

# 11. Stakeholder Process

## **Highlights**

- *Ameren Missouri conducts an inclusive stakeholder process to solicit feedback on its assumptions and analysis methods.*
- *Ameren Missouri hosted a stakeholder meeting in April 2020 to present our key assumptions and solicit stakeholder feedback.*
- *Ameren Missouri has addressed Special Contemporary Issues as ordered by the Missouri Public Service Commission ("Commission").*
- *Ameren Missouri has incorporated comments received from stakeholders in this IRP filing.*

Ameren Missouri conducts an inclusive stakeholder process to solicit feedback on its assumptions and analysis methods used for integrated resource planning. Our stakeholder group includes representatives of state agencies, consumer advocates, and environmental advocates. Our process includes the following key elements:

- A stakeholder workshop to review the assumptions and analytical methods used in the analysis of resource alternatives and selection of our preferred resource plan
- Distribution of drafts of certain chapters of our filing and review and incorporation, as appropriate, of stakeholder comments on those drafts<sup>1</sup>
- Addressing Special Contemporary Issues as part of our analysis as suggested by stakeholders and ordered by the Commission<sup>2</sup>

This chapter describes how these key elements were satisfied pursuant to the Commission's rules and its order on Special Contemporary Issues.

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<sup>1</sup> 20 CSR 4240-22.080(5)

<sup>2</sup> 20 CSR 4240-22.080(4); EO-2020-0047

## 11.1 Stakeholder Group

Ameren Missouri's stakeholder group includes representatives of the following state agencies and private organizations:

- Commission Staff ("Staff")
- Office of the Public Counsel ("OPC")
- Department of Natural Resources – Division of Energy ("DE")
- Missouri Industrial Electric Customers ("MIEC")
- Missouri Energy Consumers Group ("MECG")
- Natural Resources Defense Council ("NRDC")
- Renew Missouri ("RM")
- Sierra Club ("SC")
- NAACP
- Clean Grid Alliance ("CGA")
- Missouri Joint Municipal Electrical Utility Commission ("MJMEUC")
- Empire District Electric Co. ("EDE")

## 11.2 Stakeholder Workshop

On April 29, 2020, Ameren Missouri hosted a stakeholder workshop via a virtual meeting to present key assumptions and analytical methods to be used in our analysis of resource choices and decisions necessary to meet the electric energy needs of our customers in a safe, reliable, environmentally responsible, and cost-effective manner. The workshop included discussion of assumptions for:

- Forecasts of customer energy consumption and peak demand pursuant to 20 CSR 4240-22.030, which is discussed in detail in Chapter 3
- Potential, including costs and benefits, for utility programs to help customers use energy more efficiently and defer or reduce the need for new sources of electric generation pursuant to 20 CSR 4240-22.050, which is discussed in detail in Chapter 8
- Options, including costs and operating characteristics, for new generation pursuant to 20 CSR 4240-22.040, which are discussed in detail in Chapter 6
- Delivery infrastructure (transmission and distribution) needs and plans, and relationships to meeting customers' needs pursuant to 20 CSR 4240-22.045, which are discussed in detail in Chapter 7
- Options and costs, including the expected need for environmental equipment investments, for the operation of our existing generating portfolio pursuant to 20 CSR 4240-22.040, which are discussed in detail in Chapters 4 and 5

We also presented alternative resource plans from which we would select a preferred plan, the planned assumptions, and analytical methods we expected to use to evaluate those alternative resource plans pursuant to 20 CSR 4240-22.060. This discussion covered the following topics:

- Alternative resource plans, which are presented in Chapters 9 and 10
- Assumptions for key variables that could affect the performance of alternative resource plans, as discussed in Chapters 2 and 9
- Our approach to sensitivity and risk analysis, as discussed in Chapter 9
- Planning objectives and measures used to guide the development of alternative resource plans, as discussed in Chapter 9, and to select the preferred resource plan, as discussed in Chapter 10

Feedback received at the workshop was noted and considered in our continuing analysis to support our IRP filing.

### **11.3 Stakeholder Comments on Draft Report**

Following the stakeholder workshop in February, Ameren Missouri distributed drafts of certain chapters for its filing to stakeholders for review and comment. The following chapters were distributed:

- Chapter 3 – Load Analysis and Forecasting
- Chapter 4 – Existing Supply-Side Resources
- Chapter 5 – Environmental Regulation
- Chapter 6 – New Supply-Side Resources
- Chapter 7 – Transmission and Distribution

In addition, Ameren Missouri indicated that its Demand Side Management Market Potential Study ("DSM Potential Study"), finalized in early 2020, would serve as a proxy for a draft of Chapter 8 – Demand-Side Resources. The DSM Potential Study serves as the source of key assumptions for use in the development of demand side resource portfolios for inclusion in alternative resource plans. Ameren Missouri conducts a rigorous stakeholder process to review and test its assumptions for the DSM Potential Study as it is being developed.

Four stakeholder groups provided written comments to Ameren Missouri on its draft report in accordance with the Commission's IRP rules – OPC, SC, RM, and CGA. Their comments and our review of them are discussed in the following sections.

### 11.3.1 Comments - Office of the Public Counsel

OPC provided written comments on June 5, 2020. Following are the comments and Ameren Missouri's review of each, as well as an indication of any discussion included in our filing to address each comment.

***A. OPC noted concerns regarding the incorporation of the effects of the Covid-19 pandemic on load and indicated support for an extension of the Company's filing date to incorporate such information.***

**Review and Application** – Ameren Missouri reviewed its long-term load forecasts used for its 2020 IRP and concluded that 1) reasonable expectations regarding load impacts are that they would not last longer than five years, at most, 2) expectations regarding long-term load impacts are highly uncertain, and 3) the Company's use of a range of load forecasts, as described in Chapter 3, account for significant variability over the planning horizon, including changes in underlying economic conditions, and therefore, sufficiently addresses any long-term load uncertainty.

That said, stakeholders may still have concerns regarding the potential for load changes related to the pandemic to cause changes in the conclusions the Company has drawn from its analysis of alternative resource plans. There are two key aspects of our planning analysis through which we evaluate the implications of future loads. First, our financial and ratemaking analysis includes the cost of settling Ameren Missouri's load in MISO. Because this cost is common for all alternative resource plans for a given load forecast, it does not result in relative differences in the economics of alternative resource plans. Second, peak demands associated with our load forecasts are an input for the capacity position that we use to determine the need for new resources in terms of both magnitude and timing. Given this, we have analyzed the magnitude of long-term load reduction that would be necessary to change the timing of new resources in our preferred resource plan and key contingency plans described in Chapter 10.

For our preferred resource plan, Plan V, our need (from a planning reserve margin perspective) for new supply side resource capacity is in 2043, when we otherwise show a capacity deficit in our planning reserve margin of 1,036 MW. To avoid the needed capacity in that year, we would have to show a capacity deficit of less than 300 MW. This would mean a reduction of more than 736 MW in load and associated reserve margin requirement, or about 10%. Alternatively, Plan W, which reflects no DSM implementation after our MEEIA Cycle 3 programs, shows a planning reserve margin deficit of more than 300 MW and thus the addition of a new supply side resource in 2037, when we otherwise show a capacity deficit of

1,038 MW. To avoid the needed capacity in that year would require a reduction of more than 738 MW in load and reserve requirements, or about 8%.

In June, MISO reported to its members that its most recent assessment of load deviation due to pandemic-related closures indicated an impact of about 7% and that the magnitude of such impacts were declining as local economies reopened.<sup>3</sup> Also in June, the Congressional Research Service indicated that the U.S. Energy Information Administration projected a 5.7% reduction in demand for 2020.<sup>4</sup> While there remains much uncertainty regarding the continued duration and magnitude of load impacts associated with the pandemic, we see little reason to expect that the load impacts seen to date will be sustained far into the future or at a magnitude that might have a meaningful impact on our resource analysis.

***B. OPC noted concerns regarding the modeling of scenarios reflecting environmental upgrades mandated by the U.S. District Court, particularly the treatment of remaining plant balances for ratemaking purposes.***

**Review and Application** – Ameren Missouri has included its consideration of these scenarios in its analysis described in Chapter 9. The Company has included plans R, S, T, and U specifically for this purpose. For purposes of our analysis, we have assumed that remaining plant balances are included in the revenue requirement that would be used for ratemaking and that depreciation of plant balances would be adjusted to reflect the expected plant retirement date for each alternative resource plan that includes a change in retirement date.

***C. OPC suggests the Company include smart grid investments pursuant to SB-564 in its analysis of alternative resource plans.***

**Review and Application** – Ameren Missouri has included such investments in its financial, revenue requirements, and rates analysis described in Chapter 9.

***D. OPC suggests that Ameren Missouri account for foreseeable diminishing returns for renewable energy resources in MISO and uncertainty in transmission costs.***

**Review and Application** – Ameren Missouri has relied on MISO's most recent assessment for the effective load-carrying capability of wind and solar resources as described in Chapter 2. We have evaluated wind project costs including

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<sup>3</sup><https://cdn.misoenergy.org/20200608%20COVID%2019%20Impacts%20to%20MISO%20Load%20and%20Outage452518.pdf>

<sup>4</sup> <https://crsreports.congress.gov/product/pdf/IN/IN11300>

transmission interconnection costs as part of our analysis of project costs as a candidate uncertain factor as described in Chapter 9.

- E. OPC suggests delaying the filing date for Ameren Missouri's IRP due to potential changes in policy that could result from this November's election, citing an executive order on securing the U.S. bulk power system.***

**Review and Application** – Ameren Missouri recognizes that the landscape of energy policy is ever-changing and attempts to account for the potential impacts of uncertainty regarding energy policy and other factors on its planning analysis. Because the landscape never stops changing, and because the Company frequently updates its planning analysis to reflect new information, we believe it is reasonable to maintain the existing filing schedule.

- F. OPC suggests evaluation of aggressive DSM at a "MAP-like" level.***

**Review and Application** – Ameren Missouri has evaluated alternative resource plans with MAP DSM as described in Chapters 9 and 10.

- G. OPC notes a need for substantiating estimates of low-income electric space heating customers.***

**Review and Application** – This concern is being addressed outside of the IRP process.

- H. OPC requests a copy of (or link to) the EPRI study of electric vehicles cited in Chapter 3 or a description of the timing and scope of the study.***

**Review and Application** – Ameren Missouri's assumptions for electric vehicle load impacts are based on work EPRI is doing for a Missouri state-wide electrification assessment. This study was not complete at the time of filing. A description of the study, its scope and expected timing are included in Chapter 3.

- I. OPC suggests evaluation of more wide-ranging estimates of energy growth, citing studies by NREL, and MISO.***

**Review and Application** – Ameren Missouri has included a range of load forecasts as described in Chapter 3. Because the IRP process is focused on probable ranges, evaluation of extreme scenarios is generally not included in our base analysis. That said, Ameren Missouri is willing to consider factors that may influence its assessment of probable ranges of future load.

### 11.3.2 Comments - Sierra Club

SC provided written comments on May 29, 2020. Following are the comments and Ameren Missouri's review of each, as well as an indication of any discussion included in our filing to address each comment.

***A. SC urges Ameren Missouri to evaluate the economics of continuing to operate each of its coal-fired units.***

**Review and Application** – Ameren Missouri has analyzed alternative resource plans that reflect early retirement of each of its coal-fired units other than Meramec, which is already scheduled to be retired by the end of 2022 when necessary transmission system upgrades are expected to be complete.

***B. SC encourages Ameren Missouri to issue an RFP to test the market for the cost of new resources.***

**Review and Application** – Ameren Missouri has issued an RFP for wind and solar resources, as described in Chapter 10. Because Ameren Missouri has significant capacity in excess of its planning reserve margin and significant potential for peak load reductions from DSM programs, we have not included non-renewable technologies in the RFP. Instead, we have evaluated other supply-side alternatives in the context of capacity need while also evaluating the potential for accelerating the retirement date for each of the Company's coal-fired units, as referenced above.

***C. SC encourages Ameren Missouri not to overstate its estimate of capacity prices.***

**Review and Application** – Ameren Missouri's assumptions for capacity prices were shared with stakeholders, including SC, at its April 29<sup>th</sup> stakeholder meeting and are discussed in Chapter 2.

***D. SC encourages Ameren Missouri not to overestimate the cost of wind and battery storage resources.***

**Review and Application** – Ameren Missouri's assumptions for new supply side resources, including wind and battery storage, were shared with stakeholders, including SC, at its April 29<sup>th</sup> stakeholder meeting and are discussed in detail in Chapter 6. Ameren Missouri shared its assumptions for declining costs for wind and solar resources, as well as costs for battery storage resources with an expected reduction in installed costs of 50% every ten years.

- E. SC states that Ameren Missouri's load forecasts shared at the stakeholder meeting do not include any DSM and are therefore overstated.***

**Review and Application** – Ameren Missouri develops baseline load forecasts that only include the impacts of DSM programs implemented to date. This enables us to evaluate the impacts of new DSM resources as part of our analysis of alternative resource plans, as described in Chapter 9. The load forecasts developed pursuant to 20 CSR 4240-22.030 are intended to be developed in the manner described in Chapter 3 and used for analysis of alternative resource plans as described in Chapter 9.

- F. SC states that it believes Ameren Missouri's estimate of peak load impacts resulting from electrification are overstated.***

**Review and Application** – Ameren Missouri's assumptions for electrification impacts are described in Chapter 3.

- G. SC encourages Ameren Missouri to adequately address CO<sub>2</sub> price risk.***

**Review and Application** – Ameren Missouri's assumptions for a range of CO<sub>2</sub> prices are described and documented in Chapter 2.

- H. SC encourages Ameren Missouri to include public health impacts in its assessment of alternative resource plans.***

**Review and Application** – Ameren Missouri has included consideration of generation emissions in its preferred plan selection as described in Chapter 10. Specifically, the Company has included the planning objective of "Portfolio Transition," which captures consideration of emission reductions when comparing alternative resource plans.

- I. SC indicates that Ameren Missouri is required to consider municipal and corporate clean energy goals.***

**Review and Application** – Ameren Missouri has included in its preferred resource plan resources for renewable subscription programs to support customers and communities seeking to satisfy their clean energy goals. Our consideration of these resources as part of our assessment of alternative resource plans is described in Chapter 10.

### **11.3.3 Comments - Renew Missouri**

RM provided written comments on June 3, 2020. Following are the comments and Ameren Missouri's review of each, as well as an indication of any discussion included in our filing to address each comment.



**A. *RM suggest evaluation of the Grain Belt Express ("GBX") high voltage DC transmission project in conjunction with renewable resources.***

**Review and Application** – Ameren Missouri has evaluated an alternative resource plan including GBX and western Kansas wind. The analysis and evaluation of that alternative resource plan are included in Chapter 10.

**B. *RM indicates the need to address self-scheduling practices in the IRP.***<sup>5</sup>

**Review and Application** – Ameren Missouri has included this discussion along with discussion of other special contemporary issues later in this chapter.

### 11.3.4 Comments - Clean Grid Alliance

CGA provided written comments on June 4, 2020. Following are the comments and Ameren Missouri's review of each, as well as an indication of any discussion included in our filing to address each comment.

**A. *CGA suggest including evaluation of GBX, as RM has.***

**Review and Application** – Ameren Missouri has evaluated an alternative resource plan including GBX and western Kansas wind. The analysis and evaluation of that alternative resource plan are included in Chapter 10.

**B. *CGA urges Ameren Missouri to ensure its modeling reflects the phase out of PTC for wind resources and ITC for solar resources.***

**Review and Application** – Ameren Missouri has reflected PTC for wind and ITC for solar based on the timing of specific resource additions in alternative resource plans and consistent with current law, including the phase-out of PTC and ITC cited by CGA.

**C. *CGA suggests evaluation of hybrid wind and solar projects.***

**Review and Application** – Ameren Missouri has evaluated alternative resource plans with different combinations of resources, including different combinations of wind and solar resources. The integration and risk analysis described in Chapter 9 is more sophisticated than the LCOE calculation presented in Chapter 4, and therefore accounts for the combined benefits of wind and solar resources commensurate with the levels and timing of each represented in alternative resource plans.

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<sup>5</sup> Ameren Missouri interprets RM's reference to "self-scheduling" to be a reference to unit commitment.

***D. CGA suggests that estimates for load impacts from electrification should be increased to match other forecasts.***

**Review and Application** – Ameren Missouri's assumptions for load impacts from electrification are discussed in Chapter 3. Electrification impacts were estimated at three different levels.

***E. CGA suggests that solar and storage alternatives should be compared to wires alternatives.***

**Review and Application** – Ameren Missouri continues to evaluate the economics of non-wires alternatives as described in Chapters 6 and 7, including comparison to wires alternatives. Ameren Missouri notes that the projects cited are being evaluated for potential use at the distribution level, not at the transmission level as stated by CGA.

***F. CGA suggests a number of potential uncertain factors to consider, including permitting, congestion, interconnection costs, and geographic diversity.***

**Review and Application** – Because of the nature of the resource analysis at the planning stage, generic assumptions are used for resource cost and performance, which generally include consideration of the factors CGS suggests. Ameren Missouri considers factors such as those listed and others more specifically when evaluating and comparing specific project opportunities as part of its preferred plan implementation.

## 11.4 Special Contemporary Issues

Pursuant to its rules on Integrated Resource Planning, the Commission, on December 3, 2019, issued a revised order establishing Special Contemporary Resource Planning Issues ("Special Contemporary Issues") for Ameren Missouri to analyze and document as part of its 2020 triennial IRP filing. Following is a restatement of the Special Contemporary Issues included in the Commission's order and a brief discussion of Ameren Missouri's approach to analyzing and documenting its consideration of each issue and where in its triennial filing more detailed information can be found.

***A. Include the following as uncertain factors that may be critical to the performance of alternative resource plans in accordance with 20 CSR 4240-22.060(5)(M).<sup>6</sup>***

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<sup>6</sup> Rule references have been changed to reflect the current codification or the rules cited in the Commission's revised order on Special Contemporary Issues.

- (i) Foreseeable demand response technologies, including, but not limited to, integrated energy management control systems, linking smart thermostats, lighting controls and other load-control technologies with smart end-use devices;*
- (ii) Foreseeable energy storage technologies; and*
- (iii) Foreseeable distributed energy resources, including, but not limited to, distributed solar generation, distributed wind generation, combined heat and power ("CHP"), and microgrid formation. Develop and provide a database of information on distributed generation (both utility owned and customer owned) and distributed energy storage (both utility owned and customer owned) for purposes of evaluating current penetration and planning for future increases in the levels of distributed generation and energy storage.*

**Ameren Missouri's Approach** – Ameren Missouri has addressed items i-iii in Chapters 6, 7, 8, and 9. Ameren Missouri maintains a database of customer-owned resources in conjunction with net-metering agreements and makes an annual filing with the Commission that summarizes the number of net-metered customers, capacity and energy received by Ameren Missouri in accordance with 20 CSR 4240-20.065 (10)(A). Data from the database is provided in an Excel file in the work papers.

- B. Analyze and document the impact of electric vehicle adoption and charging station installations for the 20-year planning period upon the low-case, base-case and high-case load forecasts.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 3.

- C. Analyze and document the cost of any transmission grid upgrades or additions needed to address transmission grid reliability, stability, or voltage support impacts that could result from the retirement of any existing coal-fired generating unit in the time period established in the IRP process.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 7.

- D. Model scenarios related to environmental upgrades to the Rush Island and Labadie coal-fired plants as mandated by the federal courts.**

**Ameren Missouri's Approach** – Ameren Missouri has analyzed this issue in Chapter 9.

- E. In addition to the exercise prescribed in 20 CSR 4240-22.045, analyze integrated distribution planning as a way to manage the distribution grid in a manner that reduces peaks and fills valleys in load profiles, and lowers overall system costs with a combination of energy efficiency, demand response, electric vehicles, distributed generation, storage, advanced metering, and pricing strategies such as time-of-use rates ("TOU") and inclining block rates ("IBR").***

**Ameren Missouri's Approach** – Ameren Missouri has analyzed this issue in Chapter 7.

- F. Analyze and assess the use of mechanisms such as green tariffs and community solar to increase the availability of distributed generation for large and small customers.***

**Ameren Missouri's Approach** – Ameren Missouri has analyzed this issue in Chapters 6, 9, and 10.

- G. Analyze and document the prospects for using securitization to advance the retirement of coal generation assets, and channel the savings into more economical investments such as demand-side management, building wind and solar generation, and storage. Securitization is essentially lower cost, long-term financing that that ratepayers take out and pledge to repay using a portion of their future electricity bills using a long-term, lower-cost bond that will save customers money, some of which can be used as new capital.***

**Ameren Missouri's Approach** – Ameren Missouri believes that the prospects for using securitization to advance the retirement of coal generation assets and channel the savings into more economical investments are good, provided that appropriate legislation is passed by the Missouri General Assembly and can be properly implemented by the Commission. Utilizing securitization legislation as a means to retire coal-fired generation is complicated and the devil is often in the details. Legislation must protect the interests of bondholders, customers and electric utilities in order to be workable. Bondholders need adequate assurance that the bonds they issue to support securitization will be repaid. Customers need to be sure that repayment of the bonds will not adversely impact affordability of electric service. Electric utilities need to be sure that utilizing securitization as a means to retire coal-fired generation will not have an adverse financial impact on

them. If these interests can be protected, securitization can work for the benefit of all stakeholders.

- H. Analyze and assess the benefits of supporting the development and funding of a High Performance Building Hub to address information and financing (including bridge financing for project development) for building owners – especially affordable housing. Look at Building Energy Exchange (an informational resource for the building industry in New York) and NYC Energy Efficiency Corporation (a specialty financing corporation) as possible models.**

**Ameren Missouri’s Approach** – Ameren Missouri has analyzed this issue in Chapter 8.

- I. Staff’s report in EW-2019-0370 regarding its investigation of utility self-scheduling practices in the RTO market concluded that ratepayers were not being “actively harmed” by the practice of self-scheduling, but admitted that Staff lacked the data and resources to answer the fundamental questions of whether Missouri utilities are bidding into the markets at below production costs or otherwise harming ratepayers through “increased outage rates, decreased off-system sales revenue, increased operations and maintenance costs, shortened life of assets, increased outage frequency, decreased reliability, increased LMPs at the load node, and/or generally increased energy prices across the RTO’s footprint” (Staff Report at 13). Ameren Missouri shall address these issues in its IRP since only it possesses the necessary bid formulation and production cost data.**

**Ameren Missouri’s Approach** – Ameren Missouri has assumed in its analysis documented in Chapter 9, that all of its coal-fired units are offered into MISO on an economic basis (i.e., not "must run") starting in 2025, the earliest year in which changes are made to coal operations in any alternative resource plan compared to our base assumptions. The analysis results for all alternative plans for all price scenarios reflect this assumption and are included in the work papers. The analysis in Chapter 9 includes evaluation of alternative retirement dates for each coal-fired unit (other than Meramec, which is scheduled to be retired by the end of 2022). Comparison of results for alternative resource plans with different retirement dates provides a basis on which to assess the economics of coal-fired units unaffected by a "must run" designation.

- J. Analyze and screen electric vehicle charging infrastructure as a candidate resource option.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 7.

- K. Analyze and develop as candidate resource options the satisfaction of municipal and corporate renewable energy goals, particularly the plan of the St. Louis Board of Aldermen to have the City's electricity sector be met entirely by efficiency and renewable resources by 2035, which, when enacted into law by ordinance, may become a legal mandate within the meaning of 20 CSR 4240-22.060(3)(A).**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapters 6, 9, and 10.

- L. Analyze and document the costs of putting flue gas desulfurization (scrubbers) on Labadie and Rush Island.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 5.

- M. Analyze and document the future capital and operating costs faced by each Ameren Missouri coal-fired generating unit in order to comply with the following environmental standards:**

- (1) Clean Air Act New Source Review provisions;**
- (2) 1-hour Sulfur Dioxide National Ambient Air Quality Standard;**
- (3) National Ambient Air Quality Standards for ozone and fine particulate matter;**
- (4) Cross-State Air Pollution Rule, in the event that the rule is reinstated;**
- (5) Mercury and Air Toxics Standards;**
- (6) Clean Water Act Section 316(b) Cooling Water Intake Standards;**
- (7) Clean Water Act Steam Electric Effluent Limitation Guidelines;**
- (8) Coal Combustion Waste rules;**
- (9) Clean Air Act Section 111(d) Greenhouse Gas standards for existing sources;**
- (10) Clean Air Act Regional Haze requirements; and**
- (11) Clean Power Plan.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed these environmental issues and investments in Chapter 5.

***N. Analyze and document the criteria by which units are assigned various operational designations (e.g. “must run”) for use in all Company economic modeling and resource planning.***

**Ameren Missouri’s Approach** – Ameren Missouri is a Market Participant within the Mid-Continent Independent System Operator ("MISO"). As a Generation Resource owner, it is Ameren Missouri's obligation to offer its generation resources into the MISO Day Ahead Market (the timing and specifics of which can be found in Exhibit 2-1 of Business Practice Manual 002). One offer parameter available to Generation Resource owners is that of "Commit Status." Types of Commit Status include "Must Run," "Economic," and "Outage." The Must Run commit status is used when Generation owners choose to self-commit their generation. For an example of how self-commitment occurs, consider a hypothetical power plant that has a minimum generation level of 250 megawatts (“MW”) and a maximum generation level of 500 MW. For several reasons, a utility may self-commit that power plant at the minimum level of 250 MW (utilizing a Must Run status) to ensure that the plant remains online at 250 MW.

Ameren Missouri utilizes a status of Must Run to continue running units that were committed by MISO as "Economic" in a previous day. Unit commitment is defined as the decision to bring a unit online (or to subsequently take the unit off-line i.e., to de-commit it), which is an important distinction in contrast to unit dispatch. Unit dispatch establishes the level of output for a unit once it has already been committed. In the example above, while a utility may Must Run a unit at its 250 MW minimum, any generation above that level would be ordered by MISO as part of its dispatch based on price, if the utility has designated a unit dispatch of "Economic." So, it is crucial to note that the mere act of assigning a Must Run commit status to a unit does not mean the unit has a dispatch status of "Self-Scheduled." While it is true that Ameren Missouri Must Runs several of its generation units, it does not typically Self-Schedule its units' dispatch.<sup>7</sup>

Ameren Missouri's coal-fired units are primarily designed for base load (continuous) operation. However, cycling them on a frequent basis decreases unit availability, and shortens component life expectancies resulting in increased maintenance and capital costs. Each time a power plant is cycled, its major and minor auxiliary components experience significant thermal and pressure stresses, which cause damage. This is most concerning for equipment that is subjected to high temperatures and pressures, and other mechanical forces. Over time and repeated cycles, this can result in failure of critical components. Under a frequent cycling dispatch model, component life can be expected to be shortened. In

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<sup>7</sup> Unit Commitment and Unit Dispatch are distinct concepts. Unit *commitment* is the decision to bring a unit online (or to subsequently take the unit off-line (i.e., to decommit it)). In contrast, unit *dispatch* establishes the level of output for a unit once it has been committed.

addition, frequent cycling can be expected to result in more forced outages than would otherwise be the case; which reduces the margins that the unit can produce and increases net energy costs for customers.

In making its commit status decisions, Ameren Missouri's guiding principle is to clear (sell energy from) its units in the market when doing so benefits customers. Determining this benefit, however, is much more complex than simply comparing production cost to market price. In addition, the algorithm employed by MISO's model in its day-ahead market to commit units does not consider certain factors that must be accounted for in order to determine which commit status is most beneficial. The MISO algorithm used in its day-ahead market has certain limitations in this regard which arise from the fact that the MISO day-ahead market only clears for the 24-hour period of the next calendar day. Regarding these limitations, it is important to understand that given the relatively low cost of Ameren Missouri's baseload coal-fired units, those units clear MISO's day-ahead market most days of the year. This is true regardless of whether they were offered with a Must Run or Economic commit status. Despite the frequent commitment of these coal-fired units, Ameren Missouri will allow baseload coal-fired generators to cycle offline for any single or consecutive days that it is economically beneficially to customers.

One consequence of the model's limited forward period for analysis is that market participants do not have a clear means of informing MISO of what the cost to "de-commit" a unit is expected to be. De-commit costs would include such costs as the cost to restart the unit, foregone expected positive margins during minimum down times, and increases in maintenance and capital costs related to unit cycling (i.e., committing/de-committing/committing again).

Under its Forward Market Mechanism solution, MISO is exploring ways to help owners of "Long-Lead Resources" optimize their unit commitment decisions. Ameren Missouri is encouraging MISO to consider incorporating a De-commit Cost parameter. MISO is also considering extending the Minimum Run Time Offer parameter beyond the current 24 hour limit, implementing a Multi-Day Market Price Forecast, or even a Multi-Day Financial Commitment for those Long-Lead Resources.

### **10-Day Forecast Report**

Due to the previously discussed limitations of MISO's algorithm, Ameren Missouri has developed its own multi-day margin analysis. This analysis guides the commitment decisions of Ameren Missouri's coal-fired generators by identifying operations that produce the greatest margin benefit for Ameren Missouri's customers. This analysis is performed each business day by estimating each individual unit's hourly energy generation and ancillary services market awards ("ASM" – Regulation & Spinning Reserve). These estimates are based on a user-



created forecast curve of energy ("LMP") and ancillary services ("MCP") prices. This analysis is summarized and published in a 10-Day Forecast Report. Ameren Missouri transitions from a Must Run to Economic commit status for any day(s) that the analysis demonstrates that allowing units to cycle would benefit customers.

Ameren Missouri's process begins with creating the daily price forecasts for each of its units. These forecast curves are obtained from an internal database of historical MISO market wide information, Day Ahead LMPs and MCPs at the generation nodes along with local weather history. This database is searched for days with similar characteristics, based on the forecasted weather information from several weather services. Further refinement and filtering is performed by selecting specific day(s), based on the time of year and/or day of the week. Once the projected curves are established, each hourly value or block period (Peak/Off-peak) can be adjusted further to conform to projected average LMPs for each of the 10 days. These projected average prices are obtained by looking at current day LMPs, MISO published projections of MISO load, outages, temperature & wind forecasts, and ICE forward pricing marks.

The forecasting tool uses multiple inputs to calculate the hourly dispatch of each unit. Current day offer parameters, unit I/O Curves, fuel costs, and user-inputted operating restrictions, price breaks and reference levels are used in conjunction with the price forecast to generate each unit's hourly energy levels and incremental costs. Hour to hour MW level changes are also adjusted to conform to each unit's ramping capability. Revenues, Costs, and Margins ("RCM") are then calculated based on these forecasted hourly MW levels. Additional analysis is done to calculate the RCM for providing each ASM product. The resulting scenarios' margins: Base Case (Original dispatch), Case 1 (Providing Regulation & Spin), Case 2 (Providing Regulation only), and Case 3 (Providing Spin only) are then compared and the case with the highest margin is used for that hour's result. In an effort to avoid overestimations, a combination of the current ASM offer statuses and a look back at the hourly historical awards is used to limit the number of hours awarded ASM. In addition, for units currently in an offline status or during hours of scheduled de-rates (value tests and backwashes), only the original dispatch scenario is used.

### **10-Day Margin Forecast Walkthrough**

The 10-Day Margin Forecast model calculates daily margins for each coal unit over the 10 day forecast period based on the inputs detailed in the prior sections. The output format is shown below.

Margin vs. Cycle/Start Hurdle Cost										
Unit	Status	10 Day Margin	Negative Margin within the Next 5 Days	Normal Start Cost	Cycle O&M Cost	Misc	Cycle/Start Hurdle	Recommendation	Start Offer	Offer
Labadie 1	Online	\$866,257	\$0	(\$44,989)	\$0	\$0	(\$44,989)	Continue to Run		Must Run
Labadie 2	Online	\$850,887	\$0	(\$44,989)	\$0	\$0	(\$44,989)	Continue to Run		Must Run
Labadie 3	Online	\$772,850	\$0	(\$44,989)	\$0	\$0	(\$44,989)	Continue to Run		Must Run
Labadie 4	Online	\$854,629	\$0	(\$44,989)	\$0	\$0	(\$44,989)	Continue to Run		Must Run
Rush 1	Online	\$612,485	\$0	(\$56,029)	\$0	\$0	(\$56,029)	Continue to Run		Must Run
Rush 2	Online	\$664,475	\$0	(\$56,029)	\$0	\$0	(\$56,029)	Continue to Run		Must Run
Sioux 1	Econ Reserve	\$324,221	\$0	(\$8,205)	(\$57,400)	\$0	\$8,205	Review	\$8,200	Econ
Sioux 2	Online	\$290,076	\$0	(\$8,205)	(\$57,400)	\$0	(\$65,605)	Continue to Run		Must Run
Meramec 3	Econ Reserve	(\$150,928)	(\$44,589)	(\$13,231)	\$0	\$0	\$13,231	Econ Reserve	\$44,000	Econ
Meramec 4	Online	(\$106,774)	(\$21,948)	(\$12,530)	\$0	\$0	(\$12,530)	Review		Econ

**Status:** Outage – unavailable for dispatch, Econ Reserve – available and offered into the MISO market, Online – unit is online or coming online.

**10-Day Margin:** Cumulative margins for the 10-day forecast period.

**Negative Margin within the Next 5 Days:** Analyzes the next 5 days and sums only the negative margin days (ignores positive margins) to identify potential cycle opportunities for online resources and avoid poorly timed starts for off-line resources. All potential short term cycle opportunities are highlighted and reviewed (whether the loss is 1 day or cumulative over multiple days).

UNIT	Labadie 1	
DATE	ATC LMP	Margin
08/12/2020 - Wed	\$23.40	\$119,226
08/13/2020 - Thu	\$23.40	\$119,226
08/14/2020 - Fri	\$22.87	\$112,266
08/15/2020 - Sat	\$22.79	\$109,646
08/16/2020 - Sun	\$20.68	\$81,439
08/17/2020 - Mon	\$20.95	\$85,771
08/18/2020 - Tue	\$19.09	\$59,671
08/19/2020 - Wed	\$19.09	\$59,671
08/20/2020 - Thu	\$19.09	\$59,671
08/21/2020 - Fri	\$19.09	\$59,671
<b>Total</b>	<b>\$21.05</b>	<b>\$866,257</b>

**Normal Start Cost:** Actual unit start cost based on current fuel prices.

**Cycle O&M Cost:** Assigns a cost to cycle unit based on historical tube leak probability and costs.

**Misc:** Other costs that could impact a unit cycle or start-up. These costs would be detailed in the comment section.

**Cycle/Start Hurdle:** Start Hurdle is the positive margin required for an off-line unit to overcome the unit's Normal Start Cost. Cycle Hurdle includes a unit's Normal Start Cost

plus any O&M expected from cycling the unit.

**Recommendation:**

- Economic Reserve Status: If the 10-Day Margin Forecast indicates positive margins greater than the Start Hurdle, the unit is flagged for review. If the 10-Day Margin Forecast indicates negative margins or positive margins that are

less than the Normal Start Cost, the recommendation is to continue on Economic Reserve.

- Online Status: If the 10-Day Margin Forecast indicates positive margins or negative margins that are less than the Cycle Hurdle, the recommendation is to continue to run. If the 10-Day Margin Forecast indicates negative margins greater than the Cycle Hurdle, the unit is flagged for review. If Negative Margins within in the Next 5 Days are greater than the Cycle Hurdle cost, the unit is flagged for review.
- Outage Status: Recommendation is Outage.

**Start Offer:** Start Cost offered to MISO.

**Offer:** Must Run, Economic, or Outage status offered to MISO.

08/12/2020 - Wed's Next Day Offers	
Unit	Offer Comment
Labadie 1	Positive next day and 10 day margins.
Labadie 2	Positive next day and 10 day margins.
Labadie 3	Positive next day and 10 day margins.
Labadie 4	Positive next day and 10 day margins.
Rush 1	Positive next day and 10 day margins. Margin forecast at 550 MWs due to gland steam seal issues.
Rush 2	Positive next day and 10 day margins.
Sioux 1	Tube leak/ash pit outage complete. Positive next day and 10 day margins. Offered Economic with \$8200 Start Cost (Normal Start).
Sioux 2	Positive next day and 10 day margins.
Meramec 3	Forecasted losses. Offered Economic with risk premium in the Start Cost and No Load Cost.
Meramec 4	Forecasted losses. Offered Economic at cost.

**Offer Comment:** Offer details and strategies are included in this section.

### Coal Unit Commitment Decisions

Ameren Missouri considers each unit commitment decision as unique and considers a multitude of factors including margin forecasts, weather/price forecast risks, and unit operating restrictions. The following general guidelines are used to determine a coal unit's offer status in the MISO DA market:

#### Online Units

- Must Run: Units showing positive margins and/or have no daily or cumulative negative margin days that exceed the cycle hurdle rate (starting with the next day), are offered Must Run in the DA market. The purpose of the Must Run is to avoid single day or short term cycles in which market losses do not exceed the cycle hurdle rate.
- Economic: Units showing cumulative losses in any single or consecutive days (starting with the next day), that exceed the cycle hurdle rate are offered Economic into the MISO DA market. Depending on market prices, MISO will either continue to award the unit in the DA market or de-commit the unit.

- Outage: Units are offered as Outage if they need to come off-line for repairs/maintenance.

### Offline Units

- Must Run: Rarely used for off-line coal units. Exceptions are documented.
- Economic: Units showing positive margins exceeding the Normal Start Cost are reviewed. The daily margins are analyzed to determine the proper commitment timing. Also, the price forecast confidence is reviewed and margins are stress tested to analyze the impacts of lower market prices. Since the MISO market does not commit units over multiple days, the Normal Start Cost could keep a profitable unit from receiving a DA commitment. In this scenario, the Start Cost offer will be discounted in the DA market to incentivize a MISO start when the margins are expected to overcome the Normal Start Cost over a multi-day period. Units showing negative margins over the short term or 10-day forecast period are offered with a risk premium to avoid a single day commitment or short run cycle. The risk premium can offset forecasted market losses due to market commitments over a period of low prices.
- Outage: Units are offered Outage if they are off-line for repairs/maintenance.

Exceptions to these general guidelines are documented.

***O. Analyze and document on a unit-by-unit basis the net present value revenue requirement of the relative economics of continuing to operate each Ameren Missouri coal-fired generating unit versus retiring and replacing each such unit in light of all of the environmental, capital, fuel, and O&M expenses needed to keep each such unit operating as compared to the cost of other demand-side and supply side resources.***

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 9.

***P. Analyze and document the technical, maximum achievable, and realistic achievable energy and demand savings from demand-side management, and incorporate each level of savings into Ameren Missouri's resource planning process.***

**Ameren Missouri's Approach** – This issue has been addressed in Chapter 8 and Chapter 9.

**Q. Analyze and document the levels of achievable combined heat and power and incorporate such achievable CHP into Ameren Missouri's evaluation of demand side management.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapters 8 and 9.

**R. Analyze and document cost and performance information sufficient to fairly analyze and compare utility scale wind and solar resources, included distributed generation, to other supply side alternatives.**

**Ameren Missouri's Approach** – Ameren Missouri has addressed this issue in Chapter 6.

## 11.5 Rider EDI

Ameren Missouri obtained approval of its Missouri's Economic Development Incentive ("EDI") rider, which allows it to provide a discount of up to 40% to qualifying customers who are expanding within or relocating to Ameren Missouri's service territory, as provided for in Section 393.1640 RSMo.

Ameren Missouri currently has four customers who have expanded their businesses within or relocated to Ameren Missouri's service territory. Each of these companies make a contribution to fixed costs and thus lower the cost of service for all customers.

Ameren Missouri's tariff implementing this rider requires certain filing requirements to be included in this IRP filing. The tariff states:

Company will include, in its integrated resource plan filing and each update, a report for all active Agreements under this Rider which includes:

1. Records of the most recent verification of local, regional, or state governmental economic development incentives.
2. Company's estimate of the contribution to fixed costs after applying the Discounts for each Agreement separately, based on actual historical usage.
3. Affidavit as to the veracity of the calculations made in paragraph 2.

The required reporting information for the four participating customers can be found in the attached Appendixes A through C.

## 11.6 Post-Filing Activities

To assist stakeholders in the review of Ameren Missouri's IRP filing, Ameren Missouri plans to host a workshop in the fourth quarter of 2020 to provide an overview of the filing

and to answer questions stakeholders may have after having had time to begin reviewing the filing. Ameren Missouri will work with stakeholders to ensure understanding of the assumptions, analyses, conclusions and decisions presented in its IRP filing.