

6. New Supply-Side Resources

Highlights

- *Ameren Missouri selected four natural gas technologies as final candidate resource options – Gas Combined Cycle with and without carbon capture and sequestration (CCS), Gas Simple Cycle Combustion Turbine, and Fuel Cells. Gas Combined Cycle exhibits the lowest LCOE among non-renewable generation resources.*
- *Nuclear remains a resource option for implementation beyond 2040.*
- *The availability, duration, and structure of the Federal tax credits and incentives applicable to certain generation and storage technologies have shifted with recent legislative actions.*
- *Large scale wind resources exhibit the lowest cost on a levelized cost of energy (LCOE) basis among all candidate resource options without tax incentives.*
- *With federal investment tax credits (ITC) or production tax credits (PTC), large scale solar resources closely follow wind resources as low-cost energy resources in addition to providing significant summer peak capacity benefits.*
- *Battery storage and pumped storage have been identified as candidate resource options.*

The supply-side screening analysis of various gas, nuclear, storage and renewable power generation technologies used in the 2023 IRP was reviewed by Ameren Missouri subject matter experts and updated for use in the 2026 IRP. Since the last IRP, cost and risk assumptions for new generation have been influenced by several factors, including elevated interest rates, continued labor and equipment cost pressures, supply chain disruptions and delays, transmission and interconnection constraints, and permitting and siting challenges.

In addition, recent federal legislative actions, including the enactment of the One Big Beautiful Bill Act (OBBBA), have introduced changes to the availability, duration, and structure of the federal tax credits and incentives applicable to certain generation and storage technologies, creating additional uncertainty with respect to the long-term economics of renewable, storage, hydrogen, and carbon capture technologies. These policy changes have also been incorporated into the assumptions utilized in the 2026 IRP. See Table 6.1 for additional details related to the OBBBA's subsections 48E ITC and 45Y PTC Phase-out for Solar, Wind, and Storage.

Table 6.1 48E Clean Electricity ITC and 45Y Clean Electricity PTC

Topic	Section 45Y (Clean Electricity PTC)	Section 48E (Clean Electricity ITC)
Early Termination for Wind & Solar	Ineligible if construction begins after July 4, 2026 and placed in service after Dec 31, 2027.*	Same as 45Y, but energy storage exempt from placed-in-service deadline.*
Phaseout for Non–Wind/Solar (i.e., BESS)	2033: 100%; 2034: 75%; 2035: 50%; After 2035: 0%	Same rule as 45Y.
IRA Change	Replaces emissions-based phaseout trigger.	Same rule as 45Y.
Bonus Credits	New 10% bonus for advanced nuclear in qualifying MSAs.	No new bonus noted
Domestic Content	Existing domestic content rules apply.	Harmonized with 45Y for projects starting on/after June 16, 2025.
FEOC / PFE Restrictions	Ineligible if construction starts after Dec 31, 2025.*	Ineligible if construction starts after Dec 31, 2025.*
*Start of construction can mean both on-site and off-site work of a significant nature such as foundation excavation, installing support structures, or off-site manufacturing of major components such as transformers. Facilities must demonstrate continuous construction or satisfy the 4-year continuity safe harbor (i.e., placed in-service by end of 4 th calendar year after construction begins).		

In parallel, the development of new natural gas generation faces increasing execution risks. Global demand for large-frame gas turbines has resulted in extended manufacturing lead times, constrained availability of critical components, and limited construction and engineering resources, particularly for combined-cycle facilities. In addition, challenges associated with pipeline capacity, fuel interconnection, and permitting can further affect project schedules and risk profiles. As a result, while natural gas generation continues to be evaluated as a potential supply-side resource, including because in many cases it is the best choice to meet Company needs, the 2026 IRP reflects updated assumptions related to development, timelines, execution risk, and resource availability.

Consistent with these considerations, this IRP evaluates a diverse portfolio of supply-side resources, including solar, wind, battery energy storage systems (BESS), and natural gas (both simple cycle, combined cycle, and fuel cell) as potential new supply-side resources. Nuclear generation is also included due to its ability to provide firm, around-the-clock

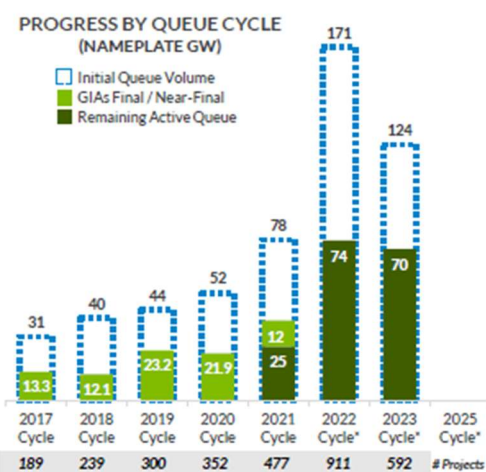
carbon-free energy and support system reliability amid projected load growth and increasing uncertainty across multiple resource types.

Ameren Missouri continues to evaluate storage resource options, including pumped hydro storage and several alternative BESS technologies. Pumped hydroelectric storage is still an energy storage resource included in our evaluation of alternative resource plans as a major supply-side resource. However, with the advancements in BESS, including various lithium-ion and flow battery technologies, and the challenges associated with permitting new pumped hydroelectric storage facilities, BESS is the primary energy storage resource included as a major supply-side resource in the near- to medium-term.

While some energy storage technologies have not been selected for integration analysis, it is important to note that the use cases for such technologies continue to develop, as does the consideration of appropriate market treatment for the services that these technologies can provide. Such ongoing developments will continue to be considered as part of our ongoing resource planning, including consideration of technologies and services provided by and to the transmission and distribution systems.

6.1 Potential Supply-Side Resources¹

Figure 6.1 MISO Queue Cycle



*Processing for 2023 started in November 2025; 2025 cycle processing begins Q1 2026. There was no queue cycle for 2024

As of 2026, the Midcontinent Independent System Operator (MISO) continues to experience sustained growth in generation interconnection (GI) requests across renewable and storage technologies. The volume of requests in recent years has contributed to increasing congestion within the interconnection queue and heightened transmission system constraints, resulting in extended study timelines, higher network upgrade requirements, and increased interconnection-related costs for new generation resources. Figure 6.1 highlights the progress by queue cycle by project count and capacity. Initial Queue Volume reflects the total nameplate capacity submitted at the start of each cycle. Remaining Active Queue indicates the amount still active within the Definitive Planning

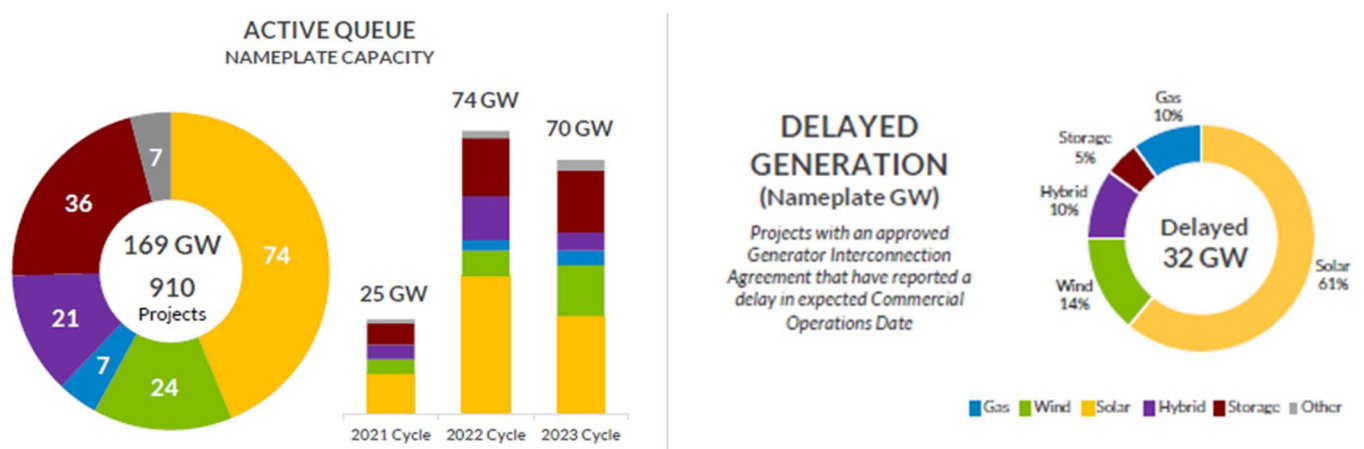
Phase (DPP) process compared to the amount of capacity with an executed or near-final Generator Interconnection Agreement (GIA) in place.

¹ 20 CSR 4240-22.040(1); 20 CSR 4240-22.040(2); 20 CSR 4240-22.040(4)(A)

In response to these conditions, MISO implemented a queue cap beginning in 2025 to manage the volume of new requests and improve the efficiency and timelines of the DPP process.

For additional background, all GI requests proceed through the DPP process as MISO and the appropriate transmission owners evaluate how the generation projects will affect the bulk electric system. Figure 6.2 shows DPP trends by year, in terms of both capacity and project count (left) and delayed capacity (right).

Figure 6.2 MISO Generator Interconnection: Overview²



While the queue cap is intended to support more efficient processing of the GI requests, it also limits the number of new projects that may enter the queue in a given cycle, introducing additional uncertainty regarding the timing and availability of new generation resources. Transmission constraints and the cost of required network upgrades also remain material considerations in areas with limited available capacity. To help mitigate these impacts, MISO and transmission owners have expanded the use of alternative interconnection pathways with the addition of the Expedited Resource Addition Study (ERAS), which is a short-term solution to address capacity concerns by fast-tracking projects that are essential to meeting near-term reliability and resource adequacy needs. In addition to ERAS, MISO's surplus and replacement processes give generation owners a variety of options to pursue interconnection in the most cost effective and timely manner. In 2025, Ameren Missouri filed an application with MISO under its ERAS Process for a solar project and a BESS project. The solar project was accepted into ERAS Study Cycle 1 and the BESS project in ERAS Study Cycle 2. The Company has also utilized both the surplus and replacement processes for BESS and natural gas projects.

² <https://cdn.misoenergy.org/GIQ%20Web%20Overview272899.pdf>

Capital costs for all preliminary candidate supply-side options include any necessary transmission interconnection costs. No preliminary candidate supply-side resource option was eliminated from further consideration due to interconnection or other transmission analysis.³

A detailed characterization of the information gathered through Ameren Missouri's subject matter experts for use in the 2026 IRP can be found in Chapter 6 – Appendix A.

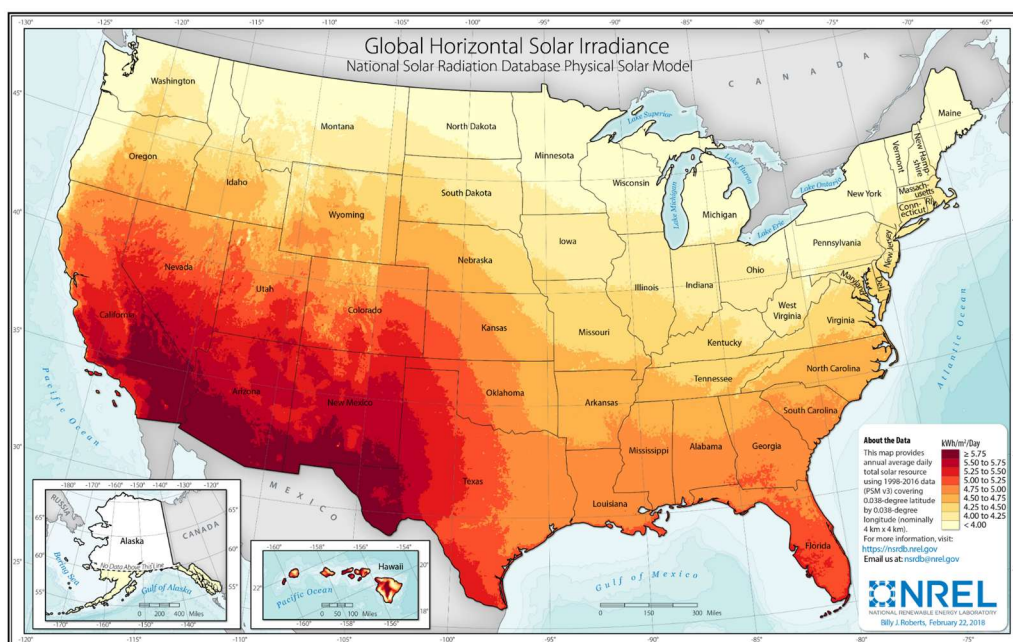
6.1.1 Potential Solar Resources

Based on a review of available solar technologies and Ameren Missouri's service territory, flat-plate solar photovoltaic (PV) is among the most practical, common, and cost-effective technologies for implementation.

Solar Resource & Technologies

A solar resource has three primary components: direct, diffuse, and ground reflected solar irradiances. Global Horizontal Irradiance (GHI) is the sum of all irradiances observed by a flat-plate over time. A map of the GHI for the U.S. is shown in Figure 6.3.

Figure 6.3 U.S. Global Horizontal Irradiance Map



As illustrated in the figure above, Missouri has a reasonably strong solar resource. St. Louis specifically averages an annual GHI value of 4.36 kWh/m²-day.⁴

³ 20 CSR 4240-22.040(4)(B); 20 CSR 4240-22.040(4)(C)

⁴ NSRDB Physical Solar Model (PSM); St. Louis; TMY hourly data; GHI

Flat Plate Photovoltaics

PV capacity has grown to be the most common form of solar technology in the U.S., and Ameren Missouri expects it will remain the dominant solar technology option for deployment for the foreseeable future. As of November 2025, Wood Mackenzie reported there were nearly 191 GW of PV operating in the U.S. and 96 GW in the late-stage development pipeline.⁵ Wood Mackenzie forecasts that the US utility-scale PV market will add 359 GW between 2025 and 2035.⁶ This is evidence of the continued improvement in technology and implementation techniques including:

- Adoption of glass-on-glass bifacial modules that decreases degradation and extends its useful life
- Widespread use of single-axis trackers that yield higher capacity factors along with extended energy production windows
- Increase of solar module to inverter (DC:AC) ratios to further increase capacity factor

Ameren Missouri Photovoltaics

In addition to the solar assets currently in operation in Ameren Missouri's generation fleet, the Company plans to build additional solar resources in the coming years. One of those solar resources has received regulatory approval and is moving forward with construction, the Reform Solar Energy Center – and two remain under regulatory review. Each planned solar resource addition is detailed below:

Reform Renewable Energy Center

Reform Renewable Energy Center is a 250 MW-AC solar energy center located in Callaway County, Missouri. The resource received regulatory approval in May of 2026 and is currently under construction. It is expected to be commercially operational in late 2028.

Tom Sawyer Renewable Energy Center

Tom Sawyer Renewable Energy Center is a 175 MW-AC solar energy center located in Audrain County, Missouri. The Company filed for regulatory approval in May of 2026. It is expected to be commercially operational in late 2028.

Ringer Solar Renewable Energy Center

Ringer Solar Renewable Energy Center is a 225 MW-AC solar energy center located in Stoddard County, Missouri. The Company filed for regulatory approval in May of 2026. It is expected to be commercially operational in 2029.

⁵ Wood Mackenzie US Utility Scale Solar Market Update: Q4 2025, Page 12

⁶ Wood Mackenzie US Utility Scale Solar Market Update: Q4 2025, Page 4

Table 6.2 lists the primary characteristics of solar resources. Chapter 6 – Appendix A contains more detailed information.

Table 6.2 Forecasted Potential Solar Resources (2027\$)⁷

Resource Option	Nameplate MW-AC	Total Project Cost Excluding AFUDC \$/kW	First Year Fixed O&M Cost \$/kW-AC	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Solar	100	*** ***	21.33	0.00	27%	8.25

Ameren Missouri expects that on average the installed cost of solar will decline in real terms, however, the effects of inflation are greater, yielding an inclining cost curve in nominal terms. The cost curve is informed by market data from Wood Mackenzie's Renewable Asset Cost Model (RACM)⁸ forecasting data and the National Laboratory of the Rockies (NLR) 2024 Annual Technology Baseline (ATB)⁹ data, which is shown in Figure 6.4 below.

Figure 6.4 Solar Total Project Cost Excluding AFUDC

⁷ LCOE reflects 40% ITC. See Figure 6.11 for LCOE results at different levels of ITC.
⁸ Wood Mackenzie, Renewable Asset Cost Model (RACM), Solar CAPEX, October 2025
⁹ National Laboratory of the Rockies (formerly NREL), 2024 ATB Excel Workbook

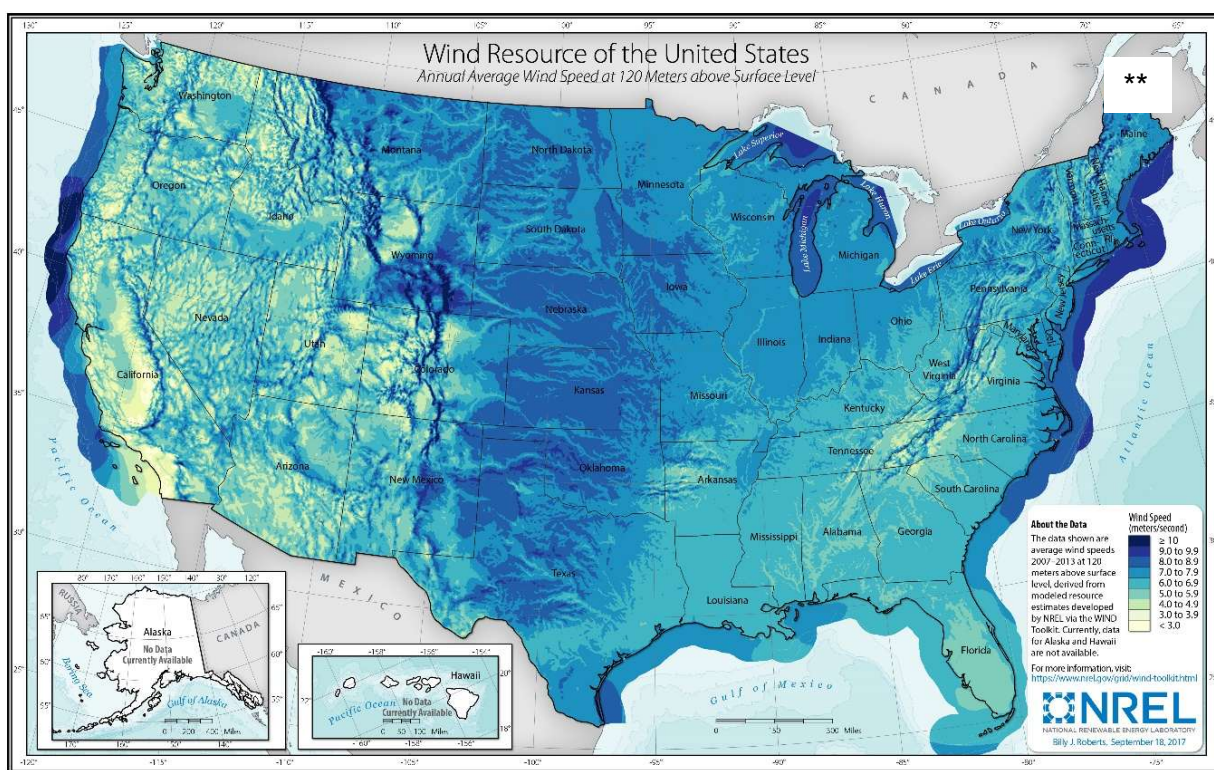
6.2 Potential Wind Resources

Wind Resource & Technologies

Ameren Missouri continues to evaluate wind projects in its territory; however, the near-term opportunities remain limited. Lower wind speeds in Missouri and longer wind development timelines, driven especially by the time and effort required to secure federal permits, have meant fewer wind projects under development in the region.

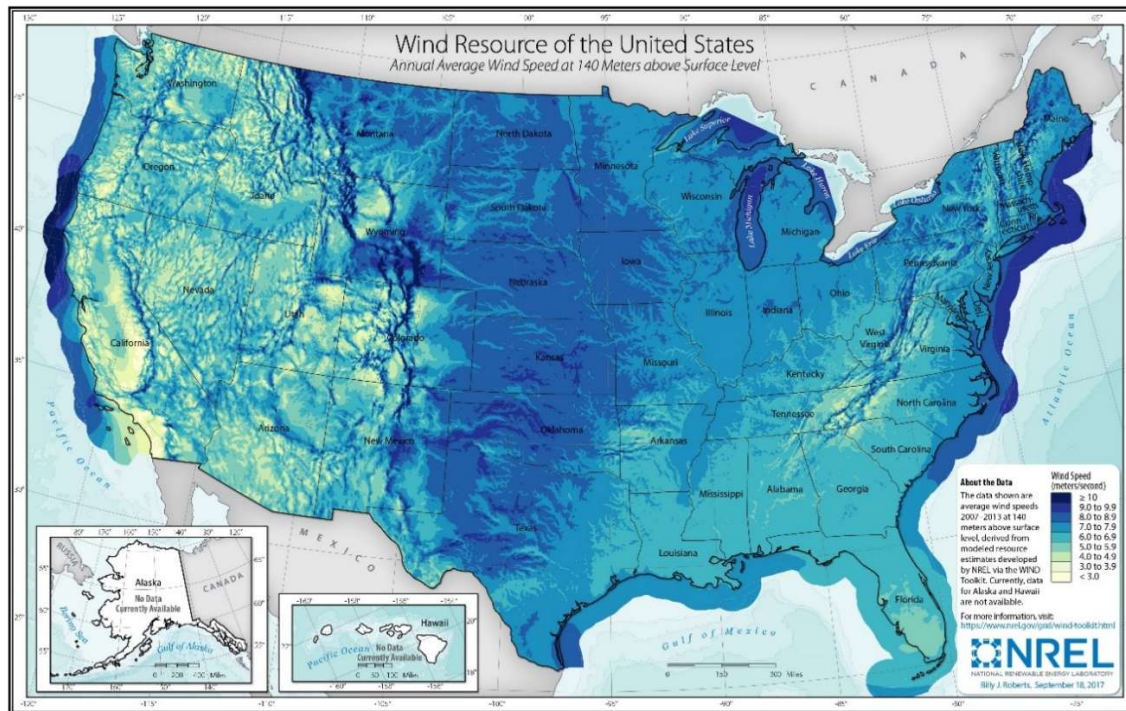
As shown in Figure 6.5. below, which maps the average wind speed at 120 meters above surface level, the average wind speed declines as one travels from west to east through the state.

Figure 6.5 U.S. Wind Resource Map – 120 m above surface level¹⁰



The lower wind resource has translated into fewer wind projects. However, with the advent of new technologies, modern turbines are getting bigger and can be mounted on higher masts. The height for turbine "hub," the part of the turbine that houses the nacelle, generator, and other ancillary systems, has been increasing, with the most recent turbine models at hub heights of 140 meters or more.

¹⁰ <https://www.nrel.gov/gis/assets/images/wtk-120m-2017-01.jpg>

Figure 6.6 U.S. Wind Resource Map – 140 m above surface level¹¹

The NLR map above, Figure 6.6 shows the wind speed at 140 meters above the surface level. As the map shows, Missouri has considerably more regions of good wind resource (shown in dark blue colors) at a 140-meter hub height, which could present opportunities in the future as turbine technologies improve and turbines become taller and larger.

Nonetheless, there is currently a limited pipeline of mature/late-stage projects in Ameren's service territory. For example, only one wind project in the state was submitted during MISO's DPP-2025 Central Cycle.

Ameren Missouri Wind

Ameren Missouri currently has two wind facilities in its generation fleet as discussed in Chapter 4: the Atchison Renewable Energy Center, and the High Prairie Renewable Energy Center.

Using market data for available regional wind projects as a reference point, Ameren Missouri subject matter experts revised the cost and operational characteristics of wind resources to be used in the 2026 IRP, as shown in Table 6.3. Chapter 6 – Appendix A contains more detailed information.

¹¹ <https://www.nrel.gov/gis/assets/images/wtk-140m-2017-01.jpg>

Table 6.3 Forecasted Potential Wind Resources (2027\$)¹²

Resource Option	Nameplate MW	Total Project Cost Excluding AFUDC \$/kW		First Year Fixed O&M Cost \$/kW	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Wind	100	***	***	40.58	0.00	42%	4.73

Ameren Missouri expects that on average the installed cost of wind will decline in real terms, however, the effects of inflation are greater, yielding a flat and then inclining cost curve in nominal terms. The cost curve is informed by market data from Wood Mackenzie's Renewable Asset Cost Model (RACM)¹³ forecasting data and the NLR 2024 Annual Technology Baseline (ATB)¹⁴ data as shown in Figure 6.7.

Figure 6.7 Wind Total Project Cost Excluding AFUDC

6.3 Potential Battery Energy Storage Systems

Battery Energy Storage Systems (BESS) have been deployed throughout the United States as both supply-side and demand-side resources. BESS can provide services such as frequency regulation, frequency response, load shifting, and renewable energy

¹² LCOE reflects PTC benefits. See Figure 6.11 for LCOE results with and without PTC.
¹³ Wood Mackenzie, Renewable Asset Cost Model (RACM), Wind CAPEX, October 2025
¹⁴ National Laboratory of the Rockies (formerly NREL) 2024 ATB Excel Workbook

smoothing, to name a few. As more intermittent renewable generation is deployed within Ameren Missouri's service territory and the surrounding regions, BESS will become more valuable as a controllable grid resource.

Ameren Missouri continues to analyze different BESS chemistries.¹⁵ Technologies such as sodium-sulfur, while mature, have limited capabilities when compared to other technologies, such as lithium-ion and redox flow batteries. Advanced lead-acid batteries also continue to improve but face a challenging market with the continued pressure from lithium-ion battery products.

Lithium-ion Batteries

In addition to electric vehicle and backup systems for residential and commercial applications, lithium-ion (Li-ion) systems have emerged as the preferred choice for new grid-scale storage systems in the United States. Li-ion battery prices have fallen an average of more than 22% year-over-year since 2013.¹⁶ Furthermore, just within MISO, the capacity of energy storage interconnection requests has increased dramatically from 140 MW in 2017 to 36 GW in 2025. Many of the MISO interconnection requests for energy storage are also paired with an intermittent renewable resource, such as solar.

In fact, heavy reliance on BESS is already a reality in regions like California. The California Independent System Operator's (CA-ISO) battery fleet grew to 13 GW (47 GWh) and the Western Energy Imbalance Market added 5 GW of battery capacity in 2024, and over 27 GW of new battery capacity is planned across the West by 2028. Similarly, the Electric Reliability Council of Texas (ERCOT) reached over 12 GW (19 GWh) of operating battery energy storage in late 2025. While not as prevalent, Li-ion batteries have also been deployed in the Pennsylvania-New Jersey-Maryland (PJM) regional transmission organization and the New York Independent System Operator (NYISO).

Ameren Missouri BESS

In addition to the solar assets currently in operation in Ameren Missouri's generation fleet, the Company plans to build additional BESS resources in the coming years. One of those BESS resources, at the Big Hollow Energy Center, has received regulatory approval and is moving forward with construction, and three others are currently under regulatory review. Each planned BESS resource addition is detailed below:

Big Hollow Energy Center

Big Hollow Energy Center is a 400 MW-AC, four-hour battery energy storage system and 4-unit, 800 MW-AC natural gas simple cycle combustion turbine facility currently under

¹⁵ 20 CSR 4240-22.040(2)(C)2

¹⁶ SEPA 2019 Utility Energy Storage Market Snapshot

construction and located in Jefferson County, Missouri, at the site of the former Rush Island coal-fired energy center. The resource received regulatory approval in February 2026 and is expected to be commercially operational in 2028. The Big Hollow BESS Energy Center utilizes existing interconnect rights at the site.

Castle Bluff BESS Energy Center

The Castle Bluff BESS Energy Center is a 95 MW-AC, four-hour battery energy storage system to be located in St. Louis County, Missouri, at the site of the former Meramec coal-fired energy center, which will also host a 4-unit, 800 MW-AC simple cycle combustion turbine facility, currently under construction. The Company filed for regulatory approval in May 2026. If approved, it is expected to be commercially operational in 2028. The Castle Bluff BESS Project utilizes existing interconnect rights at the site.

Huck Finn BESS Energy Center

The Huck Finn BESS Energy Center is a 200 MW-AC, four-hour battery energy storage system to be located in Audrain County, Missouri, at the site of the Huck Finn Solar Energy Center. The Company filed for regulatory approval in May of 2026. If approved, it is expected to be commercially operational in 2028. Huck Finn BESS Energy Center utilizes existing interconnect rights at the site.

Millcreek BESS Energy Center

The Millcreek BESS Energy Center is a 250 MW-AC, four-hour battery energy storage system to be located in Lincoln County, Missouri. The Company filed for regulatory approval in May of 2026. If approved, it is expected to be commercially operational in 2028.

Table 6.4 shows the energy storage technologies that were evaluated as candidate resource options. Li-ion battery energy storage was selected as an energy storage resource to be evaluated in the remaining resource planning process as a major supply-side resource in addition to pumped hydro storage. Ameren Missouri expects that on average the installed cost of batteries will decline in real terms, however, the effects of inflation are greater, yielding an inclining cost curve in nominal terms. The cost curve, which is shown in Figure 6.8 below, is informed by market data from RACM forecasting data and NLR ATB data.

Table 6.4 Potential Energy Storage Resources (2027\$)

Resource Option	Nameplate MW	Total Project Cost Excluding AFUDC \$/kW		First Year Fixed O&M Cost \$/kW	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Pumped Storage	1,000	***	***	13.60	4.01	25%	27.58
Li-Ion Battery (4h)	100	***	***	15.61	0.00	17%	15.98
Li-Ion Battery (8h)	100	***	***	28.41	0.00	33%	15.29

Figure 6.8 Battery Total Project Cost Excluding AFUDC

6.3.1 Additional Potential Storage Resources¹⁷

Ameren Missouri has considered a range of storage resource options, including pumped hydro storage and a number of BESS technologies. A high-level fatal flaw analysis was conducted as part of the first stage of the supply-side selection analysis for storage resources. Options that did not pass the high-level fatal flaw analysis consist of those that could not be reasonably developed or implemented by Ameren Missouri. Two options passed the initial screen: pumped hydroelectric energy storage, and lithium-ion battery

¹⁷ 20 CSR 4240-22.040(1); 20 CSR 4240-22.040(2); 20 CSR 4240-22.040(4)(A)

energy storage. Table 6.5 Potential Hydroelectric Resource lists primary characteristics of storage resources. Chapter 6 – Appendix A contains detailed resource characteristics.

Pumped Hydroelectric Energy Storage

Pumped hydroelectric energy storage is a large-scale, mature, commercial utility-scale technology used at many locations in the United States and worldwide. Conventional pumped hydroelectric energy storage uses two water reservoirs, separated vertically. During lower priced hours (historically off-peak periods), water is pumped from the lower reservoir to the upper reservoir. During high priced periods, (typically on-peak hours), the water is released from the upper reservoir to generate electricity.

A study on new pumped storage hydroelectric energy storage options was performed by HDR in February 2024. The HDR study proposed 800 MW and 1000 MW options at Church Mountain, located midway between Taum Sauk State Park and Johnson Shut-Ins State Park, and a 600 MW option at nearby Des Arc Mountain in Wayne County. Multiple design factors can materially impact the costs of a pumped storage facility, including geography, installed capacity, and storage time.

Lead Acid Batteries

Since 2015, Ameren Missouri has been supporting applied research and pilot testing of this technology at the Missouri University of Science and Technology in Rolla, Missouri. Today, we are designing, procuring, and deploying this technology at a Managed Charging for Fleet EVs site for Ameren vehicles.

Ameren Missouri is committed to supporting our region's economic development by helping bring to market lead-acid battery products that are mined, processed, manufactured, marketed, and recycled in Missouri. Through the above-described demonstration project, we will evaluate the safety and techno-economic performance of lead-acid battery technology around the following use cases: resiliency, demand charge management, demand response, and optimum charger dispatch.

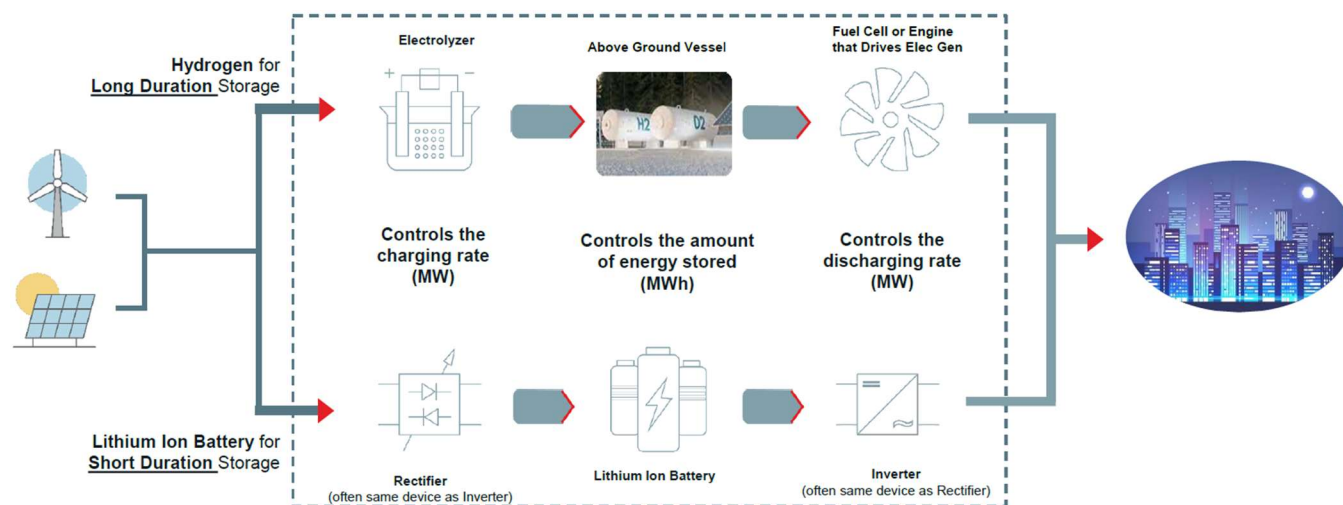
Some of the challenges Ameren Missouri has observed for advanced lead-acid batteries include lower energy density as compared to lithium-ion chemistries, larger footprint requirements for similar performance to lithium-ion applications, and performance and cyclic-life limitations. Lead-acid battery technology is very mature and has mature recycling opportunities to address overall performance, however, this application of energy storage has not demonstrated that it is a commercially viable and widely deployed technology for the reasons mentioned above.

Hydrogen Production & Storage

Hydrogen provides long-duration energy storage. Hydrogen can be stored and then consumed when needed in a combustion turbine, fuel cell, or industrial process. The amount of stored energy depends on the size of tanks and other equipment. Ameren

Missouri is investigating the potential application of hydrogen energy storage and planning demonstration projects.

Figure 6.9 Equivalency Between Lithium Ion and Hydrogen Storage Systems¹⁸



Ameren Missouri has completed a feasibility study that considered a variety of loads: (1) transportation (hydrogen buses and tractor trailers); (2) blending (to supply a load that can use a blend of natural gas and hydrogen); and (3) hydrogen fuel cell (for electrical loads as shown in Figure 6.9). The study concluded that it is technically feasible to use hydrogen to address all of the above loads. However, commercially available system components have not yet been optimized for wide adoption.

Geologic Hydrogen Onsite or Near Natural Gas Storage¹⁹

Geologic hydrogen is an emerging area of scientific study. At present, activity related to geologic hydrogen is focused on early-stage research, exploration, and resource characterization. There are no known utility-scale electric generation facilities using geologic hydrogen, and the technology has not reached a level of development that would allow for meaningful evaluation as a capacity or energy resource within the planning horizon of the 2026 IRP.²⁰

Uncertainties remain regarding the technical feasibility, cost of production, environmental risks, infrastructure requirements, and regulatory treatment of geologic hydrogen. Given these uncertainties, geologic hydrogen does not currently present a planning alternative

¹⁸ Mitsubishi Power Technical Sales Material

¹⁹ File No. EO-2026-0037 1.D

²⁰ In its pleading proposing this Special Contemporary Issue, the Office of Public Counsel stated that “At this point the technology for production of electricity by geologic hydrogen is not in use and is in the preliminary stages...”

that can be reasonably compared with established generation technologies or fuel sources.

At this time, based on the current state of geologic hydrogen development, Ameren Missouri does not anticipate changes to its planning assumptions or investment strategy related to geologic hydrogen.

6.3.2 Potential Hydroelectric Projects

Ameren Missouri previously performed studies to identify potential hydroelectric supply-side resources and projects. For this IRP, Ameren Missouri is using generic project characteristics from EIA and NLR. In addition to cost, several factors contribute to the feasibility of these projects, including accessibility of a water resource, environmental constraints, and regulatory definitions that define what types and sizes of hydropower are considered “renewable.” For instance, the state of Missouri defines “renewable” hydropower in the Renewable Energy Standard (RES), which states hydropower generators can only be considered renewable energy sources if they meet the criteria, “hydropower (not including pumped storage) that does not require a new diversion or impoundment of water and that has a nameplate rating of 10 megawatts or less.”

Table 6.5 shows assumptions for a generic hydroelectric project. The hydro resource was evaluated assuming a 60-year economic life. Because the cost estimates are screening level estimates and because obtaining necessary licenses from the FERC can be complex, a more detailed evaluation of specific projects would be necessary before moving forward with a decision to construct.

Table 6.5 Potential Hydroelectric Resource (2027\$)

Resource Option	Nameplate MW	Total Project Cost Excluding AFUDC \$/kW	First Year Fixed O&M Cost \$/kW	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Hydro - Non-Powered Dam	26	10,486	139.70	0.00	62%	22.99

6.3.3 Potential Landfill Gas Projects

Landfill gas (LFG) is produced by the decomposition of the organic portion of waste stored in landfills. LFG typically has methane content in the range of 45% to 55% and is considered an environmental issue. Methane is a potent greenhouse gas, 25 times more harmful than CO₂ by some estimates. In many landfills, a collection system has been installed, and the LFG is being flared rather than being released into the atmosphere. By adding power generation equipment to the collection system (reciprocating engines, small gas turbines, or other devices), LFG can be used to generate electricity. LFG energy

recovery is currently regarded as one of the more mature and successful waste-to-energy technologies. There are currently nearly 532 operational LFG energy systems in the United States.²¹

Ameren Missouri continues to operate the Maryland Heights Renewable Energy Center (MHREC) at the IESI Landfill in Maryland Heights, Missouri. Previous studies have identified other landfills within the Ameren Missouri service territory that could support another LFG facility. At this time, however, other renewable resources are more abundant and more cost effective. Ameren Missouri will continue to monitor this technology for opportunities for future deployment.

6.3.4 Innovative Renewables Deployment

Ameren Missouri continues to explore and implement various methods to incorporate and deploy more renewable generation throughout its service territory. Among those methods are:

Community Solar: Ameren Missouri included an application for approval of a permanent Community Solar Program within the electric rate review filed in March 2021. The program features a variety of improvements to enhance the participation experience for customers. This proposal was approved as part of an electric rate review settlement agreement, and as a result, the permanent Community Solar Program was rolled out to residential and small commercial customers in the latter half of 2022. The program redesign expands access and affordability by (1) lowering the program enrollment fee, (2) enabling customers to match up to 100% of their usage with solar energy, and (3) accelerating new facilities construction timelines.

Renewable Solutions: In 2022, Ameren Missouri filed for approval of a new subscription renewable energy program, the Renewable Solutions Program. Renewable Solutions is a voluntary renewable energy subscription program designed for larger commercial, industrial, and governmental customers. Many of Ameren Missouri's commercial and industrial customers have publicly expressed their desire for near-term access to renewable energy in the form of sustainability goals for both carbon dioxide emission reduction and renewable energy supply. The program is designed to offer those customers a pathway to meet their sustainability goals with local renewable energy while reducing cost and risk for all Ameren Missouri customers. The Renewable Solutions Program was approved on April 12, 2023, and to date three phases of the program have been fully subscribed totaling over 400 MW of nameplate capacity supported by the Boomtown, Cass County, Vandalia, and Bowling Green Renewable Energy Centers.

²¹ <https://www.epa.gov/lmop/landfill-gas-energy-project-data-and-landfill-technical-data>

Renewable Solutions Large Load Customers: Conceptually similar to the existing Renewable Solutions program, in 2025 Ameren Missouri received approval from the Missouri Public Service Commission to implement a voluntary subscription-based program for large load customers (those with peak demand 75 MW and above) allowing access to local renewable energy and the associated environmental attributes from that production. The program will support large load customers in the achievement of their Scope 2 emissions reductions goals, while also helping reduce costs for all Ameren Missouri customers.

6.4 New Thermal Resources

6.4.1 Potential Natural Gas Options

The 2023 IRP included discussion of multiple natural gas supply-side resource options, addressing base, intermediate, and peaking load requirements.

Ameren Missouri previously studied combined cycle technology, including the evaluation of potential combined cycle generating configurations and potential facility locations. Any future investment will require an updated evaluation to consider the latest technologies, costs, and developments that may impact a new energy center location. For example, since the 2023 IRP, a new 24-inch natural gas pipeline has been constructed, bringing gas from the Rockies Express Pipeline in Illinois into Missouri, through St. Charles and north St. Louis counties. Multiple combined cycle configurations are possible, providing the opportunity and flexibility to tailor a supply-side resource solution to future requirements and constraints in a cost-effective manner. In this IRP, Ameren Missouri also included combined cycle with 95% carbon capture as a potential resource.

Table 6.6 shows assumptions for potential natural gas projects. These projects were evaluated assuming a 30-year economic life (20-year economic life for fuel cells). The cost estimates for these resources are based on information from EIA, NLR, Lazard, public filings from other utilities and original equipment manufacturers. A more detailed scope and evaluation of specific projects would be performed before moving forward with a decision to construct.

West Alton Energy Center

West Alton Energy Center is a 3-unit, 2100 MW-AC combined cycle gas turbines (CCGT) located in St. Charles County, Missouri, adjacent to the current Sioux coal-fired Energy Center. The Company filed for regulatory approval in July of 2026. It is expected to be commercially operational in 2031.

Castle Bluff Energy Center

Castle Bluff Energy Center is a 4-unit, 800 MW-AC simple cycle gas turbines (SCGT) located in St. Louis County, Missouri, currently under construction at the site of the former Meramec coal-fired energy center. The combustion turbines will be dual-fuel capable. It is expected to be commercially operational in 2027.

Big Hollow Energy Center

Big Hollow Energy Center is a 400 MW-AC, four-hour battery energy storage system and a 4-unit, 800 MW-AC SCGT facility currently under construction in Jefferson County, Missouri, at the site of the former Rush Island coal-fired energy center. The combustion turbines are also dual-fuel capable. The resources received regulatory approval in February 2026 and are expected to be commercially operational in 2028.

Table 6.6 Potential Natural Gas Resources (2027\$)

Resource Option	Nameplate MW	Total Project Cost Excluding AFUDC \$/kW		First Year Fixed O&M Cost \$/kW	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Combined Cycle	1,400	***	***	11.62	3.29	80%	9.38
Combined Cycle with CCS	2,100	***	***	54.19	9.98	65%	17.28
Simple Cycle	800	***	***	7.45	4.33	20%	22.85
Solid Oxide Fuel Cells	59	***	***	***	***	0.00	12.44

Project costs in Table 6.6 include pipeline lateral costs when applicable in addition to transmission interconnection costs as discussed in Chapter 7; these costs are location specific. Though not shown in the table, firm gas costs are also included in the LCOE estimates and are provided in the electronic workpapers. The CC with CCS option also includes additional capex and O&M for transportation and storage of captured CO2 assuming a 100-mile pipeline is needed for transportation. Assumptions for CCS are shown in Table 6.7.

Table 6.7 Carbon Transportation and Storage Cost Assumptions (2027\$)

Sequestration Costs	Transportation			Storage	
	Capex (\$/mile)	Pipe O&M (% of Capex)	Pump and Other O&M (% of Capex)	Storage Capex (\$/ton)	Storage O&M (\$/ton)
Transport and Store	781,334	2.3%	4.5%	5.61	5.04

Ameren Missouri will continue to monitor developments for technological advancement and cost structure improvements.

Hydrogen

Ameren Missouri evaluated the economics of carbon emission abatement with the help of Roland Berger in 2023 following the 2022 passage of the Inflation Reduction Act. The analysis reflected blending hydrogen with natural gas at a rate of 20 percent hydrogen (by volume). This analysis was performed under both an offtake agreement structure and ownership and operation of electrolyzers by Ameren Missouri. The analysis was performed for both CC and SC gas units and compared to the cost of abatement for CCS. Federal incentives are no longer available for the production of green hydrogen in the form of PTCs. Given the absence of incentives and the ability of existing turbine technology to burn a blend of natural gas and hydrogen²², hydrogen as fuel for electric generation is considered an option to monitor for further evaluation as policies and markets evolve.

Fuel Cells

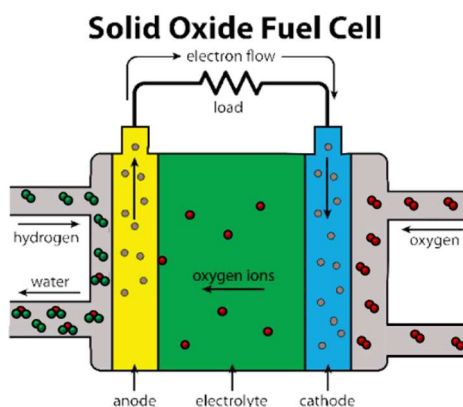
Fuel cells are a rapidly evolving, non-combustion technology suitable for mobile, distributed, and utility-scale power generation applications. Several types of fuel cell technology exist (e.g. proton exchange membrane, alkaline, phosphoric acid, molten carbonate, and solid oxide), each offering different operating characteristics and fuel options. Across all designs, fuel cells create direct current (DC) electricity through an electrochemical process and exhibit advantages of high efficiency and a compact footprint.

Electricity is produced by combining fuel, such as hydrogen, natural gas, propane, or biogas, with oxygen to produce water, electricity, and heat. This reaction occurs across an electrolyte membrane, creating the electrochemical potential that drives electrical output and enables a quiet, efficient process with minimal emissions. High-temperature

²² Both Castle Bluff and Big Hollow units are capable of burning up to 30% hydrogen.

systems such as solid oxide fuel cells, as shown in Figure 6.10 below, can convert fuels inside the unit, while low-temperature versions typically use purified hydrogen.

Figure 6.10 Solid Oxide Fuel Cell



Source: EPRI

Ameren Missouri is currently evaluating multiple fuel cell system sizes, as well as monitoring progress on announced utility-scale fuel cell projects.

6.4.2 Potential Nuclear Resources

Consistent with Ameren Missouri's previous IRP filings, new nuclear was considered in this IRP for carbon-neutral around-the-clock generating capabilities. Ameren Missouri evaluated a conventional nuclear resource and a small modular reactor (SMR) technology. Assumptions are shown in Table 6.8.

Table 6.8 Potential Nuclear Resources

Resource Option	Nameplate MW	Total Project Cost Excluding AFUDC \$/kW	First Year Fixed O&M Cost \$/kW	First Year Variable O&M Cost \$/MWh	Assumed Annual Capacity Factor %	LCOE ¢/kWh
Nuclear - SMR	1,200	10,961	154.61	3.34	95%	20.46
Nuclear - Conventional	1,100	10,961	166.18	4.09	95%	22.06

In May 2025, President Trump signed four executive orders (EOs) aimed at revitalizing the U.S. nuclear energy sector. These actions are designed to streamline regulatory processes, bolster domestic uranium production, and expand nuclear infrastructure. By addressing regulatory bottlenecks and supply chain vulnerabilities, the administration aims to ensure energy independence and meet the escalating power demands of emerging technologies.

SMR technologies are attracting increased interest from utilities, hyperscalers, and other potential investors due to their modularity, potential cost efficiency, and faster deployment compared to traditional large-scale reactors. However, with limited deployments to date, the promises of cost efficiencies and faster deployments remain to be proven. While no SMRs operate in the U.S., two are in service globally, and several models are nearing commercial deployment. Amazon and Google have secured agreements with various SMR companies to partner on first-of-a-kind deployment that will provide power for data centers, boosting private-sector confidence in the technology. Notably, in April 2025, the Canadian Nuclear Safety Commission issued Ontario Power Generation a license to construct a BWRX-300 SMR, and in May 2025, TVA became the first U.S. utility to apply for an SMR construction permit in support of its plan to bring a BWRX-300 SMR online by 2032. SMRs could offer Ameren Missouri flexibility to scale nuclear generation incrementally, but uncertainties around state and federal policy support, licensing, supply chain risks, economic constructability, and economic viability remain.

Large-scale nuclear reactors, including the Westinghouse AP1000, are the most proven technology, but deployment of such technology presents complex risks from a project schedule and cost perspective. Southern Company's development of Vogtle Units 3 and 4, the first new U.S. reactors in more than 30 years, began in 2009 and was plagued by significant project cost overruns and schedule delays. Unit 3 and Unit 4 were initially scheduled to start operations in 2016 and 2017, respectively, but various factors, including component issues, supply chain problems, and workforce challenges, contributed to delays and increased costs. Specifically, the start of commercial operation was delayed until 2023 and 2024, respectively, and the total project cost was \$35 billion (\$17.5 billion for each unit), compared to the initial total project cost estimate of \$14 billion.

Ameren Missouri has evaluated discrete permitting and construction timelines for nuclear generation, assessed development considerations for existing and greenfield sites, reviewed tax credit availability, and examined energy attribute tracking and state policy treatment of nuclear generation.²³

Ameren Missouri assumes a 54-month permitting period for both conventional nuclear reactors and SMRs. This period reflects the time required to complete Nuclear Regulatory Commission (NRC) licensing activities, including construction permits or combined operating licenses, together with associated environmental reviews and state approvals.

Following issuance of a Notice to Proceed, Ameren Missouri assumes construction durations of 72 to 96 months for a conventional nuclear reactor and 60 to 84 months for SMRs. SMR construction is assumed to occur on a rolling basis, with an initial block of up to four 300 MW units (1200 MW total) potentially achieving commercial operation in

²³ File No. EO-2026-0037 1.A; File No. EO-2026-0037 1.C

60 months. These assumptions reflect industry experience and differentiate between first-of-a-kind and subsequent deployments.

Development at an existing nuclear site offers meaningful advantages compared to a greenfield site. These advantages include prior site characterization, established emergency planning zones, an experienced nuclear workforce, and existing transmission interconnections. While incremental transmission upgrades may still be required depending on unit configuration, development at an existing site generally reduces transmission complexity and overall development risk relative to a greenfield site, which would require new interconnections, right-of-way acquisition, and additional siting approvals.

Based on current permitting and construction timelines, eligibility for existing tax credits is not likely. However, Ameren Missouri recognizes that future changes to federal tax policy, including potential extensions or modifications, could enhance eligibility for nuclear projects. As a result, tax credits are treated as a potential upside rather than a likely outcome.

Nuclear generation produces zero-emissions electricity and may qualify for nuclear-based energy attributes under emerging clean energy or carbon-free frameworks. While Missouri does not currently include nuclear generation in a renewable or clean energy standard, other states recognize nuclear attributes within clean energy standards or credit mechanisms. Ameren Missouri will continue to monitor developments in energy attribute tracking systems and evolving state and regional policies that could recognize nuclear energy's carbon-free characteristics and support future project economics.

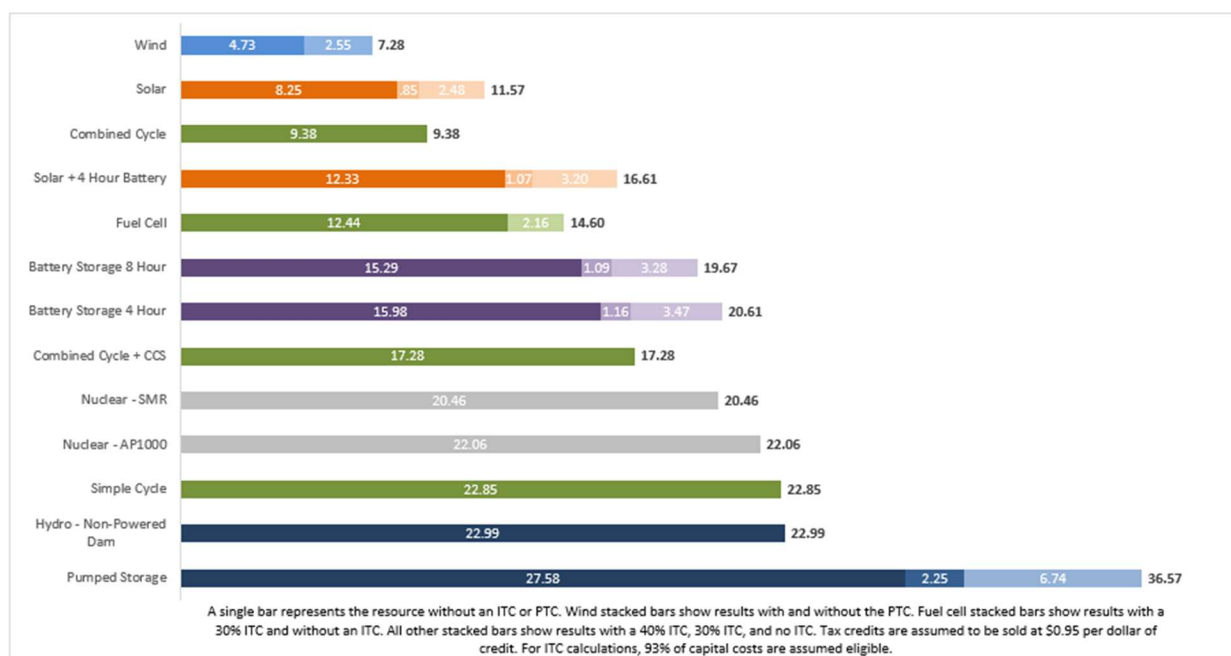
6.5 Power Purchase Agreements

After discussions with Ameren Missouri's Asset Management and Trading organization it was determined that there were no pending potential long-term power purchases for consideration at the time of the analysis. Furthermore, Ameren Missouri learned from its experience in developing the 2008 and 2011 IRPs that soliciting the market for long-term power purchases or sales is not productive for bidders given the data at this stage of the analysis is generic, and potential respondents are reluctant to share information on potential agreements without a reasonable expectation for an executed contract. Evaluation of generic power purchase agreements would not be expected to yield different results in terms of relative performance of resource types, as the only reasonable assumption that could be made absent specific information to the contrary would be that such an agreement would be effectively cost-based.

6.4 Final Candidate Resource Options²⁴

6.11 shows the LCOE with and without incentives (e.g., investment tax credits or production tax credits, if applicable) for a range of potential supply side resources. It is important to note that levelized cost of energy figures, while useful for convenient comparisons of similar resource alternatives, do not fully capture all of the relative strengths of each resource type. For example, wind resources are intermittent resources and therefore cannot be counted on for meeting peak demand requirements in the same way a nuclear or gas-fired resource can. Similarly, using an energy cost measure to evaluate peaking resources such as simple cycle combustion turbine generators (CTGs) does not fully reflect their value as a capacity resource or their quick-start capability. Table 6.9 shows the component analysis for the levelized cost of energy figures.

Figure 6.11 Levelized Cost of Energy



²⁴ 20 CSR 4240-22.040(4); 20 CSR 4240-22.040(4)(C)

Table 6.9 Levelized Cost of Energy Component Analysis²⁵

Levelized Cost of Energy (¢/kWh)									
Potential Resource	Capital	Fixed O&M	Variable O&M	Fuel	Resource Specific Cost	CO2	SO2	NOX	Total Cost
Wind ¹	5.93	1.36	0.00	--	-2.55	--	--	--	4.73
Solar ²	7.05	1.20	0.00	--	--	--	--	--	8.25
Combined Cycle: Greenfield ⁵	4.23	0.20	0.40	4.00	--	0.55	0.00	0.0007	9.38
Solid Oxide Fuel Cell ^{2,5}	7.39	1.04	0.00	3.53	--	0.48	0.00	0.0003	12.44
Storage: Li-Ion Battery (8h) ^{2,4}	8.12	1.29	0.00	--	5.88	--	--	--	15.29
Storage: Li-Ion Battery (4h) ^{2,4}	8.68	1.42	0.00	--	5.88	--	--	--	15.98
Combined Cycle w/ CCS: Greenfield ^{5,6}	10.53	1.23	0.66	4.24	0.58	0.03	0.00	0.0009	17.28
Nuclear: SMR ³	15.37	2.38	0.43	1.91	0.38	--	--	--	20.46
Nuclear: AP1000 ³	16.96	2.69	0.55	1.46	0.40	--	--	--	22.06
Simple Cycle: Greenfield ⁵	14.08	0.52	0.53	6.84	--	0.87	0.00	0.0047	22.85
Hydro - Non-Powered Dam	19.53	3.46	0.00	--	--	--	--	--	22.99
Storage: Pumped Hydro ^{2,4}	18.17	0.86	0.56	--	7.99	--	--	--	27.58

1. Resource Specific Cost: Full PTC

2. 40% ITC

3. Resource Specific Cost: Decommissioning Fund

4. Resource Specific Cost : Battery Charging/Pump Cost

5. CO2 ¢/kWh includes both the CO2 emission and capture, transportation and storage

6. For gas units, Fuel includes both the gas costs and firm gas transportation costs

The LCOE for future resource options is an important measure for assessing these options. However, it is not the only factor that must be considered in making resource decisions. Facts and conditions surrounding future environmental regulations, commodity market prices, economic conditions, economic development opportunities, and other factors must be considered as well. A robust range of uncertainty exists for many of these factors, all of which leads to one overriding conclusion – maintaining effective options to pursue alternative resources in a timely fashion is a prudent course of action.

²⁵ 20 CSR 4240-22.040(2)(B); 20 CSR 4240-22.040(2)(C)1

6.5 Compliance References

20 CSR 4240-22.040(1)	3, 13
20 CSR 4240-22.040(2)	3, 13
20 CSR 4240-22.040(2)(B)	25
20 CSR 4240-22.040(2)(C)1	25
20 CSR 4240-22.040(2)(C)2	11
20 CSR 4240-22.040(4)	24
20 CSR 4240-22.040(4)(A)	3
20 CSR 4240-22.040(4)(B)	5
20 CSR 4240-22.040(4)(C)	5, 24
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