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*Issue(s):* *Certificates of Convenience, Feasibility Analysis*
*Witness:* *Sarah L.K. Lange*
*Sponsoring Party:* *MoPSC Staff*
*Type of Exhibit:* *Rebuttal Testimony*
*Case No.:* *EA-2023-0286*
*Date Testimony Prepared:* *October 11, 2023*

# MISSOURI PUBLIC SERVICE COMMISSION

## INDUSTRY ANALYSIS DIVISION

## TARIFF/RATE DESIGN DEPARTMENT

## REBUTTAL TESTIMONY

## OF

## SARAH L.K. LANGE

## UNION ELECTRIC COMPANY, d/b/a AMEREN MISSOURI

## CASE NO. EA-2023-0286

***Jefferson City, Missouri***
***October 2023***

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

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**SARAH L.K. LANGE**

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**REBUTTAL TESTIMONY OF**

**SARAH L.K. LANGE**

**UNION ELECTRIC COMPANY,**
**d/b/a AMEREN MISSOURI**

**CASE NO. EA-2023-0286**

## EXECUTIVE SUMMARY

Q. Please state your name and business address.

A. My name is Sarah L.K. Lange, and my business address is 200 Madison Street, Jefferson City, MO 65102.

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

A. I am employed by the Missouri Public Service Commission ("Commission") as an Economist for the Tariff/Rate Design Department, in the Industry Analysis Division.

Q. Please describe your educational and work background.

A. Please see Schedule SLKL-r1.

Q. What areas will you be addressing in this testimony?

A. I will:

1. Describe the questions the Commission must answer in its decision of whether to grant permission for an electric utility to construct and operate electric generation facilities, and summarize the information Ameren Missouri should provide in supplemental direct testimony, if ordered by the Commission, as discussed by Staff Industrial Analysis Division Director James A. Busch,

3. Discuss concerns with Ameren Missouri's asserted position that the projects for which permission is requested in this docket are economically feasible, including the financial modeling presented by Ameren Missouri in Mr. Michels' testimony,

4. Provide context for certain metrics Ameren Missouri has presented in this case,

5. Place this request in the context of Ameren Missouri's regulatory framework,

6. Explain Staff' recommended conditions concerning:

A. A Risk Sharing and Levelized Revenue Requirement Mechanism,

B. A MEEIA Earnings Opportunity Moratorium, and

C. Information related to information to be included in future requests for permission to construct and operate generation facilities ("CCN Requests"), made by Ameren Missouri.

Q. Do you recommend that the Commission determine that the projects for which Ameren Missouri requests permission in this case are economically feasible?

A. As discussed below, no. There is not reasonable evidence to conclude that the projects provide value to ratepayers as operating assets that justifies the costs of the projects to ratepayers.

Q. Do you recommend that the Commission determine that the projects for which Ameren Missouri requests permission in this case provide adequate ratepayer value to proceed?

A. No. Ameren Missouri has not articulated a need for these projects to justify the extent to which the cost of the projects to ratepayers exceeds the value these projects could provide to ratepayers as operating assets. As discussed by Mr. Busch, it is possible that some of the projects could provide adequate value that the Commission could determine that permission is appropriate, but that information has not been presented to date by Ameren Missouri, and it would be inappropriate for that information to be introduced into the record without adequate opportunity for Staff and other parties to review that information, conduct discovery, and respond in prefiled testimony.

**REQUESTS FOR COMMISSION PERMISSION TO CONSTRUCT AND OPERATE ELECTRIC GENERATION FACILITIES**

Q. In general, what questions should be the starting point when the Commission reviews an electric utility's request for permission to construct and operate electric generation facilities?

A. The Commission must begin with an analysis of whether:

(1) separately for each project, each proposed asset for which authority is requested is both important to the public convenience and desirable for the public welfare,[1] or if each proposed asset for which authority is requested is effectively a necessity because the lack of the proposed asset is such an inconvenience;[2] and

(2) separately for each project, if each proposed asset for which authority is requested is of sufficient importance to warrant the expense of making it,[3] or, if each proposed asset for which authority is requested is of such an improvement as to justify or warrant the expense of making the improvement?[4]

Q. What information would the Commission require to answer these questions?

A. The Commission would need the utility to answer the following questions:

1. To what degree is some sort of generation plant necessary to meet capacity, energy, or other requirements, and at what times?

2. To what degree do these specific generation plants meet the identified needs?

[1] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[2] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[3] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[4] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

3. To what degree do these projects provide such benefits that granting permission to proceed with the project should be considered, despite the low necessity or alternative means of meeting those needs?

4. To what degree are the increases to the Ameren Missouri revenue requirement caused by the project, over time, warranted by the value the project provides to Ameren Missouri ratepayers, over time?

Q. Did Ameren Missouri provide evidence that the authority it requested in this case would result in facilities that are necessary and convenient to the public service; in other words, of sufficient importance to warrant the expense of making it,[5] or of such an improvement as to justify or warrant the expense of making the improvement; [6] and that the projects are both important to the public convenience and desirable for the public welfare,[7] or effectively a necessity because the lack of the service is such an inconvenience?[8]

A. No. While since the mid 1990's the Commission has often subsumed these questions into the "Tartan" factors, they remain relevant and important considerations in the discharge of the Commission's legal obligation to rely on competent evidence in issuance of its orders.

[5] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[6] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[7] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[8] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

Q. Does Ameren Missouri assert that projects promote the public interest?

A. Yes. As summarized in its Application, Ameren Missouri asserts that these projects promote the public interest because the Commission found that the Boomtown project was in the public interest.[9] However, under Ameren Missouri's claim, the Commission would lack discretion to conclude that any renewable generation project – or perhaps any generation project does not promote the public interest regardless of its size, capacity factor, cost, value, location, usefulness, or any other metric. While the Commission did include language in its *Report and Order* in the Boomtown case, EA-2022-0245, that "[i]t is the public policy of this state to diversify the energy supply through the support of renewable and alternative energy sources. [*citing Sections 393.1025 and 393.1030 (Renewable Energy Standard); and Section 393.1075 (Missouri Energy Efficiency Investment Act).*] and the Commission's previously expressed general support for renewable energy generation because it provides benefits to the public? [*footnote omitted*]," nothing this Commission can enter in a report and order in any case, including Boomtown and Tartan, can reduce the Commission's obligations to make determinations required by statute.

Q. What is the applicable statute?

A. RSMo 393.170.1. provides "[n]o gas corporation, electrical corporation, water corporation or sewer corporation shall begin construction of a gas plant, electric plant, water system or sewer system, other than an energy generation unit that has a capacity of one

[9] "As discussed in Company witness Steven M. Wills' Direct Testimony, implementation of the Projects promotes the public interest for the same reasons found to exist by the Commission when it approved a CCN for the Boomtown Facility in File No. EA-2022-0245, including by making the region more attractive to economic development, providing significant risk mitigation against the impact of additional environmental regulation, and promoting state energy policy, including the state's policy to 'diversify the energy supply through the support of renewable and alternative energy sources.'" Ameren Missouri Application, at page 16.

megawatt or less, ***without first having obtained the permission and approval of the commission.***" [Emphasis added.] In pertinent part, 393.170.3 provides,

> The commission shall have the power to grant the permission and approval herein specified whenever it shall after due hearing determine that such construction or such exercise of the right, privilege or franchise is necessary or convenient for the public service. The commission may by its order impose such condition or conditions as it may deem reasonable and necessary.

In other words, this Commission has the statutory requirement to determine based on competent and substantial evidence whether the projects are "necessary or convenient for the public service," and then deciding if Ameren Missouri has the Commission's permission to move forward with these projects. This statute is why Ameren Missouri is requesting the Commission authorize it to acquire the Illinois and Split Rail projects, and to build the Bowling Green and Vandalia projects.

Q. Has the Commission always required Missouri electric utilities to seek a CCN prior to building a generating plant for which it intends to seek recovery in its Missouri-regulated ratebase?

A. No. As discussed in *Stopaquila.Org v. Aquila, Inc.*, the "*South Harper*" Western District Opinion, "[b]efore 1980 the Commission did entertain and grant applications filed by public utilities for specific authority to construct power-generating plants. *See, e.g., Mo. Power & Light Co.,* 18 Mo. P.S.C. (N.S.) 116 (1973) (Commission gives public utility permission and authority to construct, operate, and maintain a 54–megawatt combustion turbine generating unit)."[10] However, as further stated in South Harper,

> …in 1980, the Commission considered an application for authority to construct a power plant and dismissed it because the application was untimely and lacked adequate information. *Union Elec. Co.,* 24 Mo.

[10] Stopaquila.Org v. Aquila, Inc., 180 S.W.3d 24, 36 (Mo. App. W. Dist. 2005).

> P.S.C. (N.S.) at 79. The Commission, **in dicta,** further opined that such applications were unnecessary, as a general rule, under *Harline. Id.* The Commission reached its conclusion by overlooking the distinction made in *Harline* between transmission lines and electric plants, *id.* at 78, and further relied on other transmission-line cases that were without application to the issue before it.13
>
> [13] The Commission virtually guaranteed that electric utilities within its jurisdiction would not seek such authority by imposing significant and burdensome requirements on those that did, stating:
>
> If utilities seek Commission approval of any plant construction in their certificated area or accept Commission regulation of their expansion plans, the Commission expects their construction programs over the next twenty (20) years to be submitted with full and complete information updated annually. Such information would include all units proposed, projected load forecasts and full cost information to support a least-cost approach to meeting energy needs. Further, in addition to annual updates of all information, the Commission would expect timely information on any changes proposed in such plans.
>
> Union Elec. Co., 24 Mo. P.S.C. (N.S.) at 79. That the information required is forward-looking is an indication that the Commission appropriately recognized that its legislative mandate requires it to consider only the most updated information in performing its regulatory functions and issuing its orders.[11]

Q. Does the *South Harper* court discuss whether the Commission's decision to grant permission under 393.170.1 is intended to be a ministerial review?

A. Yes. The *South Harper* court succinctly explains that "[b]y requiring public utilities to seek Commission approval each time they begin to construct a power plant, the legislature ensures that a broad range of issues, including county zoning, can be considered in public hearings before the first spadeful of soil is disturbed."[12] In other words, *South Harper* leaves no doubt that a utility must obtain a CCN before proceeding with generating plant for which it will seek protected recovery through its Commission-regulated rates and tariffs, and

[11] Stopaquila.Org v. Aquila, Inc., 180 S.W.3d 24, 36 (Mo. App. W. Dist. 2005).
[12] Stopaquila.Org v. Aquila, Inc., 180 S.W.3d 24, 37 (Mo. App. W. Dist. 2005).

the Commission must ensure that a broad range of issues are meaningfully considered if and when that permission is granted.[13]

Q. What are the Tartan factors?

A. Since the mid 1990's, the Commission has evaluated requests for CCNs and examinations of its jurisdiction over plant or entities owning (or planning to own) plant under the "Tartan" factors. This refers to a case where an entity desired to obtain service territory to operate a natural gas distribution utility. The Commission's order in that case was reviewed in *In the Matter of the Application of Tartan Energy Company, LLC, d/b/a Southern Missouri Gas Company,* 3 Mo P.S.C.3d 173, 177 (1994). The Commission's underlying Order described five factors it considered in making a determination on whether a utility's proposal meets the standard of being "necessary or convenient for the public service." Those factors were:

Is the service needed?
Is the applicant qualified to provide the service?
Does the applicant have the financial ability to provide the service?
Is the applicant's proposal economically feasible? and
Does the service promote the public interest?

Q. Are these factors the exclusive list of what the Commission must consider when making a determination of whether to grant permission requested by a utility under 393.170.1?

[13] Not all generating facilities participating in the MISO integrated marketplace are able to receive protected recovery through Missouri Commission-regulated rates and tariffs. MISO enables a competitive market for wholesale energy, and there is in place a competitive market for satisfying capacity requirements in the MISO region. Although Ameren Missouri's participation in these markets is effectively financially secured by ratepayers, Ameren Missouri's participation is in competition against independent power producers and other utilities that are not rate regulated by the Missouri PSC. This is the marketplace from which Ameren Missouri load and capacity requirements are served. Staff is not aware of any Missouri regulatory or statutory impediment to Ameren Missouri or an affiliate proceeding with these projects as an independent power producer, which would not require permission from this Commission.

A. No. These factors are a framework to organize discussion of some, but not all, questions the Commission actually needs to answer in review of any one of those (or other scenarios). In CCN requests, the minimum questions the Commission needs to answer are:

1. Does the Commission have jurisdiction over the Applicant?
2. Very specifically, what authority is requested, and does the Commission have jurisdiction to grant the authority requested?
3. Has the Applicant met all CCN rule requirements?
4. Has the Applicant met all other relevant filing requirements?
5. Does the Applicant have the financial ability to construct (or purchase), own, operate, and maintain each project?
6. Does the Applicant have the operational capability to construct (or purchase), own, operate, and maintain each project?
7. Separately for each project, is the project both important to the public convenience and desirable for the public welfare?[14]
   Or, is the project effectively a necessity because the lack of the service is such an inconvenience? [15]
8. Separately for each project, is the project of sufficient importance to warrant the expense of making it? [16]
   Or, is the project of such an improvement as to justify or warrant the expense of making the improvement? [17]
9. Are there conditions or mechanisms that can be imposed to overcome any deficits in the answers to the prior questions?
10. Has the Applicant presented an adequate direct case to demonstrate each question enumerated?

Q. Do these questions align with the five Tartan factors?

[14] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[15] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[16] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[17] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

A. Generally, yes. While the first four questions and the last question are not explicitly stated factors in the Tartan framework, they are questions the Commission must consider whenever any Applicant comes before it. Questions five and six are explicitly evaluated under the Tartan framework. Question seven loosely corresponds to the Tartan factors of "Need" and "Public Interest", question 8 loosely corresponds to the Tartan factor of "Economic Feasibility" and "Public Interest", and question 9 is typically addressed under the "Public Interest" factor discussion.

Q. Does utility testimony that a given project meets the Tartan factors override the Commission's obligation to ensure that a project is "necessary or convenient for the public service," before granting Ameren Missouri permission to proceed to construct and operate the projects for which it requests permission in this docket?

A. No. The Commission is not obligated to rely on the Tartan framework for its consideration whether to grant permission for Ameren Missouri to begin construction of these energy generation units after a determination that these energy generation units are necessary or convenient for the public service. Rather, the Commission is obligated to determine:

> (1) separately for each project, if each proposed asset for which authority is requested is both important to the public convenience and desirable for the public welfare,[18] or if each proposed asset for which authority is

[18] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

> requested is effectively a necessity because the lack of the proposed asset is such an inconvenience; [19] and
>
> (2) separately for each project, if each proposed asset for which authority is requested is of sufficient importance to warrant the expense of making it, [20] or, if each proposed asset for which authority is requested is of such an improvement as to justify or warrant the expense of making the improvement? [21]

Q. In light of this, does Staff refer to the familiar Tartan factors in its testimony?

A. Yes, for the convenience of the Commission, Staff retains reference to the Tartan Factors, however, in light of confusion that has been introduced in understanding the Commission's obligation to ensure that a broad range of issues is considered "before the first spadeful of soil is disturbed,"[22] Staff suggests that the Commission explicitly consider project economics in light of level of project need, with the potential for public benefit to overcome deficiencies in need. For ease of reference, Staff refers to this interrelationship as "Ratepayer Value."

**Ratepayer Value and Ameren Missouri's Evidentiary Circular Reference**

Q. What would a reasonable examination of ratepayer value consider?

A. A showing of ratepayer value would require reasonable evidence of each of the following:

1. To what degree is some sort of generation plant necessary to meet capacity, energy, or other requirements, and at what times?
    a. To what degree do these specific generation plants meet the identified needs?
    b. If the degree of necessity identified is not high, to what degree does the project provide such benefits that it should be considered despite the low necessity?

[19] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[20] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[21] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[22] Stopaquila.Org v. Aquila, Inc., 180 S.W.3d 24, 37 (Mo. App. W. Dist. 2005).

2. To what degree are the increases to the Ameren Missouri revenue requirement caused by the project, over time, warranted by the value the project provides to Ameren Missouri ratepayers, over time?

Q. Why is statement of these specific questions necessary?

A. It is said that difficult cases make bad law. Unfortunately, the use of the Tartan framework for the diversity of cases to which it has been applied has resulted in something of an ouroboros, which applicants have seized upon to minimize the justification and evidence provided in applications and direct testimony. This is confusing to Staff, and Staff reasonably expects that it is unnecessarily confusing to the Commission.

Q. What does Mr. Wills testify to regarding the Tartan factor of need?

A. At page 7, Mr. Wills begins by testifying to language from the Tartan order that "[t]he term 'necessity' does not mean 'essential' or 'absolutely indispensable,' but that an additional service would be "an improvement justifying its cost."" However, while he discusses and summarizes a variety of attributes of the projects, he fails to address the value of those attributes to ratepayers, cost of the projects to ratepayers, or any sort of thoughtful discussion of whether those attributes constitute improvements to ratepayers that justify the costs to ratepayers.

Q. What does Ameren Missouri testify to regarding the Tartan factor of "economic feasibility" in this case?

A. Ameren Missouri's testimony in this case, presented by Mr. Wills at pages 14 and 15 is that the projects are an improvement justifying their cost, because the projects are "needed," and if the projects are needed, then the cost of the projects doesn't matter as long as the Applicant can obtain project financing. He does further testify that (1) the projects are consistent with the utility Preferred Resource Plan (PRP), and (2) that Ameren Missouri

selected the projects following a Request For Proposal (RFP). He concludes that "given the foregoing, economic feasibility is established for the Solar Projects."[23] Ultimately, Ameren Missouri concludes the projects are economically feasible because it expects to be able to obtain financing for the plants, and because the plants are "needed."[24]

Q. Could you summarize the Ameren Missouri position?

A. Yes. Ameren Missouri takes the position that:

1. The projects are needed, because the projects are improvements that justify their cost, without discussing the value of the improvements or the magnitude of the cost,

2. Ameren Missouri presents the implication that the projects are improvements that justify their cost because they conclude that the projects are "economically feasible,"

3. Ameren Missouri's position is that the projects are economically feasible if either (1) the project is "needed," so the costs do not matter, or (2) the projects are economically feasible because they will be included in rates if the CCN is granted.

This argument is a circular reference, and it fails to answer the essential questions of whether (1) separately for each project, if each proposed asset for which authority is requested is both important to the public convenience and desirable for the public welfare,[25] or if each

[23] Staff experts Brad J. Fortson and J Luebbert address the suitability of the PRP for a demonstration of "economic feasibility" and Staff experts Cedric E. Cunigan, PE, and Shawn E. Lange, PE, address the reasonableness of reliance on the RFPs underlying the selection of the projects for evidence of "economic feasibility". Staff expert Michael L. Stahlman provides Staff's detailed discussion of economic feasibility.

[24] As stated by Ameren Missouri's Director of Regulatory Affairs, Steven M. Wills, in his response to Staff Data Request ("DR") No. 0029, while acknowledging that the Commission has discretion in defining economic feasibility, "as indicated in the Commission's order issued on June 28, 2023, in EA-2023-0226, economic feasibility was found to exist because of the Company's ability to recover its revenue requirement associated with the facilities at issue," and "[t]he Commission had indicated that a utility's ability to secure financing for a project is "overwhelming evidence" of economic feasibility."

[25] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of

proposed asset for which authority is requested is effectively a necessity because the lack of the proposed asset is such an inconvenience;[26] and (2) separately for each project, if each proposed asset for which authority is requested is of sufficient importance to warrant the expense of making it, [27] or, if each proposed asset for which authority is requested is of such an improvement as to justify or warrant the expense of making the improvement? [28]

Q. Did Ameren Missouri's direct filing address its estimates of the costs of the project to ratepayers, and the value the projects will provide to ratepayers under Ameren Missouri's assumptions and modeling?

A. Yes. Mr. Michels' Table 6, Tables 7-10, and Schedule 15 CONFIDENTIAL to his prefiled direct testimony includes base and risk-adjusted pricing scenarios across a range of production probabilities and value scenarios, presented as "Net Present Value of Revenue Requirement. Based on Mr. Michels' results across all projects, Ameren Missouri expects that ratepayers will pay for the projects more than the value he models that the projects with provide as operating assets.

Q. How dependable are the costs estimates and how dependable are the estimates of the value of the projects as generating assets?

A. Once a project with high capital costs and relatively low ongoing costs is reflected in a regulated utility's revenue requirement, the cost of the project to customers becomes very predictable, and will generally vary from that predictable level only due to

sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

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[27] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[28] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

changes in rate case timing and changes in the allowed return on investment. However, the value of these solar plants as generating assets will vary with the energy market, actual generation levels, actual degradation levels, actual market capacity prices, actual market capacity appetite, actual capacity value, actual REC value, actual REC appetite, and, in this case, Ameren Missouri's decisions and execution of its tax benefit strategy. Finally, the projects, if developed, will have impacts on the value of the remainder of the Ameren Missouri generation fleet's net margin on energy sales, which could be construed as either a cost or a negative benefit. In other words, cost to ratepayers are predictable with low variability, and the value of the asset is unpredictable, with high variability.

Q. How reliable are these estimates of the costs to ratepayers and benefits to ratepayers?

A. Ameren Missouri's modeling is not adequately reliable for Commission reliance in granting a CCN as discussed later in my testimony.

Q. Did Ameren Missouri present competent evidence for the Commission to reasonably rely upon that the projects provide value to the ratepayers that is roughly congruous with the costs of the projects expected for ratepayers?

A. No. In fact, Ameren Missouri provides evidence that its analysis suggests the costs of the project to ratepayers will exceed the value of the project to ratepayers, particularly when the costs of the project and value provided by the project are considered on an annual basis.

Q. Is the inclusion of a conceptually similar generation facility in an IRP preferred plan evidence of economic feasibility or of need for the authority requested for a given generation facility?

A. No. This is discussed by Mr. Luebbert and Mr. Fortson. Mr. Luebbert describes recommended conditions related to future IRPs to improve the potential relevance of IRP modeling to subsequent CCN applications. Dr. Hari Poudel identifies the significant changes in cost assumptions from the solar projects modeled in the IRP, and Mr. Luebbert addresses other changes from the IRP and 2023 PRP.

Q. Is there reason to believe that these projects provide even less ratepayer value than modeled by Ameren Missouri?

A. Yes. I will discuss concerns with Ameren Missouri's modeling, and the "energy need," that Ameren Missouri claims. The reasonableness of these assets to provide value to address an "energy need," is discussed by myself, Mr. Stahlman, Dr. Krishna Poudel, and Mr. Lange. Mr. Lange discusses the market price projections relied upon in the models Mr. Michels' provides in this case, and expresses concern with the selection of solar facilities to meet winter capacity needs. Mr. Cedric E. Cunigan, PE, describes Ameren Missouri's projected REC needs. I provide an analysis, below, to identify the market energy prices and winter capacity prices that would be necessary for ratepayers to "break even" in the cost of these projects for the value projected to be received.

## INFORMATION AMEREN MISSOURI SHOULD BE ORDERED TO PROVIDE IN SUPPLEMENTAL DIRECT TESTIMONY

Q. As described by Mr. Busch, Staff recommends that Ameren Missouri file supplemental direct testimony, and give Staff and other parties an opportunity to adequately review, conduct discovery, and respond. What information should Ameren Missouri provide in Supplemental Direct Testimony concerning the projects other than Cass?

A. The additional evidence necessary for the Commission to reasonably consider Ameren Missouri's requests in this docket is:

1. Specifically identify the "needs," alleged.
    a. If a capacity need is alleged, identify the years, seasons, and extent of alleged need.
    b. If a renewable energy certificate need is alleged, identify the years and extent of alleged need.
        i. Provide a detailed analysis providing information necessary to verify that the RES compliance plan is the least cost, prudent methodology to achieve compliance with the RES
    c. If an "energy need" is alleged, first fully define the conceptual "energy need." Which of the following constitutes meeting an "energy need":
        i. The total annual generation of a vertically integrated utility meets or exceeds the total annual load requirements of the utility as a load serving entity, although significant imbalances exist on a daily basis.
        ii. The total annual generation of a vertically integrated utility meets or exceeds the total annual load requirements of the utility as a load serving entity, although significant imbalances exist on a seasonal or monthly basis.
        iii. The daily generation of a vertically integrated utility meets or exceeds the daily load requirements of the utility as a load serving entity, although significant imbalances exist on an hourly basis.
        iv. The hourly generation of a vertically integrated utility meets or exceeds the hourly load requirements of the utility as a load serving entity in virtually every hour.
            1. How many hours are needed?
        v. The utility possesses generation capable of meeting load in every hour, although it may or may not be dispatched by its market operator to dispatch it in every hour.
        vi. If none of these specifically define Ameren Missouri's "energy need," please provide a specific definition for parties and the Commission to consider?
    d. If an energy price hedge is the need, define when and to what extent the specific solar facilities are more desirable than a financial instrument, a PPA, or other means of achieving relative price certainty.
2. Specifically state how/why the specific projects selected are reasonable choices, and ideally, best choices to fit the needs identified, for each project, for each year.
    a. Describe how and why these specific solar projects are reasonable solutions to winter capacity needs.

b. Show with adequate modeling the extent to which adding these specific solar projects would address the "energy need," as defined. This requires production runs, with and without the resource, with variation in LMP and other dispatch parameters to determine whether adding a resource actually increases the production of the Ameren Missouri generating fleet in a given interval, and whether the introduction of the solar project improves or weakens the net revenue produced by total Ameren Missouri generation. Specifically, for each project, for the projects as a whole, and for only the Missouri project:

i. When estimating the MWh total and timing of total Ameren Missouri generation, account for displacement of existing Ameren Missouri resources by self-committed solar in modeling accounting for changes in LMPs with and without the specific solar generation.

ii. When estimating margin revenues produced by the total Ameren Missouri generation, account for displacement of existing Ameren Missouri resources by self-committed solar in modeling accounting for changes in LMPs with and without the specific solar generation.

3. Economic modeling

a. Update inputs

b. Account for expected production differences among projects (P50-P95)

c. Account for PISA

d. Account for RESRAM as applicable, on the specific projects where Ameren Missouri anticipates it to be applicable,

e. Include reasonable rate case timing scenarios/permutations

f. Model tax benefit treatment in some manner other than a single year offset to expense, such as an offset to rate base to be amortized over various intervals such as 10 years, 20 years, or the life of the facility

g. Consistently model the treatment of real estate among the facilities, such as assuming appreciation at the rate of inflation and then modeled as sold at the time terminal net salvage is applied.

h. Account for voltage distinctions in the valuation of the LMPs as energy,

i. Account for voltage distinctions in the avoidance of MISO charges based on load-ratio share or other characteristics,

j. Reasonably estimate the extent to which capacity value may be monetized, addressing:

i. MISO potential revision of ratings for solar, particularly in winter,

ii. Reasonable projections of the market appetite for capacity,

k. Additional factors to include

i. Estimate the value of reduction in load LMP based on improved modeling to substantiate claimed "energy need,"

ii. Estimate the lost value of marginal revenues on existing generation due to reduction in adjacent gen node LMPs based on improved modeling to substantiate claimed "energy need,"

iii. REC sales or assumed values if and as applicable,

iv. Alternative energy pricing scenarios, such as prices resulting from environmental policies other than a carbon tax.

4. Include discussion of alternatives that were actually explored to meeting identified needs, and model impact on ratepayers, including but not limited to alternative generation options, PPAs, Demand Response, etc.

5. Loss of Load Expectation (LOLE) study

a. Withdraw if not updated for revisions in IRP PRP changing timing of other generation

b. If updating, revise for location and size of the actual solar facilities for which permission is requested.

## REVIEW OF MODELED COSTS TO RATEPAYERS AND VALUE TO RATEPAYERS

Q. For your testimony, did you rely on information from Ameren Missouri that was not included in its direct filing in this case?

A. Yes. I relied on information Ameren Missouri provided in Mr. Michels' workpapers, and in responses to data requests. Generally, copies of applicable responses are attached as Schedule SLKL-r2.[29] I generally attempted to attach complete responses, but given the printed size of attachments, this was not always practical.

### Mr. Michels' Modeling

Q. What is Mr. Michels' schedule 15, as summarized in his direct tables 7-10?

[29] Note, the response dates are the dates Ameren Missouri provided on the indicated response documents, and do not necessarily correspond with the dates Ameren Missouri actually provided the response to Staff.

A. Mr. Michels' direct tables 7-10 summarize his schedule 15, which provides a summary of his project scenario modeling results in his Schedule MMD15, a highly confidential attachment to his prefiled direct testimony. This schedule comprises the only evidence Ameren Missouri presents in this case in which it compares Ameren Missouri's projection of costs of the projects to ratepayers to Ameren Missouri's projection of value of the project to ratepayers. For each project under a variety of scenarios, this schedule provides the net present value of revenue requirement (NPVRR) impact of revenue requirement components and the net present value of revenue requirement impact of the revenues he models as generated by each project as developed in Ameren Missouri's models. Finally, for each project and scenario, Schedule MMD15 provides a line titled "(Decrease) / Increase in NPVRR."

Q. Have you reviewed the workpapers that were used to produce Schedule MMD15?

A. Yes.

Q. What are the limitations on the usefulness of Mr. Michels' direct tables 7-10 for purposes of the Commission determining whether the four solar projects are improvements justifying their costs?

A. These tables simply illustrate that, as Ameren Missouri chose to model the projects and as Ameren Missouri chose to present the results of that modeling, the NPVRR of the project costs exceeds the net present value of the project value for all projects under all modeling scenarios.

Q. What are the limits of the usefulness of Schedule MMD15 for purposes of the Commission determining whether the four solar projects are improvements justifying their costs, assuming that Mr. Michels' inputs and key assumptions are accurate?

A. There are several. First, Mr. Michels presents the results of what he terms his analysis of the economics of each project as the incremental increase in net present value of revenue requirement "NPVRR," which he presents as a single value over the life of the project, and to which he fails to provide a reasonably comparable NPVRR calculation of alternative means of satisfying established needs.

Second, Mr. Michels' models are not reflective of reasonable projection of cost of service ratemaking and ratemaking treatments. Specifically, Ameren Missouri's models do not reflect PISA treatment or potential RESRAM treatment, both of which would increase the overall costs of the projects to ratepayers. The modeling assumes annual rate cases, which understates the likely costs of the projects to ratepayers. Further the fuel adjustment clause (FAC) is not modeled, which in combination with reflection of non-annual rate cases will increase the costs to ratepayers. Finally, the investment tax credit (ITC) tax treatment is not modeled in a way credits are likely to be reflected, nor consistent with how the ITC was modeled in the integrated resource plan (IRP) PRP.

Q. Is it reasonable to assume that Mr. Michels' inputs and key assumptions are accurate?

A. No. Staff expert Shawn E. Lange, PE, discusses concerns with the impact of a carbon dioxide price on market energy prices as modeled by Mr. Michels. Staff expert Dr. Hari K. Poudel discusses concerns with the capacity factors, and subsequent energy production, modeled by Mr. Michels. Further, it is not reasonable to assume that all capacity value for the facilities can be monetized, even if the capacity prices and accreditations Mr. Michels assumed were accurate predictions. Finally, Mr. Michels failed to consider the

impact of the projects on either the cost to serve load or the net margins produced by other Ameren Missouri generation.

Q. What steps should be taken to improve the modeling in Supplemental Direct testimony in this case?

A. The models to be provided in supplemental direct should reflect the most current available inputs for project costs, O&M predictions, and other assumptions. The modeling itself should be adjusted to:

a. Account for expected production differences among projects (P50-P95)
b. Account for PISA,
c. Account for RESRAM as applicable, on the specific projects where Ameren Missouri anticipates it to be applicable,
d. Include reasonable rate case timing scenarios/permutations
e. Model tax benefit treatment in some manner other than a single year offset to expense, such as an offset to rate base to be amortized over various intervals such as 10 years, 20 years, or the life of the facility,
f. Consistently model the treatment of real estate among the facilities, such as assuming appreciation at the rate of inflation and then modeled as sold at the time terminal net salvage is applied,
g. Account for voltage distinctions in the valuation of the LMPs as energy,
h. Account for voltage distinctions in the avoidance of MISO charges based on load-ratio share or other characteristics,

The assumptions should also be revised to more reasonably estimate the extent to which capacity value may be monetized, reflecting MISO's anticipated revision of ratings for solar, particularly in winter, and to reflect reasonable projections of the market appetite for capacity.

Importantly, factors that were not included in the modeling should be included. For example, REC sales or reasonable valuation to ratepayers should be considered, as applicable, and the interaction of the potential generation sources with Ameren Missouri's load and other generation should be taken into account. Specifically, Ameren Missouri should explore energy

pricing scenarios with and without the project to attempt to quantify the impact of the project on (1) the margin revenues achieved by other generators in the Ameren Missouri fleet, and (2) the change in the cost to serve load resulting from changes in the forecasted LMP. However, the modeling should also explore the LMPs resulting from alternative energy pricing scenarios, such as prices resulting from environmental policies other than a carbon tax.

Finally, to the extent that Ameren Missouri asserts an energy need, these energy price permutations are indispensable to estimate whether or not Ameren Missouri's generation and purchase positions vary with the introduction of additional facilities, as will be discussed below.

**NPVRR Analysis As Presented Does Not Establish that Projects Are Improvements Justifying Their Costs**

Q. What is NPVRR?

A. NPVRR is an abbreviation for "Net Present Value of Revenue Requirement." As used in this case, it is Ameren Missouri's estimate, in today's dollars, of the change in ratepayer revenues that will result from adding a project to their regulated rate base.

Q. Is that a complicated way of saying NPVRR is the revenue requirement of a project, adjusted for inflation?

A. No. Mr. Michels' calculation of NPVRR is from the perspective of a shareholder who is deciding whether to invest in the studied investment opportunity, or to invest in some other enterprise. This is done by discounting the annual revenue requirement additions by the carrying cost percent the shareholder would like to receive on the investment opportunity.

Q. Is NPVRR appropriate for considering whether a proposed project is an improvement justifying its cost?

A. NPVRR is not a particularly useful metric for determining whether a proposed project is an improvement justifying its cost. It may be useful for an element of comparison between various means of meeting a need, but even then, care needs to be taken, at a minimum, to ensure that variations over the life of the project(s) are considered, and that the evaluation is made from the appropriate perspective.

Q. What are the perspectives from which NPVRR could be considered?

A. NPVRR could be considered from the perspective of a potential investor, or from the perspective of a potential consumer. From the perspective of an investor, a reasonable discount rate would be the return the investor requires to make the investment. From the perspective of a consumer, the appropriate discount rate is probably more likely the rate of general inflation, or the rate a consumer may earn through a readily available and relatively liquid banking product like a savings account, money market account, or savings bond.

Q. Why does choice of perspective matter?

A. Consider the following simple examples. Under each of these scenarios, the costs and the benefits over the life of the project are equal to exactly $2,000. In our first example, every year of the project's life, the regulated revenue requirement is exactly $100 higher than it would have been without the project, the project provides exactly $100 of value to ratepayers, and we will assume perfect ratemaking and no regulatory mechanisms.

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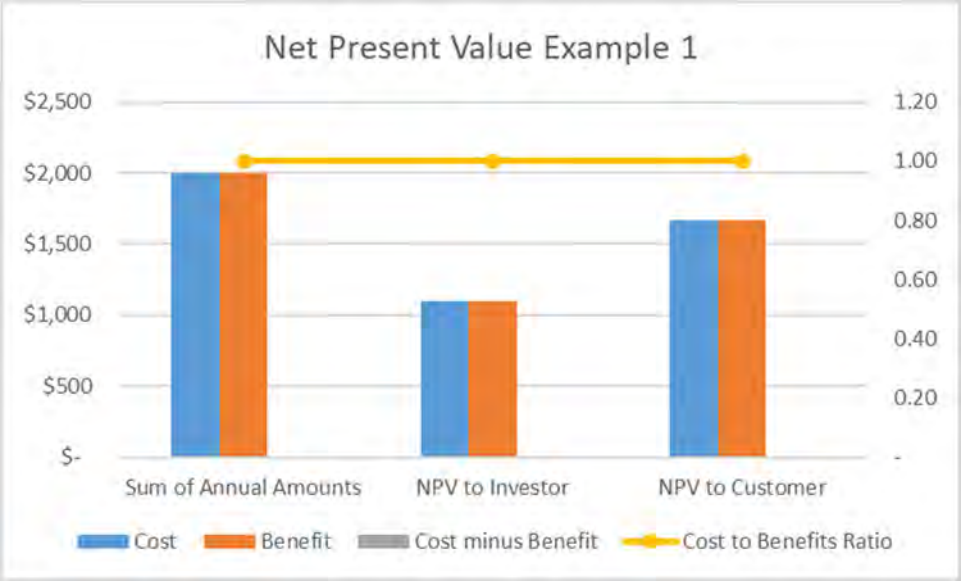
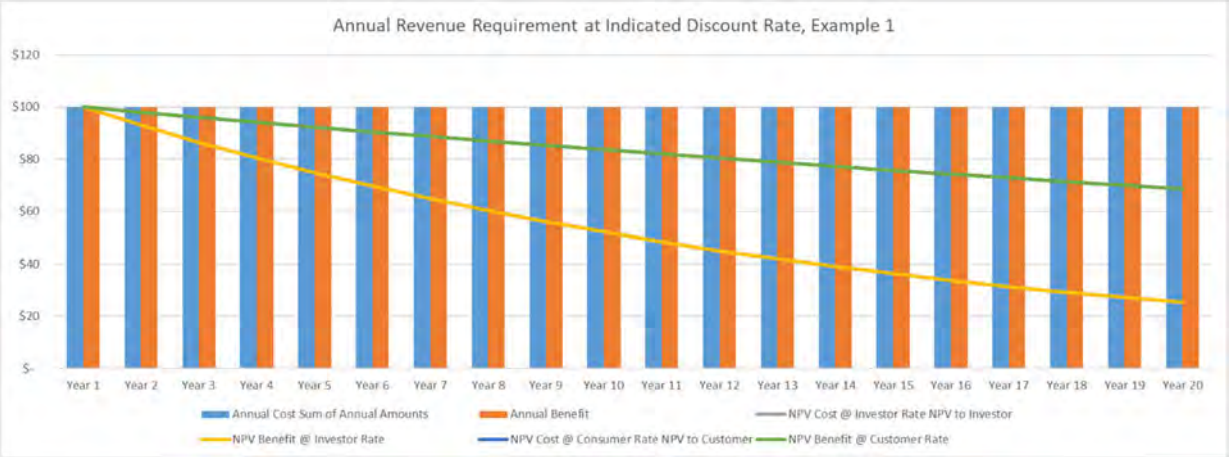


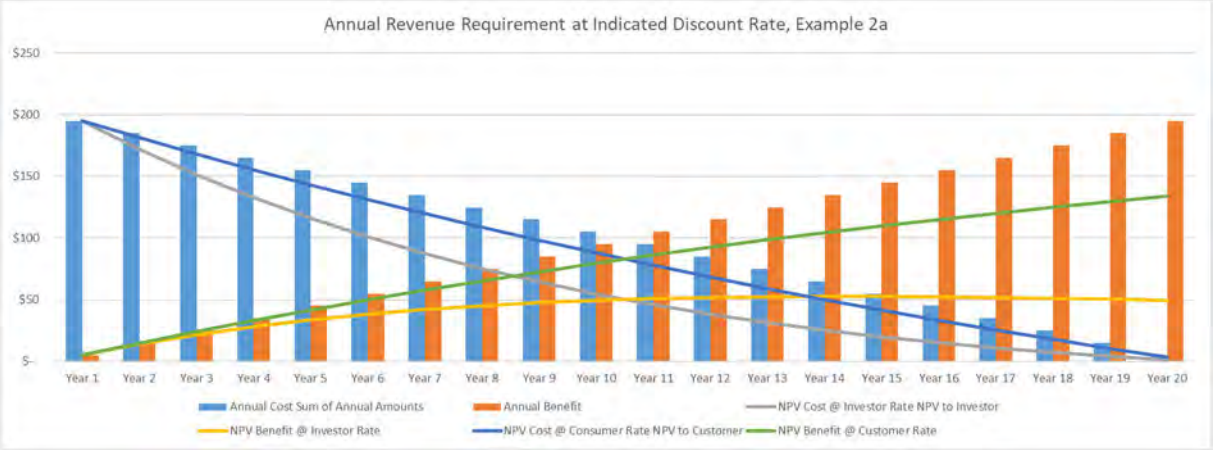

As shown above, the sum of the annual amounts of benefits equal the sum of the annual amounts of costs, and the costs and benefits are equal under the perspective of both the customer and the investor. Notice, however, that the net present value (NPV) to the consumer is much closer to the actual incurred values of $2,000, and the NPV to the investor is just over half of the actual incurred total. Throughout these examples, the project has a 20 year life, and the NPV from the customer perspective is calculated at a rate of 2.0% per year, and the NPV from the investor perspective is calculated at a rate of 7.5% per year. Additional years will increase the disparity between the sum of the annual amounts and the NPV amounts, and the higher the rate considered, the greater the disparity will be between the NPV amounts and the annual amounts.

The twenty year amounts at each level are illustrated below. Note that because costs and benefits are equal in each year, only one of the graph lines is visible for each of the NPV annual amounts.




Q. Why would variations over the life of a project matter?

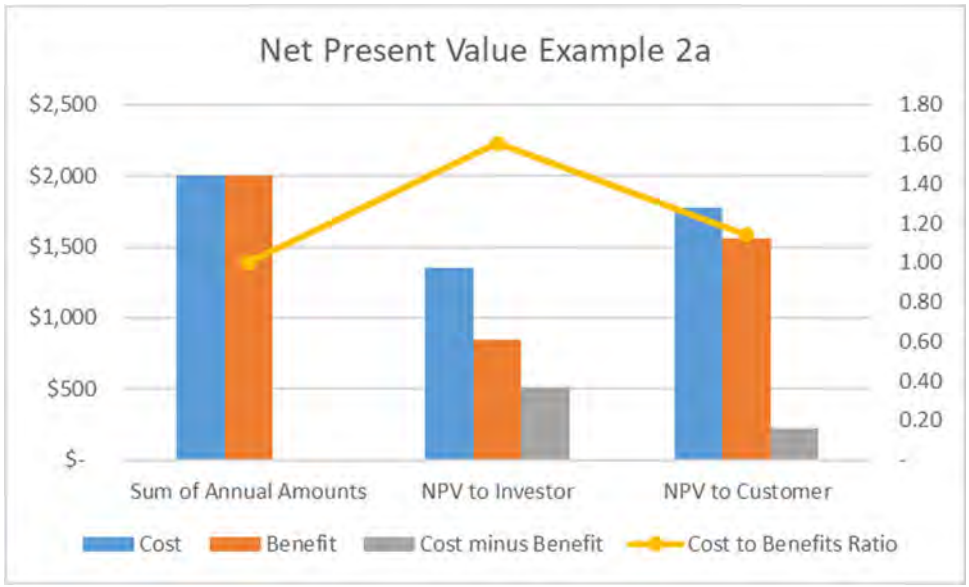
A. In this second example, we will retain everything from our example above, but instead of the costs to ratepayers and the benefits being the same every year, the costs will start high and taper off, and the benefits will start low, and build up. Over the life of the project, both will equal $2,000.




Q. What is the NPVRR that would be calculated under these examples?

A. The graph below provides the sum of annual costs, sum of annual benefits, and the NPV of costs and NPV of benefits from both investor and customer perspective. It also illustrates the net of the NPV costs and benefits from each perspective, and the "NPVRR" at

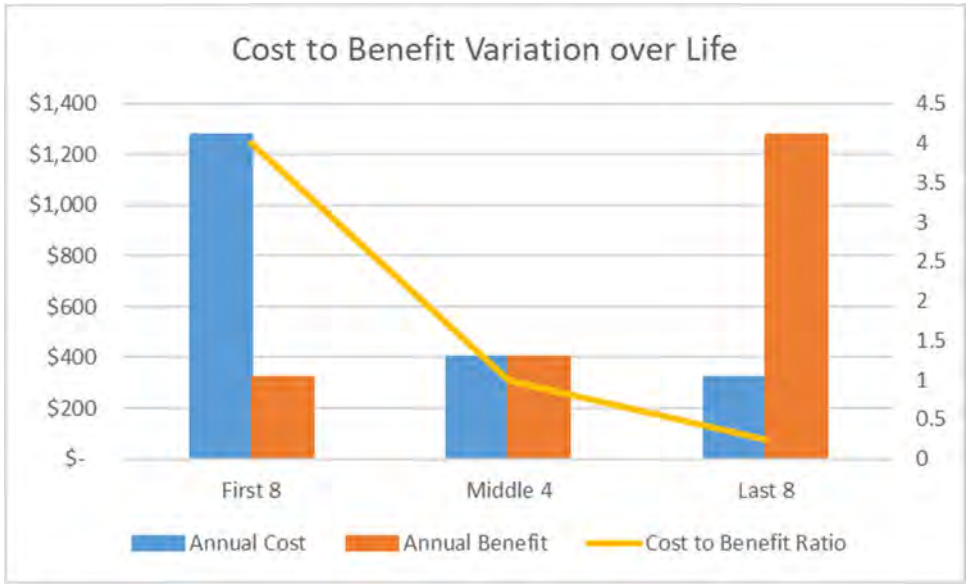
both customer and investor discount rates. The NPVRR at investor discount rates is the information presented by Mr. Michels. Note, as used in this discussion, "discount" refers to the application of a percentage value to state a monetary amount for a future year in terms of the "dollars" of an earlier year.




Q. What does the cost to benefit ratio for the sum of the annual amounts tell us?

A. The sum of the annual amounts has a cost to benefit ratio of 1. This means that over the life of the project, customers exactly break even in that the costs exactly equal the benefits. This is actually misleading, when considering the relationship of costs and benefits over the life of the project, as we saw illustrated above. In the figure "Annual Revenue Requirement at Indicated Discount Rate, Example 2" we saw that in the first half of the project's life, ratepayers bore a lot of costs, and received very little value, while at the end of the project's life, ratepayers received a lot of value, and bore little costs. In fact, ratepayers in the first eight years of the project's life would pay costs four times in excess of the value received, and

ratepayers in the last eight years of the project's life would pay one-quarter of the value they receive, as illustrated below:




Q. In the figure above, "Net Present Value Example 2a" which perspective of net present valuing appears most favorable to proceeding with the project?

A. When costs are modeled as initially high and benefits are modeled as initially low, with costs ramping down and benefits ramping up, the customer-perspective interest rate produces a lower cost to benefit ratio than the investor perspective interest rate, meaning it appears more advantageous.

Q. What shape would you expect for costs and benefits over the life of a solar project?

A. It is reasonable to assume that a solar project's costs would start high, then decline over the life of a project.

Q. As modeled by Mr. Michels, do the solar projects' estimated revenue requirements start high, then decline over the life of the project?

A. Not to the full extent as would be expected. Under the production tax credit (PTC) scenarios, it is in fact reasonable to assume that the PTCs will offset the revenue requirement of the project during their availability in the early years of a project, and then not offset the cost of the project in the later years when the PTCs are no longer available. However, Mr. Michels made the decision to model the ITCs as a single offset to expense in the first year of the project. Because the first year of a project is the least discounted, they are shown at the fullest value. So the act of reflecting a single offset to net costs and benefits in the first year of the project life overstates the value of the offset if that offset will ultimately be spread over other years.

Q. If benefits (or, in the case of the ITC, significant reductions to costs) occur early in a project's life, which NPV perspective appears most favorable?

A. If benefits (or negative expenses) are early in a project life, the NPV to investor perspective will present the most favorably-appearing results. This is illustrated in figure "Net Present Value Example 2b" below, which is a summary of the figure "Annual Revenue Requirement at Indicated Discount Rate, Example 2b."

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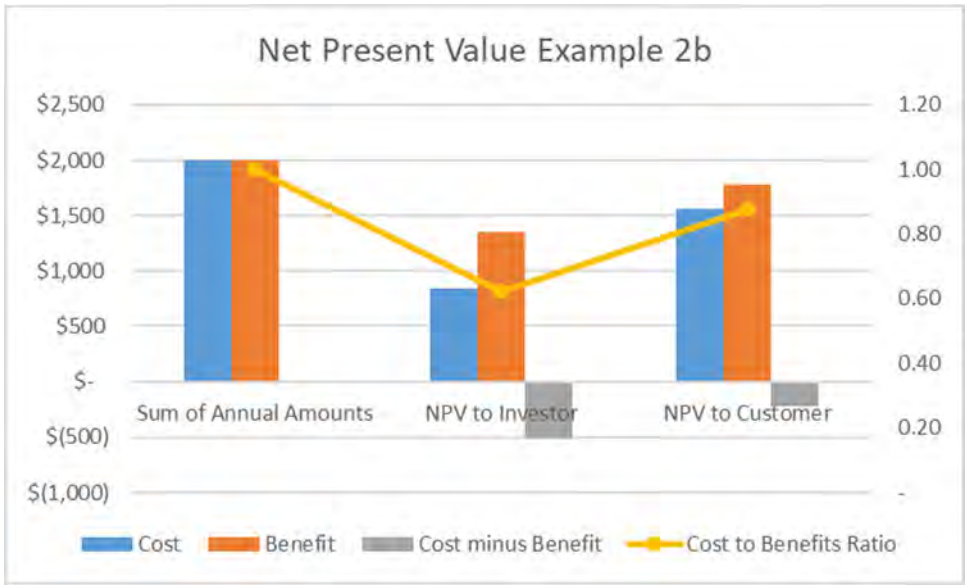
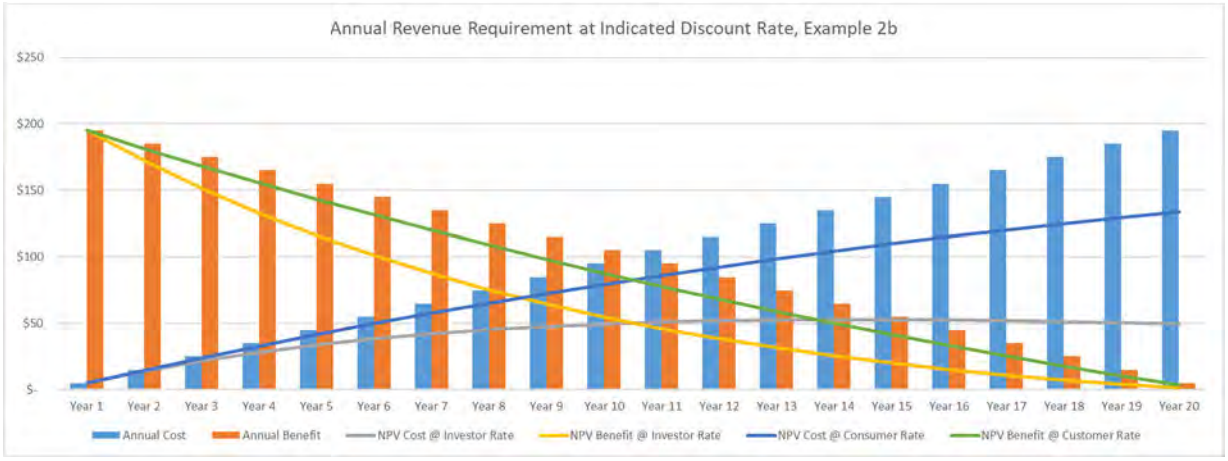



Q. Is "Example 2b" an exact inverse of "Example 2a?"

A. Yes. In reality, under Example 2b, customers in the first 8 years of the project will pay for one quarter of the value they receive, and in the last 8 years of the project, customers will pay four times the value they receive. However, if presented as the ratio of the net present value of the costs to the net present value of the benefits, this project appears to be a solid benefit, especially when discounted at an investment rate as opposed to an ordinary interest rate.

Q. Is ratepayer opportunity cost considered when evaluating the NPVRR of various resource options?

A. No.

Q. On a resource with high capital costs and low operating expense, is it possible to observe intergenerational equity problems related to ratepayer opportunity costs?

A. Yes. The net revenue requirement of a resource with high capital costs and low operating expense will tend to be higher in the first half of project life, and lower in the second half of project life, due to the operation of depreciation over the life of the asset. The result is that ratepayers essentially prepay early in the asset's life for value that is assumed will be provided in the end of the asset's life. Even if it is assumed that the same ratepayers will be paying over an asset's life, under normal ratemaking approaches, there is no value given to compensate ratepayers for this effective prepayment. Thus, while a given asset selection may have a lower NPVRR, it may result in inequities over its life, such that ratepayers would have been better off with a different asset selection.

Q. Would you recommend use of a single ratio of the net present value of the costs to the net present value of the benefits to establish whether a project is an improvement justifying its costs?

A. No. If a project is short-lived, it isn't necessary to bother net-present valuing. If a project is long-lived, it may be reasonable to account for inflation, but it would still be best to break the project life down into increments reflecting the variation that is likely over the project's life. Even then, net present valuation may be useful for comparing the relative costs and benefits of various projects, not as a stand-alone justification of a requested project or tranche of projects.

Q. Since Ameren Missouri is requesting multiple projects be approved in this case, are they using Mr. Michels' Schedule MMD15 line titled "(Decrease) / Increase in NPVRR," to identify which of those four requested projects are less costly to ratepayers relative to the value available to ratepayers?

A. No. While Mr. Michels' Schedule MMD15 is the only evidence Ameren Missouri provides in its direct case of its estimate of the lifetime cost of the projects to ratepayers, and of its estimate of the lifetime value of the project to ratepayers, he simply states at page 69 of his direct testimony that he has "analyzed the economics of each of the four Solar Projects at issue in this case," and that the analysis performed "evaluated the expected incremental net present value of revenue requirement ("NPVRR") resulting from each Project."

Q. Does quantification of the extent to which the costs of a project exceed its value, discounted at a shareholder rate to current dollars, establish that the cost of a project is justified by its value?

A. No. Mr. Michels' Tables 7-10 and Schedule 15 are a prediction of the net impact on revenue requirement shareholders may expect if the projects go forward.[30] Even if Mr. Michels had performed a multi-part NPVRR analysis from a ratepayer perspective, the results would be useful in this case only to rank the projects from worst to least-worse, in terms of the incremental increase to revenue requirement, assuming the risk and modeling shortfalls are evenly distributed among the projects (they are not.)

[30] Even if Mr. Michels had performed a multi-part NPVRR analysis from a ratepayer perspective, the most the results of that would establish (if the ratio of costs to benefits are less than one) is that ratepayers at any given point in time are not modeled to experience a rate increase. This would not establish that risks are reasonably allocated, or that the proposed project is a reasonable exercise of the utility's protection under the police powers of the State of Missouri.

Q. If Mr. Michels had prepared a model of the cost of meeting specific needs, such as winter capacity in certain years, and renewable energy credits to satisfy the Missouri renewable energy standard in certain years, would that improve the usefulness of the NPVRR results provided in Mr. Michels' Tables 7-10 and Schedule 15?

A. Models of the revenue requirement impact of alternative means of meeting specific needs would be helpful. Note, even if Ameren Missouri had provided these models, it would be most beneficial to compare discrete years or assumed rate case intervals across alternatives. NPVRR by itself oversimplifies to such a degree that it is only really helpful to the exercise of determining if a project is an improvement that justifies its costs if it is used as an incredibly broad screening tool, such as eliminating any project out of 100 projects with an NPVRR cost to benefit ratio of over 2, or advancing 20 projects for further consideration where each has an NPVRR cost to benefit ratio of under 0.9.

**Underlying models are not reflective of reasonable projection of cost of service ratemaking and requested/expected ratemaking treatments**

Q. Did Mr. Michels modeling include PISA treatment for the four solar projects?

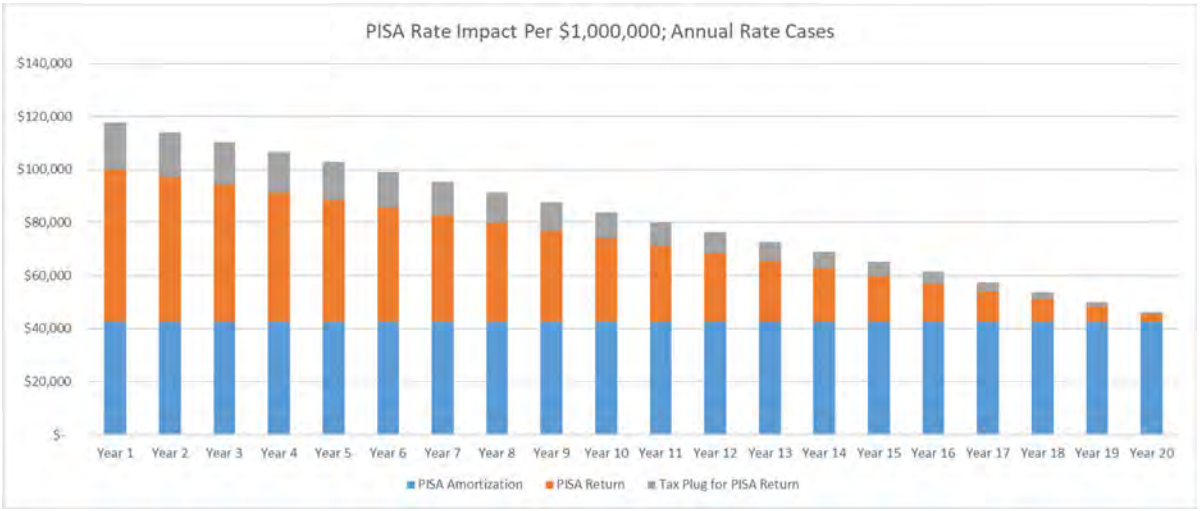
A. No. Despite Ameren Missouri's election to utilize plant in service accounting ("PISA") Mr. Michels did not reflect PISA treatment in his financial models. Staff expert Paul K. Amenthor describes the PISA regulatory treatment.

Q. How much will including PISA for the projects increase the cost of the projects to ratepayers?

A. The actual impact will vary with rate case timing, the timing of true-up relative to the completion of the project, and with the actual rate of return applicable in the initial and subsequent rate cases during the PISA amortization period. In general, PISA should be expected to have the effect of converting an amount of approximately 85% of the initial-year

revenue requirement for each project (not including tax benefits or offsetting revenues) into a ratebase item to be amortized over the following 20 years, with a return on that ratebase item reflected in revenue requirement.

Using the cost of capital found in Mr. Michels' models, every million dollars of PISA regulatory asset will increase ratepayer's costs for a project by approximately $1,641,069, if rate cases occur annually.



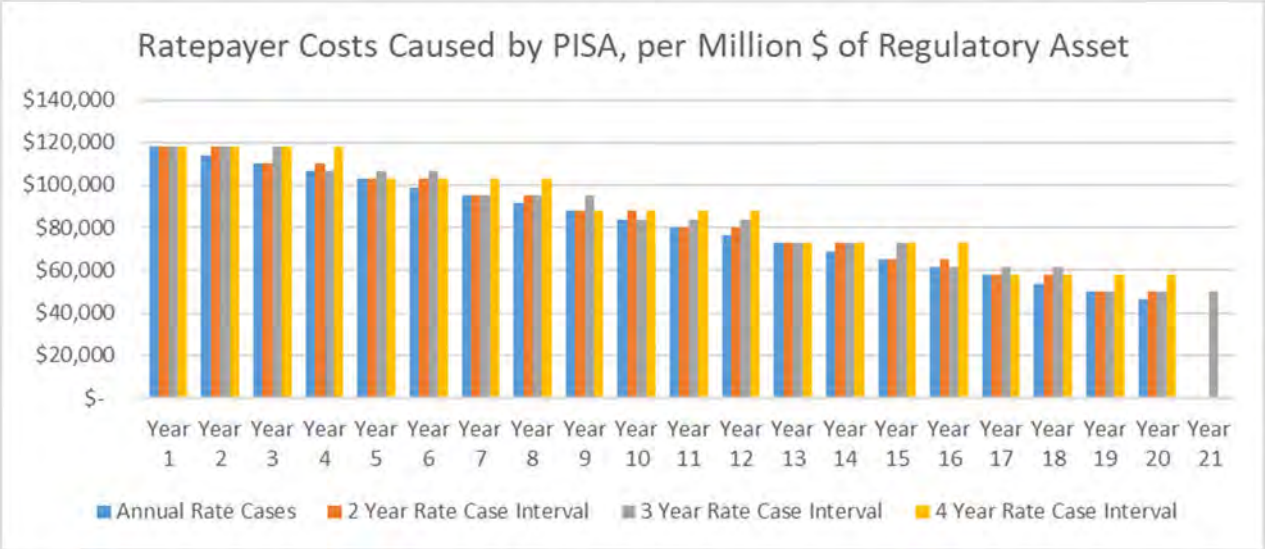

Using Ameren Missouri's NPVRR calculation, this equates to an NPVRR of $853,194 per million dollars of PISA regulatory asset for projects incorporated into the regulated revenue requirement in 2026.

Q. How much will the actual impact vary if rate cases do not occur annually?

A. The actual sums and the NPVRR sums are provided below, with the totals given by dollar amount:

| | | |
|---|---|---|
| Annual Rate Cases | $ | 1,641,069 |
| 2 Year Rate Case Interval | $ | 1,678,739 |
| 3 Year Rate Case Interval | $ | 1,762,676 |
| 4 Year Rate Case Interval | $ | 1,754,078 |
| NPVRR Annual Rate Cases | $ | 853,194 |
| NPVRR 2 Year Rate Case Interval | $ | 870,464 |
| NPVRR 3 Year Rate Case Interval | $ | 897,606 |
| NPVRR 4 Year Rate Case Interval | $ | 903,841 |

The annual values associated with each rate case scenario are illustrated below:




Applying these factors to the revenue requirement results modeled by Mr. Michels produces a simple average impact of an increase in the costs to ratepayers of 4.4%. The calculations and full range of results provided in the Confidential table below:

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[redacted]

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Q. Have you made a similar calculation of the impacts of RESRAM?

A. No. Ameren Missouri is unable to provide information as to which plants it may seek RESRAM treatment for at which time.[31]

Q. What is the significance of Ameren Missouri's choice to model only annual rate cases to estimating the cost of a project to customers?

A. Where the revenue requirement is expected to decrease overtime – as is the case with solar generation facilities – assumption of annual rate cases reduces the estimated costs to ratepayers. A range of rate case scenarios is useful to actually estimating the costs and benefits of a proposed project to ratepayers over time.

Q. Have you attempted to quantify the range of impact of rate case timing on the cost to ratepayers based on Mr. Michels' models?

A. Yes, with two caveats. First, although Ameren Missouri indicated in response to DR No. 0042 that it would retain real estate interests in both Cass and Split Rail projects, it chose to model only the Bowling Green and Vandalia projects as continuing to reflect rate base for real estate after 30 years of operation. I have truncated Mr. Michels' modeled revenue requirements at 30 years. Second, because Mr. Michels inexplicably modeled the ITC as a single year impact to revenue requirement, I have shown a second rate case immediately following the reflection of the ITC in revenue requirement under all ITC scenarios. Note, generally the PTCs as modeled present the lowest cost to ratepayers, however, when presented as NPVRR the ITCs are lower, as Mr. Michels unreasonably modeled the full value of the ITC as an offset to expense in the initial year of operation of each project.

[31] Staff expert Cedric E. Cunigan, PE, addresses Ameren Missouri's REC position under the Missouri Renewable Energy Standard.

Q. What are the results for Cass?

A. Those values are summarized in the Confidential illustrations below:

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**

Q. What are the results for Split Rail?

A. Those values are summarized in the Confidential illustrations below:

**

**

Q. Bowling Green?

A. Those values are summarized in the Confidential illustrations below:

**

**

Q. Vandalia?

A. Those values are summarized in the Confidential illustrations below:

**

**

Q. Overall, what kind of impact does incorporating reasonable rate case timing expectations have on the results presented by Mr. Michels in his CONFIDENTIAL Schedule 15?

A. The table provided below indicates the percent increase for each project for each tax benefit type, as modeled by Mr. Michels, first as the percent increase to his model results modified to a four year rate case interval, and second, as the percent increase to his model results as the NPVRR of the same calculation. Two and three year scenarios would fall somewhere between 100% of his valuation, and these results:

| | Sum of RR | NPVRR |
|---|---|---|
| Cass ITC | 110% | 108% |
| Cass PTC | 106% | 103% |
| Split Rail ITC | 110% | 107% |
| Split Rail PTC | 107% | 104% |
| Bowling Green ITC | 111% | 108% |
| Bowling Green PTC | 106% | 103% |
| Vandalia ITC | 110% | 107% |
| Vandalia PTC | 107% | 103% |

Q. Do these results incorporate PISA?

A. No. As stated above, an additional 3-6% increase to the cost to ratepayers would need to be incorporated to account for PISA.

Q. Did you include these annual revenue requirement streams as a schedule to your testimony?

A. Yes. The revenue requirement streams modified to address rate case timing (but not PISA) are attached as Schedule SLKL-r3.

**Other Issues with Mr. Michels' Models, Table 6, Tables 7 – 10, and Schedule 15**

Q. Aside from these issues, are Mr. Michels' economic models and the results presented in Table 6, Tables 7 – 10, and his Schedule 15 reasonable?

A. No. As discussed by Staff experts Shawn E. Lange, PE, and J Luebbert, the energy prices Mr. Michels uses in his model are based on a carbon tax assumption.

This results in unreasonably high energy cost projections, which in turn result in unreasonably high benefit streams.

Q. Is it reasonable to assume that 100% of the capacity value of each project would be fully monetized in every season of every year?

A. No. It is not reasonable to assume that there will always be a need for each and every MW of available seasonal capacity. This is particularly true if widespread renewable deployment occurs in the MISO region. This is further discussed by Mr. Stahlman.

Q. Would these modeling shortfalls tend to increase or decrease the resulting cost to benefit ratios of each project?

A. These shortfalls, and the rate case timing, RESRAM applicability and PISA applicability issues discussed above would all tend to result in higher cost to benefit ratios than those modeled by Mr. Michels, and would increase the "Base Case NPVRR Results" modeled by Mr. Michels in his Table 6.

Q. Can you provide an estimated revision to Table 6 that accounts for the rate case timing and PISA issues?

A. Yes. Those values are provided in the below Confidential table and graphs:

**

[redacted]

[redacted]

**

Q. What would be the value of Mr. Michels' Table 6 if presented in real dollars? In other words, if everything Mr. Michels modeled were accurate, how much more does each project cost ratepayers than the value it provides?

A. The Net ITC revenue requirement (RR) and Net PTC RR columns in the table below provide the actual dollar lifetime ratepayer costs in excess of ratepayer benefits as modeled by Mr. Michels, excluding the costs of PISA and assuming annual rate cases,

comparable to Mr. Michels' NPVRR values in his Table 6. Those values are provided in the Confidential table below:

**

**

The final two columns indicate that the costs to ratepayers exceeds the values to ratepayers under all scenarios presented by Mr. Michels in his Table 6.

Q. In addition to the modeling shortfalls you have described, are there modeling revisions that should be done in Ameren Missouri's supplemental direct and in future CCN filings that would potentially improve the modeled cost to benefit ratio for ratepayers?

A. Yes. Reasonable projections of renewable energy certificates sales or use to satisfy the Missouri RES, as applicable, should be incorporated. Also, the models should be revised to reflect that the projects interconnect at different voltages. This would be expected to increase the value of the revenue stream for ratepayers for projects that interconnect at distribution voltage. For example, certain RTO charges assessed on load ratio shares or similar metrics would be reduced, and the value of energy to serve load would be grossed-up by the avoidance of transmission-to-primary-distribution losses.

Q. Are there important considerations that models like this just can't incorporate?

A. Yes. The largest issue is that models like this do not capture the incredible risk of achieving benefits borne by ratepayers, and the virtual certainty of costs borne by ratepayers. Both this risk imbalance and the timing imbalance may be improved by a reasonable condition

discussed below in the section "Risk Sharing / Levelized Revenue Requirement Mechanism." Another issue is that resources of this nature can be viewed as an energy cost hedge, but that value is difficult to quantify when, as here, the cost of a project on a $/MWh basis greatly exceeds the Ameren Missouri projection of its value as an operating asset

Q Is there another consideration that could be incorporated to improve the model, but would likely require additional analysis?

A. Yes. Ameren Missouri should include modeling of the impact of these projects on its LMPs to serve load, and the displacement of existing generation of its fleet in the dispatch stack, and potential reduction in margin for the energy that is generated by existing Ameren Missouri resources. This is particularly relevant in light of the asserted yet ambiguous "energy need."

**Variation between Ameren Missouri's Energy Market Expectations and Project Levelized Cost of Energy (LCOE)**

Q. What does the LCOE represent?

A. While LCOE can be calculated several ways, the concept of the LCOE is to divide a project's cost by the project's energy output, to find an average $/MWh cost of the energy to be produced by a project.

Q. How has Ameren Missouri calculated LCOE?

A. Ameren Missouri's LCOE calculation represents a project's cost per MWh if all of a project's output were to occur in the present year, and all of a project's revenue requirement were to be recovered in the present year. To achieve this calculation, a string of annual assumed future outputs and revenue requirements is discounted to the present year using the utility's carrying costs.

Q. Why are the values in an LCOE calculation discounted to present value?

A. Essentially, recognizing the time-value of money, from an investment perspective it would not be appropriate to assume that revenues in year 30 of a project can be summed with revenues in year 1 of a project, because those year 30 revenues must be discounted to reflect the opportunities of other investments. In other words, if I need $10 today, I need $10 today. But, if I need $10 ten years from now, and I have an opportunity to earn 5% interest every year on an investment I make today, I don't need $10 today, I need $6.45 or so today, and the rest will accrue from compounding interest. The LCOE calculation can be useful for an investor looking to compare investment opportunities to compare output to investment over time among competing projects.

Q. Are ratepayers able to pay for future kWh discounted to today's dollars at a utility's carrying cost?

A. No.

Q. Are ratepayers able to reduce their future kWh requirements to a lower level today by discounting those kWh at a utility's carrying costs?

A. No.

Q. Do ratepayers experience opportunity costs?

A. Yes. Every dollar spent on a utility bill is a dollar that the ratepayer is not using for another purpose, be that paying towards a mortgage, avoiding consumer debt, investing, or spending as desired.

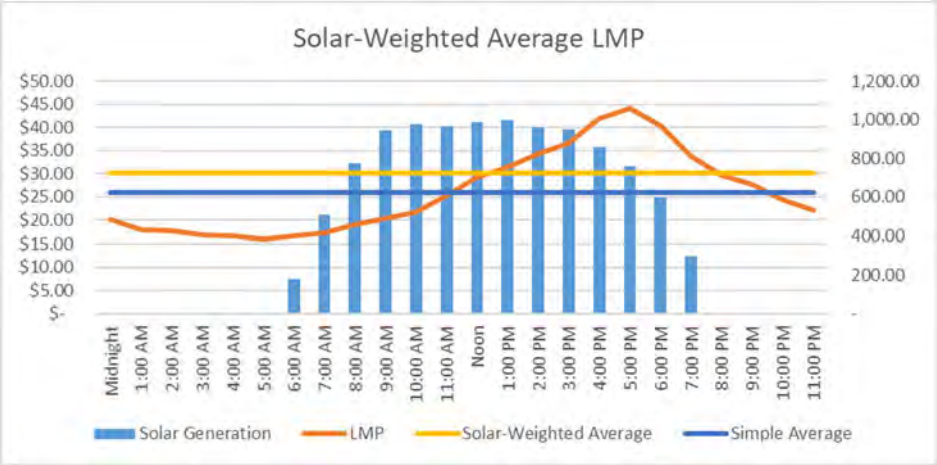
Q. Has Ameren Missouri provided a prediction in this case of its expectation of the value of wholesale energy for the next three decades?

A. Yes. Ameren Missouri has provided workproduct produced on its behalf by Charles Rivers Associates. Some of this workproduct was included in Mr. Michels' direct

workpapers; specifically, Ameren Missouri provided its prediction, by year, of the wholesale value of energy as a solar-weighted average

Q. What is a solar-weighted average?

A. The wholesale price of energy within the Midcontinent Independent System Operator (MISO) marketplace varies across product markets (real time versus day ahead), locations (wholesale nodes), and intervals (5 minute, 15 minute, 1 hour average). For simplicity when considering energy prices, often the day-ahead one hour average locational margin price (LMP) for a given node may be the most useful product to consider. A solar-weighted average is the LMP for a given node, for a given year, in which an expected solar generation shape is multiplied by the hourly LMPs. An example for a single day is illustrated below:




In this example, the simple average of the LMPs is $25.95, while the average price found by dividing the sum of the product of LMP and Solar Generation by the sum of the Solar Generation is $30.08.

Q. What is the Ameren Missouri-predicted value of solar-weighted energy over the life of the projects?

A. Ameren Missouri's workpapers indicated the following Confidential predicted solar-weighted energy values:

** [redacted] **

Q. Has Staff reviewed historic solar-weighted LMPS in the Ameren Missouri service territory?

A. Yes. Based on the solar shapes provided by another Ameren Missouri consultant, Astrape, and the historic Ameren Missouri Load LMP and the Callaway Generation LMP, the solar-weighted energy value in 2022 dollars is around ** [redacted] ** per MWh.

Q. If every assumption, prediction, and estimate contained in Mr. Michels models for each solar project occurred exactly as assumed, predicted, and estimated, have you quantified the solar-weighted average LMP that would need to be realized for ratepayers to "break even"?

A. Yes. Note, these results assume that the value of risk is properly addressed within Mr. Michels' models, assume Ameren Missouri realizes the capacity prices modeled by Mr. Michels, that there are no lost wholesale margin revenues due to the introduction of additional generation, and that all rate case assumptions occur as modeled including the lack of modeling for PISA and the modeling of annual rate cases. The solar-weighted average LMP required for "break even" for each project is provided in the Confidential table below:

**

**

Q. Can you provide an illustration of these values?

A. Yes. Those values are provided in the below Confidential graphs:

**

**

Q. In the foregoing calculations, did you assume that Ameren Missouri's capacity values are both correct, and can be fully monetized by ratepayers?

A. Yes.

**Variation between Ameren Missouri's Capacity Market Expectations and Projected Project Cost to Ratepayers**

Q. Have you preformed the inverse of the analysis described above to determine the winter capacity value at which customers would breakeven?

A. Yes. The discussion in this section has centered on the analysis appropriate to determine whether or not an investment is justified by its cost, in other words - are facilities of such an improvement as to justify or warrant the expense of–making the improvement[32] or if the facilities are of sufficient importance to warrant the expense of making them.[33]

[32] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).
[33] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

However, if we rely on the same assumptions made above – that is – that all other elements of Mr. Michels' models are accurate, we can solve for the winter capacity value at which customers would break even, to evaluate whether the projects are both important to the public convenience and desirable for the public welfare,[34] or effectively a necessity because the lack of the service is such an inconvenience [35] as a means of addressing the winter capacity need discussed by Staff expert Shawn E. Lange, PE.

Q. If every other assumption, prediction, and estimate contained in Mr. Michels' models for each solar project occurred exactly as assumed, predicted, and estimated, have you quantified the winter capacity value that would need to be realized for ratepayers to "break even"?

A. Yes. Note, these results assume that the value of risk is properly addressed within Mr. Michels' models, assume Ameren Missouri realizes the capacity prices modeled by Mr. Michels, for all other seasons, assume Ameren Missouri realizes the energy revenues modeled, that there are no lost wholesale margin revenues due to the introduction of additional generation, and that all rate case assumptions occur as modeled including the lack of modeling for PISA and the modeling of annual rate cases. The differential between the $ per solar MW

[34] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[35] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

to break even and Ameren Missouri's prediction of those values are illustrated in the below Confidential graph:

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Q. What is your take away from this graph?

A. My conclusion, based on this exercise that assumed all other aspects of Ameren Missouri's estimates and analysis are accurate, is that solar is a poor solution to a problem of needing additional winter capacity.

Q. Do you have reason to believe that Ameren's predicted solar value for winter capacity may be too high?

A. Yes. As Mr. Lange and Mr. Stahlman explain, the current winter capacity value for solar for MISO capacity purposes is 5%, and MISO is posed to reduce it further for purposes of its class-level planning reserve margin analysis.

**Staff's Threshold Analysis**

Q. What is the purpose of Staff's threshold analysis?

A. I attempted to address some of the shortfalls of Mr. Michels' modeling, while also being as generous in the assumptions in favor of moving forward with the projects as could possibly be within a reasonable range. Among other things, I relied upon the solar-weighted cost of new entry (CONE) for capacity value, and assumed that capacity value would be 100% monetized.

Q. Do these results constitute a Staff prediction of the cost of these projects to ratepayers and the value of the projects to ratepayers?

A. Absolutely not.

Q. What tax treatments are considered in your models?

A. I relied on Ameren Missouri's PTC projections per generated MWh for PTC scenarios. I relied on Ameren Missouri's ITC amounts, amortized over the life of each project, for ITC scenarios.

Q. How is capacity valued in your model?

A. I first weighted the 2022 MISO Cost of New Entry (CONE) for solar capacity valuation, using Ameren Missouri's formulas and inputs. I then escalated this value over project life at an inflation rate of 2%. My modeling reflects 100% monetization of the solar capacity at the levels predicted by Ameren Missouri.

Q. How is energy valued in your model?

A. I first compiled the 42 year solar load profiles for various generation locations prepared by Astrape, Ameren Missouri's LOLE consultant. I then aggregated this into a single shape for a year for each location. I then created an average LMP annual string based on the years 2019, 2020, 2021, and 2022 for the Ameren Load Node and the Callaway Generation Node. I used these values to calculate a solar-weighted LMP for each location modeled by

Astrape. I used the "Central Missouri Tracking" location for the Missouri-based projects, and the "West Illinois Tracking" location for Cass. I escalated these values at an energy-inflation rate of 3%.

Q. What did you assume for generation in your model?

A. I relied upon the Astrape locations referenced above. I adjusted the Bowling Green and Vandalia projects for avoided transmission-to-distribution losses. Assuming a 30 year project life, the output for each facility is presented in the below Confidential table:

**

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Q. How does the value of energy vary among the projects when modeled with these inputs?

A. If these very favorable inputs are used, the generation, energy value, and average lifetime solar-weighted LMP are those presented in the below Confidential table:

**

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Q. How did you treat PISA?

A. I assessed multiple scenarios to capture the overall impact of including or excluding PISA treatment.

Q. Why didn't you model RESRAM, and how did you treat Renewable Energy Credits ("RECs")?

A. At this time, while Ameren Missouri appears to be reserving the right to request RESRAM treatment, it has failed to present any details as to which projects may be involved. However, because Ameren Missouri has asserted in discussions that it believes it is possible it may need RECs to satisfy the Missouri RES to such an extent that it may require RESRAM treatment for the 15% of costs not covered by PISA, I applied the 125% value escalator to 50% of the output of the Split Rail project, as this is the largest Missouri-sited project. I only applied the additional credit for in-state RECs to 50% of the output for consistency with Ameren Missouri's statements that the facilities are not being driven by RES compliance needs. The remaining Missouri RECs and the Illinois RECs were modeled at a fixed value of ** [redacted] **/REC, informed by Ameren Missouri's response to DR No. 0076 , through the year 2035, at which it is assumed REC value will become negligible.

Q. How did you model depreciation, interim net salvage, terminal net salvage, and the value of land?

A. I relied on Ameren Missouri's inputs to Mr. Michels' models for these items, except for the following:

1. Based on Ameren Missouri's response to DR No. 0042 I included discrete real estate values for Cass and Split Rail, which were not subject to depreciation.

2. I modeled that real estate values for all projects appreciated at a 2% inflation rate over project lives, and were sold for those appreciated values shortly after the end of the useful life of each project.

3. I incorporated the Terminal Salvage and Terminal Cost of Removal values provided in response to DR No. 0051.

Q. What did you use for cost of capital, O&M, and project costs?

A. For Cost of Capital I used the Ameren Missouri request from their last general rate case. For O&M I used Ameren Missouri's initial year input to the Mr. Michels' models for each project, escalated with 2% inflation. For project costs, I used the values modeled by Mr. Michels for each project.

Q. Did you have the information and models available to estimate the generation opportunities lost due to the depressive effect of the additional generation on the Ameren Missouri generation nodal LMPs?

A. No.

Q. Did you have the information and models available to estimate the marginal generation revenue lost due to the depressive effect of the additional generation on the Ameren Missouri generation nodal LMPs?

A. No.

Q. Did you have the information and models available to estimate the marginal decreases in the costs to serve Ameren Missouri's load due to the depressive effect of the additional generation on the Ameren Missouri load nodal LMPs?

A. No.

Q. Did you include any other factors that were not incorporated by Mr. Michels?

A. Yes. Relying on Ameren Missouri's response to DR No. 0130, I incorporated an estimate of avoided transmission and RTO-related expenses as a value stream for the projects to be sited at distribution voltage, as they will be treated by MISO as offsets to load.

Q. Are your models predictions of future regulatory treatments?

A. No. These analyses are intended as something of a best case scenario within reason, to estimate whether or not, setting risks aside, ratepayers will or will not break even on the prospective prospect.

Q. What are the results of your analysis?

A. The results presented as the relationship between project costs to ratepayers over the life of the project and the value of the project to ratepayers over the life of the project are summarized in the below Confidential graph:

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This illustrates that over the life of the projects, under optimistic valuations, ratepayers are worse off with the Cass and Split Rail projects than without those projects, and that over the

life of the projects, the Bowling Green and Vandalia projects will provide more value than cost to ratepayers.

The dollar values used in these calculations are provided in the below Confidential table:

**
[redacted]
**

Q. Could you provide a comparison of the lifetime $/MWh value for each project with the lifetime average $/MWh of Revenue Requirement, based on a 4 year rate case interval, with PISA, and the most beneficial tax treatment for each project?

A. Yes. Note, as modeled with a 4 year rate case interval assumption and initial PISA treatment, the ITC amortized over the life of the plant produces the lowest revenue requirement for Cass and Split Rail, while the PTC produces the lowest revenue requirement for Bowling Green and Vandalia as modeled, and not attempting to account for realization risk.

**
[redacted]
**

Q. Have you examined the cost to benefit ratios of each project to account for variations in ratepayer costs and value over each project's life?

A. Yes. A summary of my results are illustrated in the below Confidential graph. The full table of my threshold analysis results are provided as Confidential Schedule SLKL-r4.

[redacted]

[redacted]

[redacted]

**

Q. Should the Commission authorize Ameren Missouri's requests for Bowling Green and Vandalia based on these models?

A. No. Staff used simple escalators and assumed 100% monetization of all possible value streams in setting up these models. The purpose of these models was to see whether any projects would pass screening for being cost effective under favorable assumptions, not to predict whether the projects are an improvement justifying their costs.

Q. Why shouldn't these models be relied upon to determine that these projects are an improvement justifying their costs and therefore authorize the requested CCNs?

A. First, these models unreasonably assume 100% monetization of all values. Second, these models do not attempt to identify or apportion risk of changes in project costs, or risk in realization of predicted valuation and monetization, especially with regards to generation-driven PTC scenarios. Also, these models do not justify the cost of the project for the value received across the projects' lives. The models demonstrate that even under very favorable, albeit unlikely, conditions, the Split Rail and Cass County projects are unlikely to produce ratepayer benefits in excess of their respective costs. But perhaps most importantly,

just because a project may be modeled as producing value to ratepayers in excess of cost to ratepayers, that does not establish that a project is ALSO both important to the public convenience and desirable for the public welfare,[36] or effectively a necessity because the lack of the service is such an inconvenience [37]

Q. Is it appropriate for this Commission to authorize a utility that acts under the police powers of the State of Missouri to proceed with the State's protection in the form of protected regulated revenues from ratepayers to construct generation facilities that are not needed as characterized in these standards?

A. No, it is not. A CCN for generation facilities should only be issued where there is need for generation facilities of the sort for which permission is requested. Here, Ameren Missouri's direct case fails to establish any need tied to these solar facilities.

**"Energy Need" and Market Efficiency**

Q. What is an energy need?

A. I don't know. Ameren Missouri participates in the MISO integrated energy market. For each interval Ameren Missouri buys all energy its load requires (except for generation interconnected at the distribution level including certain solar facilities and net metered customer-owned generation) through the MISO market. Also in each interval, Ameren

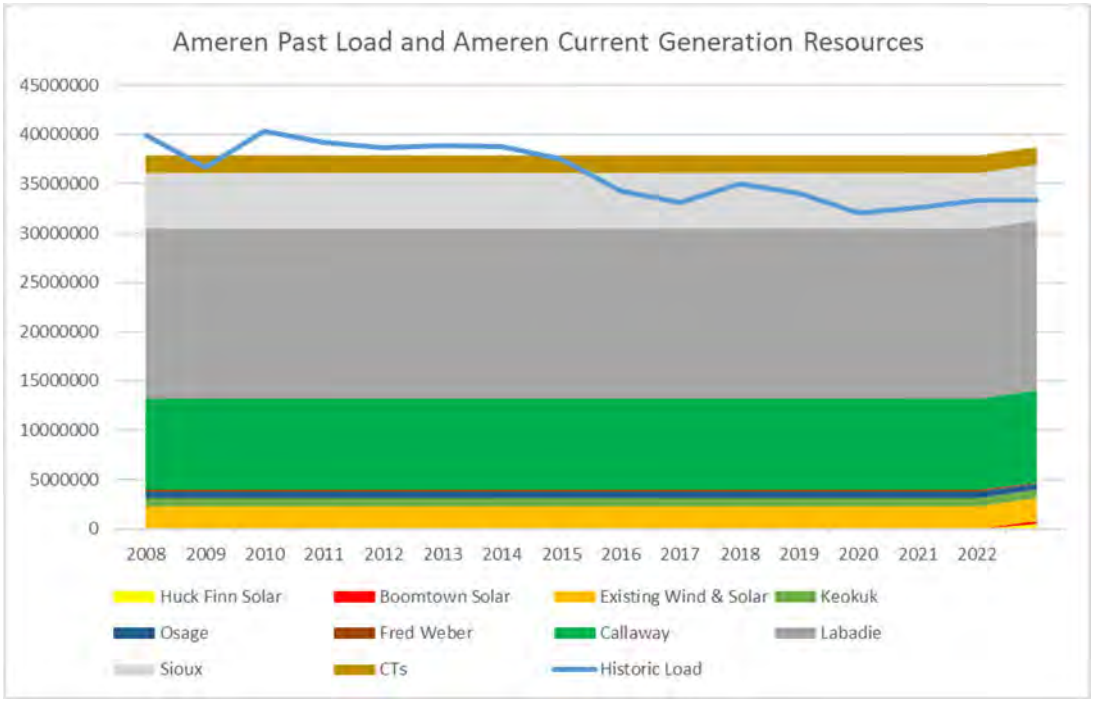
[36] "[The Kansas City Court of Appeals, Missouri] in State ex rel. Missouri, Kansas & Oklahoma Coach Lines v. Public Service Commission, 238 Mo.App. 317, 179 S.W.2d 132, loc. cit. 136, made the following comment on the question: "Necessity' as used in the phrase 'convenience and necessity', as applied to regulations by Public Service Commissions, does not mean essential or absolutely indispensable, but is used in the sense that the motor vehicle service would be such an improvement as to justify or warrant the expense of making the improvement; that the inconvenience of the public occasioned by the lack of motor vehicle transportation is so great as to amount to a necessity. Chicago, R. I. & P. R. Co. v. State, 123 Okl. 190, 252 P. 849. 'Any improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. If it is of sufficient importance to warrant the expense of making it, it is a public necessity. * * * Inconvenience may be so great as to amount to necessity'. Wabash Chester & Western R. R. Co. v. Commerce Commission ex rel., 309 Ill. 412, 418, 141 N.E. 212, 214'. State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

[37] State ex rel. Transport Delivery Co. v. Burton, 317 S.W.2d 661, 664 (Mo. App. 1958).

Missouri follows dispatch instructions from MISO as to how much energy it should generate – and how much energy it is allowed to inject – into the transmission network under MISO's functional control. In many intervals throughout a given year, Ameren Missouri generates more energy for sale through MISO than it purchases. In many intervals throughout a given year, Ameren Missouri purchases more energy than it generates for sale through MISO.

Q. Does Ameren Missouri currently own resources to generate in excess of its load on an annual basis, and will it be able to do so into the foreseeable future without grant of these CCNs?

A. Yes. Ameren Missouri's testimony does not demonstrate that Ameren Missouri needs to add additional generation in order to have the ability to generate a quantity of energy that exceeds the energy required by its load over the course of a year – even if that were a thing that needs to be done. Rather, Ameren Missouri's testimony indicates that generation owned by other utilities is called upon by MISO to meet regional loads including Ameren Missouri's load more efficiently than Ameren Missouri's own units.



This illustration compares Ameren Missouri's potential annual generation to Ameren Missouri's historic load plus losses levels reported by Mr. Michels. In this illustration, the generation that would be produced by Ameren Missouri's generation fleet as it existed in Ameren Missouri's last rate case is depicted as if the market price of energy were $100/MWh, however the coal units at Meramac and Rush Island are not included, nor are the Taum Sauk pump storage units included. At the far right, the new solar resources of Boomtown and Huck Finn are brought in. This clearly shows that if Ameren Missouri was really concerned about matching annual generation to annual load, it has resources to do so by bidding all of its units in as must-run price takers.

Q. If Ameren Missouri bid in its CTs as price takers, wouldn't that mean Ameren Missouri is spending more money to produce energy than what that energy is valued at in the MISO market?

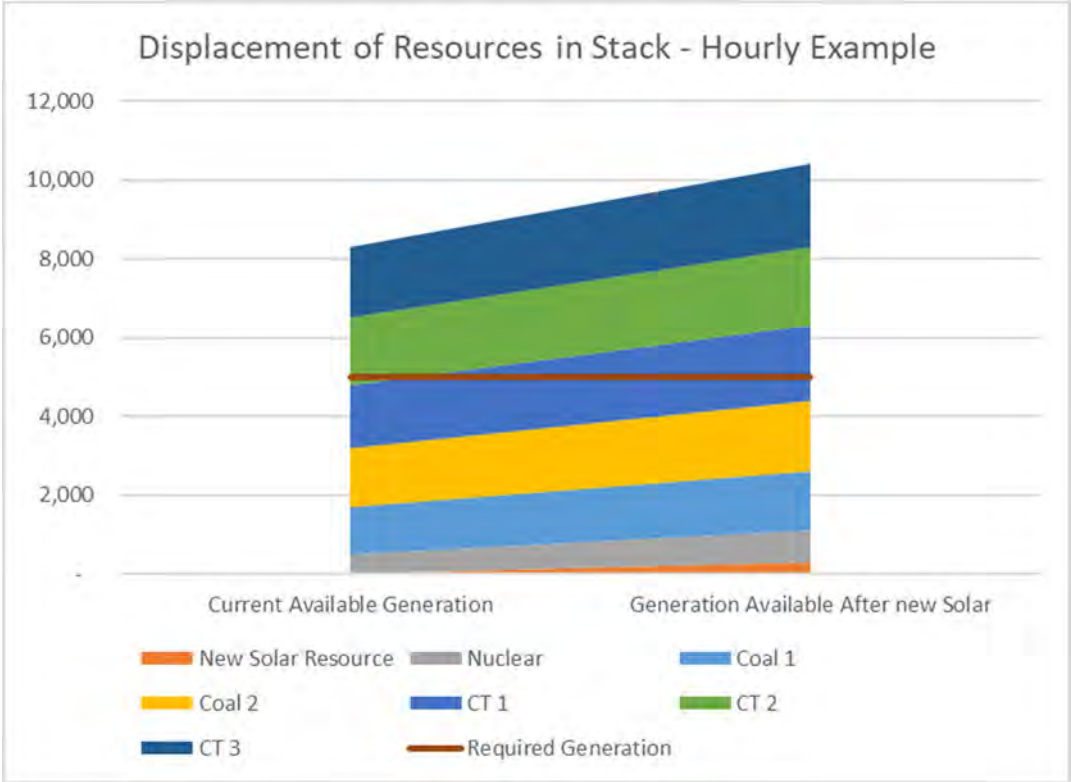
A. Yes.

Q. Would that be prudent?

A. Absolutely not.

Q. All else being equal, does Ameren (or anyone) adding additional low-operating cost generation make it more or less likely that Ameren Missouri's existing units will be called upon to efficiently meet market needs?

A. Less likely. Today, when MISO calls upon resources to meet load, it happens that not all of Ameren Missouri's resources are selected in every hour. Adding another, lower, cost resource will not cause those existing resources to be called to generate more often, rather it will push the stack up, and those existing resources will be called to generate less often, all else being equal.




The illustration above provides an intra-hour model. In the illustration above, we see that the new Solar Resource pushes the stack up, and existing resources are utilized even less. Adding a new must-run resource does not guarantee that Ameren Missouri will actually generate more energy on an annual basis under MISO's economic dispatch.

Q. Does Ameren Missouri acknowledge this in the evidence it has presented in this case?

A. No. However, Ameren Missouri has retained Charles Rivers Associates (CRA), which stated in its Report at page 20, that "Overall, renewable entry directly affects the total amount of fossil-fuel capacity in the system since low variable cost resources drive traditional fossil fuel resources up the merit order making them uneconomic more frequently." Staff has inquired if Ameren Missouri disputes this statement, and in its response to DR No. 0094.4,

Ameren Missouri acknowledged that it did not dispute its statement, but that it did not attempt to model its generation fleet with and without the addition of specific resources.

Q. Is this response relevant to Ameren Missouri's public policy arguments in this case?

A. Yes. Ameren Missouri believes it is not appropriate to model the impact of it owning particular solar resources on Ameren Missouri's generation dispatch because it effectively asserts that approximately the same amount of solar generation will be built anyway, whether or not Ameren Missouri proceeds with these projects for which it is currently requesting Commission permission.

Q. If an "energy need" is recognized by the Commission as justifying the cost of the proposed solar projects, should an "energy need" be first defined and identified by Ameren Missouri?

A. Absolutely.

Q. What questions should Ameren Missouri address in its supplemental direct to define and identify what it believes an "energy need" is, so that parties may appropriately respond and the Commission may, if appropriate, find it the justification for costs to ratepayers?

A. The following questions, at a minimum, would be a starting point:

Which of the following constitutes meeting an "energy need":

a. The total annual generation of a vertically integrated utility meets or exceeds the total annual load requirements of the utility as a load serving entity, although significant imbalances exist on a daily basis

b. The total annual generation of a vertically integrated utility meets or exceeds the total annual load requirements of the utility as a load serving entity, although significant imbalances exist on a seasonal or monthly basis

c. The daily generation of a vertically integrated utility meets or exceeds the daily load requirements of the utility as a load serving entity, although significant imbalances exist on an hourly basis

d. The hourly generation of a vertically integrated utility meets or exceeds the hourly load requirements of the utility as a load serving entity in virtually every hour. If so, in how many hours must the load requirements be exceeded in a day, a season, a year?

e. The utility possesses generation capable of meeting load in every hour, although it may or may not be dispatched by its market operator to dispatch it in every hour

f. Something else?

Q. What means are there to determine whether a given resources meets, or helps meet, an "energy need?"

A. Production runs, with and without the resource, with variation in LMP and other dispatch parameters would be essential to determining whether adding a resource actually increases the production of the Ameren Missouri generating fleet in a given interval.

**Ameren Missouri's LOLE Modeling Does Not Establish a Reliability Need for These Particular Projects**

Q. Did Ameren Missouri model these solar projects in its Loss of Load Expectation (LOLE) study conducted by Astrape?

A. No. Ameren Missouri requested that Astrape model 5 geographically diverse solar facilities, each sized the same.

Q. Did Astrape model the Ameren Missouri fleet based on the preferred resource plan that Ameren Missouri announced in September of 2023?

A, No. The LOLE study relies on inclusion of combined cycle units in 2030, which provide a great deal of operational flexibility relative to other possible plant options.

Q. Did Astrape model Ameren Missouri's participation in an integrated energy market?

A. No. Further details are discussed by Mr. Lange, but in short, the LOLE models assume that Ameren Missouri must provide energy in all hours for Ameren Missouri, with only a small amount of market energy available, and no possibility of selling excess generation in a given hour to the market. Further, the choice was made to not represent municipal load or generation that is located within MISO Zone 5 in the modeling.

Q. Why should a regulator not rely on a project's impact on LOLE alone as a factor in approving a CCN, even if Ameren Missouri had provided a LOLE study that was reflective of the proposed solar projects and did not include greater operational flexibility than its current PRP?

A. No matter what, adding a generation source or a transmission line will improve LOLE. That is a mathematical fact.

Q. Can you provide an example?

A. Consider a PSC staffer who enjoys a daily Twinkee as a snack. Consider that the staffer eats 5 Twinkees each week, and purchases 5 Twinkees each week. Consider that the staffer has 15 Twinkees in storage, such that at the beginning of each Monday, the staffer has

20 Twinkees on his desk, and at the end of Friday the staffer has 15 Twinkees on his desk. If the staffer purchased 10 Twinkees one week instead of 5, then continued purchasing 5 Twinkees in the subsequent weeks, the staffer's loss-of-Twinkee-expectation would be reduced. However, the staffer would not have a meaningfully different Twinkee supply situation than prior to the reduction in his LOTE.

Conversely, consider a staffer who attempts to obtain a Sundrop soda from the city parking garage each week day. Unfortunately for this staffer, the machine is sometimes unplugged, or the Sundrop is sometimes out of stock. If the vendor added a new machine with several bays devoted to Sundrop, and with a battery backup for the bill scanner, the staffer's loss-of-Sundrop-expectation would be reduced, and the staffer would have a meaningfully different Sundrop supply situation.

The point of these examples is to illustrate that if LOLE is already very low, an incremental reduction in LOLE may have little to no actual impact on the day-to-day reliability of the system. The additional generation or transmission may still be reasonable for other reasons, but literally any new connection that is not a load sink will improve the LOLE of a system. This must be kept in mind when reviewing whether the change that a CCN request will induce in LOLE is worth the cost of inducing that change in terms of the day-to-day reliability of the system, and the revenue requirement impact of the project.

## KPIS, CAPITAL PLANS, PISA, AND THIS CCN IN THE CONTEXT OF AMEREN MISSOURI'S OTHER OBLIGATIONS AND PROGRAMS

Q. Does Ameren Missouri management have a fiduciary duty to optimize results for ratepayers?

A. No. Protection of captive ratepayers against the interests of the shareholders or protected utilities is the primary purpose of the Missouri Public Service Commission.

Q. Does Ameren Missouri management have reason to pursue generation investments that are high capital cost and low operating cost, even if those particular generation resources do not best meet ratepayer needs?

A. Yes. Ameren Missouri has elected to participate in a form of alternative rate regulation authorized by Missouri Statute 393.1400. This statute authorizes favorable accounting treatment related to capital costs associated with new ratebase additions, in exchange for capping the revenue requirement increases a utility may receive. Since the revenue requirement is comprised of return on and of capital costs plus the annual net operating expenses of a utility, Ameren Missouri is incented to increase its rate base as much as possible while reducing its net operating expenses as much as possible under a given total revenue requirement level.

Q. Has Ameren Missouri incented its management to pursue investments that are high capital cost and low operating cost?

A. Yes. **[redacted]**

[redacted] **

Q. How does this preference for high capital costs and low O&M costs relate to this case?

A. As discussed by Staff expert Cedric E. Cunigan, PE, ** [redacted] ** Staff expert Shawn E. Lange, PE, discusses how Ameren Missouri failed to consider PPAs as a solution to any of its needs.

Q. Are there gaps in the logical consistency of Ameren Missouri's requested regulatory treatment before this Commission?

A. Yes. Ameren Missouri is inconsistent in whether additional load is desirable or undesirable and Ameren Missouri is inconsistent on whether capital expenditures for generation capacity should be encouraged or discouraged.

Q. In this case, is additional load desirable or undesirable?

A. Both. Ameren Missouri's testimony in this case is that it wants to avoid having more MWh of load in a year than it has MWh of dispatched generation. In this case, Ameren Missouri represents that these solar projects are needed due to an "energy need." Based on the limited testimony Ameren submitted to define "energy need," it appears that the asserted energy need means that Ameren Missouri projects in future years it will purchase more energy from the MISO integrated marketplace then what it projects it will be called upon to generate under MISO's economic dispatch procedures. Yet also in this case in the prefiled direct testimony of

Steven M. Wills at pages 7-8, Ameren Missouri discusses "the role that renewables play in supporting robust economic activity in the region, by helping to attract and retain customers that are ultimately large employers in the service territory and whose load contributes to affordability for all customers by providing additional sales over which to spread the Company's fixed costs of providing service," and at page 24 Mr. Wills concludes that "The Solar Projects promote the diversification of resources, enhance reliability, and have economic and economic development benefits, all factors that establish that they are both needed and in the public interest."

In other words, Ameren Missouri's position in this case is that Ameren Missouri has more load than it can economically serve with its generation fleet, so it would be good to add additional uneconomic generation so that it can attract more load. Importantly, increased energy sales require more energy purchases.

Q. Is it possible to add load that would generate incremental revenues to offset the cost of the proposed solar projects over the value of the solar projects as an operational aspect?

A. That is possible, but it is very unlikely, if not impossible as Ameren Missouri's rates are currently structured and designed, particularly in light of how Ameren Missouri has allocated the revenue requirement of renewable generation in its rate cases.

Q. Are there additional fronts on which Ameren Missouri seeks to build its load, in contrast to its concerns in this case that its load exceeds its economically-dispatched generation?

A. Yes. Ameren Missouri requested and received authority to promote Electric Vehicle incentives to grow its load. Further, to the extent that Ameren Missouri's "energy

need" is related to net energy consumption in particular hours, in that case[38] Ameren Missouri argued against requirements for time-based energy rates for customers accepting the incentives.

Q. Does Ameren Missouri have statutory incentives to pursue capital intensive projects?

A. Yes. Ameren Missouri's PISA participation is intended to incent capital cost spending that Ameren Missouri would not undertake absent the PISA treatment.

Q. Does Ameren Missouri's decision to pursue generation-related capital projects in this case contradict its past treatment and current application under the Missouri Energy Efficiency Investment Act (MEEIA)?

A. It does. This is addressed as Staff's recommended condition for the Commission to condition any approval of the permission requested in this case on Ameren Missouri's agreement to decline to pursue future "Earnings Opportunities" in its current and future MEEIA application.

Q. Is there a contrast between Ameren Missouri's requests to delay study of the costs and benefits of its participation in the MISO integrated energy market, and its positions relative to this case?

A. Yes. In EA-2022-0099, Ameren Missouri has resisted and delayed performing a robust study of whether it should remain a participant in MISO, and Staff has generally agreed that given current conditions it is unlikely that a costly study would justify the costs of leaving MISO. In this docket, Ameren Missouri testimony strongly implies that with these projects, Ameren Missouri would be insulated from MISO market shortages. In Staff DR No. 0096, Staff pointedly asked, "If MISO is unable to provide energy to meet the needs of Ameren

[38] ET-2018-0132.

Missouri load, please explain how Ameren Missouri owned generation assets will be able to alternatively meet said load outside of the frameworks of MISO markets. Does Ameren Missouri intend to exit MISO prior to 2030? Does Ameren Missouri plan to dispatch its generation against MISO instructions, and if so, under what circumstances?"

In response, Mr. Ajay K. Arora stated:

> Ameren Missouri's plan is to add summer and winter energy and capacity resources in a sustained manner to ensure it has an energy buffer in each hour of the year. Ameren Missouri anticipates continuing to be a part of MISO for the foreseeable future, and dispatching its generation consistent with MISO instructions. While Ameren Missouri's load can still be subject to impacts of shortages across MISO, ensuring that Ameren Missouri is contributing resources to the market sufficient to meet the load that it must serve from the market including a buffer of excess energy in the summer and also across all seasons reflects prudent planning. Ameren Missouri is optimistic that other states – and market mechanisms in states that with competitive generation supply - will do the same to mitigate MISO summer energy and capacity shortages. The risk that other states or competitive regions do not cover their load with resources clearly points to the fact that Ameren Missouri needs to be maintain an energy surplus to best protect its customers. In the event that other states in the MISO region do not develop resources to meet their load needs and load impacts are experienced in Ameren Missouri's service territory but Ameren Missouri is able to execute on its plan, the load impacts to the Company's customers will necessarily be less than they otherwise would have been if the Company had not developed an energy buffer, and revenues from the resources the Company has developed will be more likely to be in the higher end of the range of energy and capacity market prices reflected in the Company's IRP and project-specific economic analyses due to the supply side issues that would impact the market in such a scenario.

Yet, in DR No. 0068, Staff requested that Ameren Missouri explain "[w]hether solar panels will be oriented to achieve maximum solar energy production, maximum solar energy value, maximum coincidence with Ameren Missouri load, maximum coincidence with MISO load, maximum coincidence with expected summer peak conditions used to develop capacity requirements, or some other orientation." Ameren Missouri responded "The orientation and

design for each of the four solar sites (Vandalia, Bowling Green, Cass County, and Split Rail) has been aimed at optimizing maximum yearly energy production."

Q. If the "energy need" in Ameren Missouri's application is the "energy buffer in each hour" that Mr. Arora described, should the maximum solar energy value be the goal of these solar installations?

A. No. If the goal is to create an hourly energy buffer, the hours in which net load is highest would be the hours to which a prudent utility would optimize its generation orientation.

Q. Did Ameren Missouri take reasonable steps to project and identify its net load hours?

A. No. In Staff DR No. 0094.4 Staff asked,

> The CRA Report at page 20, states "Overall, renewable entry directly affects the total amount of fossil-fuel capacity in the system since low variable cost resources drive traditional fossil fuel resources up the merit order making them uneconomic more frequently." (1) Please state whether Ameren Missouri disputes this CRA statement. (2) Please confirm that Ameren Missouri's fuel model dispatch to market price to show meeting of "energy need" with the additions of solar resources neither (a) reflects a dynamic market price to reflect a relative increase in total fossil fuel generation in a given year when modeled with fewer renewables, nor (b) reflects a relative reduction in the total level of fossil-fuel generation in a given year when modeled with more renewables. Please confirm that in the modeling underlying Mr. Michels' Figure 5, Figure 6, and Figure 7 neither (a) reflects dynamic market pricing to reflect a relative increase output of a given fossil-fuel generator in a given year when modeled with fewer renewables, nor (b) reflects a relative reduction in the total generation modeled by a given fossil-fuel generator in a given year when modeled with more renewables.

Mr. Michels responded as follows:

> 1. The Company does not dispute the statement from CRA. 2. Ameren Missouri's dispatch model simulates its own portfolio's dispatch in the MISO market based on a range of market power price assumptions, which were in turn based on scenarios that reflect combinations of

> carbon price and natural gas price assumptions. The market power price scenario results were developed based on simulation of resource portfolio changes and dispatch for the entire Eastern Interconnect and MISO. Each modeled scenario reflects different levels and mixes of new resource deployment based on the scenario variables (carbon price and natural gas price). This modeling does not determine specific ownership of new resources (e.g., specific new resources deployed in each scenario may or may not be owned by Ameren Missouri), only the mix of resources that would be operating during the planning horizon. The energy positions presented in Figures 5, 6 and 7 of my direct testimony reflect probability weighted average results of dispatch modeling for all price scenarios. Neither power prices used by the dispatch model nor generator output produced by the model are further adjusted to reflect Ameren Missouri's ownership of specific renewable resources.

In other words, in its MISO participation case, Ameren Missouri believes it's not worth the cost of a study to even consider leaving MISO, but reading between the lines in its application in this case and statements made by Mr. Arora, it seems Ameren Missouri is saying we can't *really* rely on MISO, so we should build solar plants so that we have plenty of energy in every hour, even though we don't need to bother to do a study do see which hours may have an energy shortfall so that we can align the solar panels to address any shortfall there may be.

Q. Could you summarize the concern with Ameren Missouri's inconsistent regulatory approach to load and capital-intensive generation?

A. Yes. Ameren Missouri is concurrently requesting to spend money, which they will recoup from ratepayers with additional costs due to PISA, to acquire generation to meet an "energy need", that is expected to entice commercial and industrial customers, who will require more energy, as well as be provided discounted rates, in which all other ratepayers cover the difference, providing incentives, collected from ratepayers, to support electrification efforts to increase the "energy need", providing efficiency incentives, collected from ratepayers, to reduce the "energy need" and future capital investment, while increasing current capital investments due to PISA participation, all while chasing an undefined "energy need,"

for which it did no modeling to estimate whether the addition of these projects would do more harm than good.

## RECOMMENDED CONDITIONS

### Risk Sharing / Levelized Revenue Requirement Mechanism

Q. What type of risk sharing and revenue requirement levelization mechanism is appropriate in this case?

A. Ameren Missouri cannot at this time state what tax treatment it expects to pursue, or how it will reflect that treatment on its regulated books. In the absence of these details, it is difficult to design a risk sharing mechanism, but in general, a concept similar to that described by the Commission for the Evergy request concerning the Persimmon Creek windfarm is likely appropriate.

Q. What was the risk sharing mechanism as set out in the Persimmon Creek case?[39]

A. As set out in the *Report and Order* in File No. EA-2022-0328, at pages 35 – 37:

> 2. The certificate of convenience and necessity for Persimmon Creek is conditioned on:
>
> a. Any costs associated with owning and operating Persimmon Creek, including but not limited to those related to PISA treatment and any required wildlife mitigation, that exceed the ratepayer realized market revenues and ratepayer realized tax benefits shall be shared equally between EMW shareholders and rate payers including the market value of energy serving EMW customers.
>
> b. All PTCs EMW recognizes for income tax purposes related to Persimmon Creek shall be tracked and credited to rate payers in future rate proceedings and included in the rate payer realized tax benefits.
>
> c. EMW shall track all revenue derived from the operation of Persimmon Creek. In order to determine a sharing of costs, EMW must first be able to track the benefits occurring from Persimmon Creek generation, whether revenues or avoided purchased power costs.

[39] File No. EA-2022-0328, *In the Matter of the Application of Evergy Missouri West, Inc. d/b/a Evergy Missouri West for Permission and Approval of a Certificate of Public Convenience and Necessity Authorizing It to Purchase, Own, Operate, Maintain and Otherwise Control and Manage an Existing Wind Generation Facility in Oklahoma*.

d. EMW shall track all Persimmon Creek generation and corresponding market energy pricing at the corresponding time, and energy purchases or sales occurring at the corresponding time in meeting EMW load requirements.

e. Staff shall work with EMW in developing reporting formats that will allow a determination of costs and benefits associated with Persimmon Creek. The reporting shall include access to source documents including SPP invoices that allow Staff on a quarterly basis to validate the reporting. The initial cost and benefit report form shall be filed in this case within 90 days of any closing on Persimmon Creek.

f. The cost and benefit reports shall be provided through EFIS as non-case related submissions on a quarterly basis not later than 60 days after the end of the quarter. OPC shall also have access to information when reported. Staff shall maintain a report that can be reviewed in EMW's next rate case of the cumulative costs and benefits of Persimmon Creek from the date it is included in EMW's fleet.

g. EMW shall track all expenses related to the operation of Persimmon Creek. EMW shall provide a document containing the calculation of any Persimmon Creek related PTCs that are used for consolidated income tax purposes on an annual basis. A listing of source documents used in calculating the PTCs shall also be included. This information shall be provided through EFIS as a non-case related submission on an annual basis within 60 days of the filing of EMW's federal income taxes with the Internal Revenue Service.

Q. Does this mechanism explicitly address the concern of the variation in the costs and benefit of the project over the life of the project?

A. No. If this mechanism, exactly as written, were applied to these Ameren Missouri solar projects, even if the projects performed exactly as modeled, the project costs would exceed the project revenues in the early years, and the project revenues may exceed the project costs in the later years.

Q. Is there a way to account for this variation in costs and benefits over a project's life?

A. Yes. An option is to calculate the average $/MWh of revenue requirement in excess of the facilities in excess of the solar-weighted energy value, with 50% of the difference recorded to a regulatory asset/liability. Carrying costs would accrue on this asset/liability, but be capitalized over its life. An example spreadsheet of this treatment using Mr. Michel's

projections for Split Rail is attached as SLKL-r5, depicting the hypothetical outcome where inflation is 2%, the solar-weighted energy value is $30/MWh in the first year of operation, Ameren Missouri's modeled revenue requirement happened to be correct, and the risk-share is set at 50%/50%. This model would be updated with actuals to-date in each rate case. This is not a fully designed mechanism, and it may not be possible to fully design such a mechanism until Ameren Missouri's decisions regarding tax treatment and RESRAM are known. The interaction of the mechanism with the FAC would also require careful examination. Note, it would likely be cleanest in rate cases to impute the shareholder contribution required to constitute the sharing percentage as imputed revenues.

Q. Does Staff recommend proceeding with the projects given this model?

A. Staff does not recommend proceeding with any of these projects at this time. A 50%/50% risk share on a project that is expected to cost ratepayers significantly more than it is worth is still not a reasonable proposition. However, if the Commission does provide Ameren Missouri with the requested permissions for one or more projects, Staff does recommend that acceptance of an adequate risk sharing mechanism be ordered as a condition.

Q, Can you illustrate how this mechanism is not "enough" for the costs of the proposed projects to be justified by their value, assuming the projects are needed?

Yes. For the Split Rail project, if the actual outcome were more like Staff's threshold analysis, than Mr. Michels' models, ratepayers would pay costs that are ** 126% ** of the operational value of the asset, as opposed to ** 150% **.

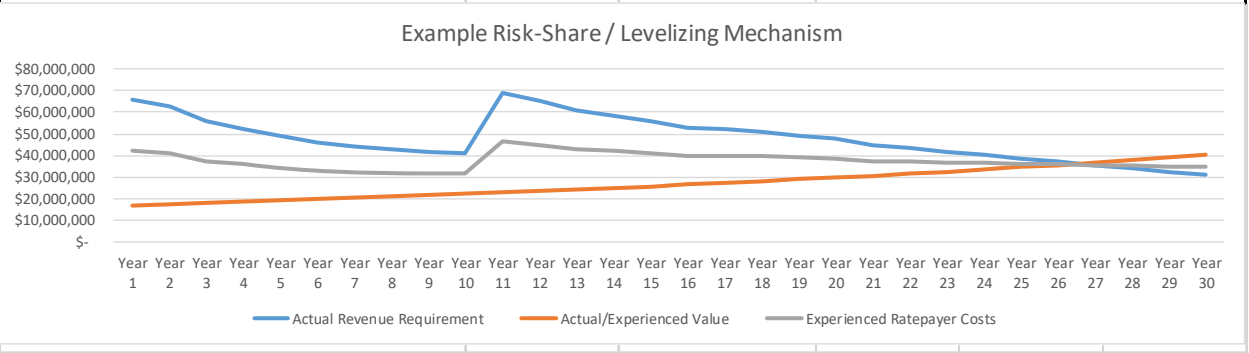
**

[redacted]

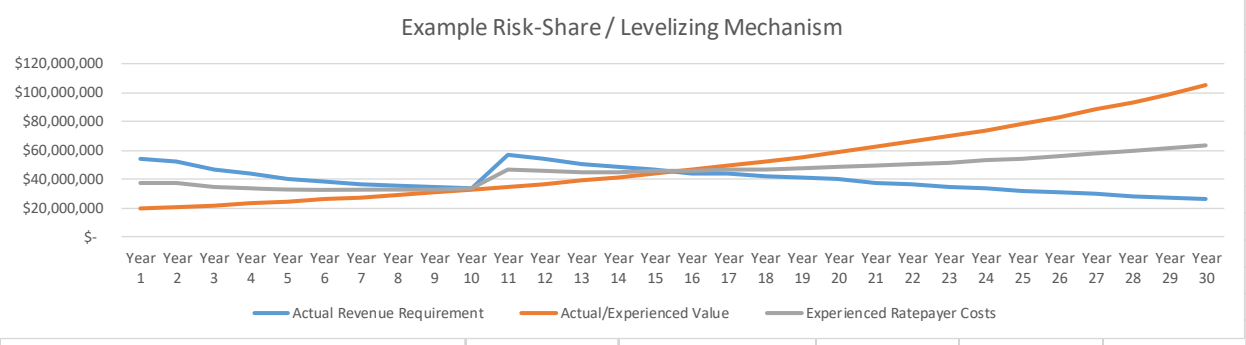
**

Included below are several examples of inputs and results, including cost to benefit ratios in real dollars. Note, this is designed as a bilateral mechanism, meaning shareholders would benefit if the cost to benefit ratio of the project dips below 1.

| | | |
|---|---|---|
| Net Revenue Requirement % from Modeled: | 120% | |
| Starting Solar-Weighted $/MWh: | $ 26.42 | |
| Energy Inflation: | 3.00% | |
| Solar Degradation: | 0.02% | |
| | | Cost : Benefit |
| Actual Revenue Requirement Lifetime | $ 1,442,989,625 | 1.78 |
| Actual/Experienced Value Lifetime | $ 812,393,963 | |
| Experienced Ratepayer Costs Lifetime | $ 1,126,447,730 | 1.39 |



| | | |
|---|---|---|
| Net Revenue Requirement % from Modeled: | 100% | |
| Starting Solar-Weighted $/MWh: | $ 30.00 | |
| Energy Inflation: | 6.00% | |
| Solar Degradation: | 0.02% | |
| | | Cost : Benefit |
| Actual Revenue Requirement Lifetime | $ 1,202,491,354 | 0.78 |
| Actual/Experienced Value Lifetime | $ 1,532,314,915 | |
| Experienced Ratepayer Costs Lifetime | $ 1,363,379,492 | 0.89 |




Q. Could a reasonable risk sharing mechanism be designed that would better align project value as an operating asset with prudent revenue requirement over the life of the project?

A. Yes. A mechanism similar to that designed for Westar's Western Plains windfarm, which treated ratepayers as a counterparty to a PPA, could be developed, if and when reasonable cost projections that are justified by a project's value are developed.[40]

[40] The relevant stipulation provisions from Kansas Docket 18-WSEE-328-RTS are set out below:
20. The Parties agree that the Western Plains Wind Farm will be recovered by Westar through a fixed price PPA approach. The revenue requirement decrease agreed to by the Parties and stated above includes a levelized revenue requirement for Western Plains of $23,697,593, which assumes a 46.57% capacity factor, and 1,144,717 MWhs, which equates to $20.70/MWh.
21. In the event that the Western Plains Wind Farm has a capacity factor of greater than 48.57%, producing more than 1,193,878 MWhs in any calendar year based on a rolling three-year average, beginning with the three-year average period ending December 2020, the Parties agree that Westar will be allowed to include a charge in the ACA filing to the benefit of Westar that equates to the difference between the actual production and the 1,193,878 MWhs, multiplied by $20. 70/MWh.
22. In the event that the Western Plains Wind Farm has a capacity factor of less than 44.57%, producing less than 1,095,556 MWhs in any calendar year based on a rolling three-year average beginning in 2020 and using the three-year average for 2018-2020, the Parties agree that there will be a credit in the ACA filing to return to ratepayers any shortfall in MWhs from 1,095,556 MWhs, multiplied by $20.70/MWh.

**MEEIA Earnings Opportunity ("EO") Moratorium**

Q, What was the rationale of the EO in file EO-2015-0055, Ameren Missouri's "MEEIA Cycle 2?"

A. As explained in my Supplemental Direct Testimony in EO-2015-0055 ("Cycle 2"), the EO was valued consistent with the stream of investment opportunity investors would forgo by accelerating the retirement of Meramec coal from 2030 to 2026, and deferring the building of a combined cycle unit.[41] This was described as "an incentive to meaningfully reduce future capacity requirements."[42] A copy of this testimony is attached as SLKL-r6.

Q. What is contemplated under the MEEIA statute for the performance incentive?

A. The MEEIA statute relies on certain assumptions:

1. Utility opportunities for profits come from investment of shareholder dollars, including investment in generation facilities.
2. Rates can ultimately be cheaper for all ratepayers to reduce the amount of generation facilities needed in the future.
3. Absent MEEIA, the utility's incentive to invest in generation facilities serves as a disincentive for that utility to facilitate programs to reduce future capacity requirements.

In light of these assumptions, the MEEIA statute provides utilities with timely earnings opportunities associated with cost-effective measurable and verifiable efficiency savings.

Q. What is the goal of the EO?

A. The EO has been designed to result in Ameren Missouri shareholders receiving a performance incentive equal to the present value of the earnings opportunity on capacity-related investments that they would receive if Ameren Missouri did not promote DSM

[41] Supplemental Direct Testimony of Sarah L. Kliethermes, File No. EO-2015-0055, pages 10 - 11.
[42] Supplemental Direct Testimony of Sarah L. Kliethermes, File No. EO-2015-0055, page 2.

programs, all else being equal. This creates an incentive for Ameren Missouri to promote energy efficiency.

Q. Has Ameren Missouri avoided earnings opportunities on capacity-related investments due to promotion of energy efficiency?

A. No. Ameren Missouri has grown its gross and net ratebase related to generation capacity while reducing its MW of accredited capacity. Note, it may be easy in this case to be confused by the usage of certain terminology across dockets. As someone deeply involved in the Cycle 2 2015 MEEIA cases and negotiations, I am very certain that references from that time to "capacity-related investments" mean generation plant. Ameren Missouri's position in this case that these solar projects are to an address an "energy need," does not in any manner change the fact that the solar projects are "capacity-related investments," as that term is understood in the MEEIA context. In other words, Ameren Missouri seeks in this case to invest in additional generation plant, after being compensated for not getting to invest in additional generation plant during the 2020s.

Q. How have Ameren Missouri's net capacity-related investment and its "UCAP" changed over time?

A. The net ratebase has increased, the UCAP has decreased, and the $/UCAP MW have increased. Essentially, Ameren Missouri has increased its investment opportunities in generation facilities, while ratepayers have been paying more for less usable capacity. These values are provided below in the Confidential table and illustration below:

**
[redacted]

[redacted]

**

Q. Were investments like these solar projects contemplated in designing the Cycle 2 EO?

A. No. The Cycle 2 EO assumed that the capacity-related investment would decrease ratably over time through the operation of depreciation.

Q. Simply put – do investors have more or less capacity-related investment opportunity than they had in 2013?

A. More.

Q. Simply put – do ratepayers have more or less available usable capacity than they had in 2013?

A. Less.

Q. Have investors avoided an earnings opportunity if the Commission grants Ameren Missouri permission to build these solar projects?

A. No. Investors are gaining an earnings opportunity if the Commission grants Ameren Missouri permission to build these solar projects. If the Commission continues to permit Ameren Missouri to pursue generation-related earnings opportunities, it is not reasonable for Ameren Missouri to be compensated for avoiding generation-related earnings opportunities.

Q. How much money did Ameren Missouri receive for the Cycle 2 EO?

A. $43,946,323, as identified in the Ameren Missouri workpaper "mpsc 0003 attach ER-2020-0147_wrd-2 meeia rider calcs November 2019"[43] located in EFIS at https://efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=939706269.

Q. What is the relevance of MEEIA Cycle 2 to this solar CCN?

A. Additional generation that is not necessary for capacity utterly defeats the purpose of MEEIA. Ratepayers were paying relatively low $/MW for the capacity that Ameren Missouri has retired, and are paying significant $/MW for the recent Ameren Missouri capacity additions. The MEEIA statute did not authorize MEEIA mechanisms to encourage environmental benefits, nor to encourage utility investment opportunities. The MEEIA statute authorized MEEIA mechanisms to reduce the investment shareholders would need to make in generation capacity. A utility decision to introduce significant capital additions into its revenue

[43] Provided in Case ER-2020-0147.

requirement for the benefit of shareholders must come at the cost of shareholder agreement to abandon incentives to shareholders to reduce the amount of capital additions to its revenue requirement. In other words, Ameren Missouri should not be able to collect forgone earnings for shareholders in the form of an earnings opportunity, when Ameren Missouri is not forgoing any earnings for shareholders. Any CCNs authorized in this docket should be conditioned such that if Ameren Missouri proceeds with the solar projects, it agrees not to seek any earnings opportunities in any MEEIA applications or MEEIA cycles through 2035.

**Condition Related to Information to Include in Future Generation CCN Requests**

Q. Should Ameren Missouri's direct testimony filing in a given case include all information necessary for the Commission to include findings of fact supporting the grant of the authority requested?

A. Yes. Ameren Missouri is not a small Home Owners' Association seeking authority to lawfully provide service to its residents. Ameren Missouri is itself a multibillion dollar utility, and it is part of a multibillion dollar multi-jurisdictional holding company, with well-known plans to become larger. It is difficult to conclude whether it is more concerning if Ameren Missouri is failing to conduct adequate internal review of the projects for which it requests the Commission's imprimatur, or if it conducts that review, but fails to provide it to the Commission for its consideration. In its supplemental direct in this case, and in all future CCN cases, Ameren Missouri should:

1. Include binary with/without scenarios with reasonable changes in inputs/assumptions
2. State explicitly what needs are being addressed, whether qualitative or quantitative
3. State what regulatory treatments are on the table

4. Provide all evidence to show that this type of plant is the right answer, and to show that this specific project is the right answer
5. The answer can't be, "Our preferred plan included X, and this project is a form of X."

As a condition of any grant of authority in this case, Ameren Missouri should accept the binding obligation to address these points.

**CONCLUSION**

Q. Do you recommend that the Commission determine that the projects for which Ameren Missouri requests permission in this case are economically feasible?

A. As discussed above, no. There is not reasonable evidence to conclude that the projects provide value to ratepayers as operating assets that justifies the costs of the projects to ratepayers.

Q. Do you recommend that the Commission determine that the projects for which Ameren Missouri requests permission in this case provide adequate ratepayer value to proceed?

A. No. Ameren Missouri has not articulated a need for these projects to justify the extent to which the cost of the projects to ratepayers exceeds the value these projects could provide to ratepayers as operating assets. As discussed by Mr. Busch, it is possible that some of the projects could provide adequate value that the Commission could determine that permission is appropriate, but that information has not been presented to date by Ameren Missouri, and it would be inappropriate for that information to be introduced into the record without adequate opportunity for Staff and other parties to review that information, conduct discovery, and respond in prefiled testimony.

Q. Does this conclude your rebuttal testimony in this matter?

A. Yes.

**BEFORE THE PUBLIC SERVICE COMMISSION**

**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and Certificates of Public Convenience and Necessity Authorizing it to Construct Renewable Generation Facilities | ) ) ) ) ) | Case No. EA-2023-0286 |

**AFFIDAVIT OF SARAH L.K. LANGE**

STATE OF MISSOURI )
) ss.
COUNTY OF COLE )

**COMES NOW SARAH L.K. LANGE** and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Rebuttal Testimony of Sarah L.K. Lange*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

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

**JURAT**

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 5th day of October 2023.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin
Notary Public