



2026 Integrated Resource Plan Annual Update Report

File No. EO-2026-0230

The Empire District Electric Company
d/b/a Liberty

March 2026

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PUBLIC VERSION

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The Empire District Electric Company d/b/a Liberty
(“Liberty” or the “Company”)
2026 Integrated Resource Plan (“IRP”) Annual Update Report

1. Introduction

The purpose of the IRP Annual Update is to ensure that Missouri stakeholders have the opportunity to provide input and to stay informed regarding the changing conditions since the last triennial IRP (“2025 IRP”) filed in April 2025 (File No. EO-2024-0280). Also, of note, the preferred plan from the 2025 triennial IRP was updated in October 2025. The updates to the preferred plan and the implementation of the resulting acquisition strategy will be discussed further herein. Consistent with 20 CSR 4240-22 (the “Rule”), this annual update filing includes updates regarding the:

- 1) utility’s current preferred resource plan;
- 2) status of the identified critical uncertain factors;
- 3) utility’s progress in implementing the resource acquisition strategy;
- 4) analyses and conclusions regarding any special contemporary issues that may have been identified pursuant to 20 CSR 4240-22.080(4);
- 5) resolution of any deficiencies or concerns pursuant to 20 CSR 4240-22.080(16); and
- 6) changing conditions generally.

In developing parts of this report, Liberty reviewed and compared the critical uncertain factors identified in the 2025 IRP. Some of these 2025 updates were based on Liberty’s 2026-2030 Budget Cycle forecast, which was developed and used for internal short-term budgeting purposes.

This report also provides updates regarding Liberty’s progress on implementing various aspects of the 2025 IRP Short-Term Action Plan, including the replacement of Riverton Units 10 and 11 and the progress being made on this project with new dual fuel (natural gas and Jet A) units that will replace them in the 2026 timeframe, and a progress update on the plans for the Company’s new thermal generation at the State Line Power Station that, subject to Commission approval, is currently estimated to enter service in the 2030 timeframe.

Resource planning is a dynamic process. As noted in the recent IRP filings, conditions in the electric industry continue to evolve. This includes changes to the Southwest Power Pool (“SPP”) resource adequacy requirements; the proposed introduction of performance-based accreditation which will be implemented in the near future for traditional generating resources; updated estimates to Effective Load Carrying Capability (“ELCC”) ratings for renewable resources; SPP’s new Expedited Resource Adequacy Study (“ERAS”) - to name just a few notable industry shifts.



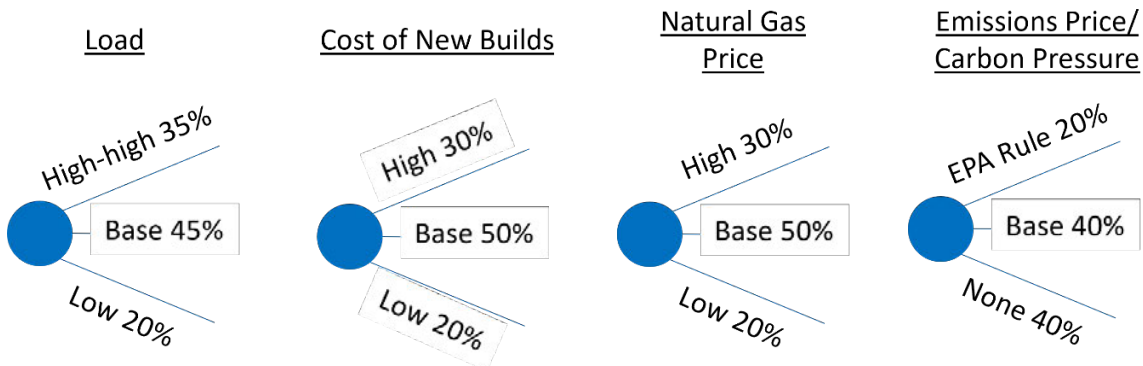
Finally, the 2026 IRP Annual Update report analyzes and responds to two special contemporary issues. As the Rule states, special contemporary issues involve a “written list of issues contained in a Commission order with input from staff, public counsel, and intervenors that are evolving new issues, which may not otherwise have been addressed by the utility or are continuations of unresolved issues from the preceding triennial compliance filing or annual update filing.” 20 CSR 4240-22.020(55). The order establishing the special contemporary issues to be addressed in this annual update was issued on October 22, 2025, in File No. EO-2026-0038, with an effective date of November 1, 2025. These issues are addressed in Section 7 of this report.

Following section (1) introduction, this report contains sections addressing (2) the status of the critical uncertain factors, (3) a resource acquisition strategy update, (4) a transmission and distribution analysis update, (5) other general updates, (6) a preferred plan update, and (7) responses to the special contemporary issues.

Liberty’s next triennial IRP compliance filing is scheduled for 2028.

2. Status of the Identified Critical Uncertain Factors

In the 2025 IRP, Liberty identified the following critical uncertain factors: (1) load; (2) the cost of new builds; (3) natural gas prices; and (4) emission prices and the pressure to reduce carbon.



This section will address the changes to these planning factors since the filing of the 2025 IRP. Most of the critical uncertain factor updates in this section are based on Liberty’s most recent rolling five-year business plan, which is internally developed on an annual basis as a part of Liberty’s ongoing internal planning and budgeting process. The 2026 internal budget covers the period 2026-2030.

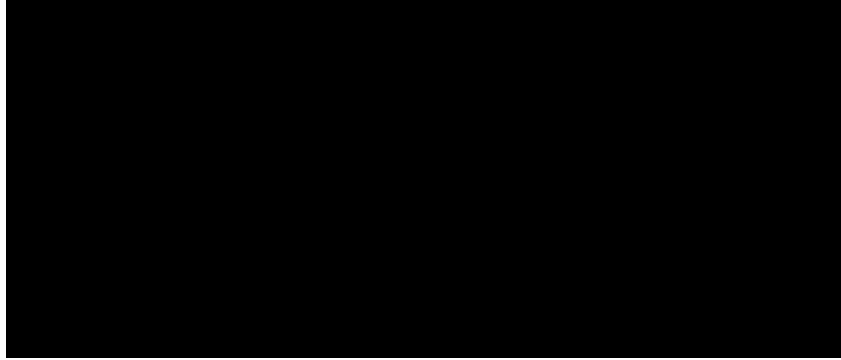
Load Forecast Update

A summary of the 2025 IRP load forecast can be found in the 2025 IRP Executive Summary. Additional information can be found in the 2025 IRP Volume 3, which is dedicated to load analysis and load forecasting. These volumes can be found in the filing made in EO-2024-0280. As a part of its ongoing internal planning process, Liberty developed a new five-year load forecast for the Company’s five-year Budget Cycle covering the period 2026-2030.

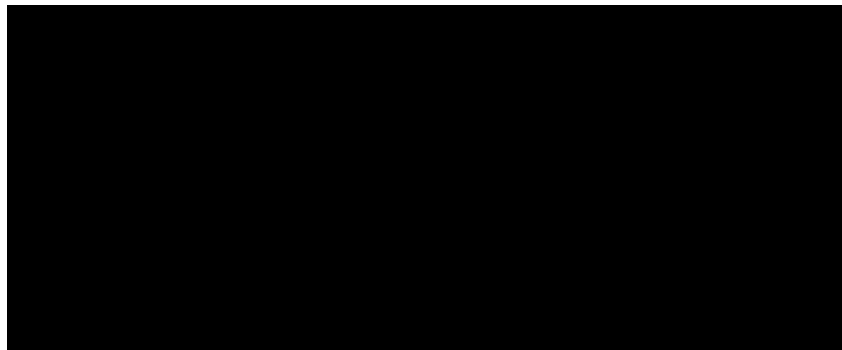


Liberty used the 2026-2030 Budget Cycle load forecast for the purpose of updating this report (“2026 Update”). The following tables compare the demand and energy forecasts from the 2025 IRP and the 2026 IRP Update for the period 2026-2030.

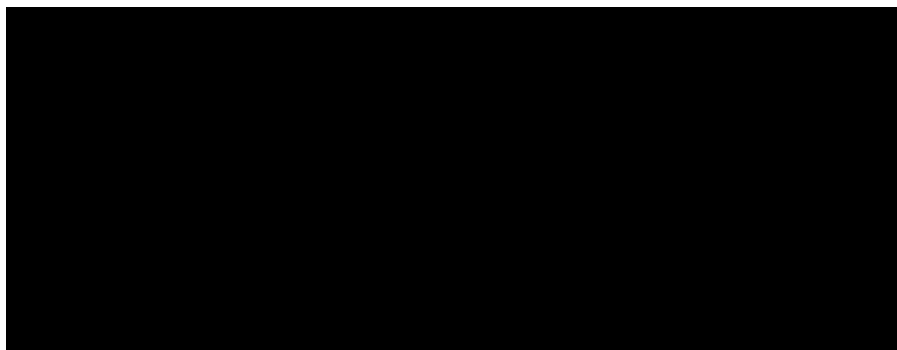
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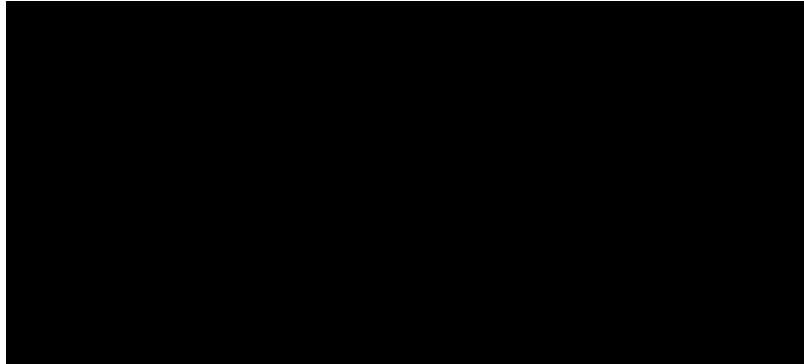


As shown in the tables above, the Company’s 2026-2030 Budget Cycle forecast (2026 Update) is similar to the load forecast presented in the 2025 IRP. The 2025 IRP was developed in late 2024 and the 2026 Update was developed in mid-2025. Some minor differences in forecasts are common and expected, based on timing and methodology. Given that the 2025 IRP is a long-term 20 plus year forecast utilizing the statistically

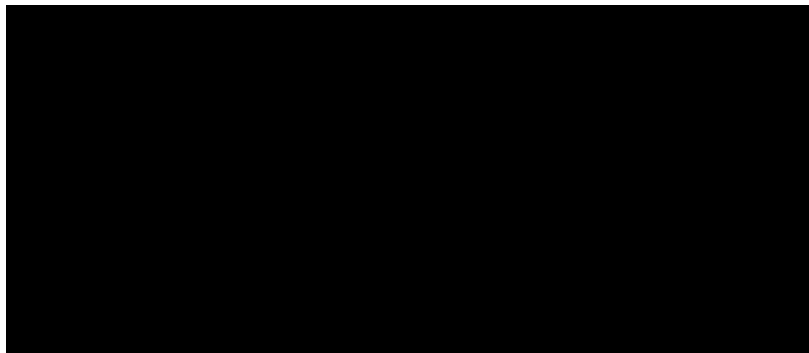


adjusted end-use (“SAE”) methodology, and the budget forecasts are shorter-term five-year non-SAE forecast, all the forecasts presented are reasonably aligned. Each year in the presented data, the 2026 Update consistently shows a slight increase compared to the annual energy forecast from the 2025 IRP. The summer peaks are slightly higher in the 2026 Update as compared to the 2025 IRP, and the winter peaks are notably higher in the 2026 Update as compared to the 2025 IRP. If you consider the absolute value difference between the 2025 IRP forecast and the 2026 Update forecast, the five-year average differences between the two forecasts would be 0.8% for summer peaks, 4.0% for winter peaks and 1.7% for the native load energy requirement. The following tables present the deltas between the two forecasts.

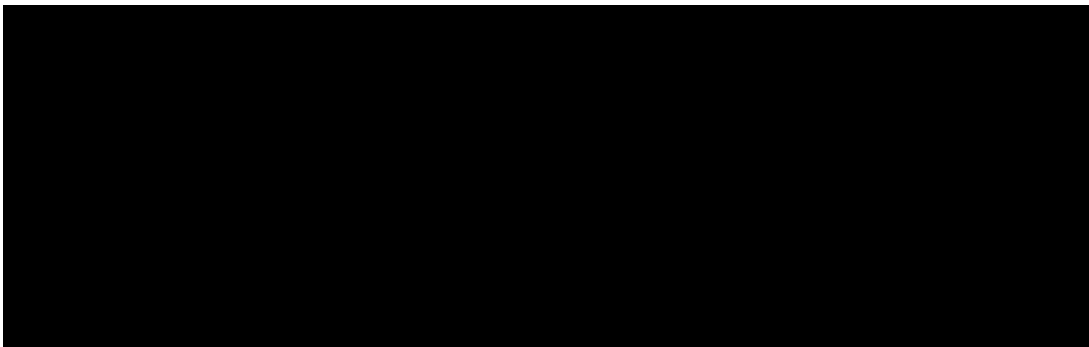
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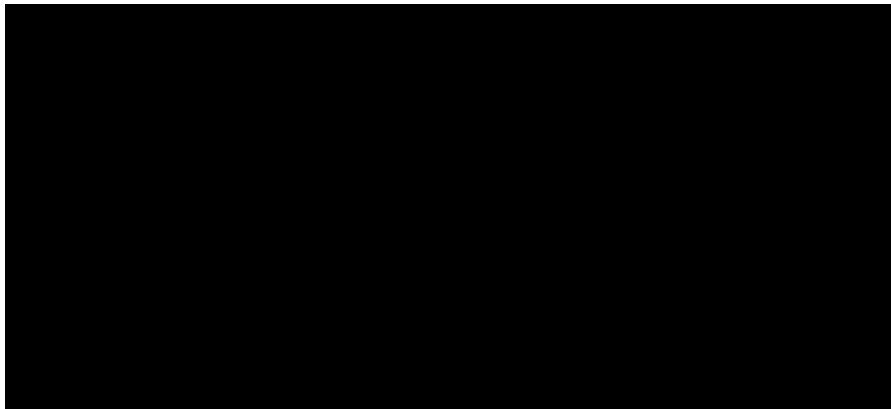


As previously mentioned, the winter peaks are notably higher in the 2026 Update, as compared to the 2025 IRP. The primary drivers were the re-estimation of the model with additional years of data and an update to the winter peak temperature used in the model. An updated analysis of winter peak producing weather back to the year 2000 concluded that a decrease in the winter peak temperature in the model was appropriate. When including more recent data and the lower winter peak temperature in the model estimation, the model reacts to these data points by increasing the peak forecast in the winter. The increase in the energy forecast can be primarily attributed to the higher customer count forecast for the 2026 Update as compared to the IRP forecast. The customer data assumptions are presented below.

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Cost of New Builds Update

The cost of 2025 IRP supply-side resource candidates can be found in the 2025 IRP Volume 4, Supply-Side Resource Analysis.

Technology Capital Cost Update

The original planning-level capital cost assumptions for generic resources in the 2025 IRP were developed by Charles River Associates (“CRA”) with review and input by experts from a third-party engineering firm, Black and Veatch.

At the time this report was prepared, the 2025 IRP was filed less than one year ago, and the update to the preferred plan was filed approximately five months ago. While no new long-term planning studies have been completed since that time, Liberty recognizes that capital costs for utility-scale generation resources have continued to increase due to inflationary pressures, supply chain constraints, labor and material cost escalation, and evolving market conditions. Consistent with these industry-wide trends, Liberty has filed supplemental direct testimony to support its application for a Certificate of Convenience and Necessity (“CCN”) that reflects materially higher estimated capital costs than those assumed in the 2025 IRP. These higher project-level cost estimates are informed by more recent vendor pricing, engineering inputs, and market data that were not available at the time of the IRP filing.

Liberty will monitor and reevaluate capital costs and all other planning assumptions during the development of the next triennial (or quadrennial) IRP.

Federal Clean Energy Incentives and Recent Legislative Changes

Federal clean-energy policy continues to evolve, affecting the cost-competitiveness and development timelines of new generating resources. The Inflation Reduction Act of 2022 (“IRA”) originally established long-term incentives to support deployment of renewable and low-emissions technologies, including a 10-year extension of the Investment Tax Credit (“ITC”) and Production Tax Credit (“PTC”), the introduction of a stand-alone storage ITC, and bonus credits tied to prevailing wage, apprenticeship, domestic content, and siting in designated energy communities.

The IRA substantially improved project economics across wind, solar, and storage technologies by expanding eligibility, restoring a 30% ITC for qualifying resources, and increasing PTC values. However, subsequent federal legislation enacted in 2025—primarily the One Big Beautiful Bill Act (“OBBBA”) and related reconciliation measures—implemented significant modifications to these incentives.

Key changes include an accelerated phase-out of the ITC and PTC for wind and solar, requiring projects to begin construction by July 4, 2026, or be placed in service by December 31, 2027, to remain eligible. Additional restrictions apply through enhanced domestic content requirements and newly implemented Foreign Entity of Concern (“FEOC”) rules, which limit tax-credit eligibility for projects involving certain foreign-owned or foreign-controlled entities.



While several IRA incentives for electric vehicles, residential solar, and certain manufacturing activities were reduced or eliminated beginning in 2025–2026, some technologies—such as storage, hydropower, geothermal, and clean fuels—retain longer credit availability periods extending into the 2030s.

These legislative changes materially influence resource economics, project sequencing, and procurement strategies. Liberty will continue to monitor federal policy developments and integrate updated incentive structures into long-term planning, modeling, and resource acquisition decisions.

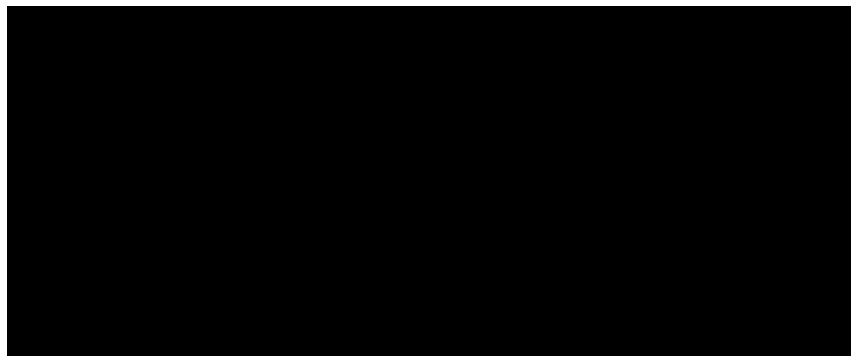
Natural Gas Price Update

This section discusses updates to natural gas prices since the filing of the 2025 IRP. A summary of the natural gas price forecast used in the 2025 IRP can be found in more detail in 2025 IRP Volume 4, Supply-Side Resource Analysis. It should be noted that natural gas prices are impacted by a number of factors and can be volatile and difficult to predict with a degree of accuracy. The triennial IRP, for example, utilizes multiple natural gas price levels and considers these factors in the risk analysis phase of the study.

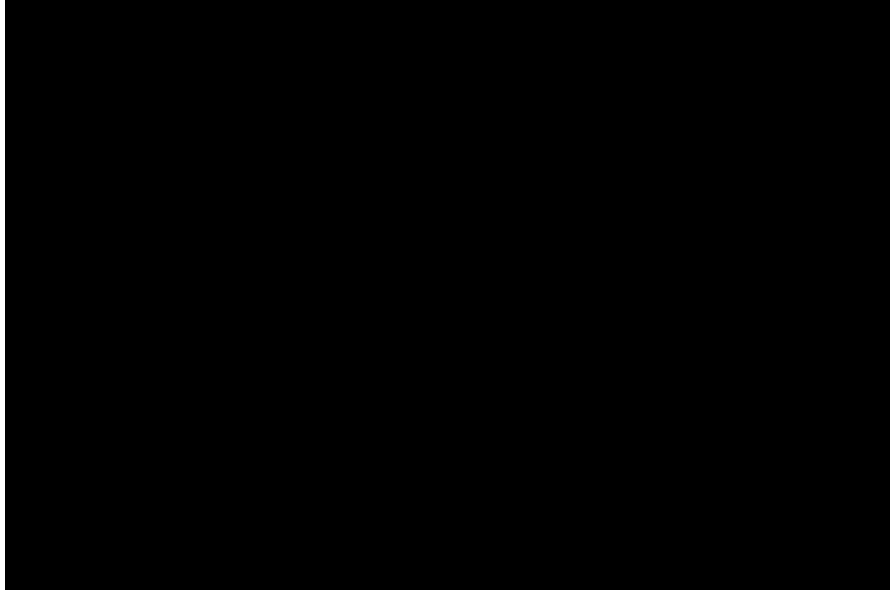
For the long-range 2025 IRP study, Liberty used the natural gas price forecasts from the CRA Natural Gas Fundamentals Model (“NGF”) (considered confidential). CRA developed three separate price forecasts for use in modeling base, low, and high gas price scenarios. For the 2026 IRP Annual Update, Liberty used natural gas price forecasts from the Horizons Energy Spring 2025 Advisory Service, which were also used in the development of Liberty’s five-year budget for the 2026-2030 Budget Cycle.

In the near-term, the natural gas price forecasts used for the 2026-2030 Budget Cycle were higher than the natural gas price forecasts modeled in the 2025 IRP Base Case but still within the range of uncertainty analyzed in the 2025 IRP in the latter years. The natural gas price forecasts from the 2025 IRP, the 2026 IRP Update and Budget Cycle, and the US Energy Information Administration’s (“EIA”) Annual Energy Outlook (“AEO”) for 2025 are shown below for comparison.

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Emission Price / Carbon Pressure Update

Carbon prices from the 2025 IRP can be found in 2025 IRP Volume 4, Supply-Side Resource Analysis, Section 5.4.1. This section will provide an update on the emission price/carbon pressure critical uncertain factor.

Carbon Emission Legislation

In December 2017, the U.S. Environmental Protection Agency (“EPA”) issued an advanced notice of proposed rulemaking (“ANOPR”) in which the EPA proposed emission guidelines to limit greenhouse gas (“GHG”) emissions from existing Electrical Generating Units (“EGUs”) and solicited information on the proper respective roles of the state and federal governments in that process, as well as information on systems of emission reduction that are applicable at or to an existing EGU, information on compliance measures, and information on state planning requirements under the Clean Air Act (“CAA”). This ANOPR did not propose any regulatory requirements.

In June 2019, the EPA issued the final Affordable Clean Energy (“ACE”) rule and repealed the Clean Power Plan. The ACE rule established emission guidelines for states to develop plans to address GHG emissions from existing coal-fired power plants. The ACE rule has several components: a determination of the best system of emission reduction for GHG emissions from coal-fired power plants, a list of “candidate technologies” states can use when developing their plans, a new preliminary applicability test for determining whether a physical or operational change made to a power plant may be a “major modification” triggering New Source Review, and new implementing regulations for emission guidelines under CAA 111(d). During 2020, Missouri utilities conducted regular meetings with the Missouri Department of Natural Resources to determine the standard



of compliance for this rule. Plum Point Energy Associates has also been working through the standard of compliance with the Arkansas Division of Environmental Quality. However, on January 19, 2021, the United States Court of Appeals for the District of Columbia Circuit struck down the ACE Rule.

On May 11, 2023, the EPA proposed new carbon pollution standards for coal and natural gas-fired power plants. The proposal includes a flexible approach administered by states with options for compliance accounting such as averaging or trading of emissions. Guidelines for emissions reduction are based on Best System Emissions Reduction (“BSER”) standards where stringency increases with time horizon, unit capacity factor, unit size, and distinguishes between new and existing units, and by technology. Of the various permutations, the following is a selection of general guidance on BSER for key applications:

- New units - Either carbon capture and storage (“CCS”) by 2035, or hydrogen blending at 30% by 2032 and at 96% by 2038.
- Existing coal units - CCS if planning to operate beyond 2039; 40% natural gas co-firing if planning to operate beyond 2032 and stop operations by 2039.
- Existing gas units – For larger baseload plants (i.e.- CCGT), either CCS by 2035, or hydrogen blending at 30% by 2032 and at 96% by 2038, although the EPA has recently indicated that a separate rule with different requirements for existing natural gas-fired plants will be issued; No BSER for smaller or peaking turbine plants.

In April 2024, the EPA finalized GHG emission standards for certain new and existing fossil fuel-fired power plants under the Clean Air Act Section 111. Although the standards were challenged in court, they were not vacated and remained legally in effect through late 2024. In June 2025, the EPA proposed repeal of the 2024 power plant GHG standards and initiated formal rescission proceedings. Following the repeal proposal, the EPA undertook additional administrative and rulemaking actions related to the standards, and litigation has shifted from challenges to the 2024 rule to challenges concerning the EPA’s proposed repeal and underlying legal determinations. Final regulatory outcomes remain subject to completion of EPA rulemaking and judicial review.

On February 12, 2026, the EPA finalized its rescission of the 2009 Greenhouse Gas Endangerment Finding and repealed the associated motor vehicle emission standards. This action eliminated the underlying legal basis for federal regulation of GHG emissions under the Clean Air Act, representing a significant movement toward deregulation. Although the action directly addressed vehicle emission standards, it signaled a broader policy shift away from regulating GHG emissions from other source categories, including EGUs. The scope and durability of this action remain uncertain, as legal challenges are anticipated and may affect its ultimate implementation.

Carbon Price Timing

In the 2025 IRP, Liberty evaluated the probable environmental costs of new supply side resource options associated with potential CO₂ emissions. Although several legislative and



executive actions related to carbon emissions have been attempted over the last couple of decades, there is currently no price on carbon and no binding emission limits at the federal level. As of the time of the development of Liberty's 2025 IRP assumptions, the Biden Administration had begun to take executive actions related to carbon emission reductions and had introduced several climate-related legislative proposals as part of its overall infrastructure package. However, as of March 2026, no economy-wide federal policy establishing a carbon price or comprehensive CO₂ emissions cap has been enacted into law.

Given a history of federal proposals to regulate carbon emissions, Liberty's Base Case incorporates a modest price on carbon emissions of \$13-14/short ton starting in 2031, which can be seen as a proxy for several different potential pathways for legislative action or executive regulation (not explicitly a carbon tax). CRA's analysis suggests that pricing between \$13-20/ton (in real 2023\$) between 2031 and 2044 would achieve 60-70% reduction in SPP carbon emissions by 2044 relative to a recent historical year baseline, depending on other market factors and dynamics. Such a carbon price would likely result in significant additional coal-to-gas switching nationwide and pressure a significant percentage of the existing coal fleet nationwide to retire by 2044. The price would also improve renewable and other clean energy generation economics.

Liberty also evaluated the EPA GHG Standards, referenced in Section 2.5.1.1, which were modeled as the high-carbon stringency forecast, serving as an alternative to carbon pricing. Finally, Liberty also evaluated a Low-Case carbon scenario, which assumes no carbon price through the horizon. A zero-carbon regulation policy could result from either less stringent environmental regulation at the federal level or environmental regulation that does not directly regulate carbon emissions.

Liberty will continue tracking federal action related to GHG emissions going forward.

3. Resource Acquisition Strategy Update

This section provides a status update on the supply-side and demand-side implementation plan and describes progress made since the filing of the 2025 IRP. For the 2026 IRP Annual Update, the following will be discussed: the Riverton replacement project in the 2026 timeframe and the recently requested new thermal generation at State Line Power Station in the 2030 timeframe.

New Thermal Generation at Riverton

The Riverton Replacement project is installing two combustion turbine ("CT") generators, Riverton Unit 13 and Riverton Unit 14, each with a nominal net output of roughly 13.3 MW. These new units will be replacing the aging Riverton Units 10 and 11 which will be retired with the project's completion. The new turbines are fast-starting and dual fuel capable (natural gas and Jet A), providing resiliency for periods of natural gas scarcity. The two new turbines will have no post-combustion pollution controls but will employ dry low NO_x combustion to limit NO_x formation. The new units will be more efficient than the existing units, meaning they will consume approximately 37% less fuel per kWh generated than the



units they will replace. Additionally, the CTs may provide a benefit for the potential of utilizing H2 as a blend fuel in the future. This project has a projected commercial operation date in the third quarter of 2026.

New Thermal Generation at State Line

To support resource adequacy, Liberty plans to use SPP's ERAS process to rapidly study and construct a generating facility featuring a single F-class combustion turbine with an approximate capacity of 250 MW at the Company's State Line Power Station in Joplin, Missouri.

Liberty's 2025 IRP acquisition strategy calls for the addition of approximately 240 MW of frame combustion turbine generation utilizing existing infrastructure in response to evolving SPP resource adequacy requirements and recent market and regulatory changes. Following a comprehensive technology selection study conducted on Liberty's behalf, several generation options were evaluated for technical feasibility, cost, and operational performance. The F-class combustion turbine was selected as the preferred solution because it offered a low installed capacity cost per kilowatt as compared to other similar competing technology, best meeting customer and stakeholder priorities for affordability and reliability.

Liberty filed its CCN application on October 24, 2025, in docket EA-2025-0299. If the CCN is approved, Liberty anticipates that construction will begin in late 2028 or early 2029 and that the new unit will be available for service in the third quarter of 2030.

4. Transmission and Distribution ("T&D") Update

This section of the report will update stakeholders about Liberty's T&D system reliability efforts, specifically the SPP Transmission Planning projects within the Liberty footprint.

SPP Transmission Planning

According to SPP, the Integrated Transmission Planning ("ITP") process promotes transmission investment to meet near- and long-term reliability, economic, public policy, and operational transmission needs. As a member of SPP, Liberty was awarded significant transmission projects within its service territory via the ITP process. These transmission projects are part of the Company's five-year investment plan. The ITP process coordinates solutions with ongoing compliance, local planning, interregional planning, and tariff service processes. The goal is to develop a 10-year regional transmission plan that provides reliable and economic energy delivery and achieves public policy objectives, while maximizing benefits to the end-use customers. The 2024 ITP is guided by requirements defined in SPP's Open Access Transmission Tariff ("OATT") Attachment O, which describes the ITP process, and can be found within the SPP's ITP Manual and the 2024 ITP scope.

The ITP process is open and transparent, allowing for stakeholder input throughout the assessment. SPP staff coordinated the study results with other entities, including those embedded within the SPP footprint and neighboring first-tier entities. The objectives of the ITP are to:



- resolve reliability criteria violations;
- improve access to markets;
- improve interconnections with SPP neighbors;
- meet expected load-growth demands;
- facilitate or respond to expected facility retirements;
- synergize with the Generator Interconnection (“GI”), Aggregate Transmission Service Studies (“ATSS”), and Delivery Point Assessment (“DPA”) processes;
- address persistent operational issues;
- facilitate continuity in the overall transmission expansion plan; and
- facilitate a cost effective, responsive, and flexible transmission network.

On October 29, 2024, the SPP Board of Directors approved a historic nearly \$7.7 billion plan to expand and upgrade the region’s transmission capacity. SPP’s 2024 ITP was, at the time, the single largest proposed construction portfolio in SPP’s 20-year history as a transmission planning coordinator. The initiative, which took 27 months of study and the evaluation of over 2,100 potential solutions to anticipated system needs, represents a major milestone in serving increasing demand for reliable electricity throughout the region. The ITP sought to provide cost levelization across the SPP footprint, relief of operational congestion, a more reliable and resilient electrical grid, and to facilitate resource adequacy, generation interconnection, and delivery point load additions. The \$7.68 billion investment in the 2024 ITP portfolio is comprised of reliability, winter weather, economic, short circuit and operational projects that will mitigate 1,062 system issues. Reliability projects allow the region to meet compliance requirements and keep the lights on by providing loading relief, voltage support, and system protection. Winter weather projects address voltage and thermal overload violations that SPP observed during winter storm Elliott (December 2022) and a generically modeled winter storm based on aggregation of common stressors from multiple previous storms. Economic projects allow the region to lower energy costs through mitigation of transmission congestion. This includes 89 projects, totaling 495 miles of transmission rebuilds and 2,333 miles of new transmission.

Liberty was selected for two extra-high voltage (“EHV”) projects as well as three high voltage (“HV”) projects. These projects amount to the largest transmission projects in the Liberty footprint in over 40 years. The Delaware–Monett 345kV project will construct 114.5 miles of new transmission lines between Delaware, Oklahoma and Monett, Missouri. The project, which will be split with American Electric Power (“AEP”), is estimated at nearly \$343 million. The Monett–North Branson 345kV project will construct 47.2 miles of new EHV transmission lines between Monett and Branson, Missouri. The project is estimated at nearly \$166 million. The Monett–Aurora, Aurora–Ozark Powersite Dam 161kV, and Ozark S.–Ozark Powersite 161kV conversion projects will rebuild 92.2 miles of existing transmission. The EHV group of projects is estimated at approximately \$337 million



(assuming 50/50 split of joint project with AEP) and the HV group of projects is estimated at over \$198 million. While Liberty will be responsible for the upfront costs of the projects, SPP's cost allocation policy will reimburse the Company over the estimated 40-year life of each project. Projects over 300kV are considered regional and Liberty will be responsible for its load ratio share (at this time just under approximately 3%). In addition, Liberty is responsible for its load ratio share for all other 300kV+ projects within the SPP region. Projects between 100kV and 300kV are considered zonal and cost allocation is 33% regional and 67% zonal. Using 2025 allocators Liberty's retail customers would pay approximately 94% of all zonal costs.

5. Other Updates

This section of the report will provide updates to other IRP related issues, or what the IRP Rule refers to as "changing conditions generally."

Demand-Side Management Update for Missouri

At the time that the 2025 IRP was developed and filed, the Company offered energy efficiency programs in Missouri in its first cycle of the Missouri Energy Efficiency Investment Act ("MEEIA"). MEEIA is the primary legal framework for energy efficiency programs in the state. The Company's application for MEEIA Cycle 2 was dismissed after the Commission raised concerns about the proposed programs and their alignment with MEEIA's intent. A settlement agreement reached by stakeholders and Liberty formally withdrew its MEEIA Cycle 2 application in April 2025, effectively cancelling the demand-side programs and necessitating its removal from the IRP Preferred Plan during the Preferred Plan Update filing made in October 2025.

Demand-Side Management Update for Arkansas

As of December 31, 2025, Liberty serves about 5,743 customers in northwest Arkansas. After demand-side programs end in Missouri, Arkansas is the only jurisdiction where Liberty offers electric demand-side programs. Liberty has been granted a variance from statewide energy efficiency savings targets for 2024-2026 due to the small customer count, the rural nature of Liberty's Arkansas service territory, and other factors. However, Liberty continues to make improvements and offers a portfolio of programs. In 2024, Liberty introduced a new portfolio, which offers a residential products program, Residential Weatherization, a school-based energy education program for residential customers, and prescriptive and custom rebates for Commercial and Industrial customers. Liberty also contributes its share to the statewide energy education program, Energy Efficiency Arkansas. Liberty has offered customer programs in Arkansas since October 2007. Liberty was approved for a new energy efficiency program plan for Arkansas in 2023, for program years 2024-2026.

Transportation Electrification

Liberty has supported transportation electrification through a range of pilot programs launched in 2022 under the Commission-approved Transportation Electrification ("TE")



Pilot (File No. ET 2020 0390). These programs—such as Residential Smart Charge, Ready Charge, School Bus Electrification, Commercial Electrification, Fleet Advisory, and Non Road Incentives—were designed to expand early EV charging infrastructure, support customer education, and provide incentives during the initial market development phase.

Liberty is no longer accepting new enrollments and anticipates that the TE Pilot will conclude at the end of its authorized term. As the Pilot winds down, Liberty continues to use the insights gathered to inform future planning, including understanding EV impacts on the distribution system, customer charging behavior, potential demand response opportunities, and the suitability of charging-based metering technologies.

Liberty continues to pursue efficiency efforts through evaluation of hybrid options and the reduction of our fleet by employing a Fleet utilization tool to identify proper levels of vehicle needs. The Company continues to evaluate the use of Hybrid vans where operationally feasible and is revising the Take-Home Vehicle policies to reduce fuel usage.

Other Environmental Updates

Liberty is subject to various federal, state, and local laws and regulations with respect to air and water quality; hazardous and toxic materials; hazardous and other wastes including their identification, transportation, disposal, and record-keeping; reporting; and remediation of contaminated sites and other environmental matters. Liberty's jointly owned coal-fired generating facilities, jointly owned combined cycle facility, and all other wholly owned resources must be operated in compliance with environmental laws and regulations.

Environmental laws or regulations that may be imposed at some point within the planning period may impact air emissions, water discharges, or waste material disposal. A brief discussion of the probable compliance costs that could result from expected and existing environmental standards was provided in the 2025 IRP Volume 4 Section 2.5. An additional update to the standards since the filing of the 2025 IRP is described below.

National Ambient Air Quality Standards

The Clean Air Act ("CAA") requires the EPA to set National Ambient Air Quality Standards ("NAAQS") for four air pollutants associated with fossil-fuel generation, including particulate matter, ground-level ozone, sulfur dioxide ("SO₂"), and nitrogen dioxides ("NO_x"). These air pollutants are regulated by setting human health-based or environmental-based criteria for permissible levels.

Particulate Matter

In 2013, the EPA strengthened the PM standard. The Jasper County (Missouri) area is currently in attainment of the 2013 PM NAAQS. On January 6, 2023, EPA announced its proposed decision to revise the annual National Ambient Air Quality Standard ("NAAQS") for fine particulate matter ("PM 2.5"). The PM 2.5 revision was finalized on February 7, 2024. It is not yet known how the revision to the PM 2.5 NAAQS will impact the generation



fleet as Jasper County currently does not have an ambient air PM 2.5 monitor to measure attainment status. However, modeling Jasper County emission source's impacts to downwind monitors (i.e., Kansas City and St. Louis) could potentially have a future impact on Liberty's fleet. Future non-attainment could require additional reduction technologies, emission limits, or both on fossil-fueled units.

Ozone

In 2015, the EPA strengthened the NAAQS for ground-level ozone. The Jasper County area is currently in attainment of the 2015 Ozone NAAQS. No additional emission control equipment is currently needed to comply with this standard. Future non-attainment of revised standards could result in regulations requiring additional NO_x reduction technologies, emission limits, or both on fossil-fueled units.

Sulfur Dioxide

In 2010, the EPA strengthened the NAAQS for SO₂. The Jasper County area is currently in attainment of the 2010 SO₂ NAAQS. No additional emission control equipment is currently needed to comply with this standard. Future non-attainment of revised standards could result in regulations requiring additional SO₂ reduction technologies, emission limits or both on fossil-fueled units.

Nitrogen Dioxides

In 2010, the EPA strengthened the NAAQS for NO_x. The Jasper County area is currently in attainment of the 2010 NO_x NAAQS. No additional emission control equipment is currently needed to comply with this standard. Future non-attainment of revised standards could result in regulations requiring additional NO_x reduction technologies, emission limits or both on fossil-fueled units.

Cross-State Air Pollution Rule

In 2011, the EPA finalized the Cross-State Air Pollution Rule ("CSAPR"), requiring eastern and central states to significantly reduce power plant emissions that cross state lines and contribute to ground-level ozone and fine particle pollution in other states. The CSAPR Update Rule took effect in 2017 with more stringent ozone-season NO_x emission budgets for electric generating units ("EGUs") in many states to address significant contribution and maintenance issues with respect to the ozone NAAQS established in 2008. In 2021, the EPA issued new amended budgets for 12 states, although Missouri and Kansas were not impacted.

In 2022, the Missouri Department of Natural Resources ("MDNR") proposed revisions to the Missouri State Implementation Plan ("SIP"). This revision is a supplement to the SIP-Interstate Transport Provisions for the 2015 Ozone Standard. The EPA's response to the MDNR SIP revision was proposed denial. In addition, the EPA also proposed implementing the Good Neighbor Federal Implementation Plan ("FIP") to assure that the 26 states identified in the proposal (including Missouri) do not significantly contribute to problems



attaining and maintaining the 2015 Ozone NAAQS in downwind states. The Good Neighbor FIP would impose more stringent NO_x ozone season compliance requirements for Missouri EGUs. Should the Good Neighbor FIP become applicable, additional emission control equipment could be needed to comply with this rule. In lieu of adding control equipment to comply with the Good Neighbor FIP, the Company could also comply through a combination of trading allowances within or outside its system and changes in operations, as necessary. The proposed Good Neighbor FIP has the potential to move Missouri sources from the Group 2 NO_x ozone season trading program to Group 3 NO_x ozone season trading program. Pricing per ton emitted is much higher in the Group 3 trading program (fall of 2022 Group 3 NO_x ozone season allowances have cost as much as \$35,000 each). Future strengthened ozone, NO_x, or SO₂ standards could result in additional cross-state rule updates requiring additional trading of allowances, emission reduction technologies or reduced generation on fossil-fueled units. The Eighth U.S. Circuit Court of Appeals granted the Missouri Attorney General's request for a stay, preventing the EPA from imposing this regulation on Missouri sources until the appeals process is complete.

Regional Haze

In June 2005, the EPA finalized amendments to the July 1999 Regional Haze Rule. These amendments apply to the provisions of the Regional Haze Rule that require emission controls known as best available retrofit technology ("BART") for industrial facilities emitting air pollutants that reduce visibility by causing or contributing to regional haze.

The pollutants that reduce visibility include PM_{2.5} and compounds which contribute to PM_{2.5} formation, such as NO_x, SO₂, and under certain conditions, volatile organic compounds, and ammonia. Under the 1999 Regional Haze Rule, states are required to set periodic goals for improving visibility in natural areas. As states work to reach these goals, they must develop regional haze implementation plans that contain enforceable measures and strategies for reducing visibility-impairing pollution.

The Regional Haze Rule directs state air quality agencies to identify whether visibility-reducing emissions from sources subject to BART are below limits set by the state or whether retrofit measures are needed to reduce emissions. It also directs these agencies to file Regional Haze plans with the EPA for approval.

Future visibility progress goals could result in additional SO₂, NO_x, and PM controls or reduction technologies on fossil-fired units.

Mercury and Air Toxics Standards ("MATS")

In 2011, the EPA finalized a rule to reduce emissions of toxic air pollutants from power plants. These MATS for power plants reduced emissions from new and existing coal and oil-fired electric EGUs. Control equipment was installed at Liberty facilities to comply with this rule. No additional emission control equipment is currently needed to comply with this standard. It is not known whether the rule will be strengthened in the future. Future



strengthening of the rule could require additional reduction technologies, emission limits, or both on coal and oil-fired units.

Water Related Impacts

Liberty operates under the Kansas and Missouri National Pollutant Discharge Elimination System (“NPDES”) plans that were implemented in response to the Federal Clean Water Act (“CWA”). Liberty operates its generation facilities in compliance with applicable regulations, and all facilities have received necessary discharge permits.

Clean Water Act Section 316(b)

On September 17, 2018, the Kansas Department of Health and Environment (“KDHE”) issued a Certificate of Determination stating that the Riverton Generating Station cooling water intake structure (“CWIS”) is in compliance with Section 316(b) of the CWA. The location, design, construction, and capacity of the CWIS reflects the best technology available (“BTA”) for minimizing adverse environmental impacts. Additionally, Iatan Unit 2 and Plum Point Unit 1 also meet the BTA standard. Future modifications at the Iatan Unit 1 facility could range from flow velocity reductions, traveling screen modifications, or the installation of a closed cycle cooling tower retrofit.

On February 9, 2026, a contractor was given notice to proceed to install a new CWIS at the State Line Power Station. Liberty has worked with the United States Army Corp of Engineers to obtain a permit for the installation of the CWIS. Liberty is also currently working with the Missouri Department of Natural Resources to include the CWIS in the facilities National Pollutant Discharge Elimination System (“NPDES”) permit.

Surface Impoundments

Liberty owns and maintains a closed coal ash impoundment at the former and closed Asbury Power Plant site. Additionally, Liberty owns a 12 percent interest in a landfill at the Iatan Generating Station and a 7.52 percent interest in a landfill at Plum Point. Future closure of all surface impoundments is anticipated.

Effluent Limitation Guidelines (“ELGs”) for Steam Electrical Power Generating Point Sources are currently incorporated into all facilities’ wastewater discharge permits. The EPA rule defines bottom ash transport water, fly ash transport water, and scrubber wastes as wastewaters which cannot be discharged after December 31, 2023.

Coal Combustion Residuals (“CCR”)

Final closure of the other existing ash impoundment at the Iatan Generating Station has been accounted for in Liberty’s Asset Retirement Obligation (“ARO”). In December 2016, The Missouri Department of Natural Resources (“MDNR”) granted Liberty a Utility Waste Disposal Area Construction Permit that could be used for CCR waste disposal. Construction of the landfill is not expected as Liberty closed the Asbury impoundment by leaving all accumulated CCR in place.

In 2014, the former Riverton Power Station impoundment was closed as a monofill landfill in accordance with Kansas Department of Health and Environmental regulations. In 2024,



the landfill also became regulated as a CCR Management Unit (“CCRMU”) under 40 CFR Part 257.

Elk River Windfarm PPA Contract Extension

The 150 MW Elk River Windfarm PPA contract was renegotiated and extended through March 31, 2030. It was originally set to expire in December 2025. This resource is located in Butler County, Kansas near the town of Beaumont. For the duration of this contract, the Company receives 100% of the output from this facility at a net energy price established by contract.

Meridian Way Windfarm PPA Contract Expiration in 2028

The 105 MW Meridian Way Windfarm PPA is a 20-year contract signed in mid-June 2007, with the windfarm entering service in mid-December 2008. This resource is located in Cloud County, Kansas, near the town of Concordia. During the duration of this contract, the Company receives 100% of the output from this facility at a net energy price established by contract. This contract will expire in December 2028.

Missouri Renewable Energy Standard Requirement

The Missouri Renewable Energy Standard (“RES”) requires Liberty and other investor-owned utilities in Missouri to generate or purchase electricity from renewable energy sources or purchase Renewable Energy Credits (“RECs”) to meet a specified percentage of the Missouri retail energy requirement. The RES portfolio requirement is currently 15% of Missouri retail electric sales. The Company currently complies with the RES by utilizing the Elk River Windfarm PPA, the Meridian Way Windfarm PPA, the Neosho Ridge Wind Farm, the North Fork Ridge Wind Farm, the Kings Point Wind Farm, the Ozark Beach hydroelectric facility, and a solar component supplied by the Customer Solar Rebate program.

Additionally, the Company has REC volumes available to Missouri retail non-residential customers based upon customer usage and a current market rate. In the future, if new renewable energy requirements are implemented, the Company is in a favorable position to accommodate those requirements.

6. Preferred Plan Update

During the period covered by this IRP Annual Update (2026-2030), the preferred plan from the 2025 IRP that was filed in April 2025 consisted of supply-side and demand-side resource additions. However, as previously mentioned, the Company updated the preferred plan in a filing made in October 2025. The 2026-2030 supply-side resources from the 2025 IRP filed in April 2025 can be summarized as follows:

- 150 MW Elk River Windfarm PPA contract expiration in December 2025
- Replacement of Riverton Units 10 and 11 in 2026 with approximately 27 MW of combustion turbines at the Riverton, Kansas site in 2026
- Continuing role for Demand Side Management (“DSM”) programs



- 175 MW utility-scale solar project in 2028
- 105 MW Meridian Way Windfarm PPA contract expiration in December 2028
- ERAS process and siting of new thermal unit.

Update to the Preferred Plan

Following the filing of its 2025 IRP, Liberty determined that the Preferred Plan was no longer appropriate as described further below. Consistent with 20 CSR 4240-22.080, Liberty notified the Commission of its determination to update the preferred resource plan on October 15, 2025. The filing included a description of all changes to the Preferred Plan and the Acquisition Strategy, along with all the other requirements specified by the resource planning rule. The primary changes are summarized as follows:

- remove the 175 MW utility-scale solar project, selected in the 2022 Triennial IRP, from the 2028 timeframe;
- remove the demand-side programs throughout the planning horizon;
- update for the newly extended Elk River purchased power agreement (“PPA”) until 2030; and
- in year 2041, near the end of the planning horizon, add more Distributed Reciprocating Internal Combustion Engine (“RICE”) generation to balance the capacity needs.

Change in Preferred Plan

The principal differences between the original 2025 IRP Preferred Plan and the Updated Preferred Plan are the removal of a 175 MW standalone utility-scale solar project, removal of MEEIA Cycle 2 DSM programs, extension of the Elk River Wind Farm contract through March 31, 2030, and addition of incremental 20 MW distributed gas RICE resource in 2041. The rationale for the changes is outlined in the following paragraphs.

The 175 MW solar project slated for the 2028 timeframe that was in the 2025 IRP Preferred Plan will not proceed and is being removed as part of the Preferred Plan change. As stated in the 2025 IRP, “Liberty will continue the evaluation of approximately 175 MW solar facility due for operation in the 2028 timeframe. However, given the changing dynamics surrounding the SPP’s resource adequacy construct, evolving market dynamics, and the timing of this filing, it is not certain that this project will proceed.” SPP’s shift to a seasonal capacity accreditation construct and significant increase in the winter Planning Reserve Margin (“PRM”), where solar is awarded relatively low levels of winter value, combined with Liberty’s winter peaking nature, was a leading factor in reconsidering the solar project.

In August 2025, Liberty successfully renegotiated its Purchased Power Agreement with Elk River Wind Farm. Initially set to expire in December of 2025, the new contract runs through March 2030, covering the Company’s capacity needs in the near-term.



The Company has offered demand-side programs dating back to the early 2000s. In January 2022, Liberty began offering its first portfolio of demand-side programs under the regulatory framework prescribed by MEEIA. At the time of inception, Liberty’s portfolio represented a three-fold increase in its investment in energy efficiency in its Missouri service territory. The first cycle of the MEEIA was intended to run for one year through December 31, 2022, but the Commission approved an extension of Liberty’s MEEIA Cycle 1 through December 31, 2024. On December 13, 2024, Liberty reached an agreement with multiple parties to extend their MEEIA Cycle 1 for a third time, through March 31, 2025, while Liberty worked on a MEEIA Cycle 2 application or settlement (Docket EO-2022-0078). The Company's application for MEEIA Cycle 2 was dismissed after the Commission raised concerns about the proposed programs and their alignment with MEEIA’s intent. A settlement agreement reached by stakeholders and Liberty formally withdrew its MEEIA Cycle 2 application in April 2025, effectively cancelling the demand-side program, necessitating its removal from the Preferred Plan.

The reductions in supply outlined above result in a minor capacity shortfall beginning in 2041. To address this shortfall, the Updated Preferred Plan includes the addition of new capacity to meet the resulting capacity needs for 2041 and beyond, where the original 2 MW addition of distributed gas RICE in 2041 increases to 24 MW.

Changes to the Acquisition Strategy

Given cancellation of the 175 MW solar project, DSM resources, and completed extension of the Elk River Wind Farm contract, the near-term acquisition strategy has been simplified with no near-term action required by Liberty, other than pursuing the single cycle frame gas CT included in the Original 2025 IRP Preferred Plan. Table 6.1 illustrates how the planned resource additions change between the Original 2025 IRP Preferred Plan and the Updated Preferred Plan.

Table 6.1 - Comparison of 2025 Original Preferred Plan and Updated Preferred Plan

Year	2025 IRP Preferred Plan (Apr-2025)	2025 IRP Preferred Plan Update (Oct-2025)
2025	Elk River PPA Ends (17 MW Summer/18 MW Winter UCAP)	
2027	RAP DSM (Low-, Mid-, and High-Cost Bundles)	
2028	Firm Solar (175 MW)	
2029	Gas Frame CT (240 MW)	Gas Frame CT (240 MW)
2030		Elk River PPA Ends (21.9 MW Summer/22.5 MW Winter UCAP)
2035	Utility-Scale Solar (150 MW)	Utility-Scale Solar (150 MW)
2036	Gas Frame CT (240 MW)	Gas Frame CT (240 MW)
2041	Utility-Scale Solar (150 MW); Dist. RICE (2 MW)	Utility-Scale Solar (150 MW); Dist. RICE (24 MW)
2042	Dist. RICE (8 MW)	Dist. RICE (8 MW)
2043	Dist. RICE (8 MW); Dist. Storage (1 MW)	Dist. RICE (8 MW); Dist. Storage (1 MW)
2044	Dist. RICE (10 MW)	Dist. RICE (10 MW)

Note – In addition to the resources above, both plans include near-term firm addition of 27 MW gas CT at the Riverton site in 2026, established as a part of previous planning.



The new acquisition strategy is not based on one of the 2025 IRP contingency plans, rather the Updated Preferred Plan outlined above. The new acquisition strategy is based on several assumptions that were not contemplated in the 2025 IRP. These include: (1) discontinuation of demand-side programs such as MEEIA Cycle 2; (2) successful renegotiation of the Elk River Wind Farm contract into 2030; and (3) abandonment of the construction of a standalone utility-scale solar project at a greenfield site.

As part of the 2025 IRP, Liberty developed 12 plans that it analyzed before settling on Plan 4 as the Preferred Plan. In addition to the 12 alternative resource plans, Liberty considered a contingency without the assumed 175 MW firm solar addition which would add a modest amount of incremental gas in the latter part of the outlook horizon to offset lower solar capacity.

The Updated Preferred Plan has a lower Present Value Revenue Requirement (“PVRR”) than the original 2025 IRP Preferred Plan on both a 20 and 30-year basis **and was** tested under the same range of Critical Uncertain Factors as the Original 2025 IRP Preferred Plan.

SPP Accreditation Changes

Resource Adequacy

Over the past few years, SPP has overhauled its Resource Adequacy framework to better reflect actual resource performance, address forecasted capacity shortfalls, and enhance the speed of the addition of new capacity. Key elements of this modernization include: the Expedited Resource Adequacy Study (“ERAS”)—a one-time, fast-track interconnection study path approved by SPP’s board and FERC to bring qualified new generation online more quickly to meet near-term reliability needs outside the traditional queue process through the end of the decade; Effective Load Carrying Capability (“ELCC”) and Performance Based Accreditation (“PBA”) capacity accreditation methodologies—both approved by FERC in mid-2025 to more accurately credit variable and conventional resources based on their actual reliability contributions during peak conditions; and revisions to the Planning Reserve Margin (“PRM”)—including the establishment of much higher seasonal minimum margins (e.g., a 36% winter and 16% summer requirement beginning in 2026/27) to ensure sufficient excess capacity amid growing load and retirements of traditional generation. Together these actions aim to align accreditation with real-world performance, strengthen margin requirements against extreme conditions, and provide mechanisms to quickly mitigate projected resource adequacy gaps.

Expedited Resource Adequacy Study (“ERAS”)

Approved by FERC in July 2025, the ERAS process is a one-time, expedited study process designed to significantly accelerate the interconnection of new generating resources to the grid. This one-time process will run in parallel to but independently of SPP’s standard generator interconnection (“GI”) study queue. Eligibility is limited to new generation nominated by Load Responsible Entities (“LRE”), of a maximum capacity set by a formula using each LREs accredited capacity and the gap between its capacity and seasonal reserve



requirements, up to a calculated ceiling. SPP estimates it will be ready to provide draft generator interconnection agreements by the end of March 2026.

Changes to the SPP Planning Reserve Margin

In 2023, SPP's Loss of Load Expectations ("LOLE") study found that the legacy 15% uniform Planning Reserve Margin ("PRM") was insufficient to meet the target reliability metric of 0.1 days/year LOLE (one day in ten years) for future planning years. Under the 2026 resource mix, it identified Base Scope PRMs of 17% summer and 45% winter, and under the 2029 resource mix, 21% summer and 51% winter, with cold-weather outages materially increasing winter risk and underscoring the need for seasonally differentiated PRMs rather than a single uniform planning reserve margin. These results informed stakeholder discussion and recommendations for separate requirements. Building on that, the 2024 LOLE study reinforced the relationship between PRM and LOLE/EUE ("Expected Unserved Energy") and projected substantial excess reserve margins based on resource submissions. For the 2029 planning year, stakeholders and governing bodies approved a revised Base PRM of 17% summer and 38% winter that corresponded to an approximate 50/50 seasonal LOLE split, reflecting a somewhat reduced winter requirement compared to 2023 results due to changes in resource mix and risk assumptions.

In response to these studies and associated analyses, SPP's Regional State Committee and Board of Directors approved new minimum Base PRM requirements of 16% summer and 36% winter, effective beginning summer 2026 and winter 2026/27, marking the first formal separation of seasonal PRMs, and these revised margins have also received Federal Energy Regulatory Commission ("FERC") approval via tariff revisions recognizing separate winter and summer PRMs to provide greater granularity in resource adequacy assessment.

SPP Capacity Accreditation

Over the last several years, Performance Based Accreditation ("PBA") and Effective Load Carrying Capability ("ELCC") have been central components of the Southwest Power Pool's ("SPP") broader reforms to modernize capacity accreditation and better reflect real-world resource availability and reliability. Historically, SPP relied on accreditation methodologies that were largely based on installed capacity and static assumptions, which increasingly failed to capture actual performance during periods of system stress. In response, SPP stakeholders and working groups developed PBA to accredit conventional, dispatchable resources based on historical performance metrics—most notably demand-equivalent forced outage rates ("EFORD") observed during high-risk conditions—thereby aligning accredited capacity with demonstrated reliability. In parallel, SPP advanced ELCC methodologies for variable and limited-duration resources, including wind, solar, and storage, to probabilistically measure each resource's contribution to reducing loss-of-load risk rather than relying on nameplate or average output assumptions. After an extended stakeholder process and refinement following earlier regulatory setbacks, SPP's Regional State Committee and Board of Directors authorized a combined ELCC/PBA tariff filing on February 23, 2024, submitting revisions to Attachment AA of the SPP Open Access Transmission Tariff to formally implement both methodologies. FERC ultimately approved



SPP's updated ELCC and PBA framework on July 18, 2025, affirming unified, data-driven accreditation methodologies that more accurately reflect actual performance across resource types and serves as a foundational element of SPP's evolving resource adequacy construct.

Below, in the Load and Capability Balance Report section, the most recent generator capacity accreditation values for the Liberty generation fleet can be found.

Load and Capability Balance Report

The 2025 IRP preferred plan was described in the 2025 IRP Executive Summary. Additional information can be found in Volume 7 of the IRP.

The Load and Capability Balance Report for the 2026 IRP Annual Update is presented on the following pages and is consistent with the current requirements of SPP Resource Adequacy and consistent with the Company's recent 2026 SPP Resource Adequacy submission.

Due to the nature of the evolving requirements of SPP Resource Adequacy, there are notable differences in certain assumptions between the 2025 IRP Load and Capability Balance Report and the 2026 IRP Annual Update Load and Capability Balance Report. For example, the new DSM that was included in the 2025 IRP is not included below as a settlement agreement was reached by stakeholders resulting in the Company formally withdrawing its MEEIA Cycle 2 application in April 2025, effectively canceling the demand-side programs.

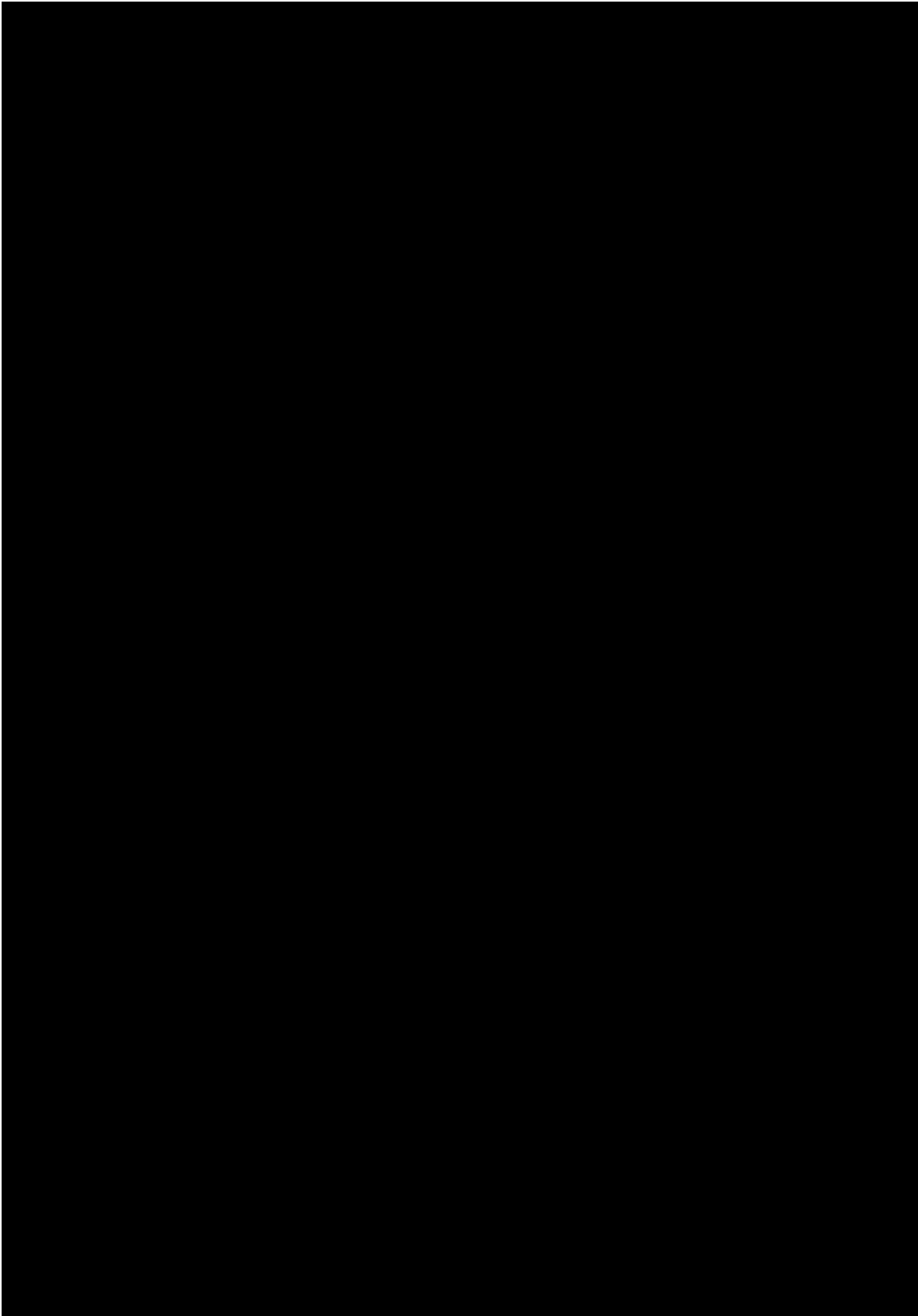
Another assumption that differs between the 2025 IRP and 2026 IRP Annual Update Load and Capability Balance Reports is the capacity credit assumed for the Company's generation resources. With SPP's transition to PBA and ELCC accreditation methodologies in the summer season of 2026 described above, SPP has published the required studies for entities to use in their Resource Adequacy submissions.

Moreover, Liberty included small community solar, distributed solar, and solar + storage resources as behind-the-meter resources, as a reduction to the load and peak forecasts rather than separate resources in the following table, as it is assumed that these resources will not be registered in the SPP Integrated Marketplace based upon SPP Business Practices Section 2.0.

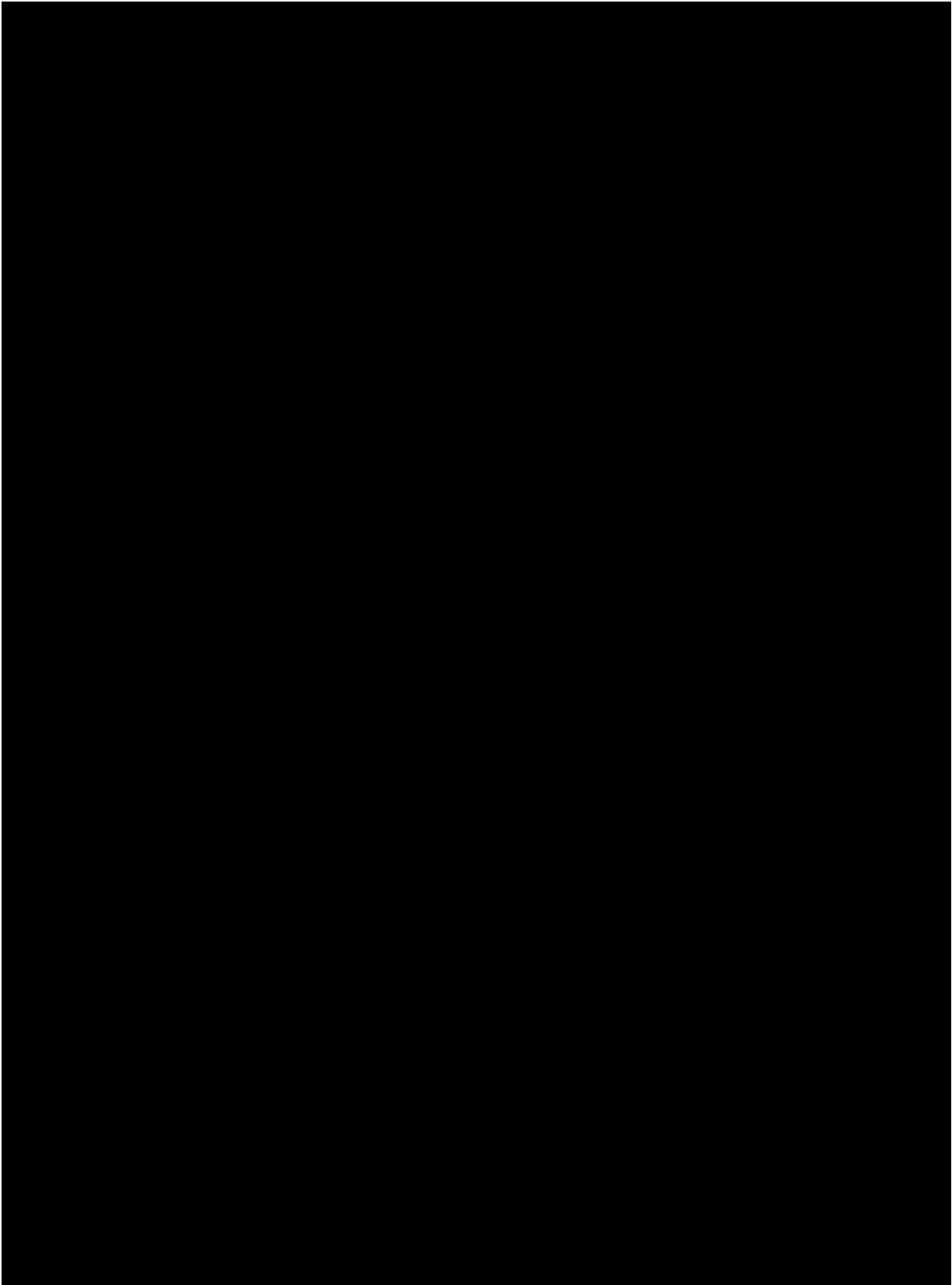
Finally, the following Load and Capability tables are updated to reflect SPP's change to seasonal planning reserve margins beginning in the summer season of 2026.



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****CONFIDENTIAL in its entirety****



7. Liberty Special Contemporary Issues

According to the Rule, special contemporary issues (“SCI”) means “a written list of issues contained in a Commission order with input from staff, public counsel, and interveners that are evolving new issues, which may not otherwise have been addressed by the utility or are continuations of unresolved issues from the preceding triennial compliance filing or annual update filing.”

In this section of the report, Liberty will address the two SCIs (issues A and B) that were established by Commission Order in File No. EO-2026-0038.

(A). Analyze and document large load customers.

According to Missouri Senate Bill 4 (“MO SB 4”), utilities such as Liberty with fewer than 250,000 customers define large loads as customers who are reasonably projected to have above an annual peak demand of 50 MW or more.¹

1. Current pipeline of large load customers and which are likely to materialize.

While Liberty has received interest from parties that reach the threshold defined in MO SB 4, at this time none of them would fall in the category of “likely to materialize.” However, discussions with the interested parties continue which could cause a shift in the categorization of “likely to materialize”.

2. Discussion on interconnection.

The Liberty Large Load Interconnection Queue Process can be found at <https://central.libertyutilities.com/all/large-load-customer-requests.html>

3. Potential impact if load does not persist for more than 5, 10, and 15 years.

The potential impact if a large load does not persist for the timeframes above would be specific to the large load customer. It is the intent of Liberty to file a large load tariff that conforms to the requirements of MO SB 4 and will mitigate the impact if the load does not persist.

(B). Analyze and document geologic hydrogen onsite or near natural gas storage.

In alignment with the Missouri Public Service Commission’s directive, Liberty has undertaken a preliminary assessment of Geologic Hydrogen, also referred to as natural hydrogen, as a potential contributor to the region’s future electricity generation portfolio. This analysis is framed within the context of evolving energy market dynamics, federal decarbonization incentives, and the need for long-term resource diversification.

Geologic hydrogen is hydrogen gas naturally produced and stored in the Earth’s subsurface through processes such as serpentinization (reaction of water with iron-rich rocks) and

¹https://www.senate.mo.gov/25info/bts_web/Bill.aspx?SessionType=R&BillID=66#:~:text=Under%20the%20act%2C%20an%20electrical,from%20service%20to%20such%20customers.



radiolysis (breakdown of water molecules by natural radiation).² Unlike hydrogen produced via industrial methods (e.g., steam methane reforming or electrolysis), geologic hydrogen is carbon-free at the point of extraction, offering a compelling environmental advantage.³

Recent research by the U.S. Geological Survey (“USGS”) and Department of Energy (“DOE”) suggests that geologic hydrogen may exist in recoverable quantities sufficient to meet global energy demand for centuries, with production costs potentially below \$1/kg.⁴ The Midcontinent region, which includes southeast Kansas and southwest Missouri, has been identified by the USGS as a moderately prospective zone for geologic hydrogen accumulation.⁵ While Liberty’s homebase in Joplin is not currently mapped as a high-prospect area, its proximity to iron-rich formations in Kansas and the Ozark Plateau suggests potential for exploratory drilling and stimulated production. Additionally, the Missouri Geological Survey’s bedrock maps indicate the presence of Precambrian basement rocks and serpentinized ultramafic formations in parts of southern Missouri, which are geologically favorable for hydrogen generation.⁶ Further geophysical mapping and subsurface imaging will be required to validate these formations as viable hydrogen reservoirs.

If viable hydrogen reservoirs were to be located, the hydrogen could be used to generate electricity via fuel cells or combustion turbines. Fuel cells offer high efficiency and zero emissions, while hydrogen-capable turbines provide dispatchable power and grid stability.⁷ Integration of geologic hydrogen into Liberty’s generation mix could support:

- Decarbonization of peaking units, such as those replacing Riverton Units 10 and 11.⁸
- Energy storage and load balancing, especially when paired with intermittent renewables.⁹
- Grid resilience, through distributed hydrogen generation and storage.¹⁰

Additionally, the DOE’s ARPA-E GeoH2 program is actively researching stimulated hydrogen production, where water is injected into iron-rich rocks to accelerate hydrogen-generating reactions.¹¹ This approach could be piloted in Liberty’s footprint if favorable geology is confirmed. Despite the theoretical potential, challenges with geologic hydrogen remain including:

² www.usgs.gov/tools/geologic-hydrogen-prospectivity-map-explorer

³ <https://www.hydrogenfuelnews.com/americas-geologic-hydrogen/8569337/>

⁴ <https://www.edengeopower.com/stimulated-geologic-hydrogen>

⁵ <https://www.hydrogenfuelnews.com/americas-geologic-hydrogen/8569337/>

⁶ <https://dnr.mo.gov/land-geology/maps-data-research/geologic>

⁷ <https://docs.nrel.gov/docs/fy22osti/82554.pdf>

⁸ <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energy-transition/101723-geologic-hydrogen-attracts-interest-as-a-clean-energy-source>

⁹ <https://docs.nrel.gov/docs/fy22osti/82554.pdf>

¹⁰ <https://energy.sustainability-directory.com/question/how-does-hydrogen-storage-affect-grid-resiliency/>

¹¹ <https://www.energy.gov/sites/default/files/2025-05/h2iqhour-04242025.pdf>



- Exploration uncertainty: Limited data on subsurface hydrogen concentrations.¹²
- Infrastructure gaps: Lack of hydrogen pipelines and refueling stations in Missouri.¹³
- Regulatory framework: Need for permitting pathways and safety standards for hydrogen wells.¹⁴

Geologic hydrogen represents a promising but nascent opportunity for clean electricity generation in Missouri. While current data does not support immediate deployment near Joplin, Liberty will continue to monitor federal and state developments, including DOE pilot programs and USGS mapping updates, to assess the feasibility of incorporating geologic hydrogen into future IRPs.

¹² <https://www.energy.gov/sites/default/files/2025-05/h2iqhour-04242025.pdf>

¹³ <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energy-transition/101723-geologic-hydrogen-attracts-interest-as-a-clean-energy-source>

¹⁴ <https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/hydrogen-program-plan-2020.pdf?Status=Master>

