

Comments of Renew Missouri on Ameren Missouri's 2025 IRP Annual Update

Renew Missouri, a nonprofit clean energy advocacy organization, respectfully submits the following comments to the Missouri Public Service Commission (“Commission”) Ameren Missouri’s 2025 IRP Annual Update. Renew Missouri is dedicated to advancing renewable energy, energy efficiency, and grid modernization for the benefit of Missouri ratepayers. These comments focus on five key areas of Ameren’s plan: (1) Battery Energy Storage Systems (“BESS”) deployment, (2) Renewable Energy Generation expansion and interregional procurement opportunities, (3) Energy Efficiency Resource Offerings under Missouri Energy Efficiency Investment Act (“MEEIA”), (4) Transmission Planning for renewable integration and reliability, and (5) Ratepayer Cost Impacts and long-term benefits. Renew Missouri appreciates the opportunity to provide input on these issues and urges Ameren to consider the recommendations covered below in future resource planning.

I. Background and Context

1. Ameren’s 2025 IRP Update Overview: In its 2025 IRP Annual Update, Ameren selected a new Preferred Resource Plan (“PRP”) to meet significant load growth and policy goals.¹ The Company anticipates large new loads totaling 1.5 GW by 2032 and 2.5 GW by 2040² - most likely due to data centers and industrial expansion - and proposes a balanced mix of new generation and grid investments to serve this demand reliably. Key elements of Ameren’s updated PRP include accelerated additions of renewable generation (2,700 MW by 2030, reaching 5,400 MW of wind and solar by 2035), deployment of 1,400 MW of battery storage by 2035, and substantial new firm capacity from natural gas and a planned

¹ Ameren Missouri, *2025 IRP Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

² *Id.*

1,500 MW nuclear unit by 2045. Ameren also commits to continued demand-side management programs under MEEIA at the currently approved levels, rather than at a higher Realistic Achievable Potential (“RAP”) scenario, through 2043. These updates mark a pivot from Ameren’s prior IRP due to rising demand and recent regulatory directives.

2. Need for Stronger Clean Energy Measures: While Ameren’s IRP update makes progress toward cleaner energy (with carbon emission reduction goals of 60% by 2030 and 85% by 2040), Renew Missouri is concerned that certain plan elements are not aggressive enough to optimally serve customers. Battery storage deployment and renewable generation expansion should be accelerated further to enhance grid reliability and integrate low-cost wind and solar resources. Similarly, energy efficiency acquisition is undervalued by capping programs at historical MEEIA levels instead of pursuing the higher savings identified as achievable in market potential studies. Additionally, transmission infrastructure planning must be more proactive, including consideration of interregional projects like the Grain Belt Express (“GBX”) high-voltage direct current (“HVDC”) line,³ to unlock remote renewable resources and maintain reliability amid load growth. Each of these areas has direct impacts on ratepayer costs and risks. Strategic investments now in clean energy, efficiency, and transmission can yield significant long-term savings and mitigate fuel price volatility for Missouri customers. These comments address each of these topics in detail and provide recommendations, supported by Ameren’s own filings and independent analysis, for the Commission’s consideration.

II. BESS Deployment

³ Grain Belt Express LLC, *Comments on Ameren Missouri’s 2025 IRP Annual Update*, File No. EO-2026-0088 (Nov. 2025).

3. Ameren’s Proposed BESS Rollout: Ameren’s preferred plan substantially increases battery storage deployments relative to its prior IRP. The Company now plans to install 1,000 MW of battery energy storage by 2030, with an additional 400 MW by 2035 and another 400 MW by 2042 (total ~1,800 MW by 2042).⁴ This acceleration of BESS is intended to provide flexible capacity for new demand and to integrate renewable resources, helping to meet peak loads and balance the variability of wind and solar. Indeed, Ameren explains that the expanded storage is driven by the significant new load additions in its service territory and a reduction in expected demand savings from scaled-back efficiency programs. Renew Missouri applauds Ameren’s recognition of battery storage as a critical resource and its inclusion of BESS on an accelerated timetable. However, we urge that even greater and faster BESS integration is warranted given the magnitude of load growth, as BESS can be placed into service much quicker than other resources,⁵ and the reliability and renewable integration benefits that storage can provide.

4. Emerging Sodium-Ion and Zinc Battery Storage Technologies: Renew Missouri also encourages Ameren Missouri to evaluate emerging sodium-ion battery technologies as a potential complement to its planned lithium iron phosphate (“LFP”) storage portfolio. CATL and other manufacturers are now commercializing next-generation sodium-ion systems with energy densities approaching LFP, wide operating temperature tolerances (down to –40°C), enhanced safety characteristics, and cycle lives exceeding 10,000 cycles, while relying on widely available, low-cost materials. Early U.S. grid-scale sodium-ion

⁴ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

⁵ Mandoj, Anandu, “An Essential Guide to Battery Energy Storage System (BESS)”, accessed at <https://www.blackridgeresearch.com/blog/what-is-battery-energy-storage-system-bess-explained?srsId=AfmBOopRP7tF9BOWE7RnMgaYU8qcZ7YC9umJqMm3TaUp0nE2B2B2Nk3C> on December 4, 2025.

deployments by Peak Energy,⁶ including recent multi-MWh pilots and multi-GWh procurement agreements, demonstrate that the technology is rapidly maturing for utility applications such as peak shaving, solar shifting, and local reliability support. Given Ameren’s substantial BESS needs in the 2030–2040 period, sodium-ion storage could offer lower lifetime costs, reduced fire-risk permitting barriers, and improved winter performance relative to incumbent chemistries.⁷ Renew Missouri recommends that Ameren: (1) include sodium-ion as a distinct storage option in future IRP modeling; (2) pursue one or more utility-scale demonstration projects to validate performance; and (3) monitor domestic vendors capable of supplying Inflation Reduction Act-compliant sodium-ion systems. Incorporating this emerging technology into Ameren’s resource planning framework will support a more robust, cost-effective, and diversified storage portfolio for Missouri ratepayers.

Renew Missouri further recommends Ameren evaluate zinc-based battery technologies as part of its long-duration and enhanced-safety storage portfolio. Zinc batteries offer several characteristics well-suited to utility deployment: less susceptible to fire risk, high tolerance for deep and frequent cycling, long-duration capability, and reliance on an abundant domestic mineral supply that avoids lithium and cobalt market constraints.⁸ Importantly,

⁶ Peak Energy, “Peak Energy Signs 4.75 GWh Contract With Jupiter Power for Industry-Leading Sodium-Ion Battery Storage Systems,” PR Newswire (Nov. 12, 2025).

⁷ Beers, K., & Lee, S. (2024, June 6). *Assessing the Future of Sodium-Ion Battery Technologies*. Exponent. Rayner, T. (2025, October 22). *Alsym Energy launches Na-Series, claiming safe, low-cost sodium-ion battery storage*. ESS News. Skok, P. (2025, July 30). *Peak Energy launches first U.S. grid-scale sodium-ion storage system*. ESS News. Bellini, E. (2025, November 28). *Sodium-ion battery cell cost could drop to \$40/kWh, says IRENA*. pv magazine. Zhao, Y., et al. (2024). *Optimization strategies toward functional sodium-ion batteries*. *Energy & Environmental Materials*, 6(4), e12633.

⁸ U.S. Department of Energy. Long Duration Energy Storage Pathways. Office of Electricity, 2023. National Renewable Energy Laboratory. Cost and Performance Characteristics of Energy Storage Technologies. 2022., Eos Energy Enterprises. Znyth® Technology Overview and Z3™ Product Documentation (non-flammable aqueous chemistry, 100% DoD cycling, long-duration design), U.S. Geological Survey. Mineral Commodity Summary: Zinc.

these technologies are now advancing from pilot to utility-scale deployment, including in Missouri. City Utilities of Springfield is currently installing a zinc-based battery system to utilize the technology's ability to load shift, its resiliency support, and its deference of distribution upgrades, which will all be done in comparable Midwest operating conditions.⁹ Ameren's own BESS plan anticipates a growing need for both 4-hour and multi-hour flexible resources; zinc batteries could fill part of this need with improved safety, lower siting barriers, and potentially lower lifetime costs for high-cycle or long-duration use cases. Renew Missouri therefore encourages Ameren to monitor progress at City Utilities and undertake one or more zinc battery demonstration projects to evaluate performance, degradation, and cost-effectiveness in Missouri's climate and regulatory framework.

5. Rationale for Greater BESS Integration: Energy storage improves grid reliability and resilience by supplying fast ramping capacity during peak hours or when other resources are unavailable and absorbing excess renewable generation for use later. Ameren's own preliminary modeling underscores the value of battery capacity: the Company found that increasing battery power capacity has a more pronounced impact on loss-of-load expectation ("LOLE") than extending storage duration beyond ~24–25 hours.¹⁰ Adding more MW of batteries significantly improves system reliability (by reducing LOLE), whereas long-duration storage yields diminishing returns beyond a certain point. This suggests that deploying a larger fleet of 4-hour batteries across the grid can substantially bolster reliability, especially to cover spikes in demand or generator outages. Given

2024., City Utilities of Springfield & Eos Energy Enterprises. Zinc Hybrid Cathode Battery Storage Project Announcement.

⁹ City Utilities of Springfield & Eos Energy Enterprises, "City Utilities partners with Eos Energy for groundbreaking battery storage project," MPUA (Feb. 3, 2025), 216 MWh / 36 MW zinc-based storage commitment.

¹⁰ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025)

Ameren’s expected 1.5 GW increase in peak demand by 2032, Renew Missouri recommends targeting at least 1.5 GW of BESS by the early 2030s (versus 1.0 GW by 2030 in the current plan) to keep capacity margins robust. Accelerating the 1,400 MW of storage slated for 2035 into the early 2030s would better align with the load growth timeline and provide critical support for the ~5.4 GW of renewables planned by 2035.

6. Grid Support and Renewable Integration: A larger BESS buildout can also improve the integration of wind and solar resources. Batteries can store midday solar surpluses for delivery during evening peaks and can smooth out the variability of wind generation, reducing curtailment and firming the renewable supply. Ameren acknowledges these uses, stating its goal is to “enhance grid reliability, grid resiliency, and support renewable energy integration”¹¹ through storage deployment. By strategically locating storage near load centers and renewable generation sites, Ameren can defer certain transmission upgrades and provide voltage support and fast frequency response, improving power quality.¹² We note that Ameren currently has 0 MW of utility-scale battery storage in service, so the Company must build operational experience. Renew Missouri supports Ameren’s ongoing battery projects, and we encourage broader demonstration of lithium-ion and other battery types on Ameren’s system in future IRP filings or updates. The current view is too limited without including all forms of potentially viable storage solutions. Given the proven performance of battery storage in other regions, there is strong precedent for scaling up. For example, utilities in states like California and Arizona have rapidly procured large BESS installations (hundreds of MW each) to meet capacity needs once met by peaking

¹¹ Ameren Missouri. *Smart Energy Plan: Enhancing Reliability, Resiliency, and Supporting Renewable Integration*. Ameren Corporation Press Release, 2024–2025.

¹² *Id.*

gas plants.¹³ Missouri should follow suit by treating batteries as a core part of the resource mix, rather than a peripheral pilot technology, and by ensuring Ameren’s storage additions keep pace with best practices.

7. BESS Targets: Renew Missouri recommends that Ameren evaluate an enhanced BESS deployment scenario in its next IRP filing. This scenario would involve achieving on the order of 1,500 MW of BESS by 2030 (instead of 1,000 MW) and potentially 2,000+ MW by 2035, with corresponding increases in stored energy MWh to provide 4–8 hours of supply per unit. The purpose is to test the reliability and economic benefits of additional storage under various scenarios. Given that Ameren’s analysis shows diminishing LOLE after about 24 hours of storage duration, the focus should be on adding more 4-hour systems rather than ultra-long duration assets. Ameren should fully-consider the capacity accreditation of storage in MISO’s resource adequacy construct. While MISO currently accredits BESS for its duration-limited capacity, storage is a highly flexible resource that can help meet planning reserve margin requirements if sufficiently deployed. By accelerating and expanding BESS, Ameren can better manage its peak loads, integrate renewables, and reduce reliance on peaking generators, ultimately enhancing reliability and reducing production cost volatility for ratepayers.

¹³ California Public Utilities Commission, *Decision 21-06-035: Mid-Term Reliability Procurement*, requiring 11,500 MW of clean capacity to replace retiring natural-gas units (2021).

California ISO (CAISO), *2024 Summer Loads and Resources Assessment*, documenting >5,000 MW of battery storage serving peak capacity.

Vistra Corp., *Moss Landing Energy Storage Facility Overview*, describing 400-MW and 350-MW BESS installations (2023).

Arizona Public Service (APS), *Clean Energy Commitment Announcement*, outlining procurement of 850 MW of battery storage for peak-demand reliability (2020).

Salt River Project (SRP), *SRP Approves 250-MW / 1-GWh Battery Project*, supporting peak capacity and renewable integration (2023).

III. Renewable Energy Generation Expansion and Interregional Procurement

7. Ameren’s Renewable Additions: The 2025 IRP Update maintains Ameren’s commitment to significant renewable energy expansion, with 2,700 MW of new wind and solar slated by 2030 (on top of 500 MW of solar brought online at end of 2024) and a total of 5,400 MW of renewable capacity by 2035.¹⁴ This is an acceleration of the timeline compared to the prior IRP, intended to help meet the needs of new large customers and support their clean energy goals. Renew Missouri strongly supports this ramp-up of utility-scale renewables. The Company has already made progress. By the end of 2024, Ameren placed in service three new solar farms totaling 500 MW (Huck Finn, Boomtown, and Cass County solar projects), and obtained Certificates of Convenience and Necessity (“CCNs”) for several more solar facilities (e.g. Vandalia-50 MW, Bowling Green-50 MW, Split Rail-300 MW) to come online in the years of 2025–2026.¹⁵ Ameren has also issued Requests for Proposals to continue building its pipeline of regional wind and solar projects. These actions indicate Ameren is on track to achieve the near-term renewable targets. However, beyond 2030, Ameren’s plan shows a plateau in renewable growth - only reaching 4,200 MW by 2045 per a recent summary¹⁶ - especially as the Company proposes adding new gas and nuclear resources in the 2030s and 2040s. Renew Missouri recommends exploring opportunities to go further on clean energy procurement, potentially exceeding the 5,400 MW by 2035 if cost-effective resources are available.

¹⁴ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

¹⁵ *Id.*

¹⁶ *Ameren Missouri Unveils Plan to Enable Economic Growth, Boost Reliability and Create Jobs in the State*, PR Newswire (Feb. 14, 2025).

8. Kansas Wind via GBX: A major opportunity for additional low-cost renewable energy lies in interregional procurement, specifically harnessing the high-quality wind resources from western Kansas via the proposed Grain Belt Express HVDC transmission project. Under a Commission-approved stipulation, Ameren was required to study a scenario with generic Kansas wind and solar resources delivered over a 500 MW share of the GBX line as a potential supply option in this IRP update. Ameren did conduct this analysis, evaluating four alternative resource portfolios that include 500 MW to 800 MW of Kansas renewables via HVDC in place of some of its planned MISO-connected renewables or in lieu of a portion of a new gas plant. In its filing, Ameren concluded that the “economics of generic Kansas renewable resources delivered by HVDC do not appear to provide net benefits to customers,”¹⁷ asserting that substituting MISO resources with Kansas wind/solar (and including delivery costs) would increase costs in its modeling. Renew Missouri urges a more critical review of this finding as it may undervalue the advantages of geographic diversity and resource quality. According to Grain Belt Express’s analysis, renewable resources delivered via GBX can “generat[e] net benefits ... for Missouri consumers”.¹⁸
9. Reliability and Extreme Event Performance: Beyond pure economics, access to a diversified renewable portfolio via GBX offers significant reliability and resiliency benefits. The CRA study explicitly evaluated extreme weather scenarios and found that adding GBX markedly improves outcomes under stress conditions. With the GBX line and Kansas resources in service, the size of potential load shed events (outages) in Ameren’s territory was reduced by roughly 50%, and the total expected unserved energy was cut by

¹⁷ Comments on Ameren's 2025 Annual Integrated Resource Plan (Grain Belt Express, LLC).

¹⁸ *Id.*

48%, 54%, and 30% in the years 2030, 2035, and 2040, respectively, compared to the case without GBX.¹⁹ Missouri’s grid would be far more resilient to extreme winter storms or summer heat waves with an interregional HVDC link as it would provide an “insurance policy” of additional import capability when local generation is strained. The GBX converter stations also bring ancillary benefits such as dynamic voltage support and frequency stabilization, which can help manage the rapid load swings associated with large industrial and data center loads. These findings directly address the Commission’s directive to weigh the “reliability, resiliency and operational benefits of the HVDC transmission facilities themselves”.²⁰ The evidence indicates that Grain Belt Express would substantially enhance grid stability and resource adequacy for Ameren Missouri.

10. Leverage Regional Clean Energy Markets: Renew Missouri recommends that Ameren fully incorporates the GBX project and associated Kansas wind/solar as a viable supply-side option in its next triennial IRP. This includes correcting any modeling biases or constraints that may have undervalued the HVDC option in the 2025 update. Ameren should continue to pursue bilateral opportunities to purchase wind energy from outside Missouri (whether via GBX or traditional transmission) when such energy is low-cost. Missouri now participates in the MISO regional marketplace and Ameren can contract for renewable energy credits or off-site renewable power purchase agreements to supplement its owned projects. By tapping regional clean energy markets, Ameren can diversify its renewable portfolio and achieve greater economies of scale and cost savings than by relying solely on

¹⁹ *Id.*

²⁰ The Brattle Group & DNV, *The Operational and Market Benefits of HVDC to System Operators* (2023); Grain Belt Express Clean Line LLC, “Reliability” (project website); U.S. Department of Energy, *Applications of HVDC Technologies – Summary* (2015).

local projects. Renew encourages - to the extent Ameren is not already doing so - the joining of initiatives like the MISO-SPP Joint Targeted Interconnection Queue or other joint RTO planning efforts that facilitate cross-regional renewable development. Accelerating renewable energy additions and integrating interregional resources (like Kansas wind via HVDC) will improve Ameren's ability to meet its clean energy targets affordably and reliably, to the benefit of Ameren customers.

IV. MEEIA and Demand-Side Resource Offerings

12. Ameren's Energy Efficiency Plan Limited to MEEIA 4 Levels: Ameren's IRP update notes a significant change in its preferred plan regarding demand-side management. Instead of modeling energy efficiency at the RAP level identified by market potential studies, Ameren's new PRP includes continued MEEIA programs through 2043 at levels similar to those recently approved by the Commission (the MEEIA Cycle 4 portfolio).²¹ In effect, Ameren has capped its energy efficiency efforts at the status quo, rather than pursuing the higher level of savings that would be achievable with more aggressive program investment. The Company cites the reduction in expected savings from demand side management ("DSM") as one reason it needed more supply-side capacity. Renew Missouri is concerned that this approach shortchanges customers by leaving cost-effective efficiency gains on the table. The MEEIA Cycle 4 plan negotiated in 2023 and covering 2025–2027 program years was a compromise, not the maximum attainable efficiency. Ameren's own 2023 Market Potential Study ("MPS") identified significantly greater efficiency potential under RAP and Max Achievable scenarios than what is embedded in MEEIA 4. By limiting DSM to

²¹ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

only “MEEIA-approved” levels in the IRP, Ameren is planning for higher load growth than necessary and potentially over-investing in supply-side capacity as a result.

13. Evidence of Higher Achievable Potential: Historically, Ameren’s energy efficiency programs have delivered strong results. The Company’s MEEIA Cycle 3 (2019–2021, extended through 2024) achieved or exceeded its energy savings targets in the early years and came very close to the later targets. These programs produced substantial net benefits to participants and to the system, Ameren reported hundreds of millions of dollars in net lifetime benefits from MEEIA 3 measures.²² The definition of RAP in the MPS is essentially all cost-effective efficiency that could realistically be acquired with enhanced program effort. By avoiding RAP, Ameren is implicitly forgoing cost-effective energy savings that would reduce customer bills and defer the need for new generation. It is premature for Ameren to conclude that only the minimal MEEIA case should be pursued long-term.

14. Pursue RAP or Higher DSM Levels: Renew Missouri recommends Ameren evaluate a higher DSM case (RAP or Maximum Achievable Potential (“MAP”)) in its resource planning. The IRP rules (20 CSR 4240-22) intend for utilities to examine demand-side resources on an equivalent basis with supply-side options. If RAP DSM can cost-effectively shave additional peak demand and energy usage, the Commission should expect to see an IRP Preferred Plan that includes those savings, rather than defaulting to a constrained scenario. We specifically request that Ameren consider, in its next annual update or triennial filing, modeling a scenario with DSM achievement at RAP levels and

²² Ameren Missouri / Cadmus / ADM Associates. *MEEIA Cycle 3 Evaluation, Measurement & Verification*.

show the impact on its capacity expansion plan and customer costs. Additionally, the Commission could signal support for future MEEIA filings that expand program portfolios, perhaps extending program cycles to achieve deeper retrofits and reach new segments. This would include, for example, programs for data center efficiency, electrification load management, or low-income energy savings. By unlocking more of the realistic achievable potential, Ameren can reduce its reliance on building expensive new generation, mitigate load growth, and provide direct bill relief to participants. Over the long term, aggressive energy efficiency is a powerful tool to keep rates affordable and system costs low, and it aligns with Missouri’s policy of considering demand-side options in IRP.

V. Transmission Planning and Infrastructure for Renewable Integration

16. MISO Long-Range Transmission Plan (“LRTP”): A robust transmission network is indispensable for integrating new renewable generation and maintaining reliability under changing load patterns. Ameren’s IRP update acknowledges significant ongoing and planned transmission investments.²³ Notably, in December 2024, MISO approved its LRTP Tranche 2.1 portfolio of regional reliability projects at an estimated cost of \$21.9 billion with approximately \$818 million of that investment allocated to Missouri.²⁴ The approved Tranche 2.1 projects in Missouri are all 345 kV lines - (complementing earlier Tranche 1 projects - and designed to “improve transfer capability into, out of, and across the state, increase transmission headroom for generation interconnections, and support the reliability and resiliency of eastern Missouri load (including the St. Louis region)”²⁵. This is a

²³ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

²⁴ *Id.*

²⁵ Midcontinent Independent System Operator. (2024). *Long-Range Transmission Plan (LRTP) Tranche 2 portfolio overview and project justification materials*. Midcontinent Independent System Operator.

welcome development as these regional upgrades will expand Missouri’s ability to import/export power and accommodate new wind, solar, and other resources being built in MISO’s queue.²⁶ Ameren notes that even larger 765 kV projects are expected in the next set of LRTP proposals, especially as MISO updates its future scenarios to account for the rapid load growth from data centers, electrification, and industrial load.²⁷ In fact, MISO had to adjust its planning futures when its previous load forecast was quickly exceeded by real-world developments.

17. Ameren’s Local Transmission Efforts: At the utility level, Ameren Missouri Transmission Planning has updated its criteria and processes to accelerate interconnection studies and reflect the evolving generation mix, such as more inverter-based resources. Ameren is also investigating new technologies such as dynamic line ratings - which can increase a line’s transfer capacity in real-time based on ambient conditions - to maximize use of existing assets.²⁸ These are positive steps. However, Ameren candidly states that, with so many unknowns about the location of future large loads and generation, “a definitive plan for the ultimate build-out of the transmission system”²⁹ is not yet in hand. Instead, a continuous, iterative approach is needed, combining long-term scenario-based planning (like MISO’s LRTP) with near-term planning to connect imminent new loads and generation by their in-service dates. Renew Missouri agrees and emphasizes that proactive transmission development must keep pace with the resource transition. The lead times for major

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ 2025 Integrated Resource Plan Annual Update, p. 30.

transmission projects can be 5–10 years (or more for 765 kV lines), so decisions made in this IRP horizon will affect the 2030s grid capabilities.

18. Grain Belt Express and Interregional Capacity: A significant element of transmission planning should include the integration of the Grain Belt Express HVDC line. As discussed earlier, GBX Phase I would bring up to 1,500 MW into Missouri by 2029.³⁰ Ameren’s analysis in the IRP treated GBX as a supply option bundled with generation, but it’s worth noting GBX also provides a transmission asset benefit. The Commission’s stipulation required Ameren to consider the “reliability, resiliency and operational benefits of the HVDC transmission facilities themselves.”³¹ The CRA study highlighted some of those operational benefits. For example, an HVDC link can dynamically control power flows, provide voltage support, and dampen oscillations, capabilities that traditional AC lines lack.³² Additionally, an interregional HVDC line effectively adds capacity margin to the system by allowing access to surplus generation in a neighboring region during emergencies.³³ While transmission lines are not yet formally accredited as capacity in MISO, Ameren estimated a contribution to available capacity from GBX in its analysis in terms of reduced effective LOLE. The IRP suggests that accrediting transmission like a resource would need Federal Energy Regulatory Commission (“FERC”) approval and is uncertain in practice. Even so, the reliability value is real as demonstrated by the extreme

³⁰ Grain Belt Express LLC, *Comments on Ameren Missouri’s 2025 IRP Annual Update*, File No. EO-2026-0088 (Nov. 2025).

³¹ *Id.*

³² Charles River Associates, *HVDC Benefits Analysis*, Appendix B (Sept. 17, 2025).

³³ U.S. Department of Energy, *National Transmission Needs Study* (2023), National Renewable Energy Laboratory (NREL), *Interconnection Seams Study* (2022) and *Value of HVDC Transmission for a Decarbonized Grid* (2023), The Brattle Group, *The Benefits of Interregional Transmission* (2021),

event simulations where GBX cut outage risk dramatically.³⁴ Renew Missouri believes the Commission should actively support efforts to assign resource adequacy value to interregional transmission (through MISO or FERC), as this will encourage projects that strengthen the grid and lower the risk of load shedding events for Missouri.

19. Strengthen Transmission Planning Commitments: Renew Missouri recommends Ameren take several actions regarding transmission in preparation of Ameren’s future plans. First, require Ameren to explicitly include the benefits and costs of approved regional transmission projects - like MISO LRTP Tranche 1 and 2.1 - in its IRP analyses. These projects will impact Ameren’s ability to deliver energy from new generation and should be reflected in modeling of congestion and curtailment. Second, Ameren should continue studying additional transmission projects that could unlock renewables, for instance, a possible Tranche 3 portfolio from MISO. The IRP hints that 765 kV lines may be needed post-2030, indicating bigger plans are coming. Ameren should not wait to react but rather engage in the planning stages so Missouri’s needs are prioritized. Third, Ameren should pursue joint, cost-sharing transmission opportunities with neighboring utilities and regions. If, for example, SPP or Associated Electric Cooperative would benefit from an intertie, Ameren could partner on that and thereby reduce costs for each party. Finally, with respect to GBX specifically, Renew Missouri requests that Ameren should treat the 500 MW HVDC capacity it studied as a selectable resource in future IRP modeling runs and not just an externally imposed scenario. Transmission should be viewed not as a fixed background grid, but as a controllable investment lever in the IRP and one that can enable more

³⁴ GridLab & University of California–Berkeley. *Reliability Under Extreme Conditions in the MISO and SPP Regions* (2023), The Brattle Group. *The Value of Interregional Transmission Under Extreme Weather Stress* (2021–2022), Invenergy Transmission. [GBX Reliability and Production Cost Modeling Summary](#), Case No. EA-2023-0017.

renewables, improve reliability, and ultimately save customers money by reducing congestion and outage costs.

VI. Ratepayer Cost Impacts and Long-Term Benefits

20. Cost Implications of Clean Energy Investments: The aforementioned recommendations for more battery storage, additional renewable procurement (including via HVDC imports), aggressive energy efficiency, and robust transmission build-out all share a common theme: they may require higher upfront investments, but they are expected to yield substantial long-term savings and risk mitigation for ratepayers. Ameren's IRP filing itself indicates significant capital investment under the preferred plan - approximately \$5 billion extra by 2030 and \$7 billion by 2035 relative to previous plans.³⁵ These investments include new generation, storage, and grid upgrades. It is crucial to evaluate these costs in a holistic, multi-decade context. For example, renewable energy projects and energy efficiency have no fuel costs, which insulates customers from volatile natural gas or coal prices and from potential carbon regulation costs. Conversely, Ameren's plan to add 6,100 MW of new natural gas generation by 2045³⁶ will expose ratepayers to fuel price volatility and future carbon taxes or pipeline constraints. By shifting more of the portfolio to wind, solar, storage, and efficiency, Ameren can provide a hedge against such volatility, a value that might not be fully captured in deterministic modeling but is very real as recent gas price fluctuations have shown.

³⁵ Ameren Missouri, *Ameren Missouri Unveils Plan to Enable Economic Growth, Boost Reliability and Create Jobs in the State*, PR Newswire (Feb. 14, 2025)

³⁶ *Id.*

21. Demonstrated Savings from Proposed Measures - Several Data Points from the Record Support the Economic Wisdom of Clean Energy Investments:

- The CRA HVDC analysis (Appendix B) showed a net present value benefit of about \$267 million from 2029–2040 for Ameren Missouri if Grain Belt Express is utilized. This is after accounting for the capital cost of the HVDC line. Such savings directly flow to customers through reduced production and capacity costs.
- Energy efficiency programs under MEEIA have consistently passed cost-effectiveness tests, meaning the avoided costs (generation, transmission, distribution) exceed the program costs. The MEEIA Cycle 3, for instance, delivered tens of millions in net benefits annually.³⁷ Those avoided energy and capacity purchases ultimately keep rates lower than they otherwise would be. By not expanding efficiency further, Ameren forgoes these savings and may incur higher supply costs that customers must pay for decades.
- Battery storage and demand response can reduce peak-related costs. For example, if Ameren can clip its peak demand through storage or efficiency, it can avoid or defer building a new peaker plant – which will save capital costs³⁸ - and reduce capacity payments in the MISO market. As noted, Ameren plans to build 800 MW of gas peakers

³⁷ Ameren Missouri. (2019–2022). *MEEIA Cycle 3 Annual Report* [Program cost-effectiveness and net benefits]. Missouri Public Service Commission. Cadmus; ADM Associates. (2019–2022). *MEEIA Cycle 3 EM&V Reports* [Evaluation of cost-effectiveness and net benefits]. Missouri Public Service Commission.

³⁸ Stock, K., Chediak, M., & Saul, J. (2025, December 4). So you want an AI boom. Bloomberg Newsletter: Green Daily. Retrieved December 4, 2025, from https://www.bloomberg.com/news/newsletters/2025-12-04/how-trump-s-renewables-roadblocks-can-stall-the-ai-boom?cmpid=BBD120425_GREENDAILY&utm_medium=email&utm_source=newsletter&utm_term=251204&utm_campaign=greendaily

at Meramec and Rush Island sites for “reliability.” Some of that need might be avoidable with sufficient storage and DSM.

- Transmission upgrades, while sometimes expensive upfront, often pay for themselves via production cost savings by accessing cheaper generation and reducing congestion. MISO approved the \$21.9 billion Tranche 2.1 portfolio precisely because its analyses showed the benefits (production cost savings, reliability, resource adequacy benefits) exceeded the costs on a net present value basis.³⁹ Missouri’s \$818 million share is expected to be recouped through lower energy costs and improved reliability for customers.⁴⁰

22. Mitigating Rate Volatility and Risk: In addition to quantifiable savings, investing in a diverse set of clean resources provides a hedge against several risks. One of which is fuel price risk. By 2040, Ameren’s preferred plan still relies heavily on natural gas for over 5 GW of capacity. If global gas markets tighten or domestic prices rise (as seen in 2022 and projected in the latest reports⁴¹), ratepayers could see fuel adjustment charges increase. Renewables, storage, and efficiency have no such risk as their costs are mostly upfront and fixed. Regulatory risk of carbon pricing or stricter emission regulations that could render new fossil investments cost-prohibitive or stranded in the future is also a concern. Clean energy pre-empts that risk entirely. There is also performance risk as centralized thermal

³⁹ Midcontinent Independent System Operator. (2024). *LRTP Tranche 2 portfolio approval announcement*. Midcontinent Independent System Operator. Midcontinent Independent System Operator. (2024). *LRTP Tranche 2 portfolio overview and benefit analysis*. Midcontinent Independent System Operator.

⁴⁰ Ameren Missouri, *2025 Integrated Resource Plan Annual Update*, File No. EO-2026-0088 (Oct. 30, 2025).

⁴¹ Maguire, G. (2025, December 3). High and rising natural gas costs may spur fresh climb in US coal use. Reuters: Commodities. Retrieved December 5, 2025, from https://www.reuters.com/markets/commodities/energy/high-rising-natural-gas-costs-may-spur-fresh-climb-us-coal-use-2025-12-03/?utm_source=Sailthru&utm_medium=Newsletter&utm_campaign=Power-Up&utm_term=120425<g=67ed690782623f2b960eb5e8

plants can suffer outages - as witnessed during Winter Storm Uri - whereas a portfolio of many wind/solar farms and smaller batteries is more distributed and resilient to these extreme winter weather events.⁴² There are also technological risks as costs may continue to favor clean resources as solar, wind, and battery costs have continued to decline dramatically over the past decade. Continued innovation makes it likely that renewable and storage options will only get more attractive. There is also a high likelihood that the clean energy tax credits will be extended or expanded at a future date,⁴³ and battery storage continues to receive tax credits through 2033.⁴⁴ Early investment and planning allow Ameren to learn and improve to get the most advantageous price for ratepayers. By contrast, committing to large, long-lived fossil projects could lock in costs that become even more prohibitive over the next two decades.

23. Ensure Comprehensive Cost-Benefit Analysis: Renew Missouri recommends that in the future, Ameren's cost assumptions and planning scenarios should fully consider the long-term fuel savings, risk reductions, and societal benefits of clean energy investments. We specifically suggest that future IRPs include a ratepayer impact measure test or equivalent

⁴² Arbaje, P. (2023, December 14). How Gas Plants Fail and Lead to Power Outages in Extreme Winter Weather. Union of Concerned Scientists blog. Retrieved December 4, 2025, from <https://blog.ucs.org/paul-arbaje/how-gas-plants-fail-and-lead-to-power-outages-in-extreme-winter-weather/>

⁴³ U.S. Congress, *Energy Policy Act of 1992* (creation of federal renewable PTC), U.S. Congress, *Energy Policy Act of 2005* (establishment of solar ITC and expansion of PTC), U.S. Congress, *Emergency Economic Stabilization Act of 2008* and *American Recovery and Reinvestment Act of 2009* (major expansions of renewable tax incentives), U.S. Congress, *Consolidated Appropriations Act of 2016* and subsequent extensions in 2020–2021 (long-term extensions of ITC/PTC), U.S. Congress, *Inflation Reduction Act of 2022* (creation of long-term technology-neutral credits and major expansion of clean energy incentives).

⁴⁴ Walton, R., & DiGangi, D. (2025, August 27). US utility-scale storage outlook ticks upward post-OBBBA. Utility Dive. Retrieved December 4, 2025, from <https://www.utilitydive.com/news/EIA-utility-scale-storage-outlook-ticks-upward-post-obbba/758710/>

Wood Mackenzie Power & Renewables & American Clean Power Association. (2025, September). US Energy Storage Monitor [Q3 2025]. Wood Mackenzie Reports. Retrieved November, 2025, from https://go.woodmac.com/l/131501/2025-09-25/34tzgr/131501/1758833792fvVm5YRQ/US_ESM_Q3_2025_ES_PR.pdf

analysis that shows the net effect on customer bills of different resource strategies over time. For instance, a scenario with higher efficiency and renewable deployment might have higher capital expenditures but could result in a flatter or lower fuel cost trajectory and reduced total revenue requirements in the long run. Ameren's analysis should also account for potential revenues or savings from market transactions, such as selling surplus renewable energy or capacity into MISO markets or using transmission like GBX to trade energy. Prior IRP dockets have raised similar questions, and it is vital to avoid a narrow view of short-term rate impacts and instead focus on total lifetime costs to customers. Renew Missouri is confident that when such comprehensive analysis is done, the strategy of investing in energy efficiency, renewable generation, storage, and transmission emerges as the least-cost, least-risk path for Missouri customers over the long term.

VII. Conclusion

24. Renew Missouri urges the Ameren to consider the following actions and recommendations when evaluating planning decisions based on this 2025 IRP Annual Update and to guide the Company's future filings: (a) evaluate and pursue greater battery storage deployment, with specific higher MW targets by 2030 and 2035, to enhance reliability and renewable integration; (b) expand its renewable generation procurements, including taking advantage of interregional resources via the Grain Belt Express HVDC line or other regional market opportunities, rather than relying solely on in-territory projects; (c) analyze RAP or higher levels of energy efficiency in its planning and, as appropriate, implement larger-scale DSM programs under MEEIA to capture all cost-effective efficiency savings; (d) emphasize proactive transmission planning, endorsing projects that increase transfer capacity and resilience such as MISO's LRTP projects and GBX, and treat transmission as a key

component of resource adequacy and clean energy delivery; and (e) evaluate resource plans on a comprehensive cost basis, recognizing the long-term ratepayer benefits of reduced fuel use and improved reliability that come from clean energy and efficiency investments, and thereby mitigate potential rate volatility.

25. Renew Missouri respectfully requests that the Commission take official notice of these comments, and that Ameren incorporate our recommendations into its IRP process. By doing so, Ameren's resource plan would truly reflect a least-cost, reliable, and sustainable strategy for serving customers consistent with Missouri's IRP goals. Renew Missouri stands ready to participate in workshops or collaborate with Ameren and other stakeholders to refine these proposals. We appreciate the opportunity to provide input in this docket.