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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. EA-2023-0286

SURREBUTTAL TESTIMONY

OF

AJAY K. ARORA

ON

BEHALF OF

UNION ELECTRIC COMPANY

D/B/A AMEREN MISSOURI

St. Louis, Missouri
December, 2023

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I. TABLE OF CONTENTS

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Ajay K. Arora. My business address is One Ameren Plaza, 1901 Chouteau Ave., St. Louis, Missouri.

Q. By whom are you employed and what is your position?

A. I am the Senior Vice President and Chief Renewable Development Officer for Ameren Missouri.

Q. Are you the same Ajay Arora that submitted direct testimony in this case?

A. Yes, I am.

II. PURPOSE OF TESTIMONY

Q. What are some of the key points you would like the Commission to take away from your surrebuttal testimony?

A. There are several points I would make in response to Staff's rebuttal testimony.

- Staff's contention that the Company has not identified its need for energy is demonstrably false. The need was identified in the Company's direct case, that is, the need to replace energy from the 5,400 mega-watts ("MW") of

coal-fired generation that either has retired or will retire over the planning horizon, including one additional large coal facility next year and another by 2032. The Company presented evidence establishing both the nature and extent of the need in its direct case that was as extensive, and in fact more so, than the evidence on the same topic presented in the Boomtown docket which the Commission accepted as establishing the Company's need for energy. While it is not the Company's position that the Commission's approval of the Boomtown facility means the facilities in this docket should automatically be approved, the simple facts are: (a) the needs to be met by the facilities are the same as the need found by the Commission to exist in Boomtown, based on similar evidence; (b) the evidence in this docket shows that those replacement energy needs still remain; and (c) the evidence in this docket shows that the facilities at issue in this docket will only meet a small portion of those needs, meaning there is no reasonable scenario where the projects at issue in this docket are not needed.

- The Company cannot simply plan to meet a capacity need at a given point in time. Prudence demands that the Company plan for both its energy and capacity needs for reliability, as it has always done. Now that the Company does not have the historical energy buffer that has benefitted its customers tremendously over the past few decades – and given that it must replace all the energy from its coal-fired generation that has traditionally had the ability to supply approximately 85% of its native load – it is critical that its resource planning be driven both by energy and capacity needs. This sort of informed

planning is what results in a preferred resource plan that uses an appropriate combination of dispatchable and on-demand resources as well as least-cost renewable energy resources in order to ensure that the generation portfolio that is replacing retiring coal plants is both least-cost and reliable to meet our customer needs.

- The Staff completely ignored the significant evidence presented by the Company in its direct case based on key planning assumptions that underlie its 2023 IRP and its current preferred resource plan. In the Boomtown docket the Company's preferred resource plan, which was similar to its current plan in its addition of renewable energy resources to replace some but not all of the energy that will no longer be produced by coal-fired generation, was a lower cost alternative for customers by more than $600 million on a net present value of revenue requirement basis. The Company's current preferred resource plan is a lower cost alternative by even more, over $700 million on a net present value basis using a comparable probability-weighted average carbon price assumption. Staff ignores this entirely.
- As the Commission recognized in its Boomtown order, renewable energy is the most affordable means to replace the energy that will no longer be produced from coal, it mitigates market risks that have become more acute, and it mitigates the significant risk that the Company's energy shortfall could occur sooner or be more severe than projected under normal conditions, including due to higher loads due to increased economic activity

and customer consumption, higher loads related to extreme weather, changes in weather impacting generation output, or environmental regulations that impact either the retirement date of existing coal-fired resources or such resources' dispatch.

- The Company cannot and should not attempt to simply run its gas-fired peaking fleet as if it consists of energy resources, as Staff suggests. Doing so is not practical, and even if it were, would be higher risk and more costly for customers. The units are not designed to be run in that fashion, cycling on and off every day, doing so could render them unavailable when they are really needed despite their high cost of energy production. In any event, operational and permitting constraints on the units mean they simply cannot meaningfully replace the energy the Company needs to serve its customers'. Nor can the Company simply add a combined cycle plant now to meet its current energy needs; it could not practically do so before 2030 and even once such a unit is added, relying on it for energy in lieu of zero fuel cost and zero emissions renewable energy would be more costly for customers.
- It would be imprudent and unwise to simply rely on the market to meet 25% of the Company's energy needs as, incredibly, Staff suggests. Doing so would be at odds with the Commission's viewpoint expressed in its Boomtown order, where the Commission clearly recognized the benefit of maintaining Ameren Missouri's historical energy buffer as a means to mitigate myriad risks and for Ameren Missouri to have the capability to serve its customers' needs in Missouri without relying on other utility

operators in other states. Midcontinent Independent System Operator ("MISO") has no load serving obligation, but the Company does. The Commission has recognized, and should continue to recognize, both that 1) its regulated utilities have an obligation to have resources to meet their loads, and 2) that there are benefits of them owning an appropriate mix of such resources to do so. Staff's position would subject the Company's customers to all of the price volatility prevalent in the MISO energy markets and also result in guaranteed cost to customers. The Company's preferred resource plan, on the other hand, provides significant mitigation of market price volatility just as it has done historically so successfully.

- Delaying the addition of renewable energy resources (and additional dispatchable resources along the way) to the late 2030s, or if at all as Staff suggests, would be risky and more costly for customers, especially given the energy needs that exist in the near-term even under normal planning conditions, the risk that more energy is needed sooner, and the significant tax benefits available now that will not be available later.
- Staff is dead wrong in its contention that the Company is adding "Mercedes Benz" resources. Indeed, it is simply not true that the Company's project selection process favors higher cost projects (it doesn't – it favors lower cost projects). What the Company is doing is meeting its customers' needs with appropriate resources identified and acquired/built using competitive request for proposal processes, with the Company choosing perfectly good Fords and Chevys that meet its customers' needs.

- The Company's robust and effective IRP process has consistently identified a need for significant expansion of renewable resources over the planning horizon and the economic and risk mitigation benefits of beginning and continuing that expansion now rather than waiting. This was reflected in the preferred plan included in the Company's 2020 IRP filing and its 2022 Notice of Change in Preferred Plan, and it is true and reflected in the Company's preferred plan included in its 2023 IRP, filed with the Commission nearly three months ago. The Company is now implementing this addition of renewable generation over the next several years consistent with the preferred plan included in several previous IRPs. This is particularly important since each renewable energy project can take five to eight years to reach commercial operations and the Company needs several dozen renewable energy projects to meet its energy needs.
- Staff's outright opposition to the Cass County project, apparently premised on its location in Illinois, is illogical and rebutted by the evidence. The Project is the most mature of the four projects proposed in this docket, is competitive from a cost perspective, provides geographic diversity, and meets the Company's needs in much the same way that the Boomtown project, also located in Illinois, does. It is also an ideal project for meeting unmet demand for the Renewable Solutions program approved by the Commission in the Boomtown case. Cass County, and all of the projects proposed in this docket, will cost-effectively contribute to meeting the Company's and its customers' needs.

III. AMEREN MISSOURI'S ENERGY AND CAPACITY NEEDS

Q. Do you agree with the Staff's contention that the Company has not demonstrated or defined a need for the four Solar Projects[1] in this CCN case?

A. No. Both Company witnesses Michels and I presented extensive direct testimony discussing the six key drivers[2] underlying the Company's need to transition its generation fleet to zero emissions renewable energy resources. As well as low carbon dispatchable resources, including significant solar generation, well beyond the 550 megawatts ("MW") of solar generation capacity proposed in this case. Despite the Company clearly articulating the basis for this need and why meeting it is in the public interest in this docket, for reasons that are quite similar to those underlying the Boomtown docket for which the Commission approved a CCN earlier this year, [3] Staff refuses to engage with or provide constructive commentary on the reality that the fleet must transition to address the inevitable loss of energy from approximately 5,400 MW of coal-fired generation that has, or is going to, retire.

It is also impossible to square Staff's position in this case, given the evidence we have already presented (which is more extensive on this issue than it was in the Boomtown docket), with key Commission findings in its decision in the Boomtown docket. At their core, the needs being met by the projects in this case are the same as the needs being met by the Boomtown facility, and the basic evidence and justifications are the same as well.

[1] Cass County, Split Rail, Bowling Green, and Vandalia.
[2] *See, e.g.,* pages 5 to 7 of my direct testimony for a list of those key drivers. My direct testimony as well as that of Mr. Michels' presents extensive evidence on each of them.
[3] While we independently provided evidence supporting the need in this docket, this follows providing extensive evidence in the Boomtown docket (File No. EA-2022-0245), which was specifically relied upon by the Commission to assess this same need. The Boomtown facility was only one small step toward meeting these needs. Company witness Steve Wills' surrebuttal testimony addresses the Staff's failure to acknowledge the Commission's own policy statements and conclusions about the need for greater renewable generation generally, and specifically for Ameren Missouri.

Staff's rebuttal is, in effect, telling the Commission that the Commission was wrong when it decided the Boomtown case.

Q. What are some of these key Commission findings?

A. In its finding of facts in its *Report and Order* in the Boomtown docket, the Commission specifically cited to testimony indicating that solar projects economically meet the Company's needs, that adding them reduces the risk of market price and fuel volatility, and that adding them diversifies the generation fleet.[4] The Commission also specifically found that the most affordable way to replace retiring coal-fired plants is with renewable generation.[5] Later, the Commission specifically points to the risk mitigation that adding solar provides.[6] The Commission also stated in its Boomtown decision that if we wait to add renewable resources we risk falling short of our energy needs, if we wait we could end up having to rapidly deploy less beneficial resources, and that future events such as legislation could change energy policy in a way that would drive the need for imminent and significant renewable expansion.[7]

These findings and conclusions by the Commission do not in and of themselves mean the Commission should approve the CCNs requested in this case, but given that the evidence that led to those conclusions continues to be true, and even more so now in this case, it makes absolutely no sense to me for Staff to go on and on for hundreds of pages claiming that we did not establish our needs when we filed our direct case. If that were true, how then did the Commission decide what it decided in the Boomtown docket?

[4] *Report and Order,* File No. EA-2022-0245, ¶ 7.
[5] *Id.*, p. 29.
[6] *Id.*, ¶ 46.
[7] *Id.*, ¶¶ 29, 31.

Q. Did you present information in this case in addition to the kind of information you presented in the Boomtown docket?

A. Absolutely. To further illustrate the need that solar projects like the Solar Projects proposed in this docket fulfill, the Company, in its direct testimony, presented numerous annual energy position charts across a variety of scenarios as well as more granular charts showing how solar resources provide for the energy needs of our customers' on an hourly basis across various seasons.[8] Our testimony showed that the Company has an imminent need for additional energy resources: without new additions we expect to be short economic energy as early as 2028 under normal conditions – and potentially sooner depending on numerous factors, including: the pace of load growth including from electrification, the weather that may occur in a given year, or any increase in environmental regulations that impact the dispatch of the old fleet resources. In addition, the hourly energy charts (we had not presented such information in the Boomtown docket) in Company witness Matt Michels' direct testimony clearly demonstrate how Solar Projects fulfill as well as align with our energy needs in both summer and winter seasons. In response to Staff's claims that the 2023 IRP may have materially changed (perhaps reduced) our energy needs, Company witness Michels also presents updated annual energy positions based on the Company's 2023 IRP analysis that reaffirm that the need for energy demonstrated by the Company's direct testimony remains.[9]

[8] Michels direct testimony, pages 25-45.
[9] Michels surrebuttal testimony, pages 61-72.

Q. Can you clarify why the Company is planning for energy needs in addition to capacity needs at a specific point in time?

A. Yes. In answering that question, we need to keep in mind that as we transition away from coal plants that have or are reaching the end of their useful life, we need to evaluate technologies that are available today that are mature, reliable, least-cost and produce low or no emissions. We also need to evaluate customer needs not just from a capacity perspective at a specific point in time, but also from an energy perspective. We take this approach not because capacity and energy are two fundamentally unrelated needs, but because our future resource fleet will consist of a diverse portfolio of resources with different strengths and weaknesses. Renewable resources are primarily *energy* resources: they generate energy throughout the year at a least cost per unit of energy generated, have zero emissions, and operate with zero fuel costs. However, we cannot say with certainty that renewable resources will always be available to meet demand. This is why we also intend to rely on natural gas resources as primarily *capacity* resources: in times of system stress or under peak load conditions, we know they will be available to dispatch and keep the system operating reliably. However, to generate energy, natural gas resources using technologies available today also generate carbon emissions, which exposes them to pressures and risks from environmental regulation, and they rely on fuel with volatile costs to operate. These realities create increased costs and risks for our customers that are not present with renewable energy resources. This perspective is not intended to suggest that renewable resources do not offer capacity benefits, or that natural gas resources do not generate energy. Rather this framing aims to ensure an overall portfolio of complementary,

resilient resources that, when operated together, can meet customer needs in a least cost and reliable way under a variety of future environmental policy regimes that might exist.

Importantly, contemplating energy needs within resource planning is not at all new or unprecedented. Staff calls the Company's energy need "amorphous" and suggests that the Company could or should not concern itself with how much economic energy its system produces, because it can lean on the market for energy. But resource planning has always, historically, and today, been about building the appropriate *mix* of resources that perform the different functions that will ultimately manifest as a coherent operational system that meets all of customers' needs and does so as economically as possible. That does not happen by accident, but rather requires careful planning on an integrated basis. This is exactly what Ameren Missouri does using its IRP process.

Q. Can you provide a historical example of how the Company specifically, and utilities in general, have contemplated and planned for energy needs?

A. Yes. The Company's Callaway nuclear energy center – which performs a critical function by producing huge quantities of low variable cost and emissions-free energy – would never have been built if the goal was exclusively to fill in a gap in a peak hour capacity position table. Nuclear plants have relatively high capital costs per kilowatt of capacity, which makes them a suboptimal solution for a pure capacity shortfall. Nuclear plants produce large quantities of energy at a low variable cost, and as a result are a valuable part of a fleet that not only ensures sufficient capacity for the peak hour, which also economically produces the energy our customers use day in and day out. I'm not suggesting that renewables are traditional baseload resources like a nuclear plant is, but I am saying that it is not new to consider both energy needs and capacity needs in a complementary

fashion while making resource selections, in order to have a system that works cohesively. For example, if the combination of capacity and energy that nuclear provides was a cheaper solution today than pairing renewables with dispatchable gas units to achieve both of these objectives, the Company's plan would include new nuclear. Suffice it to say, capitalizing on renewables' ability to produce large quantities of low variable cost energy is consistent with the idea of building a diverse generation system that, when operated, will leverage the strength of each resource to achieve reliability and affordability.

Q. Does the Company's resource plan, of which the Solar Projects at issue in this docket are a part, align with the kind of planning you just discussed?

A. Yes. The Solar Projects are part of the overall generation mix that we need to have in place as we replace 5,400 megawatts of coal-fired generation to meet our customers' needs over the long term. Specifically, the Preferred Resource Plan ("PRP") selected in the Company's 2022 Change in Preferred Resource Plan filing, and again in the Company's recently filed 2023 IRP, presents a holistic approach to meeting annual energy and capacity needs for customers, while also balancing the key risks and considerations listed above in a least-cost way. Staff repeatedly insists throughout its rebuttal testimony that the 2022 Preferred Resource Plan is invalid and no longer least-cost, due primarily to changed solar project costs and tax incentives. Inexplicably, the Staff has missed or ignored the evidence presented by Matt Michels in his direct testimony addressing *these very items.* Company witness Michels' direct testimony in this case included results from updated resource plan runs which utilized *2023 IRP assumptions* for solar costs and tax incentives to "refresh" the 2022 PRP and *ensure* that it remained the least-cost approach for

customers.[10] Company witness Michels addresses Staff's claims that the Company's information is out-of-date (it isn't) further in his surrebuttal testimony, and I will further address the specific conditions underpinning Ameren Missouri's continuing need for additional energy generation resources, and how the Company thinks about and defines "energy need."

Q. Please elaborate on why Ameren Missouri has a need for new energy resources.

A. Let me present the energy need that the Company presented in its direct testimony by taking a step back and pointing to the larger picture: Ameren Missouri is retiring all of its remaining coal-fired capacity by 2042. This equates to approximately 28 million MWh of energy every year. To put this number in perspective, Ameren Missouri's 2022 native load was approximately 32 million MWh. Consequently, as a frame of reference, the annual energy generated by the coal retirements taken by itself represents more than 85% of Ameren Missouri's current native load!

The energy generated by the retiring coal facilities must be replaced by new resources. 2042 may sound far away, but the first major coal retirement on our system has already occurred, and the next will occur in 2024, and then again in 2032 and 2036, assuming the currently planned retirement dates hold. Consequently, within just a decade of when the projects proposed in this docket are in service, that 28 million MWh covered by coal in recent years will have dropped to less than 8 million MWh; i.e., more than 75% percent of its native load will no longer have the capability to be served by coal-fired energy.

[10] Matt Michels' Direct Testimony, p. 55, Table 2. In fact, based on those 2023 IRP assumptions the 2023 IRP PRP has a greater net present value of revenue requirement advantage over the alternative.

As discussed above, the Company is considering all mature technologies that are reliable, least cost, and low emissions for replacement energy from retiring coal plants. Not all the energy to replace these coal facilities is planned to come from solar and wind – we expect natural gas generation or other clean dispatchable technologies will also make up an equal portion of the replacement energy. By 2037, the Company expects that annual energy from new solar and wind generation will make up only about 50% of the energy lost from retired coal generation.

The Company needs to plan prudently to reliably and cost-effectively replace the energy from this retiring generation to continue to serve customers' needs. Somehow the Staff continues to ignore the basic reality of these retirements and the gap they will leave. It is also notable, when considering the magnitude of the system changes ahead and the planned replacement energy needed, that the Solar Projects in this case add approximately 1.2 million MWh annually, or *less than 5%* of the energy being retired in total from coal-fired generation and less than 10% of the renewable energy we will ultimately need when the entire coal fleet is retired. For this reason, unless the Commission believes we should have a fleet with essentially no reliance on additional renewable energy resources – a belief that certainly is not reflected in the Boomtown decision or many other Commission decisions – there is no scenario where the Company's customers will not need the 550 MW of solar capacity proposed in this case.

Q. Can the Company offer a formulaic definition of energy need, as the Staff has requested?

A. No. Not to the extent the Staff seems to hope for. From the Company's perspective, the scope of change facing the electric industry today demands planning that

is truly integrated, as discussed above and throughout Company witnesses' direct testimony. Pointing to a single, near-term peak hour shortage of capacity to add new generation to meet that one need at that one point in time is not an adequate way to plan on its own. As we consider both energy and capacity needs under numerous scenarios that reflect evolving system risks and uncertainties, we have indicated repeatedly that we see an energy need because the Company's assessment of annual, available economic energy indicates an annual shortage that manifests itself as a high number of hours when we are short, and which means that we lack an adequate buffer that is consistent with our historical buffer (i.e., about 15-20%).[11] This assessment requires examining planning under numerous conditions, including: normal load growth conditions; sustained higher loads due to economic activity; more extreme conditions resulting in high loads (e.g., caused by extreme weather, which we are seeing more often and which is more extreme); and lower than planned coal dispatch due to heightened environmental regulations. To be prudent in meeting our customers' needs, we must plan for all of the above. The Company cannot simply plan for only normal conditions and hope that nothing outside of normal occurs during the entire 20-year planning horizon. The Company must plan and ensure it has the generation to meet its customers' needs under all conditions in an affordable and reliable manner.

The Company presented significant evidence and numerous charts in its direct case demonstrating the need for annual energy. Mr. Michels' direct testimony also presented specific data and charts focused on the month when our system peaks (July) at various

[11] In its *Report and Order* in the Boomtown docket, the Commission specifically pointed to the Company's historical energy buffer as one aspect of why the Commission found the Boomtown facility to be in the public interest. The same rationale applies with equal force to all four facilities proposed in this case.

points in the planning horizon (2031 and 2037), which demonstrated the significant contribution solar generation makes during those time periods and the workpapers underlying all of this information that were provided to Staff shortly after the case was filed in June of this year.

Further, to ensure reliability of the Company's energy supply in smaller time intervals, Ameren Missouri utilizes Astrape's SERVM model (discussed in Witness Michels' direct testimony in detail) to assess the adequacy of available energy and capacity on an hourly basis. Based in part on this modeling, Witness Michels provided a series of charts to further illustrate hourly contributions of solar generation and how that generation is clearly aligned with Ameren Missouri's load needs.[12] Mr. Michels also addresses Staff's incorrect claims about the efficacy of this modeling in his surrebuttal testimony.

Q. If the Company's need is for "economic" energy, why can't the Company simply run its planned and existing coal and natural gas facilities at their maximum output, as the Staff has suggested?

A. Such an approach would be both higher risk and higher cost for customers. Operationally, this also may not be feasible. Natural gas combustion turbines ("CTGs") are commonly referred to as "peakers" because they are run primarily to meet the highest peak loads the utility experiences. They are used relatively sparingly because they have high variable cost of production and require maintenance and overhaul after a certain number of starts for the generation units. In addition, there are permitting restrictions that allow peakers to only run a certain number of hours and therefore the peakers are limited on the energy that they can produce in a given year. Another danger of starting and stopping

[12] Figures 14 to 21 in Witness Matt Michels direct testimony.

peaking resources frequently to provide year-round energy is the risk that they may unexpectedly break down due to larger than expected starts and stops and therefore may not be available for the one scenario that they are supposed to protect customers from – that is producing energy when needed during "peak" time periods when there is a shortage of energy, such as another Winter Storm Uri, Winter Storm Elliot, or a sustained period of extremely hot weather, which we have seen from time-to-time, and Staff knows all of this. A utility that relied on peakers routinely on a sustained and ongoing basis to meet its daily (and therefore annual) energy requirements would be using uneconomic generation while also creating a reliability risk that it is not available when absolutely needed, and I have no doubt that Staff itself would challenge the prudence of the costs incurred under such an approach.

In regards to generating more from existing coal fired generation, the Company is limited on how much each coal plant can generate based on environmental limitations, including the possibility of additional and on-going regulations governing coal fired generation like the Good Neighbor Rule, proposed greenhouse gas emissions regulations, market conditions as well as on-going maintenance for what are now significantly aging coal plants.

Q. Staff witness Luebbert contends that if the Company builds a natural gas-fired combined cycle plant before building renewables it will be able to meet its capacity needs and therefore will not need the Solar Projects. How do you respond?

A. For several reasons, I do not agree with Staff witness Luebbert's assessment. First, Mr. Luebbert completely ignores the fact that gradually, but steadily adding renewable energy resources now and over the coming years, while adding a combined-

cycle plant essentially to replace Sioux when it retires, is approximately $700 million cheaper for customers.[13] Mr. Luebbert's suggested plan would result in the Company's customers not taking advantage of the significant renewable energy tax credits that are available now or of the zero-fuel cost energy that can be used in conjunction with these significant tax credits to start meeting the energy needs of our customers that have arisen due to the significant coal retirements.

Second, the Company may certainly see our existing load increase due to new economic activity before a new combined cycle natural gas fired plant is constructed and operational thereby causing the Company to have a higher shortage of energy before 2028.

Third, the Company could see lower than planned dispatch from its coal-fired generation due to more stringent environmental regulations such as the recently finalized Good Neighbor Rule modifications or the proposed greenhouse gas emissions regulations mentioned above, which in turn could also cause a higher shortage of energy prior to 2028.

Fourth, there exist environmental regulations and permitting uncertainty for new natural gas combined cycle generation that (a) must be managed, and (b) which remain uncertain, which has an impact on exactly how a combined cycle facility should be designed and what permitting approvals can be obtained. The demand for natural gas-fired generation has also gone up because these plants provide reliability to complement the deployment of new renewable generation. Consequently, the lead times for key equipment are increasing. For those reasons, the Company does not expect that it could place a combined cycle facility into service sooner than approximately 2030. In the meantime, our

[13] Matt Michels' surrebuttal testimony, p. 55, ll. 20-22.

future energy needs from retiring coal plants remain unmet unless we proceed with a sustained transition to greater reliance on renewables.

Q. Can Ameren Missouri simply buy the energy from MISO to cover any shortfall, as the Staff suggests in its rebuttal testimony?

A. No. It absolutely should not assume it can do so, just as it has not done so historically. To do so would be a reckless and imprudent strategy. It would essentially mean that the Company is outsourcing its obligation to reliably provide for its customers energy needs to other utility operators while it hopes that the MISO market may (1) have the energy the Company needs when it is needed and (2) at a price its customers may find affordable. As discussed in my direct testimony (and in the Boomtown docket), reliance on MISO is much riskier than it has historically been. Indeed, the Commission itself recognized this in its Boomtown decision, stating that "relying on the MISO market during peak system load period becomes a risker proposition than in the past,"[14] and also observing that the "Company can no longer count on the MISO market as a source of low cost energy to meet its peak load."[15] Moreover, the Commission recognized that having sufficient resources every year long-term, and being in the position to be a net seller of energy like it has been historically, was beneficial, given the heightened risk of relying on the market.[16]

Q. Has the Staff gotten this message from the Commission?

A. Apparently not, as evidenced by Staff witness Shawn Lange's claim that an energy shortfall of approximately 25% of our load – 8 million MWhs – is an

[14] *Report and Order*, File No. EA-2022-0245, p. 10.
[15] *Id.,* p. 29.
[16] *Id.,* p. 10.

"opportunity."[17] Just let that sink in for a moment – Staff essentially advocated the merits of exposing *a quarter of customers' annual energy requirements* to the volatility and whims of the market, that in itself may be facing shortages in the future and not be able to provide the energy our customers need. For the past several decades, Ameren Missouri has not operated as an annual net purchaser and as the Commission recognized, has maintained a 15-20% energy buffer. This has served our customers well with rates consistently far below national and regional averages[18] in no small part due to our ability to sell excess energy at a positive margin for our customers. As the Commission clearly understood when it decided the Boomtown case, the energy position that Mr. Lange points to is a position under normalized planning conditions but the reality does not always play out in a normalized way. Having an energy buffer provides significant risk mitigation against lower-than-planned generation due to environmental requirements that may reduce dispatch below that assumed, or due to unexpected outages of at a major unit, or due to higher loads than planned, including due to increasingly prevalent severe weather.

[17] Shawn Lange Rebuttal Testimony, p. 7.
[18] Company witness Steve Wills provides details on the relationship between the Company's rates and its national and regional peer utilities' rates.

Q. Has Witness Lange or any other Staff witness offered any evidence or analysis that demonstrates that the Company could or should rely on MISO to ensure the deployment and availability of resources needed to meet its customers' needs?

A. No. Beyond the simple assertion that Ameren Missouri can rely on MISO for its needs, a ridiculous assertion based on the reality of resource shortages that MISO and the entire industry can plainly see, neither Witness Lange or any other Staff witness offers any evidence, analysis, or even so much as a theory as to why Ameren Missouri should rely on MISO to ensure that such resources are available.

Q. Has the Commission ever addressed the question of whether its regulated utilities should maintain their own generation resources to meet their customers' needs?

A. Yes, it has in connection with the question of whether the Company should add capacity designed to cover its customers' peak needs. In the mid-2000s, the Company was faced with a capacity shortage and had the opportunity to purchase existing peaking capacity at net book value from its former generation affiliate in Illinois, Ameren Energy Resources ("AER"). AER had two plants for sale, what are now Ameren Missouri's Kinmundy and Pinckneyville Energy Centers. A purchase by Ameren Missouri from AER required FERC approval. In seeking FERC's approval, Ameren Missouri indicated that this Commission preferred that Ameren Missouri own generation to meet its customers' needs instead of relying on capacity or energy purchases from others through purchased power agreements ("PPAs"). This Commission submitted two letters to FERC respecting the proposed purchase. The first letter, in March 2003, assured FERC that this Commission had the ability to protect customers and ultimately decide the prudence of the proposed

purchase, and advised FERC that the purchase was consistent with the terms of a Commission-approved rate case settlement that called for additional generation additions via by Ameren Missouri. The second letter, dated June 3, 2003, stated: "The Missouri Commission prefers the surety and reliability of dedicated assets to meet Missouri load requirements to protect Missouri customers from price spikes and curtailment issues."[19] At the time of the second letter, this Commission had not sought to intervene in the FERC case but later it did, for the reasons discussed in its Motion to Intervene Out of Time. In that Motion (made after FERC had held hearings), this Commission noted that two intervenors (who supported use by Ameren Missouri of PPAs and not owned generation) had "attached the evidence and positions of Applicants and the FERC Staff regarding [this Commission's] preference, making it "necessary to formally intervene now to respond to Intervenors . . . mischaracterizations and distortions of the Missouri Commission's position."[20] This Commission's Motion to Intervene reiterated that it had already told FERC that it preferred "'the surety and reliability of dedicated assets,' that is company-owned generation." [21]

Q. Placed in context, however, when the Commission made those statements, the Company had not yet joined MISO, right?

A. That is correct, although Ameren Missouri had a pending application to transfer functional control to MISO before the Commission at the time, and MISO was planning to launch its energy market less than two years later.[22] Moreover, the Commission

[19] June 3, 2003 letter submitted on behalf of the Missouri Commission to the Federal Energy Regulatory Commission in Docket EC03-53-000,
[20] Missouri Public Service Commission Motion to Intervene, File No. EC03-53-000, ¶ 5.
[21] *Id,* ¶ 3.
[22] The Commission approved Ameren Missouri's MISO membership less than a year later.

reiterated this preference several years later in its decision involving what is now Evergy West's South Harper Plant when the utility was a participant in the Southwest Power Pool ("SPP").[23] But whether Ameren Missouri (or Evergy) had access to MISO's (SPP's) market or not didn't change the fundamental question at those times: should utilities own resources to cover their load or rely on the market? The "market" in 2003 was to enter into PPAs with independent power producers, but it was still a question of owning generation versus relying on others.[24]

Q. Please summarize your concern with simply relying on the market?

A. Following such a strategy suggests that the Company should completely ignore its responsibility and obligation to provide reliable and least-cost energy to customers, while it hopes (and prays) that its neighbor utilities are planning to not only serve their load but the load of others in MISO. MISO does not have an obligation to ensure there are sufficient resources to serve load, as made very clear by FERC Commissioner Mark C. Christie in his recent concurrence in MISO's seasonal resource adequacy construct approval docket:

> Regardless of the details of the market designs of the various RTOs/ISOs — which are not true markets at all but administrative constructs using an increasingly opaque, complex and questionable pricing mechanism— it is the states which retain the primary responsibility to ensure their load-serving entities (LSEs) have adequate resources to serve their states' consumers. While regional system operators — RTOs and ISOs — are responsible for balancing the system on a real-time operational basis to keep the lights on, RTOs/ISOs are not regional long-term Integrated Resource Plan (IRP) planners of generating or other resources. Rather, it is the states which have the ultimate authority to decide which resources get built and which get retired and whether and how their regulated LSEs have sufficient generating

[23] In the Matter of KCP&L Greater Missouri Operations, File No. EA-2009-0118 (Mar. 18, 2009), *Report and Order*, fn. 140.
[24] While in 2009 SPP did not yet have a day-ahead energy market, it did have a realtime energy market and its day-ahead market commenced shortly thereafter, on March 1, 2014.

> capacity or demand-side programs to ensure that the lights stay on for their states' residents…
>
> This is particularly true in MISO. No one disputes that the MISO capacity market has always been a purely *residual* option; it is not the primary option for an LSE to obtain the resources needed to ensure reliability. Importantly, states need to focus on their own authority to ensure adequate generating resources to serve their citizens and not default to an administrative construct regulated by FERC.
>
> Notably, approximately 90% of the load in MISO is served by vertically integrated LSEs, the vast majority of which are subject to state integrated resource planning processes. To accommodate the make-up of the MISO's footprint, MISO's proposed Tariff provisions accepted in the February 2018 Order provide that its resource adequacy requirements "are complementary to the reliability mechanisms of the states and the Regional Entities . . . within the [MISO] region." Moreover, MISO's proposed Tariff language explains that the resource adequacy requirements "are not intended to and shall not in any way affect state actions over entities under the states' jurisdiction." In other words, unlike the centralized capacity constructs used in the Eastern RTOs/ISOs, MISO's Auction is not—*and has never been*—the primary mechanism for its LSEs to procure capacity.[25]

As discussed at length in the Company's direct testimony, the entire MISO footprint, just like Ameren Missouri, is undergoing a transition from dispatchable fossil resources to a much greater reliance on renewable resources. To build off the Staff's own automobile analogy: for a utility to rely on MISO for all moments of system need without adequate resource planning would be analogous to an individual assuming they can take Uber everywhere when they need to travel, regularly, at any time, without limitation, under any weather or traffic conditions, for a reasonable cost, instead of purchasing their own vehicle. That's not to say Uber doesn't serve a purpose. The MISO market is one additional avenue by which the Company occasionally meets its needs to serve its load, and Uber is one means by which individuals can meet their transportation needs, but neither are necessarily adequate or even ideal under certain circumstances. In the case of Uber, if an

[25] Order Accepting Proposed Tariff Revisions Subject to Conditions, Concurring Opinion of Commissioner Mark C. Christie, Case No. ER-22-495-000, 001 (Aug. 31, 2022), p. 3.

individual had a need to obtain transportation anywhere, at all times, under any circumstances, Uber would not be an individual's primary solution. Ask anyone who has needed a ride-sharing vehicle during peak times before or after large sporting events or concerts: they are not always available and when they are, they are very costly. Certainly, a person would not expect to use the Uber service to travel from Saint Louis to Chicago and back if they had business or personal reasons to do so frequently, which is what Staff seems to suggest the Company do by suggesting it can rely on other out of state entities to serve a large portion of the Company's own native load.

Q. You've been discussing energy needs but what about capacity. Staff seems fixated on the winter capacity value (or Staff might say, lack of it) for solar generation. How do you respond?

A. We have never said that the principal justification for adding solar generation is to meet a winter capacity need. We've been very clear that is not the primary driver. The primary driver is to provide low-cost, emissions-free energy. We have also said, because it is true and demonstrated by our evidence in this case (and in Boomtown), that solar generation does contribute to mitigating the Company's winter capacity needs and produces a material amount of energy in the winter. *See, e.g.*, pages 40 – 45 and especially Figures 19 and 21 in Mr. Michels' direct testimony. See also pages 56 and 57 of witness Michels' direct testimony. The Commission itself also recognizes that solar does contribute in the winter, although certainly less than in other seasons.[26] Solar generation also provides for capacity needs in the summer, spring, and

[26] "The Project [Boomtown] helps meet that capacity needs – including peak summer and winter periods." *Report and Order*, File No. EA-2022-0245, p. 29.

fall seasons, especially under constrained operating energy conditions like I described earlier in my testimony and witness Michels describes in his direct testimony.

Q. Why can't the Company wait to add new solar generation until 2037 when the Company projects a sustained summer capacity need, as Staff witness Shawn Lange suggests?

A. Quite simply because it would be significantly more expensive and higher risk for customers to do so. New solar and wind projects operational by 2032 can qualify for substantial federal tax credits enabled by the Inflation Reduction Act ("IRA"), which are passed on to Ameren Missouri customers in their entirety pursuant to the IRA tracker approved in the Company's last general rate case as discussed further by witness Wills. In some cases, these tax credits can offset 40% or even up to 50% of the total project costs. Solar and wind projects that start construction after 2033 start receiving reduced tax credits every year thereafter, thereby significantly reducing the value of these projects to customers and harming customer affordability.

Moreover, as detailed in Figure 5 of witness Michels' surrebuttal testimony in this case, the Company's new IRP preferred plan, which steadily adds renewable resources through 2036, is lower cost by approximately $700 million as compared with a plan that does not add significant levels of renewable resources until after 2037 (Renewables for Capacity Need).

Further, there is no guarantee the current tax incentives will remain in place as long as currently planned. Depending on the makeup of Congress as well as which party holds the Presidency, there is certainly a risk that the IRA tax credits could be curtailed or eliminated early.

Also, in reading the chart (Figure 25) that Staff witness Shawn Lange is referring to, it actually shows that the company has a summer capacity shortage in 2031. The Company barely has a small excess capacity in 2032 to 2037, an excess that can very easily be completely eliminated by additional load in its service territory, and then the Company has a huge shortage of summer capacity again.

Finally, as the Commission itself recognized in its Boomtown decision (a fact I also discuss in my direct testimony in this case), renewable energy project development takes a long time (five to eight years), good projects are hard to come by and can be lost if we do not act on them, and waiting to add them risks us being forced to try to rapidly deploy less beneficial resources.[27]

IV. UTILITY DISCRETION IN PLANNING AND EXECUTION

Q. Should utility management have some level of discretion in appropriate planning assumptions within the IRP rules and ultimately in how the preferred plan is executed?

A. Yes. As discussed in detail by Company witnesses Michels and Wills, the IRP rules repeatedly point to the necessity of utility decision making. As noted earlier, ultimately, utility management is responsible for planning for a reliable and least-cost energy supply to its customers. As such, various risks, and considerations that utility management considers important can and should be appropriately factored into its planning efforts. To name just a few risks and considerations, these include environmental risks, price risks, reliability risks, new generation technology risk, implementation risks, tax credit benefits, economic development benefits, and more.

[27] *Report and Order,* File No. EA-2022-0245, pp. 11, 12 & 28.

Q. Staff witness Luebbert contends that the Company suggests flexibility is key to planning and implementation but has been unwilling to show such flexibility despite changing market and policy conditions. Please respond.

A. Staff witness Luebbert's premise for this criticism is that both the solar market and renewable tax incentives changed, but Ameren Missouri made no changes to its Preferred Resource Plan and instead continued to charge ahead with project implementation. As discussed above, and in more detail in Company witness Michel's surrebuttal testimony, this accusation is simply false and ignores the specific evidence presented as part of our direct case. Both solar and wind project costs, in addition to tax incentives, were updated *in Matt Michels' direct testimony* to reflect 2023 IRP assumptions. Mr. Michels specifically called this out for Staff at page 65, lines 3 - 11.[28] These results were assessed to ensure that it would continue to make sense to move ahead with implementation *despite* changing market and policy conditions. Planning and implementation in a constantly evolving industry requires just the sort of sanity checks that the Company performed prior to filing this case and will continue to complete as the Company executes on its transition to zero and low carbon resources. As I just noted earlier, these changes have confirmed that the Company's transition plan as represented in its 2023 IRP preferred plan, as opposed to waiting around to try to hit some specific capacity need at a specific time, results in lower costs to customers – over $700 million even before accounting for other key transition risks such as financing costs and land availability.

[28] Matt Michels' Direct Testimony Schedule MM-D16 details updated assumptions reflected in the Company's direct case analyses, including certain key 2023 IRP values.

Q. Does the Company have a track record of simply blindly moving forward with a plan when things change?

A. No, and Staff can't point to any such instance. When the Company first embarked on adding larger renewable energy facilities – initially wind generation facilities to be used for Renewable Energy Standard ("RES") compliance – it sought and received a CCN for the Brickyard Hills facility. Staff supported the CCN under the terms of a stipulation, but the Company did change its plan and did not close on the Brickyard Hills facility because things changed. The transmission interconnection costs came in far above expectations, rendering the project well out of the market. This example clearly rebuts Staff witness Luebbert's accusation that the Company will charge blindly ahead with any investment if it is reflected in planning. Much like the Company did in the Brickyard Hills case, we will continue to act thoughtfully and prudently to make the right resource decisions for customers, which inherently requires flexibility in both planning and implementation.[29]

Q. Staff witness Sarah Lange criticizes the Company's Key Performance Indicators suggesting that the company is investing in generation resources that do not best meet customers' needs.[30] Please respond to this assertion

A. I absolutely do not agree with the assertion that the Company is investing in resources that do not best meet customer needs. The Company has a responsibility to provide reliable energy supply at an affordable rate to its customers and undergoes an extensive IRP process to determine the generation plan to fulfill this obligation. Once the PRP is identified to

[29] Staff witness Brodrick Niemeier mentions the Brickyard Hills project in his surrebuttal testimony, claiming that Ameren Missouri has "pursued unfavorable projects," If this was intended to suggest the Company makes poor decisions it does just the opposite given that the Company's decisions regarding Brickyard Hills – including its eventual decision to abandon the project reflect sound, prudent, and in the interest-of-its-customers decision-making.

[30] Ms. Lange refers to them as a "Key Performance Index", citing to our supplemental response to Staff DR 65. The response correctly refers to them as Indicators.

meet those objectives, the Company can and should properly align its management incentives to pursue implementation of this plan. This alignment ensures that the Company is acting in the best interest of its customers. Staff witness Sarah Lange criticizes the Company for incentivizing generation resources with low operations and maintenance ("O&M") costs.[31] That this is a criticism is completely bewildering because a generation resource like solar that has low O&M costs and no fuel costs effectively results in a low LCOE. This *benefits* customers. Resources like that should be at the very top of any generation plan! Renewable resources also attract additional load to the Company's service territory, a fact that lowers fixed electric system costs for all customers, another fact inexplicably misunderstood or ignored by Staff. The Company, however, does have to factor in the benefits of these kind of resources for providing least cost energy to its customers long-term and therefore has appropriately provided management incentives to align its actions and investments with the best interest of its customers.

Q. Staff witness J Luebbert provided a Mercedes Benz analogy, suggesting that the Company only looked at the equivalent of a "Mercedes Benz" solar projects in selecting the four Projects in this CCN case. Is the implication he seeks to draw with the analogy true?

A. No. Mr. Luebbert's claim is part of a larger theme seen in Staff's rebuttal, that is, an unfounded assertion that the Company is simply growing rate base as much as it can and is seeking the highest cost projects it can find, which on its face makes absolutely no sense given the Commission's ability to disallow imprudently incurred costs. Not only did Staff mischaracterize our Key Performance Indicators, as I just explained, but another Staff witness, Mr. Cunigan, incorrectly claimed that our RFP scoring gave higher scores to

[31] Sarah Lange Rebuttal Testimony, pp. 70-71.

projects with higher capital costs than those with lower capital costs. Company witness Scott Wibbenmeyer's surrebuttal testimony demonstrates that this is simply not the case; we are not picking Mercedes Benz solar projects when a perfectly good Ford or GMC is available.

If Mr. Luebbert thinks an analogy will help the Commission assess the Company's project selection process, I'll provide one that in fact reflects that process. Consider a young family of four in rural Missouri. As the family has grown, their transportation needs have expanded to include important things like getting to work, activities for their young kids, and taking care of grandparents – one of whom needs to go to the hospital frequently for a chronic illness. This young family has benefited from using an old 1980s car that was sold to them at a very attractive cost by one of their parents. The young family also benefited from the fact that this parent took extremely good care of the old car, regularly maintaining it and fixing all issues proactively and promptly.

However, at this point the old car is well past the end of its useful life, is extremely fuel inefficient, and now breaks down much more frequently and has several unsafe parts that may cause it to fail a safety inspection. While the car has provided the family decades of reliable transportation, newer cars are available that are much more fuel efficient, safer, and more reliable. The family knows they will need multiple cars in the future to meet their expanding needs, but to start they decide to purchase a small SUV. The family reaches out to all the dealers of small SUVs in their area, evaluates the offerings, including price, and selects a car that is well priced, highly fuel efficient, and has 40% federal tax credit and dealer incentives and buys the SUV.

The Staff's rebuttal case is akin to suggesting that instead of following their well-researched decision to provide for their transportation needs safely by buying this SUV, the family should evaluate if their neighbors may be able to offer them a ride every time their old car breaks down, or perhaps that they should wait for a cab, or use ride sharing, during the various situations they face, whether it is late in the night when they need to go to the hospital or it is snowing or thunder-storming. A prudent family that has responsibility towards their family, younger and older, would choose to buy the car they need, and use the tax credits, dealer incentives and high fuel economy to provide for an affordable and reliable solution to their needs.

That is exactly what we are doing.

Q. Staff also suggests that the Company has discretion to simply rely on independent power producers and enter into PPAs instead of covering its customers' needs with owned generation. Why were PPAs not considered in the Company's 2020 and 2022 RFPs?

A. There are five key reasons to focus on acquiring and developing utility-owned generation assets as compared to trying to meet our customers' needs with PPAs:

Capturing long-term asset value: Ameren Missouri customers have benefited enormously from the long lives of coal plants that are now beginning to retire. It is certainly likely that these coal plants have operated more than the useful lives expected when the plants were originally constructed. Similarly, ownership of solar generation allows Ameren Missouri to develop a long-term asset with an expected life of at least 30 years (quite possibly more) for the benefit of Ameren Missouri customers, consistent with the long-term obligation Ameren Missouri has to serve customers. There is no

inherent reason that renewable generation should be approached any differently than the model that has operated effectively for traditional resources for decades. Ownership allows Ameren Missouri to determine the most appropriate investment injections to maximize the life of the asset and ensure reliability, while allowing a highly depreciated asset to continue to be used for serving customers. In the typical 15- or 20-year PPA, Ameren Missouri customers would pay a fixed or escalating energy price for 15-20 years, but at the end of the PPA's term, would have no asset to show for those payments. By the end of the typical PPA term, the asset will have effectively been paid for by Ameren Missouri customers through the PPA energy costs, but with no ongoing rights to the asset or its output without entering into a *new* market priced PPA that is subject to another party's decisions and priorities. By owning the asset instead, Ameren Missouri can capture for its customers the value remaining after a typical PPA term ends by continuing to operate a depreciated asset out to 30 years or more, with the option to make incremental investments in it through re-powering with more efficient and/or higher production solar modules, at a significantly lower cost than a new project.

Optimizing operations and maintenance (O&M): With Ameren Missouri owning and operating the solar projects, Ameren Missouri can optimize (i.e., lower or slow the growth in) O&M costs and capture the benefit of that optimization for its customers, while also ensuring the asset is being maintained at a level that is in line with Ameren Missouri's operational standards and its obligation to serve end use customers. If Ameren Missouri were simply purchasing power under a PPA, any O&M cost savings realized by the developer would benefit the developer's bottom line, with no reduction in the cost experienced by Ameren Missouri customers whatsoever. The opportunity to pass

O&M cost reductions to its bottom line may cause the third-party operator to forego certain maintenance activities that are necessary for the reliable and efficient operation of the resource.

Developing expertise in solar development: Through a BTA, PSA, or self-development structure, Ameren Missouri can develop valuable expertise in developing, constructing, operating, and maintaining solar projects. Over time as Ameren Missouri's coal plants retire and continue to be replaced by other resources, including low emitting technologies like wind and solar, these other resources will become the foundation for supplying power to our customers and we believe it is important that we have the experience and expertise to own and operate those facilities reliably and cost-effectively. We believe that this experience and expertise will provide a valuable long-term benefit for Ameren Missouri customers just as long-term ownership and operation of its fossil and other units has in the past.

Ensuring oversight and access: The Company has a responsibility to provide a reliable and least cost supply of energy to its customers. As such, for a generation asset that the Company owns, it is constantly monitoring the asset performance to ensure it is producing benefits for customers. When power is purchased through a PPA however, the Company, and by extension the Commission, has less oversight of and less information about the generating facilities being used to provide power to Ameren Missouri's customers and therefore the factors impacting their performance. When the utility owns the facility, it is required to file monthly reports regarding the facility's operation and must also immediately report outages and other operational issues. However, there are no similar reporting requirements for facilities owned and operated by unregulated entities. In

addition, the Commission and its Staff can access Company generation facilities today (e.g., for routine tours, to observe when material improvements are made, and other inspections), but there is no mechanism for similar access to facilities owned by an unregulated entity. As such, the Company and therefore the Commission has no transparency into the operational aspects of any facilities wherein the Company has a PPA.

Attractive financing available for utility ownership of renewable resources: Ameren Missouri is preparing an application for the U.S Department of Energy's Title 17 Clean Energy Financing Program under section 1706 Energy Infrastructure Reinvestment, a program newly created through the IRA. If selected, the Title 17 Clean Energy Financing Program offers applicants access to more competitive, lower cost financing for clean energy projects like solar, wind and battery storage that replace retiring fossil fuel infrastructure and thereby reduce emissions. Although the program is not exclusively available to utilities, the requirement to show replacement of specific fossil generation assets in order to qualify makes utilities the ideal program candidate and has the potential to reduce interest rates by approximately100 basis points for the Solar Projects at issue in this case as well as for future solar, wind, and storage projects owned by Ameren Missouri and in service prior to 2032. This program represents an additional cost saving opportunity for Ameren Missouri customers that resources secured under a PPA would be ineligible for.

Q. Staff witness Shawn Lange suggests that a variety of factors, not just poor maintenance, may have contributed to changes in resource output at the Pioneer Prairie Wind facility for which Ameren Missouri has an existing PPA. Do you disagree?

A. Not at all. Staff witness Shawn Lange's speculation on the causes of production changes at the facility only further illustrates the point the Company hopes to drive home for the Commission: with a PPA, the Company and thereby the Commission has highly limited visibility into how the facility is operated and maintained, and therefore no certainty on the causes of fluctuations or reductions in generation. We, like the Staff, can only speculate on what may be occurring onsite. With an obligation to serve customers, the Company believes it is not good enough to offer only speculation to the Commission when our resources do not perform as expected. The Staff's reference to the Taum Sauk disaster again furthers this point: when things do go wrong – operationally or otherwise – Ameren Missouri cannot correct the issue and provide full visibility into the corrective actions if the facility is not owned and operated by Ameren Missouri.

Q. In your experience is it appropriate to suggest that PPAs could have a cost advantage for customers as compared to an owned resource?

A. No. Staff witness Luebbert suggests that if the Company had identified a solar PPA consistent in pricing with its cost assumptions in the 2020 or 2022 IRP, customers would see cost savings. However, this statement is just as true for a Company-owned resource as it is for a PPA, and the solar PPA market has seen cost increases over the last several years just as the acquisition market has. No project is immune to shifting interest rates and a challenged supply chain. In fact, I expect that any project build for a PPA to be similar cost as Company owned projects. This fact, when combined with the various reasons that I outline earlier as to

why PPAs are not an effective means to serve native load obligations in a reliable and cost-effective manner really make this a sub optimal and costly option for the Company to even consider.

V. GEOGRAPHIC AND TECHNICAL PORTFOLIO DIVERISTY

Q. Staff witnesses Krishna Poudel and Cunigan discuss your comments on geographic diversity. Please respond.

A. Ameren Missouri continues to believe that building a geographically and technologically diverse portfolio of renewable generation resources is valuable for reliability. This belief is driven by industry analysis, most notably the MISO Renewable Integration Impact Assessment (RIIA) which indicated that one of their top three insights for Resource Adequacy was that "diversity of technologies and geography improves the ability of renewables to serve load. Yearly weather variations drive Resource Adequacy outcomes."[32] As a utility operating in the greater St. Louis region, there are obvious limits to how far we can take our pursuit of geographic diversity. That means we cannot define with a formula the precise distance needed to achieve a geographically diverse portfolio. Rather we aim to take a commonsense, portfolio-level approach to pursuing both technological and geographical diversity. We aim to build renewable projects across Missouri and surrounding states including Iowa, Illinois, Kansas, and Arkansas. Inevitably, as we score and select the best projects, some facilities will end up near each other, which may offer operational cost savings for customers as Staff witness Krishna Poudel points out. But at the portfolio level, as we move through the transition, we aim to increasingly see a geographic spread across our region of solar, wind, and battery storage projects.

[32] https://cdn.misoenergy.org/RIIA%20Executive%20Summary520053.pdf

Q. Do the proposed projects in this case provide additional geographic diversity that is beneficial for Ameren Missouri customers?

A. To a small extent, yes. Staff witnesses Krishna Poudel and Cunigan point out that the facilities at issue in this case are approximately 80-100 miles apart (dependent on which facilities you measure between), supposedly as evidence that the facilities are not geographically diverse. However simply from a commonsense standpoint, weather fronts are not typically 80 miles wide. Even Staff witness Cunigan acknowledges this, stating that weather events between the facilities would be experienced "in sequence, if not concurrently."[33] From an electric system standpoint, even modest separation of when weather events might impact solar production is a real operational benefit. If there was a day where the production of these facilities was strong and the combined four facilities were providing the full 550 MW that they are capable of providing, and then a front came through that brought clouds that reduced or eliminated that output, it would unquestionably be better for the system if some of those 550 MW of production were impacted a half hour, hour, or even two hours later, rather than losing 550 MW simultaneously. Any separation in the time that the facilities may be impacted by a weather front is a benefit to the system. And not every weather front that hits Ameren Missouri service territory is going to hit Cass County, Illinois.

To reiterate the Company's perspective on this issue: whether the four specific projects at issue in this case are highly geographically diverse from each other misses the point that it is a portfolio-wide goal worth striving towards, with proven reliability benefits.

[33] Cedric Cunigan Rebuttal Testimony, p. 7.

VI. CASS COUNTY SOLAR PROJECT

Q. Staff witness Busch lists four reasons the Cass County Solar Project should be rejected outright due to its lack of "additional value streams." Please address the validity of Mr. Busch's list.

A. I do not agree with Staff's dismissal of the most mature Solar Project at issue in this case, the Cass County Solar Project, supposedly due to four lacking "value streams." Under scrutiny, Staff's criticisms are not reasonable and in some cases are not even accurate. I will address each of Mr. Busch's claims individually:

1. *"The Illinois project is not geographically contiguous to Ameren Missouri's load, which is relevant to its value as a market energy price hedge."*

The Cass County Solar Project, located just over 100 miles from St. Louis, is no farther from the Ameren Missouri load than many of our existing generation facilities such as the Callaway Nuclear Plant, the Osage Plant, the Taum Sauk Plant, our Goose Creek CTGs, or the High Prairie Renewable Ener Center. And the MISO energy market itself is agnostic to state (or other administratively set) borders within an RTO – making the Cass County project's physical location in Illinois no more or less concerning than the location of the numerous existing generating facilities listed above. A project's location does impact its possible Locational Marginal Pricing (LMP) separation from the AMMO load node, but history does not indicate a Missouri location would be preferable to the Cass County project location from an energy price perspective. In fact, *the opposite is true*: historical LMP data shows a clear advantage for the Cass County project location versus Missouri project locations. The historical data provided in response to DR MPSC 0063 (provided to Staff on July 24, 2023), when weighted by the Cass County

project's output profile (the project's output profile was provided to Staff on July 12, 2023, in response to DR MPSC 0037[34]) shows just that, with the weighted average LMP prices near the Cass County project location indicating a 7-9% higher price *advantage* versus a project location near Callaway over the last five years. The location has also averaged LMP's higher than Ameren Missouri's load CpNode.[35] Using the data from the responses to DR MPSC 63 (the LMPs) and 37 (the Cass County profile), referenced above, we have prepared attached Schedule AA-S1 calculating these results. Although CRA's price modeling shows Missouri and Illinois pricing converging *over time*, which is how the Company chose to model the project, we have no reason to expect the Illinois project will receive energy prices that are materially lower than a Missouri project over time and to the extent they do not converge, Cass County is, based on historical prices, likely to receive higher LMPs than a Missouri project.

2. *"The Illinois project is not contiguous to Ameren Missouri's load, which is relevant to its value in depressing Ameren Missouri's cost of energy to serve load. Rather, its location appears to be to the advantage of Ameren Illinois for purposes of depressing the cost to serve the load of Ameren Illinois."*

Here again, the statement that the project is not "contiguous to Ameren Missouri's load" is no more concerning for the Cass County project than it is for the numerous other Ameren Missouri resources like Callaway Nuclear or the Taum Sauk Plant located a similar distance from St. Louis. Matt Michels' surrebuttal testimony addresses the approach Ameren Missouri has already taken to model and assess

[34] There was a later revision to the response to DR MPSC 0037, but it had no impact on the Cass County Project's profile, and thus no impact on this issue.
[35] I am not sure why Mr. Busch seems focus on a "benefit to Ameren Illinois." The cost of power Ameren Illinois must acquire (it cannot generate it itself given that Illinois is a restructured state) is passed through to Illinois customers. Ameren Illinois is not going to increase its earnings if LMPs go down in Illinois.

LMP changes for both load and existing generation through the development of the Company's 2023 IRP energy and capacity price assumptions, which incorporated resource additions and retirements *across* the Eastern Interconnect. It is important to note that the vast majority of these new resources will be built *regardless* of Ameren Missouri's involvement. This is true in particular for the Cass County project, meaning any impact the project may or not have on load LMPs will occur independent of the acquisition decision at question in this case.

3. *"The Illinois project is not considered an offset to load for MISO purposes, unlike Vandalia and Bowling Green."*

It is not reasonable to assume all needed generation could be built at the distribution level, and historically, it certainly has not been. Every single Ameren Missouri owned generation resource the size of the Cass County project, or larger, is interconnected at transmission, regardless of technology. The scale and scope of the transition Ameren Missouri is pursuing would quickly lose efficiencies of scale as available distribution system capacity declines and would dramatically limit Ameren Missouri's technology options. To say that a project's interconnection at the transmission level is a reason to reject the project is not a logical reason for any generation resource, is not practical given limits on available distribution level sites, and certainly is not a logical reason to reject the Cass County Solar Project.

4. *" The Illinois project location, in that it is located in Zone 4 rather than Zone 5, appears to be to the advantage of Ameren Illinois for purposes of capacity pricing, which is not an appropriate burden to place on Ameren Missouri customers."*

With one single exception (PY 15/16), these two zones have historically cleared at the same price in the MISO PRA – and in the one case where they did not, Zone 4 (Illinois) cleared much *higher* than Zone 5 (Missouri), meaning that had we owned Cass County at that time, its capacity could have been sold at those higher prices and our customers would have been significantly better off that it was in Illinois than had it been in Missouri. It is also worth noting that Zone 4 and Zone 5 have a large amount of transfer capability between the two zones. The Staff has not provided any evidence to support this claim, and historically we see none. Ameren Missouri customers bear no "burden" due to the location of Cass County in Illinois.

Q. Are there any other factors the Staff has not appropriately considered in their recommendation regarding the Cass County Solar Project?

A. Since I have addressed, and in turn dismissed, Staff witness Busch's claims that the project lacks additional value streams, I will address the project's maturity, competitive tax benefits, and potential to optimally support the Renewable Solutions Program.

First, Staff has characterized the project's maturity as a reason to reject the project. This is purely illogical. Among all four projects, the Cass County project is the most mature, by which I mean furthest along in project development and construction. For that reason, nearly all material supply agreements have been executed, and project costs are known with a high degree of certainty. One key benefit of this maturity is the project schedule and supply agreement for solar modules, which will avoid any risk of additional tariffs being applied to the project due to the U.S. Department of Commerce investigation. If anything, this cost certainty and maturity is an advantage for customers by reducing the risks and uncertainties inherent in project development, not a reason for rejection.

Second, the Cass County project is located in an Energy Community, qualifying it for an additional 10% tax credit boost. This is a huge advantage of the project, with a value of over **_____** for customers, which inexplicably the Staff has given no weight to in its recommendation. Qualifying Energy Community project sites are not unlimited and are more plentiful in Illinois than in Missouri. The Company, in its continued pursuit of cost reductions for customers, obviously is pursing these sites whenever possible and we suspect that had we not done so, we would be subject to criticism for not pursuing lower cost projects. As discussed above, fabricated reasons to avoid the Illinois location are incomparable to a tangible, immediate **_____** in customer cost reduction.

Finally, while we have made no concrete decisions on whether any of these projects will support a Phase II of the Renewable Solutions Program (assuming the Commission approves a Phase II tariff), the Cass County Project is an ideal candidate for the Program. The Company has many customers eagerly waiting to participate in the Program once new capacity becomes available and hopes to hold an enrollment event after the CCN case concludes. The Illinois location for Cass County is ideal for the Program because the location outside of Missouri makes it a less appealing candidate for RES compliance. And although pricing has yet to be finalized for the next program resource, utilizing the Cass County project for the Program could generate revenues for all customers in line with those projected for the Boomtown Project of $11.7 – $27.8 million NPV.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

P

EA-2023-0286

Schedule AA-S1 is Confidential in its Entirety

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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 a Certificate of Convenience and Necessity for Solar Facilities	)))	EA-2023-0286

AFFIDAVIT OF AJAY K. ARORA

STATE OF MISSOURI)
) ss
CITY OF ST. LOUIS)

Ajay K. Arora, being first duly sworn on his oath, states:

My name is Ajay K. Arora, and hereby declare on oath that I am of sound mind and lawful age; that I have prepared the foregoing *Surrebuttal Testimony*; and further, under the penalty of perjury, that the same is true and correct to the best of my knowledge and belief.

/s/ Ajay K. Arora
Ajay K. Arora

Sworn to me this 15th day of December, 2023.