIA rules include: 4 CSR 240-3.163, 4 CSR 240-3.164, 4 CSR 240-20.093 and 4 CSR 240-20.094.





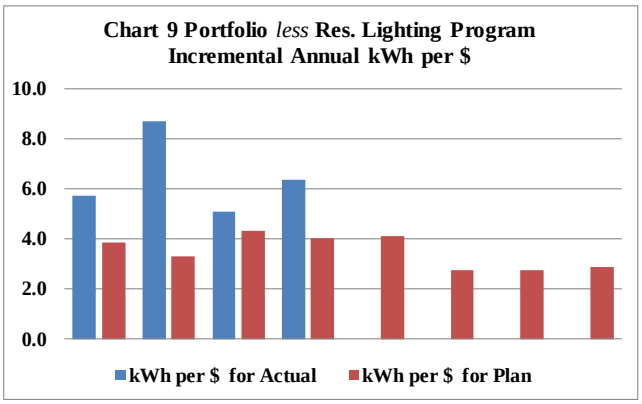
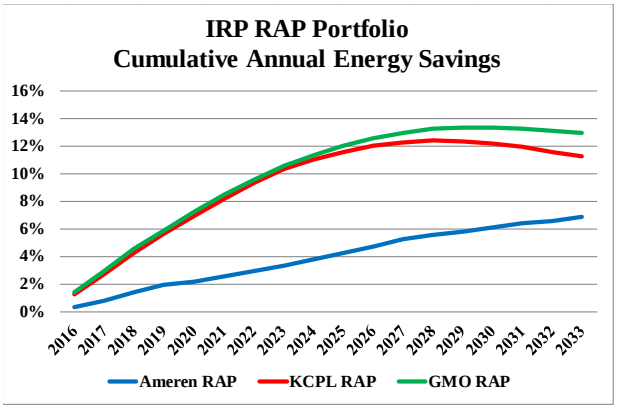


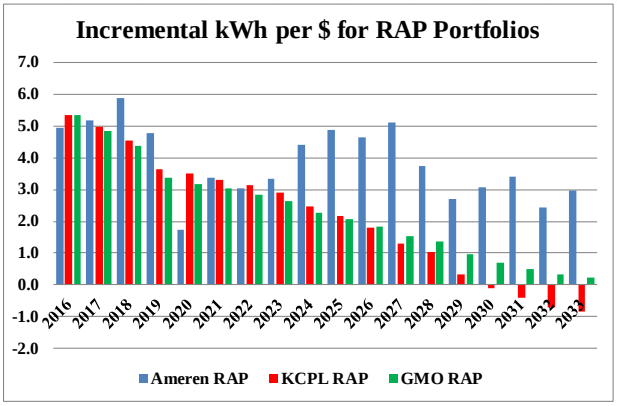
Chart 7 illustrates that actual programs' costs have been less than planned in each year and that the planned programs' costs for MEEIA Cycle 2 are approximately the same as the planned programs' costs for MEEIA Cycle 1. Charts 8 and 9 illustrate that MEEIA Cycle 2's incremental annual energy savings and incremental annual energy savings per $ of portfolio cost are approximately one half of these same planned performance metrics for MEEIA Cycle 1 and may be vastly underestimated given the fact that actual incremental annual energy savings and actual incremental annual energy savings per $ of portfolio cost far exceeded these same planned performance metrics during 2013 and 2014 of MEEIA Cycle 1 as well as 2010 and 2011 of the pre-MEEIA programs.

Staff notes that Ameren Missouri's DSM market potential study for its MEEIA Cycle 1 was performed by Global Energy Partners, LLC, and was issued in January 2011, while its DSM market potential study for its MEEIA Cycle 2 was performed by EnerNoc Utility Solutions Consulting and was issued in December 2013.

Staff also compared Ameren Missouri's IRP RAP portfolio's cumulative annual energy savings and incremental annual kWh per $ of programs' costs over a longer term period (2016 – 2033) to cumulative annual energy savings and incremental annual kWh per $ of programs' costs

of the IRP RAP portfolios of Kansas City Power & Light Company ("KCPL") and KCP&L Greater Missouri Operations Company ("GMO") and found that Ameren Missouri's RAP portfolio is expected to produce approximately one-half the annual energy savings levels[19] of the RAP portfolios of KCPL and GMO.





Staff notes that the KCPL and GMO DSM market potential studies were performed by Navigant and issued in August 2013.

Concerns

C. **The incremental annual energy savings expected from Ameren Missouri's RAP portfolio for its MEEIA Cycle 2 (2016 – 2018) may be vastly underestimated, since the kWh and kWh per $ savings are less than half the actual achieved levels of kWh and a kWh per $ during Ameren Missouri's pre-MEEIA programs (2009 – 2011) and MEEIA Cycle 1 programs to date (2013 – 2014).**

D. **The incremental and cumulative annual energy savings expected from Ameren Missouri's RAP portfolio during the long-term planning horizon may be vastly underestimated, since the Ameren Missouri savings are approximately one-half the incremental and cumulative annual energy savings of the IRP RAP portfolios of Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company.**

To remedy these concerns, Ameren Missouri should work with parties to its 2014 IRP case and with parties to its MEEIA Cycle 2 case (File No. EO-2015-0055) during joint agreement[20] discussions and during technical conferences, respectively, to help parties understand Staff's concerns and, if necessary, to resolve those concerns.

[19] Annual energy savings are expressed as: 1) a percentage of the baseline forecast for energy sales for customers who have not opted-out of participation in the DSM programs, and 2) kWh per $ of programs' costs.

[20] 4 CSR 240-22.080(9) If the staff, public counsel, or any intervenor finds deficiencies in or concerns with a triennial compliance filing, it shall work with the electric utility and the other parties to reach, within sixty (60) days of the date that the report or comments were submitted, a joint agreement on a plan to remedy the identified deficiencies and concerns. If full agreement cannot be reached, this should be reported to the commission through a joint filing as soon as possible but no later than sixty (60) days after the date on which the report or comments were submitted. The joint filing should set out in a brief narrative description those areas on which agreement cannot be reached. The resolution of any deficiencies and concerns shall also be noted in the joint filing.

4 CSR 240-22.060 Integrated Resource Analysis

Summary

Rule 4 CSR 240-22.060, Integrated Resource Analysis, requires the utility to design alternative resource plans to meet the planning objectives identified in rule 4 CSR 240-22.010(2), to set minimum standards for the scope and level of detail required in resource plan analysis, and to perform a logically consistent and economically-equivalent analysis of alternative resource plans.

Ameren Missouri developed seven attributes or dimensions for use in its creation of alternative resource plans:

1. Three (3) Meramec Retirement Options
    - Retired 12/31/2015
    - Retired 12/31/2022
    - Convert units 1 and 2 to natural gas and units 3 and 4 continue on coal. All units retired 12/31/2022

2. Three (3) Retirements
    - Labadie retired 12/31/2023
    - Rush Island retired 12/31/2024
    - Sioux retired 12/31/2033

3. Seven (7) New Supply-Side Types
    - Combined Cycle (Natural Gas)
    - Simple Cycle (Natural Gas)
    - Nuclear (100% Ownership)
    - Nuclear (75% Ownership)
    - Pumped Hydroelectric
    - Wind
    - Wind with Simple Cycle

4. Two (2) Keokuk Upgrade
    - 50 MW Expansion
    - None

5. Three (3) Energy Efficiency
    - MAP
    - RAP
    - Missouri Energy Efficiency Investment Act (MEEIA) Cycle 1 only.

6. Three (3) Demand Response
    - MAP
    - RAP
    - None

7. Two (2) Renewable Portfolios
    - Missouri Renewable Energy Standard (RES)
    - Balanced[21]

The various combinations of these seven attributes resulted in a robust set of alternative resource plans. However, some combinations result in duplicate alternative resource plans or infeasible alternative resource plans, e.g., the Meramec combined cycle option is contingent on Meramec's retirement so the interaction of Meramec continuing and the Meramec combined cycle option would produce an infeasible plan. Ultimately, Ameren Missouri analyzed 19 alternative resource plans in an initial screening process based on a scorecard approach that embodied the following Ameren Missouri performance measures and relative weights for each performance measure:

1. Environmental and resource diversity (20%) measured by resource diversity, carbon emissions, SO_2 emissions and NO_x emissions;
2. Financial and regulatory (20%) measured by return on equity (ROE), return on invested capital (ROIC), earnings per share (EPS), free cash flow, stranded cost risk, transaction risk and [cost] recovery;
3. Customer satisfaction (20%) measured by average rates and single year rate increase;
4. Economic development (10%) measured by primary job growth (FTE-years); and
5. Cost (30%) measured by net present value of revenue requirements (NPVRR).

For its risk analysis of each candidate resource plan, Ameren Missouri constructed a probability tree which contains four (4) critical dependent uncertain factors (Eastern Interconnection's coal plant retirements, carbon prices, load growth and natural gas prices) and four (4) critical dependent uncertain factors (DSM cost and load impact, long-term interest rates and return on equity, project capital cost, and coal prices) when evaluating each alternative resource plan. Ameren Missouri's final probability tree is included as Addendum A to this

[21] All alternative resource plans that are identified as "Balanced" include investment in renewable resources that are above and beyond those needed for RES compliance. (i.e., 400 MW wind, 45 MW solar, and 20 MW small hydroelectric).

Report. The final probability tree has 1,215 branches with each branch representing a unique combination of the critical uncertain factors. Once the risk adjusted present value of revenue requirements ("PVRR") of all the combinations are calculated, the sum of the individual branch probabilities equals 100%.

Ameren Missouri applied for and received from the Commission variances from five (5) provisions of this rule related to the following:

4 CSR 240-22.060(5)(E)	Total project cost (including siting, permitting and construction costs) for new generation and generation-related transmission facilities;
4 CSR 240-22.060(5)(F)	Total project cost (including siting, permitting and construction costs) for new generation and generation-related transmission facilities;
4 CSR 240-22.060(5)(K)	Future load impacts and marketing and delivery costs of demand-side programs and demand-side rates if the cost and impacts are determined to be highly correlated. Future load impacts and demand-side programs and demand-side rates if the costs and impacts are determined to not be highly correlated;
4 CSR 240-22.060(5)(L)	Future load impacts and marketing and delivery costs of demand-side programs and demand-side rates if the cost and impacts are determined to be highly correlated. Utility marketing and delivery costs for demand-side programs and demand-side rates if the costs and impacts are determined to not be highly correlated;
4 CSR 240-22.060(7)	The utility decision-makers shall assign a probability pursuant to section (5) of this rule to each uncertain factor deemed critical by the utility. The utility shall compute the cumulative probability distribution of the values of 'present value revenue requirements' performance measure for each alternative resource plan. For each of the other performance measures specified in 4 CSR 240-22.060(2)(A)1-6 and for any additional measures chosen by the utility pursuant to 4 CSR 240-22.060(2)(A)7, Ameren Missouri will compute a cumulative probability distribution of its values if inspection of the summary tabulation required by 4 CSR 240-22.060(4)A indicates that the rankings of alternative plans by this performance measure substantially differs from the ranking based on present value revenue requirements. Both the expected performance and the risks of each alternative resource plan shall be quantified. The utility shall describe and document its risk assessment of each alternative resource plan.

Based on its limited review, Staff has identified no deficiencies or concerns for Ameren Missouri's Integrated Resource Plan and Risk Analysis filing.

4 CSR 240-22.070 Risk Analysis and Strategy Selection

Summary

Rule 4 CSR 240-22.070, Risk Analysis and Strategy Selection, requires the utility to select a preferred resource plan, develop an implementation plan, and officially adopt a resource acquisition strategy. The rule also requires the utility to prepare contingency plans and evaluate the demand-side resources that are included in the resource acquisition strategy.

Ameren Missouri did not apply for any waivers from the requirements of this rule.

Ameren Missouri's final probability tree (see Addendum A) consists of the following dependent and independent critical uncertain factors:

Dependent critical uncertain factors

- Coal plant retirements
- CO_2 policy
- Natural gas prices
- Load growth

Independent critical uncertain factors

- DSM costs jointly with DSM load impacts
- Long-term interest rates jointly with return on equity
- Project cost

Ameren Missouri's decision-makers chose to use a Scorecard approach[22] to evaluate its nineteen (19) candidate resource plans during their strategy selection process to adopt a resource acquisition strategy and a preferred resource plan for Ameren Missouri. The Scorecard is included as Addendum B.

Based on its limited review, Staff has identified no deficiencies or concerns for Ameren Missouri's Resource Acquisition Strategy Selection filing.

[22] See the Plan's section 10.2 Assessment of Alternative Resource Plans.

4 CSR 240-22.080 Filing Schedule and Requirements

Summary

Chapter 4 CSR 240-22 Electric Utility Resource Planning sets minimum standards to govern the scope and objectives of the integrated resource planning process of the electric utilities regulated by the Commission. The focus of Chapter 4 CSR 240-22 is on the planning process used to determine the utility's preferred resource plan, not the outcome of that process, i.e., the adopted preferred resource plan. Rule 4 CSR 240-22.080 identifies minimum reporting requirements concerning who is to file, when to file, what to file, the review process and the Commission's authority with respect to compliance filings.

Ameren Missouri has organized its 2014 IRP in eleven (11) chapters of information and discussion which flow smoothly in a narrative form to tell a clear story. At the end of each chapter is a Compliance Reference guide which cross references each Chapter 22 filing requirement met in the chapter tied to the page in the chapter on which the filing requirement is contained. Staff finds this approach to be productive and useful and encourages Ameren Missouri to continue this practice in future filings. Chapter 11 of the IRP includes summary information on Ameren Missouri's IRP stakeholder process, which Staff finds to be very constructive overall.

Based on its limited review, Staff has identified no deficiencies or concerns related to Ameren Missouri's rule 4 CSR 240-22.080 filing.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Ameren Missouri's 2014 Utility Resource Filing pursuant to 4 CSR 240 - chapter 22	)))	Case No. EO-2015-0084

AFFIDAVIT OF JOHN A ROGERS

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

John A. Rogers, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Staff Report in pages 1-7, 12-15, 19-20; that he has knowledge of the matters set forth in such Report; and that such matters are true to the best of his knowledge and belief.

.

John A Rogers
John A. Rogers

Subscribed and sworn to before me this 27th day of February, 2015.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 28, 2018
Commission Number: 14942086

Susan L Sundermeyer
Notary Public

Schedule MM-S1

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Ameren Missouri's 2014 Utility Resource Filing pursuant to 4 CSR 240 - chapter 22	)))	Case No. EO-2015-0084

AFFIDAVIT OF DAVID C. ROOS

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

David C. Roos, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Staff Report in pages 7, 19; that he has knowledge of the matters set forth in such Report; and that such matters are true to the best of his knowledge and belief.

.

David C. Roos

Subscribed and sworn to before me this 27th day of February, 2015.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 28, 2018
Commission Number: 14942086

Notary Public

Schedule MM-S1

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Ameren Missouri's 2014 Utility Resource Filing pursuant to 4 CSR 240 - chapter 22	)))	Case No. EO-2015-0084

AFFIDAVIT OF RANDY S. GROSS

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

Randy S. Gross, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Staff Report in pages 8 - 12; that he has knowledge of the matters set forth in such Report; and that such matters are true to the best of his knowledge and belief.

.

Randy S. Gross

Subscribed and sworn to before me this 27th day of February, 2015.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 28, 2018
Commission Number: 14942086

Notary Public

Schedule MM-S1

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Ameren Missouri's 2014 Utility Resource Filing pursuant to 4 CSR 240 - chapter 22	)))	Case No. EO-2015-0084

AFFIDAVIT OF MATTHEW J. BARNES

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

Matthew J. Barnes, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Staff Report in pages 16 - 19; that he has knowledge of the matters set forth in such Report; and that such matters are true to the best of his knowledge and belief.

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Matthew J. Barnes
Matthew J. Barnes

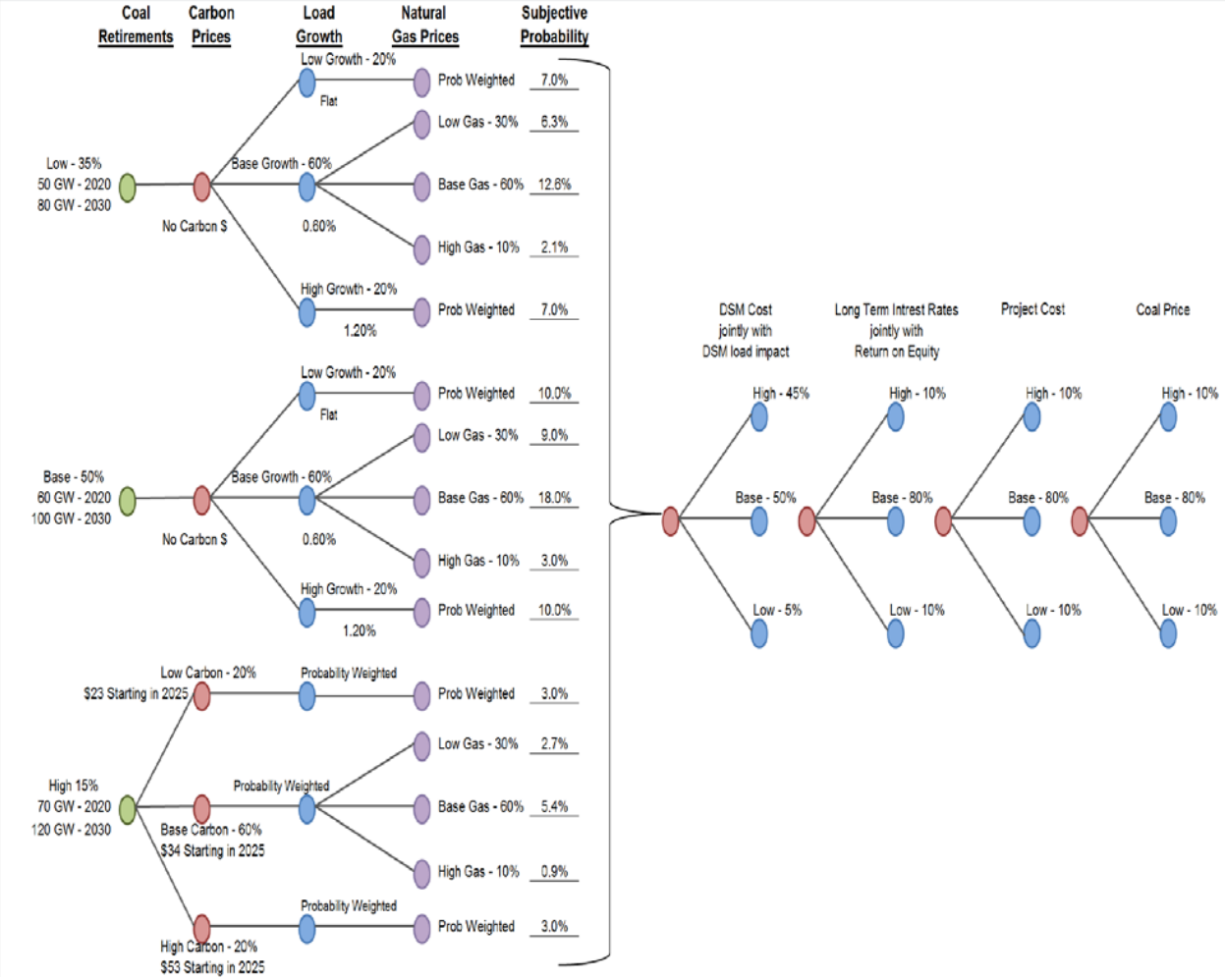
Subscribed and sworn to before me this 27th day of February, 2015.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 28, 2018
Commission Number: 14942086

Susan L. Sundermeyer
Notary Public

Schedule MM-S1

Figure 9.11 Final Probability Tree



Ameren Missouri 2014 IRP
Preferred Plan Selection Scorecard

Planning Objectives, Weights and Measures

Plan	Category / Category Weight	Environmental/ Renewable/ Resource Diversity 20%	Financial/ Regulatory 20%	Customer Satisfaction 20%	Economic Development 10%	Cost 30%	Overall Assessment 100%
R	600MW CC in 2034, MAP, Balanced	3	4	4	4	5	**4.10**
I	600MW CC in 2034, RAP, Balanced	3	5	5	2	4	**4.00**
E	800MW Wind in 2034, 352MW SC in 2034, 600MW CC in 2034, RAP	3	4	5	2	4	**3.80**
G	600MW CC in 2034, MAP	2	4	4	3	5	**3.80**
A	600MW CC in 2034, RAP	2	5	4	2	4	**3.60**
C	704MW SC in 2034, RAP	1	5	4	1	5	**3.60**
S	600MW CC in 2034, MAP EE Only	2	4	3	3	5	**3.60**
H	169MW Nuke in 2034, 600MW CC in 2034, RAP, Balanced	4	3	4	3	3	**3.40**
F	1200MW CC in 2034,RAP EE Only	2	4	3	2	4	**3.20**
D	600MW Pumped Hydro in 2034, RAP	2	4	4	2	3	**3.10**
Q	169MW Nuke in 2034, MAP, Balanced	3	2	4	4	3	**3.10**
P	169MW Nuke in 2025, 600MW CC in 2025, 1200MW CC in 2034, RAP, Balanced, RI Ret 12/31/2024	5	2	3	4	2	**3.00**
B	450MW Nuke in 2034, 600MW CC in 2034, RAP	3	3	2	3	3	**2.80**
O	169MW Nuke in 2025, 1800MW CC in 2024, 1200MW CC in 2034, RAP, Balanced, LAB Ret 12/31/2023	5	1	3	4	1	**2.50**
N	600MW CC in 2025, 1200MW CC in 2034, MAP, RI Ret 12/31/2024	3	2	2	4	2	**2.40**
K	600MW CC in 2023, 600MW CC in 2031, 600MW CC in 2034, MEEIA1, Balanced	2	3	2	1	2	**2.10**
M	1800MW CC in 2024, 1200MW CC in 2034, MAP, LAB Ret 12/31/2023	3	2	2	4	1	**2.10**
J	169MW Nuke in 2031, 600MW CC in 2023, 1200MW CC in 2034, MEEIA1, Balanced	3	2	1	2	2	**2.00**
L	3300MW Wind in 2023, 3300MW Wind in 2027, 6600MW Wind in 2034, MEEIA1	1	2	1	5	1	**1.60**

Scoring Guide	
Significant Advantage	5
Moderate Advantage	4
No Advantage or Disadvantage	3
Moderate Disadvantage	2
Significant Disadvantage	1

Overall Assessment Guide	
Top-tier Plan	
Mid-tier Plan	
Bottom-tier Plan	

Notes on Scores by Policy Objective

Environmental/Diversity	Inclusion of MAP or RAP energy efficiency; new nuclear; combined cycle; additional coal retirement beyond Meramec and Sioux; additional renewables; and/or pumped hydro were viewed as advantageous.
Financial Regulatory	Financial and regulatory risks associated with new nuclear; additional coal retirement beyond Meramec and Sioux; cessation of energy efficiency programs; implementation of overly aggressive energy efficiency programs; and/or vast amounts of wind generation were viewed as disadvantageous, as were large negative impacts on cash flow.
Customer Satisfaction	Lower levelized annual rate increases, inclusion of energy efficiency and demand response, and inclusion of renewables were viewed as advantageous.
Economic Development	Plans were rated on a relative scale based on direct jobs (FTE-years) including both construction and operation.
Cost (PVRR)	Plans were rated on a relative scale based on present value of revenue requirements (PVRR).

Key to Abbreviations

EE = Energy Efficiency Only, No Demand Response
MEEIA = Missouri Energy Efficiency Investment Act Cycle 1
RES = Renewable Energy Standard
Balanced = Balanced plan (solar, wind, hydro)
LAB = Labadie Energy Center
MW = Megawatts
RI = Rush Island Energy Center
CC = Combined Cycle Gas Turbine Generator
MAP = Maximum Achievable Potential DSM Portfolio
RAP = Realistic Achievable Potential DSM Portfolio
Ret = Retirement

Forecast of Capacity Balance (MW) **Highly Confidential**

Ameren Missouri

2014 IRP

A. System Generation Capacity		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Existing Generation Capacity																						
Callaway	Nuclear	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190
Keokuk	Hydro	141	141	145	145	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149
Labadie Unit 1	Coal	593	593	593	593	593	593	593	593	593	583	583	583	583	583	583	583	583	583	583	583	583
Labadie Unit 2	Coal	593	593	593	593	593	593	593	593	593	583	583	583	583	583	583	583	583	583	583	583	583
Labadie Unit 3	Coal	594	594	594	594	594	594	594	594	571	571	561	561	561	561	561	561	561	561	561	561	561
Labadie Unit 4	Coal	594	594	594	594	594	594	594	594	571	571	561	561	561	561	561	561	561	561	561	561	561
Rush Island Unit 1	Coal	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591
Rush Island Unit 2	Coal	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591
Sioux Unit 1	Coal	487	487	487	487	487	487	485	485	485	485	485	485	485	485	485	485	485	485	485	485	0
Sioux Unit 2	Coal	487	487	487	487	487	487	485	485	485	485	485	485	485	485	485	485	485	485	485	485	0
Meramec Unit 1	Coal	119	119	119	119	119	119	119	119	119	0	0	0	0	0	0	0	0	0	0	0	0
Meramec Unit 2	Coal	121	121	121	121	121	121	121	121	121	0	0	0	0	0	0	0	0	0	0	0	0
Meramec Unit 3	Coal	259	259	259	259	259	259	259	259	259	0	0	0	0	0	0	0	0	0	0	0	0
Meramec Unit 4	Coal	335	335	335	335	335	335	335	335	335	0	0	0	0	0	0	0	0	0	0	0	0
Maryland Heights	LFG	9	9	9	9	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
O'Fallon	SOLAR	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Base Capacity		6704	6705	6709	6709	6718	6718	6713	6713	6667	5813	5793	5793	5793	5793	5793	5793	5793	5793	5793	5793	4824
Osage	Hydro	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
Taum Sauk Unit 1	Hydro	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Taum Sauk Unit 2	Hydro	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Audrain 1	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 2	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 3	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 4	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 5	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 6	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 7	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Audrain 8	Gas	71	71	71	71	71	71	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Fairgrounds	Oil	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goose Creek 1	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Goose Creek 2	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Goose Creek 3	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Goose Creek 4	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Goose Creek 5	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Goose Creek 6	Gas	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
Howard Bend	Oil	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kinmundy CTG-1	Gas	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Kinmundy CTG-2	Gas	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Kirksville	Gas	13	13	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meramec CTG-1	Oil/Gas	54	54	54	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meramec CTG-2	Oil/Gas	45	45	45	45	45	45	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	Oil	54	54	54	54	54	54	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moberly	Oil	54	54	54	54	54	54	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moreau	Oil	54	54	54	54	54	54	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peno Creek CTG-1	Gas/Oil	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Peno Creek CTG-2	Gas/Oil	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Peno Creek CTG-3	Gas/Oil	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Peno Creek CTG-4	Gas/Oil	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Pinckneyville CTG-1	Gas	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Pinckneyville CTG-2	Gas	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Pinckneyville CTG-3	Gas	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Pinckneyville CTG-4	Gas	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Pinckneyville CTG-5	Gas	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Pinckneyville CTG-6	Gas	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Pinckneyville CTG-7	Gas	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Pinckneyville CTG-8	Gas	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Racoon Creek 1	Gas	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Racoon Creek 2	Gas	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Racoon Creek 3	Gas	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Racoon Creek 4	Gas	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Venice CTG-2	Gas	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Venice CTG-3	Gas	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168
Venice CTG-4	Gas	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168
Venice CTG-5	Gas	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Total Intermediate/Peaking Capacity		3546	3453	3453	3453	3386	3386	3416	3209	3209	3209	3209	3209	3209	3209	3209	3209	3209	3209	3209	3209	3209
Total Generation Capacity (TGC)		**10250**	**10158**	**10162**	**10162**	**10104**	**10104**	**10129**	**9922**	**9876**	**9022**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**8033**

Schedule MM-S1

Addendum C-1

Forecast of Capacity Balance (MW) **Highly Confidential**

Ameren Missouri
2014 IRP

			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
A.	**System Generation Capacity**																						
	Total Generation Capacity (TGC)		**10250**	**10158**	**10162**	**10162**	**10104**	**10104**	**10129**	**9922**	**9876**	**9022**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**9002**	**8033**
B.	**Capacity Transactions**		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Purchases																						
	102.3 Pioneer Prairie Wind	14%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Purchases = P		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Existing sales		820	413	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Sales = S		820	413	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Net Transactions = NT = P - S		-820	-413	-125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total System Capacity = TSC = TGC + NT		9430	9745	10037	10162	10104	10104	10129	9922	9876	9022	9002	9002	9002	9002	9002	9002	9002	9002	9002	9002	8033
C.	**System Peaks & Reserves**		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Peak Demands																						
	Ameren Missouri Forecasted Peak		7983	7985	7990	7995	8013	8036	8022	8059	8118	8163	8211	8226	8274	8352	8407	8445	8482	8521	8559	8603	8648
	Voltage Reduction		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Full/Partical Requirements Contracts		3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DSM - EE RAP		0	0	-30	-65	-111	-169	-220	-270	-313	-360	-421	-484	-543	-606	-660	-700	-755	-803	-833	-883	-929
	DSM - DR RAP		0	0	0	0	0	-47	-96	-147	-146	-145	-146	-153	-149	-153	-158	-156	-155	-156	-161	-166	-161
	Peak Forecast less DSM = PF		7986	7987	7962	7930	7902	7820	7706	7642	7659	7658	7644	7589	7582	7593	7589	7589	7572	7562	7564	7554	7558
	Capacity Reserves = CR = TSC - PF		1444	1757	2075	2232	2202	2284	2423	2280	2216	1364	1357	1413	1420	1408	1412	1413	1430	1440	1438	1448	475
D.	**Capacity Needs**		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	% Reserve Margin = RM		14.8%	14.9%	15.0%	15.1%	15.1%	15.6%	16.0%	16.4%	16.8%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%
	% Capacity Margin = CM = RM/(1+RM)		12.9%	13.0%	13.0%	13.1%	13.1%	13.5%	13.8%	14.1%	14.4%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%
	Required Capacity = RC = PF/(1-CM)		9168	9178	9156	9128	9095	9040	8939	8895	8946	8983	8967	8902	8894	8907	8902	8902	8882	8870	8872	8861	8865
	Capacity Balance = TSC - RC		262	567	881	1034	1009	1064	1190	1027	930	39	35	100	108	95	100	100	120	132	129	141	(833)
	Adjustments before new generation, MWs		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
14.10%	Renewable Portfolio - Wind		0	0	0	0	0	7	14	14	28	28	42	42	56	56	56	56	56	56	56	56	56
20%	Renewable Portfolio - Solar		0	0	2	2	2	2	2	4	4	4	4	6	6	8	8	8	8	8	8	8	8
	Renewable Portfolio - Hydro		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	20	20	20	20
	Total generation adjustments		0	0	2	2	2	9	16	18	32	32	46	48	62	64	64	69	74	84	84	84	84
	Capacity position after RES Compliance		262	567	883	1036	1011	1073	1206	1045	962	71	81	148	170	159	164	169	194	216	214	225	-748
	New Generation, MWs		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	CC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Cap position after all adjustments & new PRIMARY generation		**262**	**567**	**883**	**1036**	**1011**	**1073**	**1206**	**1045**	**962**	**71**	**81**	**148**	**170**	**159**	**164**	**169**	**194**	**216**	**214**	**225**	**(148)**
	New Purchase (+), or New Sales (-)		**-262**	**-567**	**-883**	**-1036**	**-1011**	**-1073**	**-1206**	**-1045**	**-962**	**-71**	**-81**	**-148**	**-170**	**-159**	**-164**	**-169**	**-194**	**-216**	**-214**	**-225**	**148**

Schedule MM-S1

Addendum C-2

Summary of Actual vs. Plan for Ameren Missouri DSM Programs (1)

Total Portfolio			MEEIA Cycle 1			MEEIA Cycle 2		
	2010	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 19,900	$ 37,783	$34,432	$41,518				
Programs' Costs Plan ($000)	$ 32,123	$ 39,670	$36,119	$47,121	$64,088	$ 36,408	$ 48,838	$ 62,321
Variance Amount	$ (12,223)	$ (1,887)	$ (1,687)	$ (5,603)				
Percent Variance	-38.1%	-4.8%	-4.7%	-11.9%				
Energy Savings Actual (MWh)	155,551	379,129	337,368	361,915				
Energy Savings Plan (MWh)	145,350	160,249	250,792	263,305	307,723	104,757	137,617	183,859
Variance Amount	10,201	218,880	86,576	98,610				
Percent Variance	7.0%	136.6%	34.5%	37.5%				
kWh per $ for Actual	7.8	10.0	9.8	8.7				
kWh per $ for Plan	4.5	4.0	6.9	5.6	4.8	2.9	2.8	3.0

Residential Lighting Program			MEEIA Cycle 1			MEEIA Cycle 2		
	2010	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 5,399	$ 4,963	$ 7,077	$ 7,871				
Programs' Costs Plan ($000)	$ 4,076	$ 5,252	$ 6,237	$ 5,924	$ 4,331	$ 5,696	$ 5,500	$ 6,717
Variance Amount	$ 1,323	$ (289)	$ 840	$ 1,947				
Percent Variance	32.5%	-5.5%	13.5%	32.9%				
Energy Savings Actual (MWh)	72,384	93,702	198,735	147,749				
Energy Savings Plan (MWh)	37,179	46,742	121,258	96,837	62,371	20,234	18,345	22,928
Variance Amount	35,205	46,960	77,477	50,912				
Percent Variance	94.7%	100.5%	63.9%	52.6%				
kWh per $ for Actual	13.4	18.9	28.1	18.8				
kWh per $ for Plan	9.1	8.9	19.4	16.3	14.4	3.6	3.3	3.4

Total Portfolio *less* Residential Lighting			MEEIA Cycle 1			MEEIA Cycle 2		
	2010	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 14,501	$ 32,820	$ 27,355	$ 33,647				
Programs' Costs Plan ($000)	$ 28,047	$ 34,418	$ 29,882	$ 41,196	$ 59,757	$ 30,712	$ 43,338	$ 55,604
Variance Amount	$ (13,546)	$ (1,598)	$ (2,527)	$ (7,549)				
Percent Variance	-48.3%	-4.6%	-8.5%	-18.3%				
Energy Savings Actual (MWh)	83,167	285,427	138,633	214,166				
Energy Savings Plan (MWh)	108,171	113,507	129,535	166,468	245,351	84,523	119,272	160,931
Variance Amount	-25,004	171,920	9,099	47,698				
Percent Variance	-23.1%	151.5%	7.0%	28.7%				
kWh per $ for Actual	5.7	8.7	5.1	6.4				
kWh per $ for Plan	3.9	3.3	4.3	4.0	4.1	2.8	2.8	2.9

Incremental Annual Energy Savings				
	PY 1	PY 2	PY 3	Total
Pre-MEEIA Actual vs. Plan		0.77	2.51	1.66
Cycle 1 Actual vs. Plan	1.07	1.29		1.19
Cycle 2 Plan vs. Cycle 1 Plan	0.65	0.72	0.66	0.67
Cycle 1 Actual vs. Cycle 2 Plan	1.64	1.80		1.73

(1) Excluding PY 2012 "Bridge" Programs' actual and plan.
(2) 2013, 2014 and 2015 from Ameren Draft Report as of 2 12 2015

Summary of Actual vs. Plan for Ameren Missouri DSM Programs (1)

C&I Custom

			MEEIA Cycle 1			MEEIA Cycle 2		
	2009-10	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 8,159	$ 10,272	$6,581	$7,519				
Programs' Costs Plan ($000)	$ 8,510	$ 4,415	$8,357	$8,840	$13,133	$ 8,709	$ 16,815	$ 22,538
Variance Amount	$ (351)	$ 5,857	$ (1,776)	$ (1,321)				
Percent Variance	-4.1%	132.7%	-21.3%	-14.9%				
Energy Savings Actual (MWh)	56,642	129,797	51,530	80,374				
Energy Savings Plan (MWh)	54,198	27,099	54,961	54,691	74,509	27,633	53,515	71,962
Variance Amount	2,444	102,698	-3,431	25,682				
Percent Variance	4.5%	379.0%	-6.2%	47.0%				
kWh per $ for Actual	6.9	12.6	7.8	10.7				
kWh per $ for Plan	6.4	6.1	6.6	6.2	5.7	3.2	3.2	3.2

C&I Standard

			MEEIA Cycle 1			MEEIA Cycle 2		
	2009-10	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 3,007	$ 2,041	$ 2,324	$ 3,915				
Programs' Costs Plan ($000)	$ 11,327	$ 8,320	$ 3,222	$ 4,868	$ 8,051	$ 5,886	$ 6,586	$ 10,963
Variance Amount	$ (8,320)	$ (6,279)	$ (898)	$ (953)				
Percent Variance	-73.5%	-75.5%	-27.9%	-19.6%				
Energy Savings Actual (MWh)	24,515	20,034	22,602	38,875				
Energy Savings Plan (MWh)	68,985	40,753	25,125	33,686	51,784	18,619	20,853	35,004
Variance Amount	-44,470	-20,719	-2,523	5,189				
Percent Variance	-64.5%	-50.8%	-10.0%	15.4%				
kWh per $ for Actual	8.2	9.8	9.7	9.9				
kWh per $ for Plan	6.1	4.9	7.8	6.9	6.4	3.2	3.2	3.2

C&I Portfolio

			MEEIA Cycle 1			MEEIA Cycle 2		
	2009-10	2011	2013	2014	2015	2016	2017	2018
Programs' Costs Actual ($000)	$ 12,361	$ 17,982	$ 9,591	$ 14,776				
Programs' Costs Plan ($000)	$ 27,245	$ 17,134	$ 12,485	$ 15,000	$ 23,301	$ 14,595	$ 30,231	$ 39,364
Variance Amount	$ (14,884)	$ 848	$ (2,894)	$ (224)				
Percent Variance	-54.6%	4.9%	-23.2%	-1.5%				
Energy Savings Actual (MWh)	87,331	234,535	74,616	144,510				
Energy Savings Plan (MWh)	153,384	82,197	85,517	95,067	135,766	46,252	91,927	122,536
Variance Amount	-66,053	152,338	-10,901	49,443				
Percent Variance	-43.1%	185.3%	-12.7%	52.0%				
kWh per $ for Actual	7.1	13.0	7.8	9.8				
kWh per $ for Plan	5.6	4.8	6.8	6.3	5.8	3.2	3.0	3.1

Incremental Annual Energy Savings

	PY 1	PY 2	PY 3	Total
Pre-MEEIA Actual vs. Plan		0.57	2.85	1.37
Cycle 1 Actual vs. Plan	0.87	1.52		1.21
Cycle 2 Plan vs. Cycle 1 Plan	0.54	0.97	0.90	0.82
Cycle 1 Actual vs. Cycle 2 Plan	1.61	1.57		1.59

(1) Excluding PY 2012 "Bridge" Programs' actual and plan.
(2) 2013, 2014 and 2015 from Ameren Draft Report as of 2 12 2015

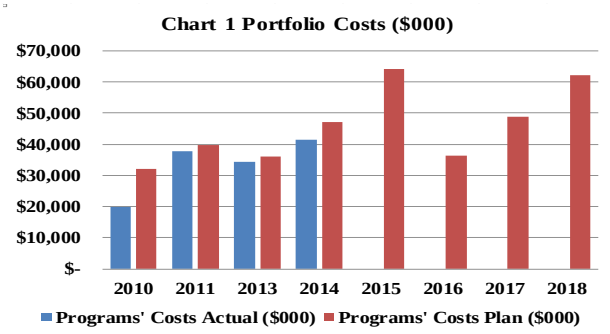


Chart 1 Portfolio Costs ($000)
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$-
2010 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

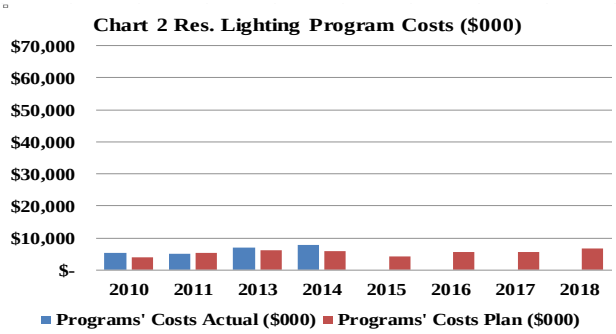


Chart 2 Res. Lighting Program Costs ($000)
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$-
2010 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

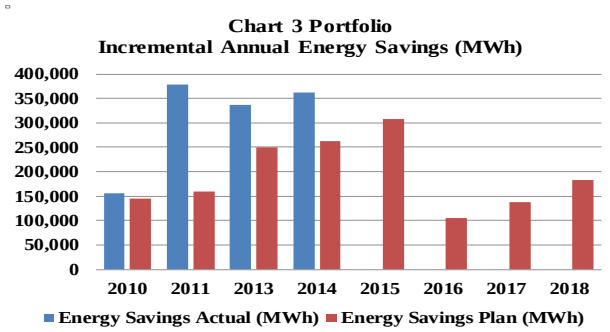


Chart 3 Portfolio
Incremental Annual Energy Savings (MWh)
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2010 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

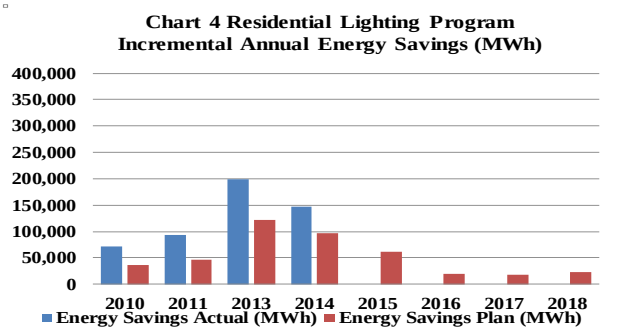


Chart 4 Residential Lighting Program
Incremental Annual Energy Savings (MWh)
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2010 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

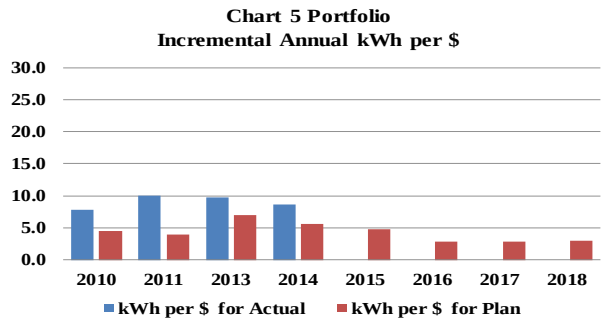


Chart 5 Portfolio
Incremental Annual kWh per $
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2010 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan

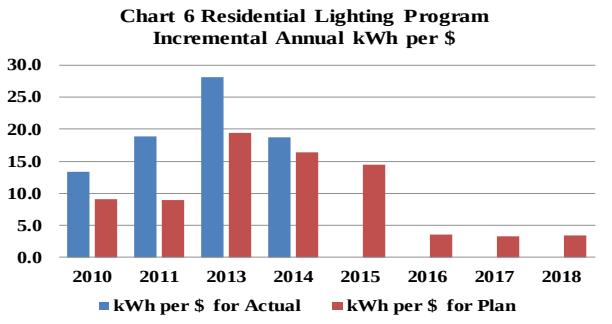


Chart 6 Residential Lighting Program
Incremental Annual kWh per $
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2010 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan

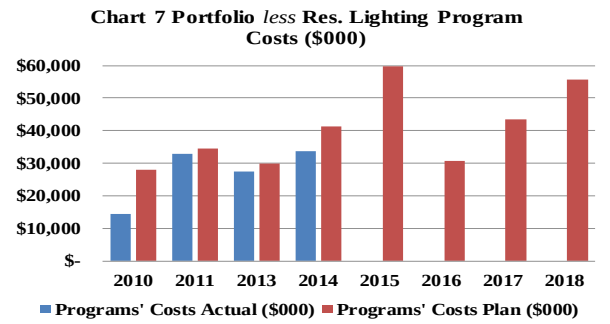


Chart 7 Portfolio less Res. Lighting Program
Costs ($000)
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$-
2010 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

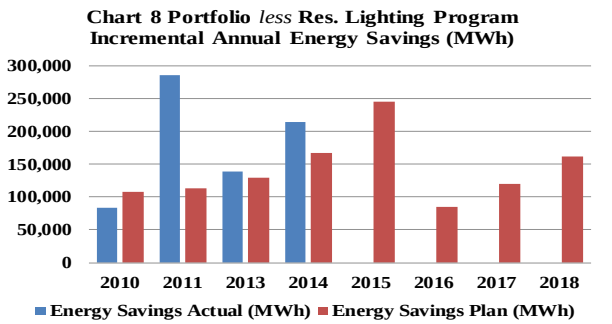


Chart 8 Portfolio less Res. Lighting Program
Incremental Annual Energy Savings (MWh)
300,000
250,000
200,000
150,000
100,000
50,000
0
2010 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

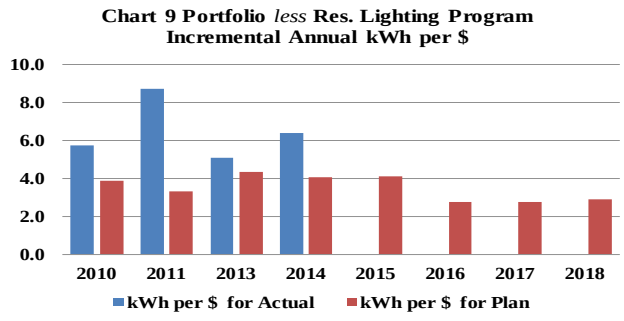


Chart 9 Portfolio less Res. Lighting Program
Incremental Annual kWh per $
10.0
8.0
6.0
4.0
2.0
0.0
2010 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan

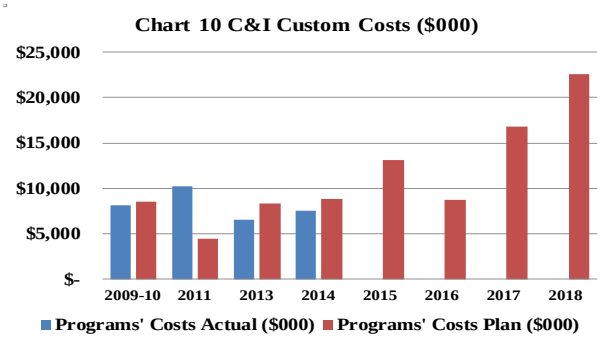


Chart 10 C&I Custom Costs ($000)
$25,000
$20,000
$15,000
$10,000
$5,000
$-
2009-10 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

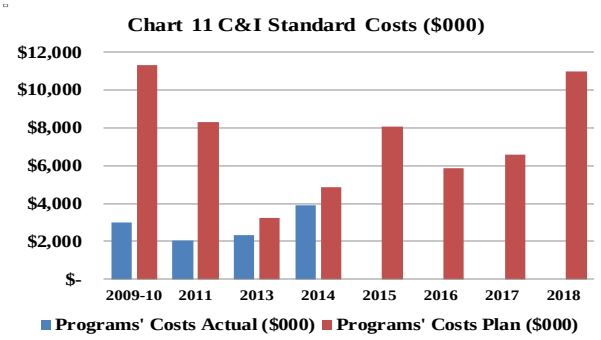


Chart 11 C&I Standard Costs ($000)
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$-
2009-10 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

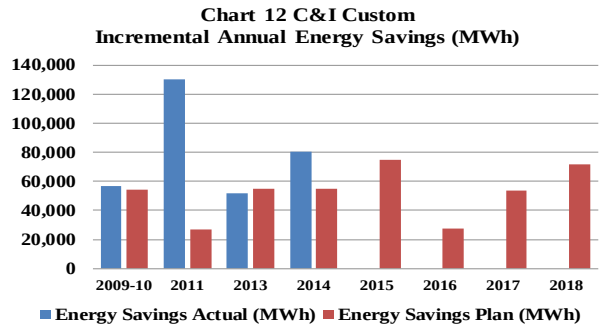


Chart 12 C&I Custom
Incremental Annual Energy Savings (MWh)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2009-10 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

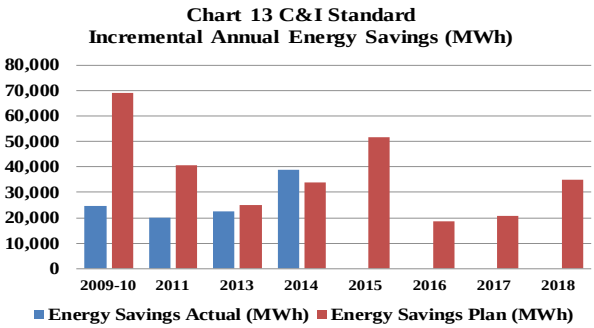


Chart 13 C&I Standard
Incremental Annual Energy Savings (MWh)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2009-10 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

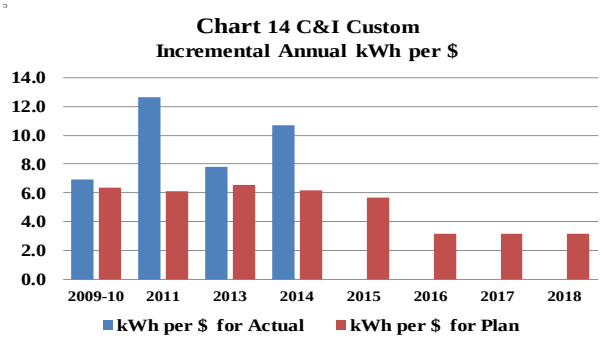


Chart 14 C&I Custom
Incremental Annual kWh per $
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009-10 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan

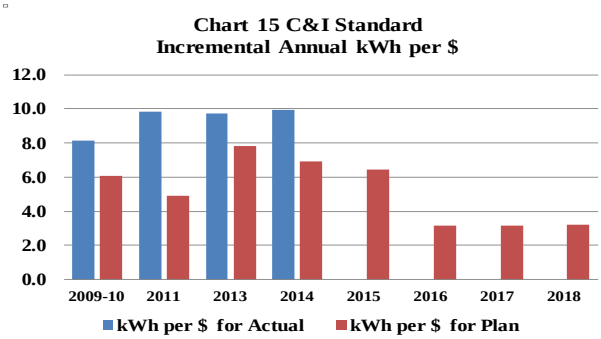


Chart 15 C&I Standard
Incremental Annual kWh per $
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009-10 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan

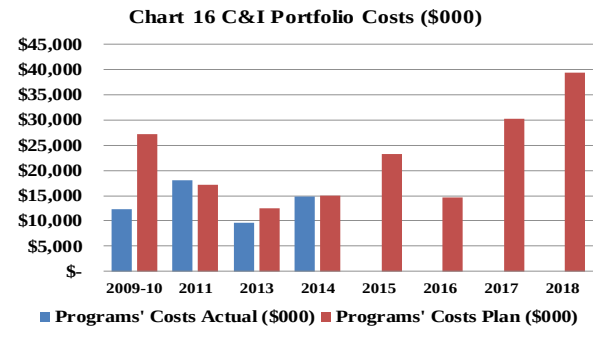


Chart 16 C&I Portfolio Costs ($000)
$45,000
$40,000
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$-
2009-10 2011 2013 2014 2015 2016 2017 2018
Programs' Costs Actual ($000)
Programs' Costs Plan ($000)

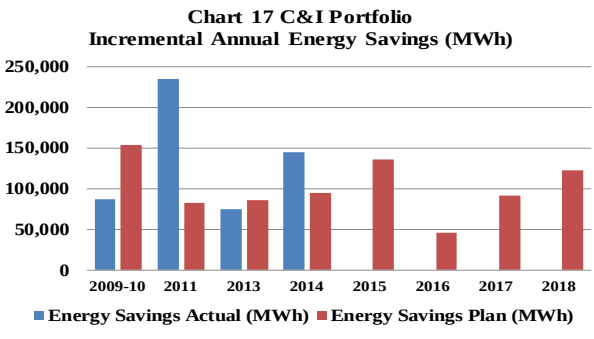


Chart 17 C&I Portfolio
Incremental Annual Energy Savings (MWh)
250,000
200,000
150,000
100,000
50,000
0
2009-10 2011 2013 2014 2015 2016 2017 2018
Energy Savings Actual (MWh)
Energy Savings Plan (MWh)

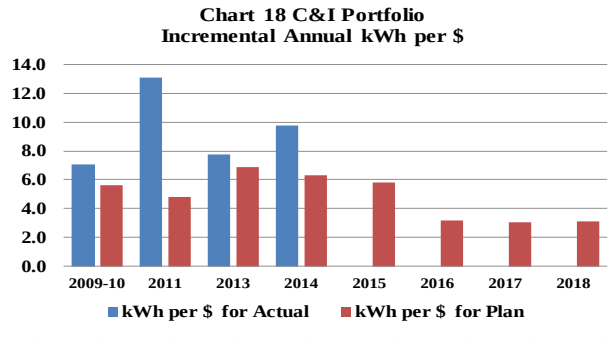


Chart 18 C&I Portfolio
Incremental Annual kWh per $
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009-10 2011 2013 2014 2015 2016 2017 2018
kWh per $ for Actual
kWh per $ for Plan