BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Ameren Missouri's 2024 Integrated Resource Plan Annual Update Report.	)))	File No. EO-2025-0123

THE COUNCIL FOR THE NEW ENERGY ECONOMICS' COMMENTS ON AMEREN'S 2024 INTEGRATED RESOURCE PLAN ANNUAL UPDATE

COMES NOW the Council for the New Energy Economics ("NEE") and pursuant to 20 CSR 4240-22.080, respectfully submits these Comments regarding Union Electric Company d/b/a Ameren Missouri's ("Ameren" or the "Company") 2024 Integrated Resource Plan ("IRP") Annual Update filing ("Annual Update").

NEE is a non-profit organization committed to helping utilities and energy decision-makers navigate rapidly evolving utility industry economics using neutral data and analysis. NEE approaches the complex landscape of utility resource planning from a long-term stakeholder present value perspective, encouraging the review of comprehensive data in order to select the most economically beneficial resources.

NEE's primary concern is that the use of economically inaccurate, incomplete, or outdated assumptions, inputs, or methods can directly result in the selection of a preferred portfolio that will cost more than necessary. By contrast, more accurate, complete, and current assumptions and inputs are likely to yield a more reliable and resilient preferred portfolio at a lower cost than the one selected in the 2023 Triennial IRP and reiterated in the 2024 IRP Update. As Ameren enters a period of resurgent load growth, this concern is magnified and its consequences multiplied.

Considering that the Company's 2024 IRP Annual Update centers on discussion of emerging trends and the potential need for revisions, NEE's comments should be considered while both preparing and evaluating any future IRP Annual Updates, Triennial Plans, or filings of revised

preferred portfolios. The following recommendations are tailored towards planning for a higher load forecast while protecting consumer interests:

- New load will come with higher demand for renewable energy. Ameren should leverage this demand through effective customer programs, which can reduce net-load growth.
- New load can also be met with additional storage resources, but Ameren did not update its supply side resource assumptions, including storage, for this Annual Update. Ameren should update its assumptions for battery storage resources, which have declined in cost since Ameren's 2023 Triennial IRP filing.
- With newly provided details on Ameren's natural gas price forecast methodology, it is clear that the Company's price forecast understates the costs and risks of natural gas reliance, including for natural gas plants already included under the 2023 preferred portfolio. Adding incremental natural gas capacity to meet new load will increase fuel costs and market risk exposure for all customers. Ameren should properly account for these risks in developing its price forecasts.

Each of these recommendations are explained in further detail below. NEE looks forward to working with Ameren and other stakeholders to achieve a resilient, cost-effective preferred portfolio.

I. AMEREN'S PREFERRED PLAN DOES NOT FULLY LEVERAGE GROWING DEMAND FOR RENEWABLE CUSTOMER PROGRAMS.

20 CSR 4240-22.040(1) requires that the utilities shall:

> "...evaluate all existing supply-side resources and identify a variety of potential supply-side resource options which the utility can reasonably expect to use, develop, implement, or acquire, and, for purposes of integrated resource planning, all such supply- side resources shall be considered as potential supply-side resource options."[1]

[1] 20 CSR 4240-22.040(1).

As stated by Ameren in the Stakeholder Workshop, large corporate customers have a "general preference for clean, transparently-sourced energy." Analysis from Deloitte confirms that leading players in many growth sectors, including data centers, have committed to meeting power demand partly with renewable resources.[2] In analyzing industrial load growth, Wood Mackenzie provides a helpful takeaway for utility resource planning: "[t]hese large loads want renewable power, are far less price sensitive than most customers and have proven themselves willing to pay a premium for a constrained amount of renewable supply."[3]

The demand for clean, transparently procured power is further evidenced by the Company's current Renewable Solutions Program ("RSP"). For both projects in the RSP, demand has widely outstripped the capacity made available. Even while the second project received slightly lower interest, bids exceeded available capacity by a 55% margin.[4] Furthermore, five unnamed customers were excluded from the second round due to a lack of capacity,[5] a poor outcome for ensuring customer satisfaction and Missouri's attractiveness for future investment. As Ameren has testified in previous dockets, "[o]ther utilities and independent energy providers are investing in renewables now… [if Ameren does not keep pace, the Company will face] unhappy and frustrated customers unable to meet their decarbonization goals."[6] Clearly, the current program has not kept up with demand for renewable energy and has not proven itself capable of scaling at the rate needed to match the wave of load growth anticipated for the near future.

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[2] Deloitte Research Center for Energy & Industrials, "2025 Renewable Energy Industry Outlook." Accessible at: https://www2.deloitte.com/us/en/insights/industry/renewable-energy/renewable-energy-industry-outlook.html.
[3] Wood Mackenzie, "Gridlock: the demand dilemma facing the US power industry." Accessible at: https://www.woodmac.com/horizons/gridlock-demand-dilemma-facing-us-power-industry/.
[4] Missouri Public Service Commission ("PSC") Docket No. EO-2025-0123, Annual Update Post-Workshop Summary Report, ¶ 4 (Nov. 15, 2024).
[5] *Id*.
[6] Missouri PSC Docket No. EA-2022-0245, Direct Testimony of Ajay K. Arora, p. 28 (Jul. 14, 2022).

Figure 1. Bids on Capacity in Renewable Solutions Program[7]

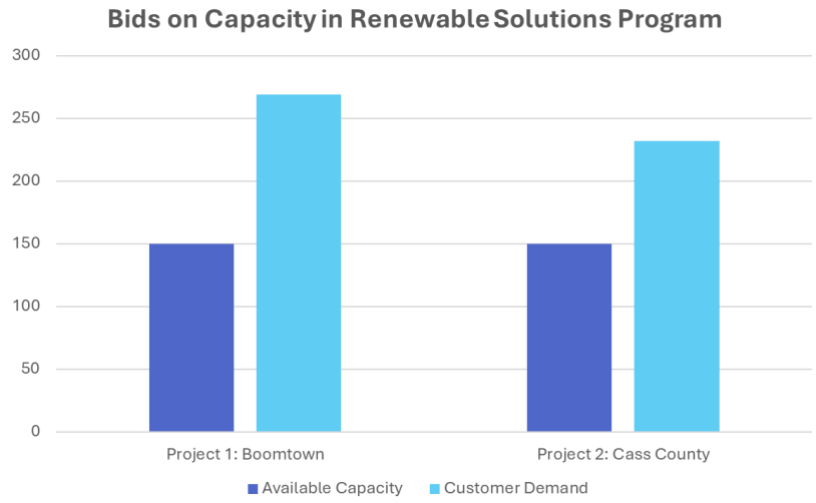


Figure 2. Renewable Solutions Program - Participants[8]

Renewable Solutions Program – Participants

	Project 1: Boomtown	Project 2: Cass County
Included	Bi-State Development	Air Products
	bioMérieux	bioMérieux
	Emerson	Danforth Plant Science Center
	General Motors	Mastercard
	Mastercard	SSM Health
	SSM Health	Walmart
	Walmart	World Wide Technology
	3 unnamed organizations	
Excluded		*5 unnamed organizations*

[7] Ameren Missouri, "Ameren Missouri receives approval to acquire new solar facility to supply local organizations with up to 100% renewable energy." Accessible at: https://ameren.mediaroom.com/2023-04-13-Ameren-Missouri-receives-approval-to-acquire-new-solar-facility-to-supply-local-organizations-with-up-to-100-renewable-energy; Ameren Annual Update Post-Workshop Summary Report at ¶ 4.

[8] "Ameren Missouri receives approval to acquire new solar facility to supply local organizations with up to 100% renewable energy"; Ameren Missouri, "Ameren Missouri doubles renewable energy program." Accessible at: https://www.amereninvestors.com/investors/financial-releases/financial-releases-details/2024/Ameren-Missouri-doubles-renewable-energy-program/default.aspx; Ameren Annual Update Post-Workshop Summary Report at ¶ 4.

NEE recommends an expansion of customer programs be considered as part of the IRP process. Anticipated projects brought through customer programs should reduce the net load amount Ameren then needs to model to meet the preferred portfolio requirements. Improving the design and increasing the scale of customer programs presents an opportunity to not only satisfy a growing portion of new load growth, but to do so cost-effectively while satisfying customers' growing preference for clean energy and supporting economic development. Realizing these opportunities would reduce the dual risk of new load growth projections not materializing and building new capacity to serve load that does not materialize.

II. AMEREN DOES NOT ACKNOWLEDGE DECLINING RESOURCE COSTS, WHICH ARE MATERIAL TO SELECTING A LEAST-COST PORTFOLIO.

20 CSR 4240-22.040 sets forth the Commission's requirements for the analysis of supply-side resources within a utility's IRP. Specifically, 20 CSR 4240-22.040(1) requires that the utilities shall:

> "...collect generic cost and performance information sufficient to fairly analyze and compare each of these potential supply-side resource options, including at least those attributes needed to assess capital cost, fixed and variable operation and maintenance costs, probable environmental costs, and operating characteristics."[9]

The United States economy is emerging from its highest inflationary period in four decades, which near universally impacted the supply chains and costs of all supply side and demand side resource options. Costs were temporarily elevated during the 2023 Triennial Planning process, have since declined, and are no longer accurate.

[9] 20 CSR 4240-22.040(1).

In addition to new utility-scale wind and solar capacity, virtual power plants ("VPPs") and energy storage resources can help to meet new load while helping offset the intermittency of renewable generation. For energy storage specifically, Ameren has to date installed 0 MW battery energy storage capacity, 408 MW of pumped hydro storage capacity, and includes 800 MW of planned energy storage capacity in its 2024 IRP Annual Update.[10]

In reference to a list of supply-side resource options including battery storage, Ameren noted that it has reviewed "assumptions for generating resources" for this IRP Annual Update and "determined, at this time, the 2023 Triennial IRP assumptions are still appropriate."[11] Further, the discussion of battery storage indicates that Ameren is only considering recycled battery storage options, which is inconsistent with information provided in response to questions during the Stakeholder Workshop.[12]

In addition, the Lawrence Berkeley National Laboratory interconnection queue report shows battery storage and solar plus battery storage systems in the nationwide queue increased from just under 700 GWs in 2022 to over 1,000 GWs in 2023, with solar plus battery storage comprising 52% of all solar projects submitted for grid interconnection.[13] The market is finding economic deployment of solar paired with batteries, but this hybrid combination of solar and battery storage was not included as a resource in the 2023 Triennial IRP Chapter 6 Appendix and presumably by extension is not incorporated in the 2024 IRP Annual Update.

The current plan to install 800 MW of battery storage is a step in the right direction and more conservative than the current storage capacity Ameren has pending in the MISO

[10] Missouri PSC Docket No. EO-2025-0123, Ameren IRP Annual Update at 1; Energy Information Administration, Form EIA-860M. Accessible at: https://www.eia.gov/electricity/data/eia860m/.
[11] Ameren IRP Annual Update at 15-16.
[12] *Id*. at 20.
[13] Lawrence Berkeley National Laboratory, "Queued Up: Complete cleaned interconnection queue data through 2023" (Apr. 2024). Accessible at: https://emp.lbl.gov/queues.

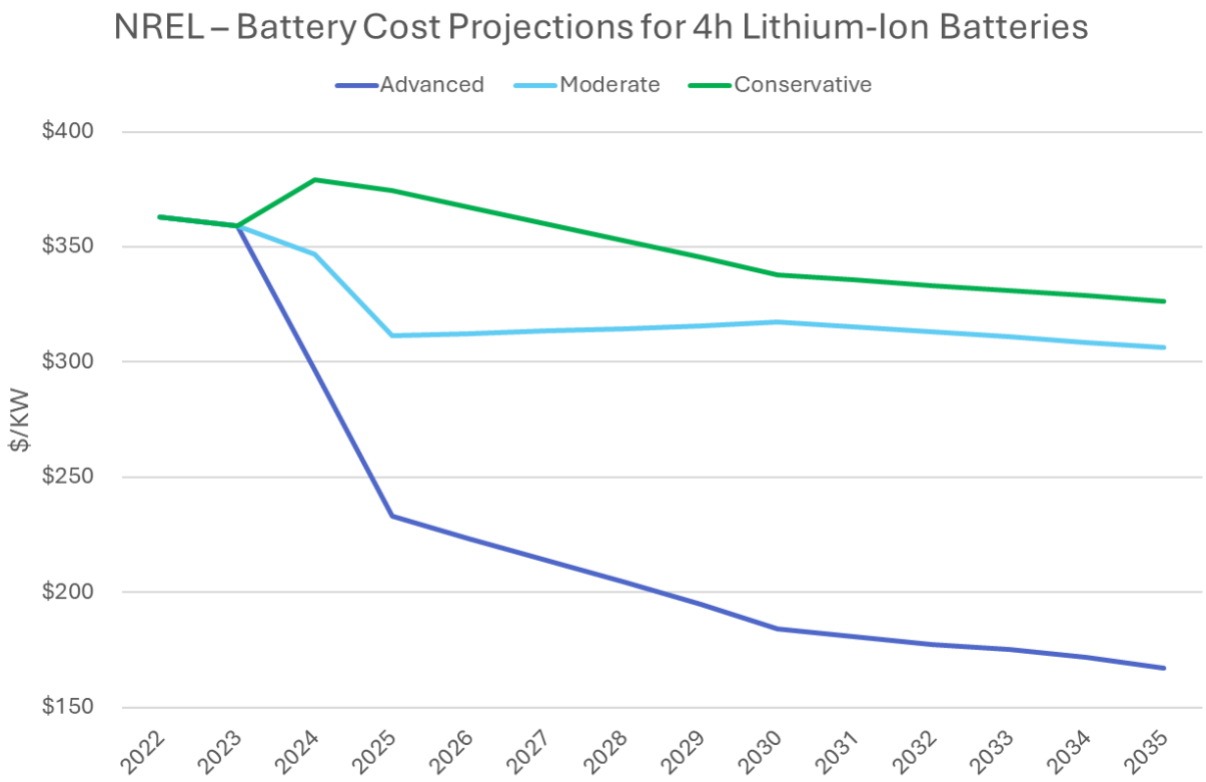
interconnection queue.[14] Accordingly, Ameren's planned storage additions should increase and likely accelerate given recent drops in the price of batteries, the expectation for significant load growth, and the customer preferences for clean energy discussed above. Ameren's Triennial IRP filing assumed 4-hour battery storage has the shortest permitting period of all supply side resources evaluated and, along with solar, is the fastest to deploy at 6 months from Notice to Proceed (NTP) to Commercial Operation Date (COD).[15] The acceleration of 800 MW of battery storage deployment by one year from 2035 to 2034, as agreed upon in the Castle Bluff settlement,[16] is a necessary but likely not sufficient step because, to NEE's knowledge, this decision did not assess the cost benefit of further accelerating storage deployment in light of abating inflation, declining storage costs, and the short time required for permitting and deployment of storage systems.

Notably, battery storage technologies are in the midst of a rapid cost-reduction. As shown in Figure 3 below, the most recent "moderate" projection of utility-scale lithium-ion batteries published by the National Renewable Energy Laboratory ("NREL") foresees a 14% drop in costs in 2025 compared to costs in 2023. In the more aggressive case, costs are projected to fall 35% in the same window.[17] The more aggressive estimate is supported by Goldman Sachs' recently published prediction that lithium battery prices in other industries could fall by 40% between 2023 and 2025, given improved technology and lower input prices.[18] Without access to the capital cost

[14] Midcontinent Independent System Operator, Generator Interconnection Queue. Accessible at: https://www.misoenergy.org/planning/resource-utilization/GI_Queue/gi-interactive-queue/.
[15] Missouri PSC Docket No. EO-2024-0020, Ameren 2023 Triennial Integrated Resource Plan, Chapter 6 Appendix A, Table 6A.2.
[16] Missouri PSC Docket No. EA-2024-0237, Unanimous Stipulation and Agreement (Oct. 17, 2024); Missouri PSC Docket No. EA-2024-0237, Order Approving Stipulation and Agreement and Granting Certificate of Convenience and Necessity (Oct. 30, 2024).
[17] National Renewable Energy Laboratory, "Cost Projections for Utility-Scale Battery Storage: 2023 Update." Accessible at: https://www.nrel.gov/docs/fy23osti/85332.pdf.
[18] Goldman Sachs, "Electric vehicle battery prices are expected to fall almost 50% by 2026." Accessible at: https://www.goldmansachs.com/insights/articles/electric-vehicle-battery-prices-are-expected-to-fall-almost-50-percent-by-2025.

inputs currently being used for utility-scale batteries, and given the previously cited statement that Ameren believes its 2023 assumptions still hold, NEE's assumption is that Ameren's inputs do not reflect the most recent market intelligence.

Figure 3. NREL – Capacity Cost Projections for 4h Li-Ion Batteries[19]



NEE recommends that prior to Ameren's next IRP filing, including any revised preferred portfolio, the Company should update cost inputs and technological assumptions for various durations of lithium-ion battery storage. Further, to better ensure productive stakeholder engagement, NEE recommends that Ameren include updated cost inputs and technological assumptions for various durations of lithium-ion battery storage in future Annual Updates, Changes in Preferred Resource Plan Filings, or Triennial IRP filings. This information would allow stakeholders to more effectively evaluate energy storage resource options. Inclusion of this

[19] "Cost Projections for Utility-Scale Battery Storage: 2023 Update."

information upfront would further facilitate greater transparency in between Triennial filings and allow the Commission greater insight into the Company's resource planning processes.

III. AMEREN'S RESOURCE PLANNING PROCESS DOES NOT ADEQUATELY ACCOUNT FOR THE FULL COST AND RISK OF FUELING NATURAL GAS PLANTS.

20 CSR 4240-22.010 sets forth the objectives that the electric utility resource planning process is designed to serve. Specifically, the Missouri resource planning rules require that the utilities shall:[20]

> "…Explicitly identify and, where possible, quantitatively analyze and other considerations which are critical to meeting the fundamental objectives of the resource planning process, but which may constrain or limit the minimization of the present worth of expected utility costs. …**These considerations shall include, but are not necessarily limited to, mitigation of: (1) Risks associated with critical uncertain factors that will affect the actual costs associated with alternative resource plans.**"

A critical uncertain factor is defined as any uncertain factor likely to materially affect the outcome of a resource planning decision.[21] Consideration of critical uncertain factors is required throughout many provisions of the Commission's resource planning rules.

This section describes several revisions to the IRP which are necessary to best meet a higher load forecast. Ultimately, incremental natural gas-fueled capacity is an inferior strategy, due especially to fuel market risk and the possibility of incurring high costs for fuel.

As resolved in the 2023 Triennial IRP docket, the Company has now provided more information regarding the inputs and risks related to its natural gas price forecast. From the Stakeholder Workshop and IRP Annual Update materials, NEE understands Ameren's methodology to focus on supply and demand fundamentals at Henry Hub with adjustments made

[20] 20 CSR 4240-22.010(2)(C) (emphasis added).
[21] 20 CSR 4240-22.020(8).

to account for transportation tariffs and local basis. Ameren did not provide any additional information on how tariffs and local basis are forecasted, but these local factors can frequently make a larger impact on the delivered cost of fuel than national fundamentals.

The Company's forecasting methodology is premised on a plan to procure gas at prices near Henry Hub via heavy use of firm pipeline reservations.[22] Though, as discussed in Ameren's Annual Update, the utility plans to only subscribe to a portion of the firm transport needed to supply natural gas plants during peak times.[23] During peak demand events, the Company will be required to source fuel via other means. The Company is expanding its ability to substitute fuel oil at CT plants which would help hedge against the need to buy gas during demand peaks when local gas supply is limited or spot prices are spiking.[24] However, fuel oil is itself very expensive, with delivered costs averaging $21.96/MMbtu for Missouri power plants in 2023.[25]

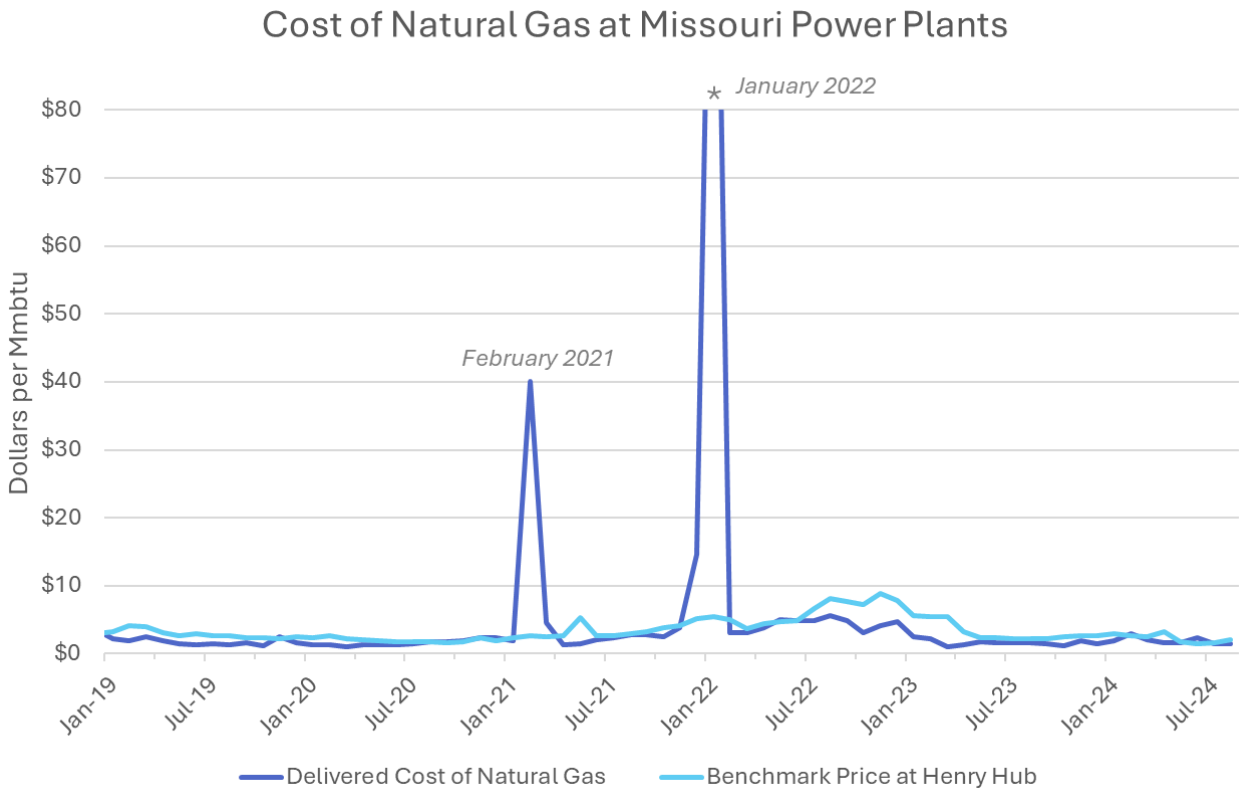
Ameren has stated that it does intend to subscribe to firm transport for the entirety of fuel needed for new CCGTs,[26] but more information would be needed to understand if that would be a successful or cost-effective strategy to manage risk. Many utilities with firm transport have nonetheless seen delivered costs blow-out from Henry Hub if transportation reservations do not effectively cover the entire route between plants and production basins. Additionally, if the utility is relying on spot purchases to fill firm transport capacity, as several Missouri utilities have historically done,[27] costs will be susceptible to price spikes in source markets.

Historically, Missouri power plants have already paid exceptionally high costs for natural gas during peak winter events. This has been true even while the majority of these gas volumes

[22] Ameren IRP Annual Update at 25-28 and 42-50.
[23] *Id*. at 25-28.
[24] *Id*. at 28.
[25] Energy Information Administration, Form EIA-923 Detailed Data Schedule 2. Accessible at: https://www.eia.gov/electricity/data/eia923/.
[26] Ameren IRP Annual Update at 28.
[27] Energy Information Administration, Form EIA-923 Detailed Data Schedule 2.

were reported as being shipped via firm transport.[28] As shown in the chart below, the unit-cost of gas delivered in February 2021 surged to over $40/MMbtu and over $147/MMbtu in January 2022. This led to total costs of $195M and $732M to procure natural gas during these two months, respectively.[29]

Figure 4. Cost of Natural Gas at Missouri Power Plants[30]



While infrequent, the impact of these events on overall costs is significant enough to undo the benefits of plant operators successfully procuring gas at relatively low-cost during other periods. NEE calculates that, from 2019 through August 2024, the most recent month for which data is available, the total amount of natural gas consumed at Missouri power plants would be

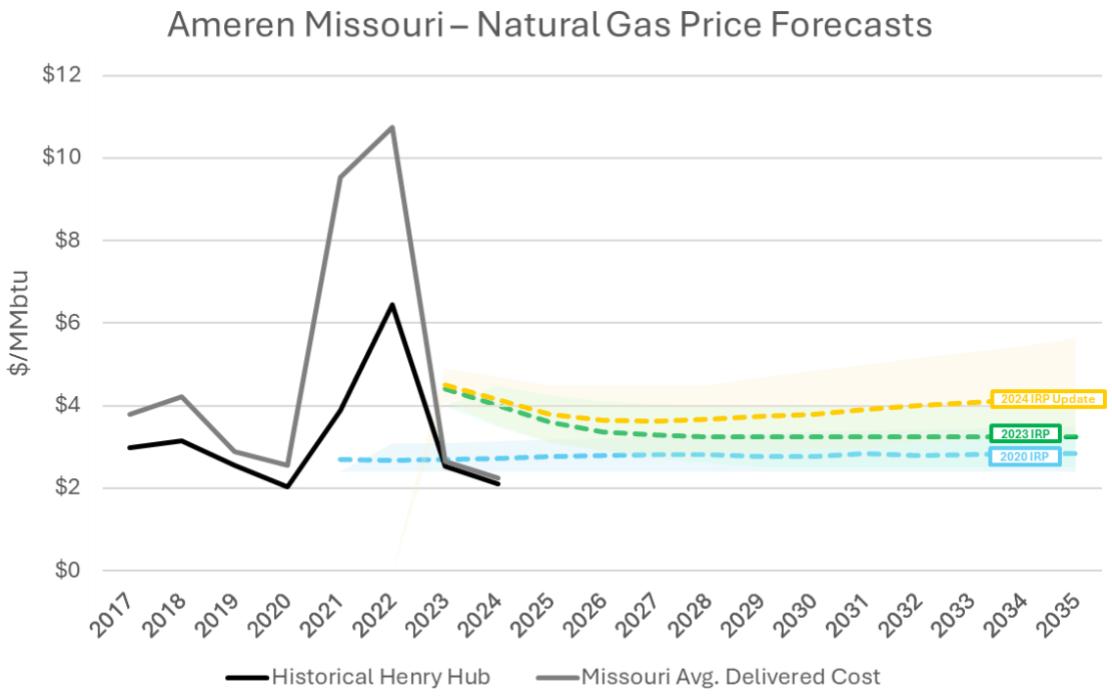
[28] *Id.*
[29] *Id.*
[30] *Id.*

valued at $846M if purchased at monthly Henry Hub spot averages. Due in large part to the acute spikes shown above, the actual cost incurred by Missouri power plant operators was $1,526M[31] — 80% higher than the value of the fuel at Henry Hub. While a small part could be attributed to transportation tariffs, the difference is too large to explain by transport costs alone. Without accounting for acute blow-outs like these, Ameren could be understating the ultimate cost of natural gas by a similarly large margin.

Additionally, the Company's forecast should reflect potential long-term local dynamics, such as the regional expansion of natural gas power, which is likely to drive up transport tariffs and local basis pricing as more plants compete for a limited supply from the region's pipelines. In the MISO and SPP interconnection queues, there is a total capacity of 29.3 GW of natural gas-fueled plants actively seeking interconnection by 2030.[32] Assuming a generic heat rate of 7,000 btu/kWh, this represents a potential of 4.9 Bcf/d in new demand for gas during peaks. If it materializes, even a fraction of this demand could significantly strain existing pipelines along major corridors, leading to more expensive transport tariffs and more volatile local spot pricing. Rising regional demand could necessitate new pipelines to supply Missouri power plants, which would also result in higher transport tariffs.

[31] *Id.*
[32] Midcontinent Independent System Operator, Generator Interconnection Queue; Southwest Power Pool, Generator Interconnection Queue. Accessible at: https://opsportal.spp.org/Studies/GIActive.

Figure 5. Ameren Missouri - Natural Gas Price Forecasts[33]



The lack of attention to these factors in published materials and the Stakeholder Workshop suggests that the Company's forecast is too low to capture the full cost of delivered fuel. Figure 5 shows three of Ameren's recently published forecasts for Henry Hub prices. Even as the Company has revised upward, the current base forecast remains below $4.00/MMbtu for the remaining half of the 2020's, below the average Henry Hub price for the last three calendar years, and dramatically below the average delivered cost for Missouri power plants during the same period.

Each forecast was provided with a range of scenarios for the purpose of risk analysis, shown in the shaded areas of Figure 5. However, these bands are clearly much narrower than the actual range of observed prices in recent years. Comparing the 2020 IRP forecast to recent history

[33] Energy Information Administration, Form EIA-923 Detailed Data Schedule 2; Ameren IRP Annual Update at 43; Ameren 2023 Integrated Resource Plan Chapter 2 Appendix at 6; Ameren, 2020 Integrated Resource Plan Chapter 2 at 8.

illustrates that the company not only failed to anticipate a massive price spike but failed to set risk scenarios even close to the actual magnitude of risk. The Company set a 2022 high-case price for Henry Hub at $3.08/MMbtu[34] which turned out to be less than half the average Henry Hub price and less than a third the average delivered cost for Missouri power plants during that year. Clearly, a "high-case" for this period should have been significantly higher, yet the Company has continued to set the high-case below 2022 levels in the current forecast.

By under-forecasting natural gas and understating risks, the Present Value Revenue Requirement ("PVRR") impact of modeled natural gas plants is artificially low which subsequently will lead the Company's capacity models to over-select gas capacity at the exclusion of other more economic resources. Planned gas capacity already included in the preferred portfolio will increase consumer exposure to costs and commodity market risks not reflected in Ameren's modeling, and any proposal to add incremental gas capacity to the plan will increase exposure further. While the other strategies described in these comments give the Company options to satisfy new customers and protect existing customers, a natural gas-reliant strategy could increase costs and risks for the existing ratepayer base.

NEE appreciates that Ameren has named and to a greater extent addressed the risks NEE identified in its filed comments on Ameren's 2023 Triennial IRP, and recognize that Ameren has increased its assumed probability of higher natural gas fuel prices. However, NEE is still of the position that Ameren's natural gas fuel price forecast does not sufficiently incorporate the full and volatile cost of natural gas fuel and risk. Chronically under-forecasting natural gas fuel prices in planning can lead to selecting a preferred portfolio that is not actually least cost.

[34] Ameren, 2020 Integrated Resource Plan Chapter 2 at 8.

NEE recommends Ameren continue to improve its natural gas forecast methodology and assumptions used as inputs for subsequent annual updates, triennial IRPs, or any updates to its preferred portfolio, to more effectively close the significant gap between modeled and actual natural gas costs. Specifically, Ameren should a) publish their assumptions for tariffs and basis and make available for stakeholders to work with Ameren to bring fuel cost estimates for delivered costs closer to historical costs, b) widen its risk analysis to more accurately capture the full natural gas price risk, c) use higher forecast costs for modeling by referencing longer-term supply contract quotes or using long-term hedge prices (for the life of the generating asset or the utility's planning horizon).

Doing so should produce a more economically accurate preferred portfolio and likely result in a different diverse portfolio of resources than is preferred by Ameren in the 2023 Triennial IRP and this 2024 IRP Update.

IV. CONCLUSION

WHEREFORE, NEE respectfully submits its Comments regarding Ameren's 2024 IRP Annual Update filing.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was served upon all counsel of record by email, this December 16th, 2024.

/s/Alissa Greenwald
Alissa Greenwald