

Energy Kansas Central

and

Energy Metro

Volume 5

Integrated Resource Plan and Risk

Analysis

Integrated Resource Plan

May 2024



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Appendix 5A Evergy Kansas Central Rankings and Performance Metrics

Appendix 5B Evergy Metro Rankings and Performance Metrics

Volume 5: Integrated Resource Plan and Risk Analysis

Highlights

- Solar, wind, and battery storage resources were identified as new resource candidates based on responses to Evergy’s all-source RFP issued in 2023; all are expected to be eligible for Inflation Reduction Act tax credits.
- Combined-cycle and combustion-turbine resources were identified as self-build options for new firm-dispatchable resources.
- Nuclear SMR and combined cycle with carbon capture were also considered in scenarios with high carbon dioxide restrictions.
- Resource adequacy needs and SPP capacity requirements are projected to increase due to weather-related risk and changes to the resource mix.
- Evergy’s long-term planning criteria includes meeting its customers’ energy and capacity needs while balancing future risks.
- Energy market forecasts were developed based on the expected resource transition in SPP over the 20-year planning period, with sensitivities for natural gas price changes and future carbon dioxide emissions restrictions.
- The Preferred Portfolios selected for Kansas Centro and Metro maintain the same retirement dates as the 2023 Preferred Portfolios.
- Kansas Central’s Preferred Portfolio outlines new demand-side programs, new solar and new combined cycle generation resources by 2030.
- Metro’s Preferred Portfolio outlines new demand-side programs, new solar, and new wind by 2030.
- Alternative resource plans were developed to consider base planning options, varying future demand-side management portfolios, retirement dates, and resource additions.
- Resource plans were also developed to evaluate directed strategies such as minimum or maximum renewable additions and discrete scenarios of future environmental policy.

- Contingency plans address planning alternatives if conditions change, such the next best resource additions in the short term if execution challenges occur, and longer-term variation in resource decisions directly tied to higher and lower than expected load growth scenarios.
- Resource plans were evaluated economically based on their performance in future scenarios with varied levels of the identified critical uncertain factors: natural gas prices, CO₂ emissions restrictions, and construction costs.
- Plans were ranked based on expected net present value revenue requirements in different future scenarios and on a weighted-average risk basis. Performance measures also quantify costs and risks of each alternative resource plan.

Section 1: New Resources

1.1 Selection of Resource Candidates

In January 2023, Evergy issued an all-source request for proposals (RFP) for new resources. In March 2023, Evergy received offers for wind, solar, solar-hybrid, and battery storage resources from various suppliers, with different contract structures, locations, and technologies offered. Evergy used the information from the RFP to estimate the near-term availability of resources, expected costs, and operating characteristics. Evergy received offers for both Build-Transfer (i.e., owned resources) and Power Purchase Agreements (PPA) through this RFP, however, all resources evaluated in this IRP are assumed to be owned, consistent with the approach used in past IRPs. This consistency of assumptions enables better comparison of “generic” resource options and leaves the evaluation of different ownership structures (e.g., PPA) to more detailed analysis during the resource procurement process.

Evergy is currently conducting a study to determine optimal locations to build new natural gas resources in the future. While the study is not complete in time for this IRP filing, resource specifications and costs were updated in the IRP modeling analysis. Evergy has determined that due to interconnection queue times and siting needs, the earliest operational year for a new natural gas resource is 2028.

Table 1: Primary Resource Options **Confidential**

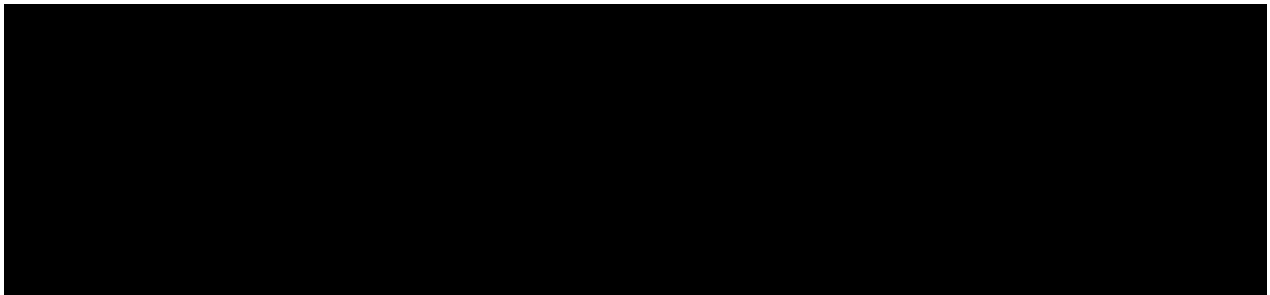


Table 2: Primary Resource Costs in First Year of Operation **Confidential**

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Based on stakeholder feedback, Evergy also considered Combined Cycles with Carbon Capture and Nuclear SMR as resources that could be deployed to enable future emissions reductions. While these technologies are not currently operating, and cost data is more speculative, they may assist in the analysis of tradeoffs in a low-carbon future.

Table 3: Future Low Emissions Options **Confidential**

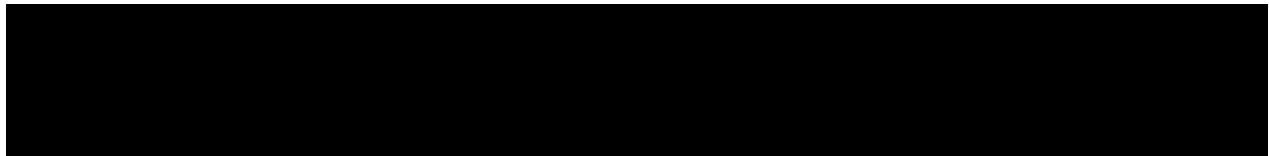
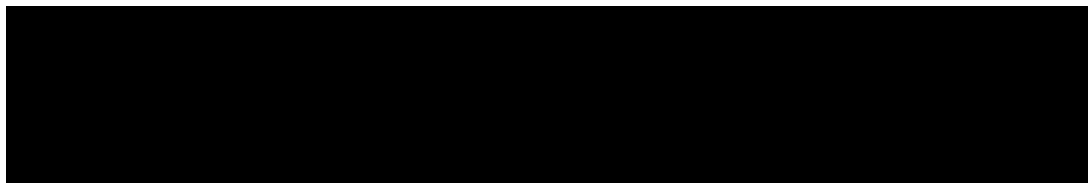
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Table 4: Future Low Emissions Costs in First Year of Operation **Confidential**

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1.2 Renewable and Storage Tax Incentives

In August 2022, Congress passed the Inflation Reduction Act (IRA) and it was signed into law by President Biden. The IRA includes availability of production tax credits (PTC) and investment tax credits (ITC). Evergy assumes that new wind and solar will receive PTC and new battery resources will receive ITC. New wind and solar resources can select either the PTC or ITC. New wind resources are expected to have high capacity factors, making the PTC advantageous. Solar resources have lower capacity factors, however the PTC is still expected to be the most economic option for Evergy customers, because of the expected capacity factor and the requirement for utilities to amortize the ITC over

the life of the asset. New battery resources are only able to use the ITC and utilities are able to take the credit upfront (rather than amortizing it) as part of the IRA guidelines.

The Internal Revenue Service (IRS) released the PTC value for 2022 and guidelines for calculating future amounts.¹ Eversky incorporated the IRS guidance and information from other sources in evaluating the future PTC forecast. The benefit of the PTC is equivalent to the credit grossed up for federal taxes (before tax value). In 2027, this benefit is expected to be over \$39/MWh.

Eversky expects new wind and solar projects to meet the eligibility criteria for 100% PTC, with a PTC earned for every MWh of production for the first 10-years of operation. Consistent with IRA provisions, production tax credit eligibility for new projects phases out as the US meets its GHG emissions reduction goals. Projects beginning operation in 2034 and 2035 are eligible for 75% PTC and 50% PTC, respectively, before the credit ceases for projects after 2035.

Eversky expects new battery projects to meet the eligibility criteria for 30% ITC, with the benefit received upfront in the first year of operation. The IRA allows additional bonus credit eligibility for projects located in “energy communities”.² Eversky is modeling additional bonus credit eligibility for a total of 40% ITC, beginning in 2029, after the scheduled retirement of Lawrence 4. As the credit phases out, projects beginning operation in 2034 and 2035 are eligible for 75% and 50% of the expected credits, respectively, before the credit ceases for projects after 2035.

¹ Renewable Electricity Production Credit Amounts for Calendar Year 2022. <https://www.irs.gov/pub/irs-drop/a-22-23.pdf>.

² IRS. Energy Community Bonus Credit Amounts under the Inflation Reduction Act of 2022 Notice 2023-29. https://www.irs.gov/irb/2023-29_IRB#NOT-2023-29.

1.3 Resource Discussion

1.3.1 Solar

Currently, solar accounts for only 0.3% of nameplate capacity and 0.2% of generation for SPP,³ but there are many potential future projects in the interconnection queue. According to the US EIA, solar is projected to be the fastest growing utility power source in the next two years, with installed nameplate expected to grow from 95 GW at the end of 2023 to 131 GW at the end of 2024.⁴ Solar production is greatest during summer daylight hours, which typically correspond to high load and high system energy needs in SPP. New solar is expected to have high summer capacity value in SPP due to its ability to operate during peak conditions. Generally solar irradiance is better the further south and west in and outside of Eversource's service territory. The solar projects Eversource is considering benefit from being closer to load and are expected to be less transmission constrained than wind projects.

Eversource received multiple offers for solar resources in its 2023 RFP. These resources have interconnection queue positions and other milestones, however the earliest delivery dates are for 2027 summer capacity. In the past few years there have been many issues causing cost increases and delays in solar projects. Pandemic-related global price increases and supply chain issues compounded with US government action preventing import of materials made with forced labor, and threats of high tariffs for dumping and penalties for tariff circumvention delayed the import of solar panels. Installed cost estimates for solar projects increased 62% between the 2021 and 2023 IRPs. With some supply chain pressures easing and temporary suspension of US enforcement of tariffs, costs are stabilizing for solar projects. Eversource has refreshed offers for its short-listed solar projects from the RFP and determined that costs are the same as forecasted in the 2023 IRP.

³ SPP. Fast Facts. <https://www.spp.org/about-us/fast-facts/>.

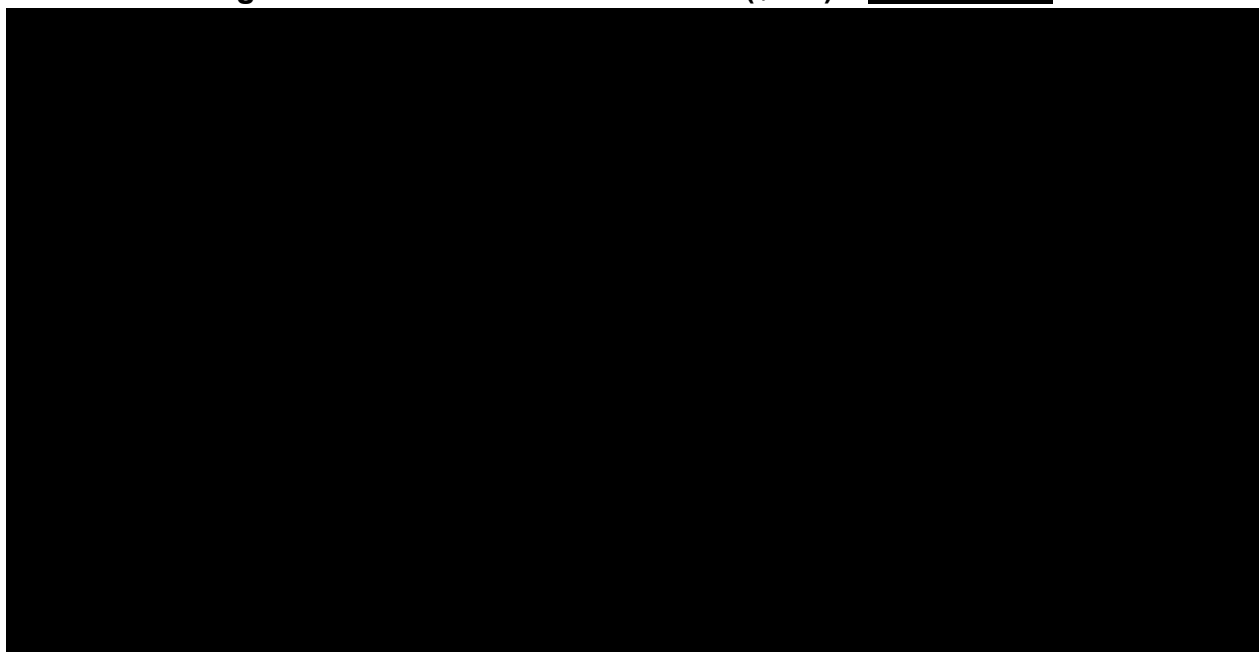
⁴ EIA. Solar and wind to lead growth of U.S. power generation for the next two years. <https://www.eia.gov/todayinenergy/detail.php?id=61242>.

Eversource is also pursuing self-build options for solar, and hoped to have one potential project available for 2026 summer capacity. However, some local opposition is likely to delay the project, eliminating 2026 delivery of a solar resource as a possible option for the resource plan.

For 2027 solar, Eversource used installed cost estimates based on RFP results. For projects after 2027, Eversource applied a technological improvement factor and inflation to the 2027 installed costs. The technology curve was constructed using EIA and NREL estimates of future project costs and averaging the implied cost reduction factors.

The technology curve declines most steeply through 2030. NREL estimates are more aggressive than EIA, but on average technological improvement outweighs inflation from 2027-2030, reducing expected nominal costs each year, and after 2030 costs rise annually.

Figure 1: Annual Solar Build Costs (\$/kw) **Confidential**

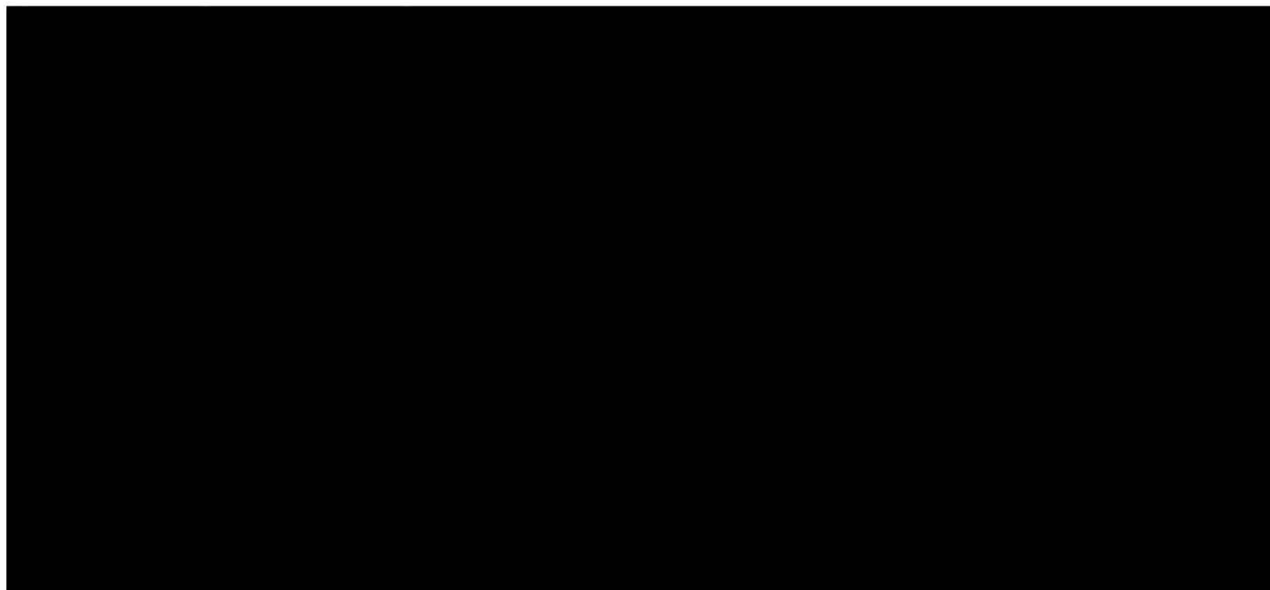


1.3.2 Wind

Eversource received offers for existing and new build wind projects in its 2023 RFP. New projects had significantly higher installed costs than operating projects but will have a full

10 years of PTC eligibility when constructed. Cost estimates, based on these RFP results, rose significantly from the 2022 IRP assumptions. However, based on the most recent information, including offer refreshes from the RFP short list cost estimates have remained steady from 2023 IRP assumptions to the 2024 IRP.

Figure 2: Annual Wind Build Costs **Confidential**



A recent NREL analysis cited design innovations which may improve wind performance in the future, including taller towers, longer blades, larger rotors, and improved steering controls and cost reducing innovations including on-site manufacturing, and climbing cranes.⁵ The average EIA/NREL technology curve declines most steeply through 2030. However, the average technology curve is similar to the inflation rate, keeping costs relatively flat from 2027-2030. After 2030 costs rise annually.

Some asset owners are considering repowering older wind resources to take advantage of IRA incentives. A repowered facility becomes eligible for the 10-years of PTC again.

⁵ NREL. Technology Advancements Could Unlock 80% More Wind Energy Potential During This Decade. September 22, 2023. <https://www.nrel.gov/news/program/2023/technology-advancements-could-unlock-80-more-wind-energy-potential-during-this-decade.html>.

Eversource did not receive any repowering offers in the RFP and did not specifically consider repowering in the IRP analysis. Costs to repower are likely similar to the estimates for new installations because of the 80/20 rule established by IRS guidance that the cost of adding the new components of the project must account for at least 80% of its value to qualify as a new installation eligible for tax credits. Most of Eversource's current wind is in PPAs, and Eversource will evaluate offers to extend or repower these PPAs as they arise.

1.3.3 Battery

Utility-scale battery storage capacity for electricity has been growing in recent years. Based on reporting to EIA, 16 GW of installed capacity was expected in the US by the end of 2023, up from less than 2 GW in 2020.⁶ The majority of battery capacity as of November 2023 was located in California, which had 7.3 GW, and Texas, which had 3.2 GW. There is currently very little battery storage in SPP. Eversource operates a 1 MW battery pilot project connected at distribution voltage in the Wichita area which is providing experience navigating SPP market nuances that impact a battery resource, but SPP rules related to batteries still need to be further developed for larger utility-scale facilities.

The predominant battery technology used in power system operations is Lithium-ion batteries.⁷ Batteries do not produce energy, but store energy for future use. Batteries can be a useful addition to the resource mix because they can store energy produced at low-need or low-priced times and release it at high-need or high-priced times, providing reliability value as capacity, and economic arbitrage value. Batteries lose some energy in the charging process and are limited by the duration of energy supply (4 hours) before needing to be recharged.

Eversource received offers for 4-hour Lithium-Ion batteries in its all-source RFP for delivery in time for summer 2026 and summer 2027 capacity needs. These offers are for battery

⁶ US EIA, Today in Energy. "US Battery Storage Capacity Expected to Nearly Double in 2024." January 9, 2024. <https://www.eia.gov/todayinenergy/detail.php?id=61202>.

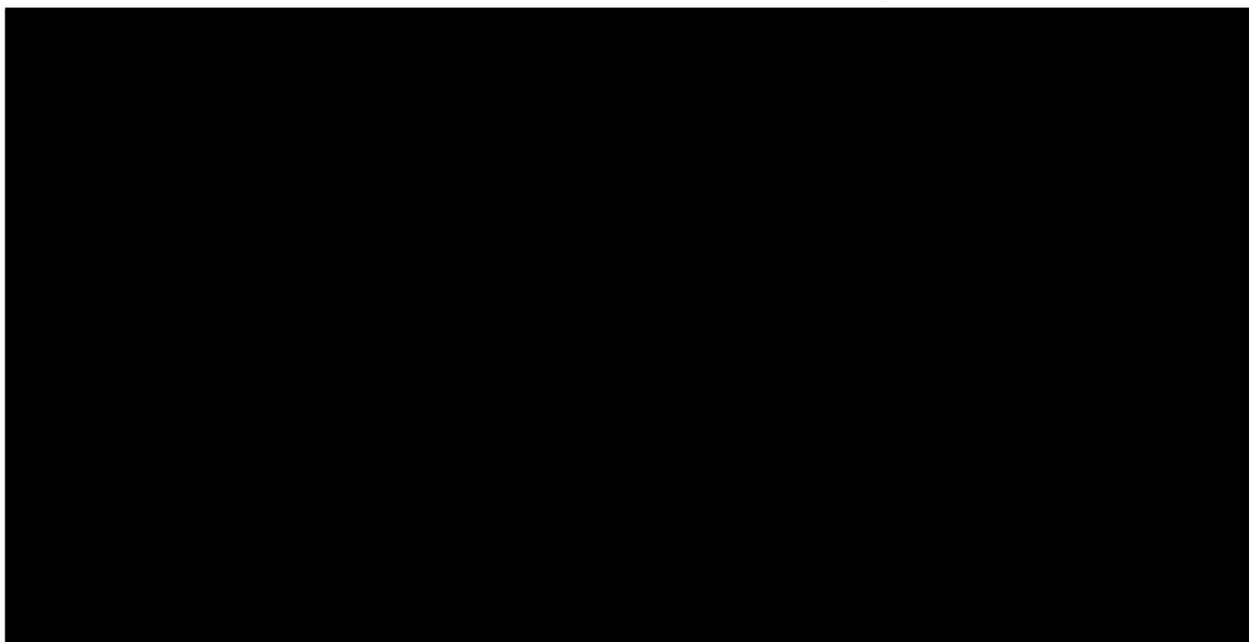
⁷ US EIA, Electricity Explained, Energy Storage for Electricity Generation. <https://www.eia.gov/energyexplained/electricity/energy-storage-for-electricity-generation.php>.

projects in the SPP interconnection queue. Evergy also believes it could procure batteries for self-build options. In early years, these batteries could use surplus interconnection, particularly at wind sites. Evergy would need to enter the interconnection queue to self-build at new locations.

For 2026 and 2027 Battery projects, Evergy used installed cost estimates based on RFP results. For projects after 2027, Evergy applied a technological improvement factor and inflation to the 2027 installed costs. The technology curve was constructed using EIA and NREL estimates of future project costs and averaging the implied cost reduction factors.

The technology curve steeply declines through 2030, implying rapid cost reductions. Technological improvement outweighs inflation from 2027-2030, reducing expected nominal costs each year, and after 2030 costs rise annually.

Figure 3: Battery Build Costs (Excluding ITC) (\$/kw) **Confidential**



1.3.4 Combined Cycle

The need for firm dispatchable generation beginning in the late 2020's to early 2030's was identified in the 2023 IRP. Evergy expects to self-develop these resources because

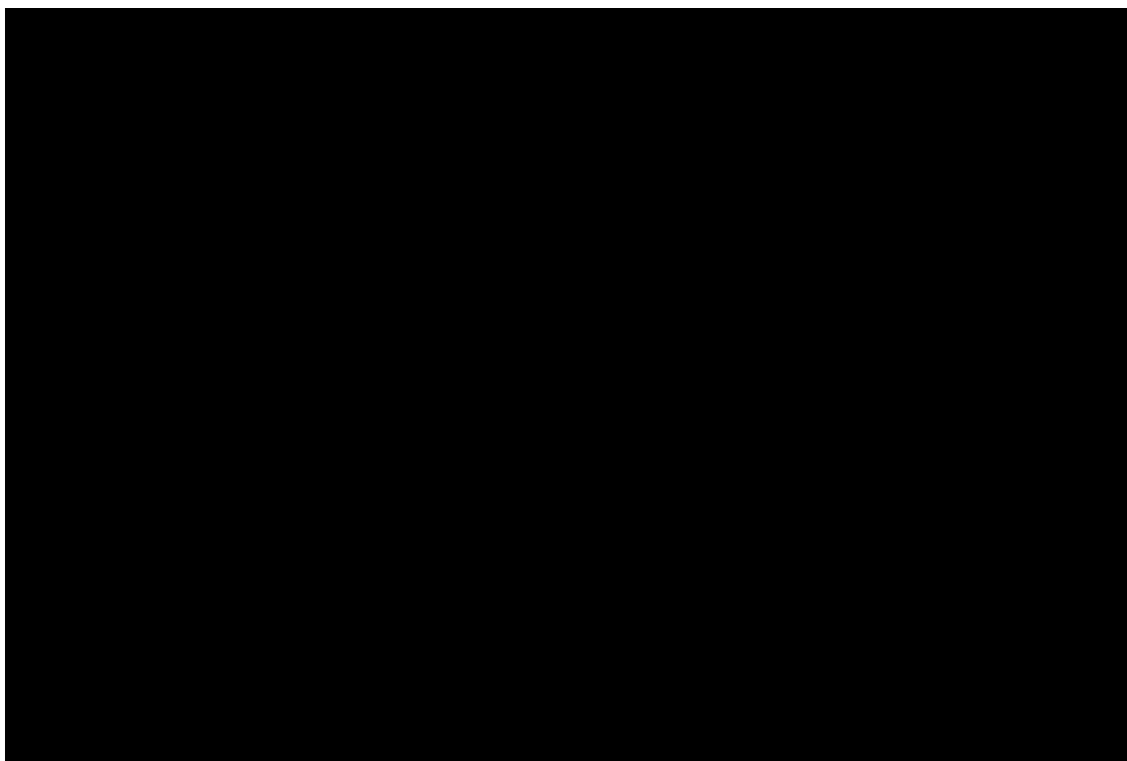
no thermal resources were offered in response to the 2023 RFP and developers are not pursuing speculative thermal resource projects in SPP.

In 2023, Eversky ran a technology study exploring various simple and combined cycle natural gas technologies. Various technologies were explored including: simple cycle heavy frame E class, heavy frame F class, aeroderivative, and reciprocating engines. Additionally, combined-cycle E class, F class, and advanced class with wet and dry cooling were modeled. The results of that study showed that advanced class units had relatively low construction costs on a per kilowatt basis and comparative heat rate advantages. Additionally, in both simple cycle and combined cycle configurations, the advanced class units met the Best System of Emission Reduction (BSER) and CO₂/MWh standards for low load and intermediate load units as contained in the Environmental Protection Agency's proposed Greenhouse Gas (GHG) Regulations (and now in the final regulations). Due to these characteristics, the team moved forward with advanced class simple and combined cycle as the modeled case for the 2024 triennial IRP.

Cost estimates for the 2023 IRP were based on engineering estimates and recently completed projects, however inflationary pressures have increased projected costs based on engineering estimates, newly announced projects and publicly available information. Eversky still estimates that the earliest available combined cycle build would be for commercial operation by summer 2028.

Costs for future years were estimated by scaling the 2028 cost estimate by inflation and the average of the NREL and EIA technology curves. Inflation exceeds technological innovation, resulting in higher nominal costs each year.

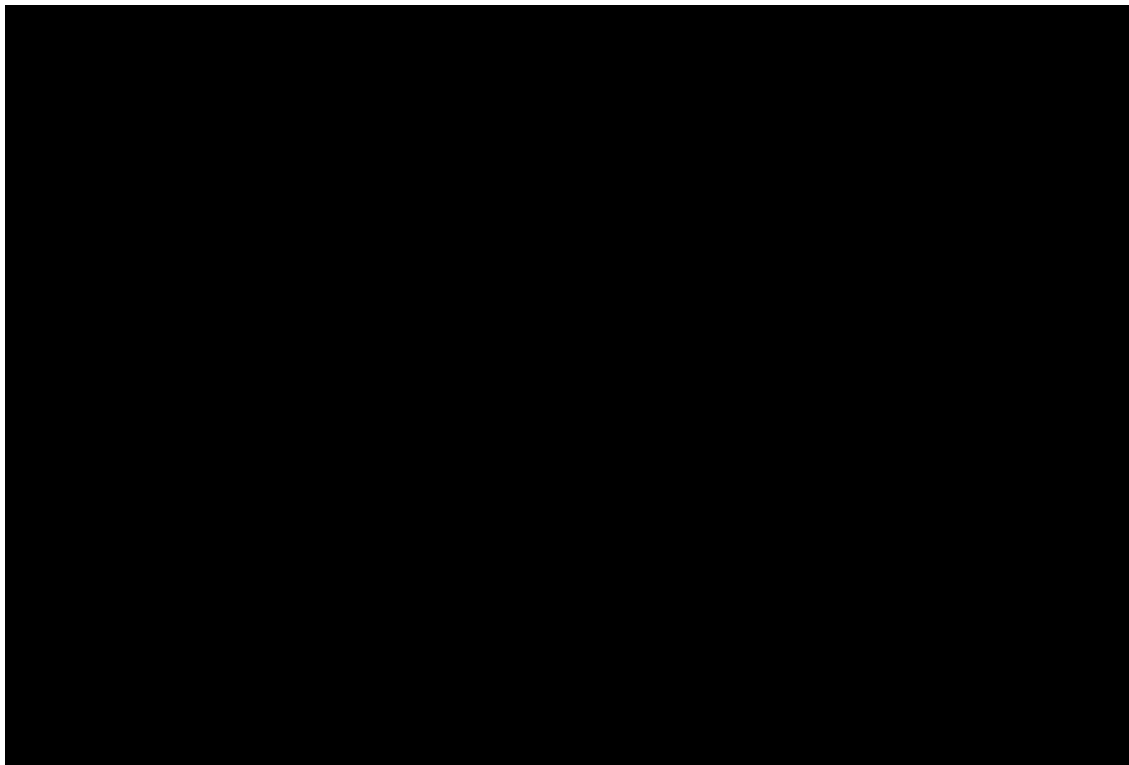
Figure 4: Combined Cycle Build Costs (\$/kw) **Confidential**



1.3.5 Combustion Turbine

Evergy also expects to self-develop combustion turbines if needed. Cost estimates for the 2024 IRP were based updated engineering estimates, newly announced projects and publicly available information. Evergy still estimates that the earliest available combined turbine build would be for commercial operation by summer 2028.

Costs for future years were estimated by scaling the 2028 cost estimate by inflation and the average of the NREL and EIA technology curves. Inflation exceeds technological innovation, resulting in higher nominal costs each year.

Figure 5: Combustion Turbine Build Costs (\$/kw) **Confidential**

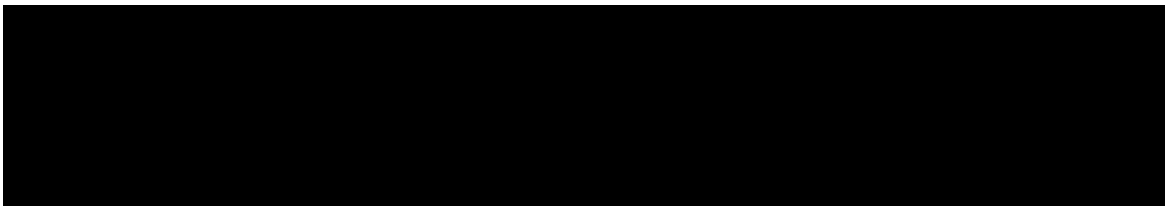
1.4 Low-Emission Future Resources Discussion

1.4.1 Combined Cycle with CCS

Eversource modeled retrofitting new combined cycle builds with CCS, beginning in 2035 as an option for compliance with the strict (high) CO₂ emissions reductions scenarios. Carbon capture facilities have high capital costs, similar to the costs of building the generator. The operation of carbon capture increases fixed and variable costs, and decreases the efficiency (i.e., increases the heat rate) and the net output of the underlying resource. However, the net CO₂ emissions are also reduced by 95%. Plant capital and operating costs were modeled using NREL estimates from the 2023 Annual Technology Baseline (ATB),⁸ while the cost of CO₂ transportation and storage was estimated from a 2022 report by the National Energy Technology Laboratory (NETL).⁹

⁸<https://atb.nrel.gov/electricity/2023/data>

⁹https://netl.doe.gov/projects/files/CostAndPerformanceBaselineForFossilEnergyPlantsVolume1BituminousCoalAndNaturalGasToElectricity_101422.pdf

Table 5: Unit Characteristics of Combined Cycle with and without CCS****Confidential****A large black rectangular redaction box covers the entire content of Table 5, which would otherwise contain unit characteristics for combined cycle with and without CCS.

1.4.2 Nuclear SMR

Evergy also modeled small modular nuclear reactors as a resource option for high CO₂ emissions reductions scenarios. Evergy expects that the timeline for siting, permitting, and construction of a facility would take at least 10 years due to the intense regulatory requirements for nuclear projects. Small modular reactors are an immature technology, with a lot of research and development activity occurring around the world. There is still significant uncertainty about which technologies will ultimately become operational and their costs. Evergy does not expect to be a first adopter, and the IRP cost and timing assumptions incorporate the expected strategy of building an “nth” of a kind” (NOAK) reactor, meaning several resources of the same technology would be in commercial operation first. For planning purposes, the 2024 IRP considers building a nuclear SMR in 2038 or later.

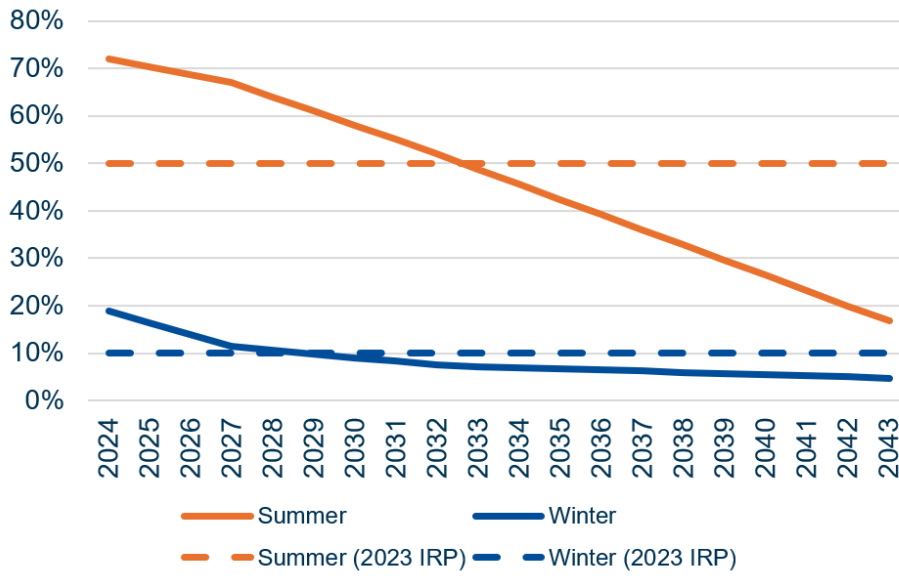
1.5 Resource Capacity Accreditation

1.5.1 ELCC for Renewables and Storage Resources

Evergy expects new renewable and battery resources to be subject to Effective Load Carrying Capability (ELCC) capacity accreditation rules beginning in summer 2026. ELCC measures the effectiveness of the resource to produce energy at times needed to meet load. Generally, as the saturation of the resource type increases in the market, each resource is less effective at meeting load requirements. SPP has conducted studies to estimate the relationship between increasing amounts of resources and ELCC value. Evergy used the study results in conjunction with the ITP futures expectations of resource penetration in order to develop a forecast of how ELCC accreditation will vary over the 20-year planning horizon.

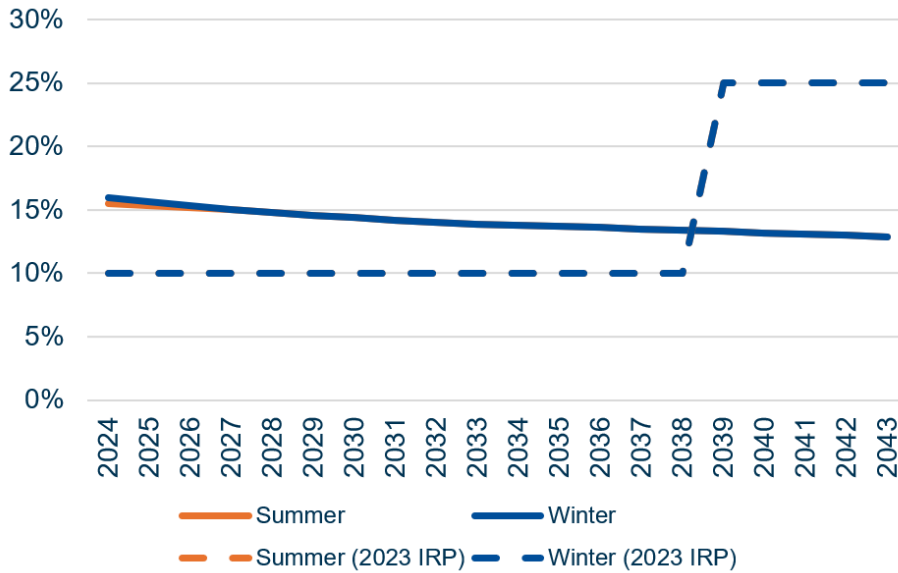
The forecasts differ from 2023 IRP assumptions because SPP stakeholders have modified some of the proposed implementation of ELCC. For the 2023 IRP, Evergy assumed that renewable resources would be allocated ELCC according to tiers based on share of load. In particular, solar nameplate equivalent to 20% of load (2,000 MW for Evergy) would receive higher summer accreditation (50%), and incremental solar would receive lower accreditation (10%). This construct is no longer part of the proposed method for implementing ELCC. Evergy expects some variation in ELCC based on whether resources procure network transmission service to ensure capacity deliverability. However, Evergy expects that new resources will pursue network transmission service.

Figure 6: New Solar ELCC Assumptions



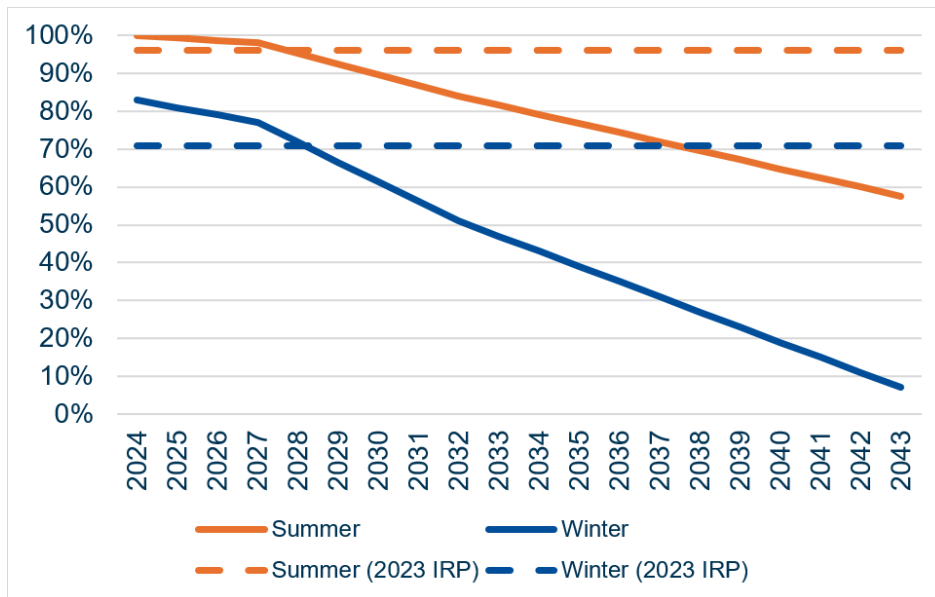
Solar resources are projected to have higher ELCC values in the first half of the time horizon, and lower values as more solar resources enter the market in the second half of the planning horizon.

Figure 7: New Wind ELCC Assumptions



New wind ELCC assumptions increased slightly for most of the planning horizon, but are lower at the end. Evergy previously assumed that it had exhausted its load-ratio share of wind under the tier system, but would get higher accreditation as wind PPAs rolled off at the end of the planning horizon.

Figure 8: New Battery ELCC Assumptions



In the 2023 IRP, Eversource assumed that new battery ELCC would be consistent with an SPP build out of 3,000 MW batteries. However, the 2024 IRP aligns ELCC with the 2023 ITP forecast which assumes much higher build out of batteries in future years.

1.5.2 PBA for Thermal Resources

Since performance-based accreditation (PBA) is a reallocation of thermal accreditation, no adjustments were made for new resources under the assumption that they would have forced outage rates consistent with or lower than the broader market.

1.6 Environmental Issues with New Resources

New resources will be subject to different environmental standards depending on the technology. Local, state, and federal permits will be obtained to site, permit, and construct these resources. Eversource plans to do a full permit matrix for each project pursued and has access to expertise internally and externally to support those permitting plans.

Permitting restrictions for future regulation is difficult to predict but it is likely that conventional generation will be subject to air emissions limitations for both traditional controlled emissions such as water effluent, SO_x, NO_x and particulate matter and carbon emissions in the future. Wildlife protection is also a strong consideration when siting a new generating facility.

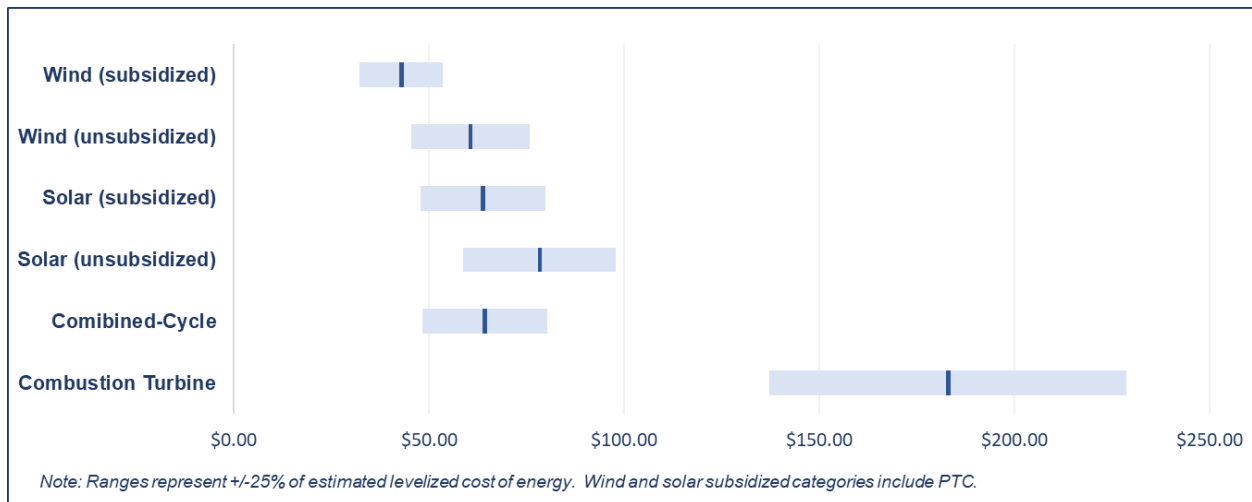
On the renewables side, solar and wind do not have the traditional or carbon air emissions but do have different impacts on land use. Bat and bird impacts are a strong consideration in the environmental impact of new wind generation and is being evaluated for solar. Recent environmental activity for solar has focused on the impact of materials in the panels on the surrounding environment and the change in groundwater characteristics from having the panels installed above the ground.

1.7 LCOE

The Levelized Cost of Energy (LCOE) is a useful measure to evaluate the costs of different generation resource types. The LCOE values found in the Figure below estimate

the cost of owning and operating select resource types over the current IRP planning period. While LCOE provides a useful indication of the relative cost of producing energy, it does not capture all the strengths and capabilities of each generating technology required for long-term generation resource planning. Eversky uses the Net Present Value of Revenue Requirement as the financial measure to evaluate and compare the cost-effectiveness of resource plans.

Figure 9: Levelized Cost of Energy (\$/MWh)



Section 2: Planning Criteria

2.1 Resource Adequacy Requirements

SPP requires all load-serving entities to meet Resource Adequacy Requirements based on forecasted peak load plus planning reserve margins. SPP conducts a LOLE (loss of load expectation) study at least every two years, setting the planning reserve margin based on a LOLE of less than one day in ten years.¹⁰ Eversky plans to have sufficient capacity to meet SPP requirements in every planning year. Eversky submits planning data, including load forecasts and resource accreditation to SPP annually to confirm it has met the requirements prior to the summer season.

Eversky expects significant changes to Resource Adequacy Requirements in the future. There are numerous components of resource adequacy planning that are working through the stakeholder process. Eversky expects SPP to file tariff changes to implement winter Resource Adequacy Requirements, performance-based accreditation, and Effective Load Carrying Capability (ELCC). However, there are many interrelated issues to work through which could influence future requirements – including LOLE study assumptions and variations in accreditation calculations.

2.1.1 Winter Reserve Margin Requirement

The Federal Energy Regulatory Commission (FERC) rejected SPP's tariff change to implement a winter reserve margin requirement beginning in 2024/25 Winter, based on the impression that it was not strict enough in ensuring capacity resources would be available.¹¹ Eversky expects SPP to submit a revised tariff filing. The initial winter reserve margin for winter 24/25 was 15%, however SPP studies have indicated potential dramatic increases in future winter requirements. There is still uncertainty in predicting what the winter reserve margins will be as stakeholders need to work through LOLE study assumptions that may show greater risks in winter such as higher forced outage rates in

¹⁰ SPP OATT Attachment AA, Section 4.0 Planning Reserve Margin

¹¹ *Sw. Power Pool, Inc.*, 185 FERC ¶ 61,159, at P 38 (2023).

extreme cold weather, balance of when loss-of-load events occur between summer and winter in modeling, and planned outages scheduled in winter months.

2.1.2 LOLE Study Results and Reserve Margin Expectations

Eversky incorporated a 12% summer reserve margin in its resource plans for the 2021 and 2022 IRPs, consistent with SPP requirements. In July 2022, the SPP board approved an increase in the summer reserve margin to 15% beginning in summer 2023, and Eversky's 2023 IRP met that minimum value for the 20-year planning horizon. The required reserve margin for summer 2024 has been set at 15%, and no winter requirement is in effect for winter 2024/2025. However, SPP's draft LOLE study results anticipate higher reserve margins in future years.

The draft 2023 LOLE study results for the 2026 planning year show a 16% summer reserve margin and a 27%-46% winter reserve margin, depending on the level of cold-weather correlated outages assumed.¹² For planning year 2029, the summer reserve margin rises to 21.4%, and the winter reserve margin rises to 50.7% with full cold-weather outages assumed.¹³ The rise in reserve margins from 2026 to 2029 in the study is attributed to changes in the resource mix, planned outage scheduling overlaps with high need hours in winter, increase in load, shift in risk hours, and allocation of most LOLE risk to winter.¹⁴

Based on these results, Eversky has revised its planning assumptions to anticipate a higher initial winter reserve margin and higher reserve margins for both summer and winter over the planning horizon. The summer base assumption is that the reserve margin of 15% in 2024 will increase by 1% per year through 2030 and then stabilize, rising 0.5% every three years. The winter base assumption is that the same amount of capacity is needed in both seasons, despite the lower winter load. SPP winter peak is

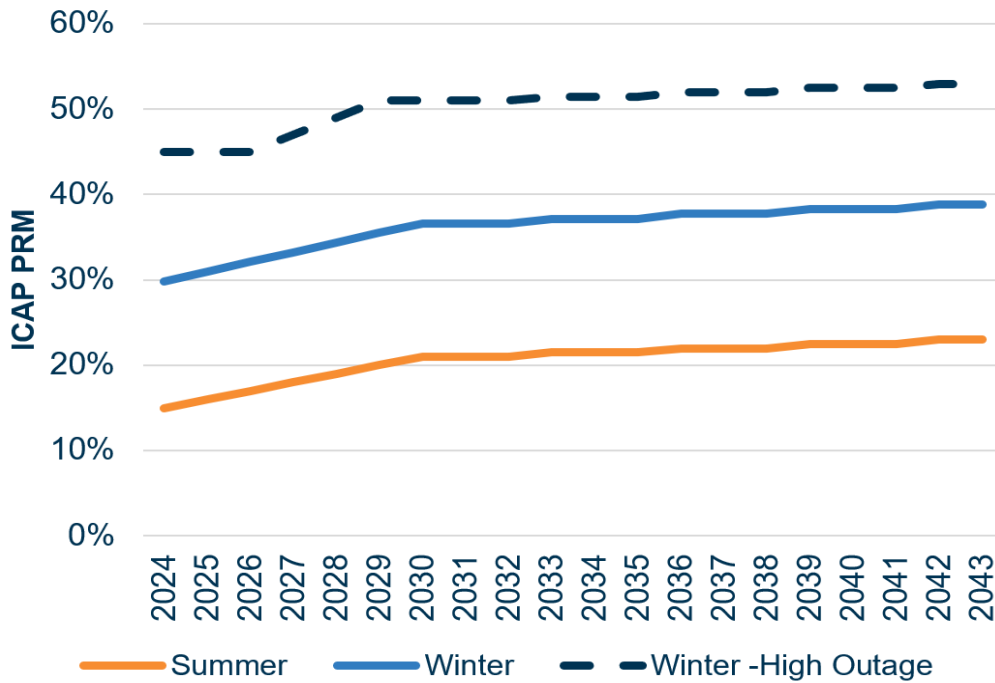
¹² SPP, 2023 Loss of Load Expectation (LOLE) Study Draft Results, December 2023 SAWG Meeting, Slide 19 (assuming 50% split between summer and winter LOLE allocation). ("LOLE Draft Results")

¹³ Id., Slide 22. (Assumes 97% of LOLE in winter, 3% in summer).

¹⁴ Id., Slide 22.

approximately 89% of summer peak, implying an initial reserve margin of 30% and rising as the summer reserve margin increases. As a high case, the winter reserve margin starts at 45%, reflecting full cold weather correlated outage risk.

Figure 10: SPP Reserve Margin Assumptions IRP 2024



The draft study results and future LOLE study assumptions are still being vetted in the stakeholder process. Some of the primary focus areas for refinement may be:¹⁵

- Future Weather Expectations:** The 2023 draft LOLE study uses 43 years of historical weather data to model load, wind, and solar patterns.¹⁶ The Monte Carlo approach runs thousands of models with these weather-patterned loads, and varying resource availability based on historical outage distributions. The summer 2026 LOLE events occurred in 10 different weather years, with the most events, 33%, in the 1980 models.¹⁷ The winter 2026 LOLE events occurred in only four

¹⁵ Id., Slide 18.

¹⁶ Id., Slide 7.

¹⁷ Id., Slide 14.

different weather years, with 72% of events in the 2021 model which had the winter storm Uri.¹⁸ Stakeholders may consider whether a Uri-type event is likely to occur again and how much weight it should carry in the modeling.

- **Cold-Weather Correlated Outages:** Historical analysis shows a large increase in forced outages when temperatures are below zero in SPP.¹⁹ When the LOLE study considers historical cold-weather outage correlation, more LOLE events occur in winter, increasing the reserve margin needed to lower the number of events back to the 1-in-10 years standard. Stakeholders may consider whether cold weather issues are expected to persist in the future or may have been remedied by better practices in the natural gas industry, winterization, and incorporation of lessons learned.
- **Seasonal Balance of Risk:** The allocation of events to summer and winter changes the reserve margin for each season. For example, allowing more events to occur in winter raises the summer reserve margin and lowers the winter reserve margin. This may affect utilities that are summer and winter peaking differently.
- **Scheduling of Maintenance Outages:** The modeling accounts for some scheduled outages in winter, consistent with historical scheduling practices. The presence of scheduled outages in winter increases the need for other resources to be available, raising the winter reserve margin.

2.1.3 Performance-Based Accreditation

Performance-based accreditation is a metric to redistribute accreditation based on historical availability at peak times. SPP currently accredits thermal resources based on their tested summer capacity, through 3-hour capability tests every three years, supplemented by 1-hour operational tests annually. The new method proposed in the stakeholder process reduces accreditation based on each resource's seasonal (winter or summer) forced outage rate. Seven-year average seasonal forced outage rates will be used. However, until SPP collects seven years of data, class average outage rates will

¹⁸ Id., Slide 14.

¹⁹ Id., Slide 8.

substitute for resource-specific forced outage rates as part of the calculation. All resources lose accreditation under PBA, however the SPP reserve margin will also decrease to reflect the system need for unforced capacity. Therefore, resource portfolios with higher outages than average, will get less relative accreditation and will need more capacity to meet requirements and portfolios with lower outages than average, will get more relative accreditation and will need less capacity. For the 2024 IRP, Evergy has incorporated the expected change in accreditation in its resource planning beginning summer 2026.

2.1.4 Effective Load Carrying Capability (ELCC)

ELCC is a method to measure the contribution a resource makes to meeting load, taking into account fuel supply and duration limitations (for example, solar resources cannot serve load at night). FERC rejected SPP's tariff change to implement ELCC before summer 2023, due to deficient tariff language.²⁰ SPP filed with FERC again in February 2024, coupling ELCC with performance-based accreditation for thermal resources.²¹ The tariff changes are contested. For the 2024 IRP, Evergy is factoring in expected ELCC values for renewable and battery resources in its resource planning beginning in summer 2026.

2.1.5 Accredited Capacity (ACAP) Reserve Margin

As SPP moves to performance-based accreditation and ELCC it will be measuring the unforced capacity of resources rather than the installed capacity. ACAP reserve margins will reflect the need for resource capacity that has already been adjusted for ELCC and performance-based accreditation. In the 2024 IRP, Evergy includes this beginning in summer 2026 as part of the adjustment to the capacity need for performance-based accreditation.

²⁰ *Sw. Power Pool, Inc.*, 182 FERC ¶ 61,100 at P 25 (2023).

²¹ Docket ER24-1317.

2.1.6 Demand Response Accreditation

Demand response resources are currently netted against peak load based on their tested capabilities. Stakeholders have discussed whether these resources should be accredited using an ELCC construct to reflect their availability limitations – such as number and duration of events. The 2024 IRP incorporates an assumption that demand response receives accreditation up to its expected tested capacity. This is lower than the past IRP assumption that demand response would continue to be treated as a net to load, which gave it a capacity value equivalent to its tested capacity plus the reserve margin. Updated policy related to Demand Resource is still in very early stages of development, but this change in assumption allows for a slightly more conservative assessment of accreditation in expectation of potential future changes.

2.1.7 Other Possible Policy Changes

SPP stakeholders have discussed other possible policy changes, that Eversource is monitoring, but has not included in the 2024 IRP analysis, including:

- Potential incorporation of on-site fuel or firm fuel requirements or changes to accreditation calculations based on fuel supply. At this time, the incorporation of a specific fuel supply requirement is considered unlikely, but considerations specific to fuel supply are being assessed in the evaluation of peak hours (next bullet).
- Possible incorporation of a calculation to assess resource availability in peak load hours (i.e. top 3% of load hours or reliability event hours) as a refinement to performance-based accreditation.
- Outage scheduling requirements, possibility needed to ensure adequate energy supplies throughout the planning year, including spring and fall. This could potentially affect winter and summer capacity accreditation if resources need to shift planned outages to those seasons.

2.1.8 Availability of Market Capacity

These forecasted changes in SPP capacity requirements, including increasing reserve margins and decreasing accreditation for resources, will reduce the amount of “excess”

capacity held by load-serving entities and limit the possibility of meeting additional capacity requirements by purchasing market capacity. Eversource has seen evidence that other utilities are forecasting potential shortfalls in capacity due to these policy changes and are issuing RFPs and accelerating build plans. Additionally, all three Eversource utilities are forecasting significant load growth due to economic development. Eversource affiliates will no longer have excess capacity to sell as it will be absorbed by increasing load and capacity needs.

Table 6: Market Capacity Available by Utility (Annual MW)

	2024	2025	2026	2027+
Market Capacity (MW)	300	300	300	50

2.2 Energy Needs

The SPP market economically dispatches resources to minimize the variable costs to serve load on a short-term basis. Available resources offer energy into the SPP market based on their expected production costs. When a resource is dispatched by the SPP market it is because its marginal production costs are less than the SPP market price. If a resource is not dispatched, it is because the SPP market price is less than the resource's short-run marginal cost. If a utility is more frequently a net buyer from the market, it simply means that, at the times it is a net buyer, SPP market prices are cheaper than the production costs of its resources and thus buying from the market reduces overall costs for that utility.

Eversource expects all of its utility customers to continue to benefit from production cost savings through participation in the SPP market. However, planning is conducted in order to develop a future portfolio that is aligned with Eversource's customers' energy needs and not overly dependent on the SPP market. The SPP market resource mix is transitioning with expected retirements of baseload (coal) generation and additions of renewables, which have low (sometimes negative) production costs but are weather dependent. Eversource utilities and others expect load growth driven by economic development. Planning for a future resource mix that matches expected energy needs (considering seasonal and

time-of-day resource limitations) at the lowest cost will provide an economic and physical hedge for customers.

Beginning in 2031, the allowed level of market purchases / sales is set at approximately 10% of each utility's peak load and 15% of its average load. Allowing market purchases does not mean that a utility is physically incapable of meeting 100% of customer energy needs. Resource Adequacy Requirements are established to outline the amount of physical capability (i.e., accredited capacity) necessary to meet customer energy needs. These market purchase constraints simply mean that, when an optimal resource mix is selected, it is selected not only because it is the lowest-cost way to meet these Resource Adequacy Requirements, but also because it is the lowest-cost way to produce energy which aligns closely (within 10-15%) with the utility's customers' hourly energy needs. On the market sale side, it also means that an optimal plan will not be developed solely because of the revenues it could generate from selling energy in excess of customer needs. In short, this constraint ensures that a resource portfolio is developed based on specific customer energy needs and not just forecasted energy market prices. This constraint is phased in over time because it is most relevant in the second decade of the planning horizon when expected fossil retirements across the SPP and within Energys fleet, combined with the expiration of Energys wind PPAs, are expected to significantly change Energys net position in the SPP energy market.

2.3 Future Risks

2.3.1 Critical Uncertain Factors

As part of the triennial IRP process, Energys analyzed future uncertain factors to determine which uncertainties are critical to the performance of a resource plan.²²

²² Critical Uncertain Factor Analysis Workpaper

Table 7: Uncertain Factors Evaluated

Uncertain Factor	Evaluated?	Critical?	Comments
Load Growth	✓	✓	
Interest Rate	✓	✗	
Legal Mandates	✓	✓	CO ₂ restriction
Fuel Prices	✓	✗	Natural gas only
New Gen Construction / Permitting	✓	✓	
Purchased Power	N/A	✗	Uncertainty assessed using other factors
Emission Allowance Pricing	✓	✗	
Gen O&M costs	✓	✗	
Forced Outage Rates	✓	✗	
DSM Load Impacts	✓	✗	
DSM Costs	✓	✗	
Other potential uncertain factors	N/A	N/A	None identified

Eversource identified natural gas prices, CO₂ restrictions, and construction costs (including build and interconnection costs) as the three critical uncertain factors. High, mid, and low forecasts for these factors over the 20-year time horizon were used in testing alternate resource plans through different futures to calculate expected performance given these critical uncertainties. Additional details on the Natural Gas and Construction Cost uncertain factors are outlined below. CO₂ restriction scenarios are discussed in Section 3.2.

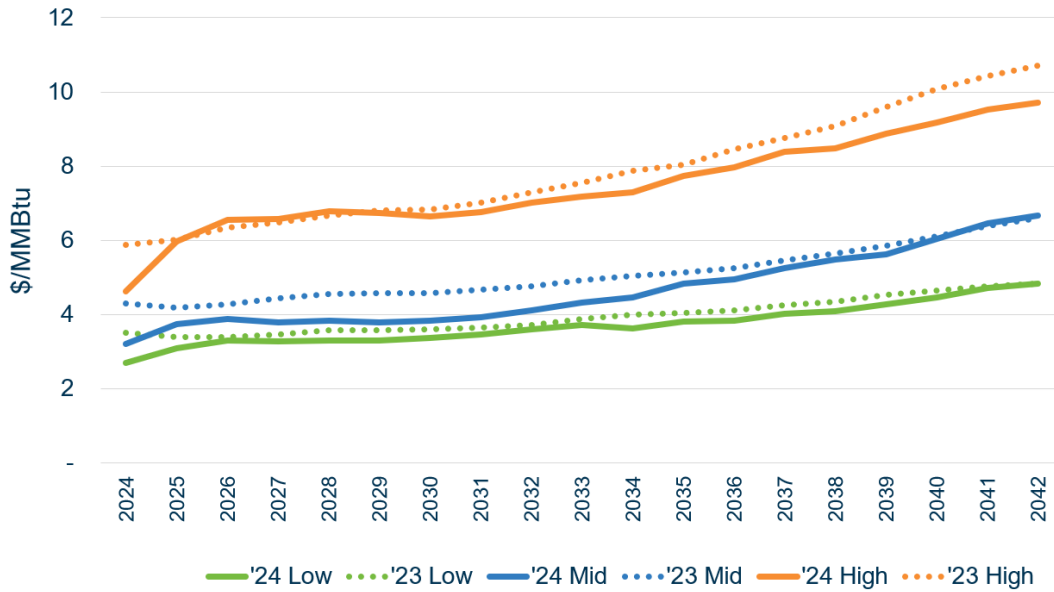
Natural Gas Prices

Eversource updates the IRP natural gas forecast annually based on the forecast used for internal budgeting, which is developed from vendor forecasts and forward markets.²³ The 2024 IRP forecast decreased from the 2023 IRP. Natural Gas prices were identified as a critical uncertain factor, consistent with the 2021 Triennial IRP and the 2022 and 2023

²³ Third party sources include IHS Markit, Energy Information Administration, S&P Global Platts, Energy Ventures Analysis, CME Futures, and ICE.

IRPs. High, mid (base) and low forecasts are also used in the development of resource plans and evaluation of plan economics.

Figure 11: Natural Gas Price Forecasts 2024 IRP and 2023 IRP

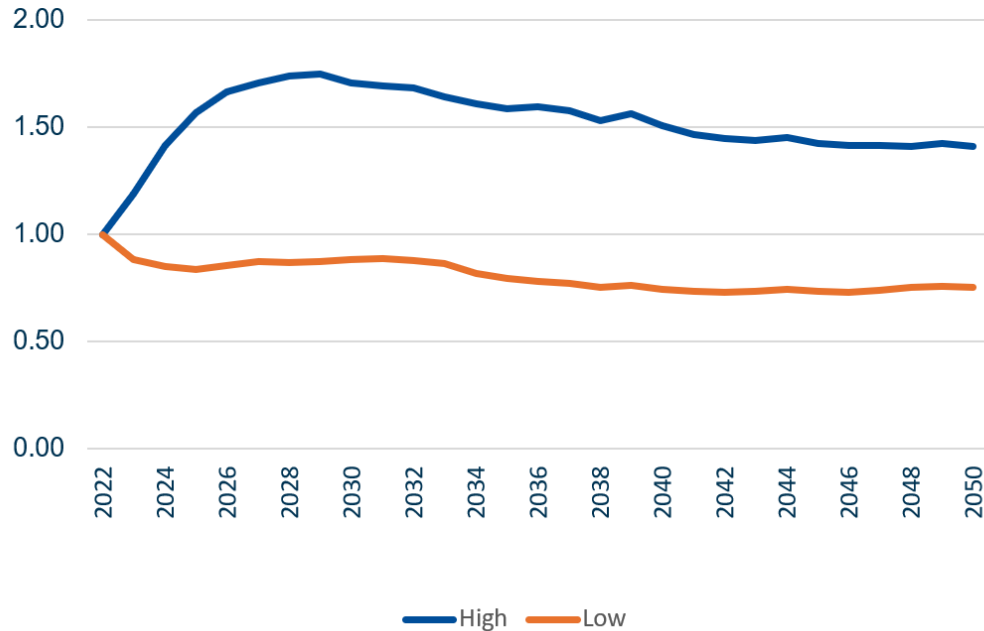


Prices and price expectations for the next few years have fallen from the higher levels that were seen in last year’s forecast which was thought to be driven by the Ukraine War, supply chain pressures, global demand, and inflation.

The high and low forecasts were developed by using the mid forecast and scaling it based on the fundamental supply and demand forecasts in the EIA Annual Energy Outlook model. The EIA builds its forecasts considering a variety of factors, including current laws and regulations, current assessments of economic and demographic trends, technology improvements, compounded annual economic growth, oil and natural gas supply and demand, and renewable energy cost cases. Key drivers for US natural gas production volumes include EIA’s outlook on international prices and US LNG exports, as well as technology assumptions. Evergy used the “High Oil and Gas Supply” to calculate the

low natural gas price forecast, and the “Low Oil and Gas Supply” for the high natural gas price forecast.²⁴

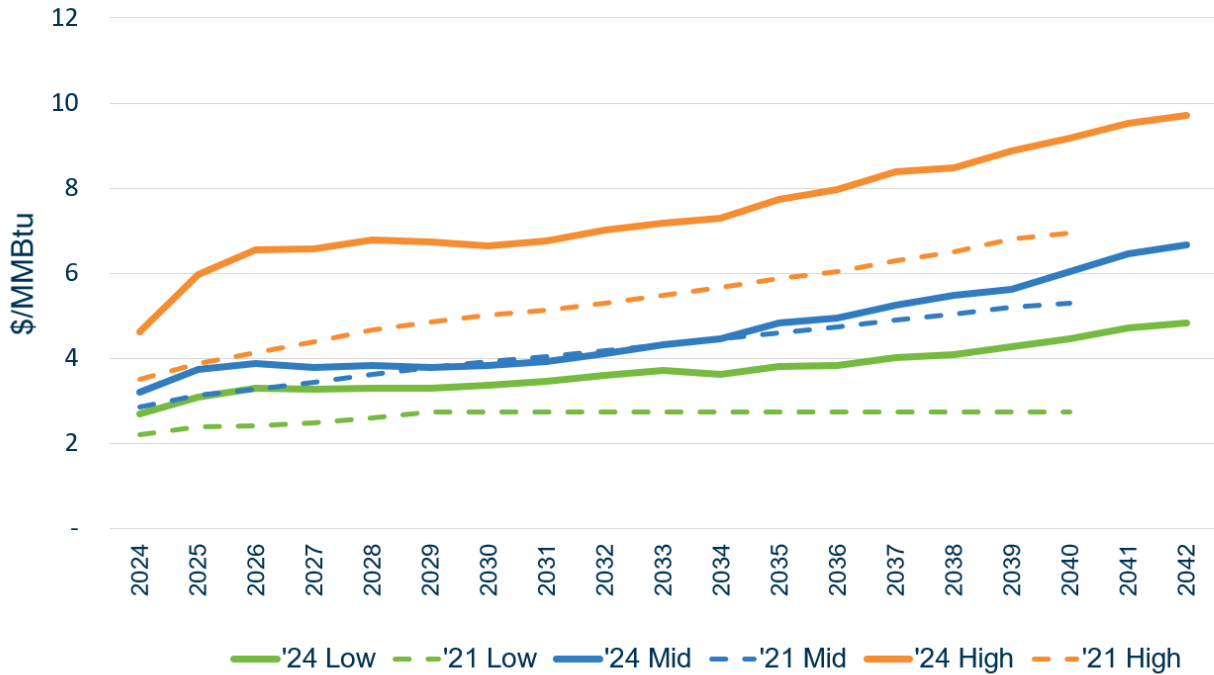
Figure 12: Henry Hub Natural Gas Scalar



This method was used beginning in the 2022 IRP to derive a wider range of prices based on changes in fundamental assumptions. For the 2021 Triennial IRP, the high and low forecasts were derived statistically from the range of vendor forecasts, with the low forecast capped at the five-year historical average. All forecasts for the 2024 IRP are higher than the 2021 Triennial IRP forecasts.

²⁴ See 2023 EIA Annual Energy Outlook, Table 13. Natural Gas Supply, Disposition, and Prices.

Figure 13: Natural Gas Price Forecasts 2024 IRP and 2021 IRP

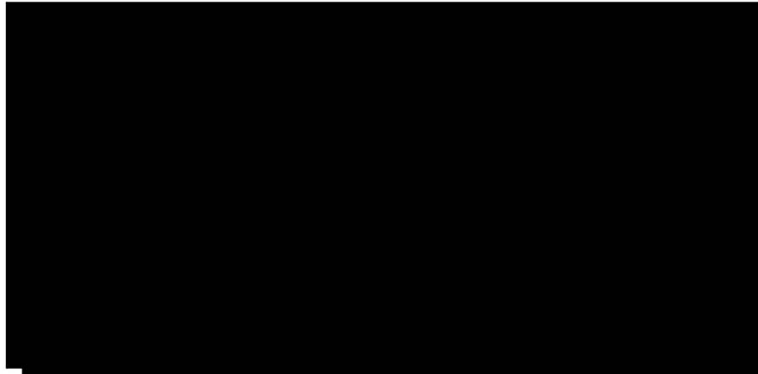


Construction Costs

Evergy combined construction and interconnection estimates costs for construction cost uncertain factor sensitivities. Due to their relative size difference, construction cost changes for new resources have a larger impact on build plans and NPVRR than interconnection costs. Interconnection cost estimates in the 2024 IRP represent just 3-7% of a resource’s total build cost.

Evergy estimated interconnection costs for renewable and storage resources using a 2019-2023 SPP sample of active and completed projects compiled by Berkeley Labs. Since costs by fuel type were not normally distributed, the median observation for each fuel type was used as the midpoint estimate. The 25th and 75th percentile of each fuel type was used as the high and low estimated costs.

Table 8: Interconnection Cost Sensitivities (2022 \$/kW) **Confidential**

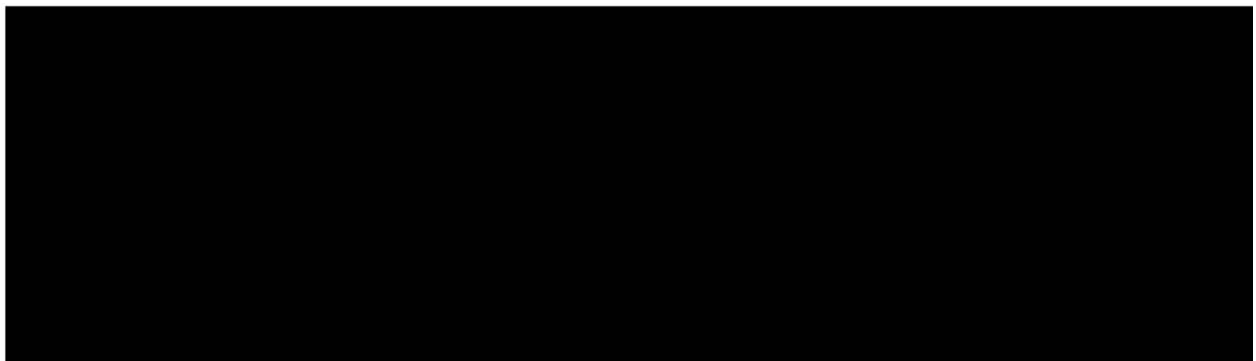
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CC and CT interconnection cost mid estimates were based on internal estimates due to the small SPP sample. High and low CC and CT interconnection costs estimates vary by 15% from the mid value for the total build scenario.

Evergy has seen considerable variation in construction cost estimates over the past few years, likely due to inflation and policy changes. High and low construction cost sensitivities were created with a 25% increase or decrease in cost from the current midpoint estimate. The combined interconnection and construction cost sensitivities were used in uncertain factor analysis.

Table 9: Construction and Interconnection Cost Scenario Values (\$/kW)

****Confidential****

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Uncertain Factor Probabilities

The probability of each factor was determined based on the business judgment of Eversource subject-matter experts regarding the likelihood of the 20-year forecast levels. These probabilities were then approved by the Eversource executive team and reviewed with IRP stakeholders. The probabilities for natural gas price scenarios are consistent with the probabilities used in recent IRPs since the 2021 Triennial and reflect the expectation the lower natural gas prices are relatively more likely in the long-term than sustained high prices. The probabilities utilized for CO₂ emissions are also similar to weightings used in past years, but are adjusted slightly to reflect a higher relative weighting of low restrictions versus high. While the Greenhouse Gas rules from the EPA (“GHG rules”) are aligned with the high scenario and thus the high scenario is certainly possible, these rules have been evaluated as a discrete scenario in this IRP to develop resource plans which would comply with the proposed rules. In comparing plans’ performance across scenarios, however, this high scenario can skew results dramatically given costs associated with carbon capture and sequestration (which are necessary to achieve required emissions reductions) are included only in that high scenario. This represents a different approach than what was done in recent IRPs (where emissions reductions in the high scenario were assumed to be possible without incremental costs) and thus the weighting was slightly reduced (from 20% to 15%) for this scenario to mitigate the impact of this single set of scenarios on expected value costs. Finally, construction costs are a new critical uncertain factor in this triennial filing and these probabilities were informed by the statistical variation between the high/low and mid scenarios (e.g., the interconnection costs utilized represent the 25th and 75th percentile of the historical dataset).

Table 10: Critical Uncertain Factor Probability Weightings

	Natural Gas Price	CO ₂ Emissions Restrictions	Construction Cost
Low	35%	25%	25%
Mid	50%	60%	50%
High	15%	15%	25%

2.3.2 Load Growth

Meeting future customer load, including energy and capacity needs is fundamental to resource planning. The load forecast is critical because it drives these needs. Higher load growth will drive the need to add more resources, while lower load growth may allow deferral of resource additions. Historically, load was added as a critical uncertain factor and used in the calculation of expected value, but the resource plans were not modified to reflect the capacity additions that would be needed or deferrals that would be enabled by the different load forecast.

In this IRP, Eversource created alternative resource plans to analyze how the resource plan would change in response to load growth in the high and low forecast scenarios. These contingency plans will help assess how the resource plan may pivot in the future in response to the pace of electrification, technological improvement, and economic growth.

For the purpose of integrated analysis included in this section, the forecasted impact of the recently announced Google data center was included in all Eversource Metro load forecasts, unless otherwise noted.

2.3.3 Future Environmental Policy

Risks of future environmental policy are included in the analysis of resource plans. Eversource complies with all local, state and federal environmental rules, and includes the expected costs of compliance in capital plans and operations and maintenance budgets. Eversource also plans for probable environmental costs. The CO₂ emissions restrictions critical uncertain factor serves as a proxy for future emissions policy and impacts the expected value of the alternative resource plans.

There is also uncertainty of the outcome of the EPA's GHG rules. Eversource is not able to estimate a probable effect of these rules given that significant concerns were raised in comments, there is a presidential election this year, and legal challenges of the rule have already begun following its publication in early May. Eversource estimates that a possible outcome may be CO₂ emissions reductions that resemble the high CO₂ emissions critical

uncertain factor forecast. Additional alternative resource plans were developed to assess potential compliance paths based on the proposed rules (which align closely with the more recently published final rule – which was released too late in the IRP process to be explicitly evaluated).

2.3.4 Execution and Financial Risks

Evergy may experience risks in executing on its resource plan. Alternative resource plans were developed using informed judgment of the availability and timing of potential resource additions, considering construction and interconnection timelines. Cost and timing assumptions were based on offers in Evergy's 2023 RFP, research into self-build options, SPP's interconnection queue timelines and publicly available information.

The amount of resource additions was limited in each year of the planning period to respect expected capital budget spending considerations. All alternate resource plans developed using these limits are expected to maintain balance sheet stability and financial metrics. Variations in spending from year to year, within these limitations, are not expected to change Evergy's financial ratios, as other components of the company capital budget can be adjusted to accommodate higher resource spends in some years (with lower spend years making room for other priorities).

Ratemaking treatment was not factored into the expected value of alternative resource plans. In practice, Evergy utilities may experience lags between spending capital and recovering costs through rates, however, perfect ratemaking is assumed in resource plan economics.

Evergy developed alternate resource plans to assess the next best planning options for execution contingencies. Additionally, alternate resource plans were created relaxing capital budget limits to illustrate more extreme planning strategies. These plans would not be expected to maintain financial ratios and would likely need alternative financing strategies. They would also have much greater execution risk due to siting and procurement challenges in adding large volumes of resources in some years.

2.3.5 Fossil Resource Risks

There are various pressures on Evergy's existing fossil resources, particularly its coal resources. Future / tightening environmental regulations, customer / community sustainability goals (e.g., Kansas City, Missouri climate goals), expiration of existing agreements (e.g., Crossroads transmission contract, Kansas Central's lease for La Cygne 2), and operational risk or large investments needed due to age all contribute to the need to plan for the retirement of the majority of Evergy's coal fleet, and portions of its gas fleet, over the coming decades. While some of these risks are directly incorporated into IRP analysis through costs, others are not quantified / quantifiable. The current Preferred Portfolio order of retirements is based on current expectations of economic viability, however, changes to future conditions could change the order or cause acceleration / deceleration of the pace of retirements.

Most simplistically, however, Evergy does not believe it is prudent to plan for a future with no coal retirements even if the order / pace of retirements could change over time. The expected risk balance is that some level of coal retirements will occur. If Evergy does not plan for enough capacity additions to replace a retirement it may be left without options and will be forced to add resources reactively at a higher cost and/or pay deficiency payments due to not meeting resource adequacy requirements. Alternative resource plans were developed to acknowledge this baseline risk and test changes in the pace/sequencing of retirements to determine economic tradeoffs.

Section 3: Economic Modeling

3.1 Market Prices

Eversky considers current and future market conditions in developing its 20-year forward looking forecasts for the IRP. Starting with the 2022 IRP Annual Update, Eversky contracted with 1898&Co. to produce 20-year market price forecasts using SPP’s transmission planning models as a baseline.

SPP conducts the integrated transmission planning process (ITP) on an annual basis, to assess reliability and economic transmission needs up to 10 years in the future. Every five years, SPP also performs a 20-year assessment. To perform these transmission assessments, SPP develops different future resource mix scenarios based on stakeholder feedback, including utility IRP plans. These resource mix assumptions, which include retirements or continued operation of existing resources and additions of new resources, enable the models to predict future economic dispatch of the system, transmission congestion, and resulting price differentials between load and resources.

For the 2024 IRP, 1898&Co. used the 2023 ITP models to produce market prices using Eversky’s load and fuel price assumptions, including high, mid, and low natural gas price scenarios. This ITP included forecasting models for years 2, 5, 10 and 20. The 2023 ITP models were also used for the 2023 IRP, however for the 2024 IRP, 1898&Co. updated the natural gas prices for Eversky’s updated 2024 forecast, included expected transmission upgrades that were approved as part of the 2023 ITP process that had not been completed as of the 2023 IRP filing, and included expected near-term combined-cycle builds that were in Eversky’s Preferred Portfolios in the 2023 IRP.

3.1.1 SPP ITP Futures

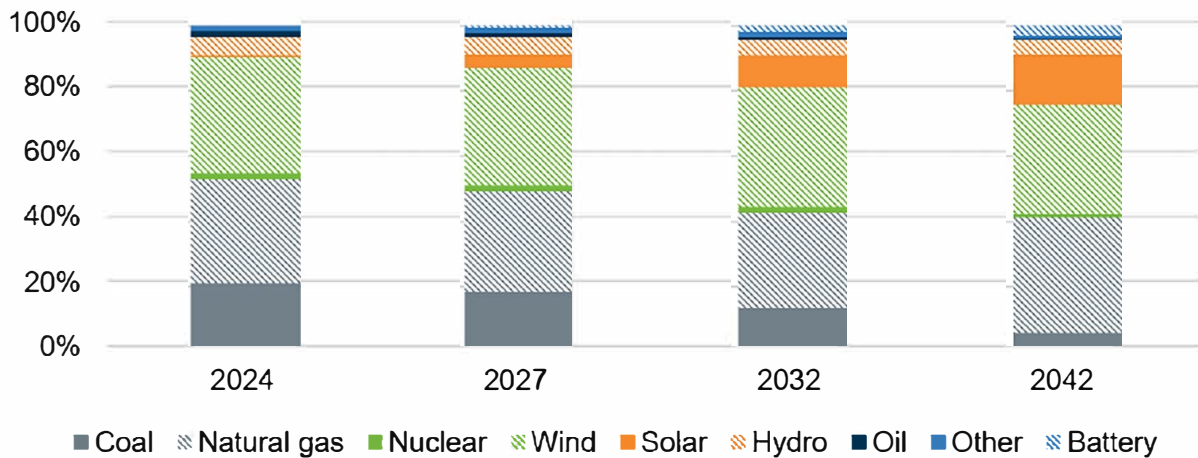
The SPP Future 1 case represents a “business as usual” case with longer retention of existing resources, assuming by 2042 coal resources 56 years and older as well as natural gas and oil generators 50 years and older will retire. The 2024 planning model reflects near-term transmission upgrades and resource additions and is the same for all Futures described.

Table 11: SPP Future 1 Overview

Resource	2024	2027	2032	2042
Coal	21%	18%	14%	6%
Natural gas	31%	31%	29%	35%
Nuclear	2%	2%	2%	1%
Wind	35%	36%	36%	33%
Solar	1%	4%	10%	16%
Hydro	6%	5%	5%	4%
Oil	2%	1%	1%	0%
Other	2%	1%	1%	1%
Battery	0%	1%	2%	3%

Source: 1898&Co.

Figure 14: SPP Future 1 Overview



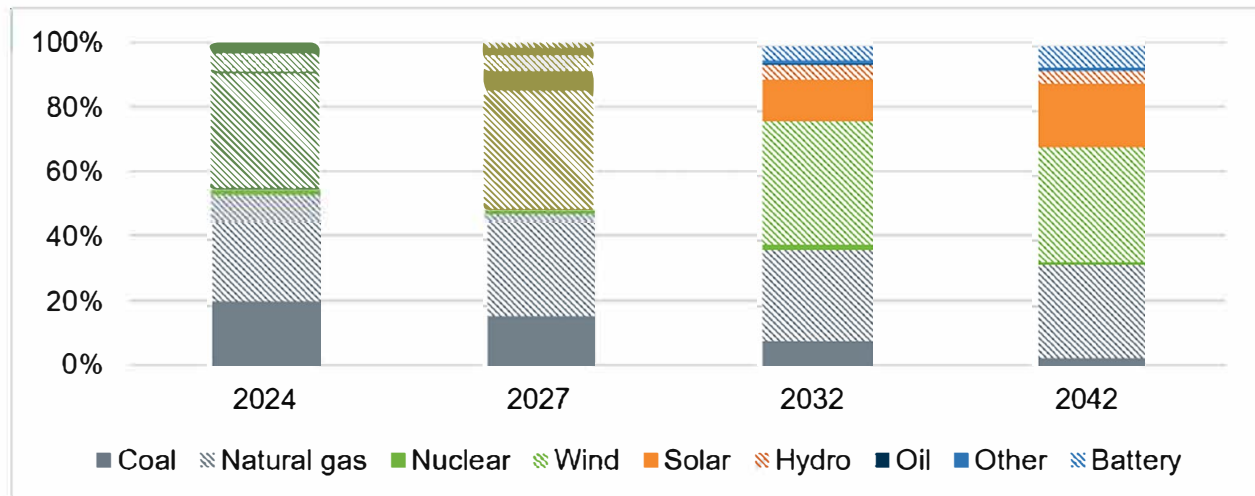
The SPP Future 2 case is an emerging technologies scenario, incorporating growth of electric vehicles and distributed generation as well as higher penetration of renewables and earlier retirement of existing generation. The ages for retirements are reduced to 52 years for coal units and 48 years for natural gas and oil units. Solar and battery resources account for a larger portion of 2042 capacity.

Table 12: SPP Future 2 Overview

Resource	2024	2027	2032	2042
Coal	21%	17%	9%	4%
Natural gas	31%	30%	28%	29%
Nuclear	2%	2%	2%	1%
Wind	35%	36%	38%	35%
Solar	1%	6%	13%	20%
Hydro	6%	5%	4%	4%
Oil	2%	0%	0%	0%
Other	2%	1%	1%	1%
Battery	0%	2%	4%	7%

Source: 1898 & Co.

Figure 15: SPP Future 2 Overview



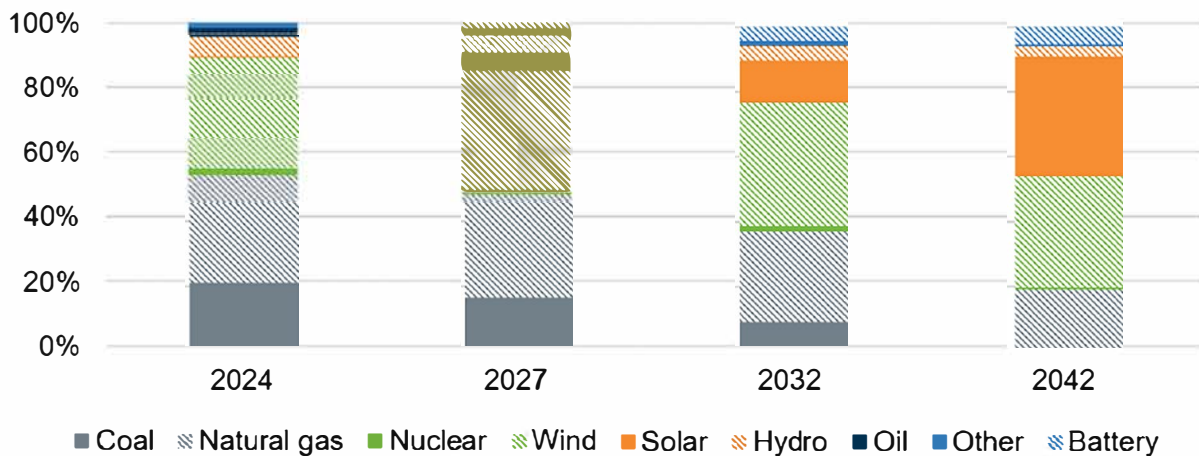
The SPP Future 3 case models accelerated decarbonization. All coal and oil resources are retired by 2042 and new resource build is driven by targeted emissions reductions of approximately 95% from 2017 by 2042. Future 3 is only modeled for 2042, so years 5 and 10 (2027 and 2032) reflect Future 2 models.

Table 13: SPP Future 3 Overview

Resource	2024	2027	2032	2042
Coal	21%	17%	9%	0%
Natural gas	31%	30%	28%	19%
Nuclear	2%	2%	2%	1%
Wind	35%	36%	38%	34%
Solar	1%	6%	13%	37%
Hydro	6%	5%	4%	3%
Oil	2%	0%	0%	0%
Other	2%	1%	1%	1%
Battery	0%	2%	4%	5%

Source:
1898&Co.

Figure 16: SPP Future 3 Overview



Consistent with the 2023 IRP, the Evergy market price forecasts for the 2024 IRP use a combination of the SPP Futures models. Evergy believes that Future 2 is the most representative forecast considering the recent pace of resource additions in SPP, interconnection queue activity and utility resource plans. However, the IRP also uses market prices from Future 3 to forecast a potential future with more stringent carbon regulation. Evergy believes this Future 3 scenario is particularly informative given the EPA's recently proposed Greenhouse Gas rules, which would drive a similarly aggressive pace of decarbonization.

3.1.2 Congestion and Nodal Pricing

Since the 2022 IRP Annual Update, Eversource has incorporated transmission congestion in its modeling by using market prices at different nodes/zones within the SPP system. The 2021 Triennial IRP used a single market clearing price for all load and resources but included some dispatch adjustments to align resource capacity factors with historical averages. This historical use of a single zonal price reflected the availability of Transmission Congestion Rights (TCRs) which enable basis differential (i.e., congestion) between different nodes to be hedged. Due to increasing penetration of renewables and increasing basis differential between nodes, particularly between resources in the western portion of SPP's territory and Eversource's load nodes, Eversource began incorporating different nodal prices in IRP modeling in 2022. TCRs are still available to mitigate the impact of congestion and will continue to be a part of Eversource's strategy for optimizing its fleet, but utilizing more granular nodal pricing enables a more conservative assessment of resource economics in the context of an IRP. This is most relevant for wind resources which typically see greater basis differential compared to load than other resource types.

The 2024 IRP pricing models, based on the finalized 2023 SPP ITP models, reflect current transmission topology and near-term transmission upgrades, including those approved by the SPP Board of Directors to resolve new constraints identified in the 2023 ITP process. The models use economic dispatch, considering transmission limits, to calculate nodal pricing. Pricing was reported at the following locations:

- Load zones for each utility: used for load and DSM
- Coal resource locations for each coal site
- Wind location: used for all new and existing wind and wind PPAs
- Generation zones for each utility: used for existing generators; Metro location used for all non-wind new resources

Because these models are used to identify future transmission needs, congestion tends to increase in future model years as new resources are assumed without corresponding transmission upgrades that might improve their economic deliverability to load. The base

models are likely to overestimate future congestion, however future transmission upgrades are uncertain. The long-term transmission planning processes attempt to identify and select beneficial transmission projects that can reduce the total costs to serve load. Development of new resources may exacerbate congestion, but it can take time for potential savings to reach a tipping point where transmission becomes cost effective. Lags in planning and uncertainty around the timing and viability of new resource additions can also delay new transmission investment. Given the significant expected build-out of renewable resources between 2032 and 2042, which is not accompanied by forecasted enabling transmission investment and thus results in a significant increase in congestion in the “base” SPP model, Eversource assumes congestion is held constant over this second decade of the planning horizon.

Consistent with the 2023 IRP, the 2024 IRP Future 2 prices (used in the low and mid carbon restriction scenarios) have slowly rising prices over time. The 2024 IRP market price forecasts are lower, due to lower natural gas price forecasts. Eastern locations are generally slightly higher priced than western locations within Eversource, and the wind location is the lowest priced due to congestion.

Figure 17: IRP 2024 Kansas Central Market Prices Mid NG Future 2

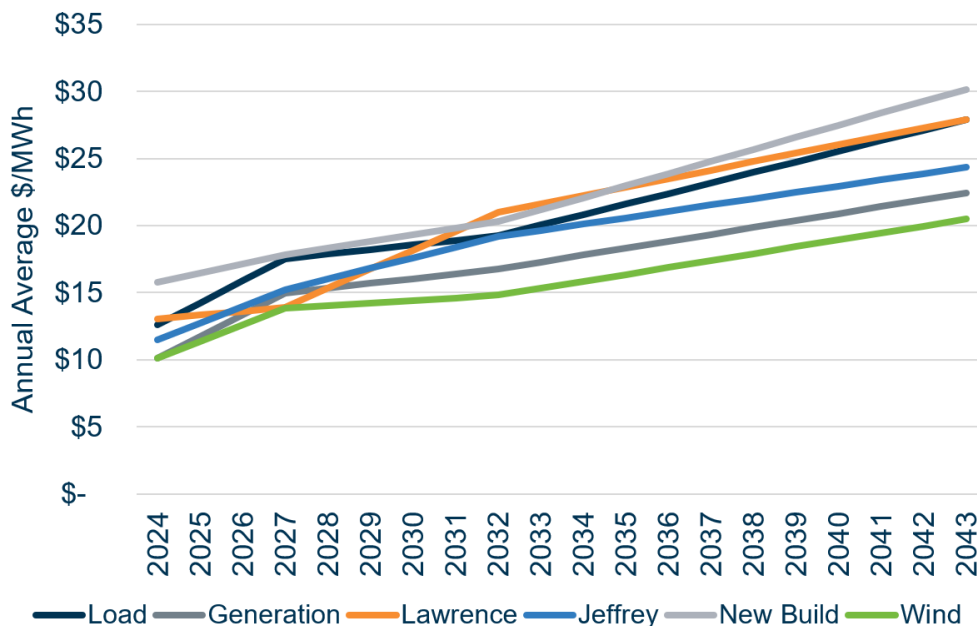
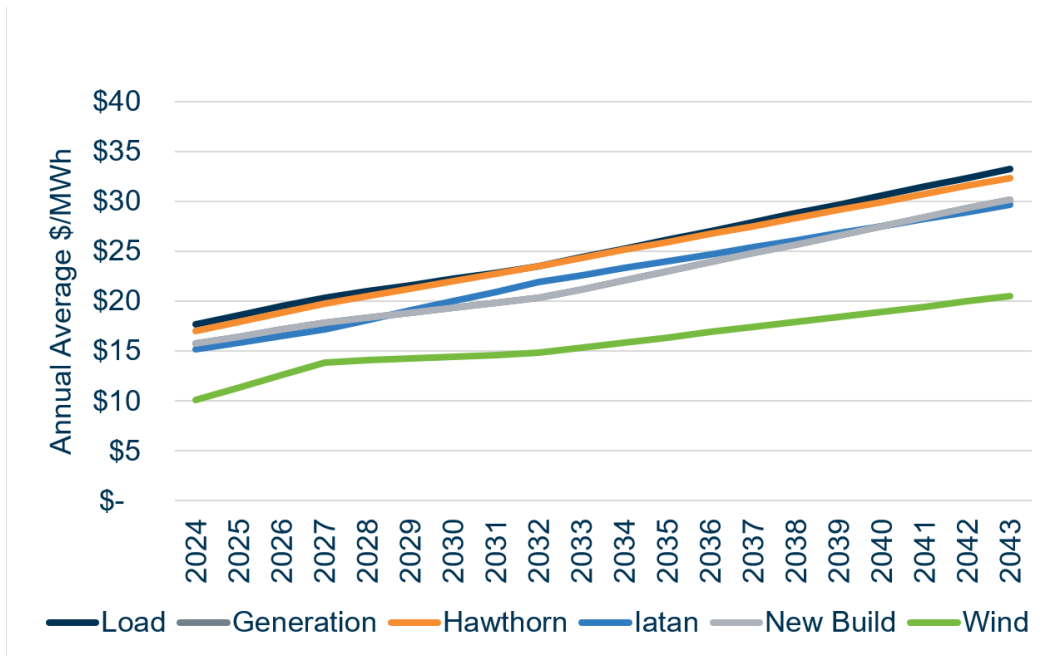


Figure 18: IRP 2024 Metro Market Prices Mid NG Future 2



Note: "New Build" node is equivalent to Metro Generation load. As a result, Metro generation is not visible on chart.

Future 3, used for the high carbon restriction scenarios in IRP 2024, predicts a decreasing price future as resource additions continue to have fixed costs, but no production costs. Market prices are driven down by a high penetration of zero cost renewable resources, that may also have production tax credits, making their marginal production cost negative.

Figure 19: IRP 2024 Kansas Central Market Prices Mid NG Future 3

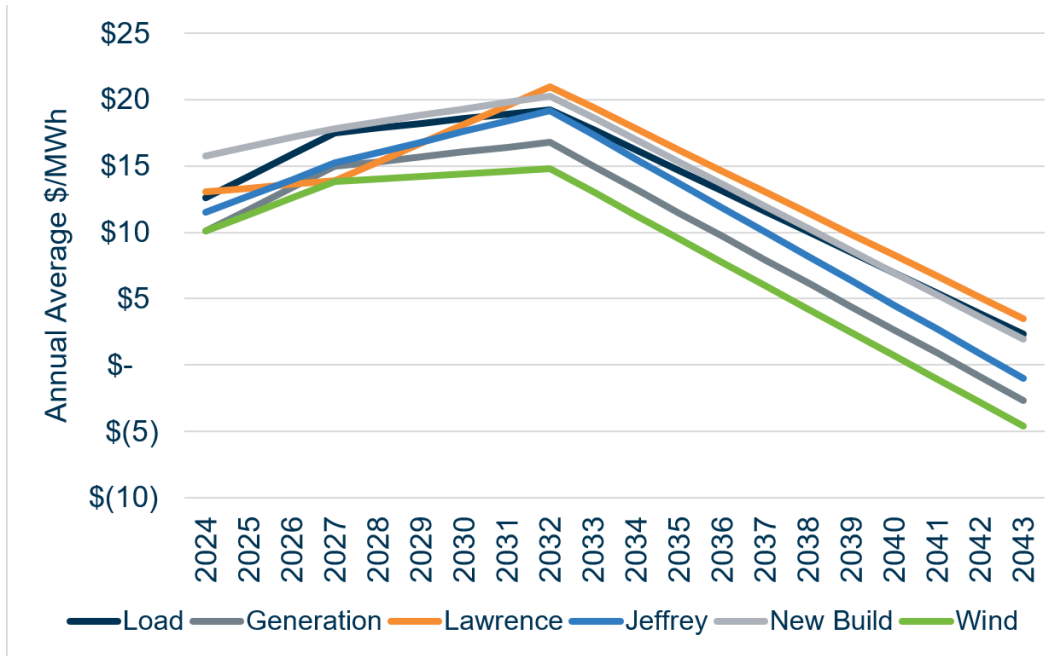
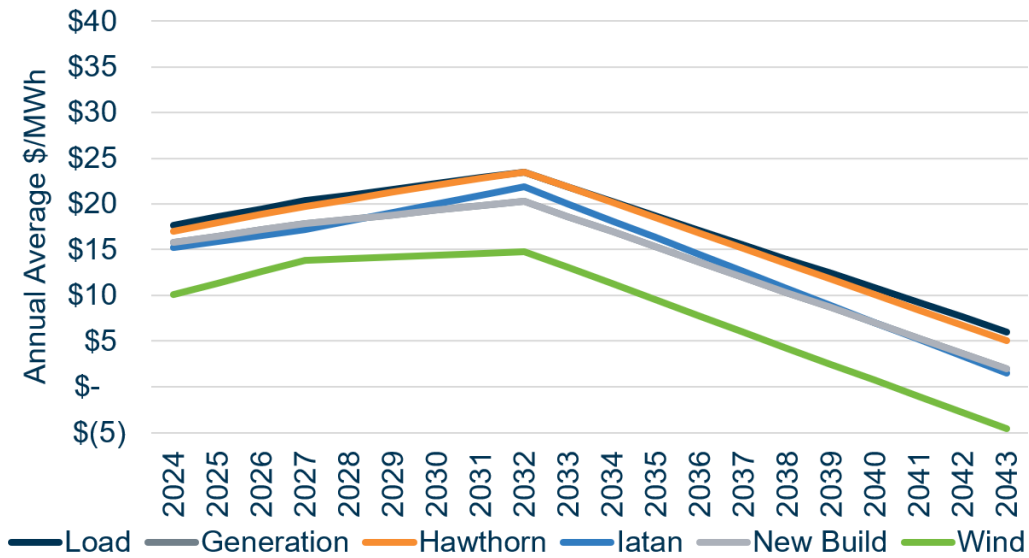


Figure 20: IRP 2024 Metro Market Prices Mid NG Future 3



Note: "New Build" node is equivalent to Metro Generation load. As a result, Metro generation is not visible on chart.

Prices are also generally lower than prices in the 2021 and 2022 IRPs due to higher expected renewable penetration in the future resource mix. Prices in the 2021 and 2022 IRPs also reflected explicit carbon emissions taxes for the mid and high carbon scenarios which resulting in higher production costs and higher market prices. The change in planning assumption to a carbon restriction results in lower prices as the tax no longer impacts production costs.

3.1.3 Negative Prices

The market price forecasts reflect the negative pricing that has been observed in SPP and predict that the number of negative-priced hours in SPP will continue to grow. When Eversource began using SPP ITP models for its pricing forecast in the 2022 IRP, it also introduced negative pricing into the IRP analysis. The previous software, used for the 2021 Triennial IRP and prior IRPs did not calculate negative prices. The 2022 IRP price forecasts had a small percentage of negative prices, which was consistent with the modeling assumptions in the most current version of the SPP ITP model available, which had slightly dated assumptions given the pace of change in SPP resource additions. The 2023 and 2024 IRP market price forecasts have more up-to-date planning assumptions and align more closely with recent SPP experience.

Figure 21: Actual Day Ahead Negative Prices at Load (% of Annual Hours)

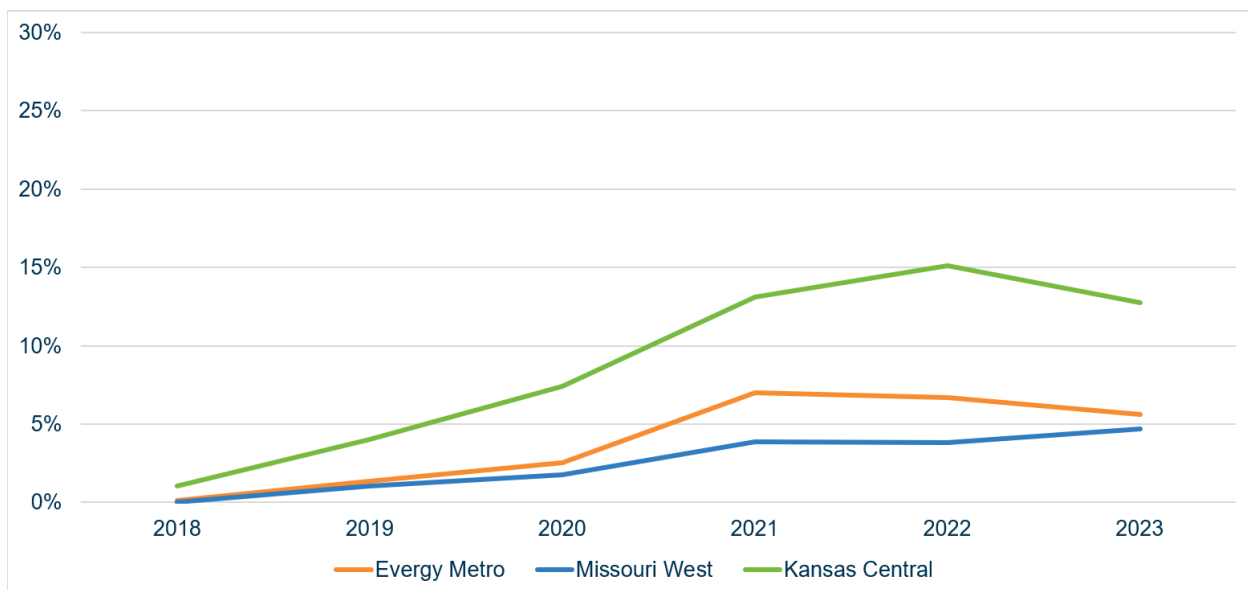


Figure 22: 2024 IRP Modeled Negative Prices at Load (Kansas Central)

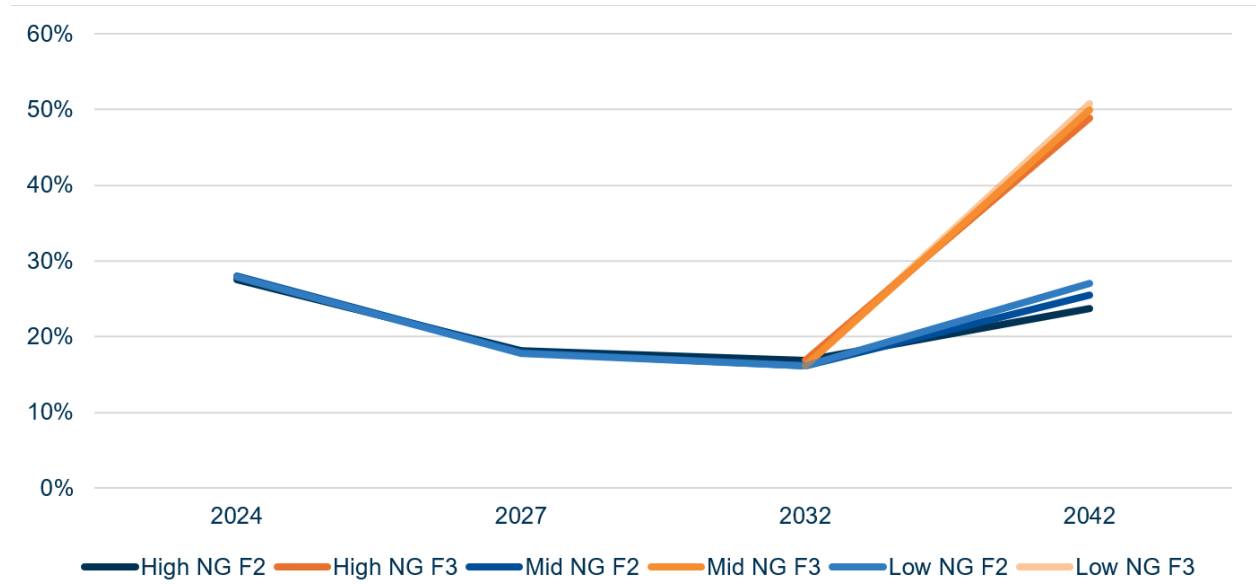


Figure 23: 2024 IRP Modeled Negative Prices at Load (Metro)

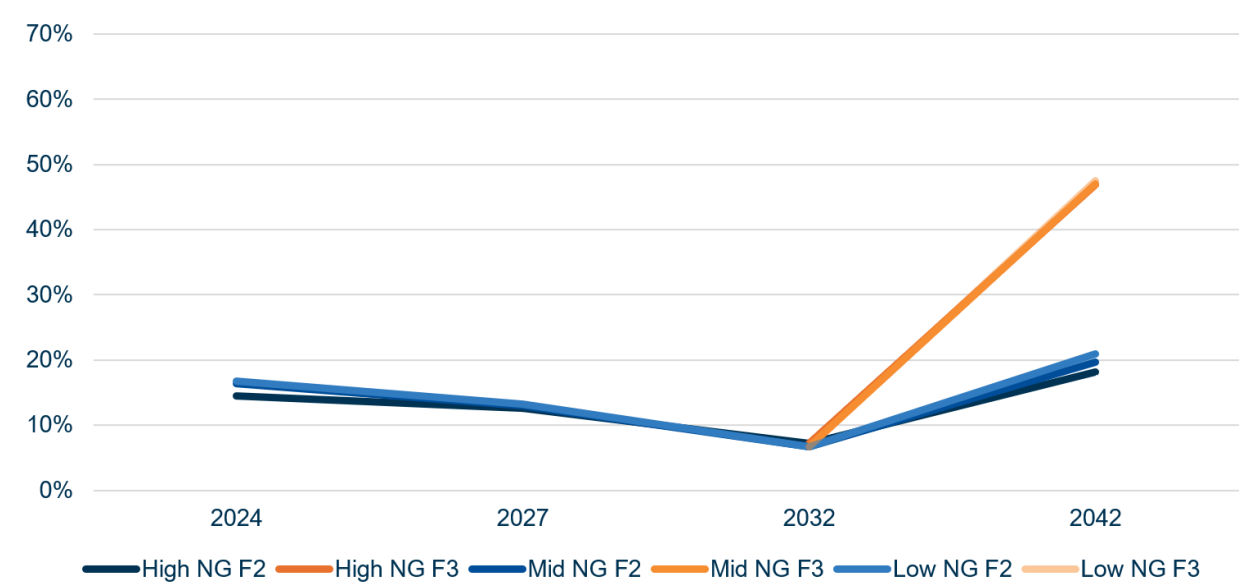


Figure 24: Actual Day Ahead Negative Prices at Generator Nodes (% of Annual Hours)

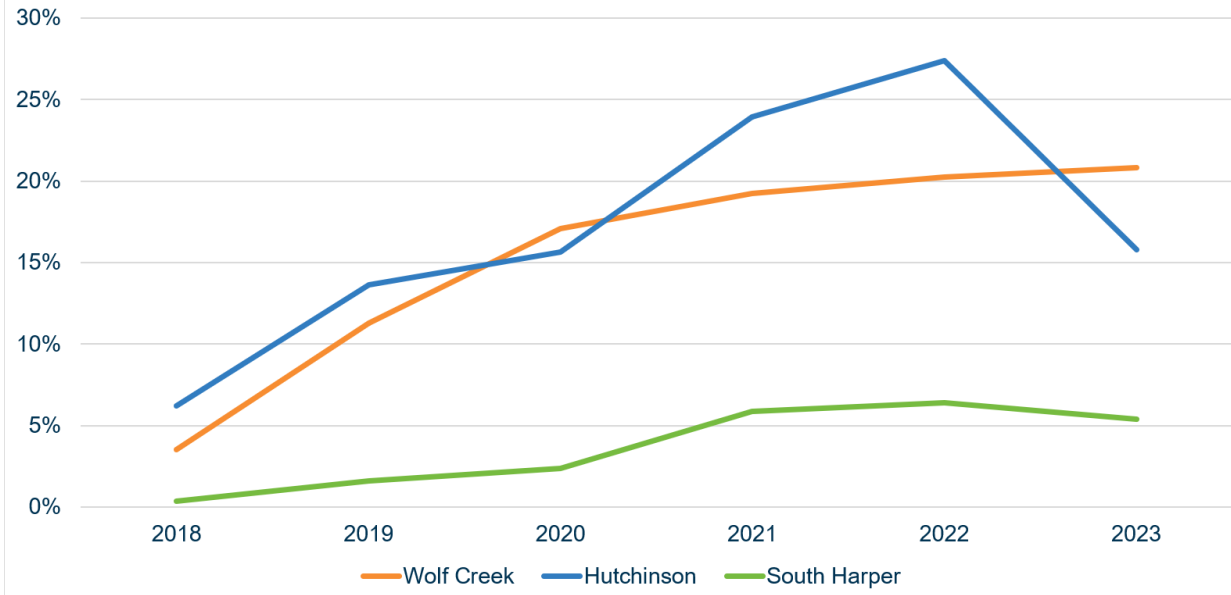


Figure 25: 2024 IRP Modeled Negative Prices at Generator Nodes (Kansas Central)

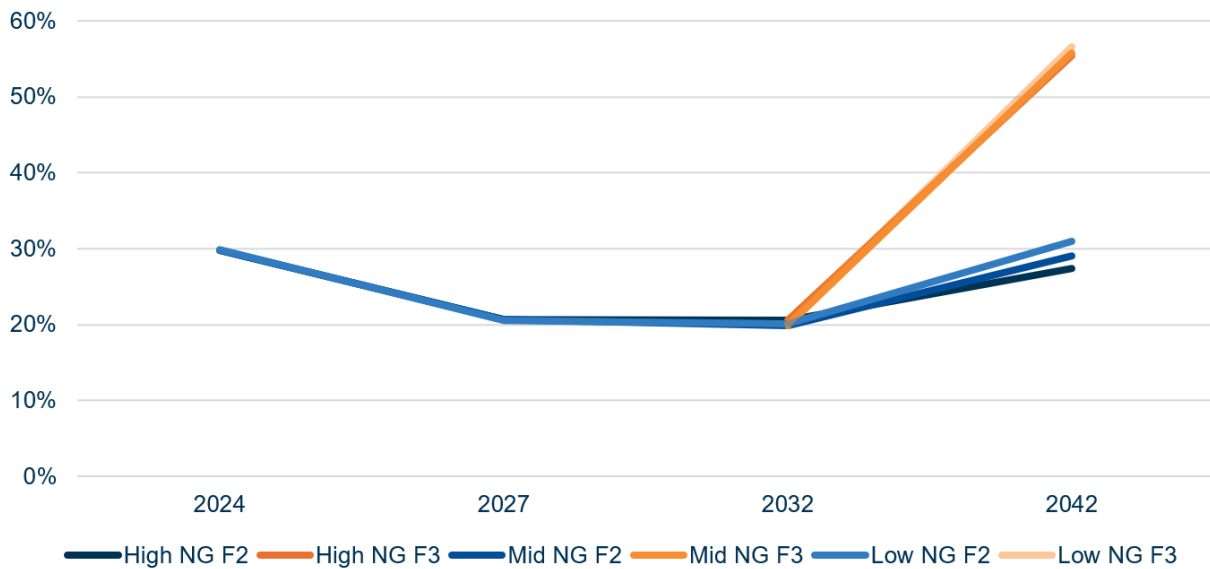


Figure 26: 2024 IRP Modeled Negative Prices at Generator Nodes (Metro)

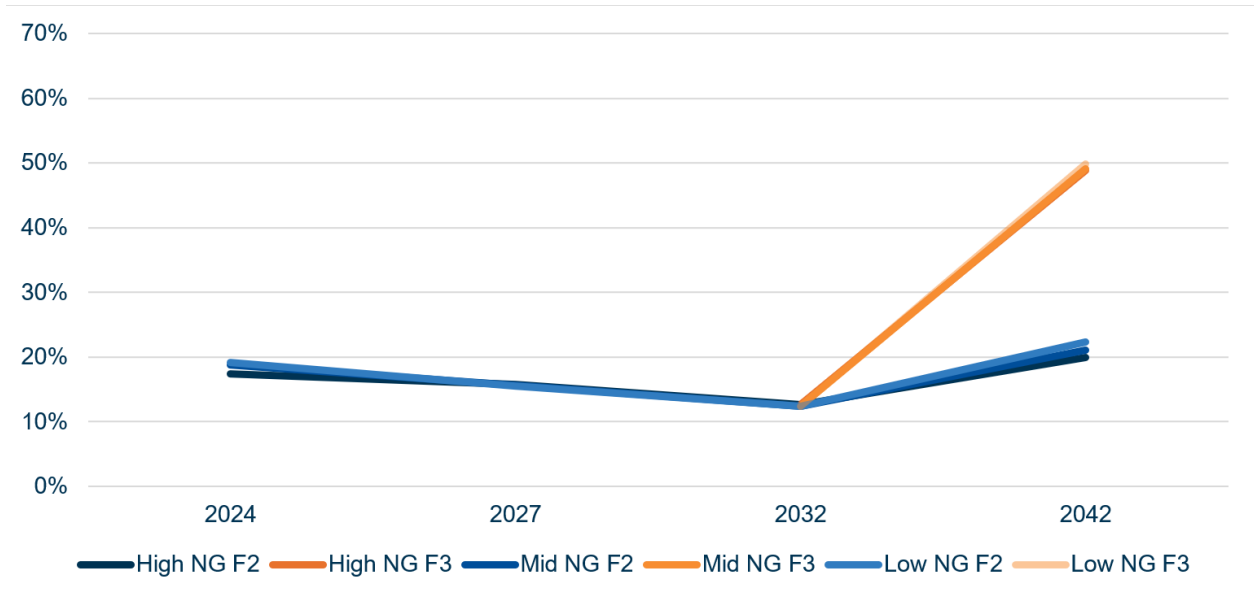


Figure 27: Actual Day Ahead Negative Prices at Wind Nodes (% of Annual Hours)

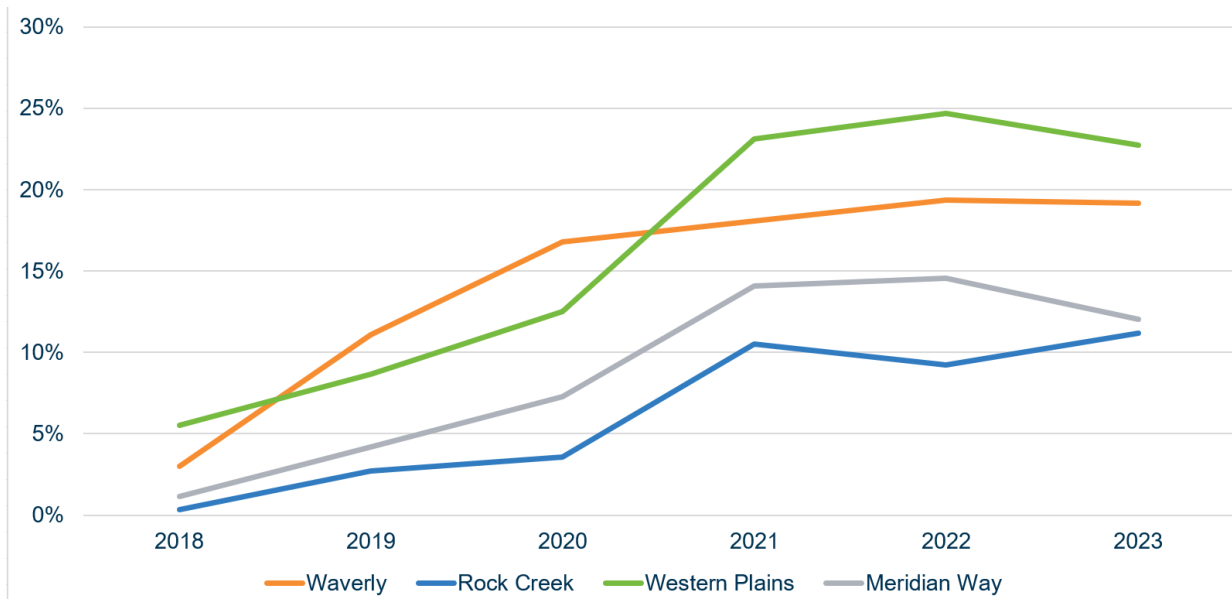
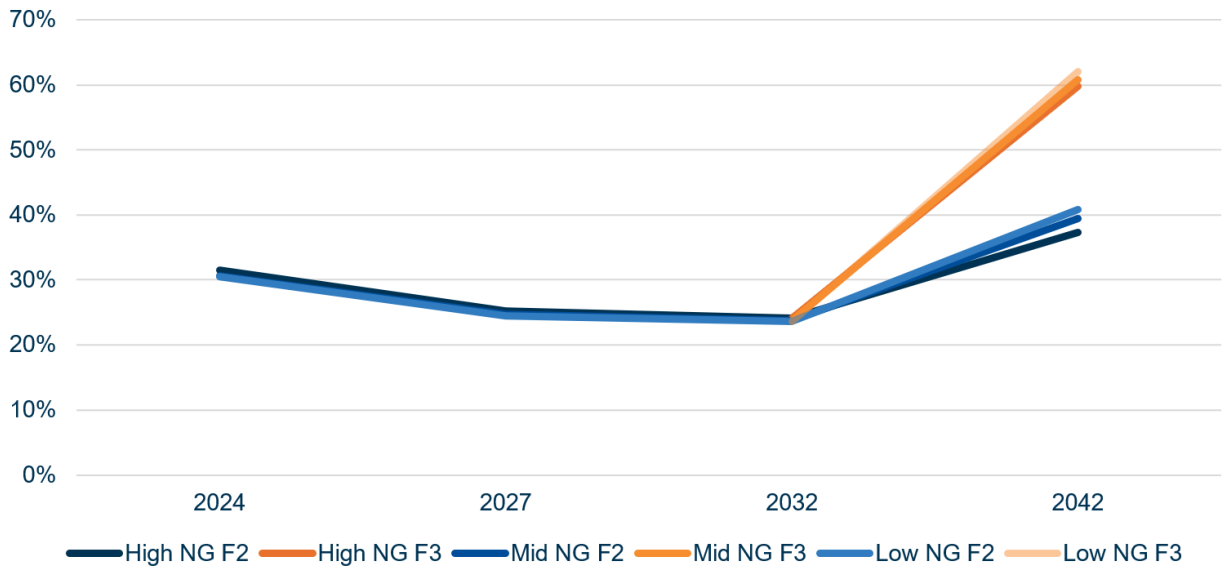
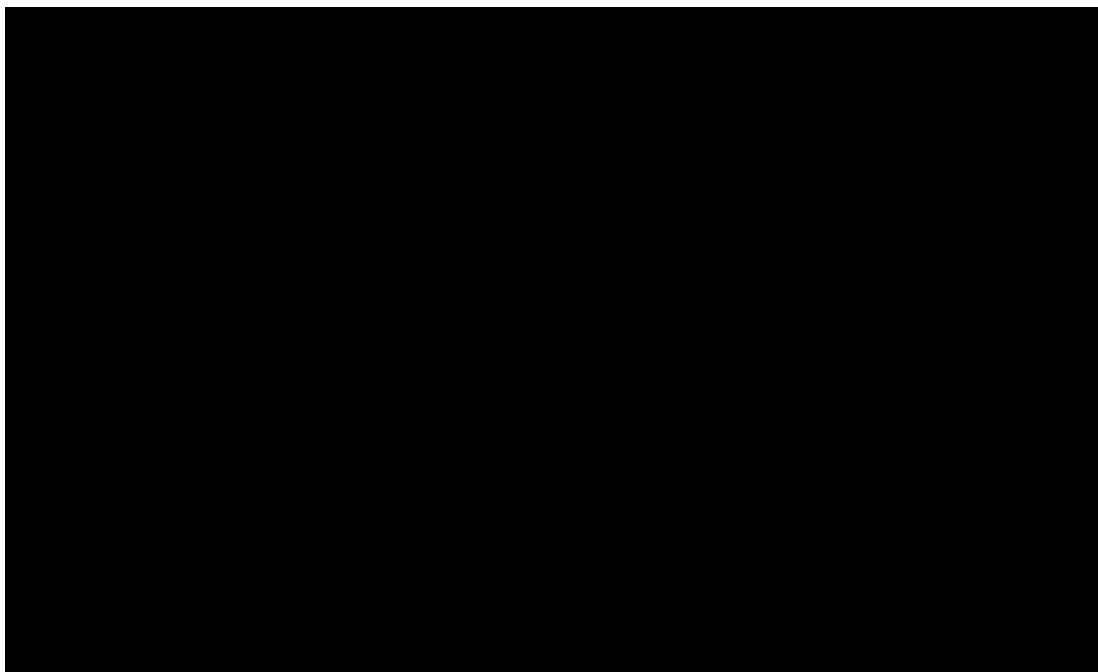


Figure 28: 2024 IRP Modeled Negative Prices at Wind Nodes



3.2 Carbon Restrictions

Carbon emissions policy was identified as a critical uncertain factor, consistent with the 2021 Triennial IRP, and subsequent updates. Evergy has modeled three levels of potential future carbon emissions policies. For the 2021 and 2022 IRPs, the policies were modeled as a carbon emission tax, while for the 2023 and 2024 IRPs they were modeled with both restrictions on carbon emissions production and carbon emissions taxes.

Figure 29: CO₂ Emissions Tax Forecasts in IRP 2021 & 2022 **Confidential**

For the 2023 IRP, Evergy modeled carbon restrictions using assumptions built into the SPP futures models, aligning emissions reduction scenarios with market forecast expectations. Evergy discontinued using vendor carbon tax forecasts. Vendor forecasts were no longer available or were outdated considering the current administration and recent policy actions. In addition, Evergy currently expects future carbon policies to be in the form of incentives (such as those in the Inflation Reduction Act or IRA), or requirements for physical emissions reductions, rather than carbon taxes.

The low forecast for the 2024 IRP has no emissions restrictions with market prices developed using the Future 2 pricing model. The mid forecast uses the same market price forecast, but employs a carbon emissions restriction consistent with the dispatch solution of the pricing model. The CO₂ production constraint mirrors Evergy's anticipated emission levels within the SPP market (e.g., if the dispatch in the pricing model produced a 70% reduction in Evergy's carbon emissions in 2042, the carbon restriction applied in the IRP dispatch model for 2042 is 70%). The high forecast is consistent with the assumptions in the SPP Future 3 model which was engineered with an explicit carbon reduction goal of an approximately 95% reduction in CO₂ production from 2017 levels.

Energy used the same logic to ratably restrict emissions from historic 2017 CO₂ production levels to culminate 2042 with a 95% reduction. The high forecast also incorporates a carbon tax which ramps to \$25/ton by the end of the twenty-year horizon, consistent with Future 3.

Figure 30: Metro CO₂ Emission Constraint

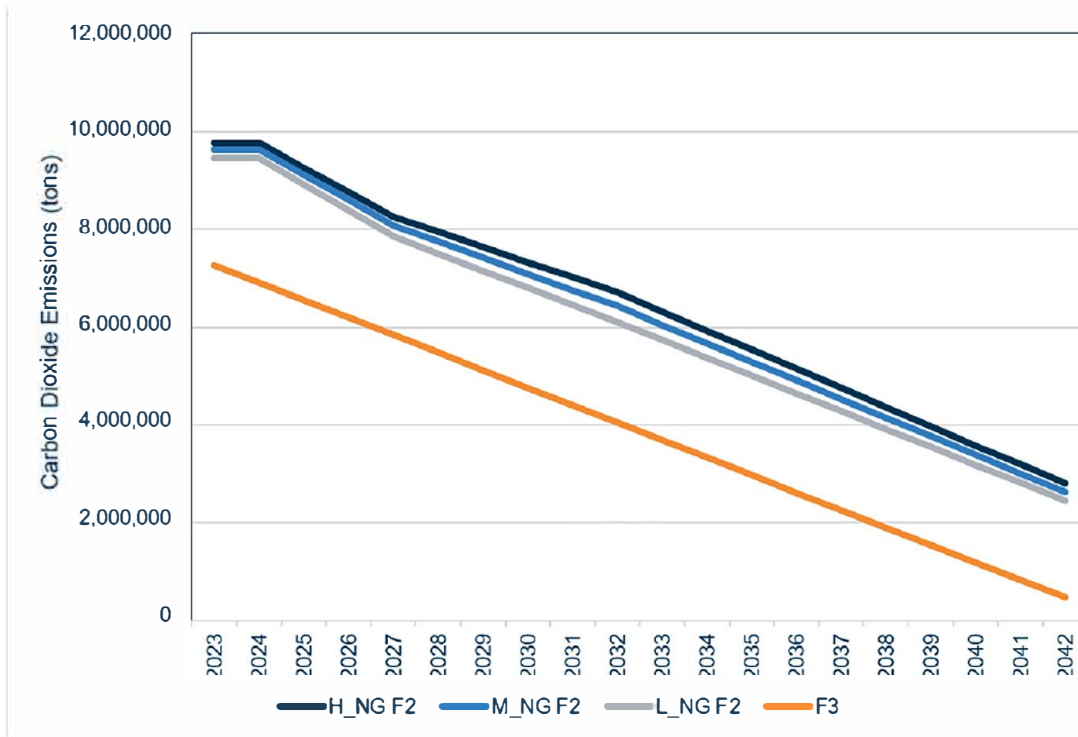


Table 14: Future 3 CO₂ Emission Tax (\$/ton)

Year(s)	Price
2024-2032	0
2033	2.5
2034	5
2035	7.5
2036	10
2037	12.5
2038	15
2039	17.5
2040	20
2041	22.5
2042	25
2043	25

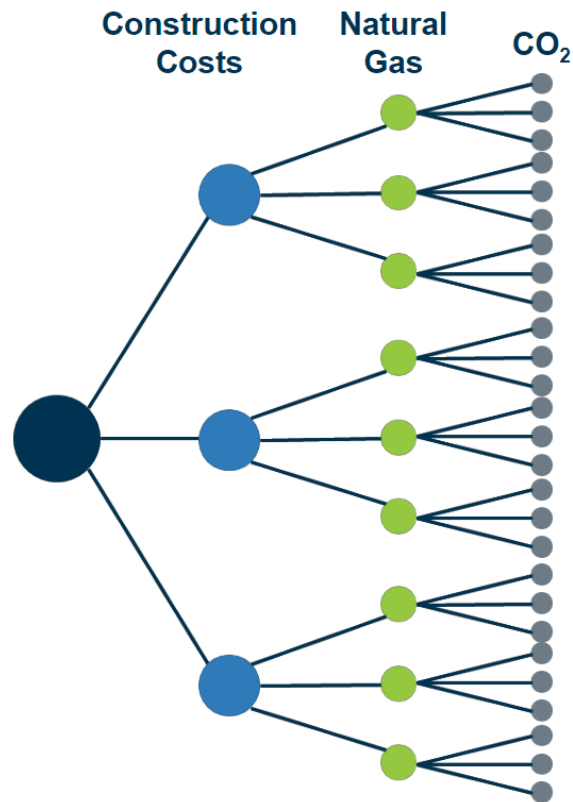
In order to achieve SPP Future 3 emissions goals, breakthroughs would be needed in dispatchable carbon-emissions-free technology. Newer combined cycles and combustion turbines are engineered to burn cleaner fuels including hydrogen or ammonia blends. However, production and transport of these fuels is still cost prohibitive. Improvements in carbon capture and sequestration technologies are another option for reducing or eliminating emissions. US government subsidies are encouraging innovation in these areas. In the 2023 IRP, new combined cycles and combustion turbines were assumed to have zero emissions beginning in 2036, at no cost, for Future 3 models, representing the necessary technological breakthroughs. In the 2024 IRP, costs associated with carbon capture and storage were applied to new combined cycles beginning in 2035 in Future 3, reflecting an assumed cost associated with mitigating carbon emissions from these new resources. Additionally, carbon-free energy was assumed to be available in all models for \$300/MWh in case the fleet was unable to generate enough energy, or carbon-free energy to serve load. This price point is based on the current typical price of fuel oil-fired peaking units which, although clearly not representative of actual carbon-free energy, provides a “scarcity price” proxy for the cases when Eversource is unable to meet its own load.

3.3 Portfolio Modeling Approach

Eversource used a three-step approach in modeling alternative resource portfolios. First, a scenario was determined, based on planning options. Next, the plan for resource additions was created for each scenario through capacity expansion modeling. Capacity expansion modeling determines the lowest total cost resource plan that meets capacity and energy needs (and other criteria if applicable), for the given scenario. The lowest cost resource plan is based on the planning assumptions used (typically the base or “mid” case for each critical uncertain factor). However, to incorporate the risk of different future uncertainties, the optimized resource plan was then evaluated in each critical uncertain factor combination (endpoint) to determine the expected cost in that future. The resource plan meets capacity and energy needs in every endpoint, but will have differing economics due to changes in expected production costs, costs to serve load, and fixed costs. The natural gas price and carbon dioxide restriction critical uncertain factors both

affect market prices, resource costs, and expected economic dispatch in the production cost model. The construction cost critical uncertain factor affects fixed costs of resource additions. The forecasted revenue requirements associated with each endpoint were calculated based on the modeling results. The metric net present value revenue requirement (NPVRR) can be compared to determine the economic differences between plans at different endpoints.

Figure 31: Critical Uncertain Factor Scenarios



Evergy assigned probability weightings to each critical uncertain factor based on subject-matter expert and management team's expectations for the likelihood of each forecast. Weighted average NPVRR calculations were made using these probabilities, as a metric for expected value of the plan considering future uncertainties.

3.3.1 Capacity Expansion Modeling

Evergy developed alternative resource plans through capacity expansion planning. Capacity expansion planning involves using a long-term wholesale market simulation

model (Eversource utilizes PLEXOS) which is designed to generate the lowest-cost resource plan given a set of resource options, a given market scenario (e.g., natural gas prices, wholesale energy prices, emissions constraints), and a forecasted capacity requirement (i.e., forecasted load plus planning reserve margin). Eversource's goal in this IRP was to use Capacity Expansion to the fullest extent practical in selecting the lowest-cost resource additions. Specific scenarios were tested such as plant retirements and demand-side management portfolio additions to determine what the optimal resource builds would be given those choices. This is so that it is easier to compare different options side-by-side to see what trade-offs may exist between decisions. Even in testing these decisions, however, Capacity Expansion was still used to develop the lowest-cost portfolio of supply-side resources (e.g., if a higher level of DSM was assumed, then Capacity Expansion would build less resources as part of the optimized resource plan). This approach makes comparison somewhat more complicated than the past approach where plans could be compared on a truly apples-to-apples basis (i.e., because only one item in the whole plan changed and thus the difference in cost between the two plans is driven specifically by that one item), but it also more accurately depicts the integrated nature of resource planning, where every decision has an impact on future decisions and a portfolio should be viewed holistically as opposed to looking at an individual decision in a vacuum.

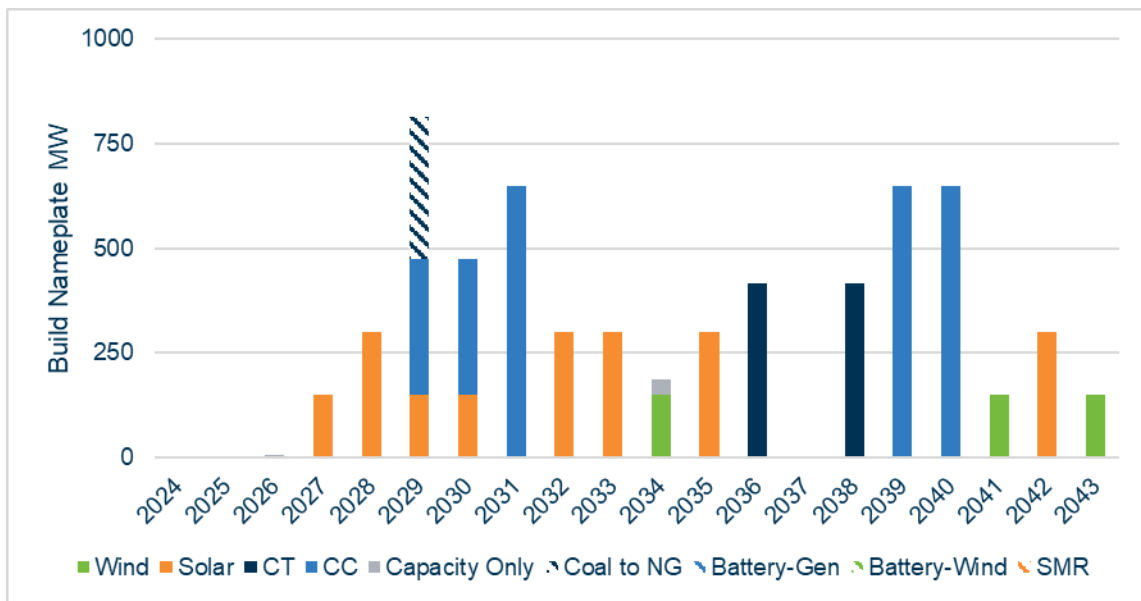
Unless otherwise noted in the description, capacity expansion modeling was performed using the "Mid-Mid-Mid" endpoint, based on the Mid natural gas forecast, Mid construction costs, and Mid level of carbon restrictions. This was, again, to provide easier comparisons between resource plans because a capacity expansion model will often generate different resource plans in different market scenarios. Eversource believes this approach provides a viable assessment of our current "base" expectations and that using these capacity expansion results, with revenue requirements for these Alternative Resource Plans calculated across all 27 endpoints, enables a robust analysis of these "base-case" Alternative Resource Plans across a wide variety of potential future scenarios.

Section 4: Overview of Preferred Portfolio’s Selected

4.1 Evergy Kansas Central Preferred Portfolio

The Preferred Portfolio for Evergy Kansas Central maintains the same retirement dates as the 2023 Preferred Portfolio and includes the KEEIA demand-side programs extending throughout the planning horizon. The first resource additions include 150 MW of solar in 2027, 300 MW of solar in 2028 and 150 MW of solar in 2029 and 2030. The first thermal addition is ½ combined cycle (325 MW) in 2029, followed by another ½ combined cycle (325 MW) in 2030 and a full combined cycle (650 MW) in 2031, totaling 1,300 MW.

Figure 32: Kansas Central Preferred Portfolio AAAB



The resource portfolio was based on capacity expansion optimal results, with an execution change to accelerate ½ combined cycle from 2030 to 2029 and defer a 150 MW of solar from 2029 to 2030 to balance capital spend. Evergy Kansas Central expects to be able to share ownership of the combined-cycle resource with Evergy Missouri West.

Figure 33: Evergy Kansas Central Base Plan AAAA

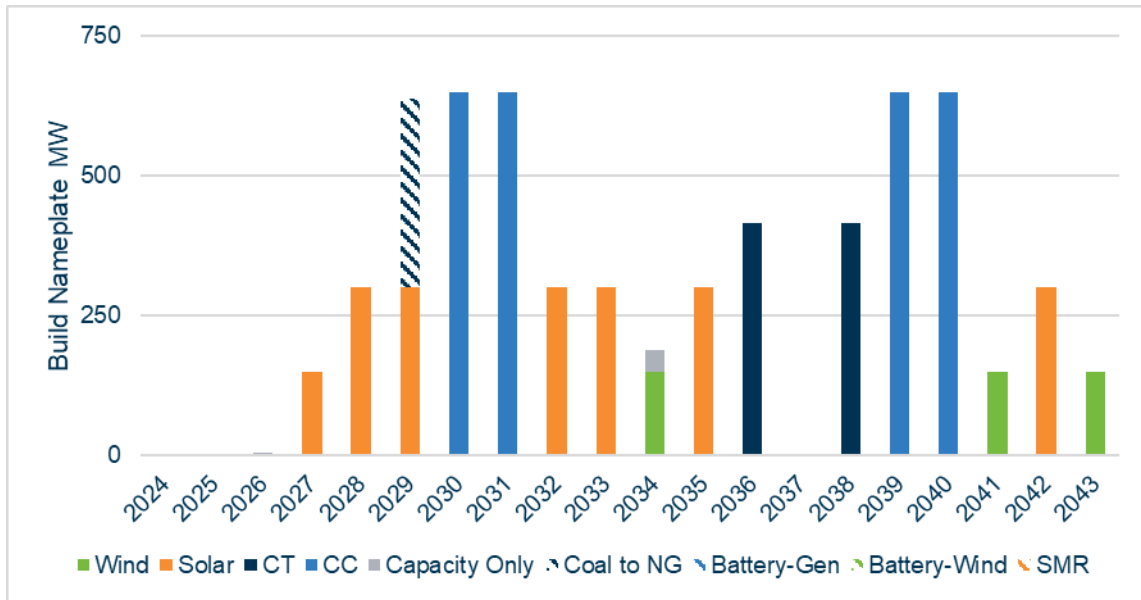
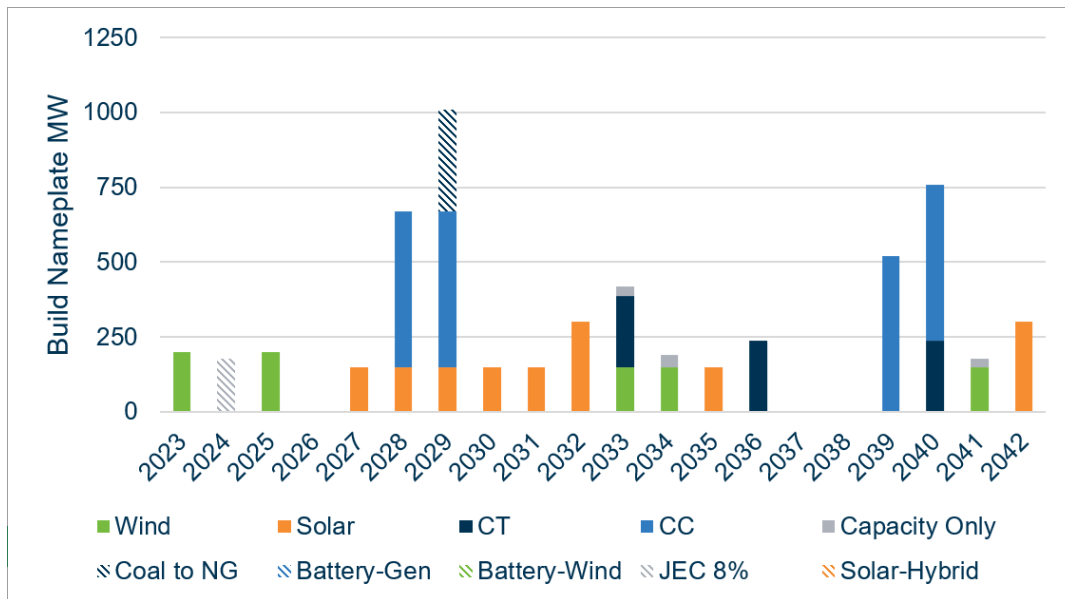


Figure 34: Kansas Central 2023 Preferred Portfolio

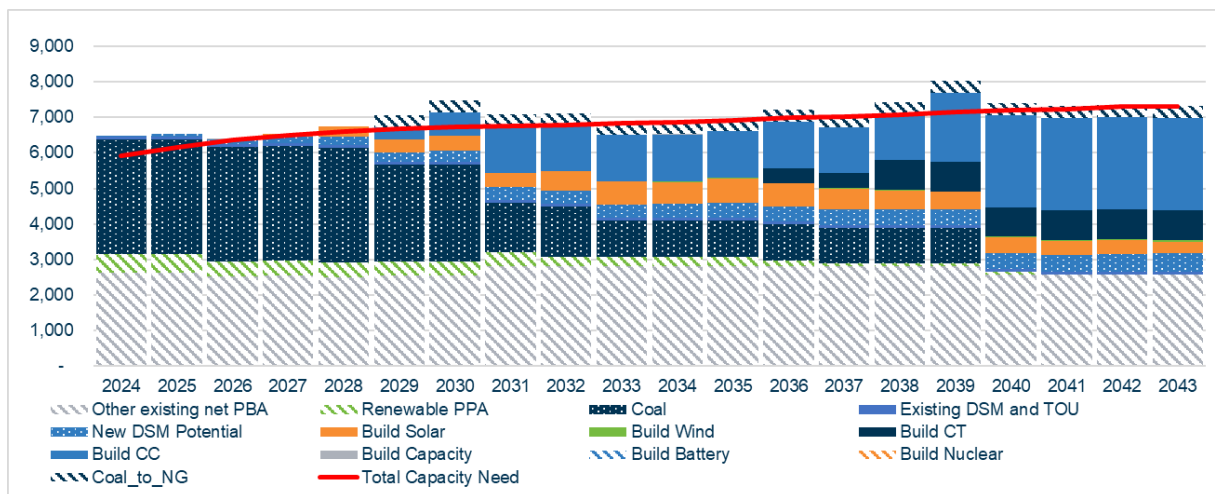


Evergy Kansas Central has acquired the Persimmon Creek Wind resource and an additional 8% ownership share of Jeffrey Energy Center, both included in the 2023 Preferred Portfolio, since filing the 2023 IRP. Those resources are included in the 2024 base resource plan.

The Preferred Portfolio for 2024 has some differences in future resource additions. The 2023 Preferred Portfolio assumed a smaller amount of demand-side programs, which were forecast only for the first few years of the horizon. Since KEEIA programs were approved in 2023, the future forecast is higher and demand-side programs are assumed to continue throughout the planning period. This improves Evergy Kansas Central’s expected capacity position. However, the need for new resources has not changed substantially due to increases to planning reserve requirement expectations and continued expectations for economic development.

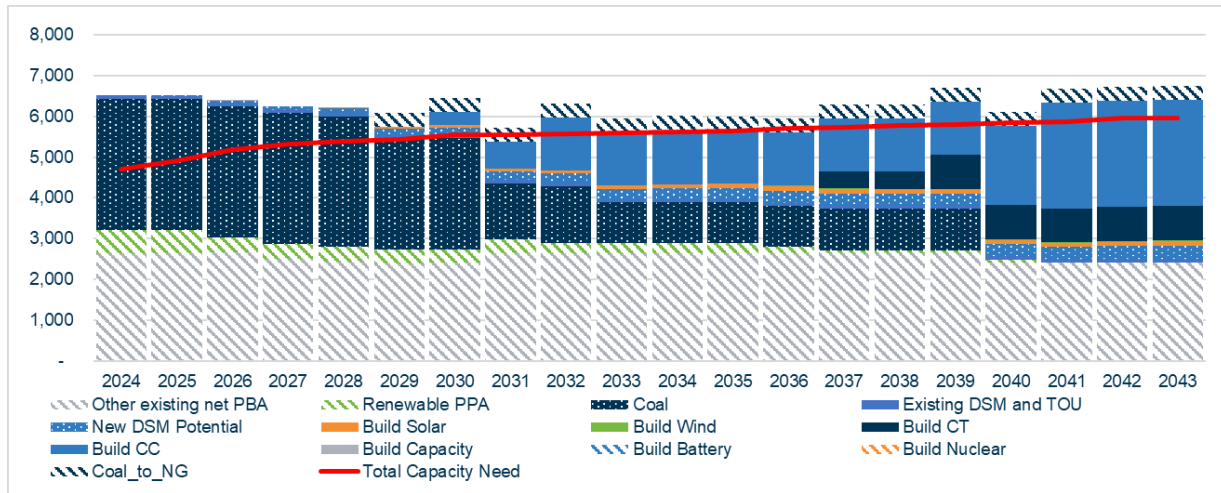
The 2024 Preferred Portfolio does not include the 2025 wind addition, which is no longer available. However, it similarly has 1,050 MW of solar additions through 2032 with some timing differences. Also, the 1,042 MW of combined-cycle resources have increased to 1,300 MW, but are now planned for 2029-2031 rather than 2028-2029.

Figure 35: Evergy Kansas Central Summer Capacity Position AAAB



The Preferred Portfolio meets expected annual summer and winter capacity requirements in all years of the planning horizon. New demand-side programs and solar additions meet summer needs as capacity requirements increase through 2028. New combined cycles beginning in 2029 offset the capacity losses from coal retirements including Lawrence 4 at the end of 2028 and Jeffrey 2 & 3 at the end of 2030.

Figure 36: Evergy Kansas Central Winter Capacity Position AAAB

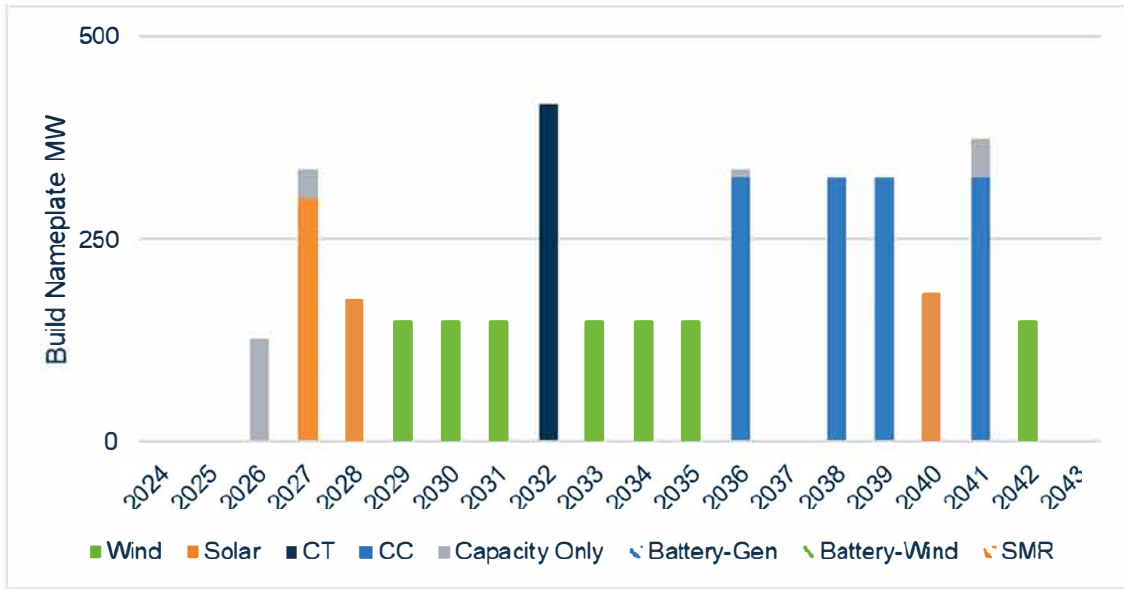


Evergy Kansas Central is not expected to fall short of winter capacity in the near term due to its relatively lower winter peak and current resource mix. However, the combined-cycle additions are needed to meet capacity needs as coal units retire.

4.2 Evergy Metro Preferred Portfolio

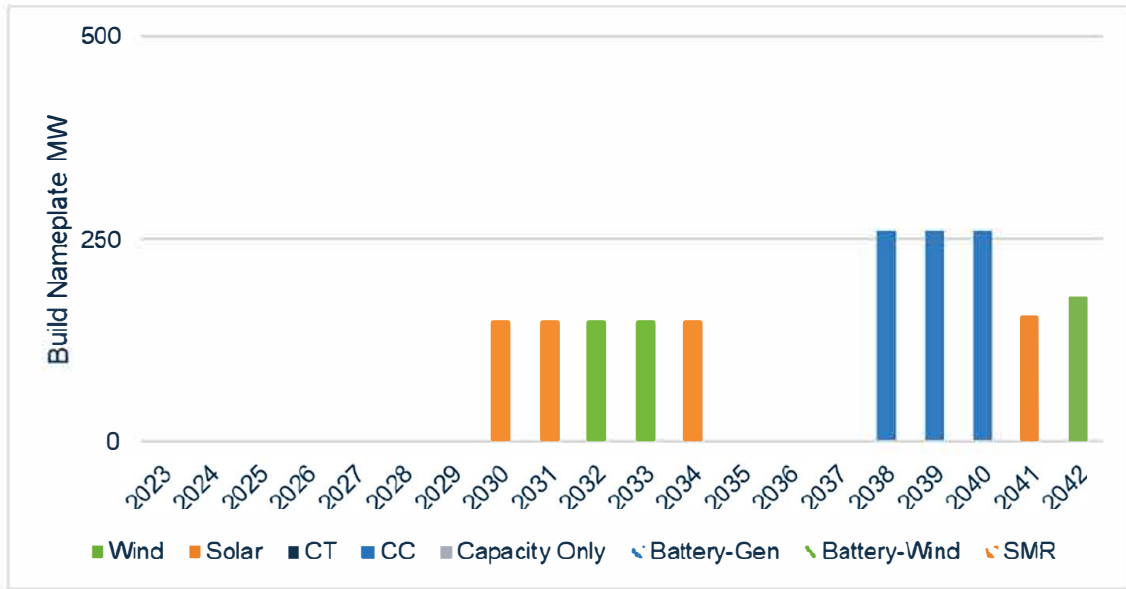
The Preferred Portfolio for Evergy Metro includes the RAP Plus demand-side management portfolio with additions of 300 MW of solar in 2027, 150 MW of solar in 2028 and 150 MW of wind each year 2029-2031, with the first thermal resource addition in 2032, a 415 MW combustion turbine.

Figure 37: Evergy Metro Preferred Portfolio 2024 CAAB



The Preferred Portfolio for 2024 significantly accelerates resource additions compared to the 2023 Preferred Portfolio. The largest driver is a higher level of forecasted load growth as a result of economic development. The increase in forecasted capacity needs, due to expected increases in reserve margin requirements and enforcement of winter capacity requirements, also prompt earlier capacity resource build.

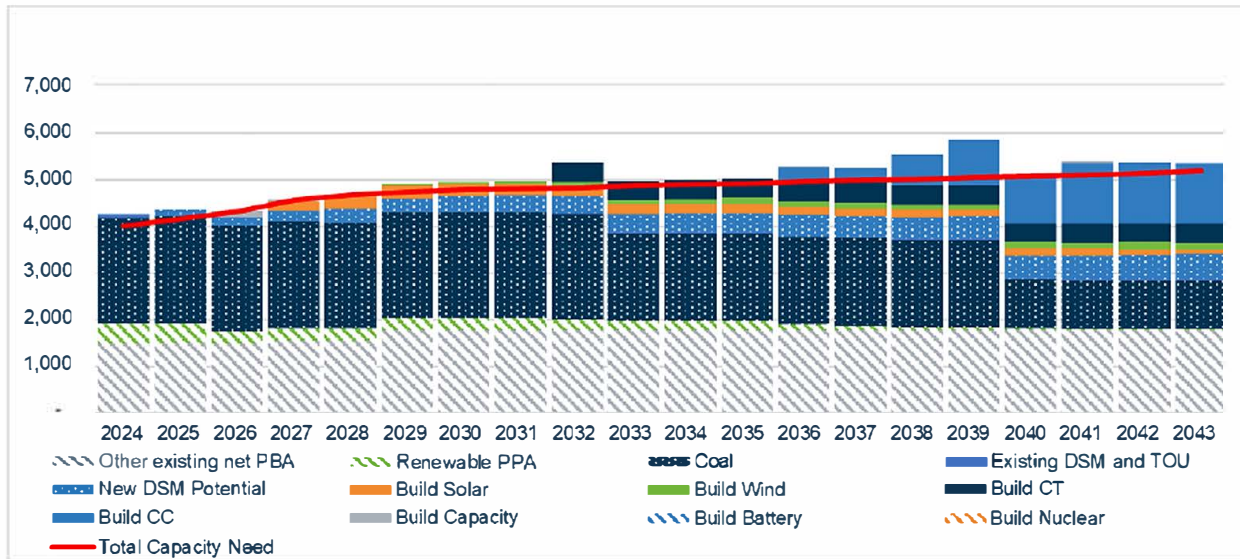
Figure 38: Evergy Metro Preferred Portfolio 2023



The first new resource continues to be solar. Solar resources are the first near-term builds for all Evergy utilities’ preferred resource portfolios. There is currently very little solar in the SPP resource mix; incremental solar is expected to have high summer accreditation and provide peak-correlated energy. These attributes, and the availability of solar production tax credit incentives from the Inflation Reduction Act, make early solar builds attractive to meet customer needs at lowest cost. Evergy has shortlisted offers from its 2023 RFP, based on the expected solar additions in its other utility IRP 2023 Preferred Portfolios, and has viable projects to fill the 2027 solar need.

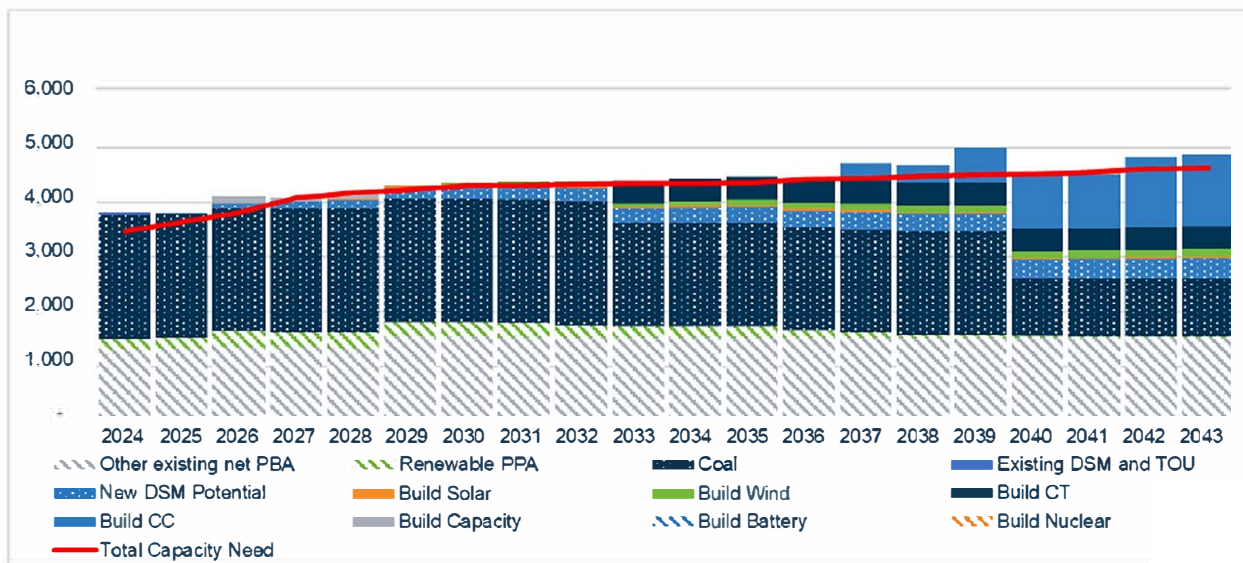
The Preferred Portfolios meets expected annual summer and winter capacity requirements in all years of the planning horizon. The load ramp for economic development creates a summer capacity need as early as 2026 summer. Evergy Metro plans to meet that need through coordinating the timing of new customer load ramps or bridging with market capacity for 2026, until the 300 MW of new solar additions are operational for 2027 summer capacity.

Figure 39: Preferred Portfolio (CAAB) Summer Capacity Position MW



Energy Metro has a relatively smaller need for winter capacity early in the planning horizon due to its lower winter peak and its resource mix. The Energy Metro Preferred Portfolio adds the first thermal resource in 2032 when it has a more sizable need for both summer and winter capacity due to the projected La Cygne 1 retirement.

Figure 40: Preferred Portfolio (CAAB) Winter Capacity Position MW

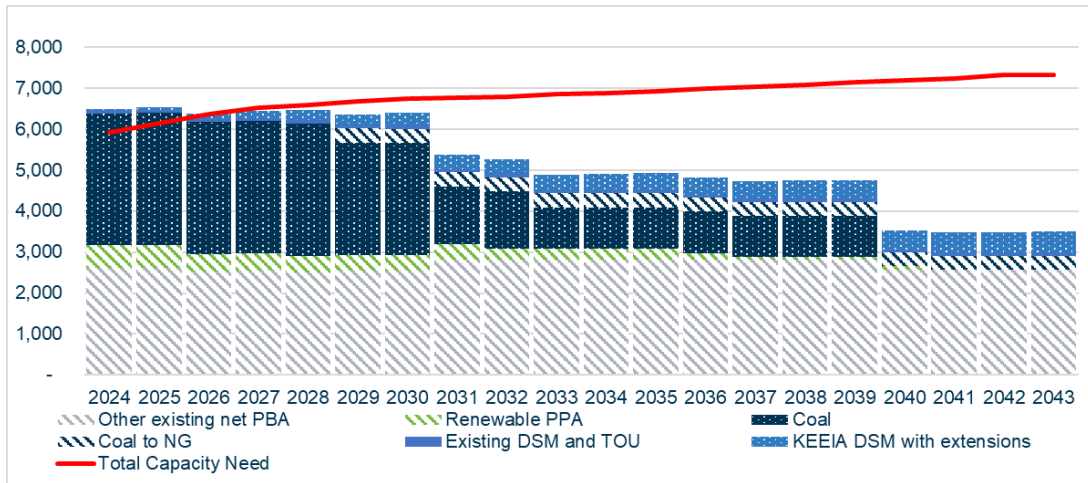


Section 5: Evergy Kansas Central Alternative Resource Portfolio Development

In the 2023 IRP forecast, Evergy Kansas Central was projected to have increased capacity needs due to load growth driven by economic development and increased SPP capacity requirements. Evergy Kansas Central selected Persimmon Creek Wind and an increased share of the Jeffrey Energy Center as near-term additions in its Preferred Portfolio. It has executed on both of those resource additions in the past year. Additionally, the Kansas Commission approved KEEIA, a portfolio of demand-side management programs. The approved portfolio is forecast to provide higher load reductions, with greater capacity value than the 2023 Preferred Portfolio demand-side assumption.

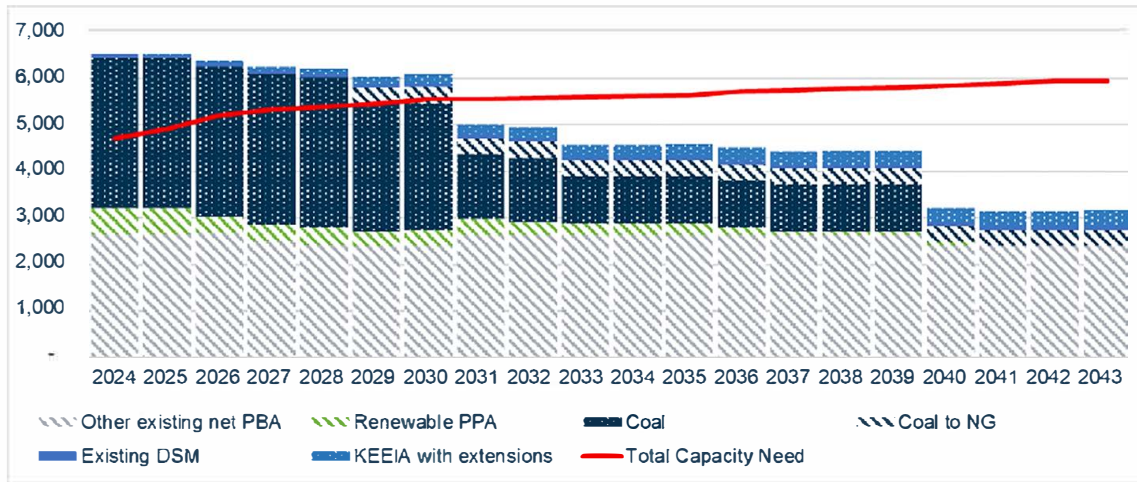
Evergy Kansas Central is forecasted to need summer capacity as early as 2026. Capacity needs are forecasted to grow over time due to load growth, increasing reserve margin requirements, the expiration of renewable PPAs, and retirements of coal resources (based on the 2023 Preferred Portfolio retirement dates). Evergy Kansas Central developed various future alternate portfolios which meet its capacity needs with owned/contracted resources and minimal reliance on market capacity purchases due to the changing market environment. New resource builds available beginning in 2026 were considered to meet capacity needs. Evergy Kansas Central's planning criteria was to meet the majority of the summer need with resource additions and demand-side programs, with only 50 MW of market capacity available annually beginning in 2027.

Figure 41: Evergy Kansas Central Summer Capacity Position



Evergy Kansas Central resource plans also include meeting the forecasted winter capacity requirement. Evergy expects SPP to impose a winter requirement beginning in the winter of 2026/2027. Evergy Kansas Central is summer peaking, as are all of the Evergy utilities, and it has a lower need in winter than summer due to its fleet characteristics and winter peak forecast. Evergy Kansas Central is forecast to have significant winter capacity length through winter 2029/2030. Future demand-side management programs and renewable and storage resource builds provide less winter capacity than summer capacity, which is considered in developing the optimal resource plans to meet both winter and summer needs.

Figure 42: Evergy Kansas Central Winter Capacity Position



Alternative resource portfolios (ARPs) were developed to assess base planning options, directed strategies, discrete scenarios, and contingency plans.

5.1 Base Planning Options

Base planning options include expected options available to Evergy Kansas Central over the planning horizon. These include accelerated or delayed retirements of coal resources, and addition of new renewable, storage, and thermal resources in a cadence that respects capital budget and commercial availability limitations.

Since KEEIA programs were approved and the company is currently implementing them in Kansas, no changes to DSM portfolios were tested as base planning options. However, the possibility that KEEIA could end after the four year cycle was tested as a contingency.

Table 15: Base Coal Retirement Options

Coal Resource	Base Retire Year	Early Retire Year	Late Retire Year
Lawrence 4	2028	n/a	n/a
Lawrence 5	2028 (coal)	n/a	n/a
La Cygne 1	2032	n/a	n/a
La Cygne 2	2039	2032	n/a
Jeffrey 1	2039	2030	n/a
Jeffrey 2	2030	n/a	2039
Jeffrey 3	2030	n/a	2039

Table 16: Base Resource Addition Options

Resource Addition Type	Earliest Year Available
Battery-Wind	2026
Battery-Gen	2026
Wind	2026
Solar	2027
Combined Cycle	2028
Combustion Turbine	2028

5.2 Directed Strategies

Eversource Kansas Central also developed several scenarios to reflect how changes to planning strategy would affect planned additions and economics, including the following ARPs:

- Plan for high natural gas – high carbon dioxide emissions limit future, with availability of combined-cycle with carbon capture beginning in 2035, and nuclear SMR beginning in 2039
- Plan for low natural gas – low (no) carbon dioxide emissions limit future
- Plan with only renewable and storage additions
- Plan with earliest retirement of coal fleet and only renewable and storage additions

5.3 Discrete Scenarios

Eversource Kansas Central developed two scenarios intended to be extremes in planning strategy. One reflects a possible implementation of the EPA GHG rule, and optimizes the retirement and new addition decisions based on the high natural gas, high carbon dioxide emissions restriction future. The second reflects a different future with reduced expectations of environmental rules, including no emissions restrictions and no requirements for selective catalytic reduction (SCR) addition (where applicable). This plan is optimized using the low natural gas, low (no) carbon dioxide emissions future forecast.

5.4 Contingency Plans

Evergy Kansas Central developed contingency plans to understand how optimal resource additions might vary based on risks around planning assumptions. One risk is near-term execution of the resource plan. If Evergy Kansas Central is unable to acquire or develop a resource in the expected timeline, or does not receive regulatory approval for the resource, it may have to make changes to its plan. The two scenarios considering these near-term risks are:

- No 2027 solar build
- DSM programs are discontinued after KEEIA

The other risk that Evergy Kansas Central considered through contingency plans is that the long-term load forecast may differ from the base planning assumption. Higher or lower load growth over the planning horizon may change the optimal timing, type, and amount of resource additions. The two alternate load forecasts considered were:

- High Load – including electrification
- Low Load

Section 6: Evergy Kansas Central Alternative Resource Plans and Rankings

6.1 Summary of Alternative Resource Plans

Table 17: Evergy Kansas Central Alternative Resource Plan Descriptions²⁵

Plan Name	DSM Level	Retirements	Renewable Additions		Storage/Hybrid Additions	Thermal Additions
			Wind	Solar		
KSC AAAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2034 150 MW 2041 150 MW 2043	150 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 300 MW 2035 300 MW 2042		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AAAB	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2034 150 MW 2041 150 MW 2043	150 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 300 MW 2035 300 MW 2042		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AAAC	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2034 150 MW 2035 150 MW 2037 150 MW 2043	300 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 150 MW 2041	150 MW BW 2041	LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CC (650 MW) 2036 SMR (300 MW) 2039 SMR (300 MW) 2040 SMR (300 MW) 2042
KSC AAAD	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039		150 MW 2027 150 MW 2028 300 MW 2029 300 MW 2032 300 MW 2034		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CT (415 MW) 2031 1 CT (415 MW) 2033 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AAAE	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039		300 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 300 MW 2034 300 MW 2035 300 MW 2036 300 MW 2041 300 MW 2042 300 MW 2043		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2037 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040

²⁵ BW refers to battery at wind node, BG refers to battery at generation node

KSC AAAF	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2034 150 MW 2042	150 MW 2027 300 MW 2028 300 MW 2029 300 MW 2031 300 MW 2033 150 MW 2035		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CT (415 MW) 2032 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AAAG	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	1050 MW 2031 1500 MW 2032 1500 MW 2033 600 MW 2034 300 MW 2041 1500 MW 2042	150 MW 2027 150 MW 2031 300 MW 2042	300 MW BG 2029 600 MW BG 2030 300 MW BG 2031 1500 MW BG 2033 1200 MW BG 2038 1500 MW BW 2038 1500 MW BG 2039 1500 MW BW 2039 900 MW BG 2040 1500 MW BW 2040 1500 MW BG 2041 1500 MW BW 2041 1500 MW BG 2042 1500 MW BW 2042	LEC5 NG (338 MW) 2029
KSC AAAH	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2034	150 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 300 MW 2035 150 MW 2041	150 MW BW 2041	LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CT (415 MW) 2039 1 CC (650 MW) 2040 SMR (300 MW) 2042
KSC AAAI	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039		150 MW 2027 300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2033 300 MW 2034 150 MW 2041 150 MW 2042	150 MW BW 2042 150 MW BW 2043	LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2036 SMR (300 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AAAJ	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2027 150 MW 2041 150 MW 2043	300 MW 2028 300 MW 2029 300 MW 2032 300 MW 2034 300 MW 2035 150 MW 2036 300 MW 2042		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CT (415 MW) 2031 1 CT (415 MW) 2033 1 CC (650 MW) 2037 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC ABAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039 Jeffrey 2: 2039	150 MW 2035	300 MW 2027 300 MW 2028 300 MW 2029 300 MW 2030 300 MW 2031 300 MW 2033 300 MW 2034 300 MW 2041 150 MW 2042 300 MW 2043	150 MW BW 2042	LEC5 NG (338 MW) 2029 1 CT (415 MW) 2032 1 CT (415 MW) 2036 1 CC (650 MW) 2037 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040

KSC ACAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 1: 2030 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039	150 MW 2035	300 MW 2027 300 MW 2028 300 MW 2032 150 MW 2033 300 MW 2034 150 MW 2037 300 MW 2038 300 MW 2041 300 MW 2042 150 MW 2043	150 MW BG 2033 150 MW BW 2043	LEC5 NG (338 MW) 2029 1 CC (650 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CC (650 MW) 2036 1 CT (415 MW) 2036 1 CT (415 MW) 2039 1 CT (415 MW) 2040
KSC ADAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2032 Jeffrey 1: 2039	150 MW 2034 150 MW 2038 150 MW 2041	300 MW 2027 300 MW 2028 300 MW 2029 300 MW 2033 300 MW 2035 300 MW 2042 150 MW 2043		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2030 1 CT (415 MW) 2031 1 CC (650 MW) 2032 1 CT (415 MW) 2036 1 CC (650 MW) 2039 1 CC (650 MW) 2040
KSC AEAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 1: 2030 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2032	150 MW 2038 150 MW 2039 150 MW 2041 150 MW 2043	150 MW 2027 300 MW 2028 300 MW 2032 300 MW 2034 300 MW 2035 300 MW 2042		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CC (650 MW) 2033 1 CT (415 MW) 2037 1 CT (415 MW) 2040
KSC AEAG	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 1: 2030 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2032	1350 MW 2031 1500 MW 2032 1500 MW 2033 300 MW 2034 300 MW 2041 1500 MW 2042	150 MW 2027 150 MW 2031 300 MW 2042	300 MW BG 2029 1500 MW BG 2030 150 MW BW 2030 1200 MW BG 2032 1500 MW BG 2033 600 MW BG 2034 900 MW BW 2038 750 MW BG 2039 1500 MW BW 2039 900 MW BG 2040 1500 MW BW 2040 1500 MW BG 2041 1500 MW BW 2041 1500 MW BG 2042 1500 MW BW 2042	LEC5 NG (338 MW) 2029
KSC AFAA	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028	150 MW 2028 150 MW 2030 150 MW 2031 150 MW 2032 150 MW 2033 150 MW 2034 150 MW 2038 150 MW 2039 150 MW 2040 150 MW 2041	150 MW 2027 300 MW 2029 300 MW 2035		LEC5 NG (338 MW) 2029 1 CC (650 MW) 2037 1 CC (650 MW) 2042
KSC AFAD	Extend DSM	Lawrence 4: 2028 Lawrence 5: 2028		150 MW 2027 300 MW 2029 150 MW 2030 150 MW 2033	150 MW BW 2042	LEC5 NG (338 MW) 2029 1 CT (415 MW) 2036 1 CT (415 MW) 2040
KSC BAAA	KEEIA Only	Lawrence 4: 2028 Lawrence 5: 2028 Jeffrey 2: 2030 Jeffrey 3: 2030 La Cygne 1: 2032 La Cygne 2: 2039 Jeffrey 1: 2039	150 MW 2035 150 MW 2037	300 MW 2027 300 MW 2028 300 MW 2032 300 MW 2033 300 MW 2034 300 MW 2041 300 MW 2042 300 MW 2043		LEC5 NG (338 MW) 2029 1 CT (415 MW) 2029 1 CC (650 MW) 2030 1 CC (650 MW) 2031 1 CT (415 MW) 2036 1 CT (415 MW) 2038 1 CC (650 MW) 2039 1 CC (650 MW) 2040

Table 18: Eversky Kansas Central Alternative Resource Portfolio Name Key

Demand Response Potential	Retirements	Coal to NG	Other
A. Extend DSM	A. PP 2023	A. Lawrence 5 to NG 2029	A. None
B. KEEIA Only	B. Retire Jeffrey 2 2039		B. 1/2 CC
	C. Retire Jeffrey all 2030		C. High/High
	D. Retire La Cygne 2 2032		D. Low/Low
	E. Retire all earliest		E. High Load
	F. No retirements (exl. LEC4)		F. Low Load
			G. Only renewable/Storage build, no budget constraint
			H. Allow SMR build 2039+
			I. Allow SMR build 2038+
			J. No 2027 Solar

6.2 Overall Portfolio Rankings

Table 19: Eversky Kansas Central Overall Portfolio Rankings

Rank	Plan	NPVRR	Difference	Description
1	ABAA	34,081		Retire Jeffrey 2 2039
2	AAAA	34,092	10	PP 2023; Extend DSM
3	AAAB	34,109	27	1/2 CC
4	AAAJ	34,141	59	No 2027 Solar
5	ADAA	34,213	132	Retire La Cygne 2 2032
6	BAAA	34,514	432	KEEIA Only
7	AAAD	34,538	457	Low/Low
8	ACAA	34,577	496	Retire Jeffrey all 2030
9	AEAA	34,742	661	Retire all earliest
10	AAAC	34,860	778	High/High
11	AFAD	36,490	2,409	Low/Low, No retirements
12	AAAG	39,320	5,239	Only renewable/storage build, budget relaxed
13	AEAG	39,349	5,268	Retire all early, only renewable/storage, budget relaxed

6.3 Rankings by CO₂ RestrictionTable 20: Energy Kansas Central High CO₂ Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,966		PP 2023; Extend DSM
2	AAAB	34,982	16	1/2 CC
3	AAAJ	35,013	47	No 2027 Solar
4	ADAA	35,065	99	Retire La Cygne 2 2032
5	AAAC	35,213	247	High/High
6	ABAA	35,218	252	Retire Jeffrey 2 2039
7	BAAA	35,387	420	KEEIA Only
8	ACAA	35,467	501	Retire Jeffrey all 2030
9	AEAA	35,740	773	Retire all earliest
10	AAAD	35,842	876	Low/Low
11	AAAG	39,802	4,836	Only renewable/storage build, budget relaxed
12	AEAG	39,816	4,850	Retire all early, only renewable/storage, budget relaxed
13	AFAD	41,608	6,641	Low/Low, No retirements

Table 21: Energy Kansas Central Mid CO₂ Rankings

Rank	Plan	NPVRR	Difference	Description
1	ABAA	33,943		Retire Jeffrey 2 2039
2	AAAA	33,991	47	PP 2023; Extend DSM
3	AAAB	34,008	64	1/2 CC
4	AAAJ	34,040	96	No 2027 Solar
5	ADAA	34,098	155	Retire La Cygne 2 2032
6	BAAA	34,448	504	KEEIA Only
7	ACAA	34,456	513	Retire Jeffrey all 2030
8	AAAD	34,566	623	Low/Low
9	AEAA	34,605	662	Retire all earliest
10	AAAC	34,806	863	High/High
11	AFAD	36,809	2,866	Low/Low, No retirements
12	AAAG	39,237	5,294	Only renewable/storage build, budget relaxed
13	AEAG	39,269	5,326	Retire all early, only renewable/storage, budget relaxed

Table 22: Evergy Kansas Central Low CO₂ Rankings

Rank	Plan	NPVRR	Difference	Description
1	AFAD	32,653		Low/Low, No retirements
2	AAAD	33,689	1,036	Low/Low
3	ABAA	33,731	1,078	Retire Jeffrey 2 2039
4	AAAA	33,810	1,157	PP 2023; Extend DSM
5	AAAB	33,827	1,174	1/2 CC
6	AAAJ	33,861	1,208	No 2027 Solar
7	ADAA	33,978	1,325	Retire La Cygne 2 2032
8	BAAA	34,149	1,496	KEEIA Only
9	ACAA	34,334	1,681	Retire Jeffrey all 2030
10	AEAA	34,471	1,818	Retire all earliest
11	AAAC	34,776	2,123	High/High
12	AAAG	39,232	6,579	Only renewable/storage build, budget relaxed
13	AEAG	39,261	6,608	Retire all early, only renewable/storage, budget relaxed

6.4 Rankings by Natural Gas Price

Table 23: Evergy Kansas Central High Natural Gas Price Rankings

Rank	Plan	NPVRR	Difference	Description
1	ABAA	34,954		Retire Jeffrey 2 2039
2	AAAA	35,127	173	PP 2023; Extend DSM
3	AAAB	35,147	193	1/2 CC
4	AAAJ	35,197	243	No 2027 Solar
5	ADAA	35,322	368	Retire La Cygne 2 2032
6	BAAA	35,614	660	KEEIA Only
7	AAAD	35,716	762	Low/Low
8	AAAC	35,718	764	High/High
9	ACAA	35,842	888	Retire Jeffrey all 2030
10	AEAA	36,182	1,228	Retire all earliest
11	AFAD	37,494	2,541	Low/Low, No retirements
12	AAAG	39,295	4,341	Only renewable/storage build, budget relaxed
13	AEAG	39,422	4,468	Retire all early, only renewable/storage, budget relaxed

Table 24: Energy Kansas Central Mid Natural Gas Price Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,073		PP 2023; Extend DSM
2	ABAA	34,079	6	Retire Jeffrey 2 2039
3	AAAB	34,090	17	1/2 CC
4	AAAJ	34,121	48	No 2027 Solar
5	ADAA	34,196	123	Retire La Cygne 2 2032
6	BAAA	34,488	415	KEEIA Only
7	AAAD	34,507	434	Low/Low
8	ACAA	34,549	476	Retire Jeffrey all 2030
9	AEAA	34,704	631	Retire all earliest
10	AAAC	34,858	784	High/High
11	AFAD	36,434	2,361	Low/Low, No retirements
12	AAAG	39,313	5,240	Only renewable/storage build, budget relaxed
13	AEAG	39,337	5,264	Retire all early, only renewable/storage, budget relaxed

Table 25: Energy Kansas Central Low Natural Gas Price Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAA	33,675		PP 2023; Extend DSM
2	AAAB	33,691	16	1/2 CC
3	ABAA	33,710	36	Retire Jeffrey 2 2039
4	AAAJ	33,717	42	No 2027 Solar
5	ADAA	33,762	87	Retire La Cygne 2 2032
6	ACAA	34,076	402	Retire Jeffrey all 2030
7	AAAD	34,078	404	Low/Low
8	BAAA	34,079	405	KEEIA Only
9	AEAA	34,178	504	Retire all earliest
10	AAAC	34,495	821	High/High
11	AFAD	36,139	2,465	Low/Low, No retirements
12	AEAG	39,335	5,660	Retire all early, only renewable/storage, budget relaxed
13	AAAG	39,342	5,667	Only renewable/storage build, budget relaxed

6.5 Rankings by Construction Costs

Table 26: Evergy Kansas Central High Construction Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,815		PP 2023; Extend DSM
2	AAAB	34,832	17	1/2 CC
3	AAAJ	34,866	51	No 2027 Solar
4	ABAA	34,887	72	Retire Jeffrey 2 2039
5	ADAA	34,971	156	Retire La Cygne 2 2032
6	AAAD	35,124	309	Low/Low
7	BAAA	35,306	491	KEEIA Only
8	ACAA	35,374	559	Retire Jeffrey all 2030
9	AEAA	35,463	648	Retire all earliest
10	AAAC	35,907	1,092	High/High
11	AFAD	36,760	1,945	Low/Low, No retirements
12	AAAG	42,320	7,505	Only renewable/storage build, budget relaxed
13	AEAG	42,427	7,612	Retire all early, only renewable/storage, budget relaxed

Table 27: Evergy Kansas Central Mid Construction Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,074		PP 2023; Extend DSM
2	ABAA	34,085	11	Retire Jeffrey 2 2039
3	AAAB	34,089	15	1/2 CC
4	AAAJ	34,137	63	No 2027 Solar
5	ADAA	34,199	126	Retire La Cygne 2 2032
6	BAAA	34,496	422	KEEIA Only
7	AAAD	34,530	456	Low/Low
8	ACAA	34,532	458	Retire Jeffrey all 2030
9	AEAA	34,703	629	Retire all earliest
10	AAAC	34,747	673	High/High
11	AFAD	36,486	2,412	Low/Low, No retirements
12	AAAG	38,962	4,889	Only renewable/storage build, budget relaxed
13	AEAG	38,975	4,901	Retire all early, only renewable/storage, budget relaxed

Table 28: Energy Kansas Central Low Construction Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	ABAA	33,269		Retire Jeffrey 2 2039
2	AAAA	33,405	136	PP 2023; Extend DSM
3	AAAJ	33,424	155	No 2027 Solar
4	AAAB	33,426	157	1/2 CC
5	ADAA	33,483	214	Retire La Cygne 2 2032
6	BAAA	33,757	488	KEEIA Only
7	ACAA	33,873	604	Retire Jeffrey all 2030
8	AAAD	33,970	701	Low/Low
9	AAAC	34,038	769	High/High
10	AEAA	34,099	830	Retire all earliest
11	AFAD	36,229	2,960	Low/Low, No retirements
12	AEAG	37,019	3,750	Retire all early, only renewable/storage, budget relaxed
13	AAAG	37,037	3,768	Only renewable/storage build, budget relaxed

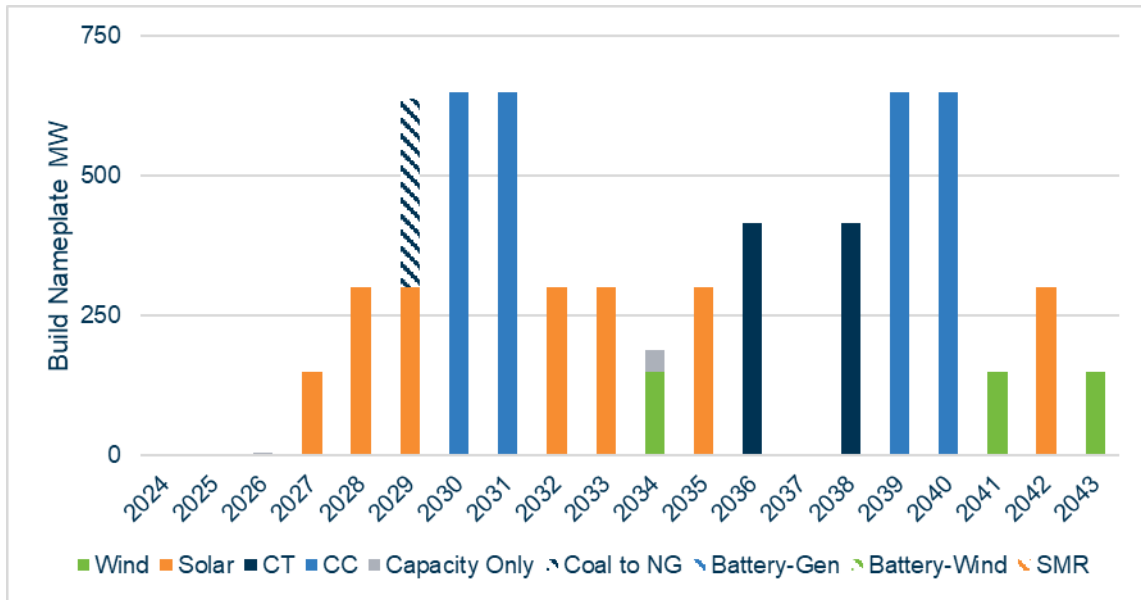
Section 7: Analysis of Kansas Central Base Planning Decisions

7.1 Comparison of Retirement Options

Eversource Kansas Central owns Lawrence Units 4 & 5, and jointly owns La Cygne Units 1 & 2 (50% share), and Jeffrey Units 1-3 (92% share). Eversource Kansas Central's 2023 IRP Preferred Portfolio extended Lawrence Units 4 & 5 operation on coal through the end of 2028, with Lawrence 4 retiring in 2028 and Lawrence 5 beginning natural gas-only operation in 2029. Plans for Lawrence Units were not retested. Each additional coal retirement brings a loss of capacity of approximately 300 MW – 700 MW as well as a loss of baseload energy. Eversource Kansas Central assumes that if it continues to operate coal resources, it will comply with all environmental and other regulations and keep the plants maintained. These costs are included in the expected value of the resource plan.

The 2023 Preferred Portfolio retired Jeffrey Units 2 & 3 in 2030, La Cygne Unit 1 in 2032, and Jeffrey Unit 1 and La Cygne Unit 2 in 2039. The portfolio AAAA has optimized resource builds including these retirement dates. Alternative portfolios with varied retirement dates were developed, with the same assumption that KEEIA demand response programs extend through the time horizon.

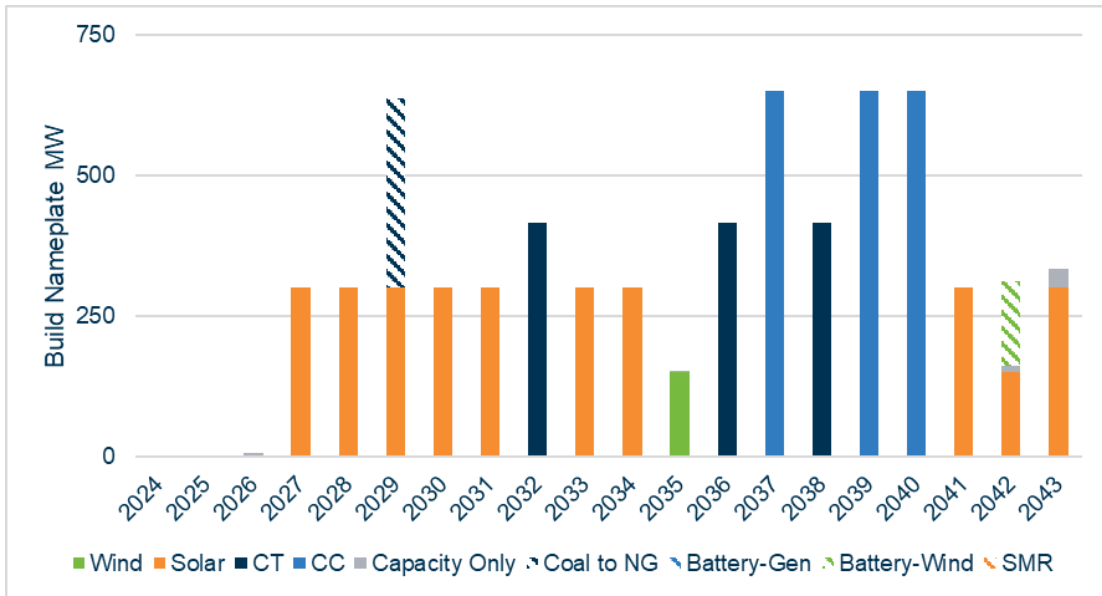
Figure 43: 2023 IRP Preferred Retirements AAAA



Portfolio AAAA includes 750 MW of new solar in 2027-2029, followed by 1,300 MW of new combined-cycle resources in 2030-2031. Solar and wind are added 2032-2035, and then 2,130 MW of thermal generation 2036-2040.

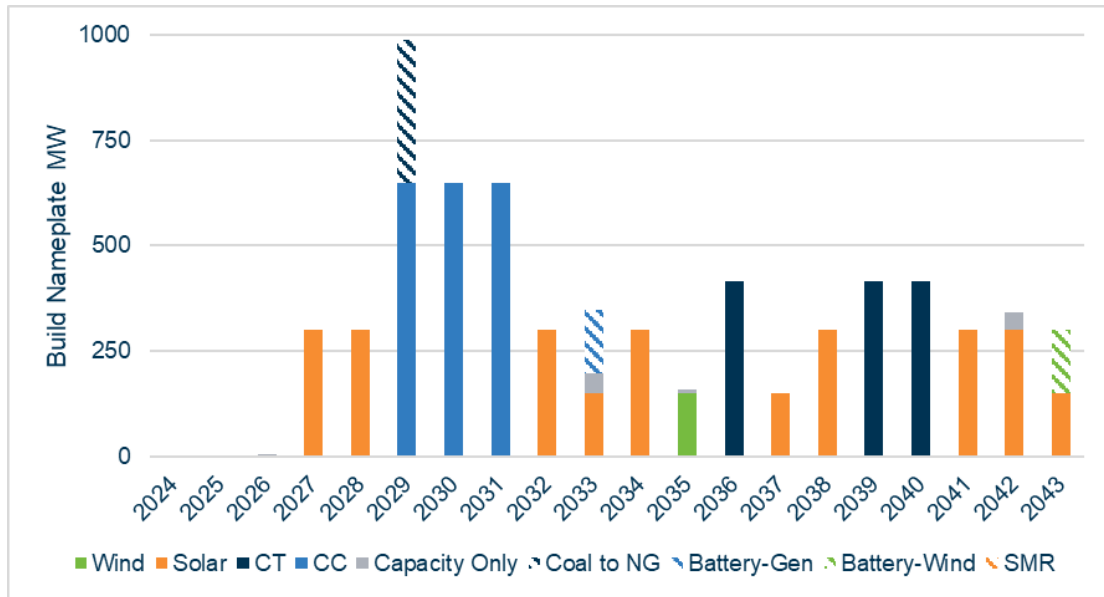
Postponing the retirement of Jeffrey 2 increases the amount of early solar added in the plan to 1,500 MW through 2031 and defers the first thermal build until 2032, with the second deferred until after 2036.

Figure 44: Later Jeffrey 2 Retirement 2039 ABAA



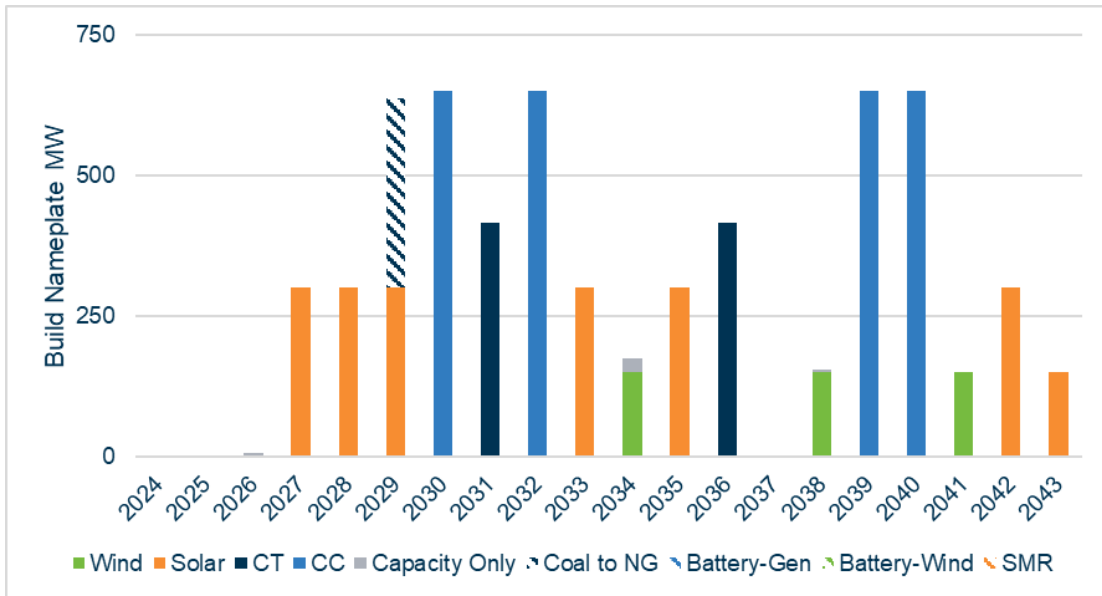
Portfolios with earlier retirements have earlier thermal builds. The portfolio ACAA that includes retirement of Jeffrey 1 in 2030 (all Jeffrey units retired in 2030), has an additional combined-cycle build in 2029, with 1,950 MW of thermal generation 2029-2031 to replace the three Jeffrey units. The portfolio first adds 600 MW of solar in 2027-2028, and also adds solar and wind before the next thermal resource addition in 2036.

Figure 45: Earlier Jeffrey 1 Retirement 2030 ACAA



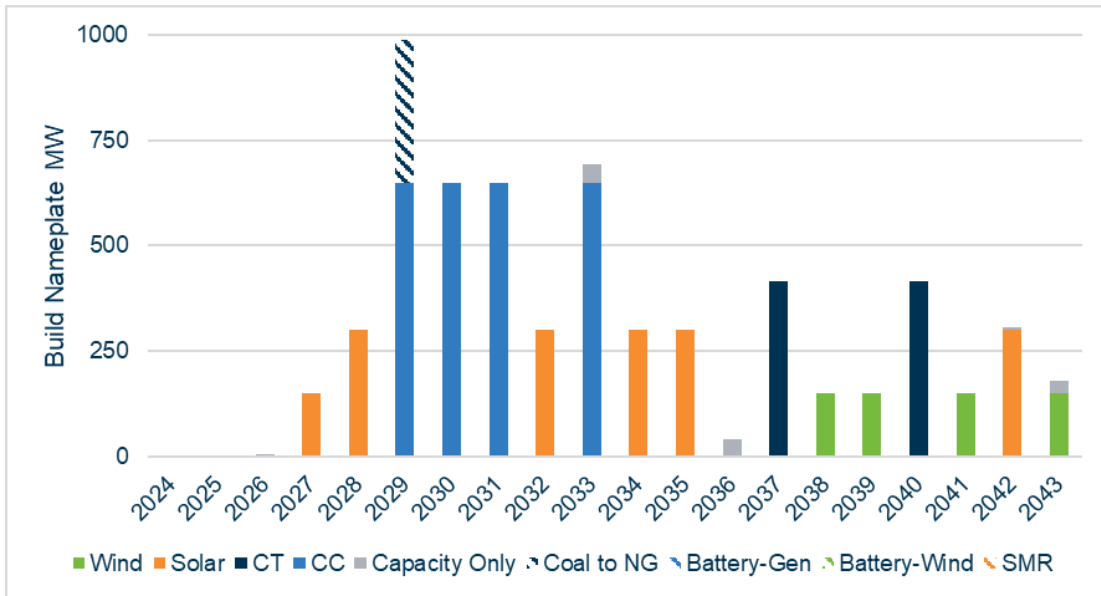
The portfolio ADA that includes retirement of La Cygne 2 in 2032, also has an additional thermal build in the first ten years of the horizon. The La Cygne 2 retirement is a smaller loss in capacity than Jeffrey 1, and also comes two years later. The resource portfolio includes more early solar and less mid-term thermal capacity than the Jeffrey early retirement portfolio.

Figure 46: Earlier La Cygne 2 Retirement 2032 ADA



Portfolio AEA includes early retirements of Jeffrey 1 in 2030 and La Cygne 2 in 2032, with no coal resources in operation after 2032. The portfolio includes earlier thermal builds to replace the coal capacity, with four combined-cycle resource builds (2,600 MW) in 2029-2033.

Figure 47: All Earlier Retirements AEEA



The least-cost retirement plan includes extending the Jeffrey 2 retirement to 2039. The portfolios retiring Jeffrey 2 in 2030 (AAAA) and retiring Jeffrey 2 in 2039 (ABAA), with all other retirement dates aligning, are very close in expected value. The economics of the Jeffrey 2 retirement decision are heavily influenced by expected environmental regulations prompting the need for a relatively high-cost capital investment in selective catalytic reduction equipment. Based on the current cost and timing estimates, Evergy Kansas Central could invest in upgrading Jeffrey 2 with this equipment, and build solar resources to bridge energy and capacity needs, or it could retire Jeffrey 2 to avoid the investment and build new combined-cycle resources. Evergy Kansas Central has selected the plan which includes the earlier Jeffrey 2 retirement as its Preferred Portfolio due to the small difference in NPVRR and the additional long-term flexibility which new combined-cycle resources will give in meeting future load growth and/or replacing coal capacity. Retiring La Cygne 2 or Jeffrey 1, or both, in addition to the Preferred Portfolio retirements is more costly, due to the need to pull forward additional thermal resource builds.

Table 29: Evergy Kansas Central Retirement Rankings

Rank	Plan	NPVRR	Difference	Description
1	ABAA	34,081		Retire Jeffrey 2 2039
2	AAAA	34,092	10	PP 2023; Extend DSM
3	ADAA	34,213	132	Retire La Cygne 2 2032
4	ACAA	34,577	496	Retire Jeffrey all 2030
5	AEAA	34,742	661	Retire all earliest

Section 8: Evergy Kansas Central Analysis of Directed Strategies

8.1 Plans at Endpoints

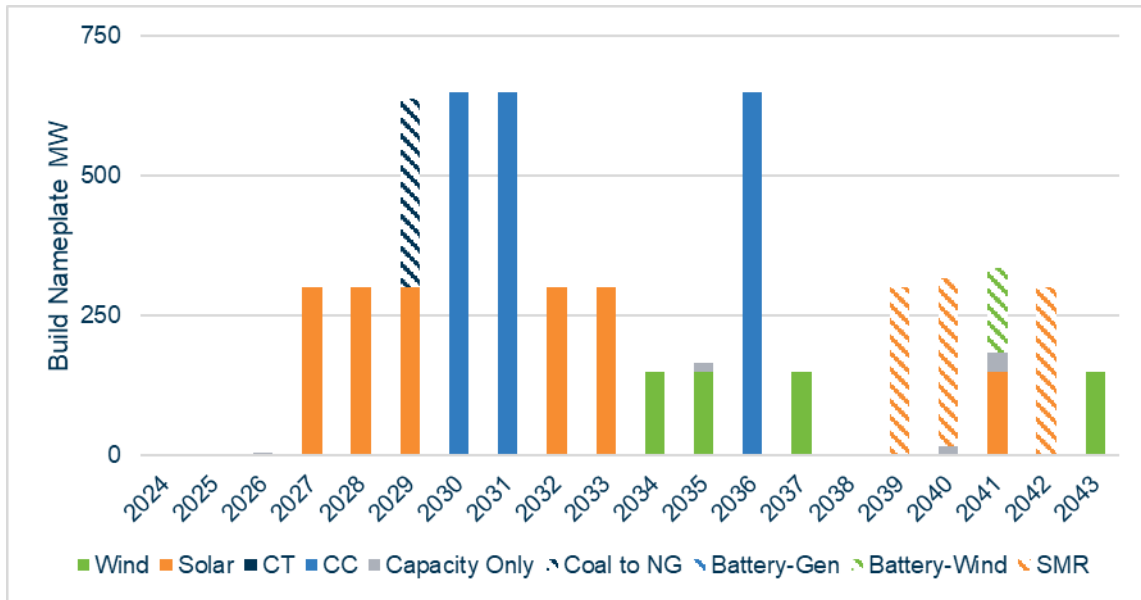
Plans created to determine the optimal resource additions in the High Carbon Restriction – High Natural Gas Price (“High/High”) future and the Low Carbon Restriction – Low Natural Gas Price (“Low/Low”) future are costly on a weighted-average basis.

Table 30: Rankings of Plans Created for Specific Futures

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,092		Mid/Mid
2	AAAD	34,538	447	Low/Low
3	AAAC	34,860	768	High/High

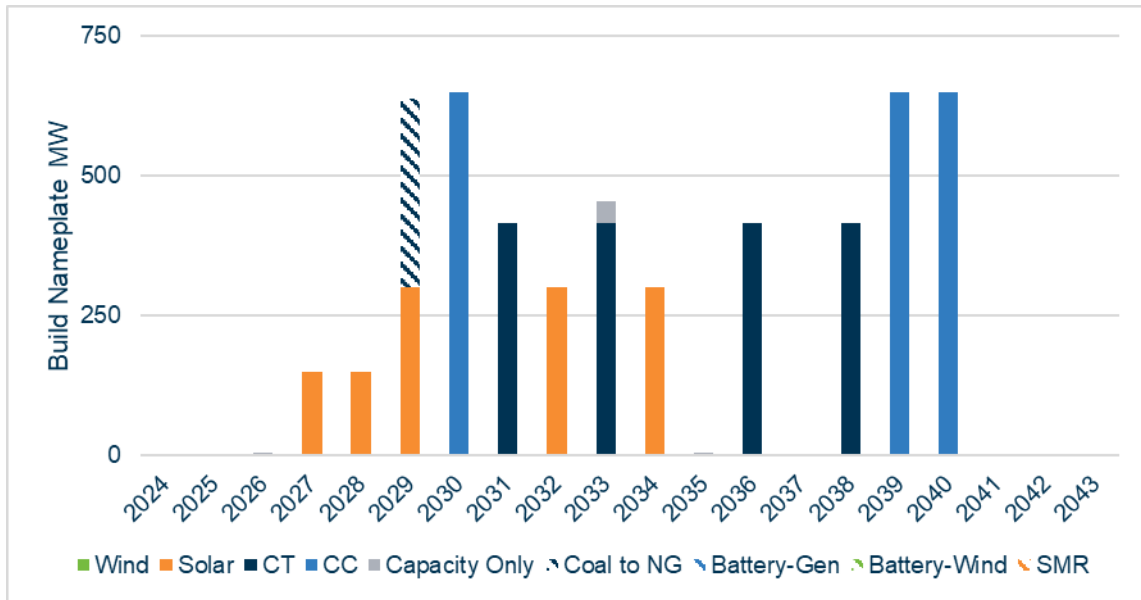
Capacity expansion modeling performed specifically in the High Carbon Restriction – High Natural Gas Price (“High/High”) scenario shows an additional early solar build and an increased level of wind builds compared to the Preferred Portfolio given the increased value of zero-carbon energy in a heavily carbon-restricted market. In the last five years of the planning horizon, three 300 MW Nuclear SMRs are added as well as 150 MW of storage. This plan demonstrates the elevated need for new sources of carbon-free energy if stringent carbon restrictions are in place.

Figure 48: Optimal Build Plan for High CO₂/ High NG Future AAAC



In contrast, there are no wind additions in the optimal resource plan for the Low/Low future, given the reduced value of zero-carbon energy without the imposition of carbon restrictions. The Low/Low has fewer early solar builds than the portfolio optimized at the Mid/Mid. Thermal resources are added with similar timing, although the Low/Low Plan is more heavily weighted toward combustion turbines as opposed to combined cycles. This is, again, driven by the reduced value of low- or zero-carbon energy which makes higher capacity factor Combined Cycles less valuable compared to Combustion Turbines (which are largely a capacity resource – as opposed to an energy resource).

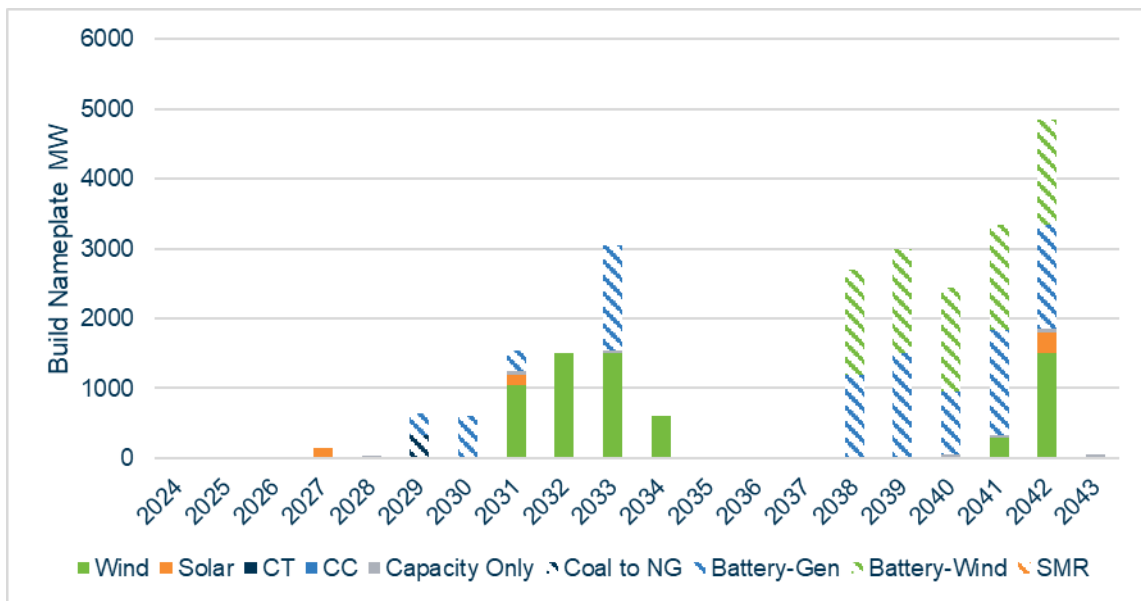
Figure 49: Optimal Build Plan for Low CO₂/ Low NG Future AAD



8.2 High Renewables Plans

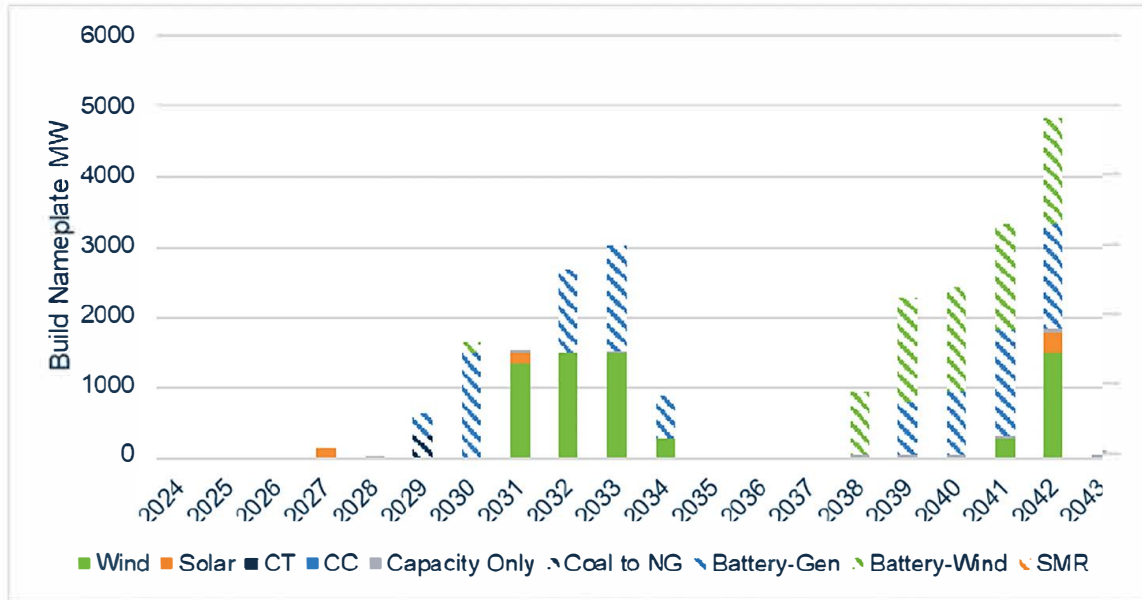
Two alternative resource plans were developed to maximize renewable resources. The first, AAAG used the Preferred Portfolio retirement dates, and optimized future builds using only renewables and storage.

Figure 50: Only Renewable and Storage Additions AAAG



The second, AEAG, included early retirements of all coal units (Jeffrey Unit 1 in 2030, La Cygne Unit 2 in 2032) with only renewable and storage builds.

Figure 51: Earliest Retirements, Only Renewable and Storage Additions AEAG



Renewable build alone, and renewable and storage build together cannot meet the summer and winter capacity requirements of Evergy Kansas Central in every year if capital spend limits are respected. Therefore, AAAG and AEAG resource portfolios were optimized for lowest cost with relaxed build limits. They would be difficult to implement due to the high volume of additions and would not meet financial metrics. Both plans have significantly higher NPVRR than the Preferred Portfolio.

Table 31: NPVRR Comparison of High Renewable Plans

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,092		Any builds, capital budget respected
2	AAAG	39,320	5,229	Only renewable/storage build, budget relaxed
3	AEAG	39,349	5,257	Retire all early, only renewable/storage, budget relaxed

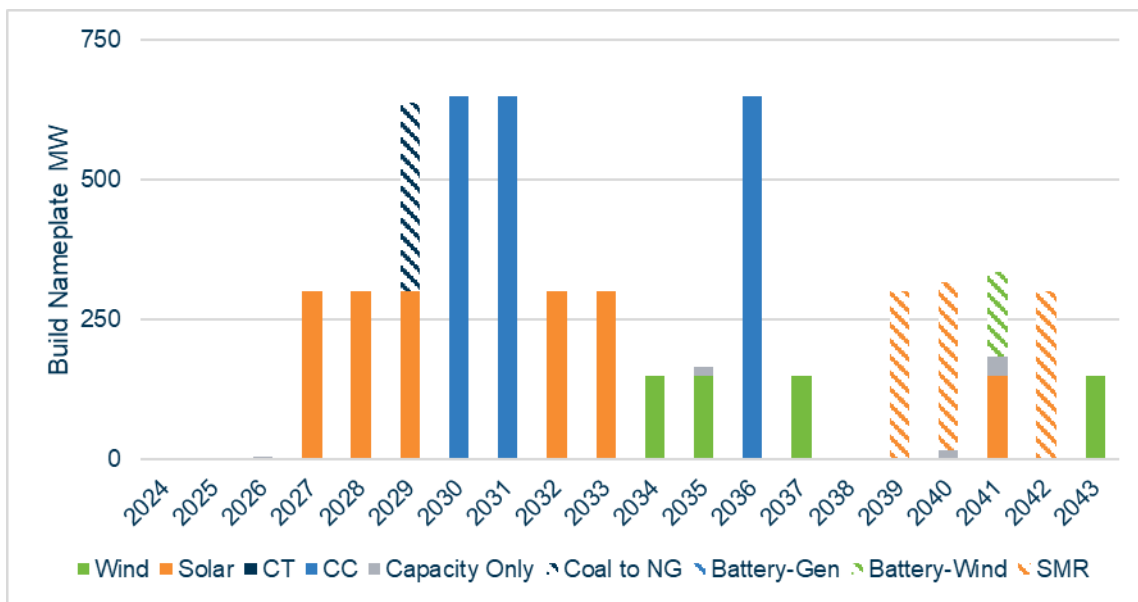
Section 9: Evergy Kansas Central Analysis of Discrete Scenarios

Evergy Kansas Central developed two ARPs to determine the optimal resource plans that would be lowest cost under either environmental policy extreme – high carbon restrictions due to new GHG rules and no carbon restrictions and no retirement pressures for coal resources.

9.1 Evergy Kansas Central GHG-Driven Retirement Portfolio

As will be explained in section 15.1.1 Evergy tested the optimal coal fleet retirement strategy assuming high carbon restrictions and high natural gas prices, at the joint-planning level. A prescriptive compliance plan applying the proposed GHG rule best system of emission reduction (BSER) was also developed and included for comparison with the retirement strategies. The lowest cost GHG ARP had the same retirements as the Preferred Portfolio, so the GHG portfolio is the same as the High/High portfolio AAAC.

Figure 52: GHG Rule Optimal Plan AAAC

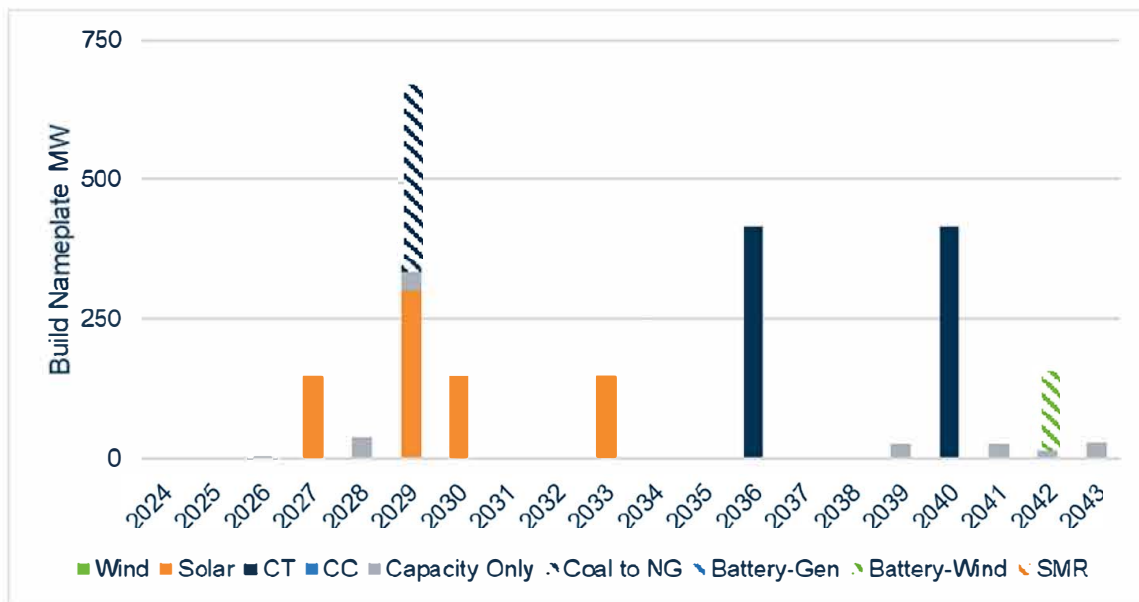


9.2 Low/Low No Retirements

The Low/Low No Retirements ARP was developed by extending the operation of all Jeffrey and La Cygne coal units through the planning horizon and optimizing resource

additions for the expectation of a non-CO₂ restricted, low natural gas price future. The plan added significantly less capacity, as would be expected, with solar additions in the first ten years, and combustion turbines and storage in later years. It did not add any wind resources and filled gaps in capacity in some years through market capacity.

Figure 53: Low/Low No Retirements Plan AFAD



9.3 Expected Costs of Planning for Discrete Scenarios

Both discrete plans are significantly higher cost than the Preferred Portfolio on a weighted-average-risk basis. AFAD is the most costly due to the lack of carbon-free energy available in carbon-restricted futures.

Table 32: NPVRR Comparison of Discrete Scenarios

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,092		Base planning assumptions
2	AAAC	34,860	768	High/High GHG rules
3	AFAD	36,490	2,398	Low/Low, No retirements

Section 10: Analysis of Evergy Kansas Central Contingency Plans

10.1 Execution Risk of 2027 Solar

If Evergy Kansas Central is unable to execute on the 150 MW of solar planned for 2027 in the Preferred Portfolio, the next best option is to add 150 MW of wind in 2027. This option also changes future resource build optimality. The 2031 combined cycle becomes a combustion turbine, and the next thermal resource is needed earlier, in 2033 rather than 2036.

Figure 54: Alternative Plan Without 2027 Solar AAAJ

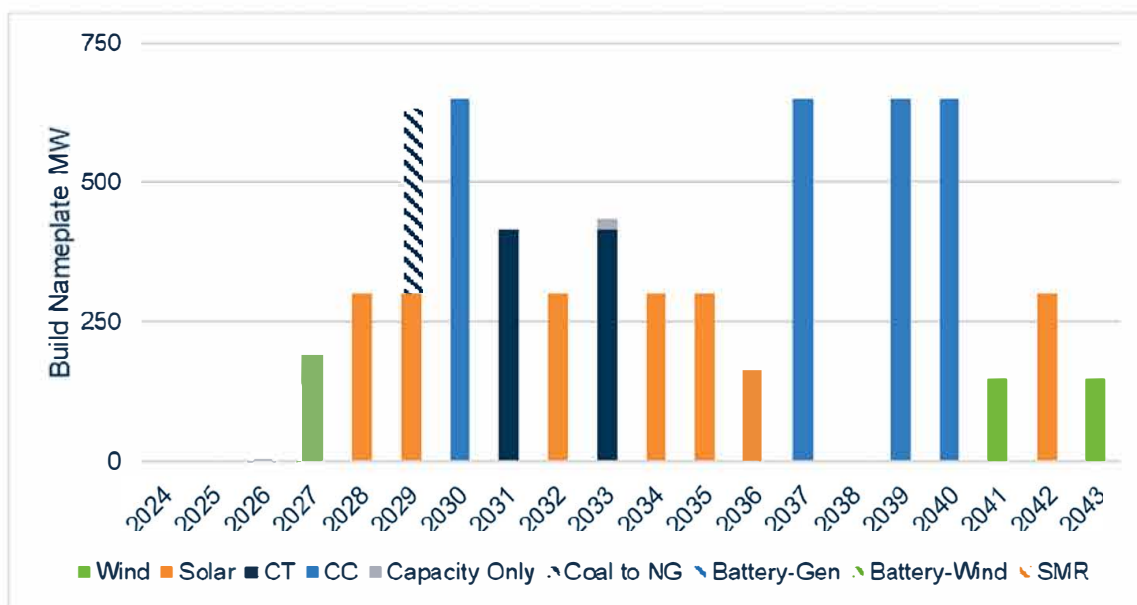


Table 33: NPVRR Comparison Without 2027 Solar

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,092		Base case builds
2	AAAJ	34,141	49	No 2027 Solar

10.2 DSM Programs End After KEEIA

Evergy Kansas Central's base planning assumption is that KEEIA programs continue to be approved through the 20-year planning horizon and grow over time. Evergy Kansas Central developed plan BAAA to assess how the need for resource additions would change if Kansas does not approve DSM programs after the 4-year KEEIA programs end.

The plan moves forward solar build in 2027 and adds a combined cycle in 2029. The additional capacity needs increase the expected value by over \$400 million.

Figure 55: Contingency Plan for KEEIA Programs End BAAA

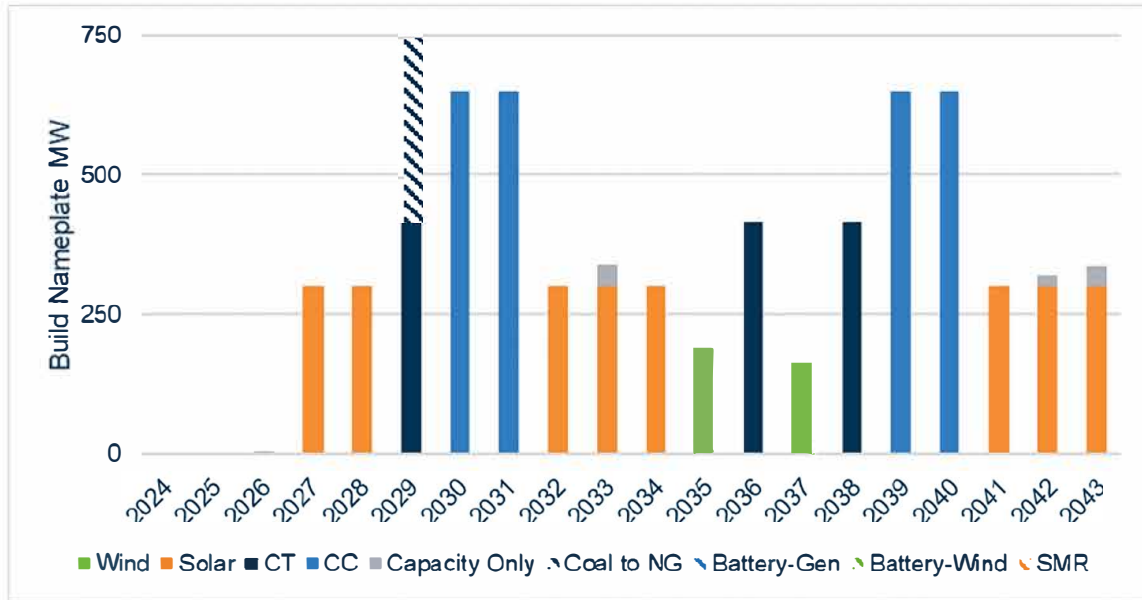


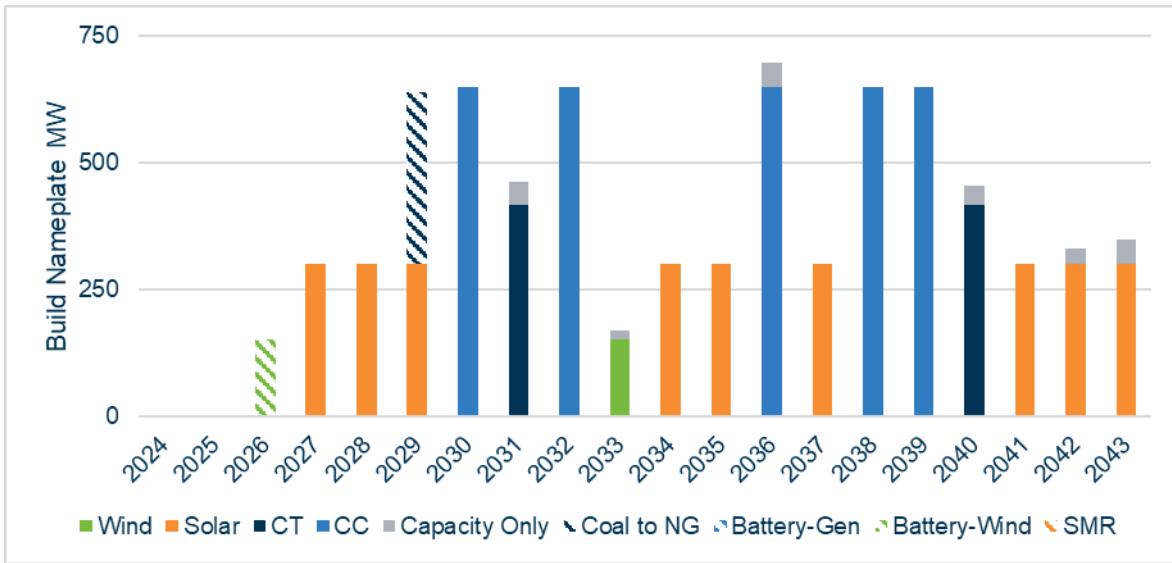
Table 34: NPVRR Comparison KEEIA DSM Ends

Rank	Plan	NPVRR	Difference	Description
1	AAAA	34,092		Extend DSM
2	BAAA	34,514	422	KEEIA Only

16.3 High Load Growth

Evergy Kansas Central developed an ARP using the high load forecast, which includes high economic growth as well as economy-wide electrification. This forecast requires significant energy and capacity additions as compared to the base load forecast. The ARP builds new resources in every year and shifts to more firm dispatchable resources. If the pace of electrification and economic growth align with this forecast, Evergy Kansas Central will need to adjust its resource plan to develop more firm dispatchable resources.

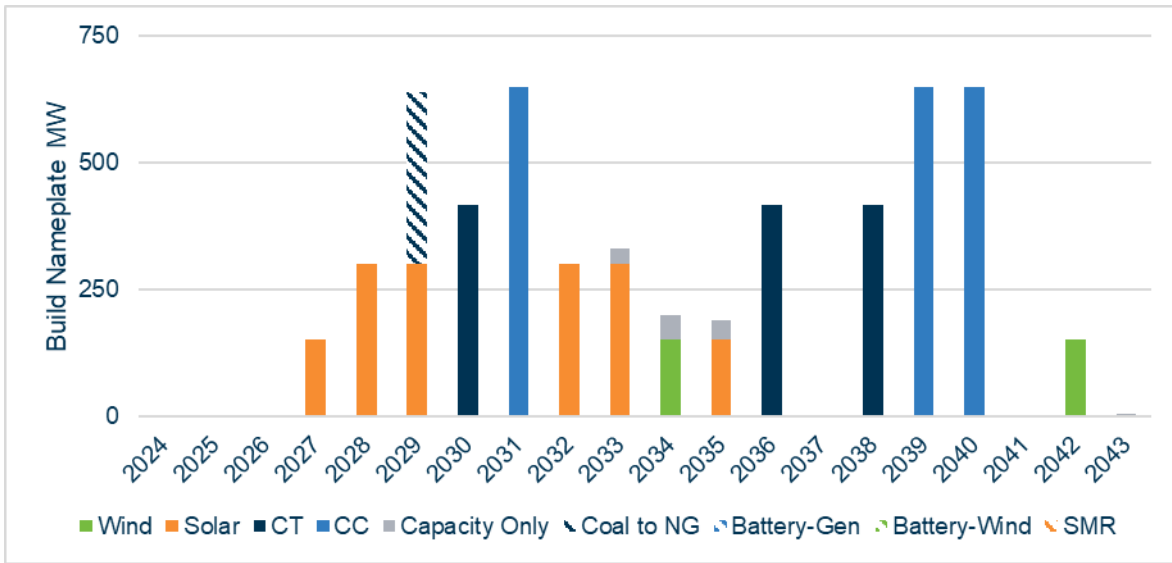
Figure 56: High Load Growth Plan AAAE



10.4 Low Load Growth

Eversky Kansas Central also developed an ARP using the low load forecast. The portfolio includes the same additions in 2027-2030 as the AAAA portfolio with the mid load forecast. The portfolio includes a combustion turbine rather than a combined cycle in 2030, and 300 MW less solar and wind resources in the later years of the plan.

Figure 57: Low Load Growth Plan AAAF

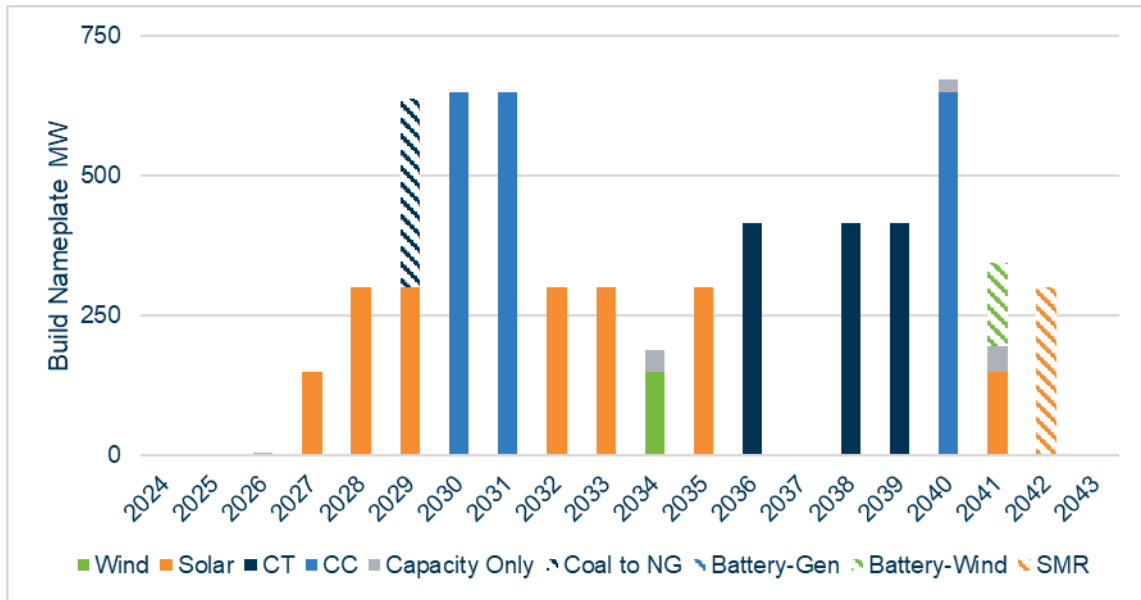


10.5 Future Carbon Capture and Nuclear SMR Options

Combined cycles with carbon capture were available resource options for the high CO₂/high natural gas future alternative resource plan and GHG rule alternative resource plans. All plans with combined cycle builds were upgraded to include carbon capture beginning in 2035 for the High CO₂ restriction endpoints (with capital costs and resource modifications included).

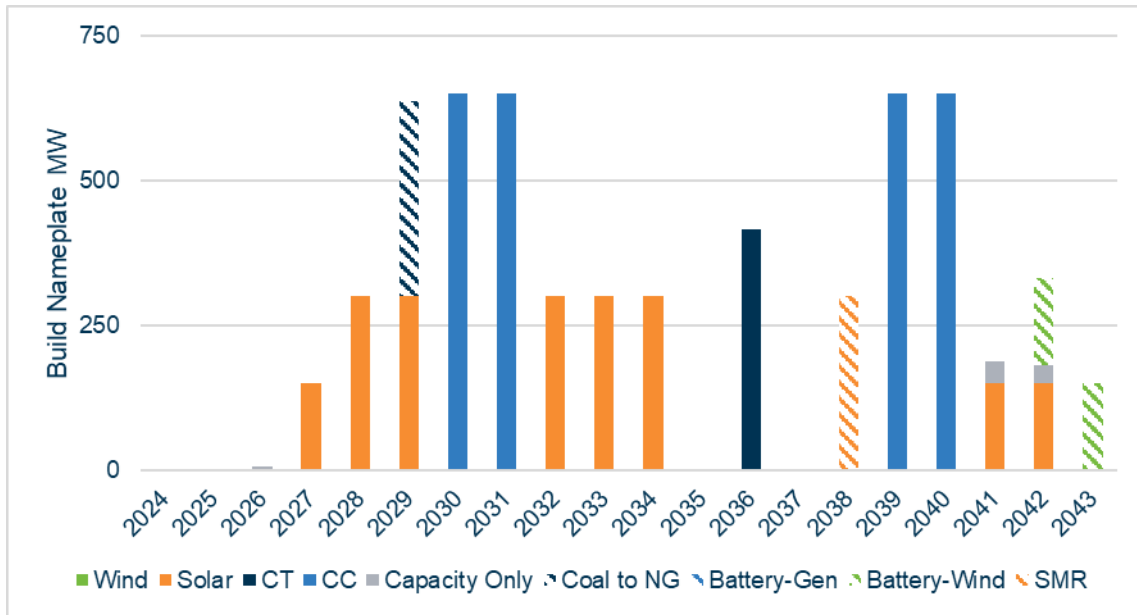
Evergy allowed Nuclear SMR as a resource option in the high CO₂/high natural gas future alternative resource plan and in the GHG rule alternative resource plans. The high CO₂/high natural gas resource plan selected an SMR in 2039.

Figure 58: SMR Build Portfolio AAAH



Eversky Kansas Central also tested SMR as a resource option in portfolio AAAH, when optimizing builds for the mid/mid/mid future. Given the option of adding one 300 MW SMR per year in 2039-2043, one SMR was selected in 2042. When the portfolio was given the option of selecting an SMR as early as 2038, when there are more favorable tax credits, the SMR was selected in 2038.

Figure 59: Earlier SMR Build AAI



Both portfolios have the same early and mid-term build decisions as portfolio AAAA which does not include the SMR option. If SMR technology becomes viable over the next few years, it may be an economic substitute for some of the later resource additions in the plan, such as wind, which also has high capacity factors of carbon-free generation.

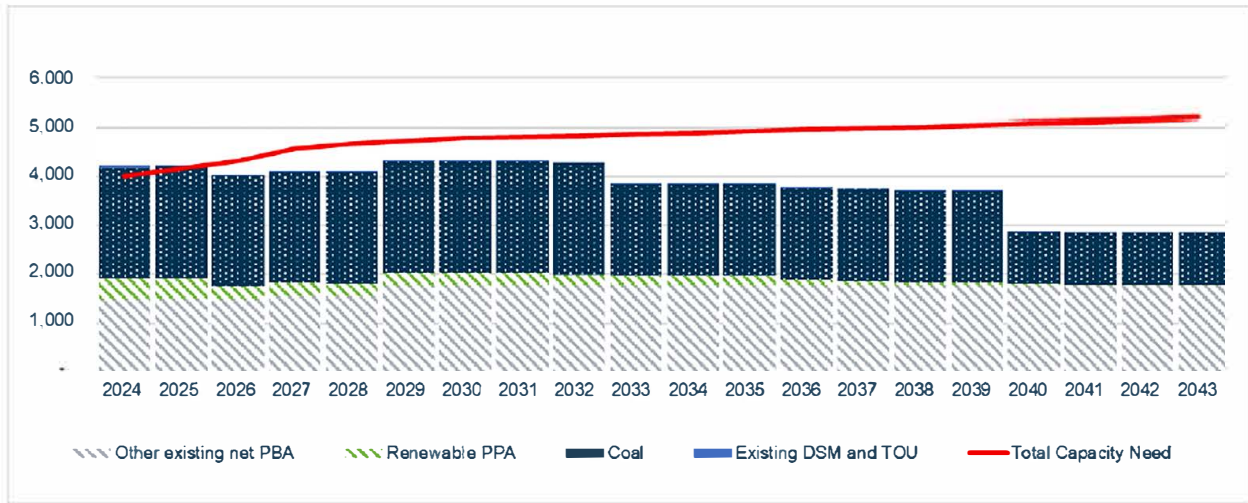
Section 11: Eversource Metro Alternative Resource Portfolio Development

In the 2023 IRP forecast, Eversource Metro was projected to have sufficient capacity for the next several years and selected a Preferred Portfolio that did not add new resources until 2029. The Eversource Metro fleet has capacity accreditation that currently exceeds its required needs and has contracted with Eversource Missouri West to sell capacity for the next few years.

Eversource Metro is now forecasting significant load growth over the next few years due to economic development. This load growth has been driven by economic development which is not yet included in the load forecasts described in Volume 2. Due to the maturity of the economic development activity, the forecasted impact on Eversource Metro's capacity and energy needs was factored into the requirements utilized for the development of alternative resource plans and this results in capacity being needed earlier to meet customer needs.

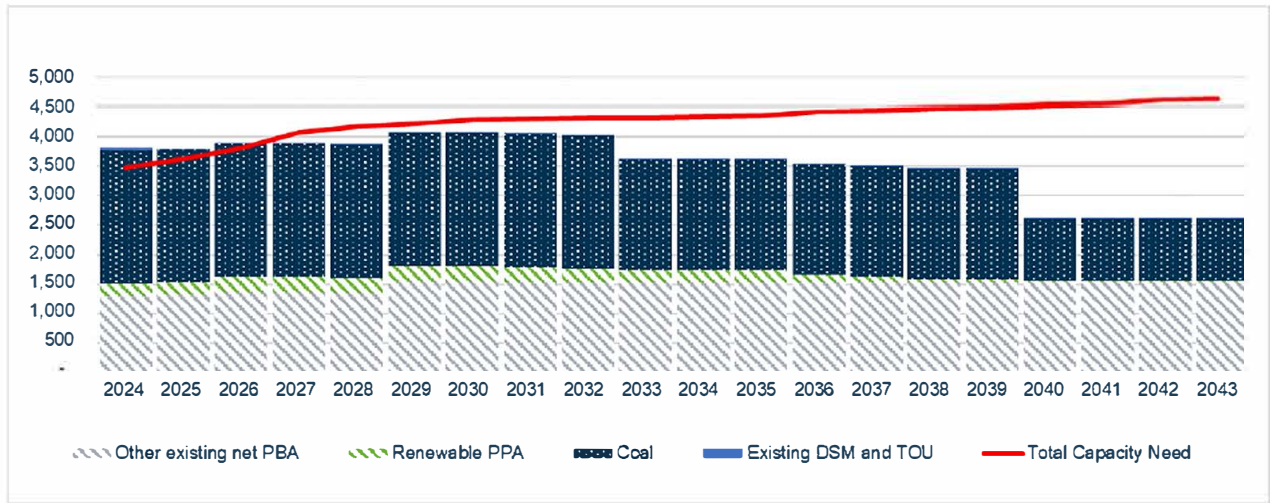
Eversource Metro developed various future alternate portfolios which meet its capacity needs with owned/contracted resources and minimal reliance on market capacity purchases due to the changing market environment. Eversource Metro is forecasted to need summer capacity as early as 2026. Capacity needs are forecasted to grow over time due to load growth, increasing reserve margin requirements, the expiration of renewable PPAs, and retirements of coal resources (based on the 2023 Preferred Portfolio retirement dates). New demand-side management programs beginning in 2025 and resource builds available beginning in 2026 were considered to meet capacity needs. Eversource Metro's planning criteria was to meet the majority of the summer need with resource additions and demand-side programs, with only 50 MW of market capacity available annually beginning in 2028.

Figure 60: Evergy Metro Summer Capacity Position



Evergy Metro resource plans also include meeting the forecasted winter capacity requirement. Evergy expects SPP to impose a winter requirement beginning in the winter of 2026/2027. Evergy Metro is summer peaking, as are all of the Evergy utilities, and it has a relatively lower need in winter than summer due to its fleet characteristics and winter peak forecast. Because Evergy Kansas Central has significant winter capacity length (due to its resource mix and lower winter peak load ratio), Evergy Metro’s resource planning includes the option to purchase winter market capacity through winter 2029/2030, after which it must be self-sufficient except for the annual market capacity allowance. Future demand-side management programs and renewable and storage resource builds provide less winter capacity than summer capacity, which is considered in developing the optimal resource plans to meet both winter and summer needs.

Figure 61: Evergy Metro Winter Capacity Position



Alternative resource portfolios (ARPs) were developed to assess base planning options, directed strategies, discrete scenarios, and contingency plans.

11.1 Base Planning Options

Base planning options include expected options available to Evergy Metro over the planning horizon. These include implementation of varying portfolios of demand-side management programs, accelerated or delayed retirements of coal resources, and addition of new renewable, storage, and thermal resources in a cadence that respects capital budget and commercial availability limitations.

Table 35: Base DSM Portfolio Options

Missouri DSM Portfolios
MAP
RAP
RAP Plus
RAP Minus
None

Since KEEIA programs were approved and the company is currently implementing them in Kansas, no changes to Kansas DSM portfolios were tested as base planning options.

However, the possibility that KEEIA could end after the four year cycle was tested as a contingency.

Table 36: Base Coal Retirement Options

Coal Resource	Base Retire Year	Early Retire Year	Late Retire Year
Iatan 1	2039	2030	n/a
Iatan 2	None	2030	n/a
La Cygne 1	2032	n/a	n/a
La Cygne 2	2039	2032	n/a
Hawthorn 5	None	2027	n/a

Table 37: Base Resource Addition Options

Resource Addition Type	Earliest Year Available
Battery-Wind	2026
Battery-Gen	2026
Wind	2026
Solar	2027
Combined Cycle	2028
Combustion Turbine	2028

11.2 Directed Strategies

Eversource Metro also developed several scenarios to reflect how changes to planning strategy would affect planned additions and economics, including the following ARPs:

- Plan for high natural gas – high carbon dioxide emissions limit future, with availability of combined-cycle with carbon capture beginning in 2035, and nuclear SMR beginning in 2039
- Plan for low natural gas – low (no) carbon dioxide emissions limit future
- Plan with only renewable and storage additions
- Plan with earliest retirement of coal fleet and only renewable and storage additions

11.3 Discrete Scenarios

Eversource Metro developed two scenarios intended to be extremes in planning strategy. One reflects a possible implementation of the EPA GHG rule, and optimizes the retirement and new addition decisions based on the high natural gas, high carbon dioxide emissions

restriction future. The second reflects a different future with reduced expectations of environmental rules, including no emissions restrictions and no requirements for selective catalytic reduction (SCR) addition (where applicable). This plan is optimized using the low natural gas, low (no) carbon dioxide emissions future forecast.

11.4 Contingency Plans

Eversource Metro developed contingency plans to understand how optimal resource additions might vary based on risks around planning assumptions. One risk is near-term execution of the resource plan. If Eversource Metro is unable to acquire or develop a resource in the expected timeline, or does not receive regulatory approval for the resource, it may have to make changes to its plan. The two scenarios considering these near-term risks are:

- No 2027 solar build
- Kansas DSM programs end after the approved 4 years

The other risk that Eversource Metro considered through contingency plans is that the long-term load forecast may differ from the base planning assumption. Higher or lower load growth over the planning horizon may change the optimal timing, type, and amount of resource additions. The three alternate load forecasts considered were:

- High Load – including electrification
- Mid Load forecast with no new economic development load included
- Low Load

Section 12: Evergy Metro Alternative Resource Plans and Rankings

12.1 Summary of Alternative Resource Plans

Table 38: Evergy Metro Alternative Resource Plan Name Key

Demand Response Potential	Retirements	Coal to NG	Other
A. RAP MO, Extend KS DSM	A. PP 2023 retirement dates	A. None	A. No Economic Development
B. MAP MO, Extend KS DSM	B. Retire Iatan1 2030		C. No 2027 Solar
C. RAP Plus MO, Extend KS DSM	C. Retire Hawthorn 5 2027		D. High/High
D. RAP Minus MO, Extend KS DSM	D. Retire La Cygne 2 2032		E. Low/Low
E. No DSM MO, Extend KS DSM	E. All early retirements		F. High load
F. No TOU, No DSM MO, Extend KS DSM	F. No retirements		G. Low load
G. RAP Plus MO, KEEIA Only DSM			I. Only renewable/storage build, no budget constraint
H. No DSM MO, KEEIA Only DSM			J. RES Only
			K. Allow SMR 2039+
			L. Allow SMR 2038+

Table 39: Evergy Metro Alternative Resource Plan Descriptions²⁶

Plan Name	DSM Level	Retirements	Renewable Additions		Storage Additions	Thermal Additions
			Wind	Solar		
Metro AAAB	RAP MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2026 150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035	300 MW 2027 150 MW 2028 150 MW 2041 300 MW 2042 150 MW 2043		415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 415 MW CT 2039
Metro BAAB	MAP MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2040 150 MW 2041	300 MW 2027 150 MW 2028 150 MW 2042 300 MW 2043		415 MW CT 2032 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039
Metro BEAI	MAP MO, Extend KS DSM	Hawthorn 5: 2027 Iatan 1: 2030 Iatan 2: 2030 La Cygne 1: 2032 La Cygne 2: 2032	300 MW 2030 150 MW 2031 1200 MW 2032 1500 MW 2033 600 MW 2041 1500 MW 2042	600 MW 2042	150 MW BW 2026 150 MW BW 2027 600 MW BW 2028 1500 MW BG 2030 300 MW BG 2031 1350 MW BG 2032 1500 MW BG 2033 1200 MW BG 2034 1050 MW BW 2038 1500 MW BW 2039 1500 MW BW 2040 600 MW BG 2040 1500 MW BW 2041 1500 MW BG 2041 1500 MW BW 2042 1500 MW BG 2042	
Metro CAAA	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2031 150 MW 2032	300 MW 2033 300 MW 2034 300 MW 2042 150 MW 2043		325 MW CC 2037 325 MW CC 2038 415 MW CT 2039
Metro CAAB	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2040		415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 325 MW CC 2039 325 MW CC 2041
Metro CAAC	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2040 150 MW 2042	300 MW 2028	150 MW BW 2026	415 MW CT 2032 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039 325 MW CC 2041

²⁶ BW refers to battery at wind node, BG refers to battery at generation node

Metro CAAD	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2026 150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2036 150 MW 2038	300 MW 2027 300 MW 2028 150 MW 2042	150 MW BW 2041 150 MW BG 2041 150 MW BG 2042	415 MW CT 2032 325 MW CC 2037 300 MW SMR 2039 300 MW SMR 2040
Metro CAAE	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039		300 MW 2027 150 MW 2028	150 MW BW 2042	415 MW CT 2032 325 MW CC 2035 415 MW CT 2038 415 MW CT 2039
Metro CAAF	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029	300 MW 2027 300 MW 2033 300 MW 2040 300 MW 2042 300 MW 2043	150 MW BG 2026 150 MW BW 2026	325 MW CC 2028 325 MW CC 2030 325 MW CC 2031 325 MW CC 2032 325 MW CC 2034 325 MW CC 2035 325 MW CC 2036 415 MW CT 2037 415 MW CT 2038 415 MW CT 2039 325 MW CC 2041
Metro CAAG	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2041 150 MW 2042	300 MW 2027		325 MW CC 2032 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039
Metro CAAI	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	1050 MW 2032 1500 MW 2033 150 MW 2039 300 MW 2042	300 MW 2027 150 MW 2028	450 MW BG 2032 600 MW BG 2033 900 MW BW 2038 1500 MW BG 2039 1500 MW BW 2039 1200 MW BW 2040 1050 MW BG 2041 900 MW BW 2041 1200 MW BG 2042 1500 MW BW 2042	
Metro CAAK	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2040		415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 325 MW CC 2039 325 MW CC 2041
Metro CAAL	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2040		415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 325 MW CC 2039 325 MW CC 2041
Metro CBAB	RAP+ MO, Extend KS DSM	Iatan 1: 2030 La Cygne 1: 2032 La Cygne 2: 2039	150 MW 2026 150 MW 2029 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2040 150 MW 2041 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2038		415 MW CT 2030 415 MW CT 2032 325 MW CC 2035 325 MW CC 2039

Metro CCAB	RAP+ MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2032 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2040 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2038		325 MW CC 2031 415 MW CT 2032 325 MW CC 2036 325 MW CC 2039 325 MW CC 2041
Metro CDAB	RAP+ MO, Extend KS DSM	Hawthorn 5 2027 La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2040	300 MW 2027 300 MW 2042	150 MW BW 2026 150 MW BG 2026	415 MW CT 2028 415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 415 MW CT 2039 325 MW CC 2041
Metro CEAB	RAP+ MO, Extend KS DSM	Hawthorn 5 2027 Iatan 1: 2030 Iatan 2: 2030 La Cygne 1: 2032 La Cygne 2: 2032	150 MW 2033 150 MW 2035 150 MW 2036 150 MW 2037 150 MW 2038 150 MW 2040 150 MW 2041	300 MW 2042 150 MW 2043	150 MW BG 2026 150 MW BW 2026 300 MW BW 2027	415 MW CT 2028 415 MW CT 2029 415 MW CT 2030 325 MW CC 2031 415 MW CT 2032 325 MW CC 2034 325 MW CC 2039
Metro CFAB	RAP+ MO, Extend KS DSM		150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2032 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2041 150 MW 2042	300 MW 2027 150 MW 2028 150 MW 2040		325 MW CC 2036
Metro CFAE	RAP+ MO, Extend KS DSM			300 MW 2027 150 MW 2028 150 MW 2043		415 MW CT 2035
Metro DAAB	RAP- MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2035 150 MW 2040	150 MW 2027 150 MW 2028 300 MW 2041 300 MW 2042	150 MW BW 2026	415 MW CT 2032 325 MW CC 2036 325 MW CC 2038 415 MW CT 2039
Metro EAAB	No DSM MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2040 150 MW 2041	300 MW 2027 300 MW 2028 300 MW 2042	150 MW BW 2026	415 MW CT 2032 325 MW CC 2035 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039
Metro EAAJ	No DSM MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039		8 MW 2034	150 MW BG 2026 150 MW BW 2026 150 MW BW 2027	325 MW CC 2028 325 MW CC 2032 325 MW CC 2036 325 MW CC 2037 325 MW CC 2038 325 MW CC 2040
Metro FAAB	No TOU, No DSM MO, Extend KS DSM	La Cygne 1: 2032 La Cygne 2: 2039 Iatan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2040	150 MW 2027 300 MW 2028 300 MW 2041 300 MW 2042	150 MW BG 2026 150 MW BW 2026	325 MW CC 2032 325 MW CC 2035 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039

Metro GAAB	RAP+ MO, KEEIA Only DSM	La Cygne 1: 2032 La Cygne 2: 2039 latan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2034 150 MW 2041 150 MW 2042	300 MW 2027 300 MW 2028 150 MW 2040		415 MW CT 2032 325 MW CC 2035 325 MW CC 2037 325 MW CC 2038 325 MW CC 2039
Metro HAAB	No DSM MO, KEEIA Only DSM	La Cygne 1: 2032 La Cygne 2: 2039 latan 1: 2039	150 MW 2029 150 MW 2030 150 MW 2031 150 MW 2033 150 MW 2035 150 MW 2040 150 MW 2041	300 MW 2027 300 MW 2028 300 MW 2042 150 MW 2043	150 MW BG 2026 150 MW BW 2026	415 MW CT 2032 325 MW CC 2034 325 MW CC 2037 325 MW CC 2038 415 MW CT 2039

12.2 Overall Plan Rankings

Table 40: Metro Overall Plan Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus
2	AAAB	23,190	47	RAP
3	CCAB	23,217	73	Retire La Cygne 2 2032
4	GAAB	23,271	128	RAP Plus MO, KEEIA Only DSM
5	CAAC	23,274	130	No 2027 Solar
6	CBAB	23,307	163	Retire latan 1 2030
7	DAAB	23,337	193	RAP Minus
8	BAAB	23,370	226	MAP
9	EAAB	23,394	250	No DSM MO
10	FAAB	23,516	372	No TOU, No DSM MO
11	CAAD	23,574	430	High/High
12	HAAB	23,685	542	No DSM MO, KEEIA Only DSM
13	CDAB	23,881	738	Retire Hawthorn 5 2027
14	CAAE	24,936	1,792	Low/Low
15	CEAB	25,029	1,885	All early retirements
16	EAAJ	25,079	1,935	RES only
17	CFAE	25,130	1,986	Low/Low, no retirements
18	CAAI	26,316	3,172	Only renewable/storage build, no budget
19	BEAI	30,424	7,280	MAP; Ret all early; Only renewable/storage build, no budget

12.3 Rankings by CO₂ Emissions RestrictionTable 41: High CO₂ Emissions Restrictions Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,864		RAP Plus
2	CCAB	23,918	54	Retire La Cygne 2 2032
3	CAAD	23,948	84	High/High
4	GAAB	24,025	161	RAP Plus MO, KEEIA Only DSM
5	AAAB	24,097	233	RAP
6	CAAC	24,117	253	No 2027 Solar
7	BAAB	24,135	271	MAP
8	EAAB	24,144	280	No DSM MO
9	FAAB	24,283	420	No TOU, No DSM MO
10	CBAB	24,422	558	Retire Iatan 1 2030
11	DAAB	24,453	589	RAP Minus
12	HAAB	24,585	721	No DSM MO, KEEIA Only DSM
13	CDAB	24,721	857	Retire Hawthorn 5 2027
14	EAAJ	25,598	1,734	RES only
15	CEAB	25,850	1,986	All early retirements
16	CAAI	26,717	2,854	Only renewable/storage build, no budget
17	CAAE	27,769	3,905	Low/Low
18	CFAE	28,867	5,003	Low/Low, no retirements
19	BEAI	30,935	7,071	MAP; Ret all early; Only renewable/storage build, no budget

Table 42: Mid CO₂ Emissions Restrictions Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,111		RAP Plus
2	AAAB	23,122	11	RAP
3	CCAB	23,186	75	Retire La Cygne 2 2032
4	CBAB	23,210	99	Retire Iatan 1 2030
5	CAAC	23,230	119	No 2027 Solar
6	GAAB	23,243	132	RAP Plus MO, KEEIA Only DSM
7	DAAB	23,259	148	RAP Minus
8	BAAB	23,318	207	MAP
9	EAAB	23,363	252	No DSM MO
10	FAAB	23,488	377	No TOU, No DSM MO
11	CAAD	23,532	421	High/High
12	HAAB	23,665	554	No DSM MO, KEEIA Only DSM
13	CDAB	23,797	686	Retire Hawthorn 5 2027
14	CEAB	24,916	1,805	All early retirements
15	CAAE	25,249	2,138	Low/Low
16	CFAE	25,508	2,397	Low/Low, no retirements
17	EAAJ	25,761	2,650	RES only
18	CAAI	26,259	3,148	Only renewable/storage build, no budget
19	BEAI	30,336	7,225	MAP; Ret all early; Only renewable/storage build, no budget

Table 43: Low CO₂ Emissions Restrictions Rankings

Rank	Plan	NPVRR	Difference	Description
1	CFAE	21,980		Low/Low, no retirements
2	CAAE	22,485	505	Low/Low
3	CAAB	22,790	810	RAP Plus
4	AAAB	22,811	831	RAP
5	DAAB	22,854	874	RAP Minus
6	CBAB	22,869	889	Retire Iatan 1 2030
7	CCAB	22,870	889	Retire La Cygne 2 2032
8	CAAC	22,874	894	No 2027 Solar
9	GAAB	22,887	907	RAP Plus MO, KEEIA Only DSM
10	EAAB	23,018	1,038	No DSM MO
11	BAAB	23,036	1,055	MAP
12	FAAB	23,122	1,142	No TOU, No DSM MO
13	EAAJ	23,129	1,148	RES only
14	HAAB	23,195	1,215	No DSM MO, KEEIA Only DSM
15	CAAD	23,450	1,470	High/High
16	CDAB	23,580	1,600	Retire Hawthorn 5 2027
17	CEAB	24,807	2,827	All early retirements
18	CAAI	26,211	4,230	Only renewable/storage build, no budget
19	BEAI	30,328	8,348	MAP; Ret all early; Only renewable/storage build, no budget

12.4 Rankings by Natural Gas Price

Table 44: High Natural Gas Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAB	23,552		RAP
2	CAAB	23,562	10	RAP Plus
3	CCAB	23,670	118	Retire La Cygne 2 2032
4	GAAB	23,713	160	RAP Plus MO, KEEIA Only DSM
5	CAAC	23,716	164	No 2027 Solar
6	CAAD	23,726	174	High/High
7	CBAB	23,755	203	Retire Iatan 1 2030
8	BAAB	23,763	211	MAP
9	DAAB	23,792	240	RAP Minus
10	EAAB	23,833	281	No DSM MO
11	FAAB	23,969	417	No TOU, No DSM MO
12	HAAB	24,149	597	No DSM MO, KEEIA Only DSM
13	CDAB	24,400	848	Retire Hawthorn 5 2027
14	CAAE	25,575	2,023	Low/Low
15	CFAE	25,724	2,172	Low/Low, no retirements
16	EAAJ	25,797	2,244	RES only
17	CEAB	26,122	2,569	All early retirements
18	CAAI	26,290	2,738	Only renewable/storage build, no budget
19	BEAI	30,363	6,811	MAP; Ret all early; Only renewable/storage build, no budget

Table 45: Mid Natural Gas Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,140		RAP Plus
2	AAAB	23,191	51	RAP
3	CCAB	23,212	72	Retire La Cygne 2 2032
4	GAAB	23,267	127	RAP Plus MO, KEEIA Only DSM
5	CAAC	23,270	129	No 2027 Solar
6	CBAB	23,304	164	Retire Iatan 1 2030
7	DAAB	23,331	191	RAP Minus
8	BAAB	23,371	230	MAP
9	EAAB	23,392	251	No DSM MO
10	FAAB	23,512	371	No TOU, No DSM MO
11	CAAD	23,573	433	High/High
12	HAAB	23,674	534	No DSM MO, KEEIA Only DSM
13	CDAB	23,873	732	Retire Hawthorn 5 2027
14	CAAE	24,896	1,755	Low/Low
15	CEAB	24,978	1,838	All early retirements
16	EAAJ	25,022	1,881	RES only
17	CFAE	25,081	1,940	Low/Low, no retirements
18	CAAI	26,307	3,167	Only renewable/storage build, no budget
19	BEAI	30,408	7,268	MAP; Ret all early; Only renewable/storage build, no budget

Table 46: Low Natural Gas Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	22,969		RAP Plus
2	CCAB	23,028	59	Retire La Cygne 2 2032
3	AAAB	23,034	64	RAP
4	GAAB	23,088	119	RAP Plus MO, KEEIA Only DSM
5	CAAC	23,091	121	No 2027 Solar
6	CBAB	23,118	148	Retire Iatan 1 2030
7	DAAB	23,149	179	RAP Minus
8	BAAB	23,200	231	MAP
9	EAAB	23,209	240	No DSM MO
10	FAAB	23,327	358	No TOU, No DSM MO
11	HAAB	23,503	533	No DSM MO, KEEIA Only DSM
12	CAAD	23,509	540	High/High
13	CDAB	23,671	702	Retire Hawthorn 5 2027
14	CEAB	24,633	1,664	All early retirements
15	CAAE	24,720	1,751	Low/Low
16	EAAJ	24,852	1,883	RES only
17	CFAE	24,945	1,976	Low/Low, no retirements
18	CAAI	26,339	3,370	Only renewable/storage build, no budget
19	BEAI	30,472	7,503	MAP; Ret all early; Only renewable/storage build, no budget

12.5 Rankings by Construction Costs

Table 47: High Construction Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,722		RAP Plus
2	CCAB	23,784	62	Retire La Cygne 2 2032
3	CAAC	23,831	109	No 2027 Solar
4	AAAB	23,857	135	RAP
5	GAAB	23,883	161	RAP Plus MO, KEEIA Only DSM
6	DAAB	23,927	205	RAP Minus
7	CBAB	23,949	227	Retire Iatan 1 2030
8	BAAB	23,963	241	MAP
9	EAAB	24,049	327	No DSM MO
10	FAAB	24,131	409	No TOU, No DSM MO
11	HAAB	24,390	668	No DSM MO, KEEIA Only DSM
12	CAAD	24,520	798	High/High
13	CDAB	24,574	852	Retire Hawthorn 5 2027
14	CAAE	25,214	1,491	Low/Low
15	EAAJ	25,305	1,583	RES only
16	CFAE	25,330	1,608	Low/Low, no retirements
17	CEAB	25,703	1,981	All early retirements
18	CAAI	28,058	4,336	Only renewable/storage build, no budget
19	BEAI	33,106	9,384	MAP; Ret all early; Only renewable/storage build, no budget

Table 48: Mid Construction Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,150		RAP Plus
2	AAAB	23,193	43	RAP
3	CCAB	23,216	67	Retire La Cygne 2 2032
4	CAAC	23,270	121	No 2027 Solar
5	GAAB	23,280	130	RAP Plus MO, KEEIA Only DSM
6	CBAB	23,309	160	Retire Iatan 1 2030
7	DAAB	23,330	180	RAP Minus
8	BAAB	23,374	224	MAP
9	EAAB	23,392	242	No DSM MO
10	FAAB	23,503	353	No TOU, No DSM MO
11	CAAD	23,553	404	High/High
12	HAAB	23,669	519	No DSM MO, KEEIA Only DSM
13	CDAB	23,866	716	Retire Hawthorn 5 2027
14	CAAE	24,937	1,787	Low/Low
15	CEAB	24,988	1,838	All early retirements
16	EAAJ	25,047	1,898	RES only
17	CFAE	25,128	1,978	Low/Low, no retirements
18	CAAI	26,109	2,959	Only renewable/storage build, no budget
19	BEAI	30,003	6,854	MAP; Ret all early; Only renewable/storage build, no budget

Table 49: Low Constructions Costs Rankings

Rank	Plan	NPVRR	Difference	Description
1	AAAB	22,519		RAP
2	CAAB	22,553	35	RAP Plus
3	GAAB	22,644	125	RAP Plus MO, KEEIA Only DSM
4	CCAB	22,649	130	Retire La Cygne 2 2032
5	CBAB	22,658	139	Retire Iatan 1 2030
6	CAAD	22,667	148	High/High
7	CAAC	22,724	206	No 2027 Solar
8	EAAB	22,743	224	No DSM MO
9	DAAB	22,760	241	RAP Minus
10	BAAB	22,769	250	MAP
11	FAAB	22,927	408	No TOU, No DSM MO
12	HAAB	23,012	494	No DSM MO, KEEIA Only DSM
13	CDAB	23,220	701	Retire Hawthorn 5 2027
14	CEAB	24,437	1,918	All early retirements
15	CAAE	24,657	2,138	Low/Low
16	EAAJ	24,915	2,396	RES only
17	CFAE	24,933	2,415	Low/Low, no retirements
18	CAAI	24,987	2,469	Only renewable/storage build, no budget
19	BEAI	28,583	6,064	MAP; Ret all early; Only renewable/storage build, no budget

Section 13: Analysis of Metro Base Planning Decisions

13.1 Comparison of Demand-Side Management Potential Portfolio Options

An ARP for each Missouri demand-side management portfolio was created by using the same base scenario assumptions and varying only the portfolio option. Generally, the greater the amount of peak load reduction associated with a portfolio, the more it would be expected to reduce the need for other resource additions or defer additions to later in the time horizon. Maximum Achievable Potential (MAP) has the highest peak load reduction over the 20-year horizon, and the highest costs per unit of reduction. Other programs considered, in order of declining capacity value and cost, were RAP Plus, RAP, and RAP Minus. A plan without future DSM programs, after the MEEIA extension ends in 2024, was also considered.

Table 50: Rankings of Demand-Side Management Portfolio Options

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus
2	AAAB	23,190	47	RAP
3	DAAB	23,337	193	RAP Minus
4	BAAB	23,370	226	MAP
5	EAAB	23,394	250	No DSM MO

The top ranked plans were CAAB (RAP Plus) followed by AAAA (RAP). Both have very similar optimal resource plans, with the same additions 2027-2036, including 300 MW solar in 2027 and 150 MW solar in 2028, 450 MW of wind 2029-2031. The primary near-term difference is that the RAP plan includes a wind build in 2026 that is deferred until 2042 in the RAP Plus plan. The greater capacity need earlier in the plan makes the RAP Plan more costly.

Figure 62: RAP Plan AAAB

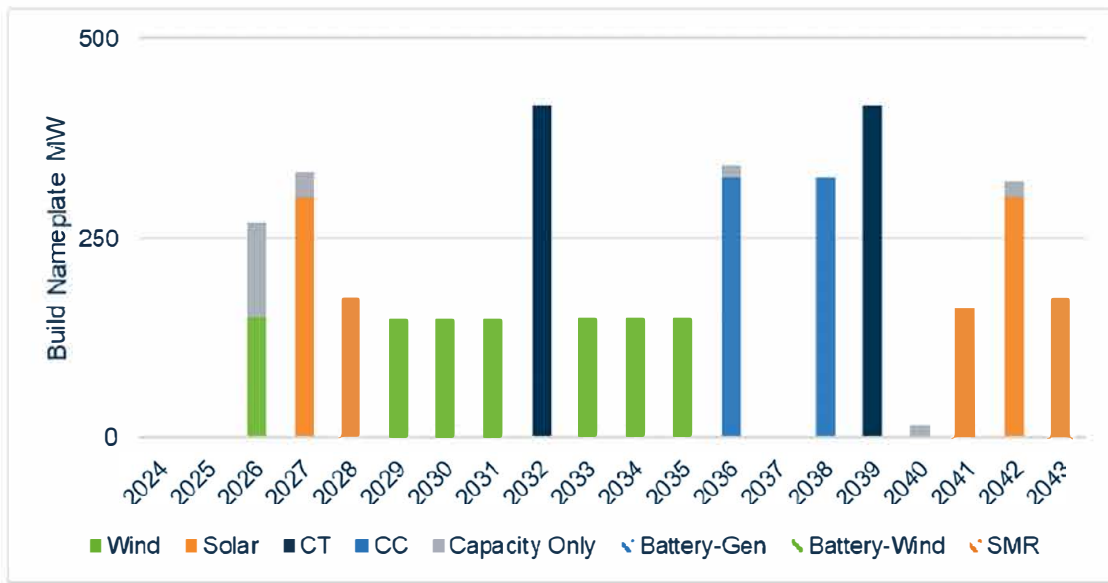
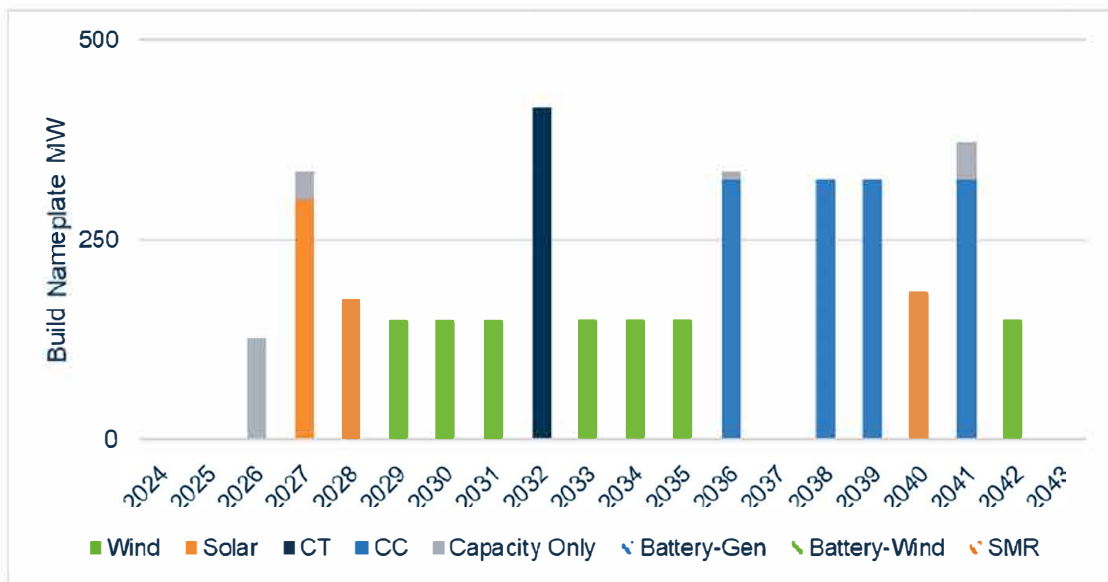
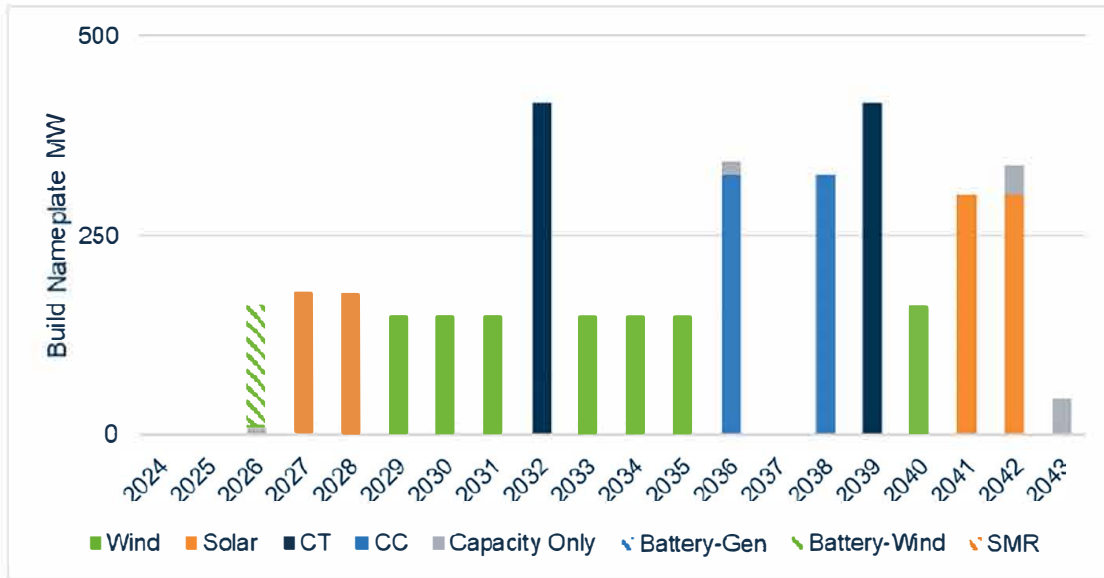


Figure 63: RAP Plus Plan CAAB



The RAP Minus Plan (DAAB) substitutes a 150 MW storage build in 2026 for 150 MW of solar in 2027, compared to the RAP Plus Plan, and is higher cost by over \$200 million.

Figure 64: RAP Minus Plan DAAB



The MAP (BAAB) and No DSM (EAAB) plans are significantly more expensive. The MAP plan additions are the same as RAP Plus through 2035. The plan with No DSM is the most expensive and includes an additional 150 MW battery build in 2026 and an additional 150 MW of solar in 2028, likely to meet the greater capacity need.

Figure 65: MAP Plan BAAB

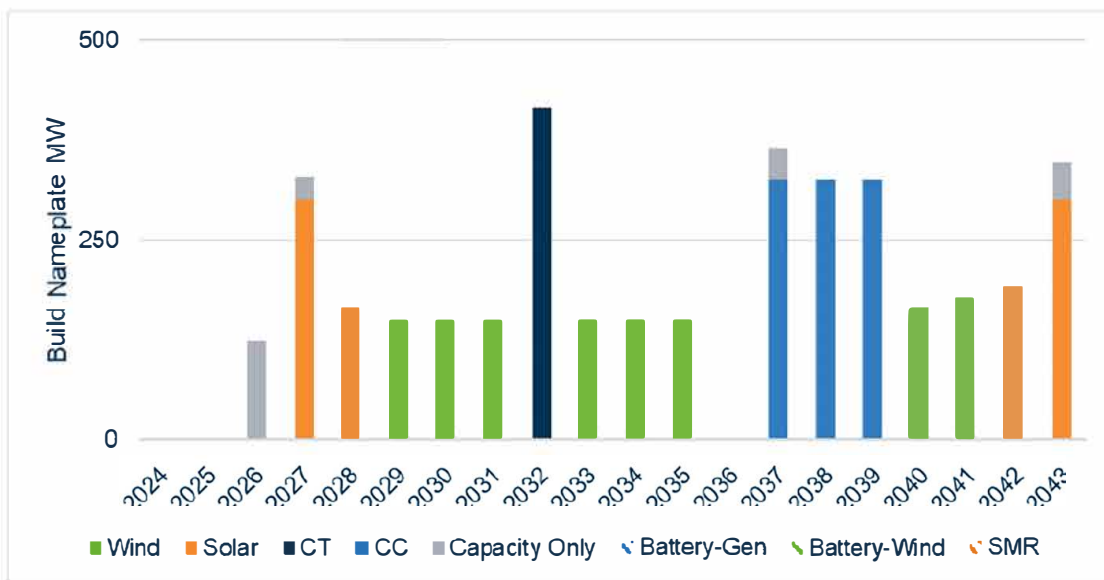
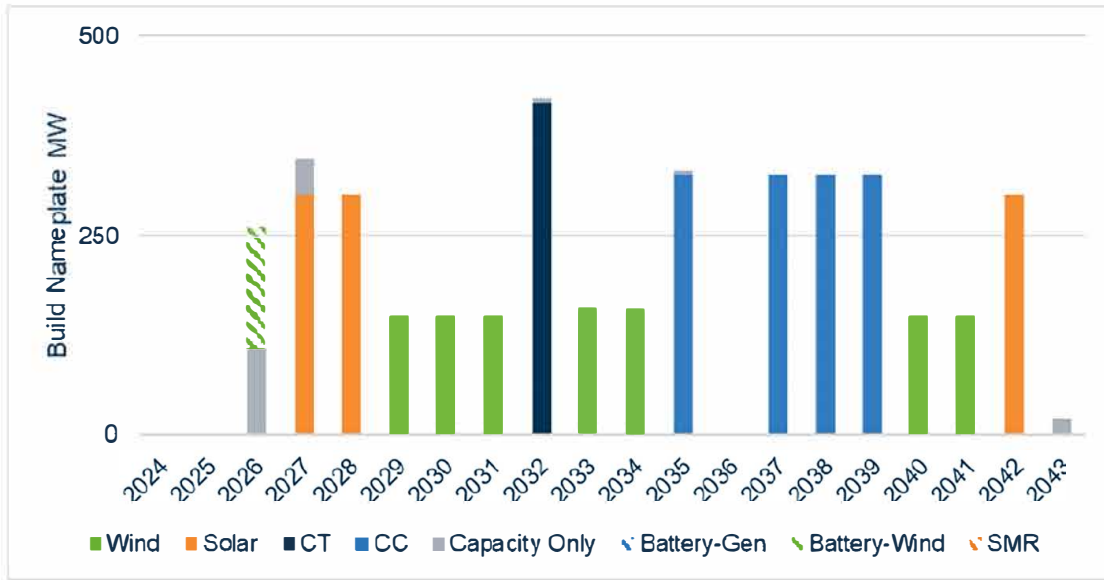


Figure 66: No DSM Plan EAAB



13.2 Comparison of Retirement Options

Evergy Metro owns Hawthorn 5 and has large shares of its jointly-owned coal resources, 50% of La Cygne Units 1 & 2, 70% of Iatan 1 and 54.71% of Iatan 2. Each coal retirement brings a loss of capacity of approximately 300 MW – 550 MW, as well as a loss of baseload energy (with recent capacity factors ranging from 38% to 62%). Evergy Metro assumes that if it continues to operate coal resources, it will comply with all environmental and other regulations and keep the plants maintained. These costs are included in the expected value of the resource plan.

The 2023 preferred resource portfolio included retirement of La Cygne 1 in 2032, and La Cygne 2 and Iatan 1 in 2039. Retirement dates of Iatan 2 and Hawthorn 5 were expected to be outside of the 20-year planning horizon. These retirements are in the 2024 Preferred Portfolio (CAAB) which also includes the RAP Plus demand-side portfolio. Alternative resource plans with the same demand-side portfolio were developed to compare the expected value of accelerating retirements. Plans accelerating retirements include CBAB (Iatan 1 2030), CCAB (La Cygne 2 2032), CDAB (Hawthorn 5 2027), and CEAB (all early retirement dates including Iatan 2 2030).

All accelerated retirement plans include earlier thermal additions to replace the retiring capacity, in addition to the 2032 combustion turbine that is added in all plans. For the 2030 retirement of Iatan 1, a combustion turbine is added in 2030, for the 2032 La Cygne 2 retirement, a combined cycle is added in 2031, and for the 2027 Hawthorn 5 retirement, a combustion turbine is added in 2028. The Hawthorn 5 retirement plan also includes 300 MW of storage in 2026. The plan with all earliest retirements requires 600 MW of battery storage in 2026-2027, followed by three combustion turbines and a half combined cycle through 2031 (1570 MW).

Figure 67: Earlier Retirement Iatan 1 2030 CBAB

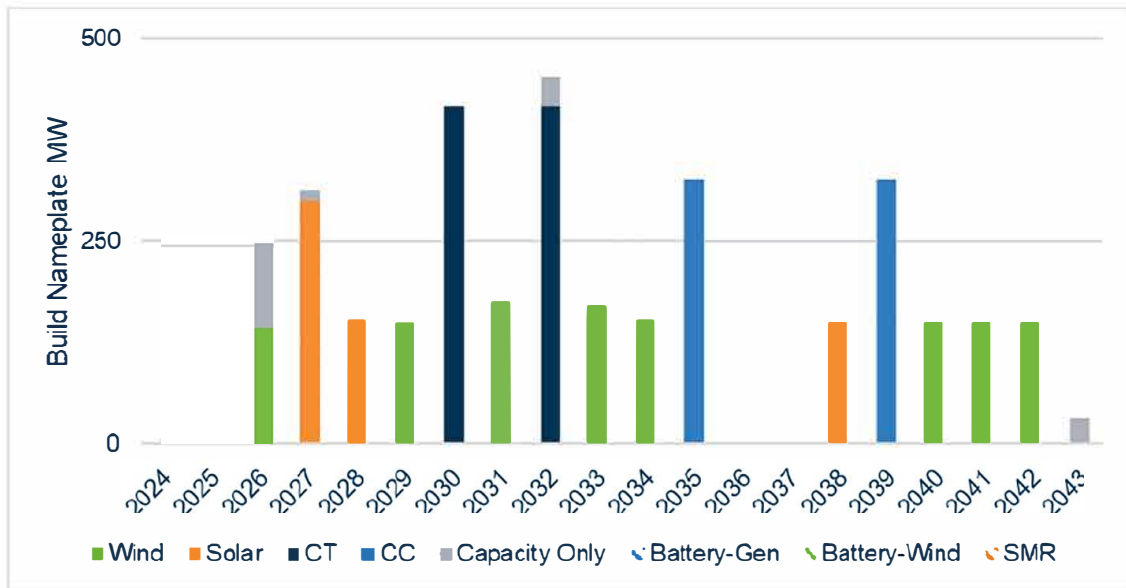


Figure 68: Earlier Retirement La Cygne 2 2032 CCAB

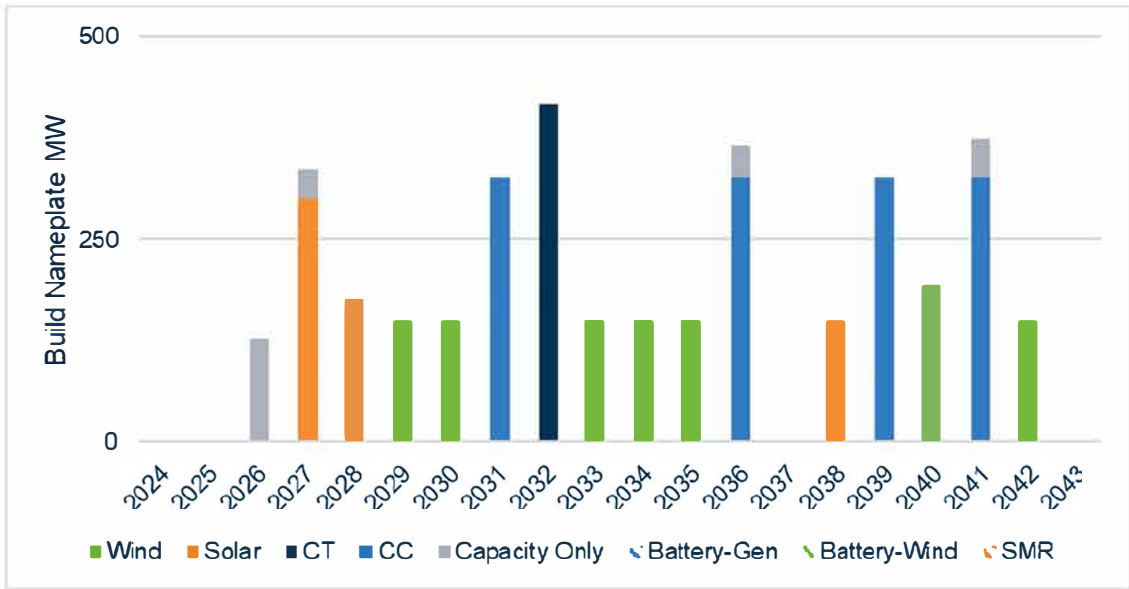


Figure 69: Earlier Retirement Hawthorn 5 2027 CDAB

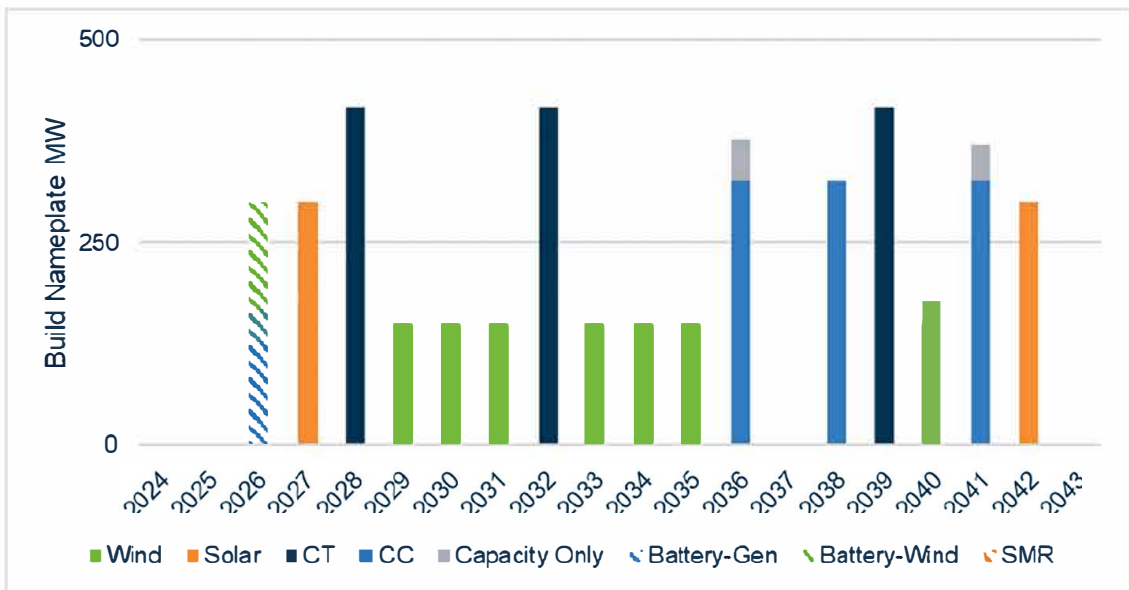
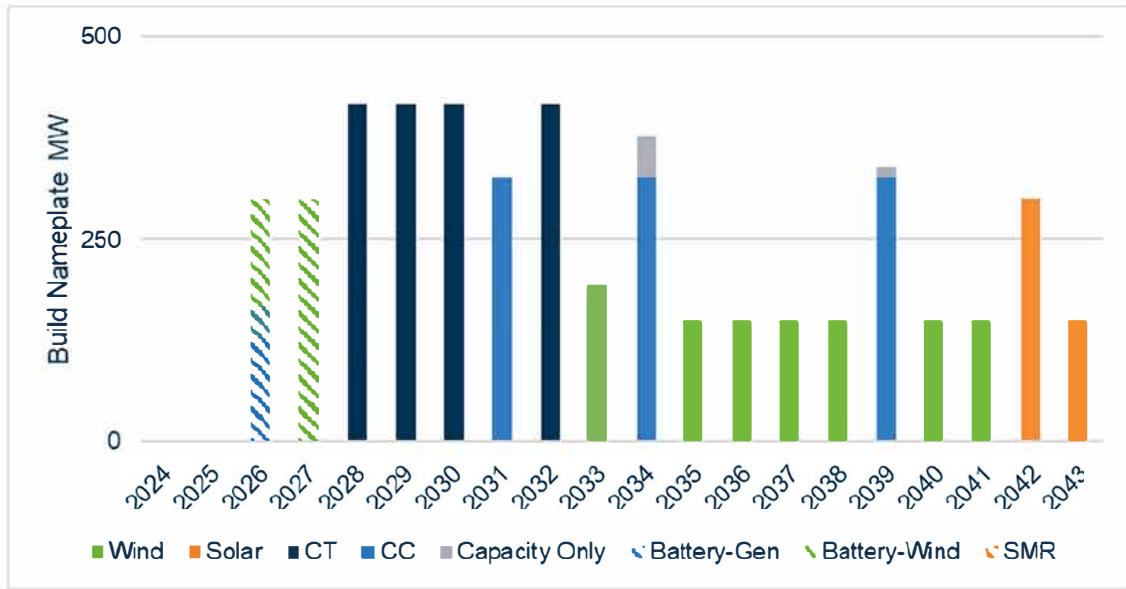


Figure 70: Earliest Retirement All Coal CEAB



All accelerated retirement plans are higher cost than the Preferred Portfolio.

Table 51: Evergy Metro Retirement Plan Rankings

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		PP 2023 retirements
2	CCAB	23,217	73	Retire La Cygne 2 2032
3	CBAB	23,307	163	Retire Iatan 1 2030
4	CDAB	23,881	738	Retire Hawthorn 5 2027
5	CEAB	25,029	1,885	All early retirements

Section 14: Evergy Metro Analysis of Directed Strategies

14.1 Plans at Endpoints

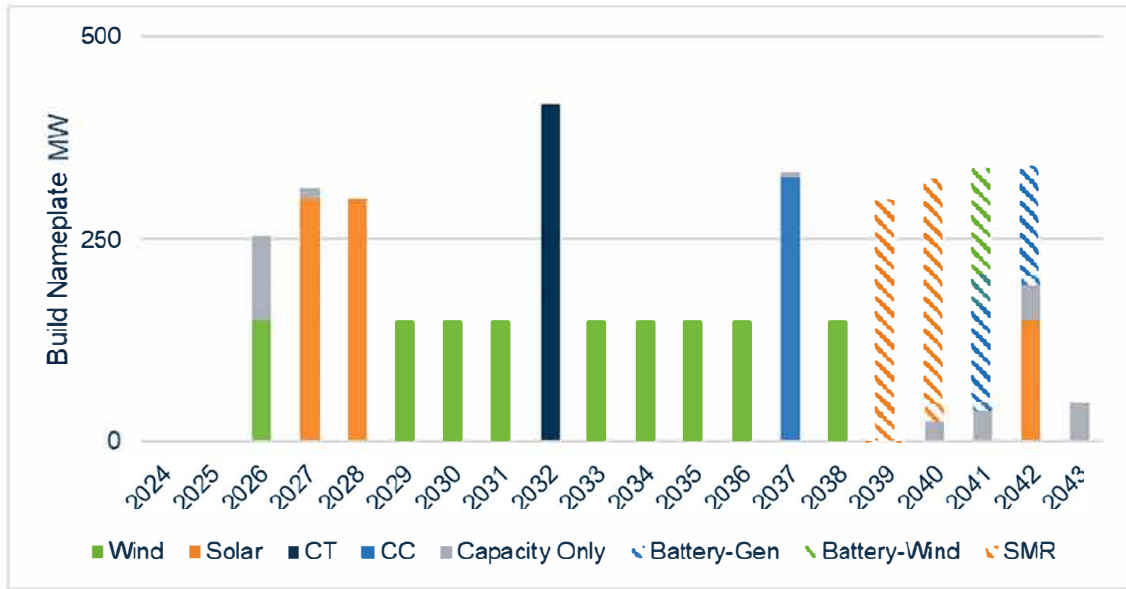
Plans created to determine the optimal resource additions in the High Carbon Restriction – High Natural Gas Price (“High/High”) future and the Low Carbon Restriction – Low Natural Gas Price (“Low/Low”) future are costly on a weighted-average basis.

Table 52: Rankings of Plans Created for Specific Futures

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus
2	CAAD	23,574	430	High/High
3	CAAE	24,936	1,792	Low/Low

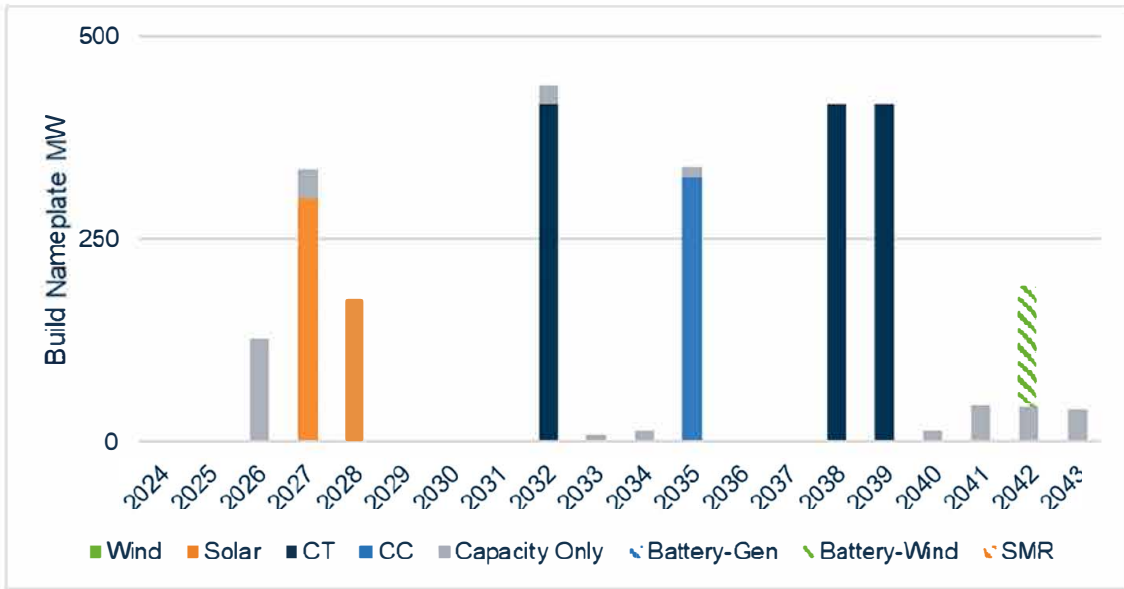
Capacity expansion modeling performed specifically in the High Carbon Restriction – High Natural Gas Price (“High/High”) scenario shows an additional early solar build and an increased level of wind builds compared to the Preferred Portfolio given the increased value of zero-carbon energy in a heavily carbon-restricted market. In the last five years of the planning horizon, two 300 MW Nuclear SMRs are added as well as 450 MW of storage. Given Metro’s large coal fleet, this plan demonstrates the elevated need for new sources of carbon-free energy if stringent carbon restrictions are in place.

Figure 71: Optimal Build Plan for High CO₂/ High NG Future CAAD



In contrast, there are no wind additions in the optimal resource plan for the Low/Low future, given the reduced value of zero-carbon energy without the imposition of carbon restrictions. The Low/Low early solar builds are consistent with the Preferred Portfolio. Thermal resources are added with similar timing, although the Low/Low Plan is more heavily weighted toward combustion turbines as opposed to combined cycles. This is, again, driven by the reduced value of low- or zero-carbon energy which makes higher capacity factor Combined Cycles less valuable compared to Combustion Turbines (which are largely a capacity resource – as opposed to an energy resource).

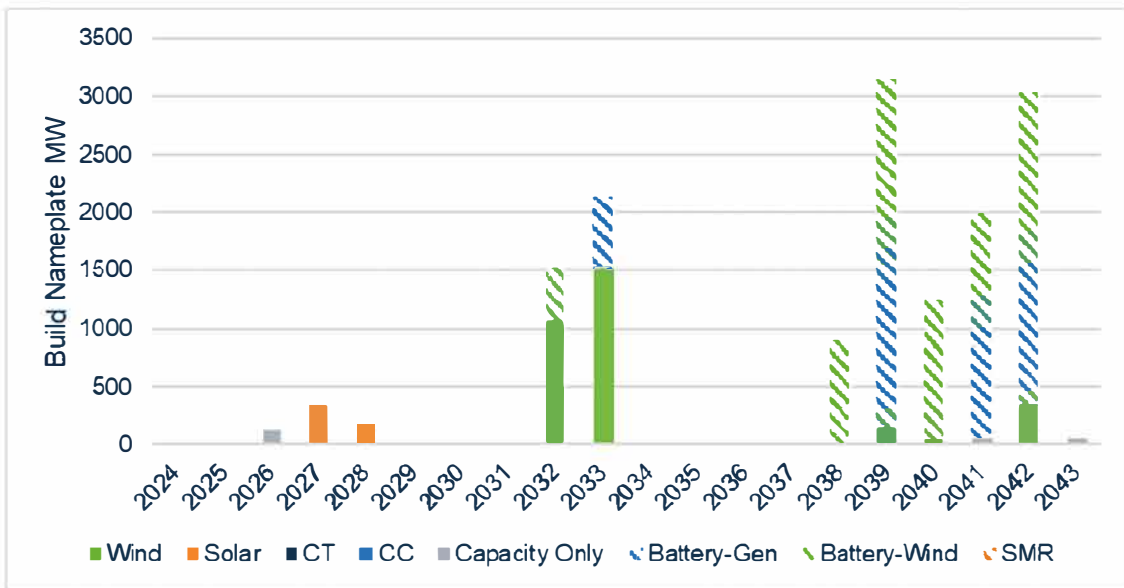
Figure 72: Optimal Build Plan for Low CO₂/ Low NG Future CAAE



14.2 High Renewables Plans

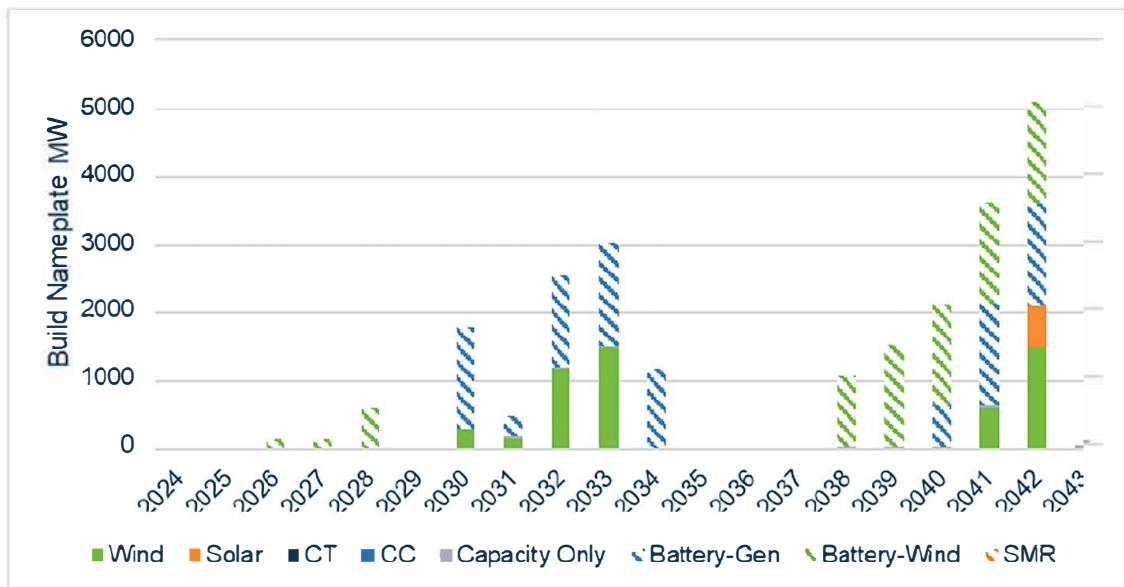
Two ARPs were developed to maximize renewable resources. The first, CAAI used the Preferred Portfolio demand-side management portfolio level – RAP Plus, and Preferred Portfolio retirement dates, and optimized future builds using only renewables and storage.

Figure 73: Only Renewable and Storage Additions CAAI



The second, BEAI, included MAP DSM and early retirements of all coal units (Hawthorn 5 in 2027, Iatan Units 1 & 2 in 2030, La Cygne Units 1 & 2 in 2032) with only renewable and storage builds.

Figure 74: Earliest Retirements, Only Renewable and Storage Additions BEAI



Renewable build alone, and renewable and storage build together cannot meet the summer and winter capacity requirements of Evergy Metro in every year if capital spend limits are respected. Therefore, CAAB and BEAI resource plans were optimized for lowest cost with relaxed build limits. They would be difficult to implement due to the high volume of additions and would not meet financial metrics. Both plans have significantly higher NPVRR than the Preferred Portfolio.

Table 53: NPVRR Comparison of High Renewable Plans

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus, All build options, budget
2	CAAI	26,316	3,172	RAP Plus, Only renewable/storage build, no budget
3	BEAI	30,424	7,280	MAP; Ret all early; Only renewable/storage build, no budget

Section 15: Analysis of Evergy Metro Discrete Scenarios

Evergy Metro developed two ARPs to determine the optimal resource plans that would be lowest cost under either environmental policy extreme – high carbon restrictions due to new GHG rules and no carbon restrictions and no retirement pressures for coal resources.

15.1 GHG Rules

15.1.1 Evergy Compliance Paths with Proposed GHG Rules

In May 2023, the U.S. Environmental Protection Agency (EPA) proposed rules that would directly regulate greenhouse gas (GHG) emissions (specifically, carbon dioxide (CO₂)) from new natural gas-based units while also setting guidelines for the states to address emissions from existing coal- and natural gas-based units.²⁷ The proposal sets standards for CO₂ emissions limitations reflecting the application of the best system of emission reduction (BSER) for covered electric generating units (EGUs). Units subject to the standard of performance can use any system of reduction to meet the limit; they are not required to use the system that EPA determined is the BSER.

EPA established these proposed emission limitations based on utilizing technologies such as hydrogen co-firing with natural gas and carbon capture and sequestration/storage (CCS). It is highly likely this proposed regulation will face administrative and legal challenges prior to finalization. However, this regulation could require hydrogen co-firing with natural gas, natural gas co-firing with coal, reduced generation, CCS, alternate generation, or demand reduction technologies.

While the cost and availability of many of these technologies is highly uncertain, Evergy conducted a screening analysis to evaluate the potential cost impact of the proposed rule using currently available information. The analysis focused on two potential pathways for

²⁷ A final rule was announced by EPA on April 25, 2024. The analysis for the 2024 IRP was based on the proposed rule which may differ from the recent issuance.

compliance: 1) a prescriptive application of BSER, and 2) the accelerated retirement of coal resources.

The analysis was conducted at the Evergy level to develop capacity expansion plans and prepare estimated costs. The plans were developed assuming high natural gas prices under SPP Future 3, which aligns with accelerated decarbonization.

For the prescriptive compliance pathway, Evergy assumed that coal units would apply BSER according to the Preferred Portfolio retirement dates. Additionally, nuclear SMR beginning in 2039 and combined cycle with CCS beginning in 2035 were provided as new resources options to meet the stringent carbon dioxide limits. The BSER technologies and timeline are summarized below.

Table 54: Evergy GHG BSER Prescriptive Technologies

Unit	Retirement Date	GHG BSER	BSER Compliance Period
Hawthorn 5	2039	Co-Firing with 40% Natural Gas	Jan 1, 2030 through Dec 31, 2039
Iatan 1	2039	Co-Firing with 40% Natural Gas	Jan 1, 2030 through Dec 31, 2039
Iatan 2	2039	Co-Firing with 40% Natural Gas	Jan 1, 2030 through Dec 31, 2039
Jeffrey 1	2039	Co-Firing with 40% Natural Gas	Jan 1, 2030 through Dec 31, 2039
Jeffrey 2	2030	Routine Operations	Not Applicable
Jeffrey 3	2030	Routine Operations	Not Applicable
La Cygne 1	2032	20% Capacity Factor Restriction	Jan 1, 2030 through Dec 31, 2032
La Cygne 2	2039	Co-Firing with 40% Natural Gas	Jan 1, 2030 through Dec 31, 2039
Lawrence 4	2028	Routine Operations	Not Applicable
Lawrence 5	2028	Conversion to Natural Gas in 2029	Jan 1, 2030 through Dec 31, 2039

The retirement dates for Hawthorn 5 and Iatan 2 were adjusted to 2039 to model BSER compliance using natural gas co-firing. The Preferred Portfolio does not include retirement of either of these units in the planning horizon, which would require application of CCS beginning in 2030. However, the electric industry has challenged CCS as BSER for a host of reasons delineated in the Edison Electric Institute's August 2023 comments²⁸

²⁸ https://www.eei.org/-/media/Project/EEI/Documents/Resources-and-Media/TFB/EEIComments_111Rules_FINAL_080823.pdf

on the proposed rule. In summary, the concerns with CCS center on the current limited deployment and adequate demonstration of the technologies, the unlikely availability at the required scale according to the proposed compliance date, and the lack of documented integration of the individual components (capture, transportation, and storage). Choosing natural gas co-firing at Hawthorn 5 and Iatan 2 allows the evaluation of BSER without introducing the myriad uncertainties associated with CCS.

As an alternative to BSER, coal unit retirements were pulled forward from the Preferred Portfolio dates to earlier dates. According to the following Table, early unit retirements were added successively to the model.

Table 55: Eversky GHG Retirement Scenarios

Plan	Early Retirements
BAAB	Preferred Portfolio 2023
BBAB	Iatan 1 2030
BCAB	Iatan 1 2030, Jeffrey 1 2030
BDAB	Iatan 1 2030, Jeffrey 1 2030, La Cygne 2 2032
BEAB	Iatan 1 2030, Jeffrey 1 2030, La Cygne 2 2032, Hawthorn 5 2027
BFBB	Iatan 1 2030, Jeffrey 1 2030, La Cygne 2 2032, Hawthorn 5 2027, Iatan 2 2030
BGAB	Hawthorn 5 & Iatan 2 2039 (GHG BSER Scenario)

A total of seven plans were evaluated with the Preferred Portfolio retirement schedule (BAAB) producing the lowest overall cost. Retiring all units early produced the highest cost plan (BFBB), while the prescriptive BSER plan (BGAB) was higher cost than all the early retirement scenarios that did not include Hawthorn 5 and Iatan 2 (BAAB-BDAB). The plans that introduced the early retirement of Hawthorn 5 (BEAB) followed by Iatan 2 (BFBB) were higher in overall cost than the BSER plan (BGAB). The results are summarized below.

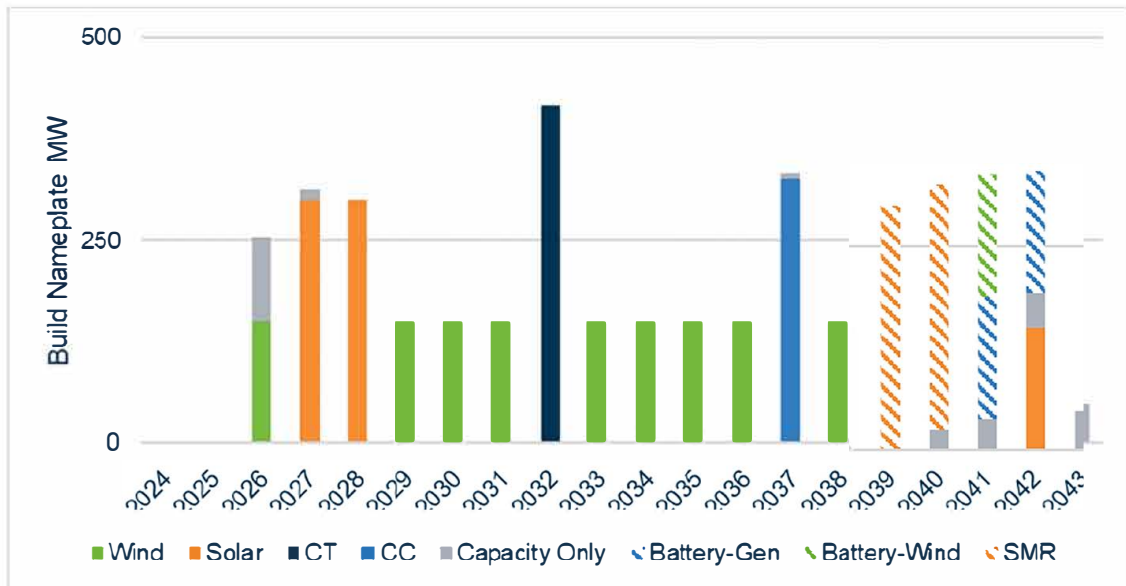
Table 56: Evergy GHG Compliance Resource Plans

New Builds (MW)	BAAB	BBAB	BCAB	BDAB	BEAB	BFBB	BGAB
Wind	7,200	7,050	7,050	7,050	6,900	7,200	7,200
Solar	3,150	3,450	3,450	3,900	3,600	3,000	3,150
CT	2,490	2,905	2,905	3,320	3,320	4,565	4,150
CC	2,093	1,443	1,443	793	1,443	1,443	1,443
Battery-Gen	600	600	750	900	750	900	600
Battery-Wind	-	300	150	300	450	-	300
New Build Total	15,533	15,748	15,748	16,263	16,463	17,108	16,843
NPVRR Increase vs Low-Cost Plan (\$ million)	-	122	431	512	1,115	1,726	1,106

15.1.2 Evergy Metro GHG-Driven Retirement Portfolio

The lowest cost GHG ARP had the same retirements as the Preferred Portfolio. For Evergy Metro, this includes La Cygne 1 retiring in 2032, Iatan 1 and La Cygne 2 retiring in 2039, and operation of Hawthorn 5 and Iatan 2 throughout the planning period. The portfolio optimized for high natural gas prices and high CO₂ restrictions with those retirements is the same as the High/High portfolio CAAD.

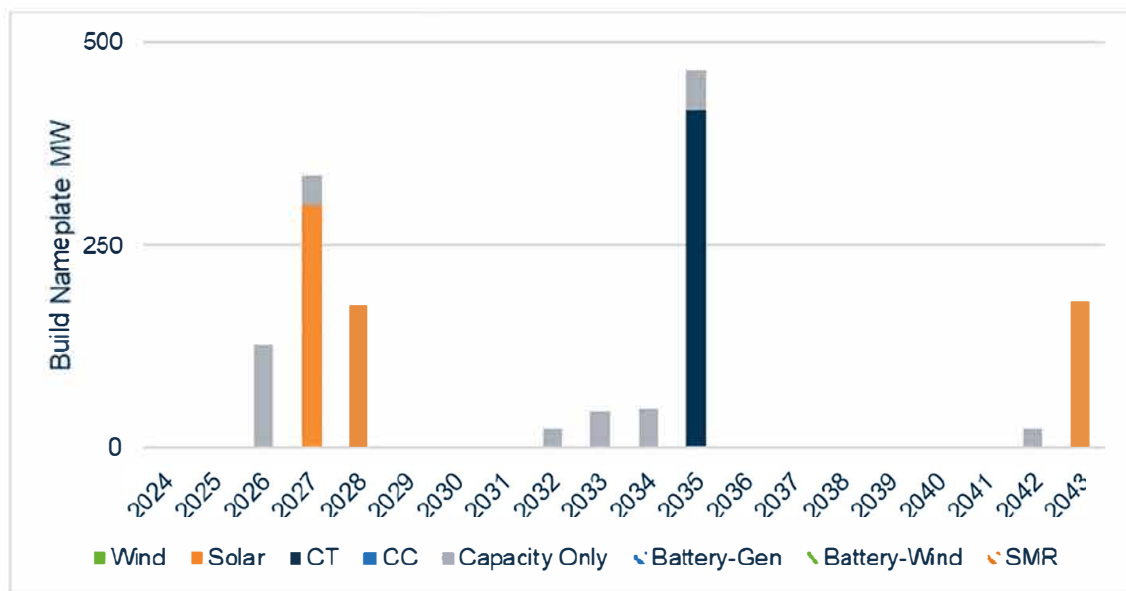
Figure 75: GHG Rule Optimal Plan CAAD



15.2 Low/Low No Retirements

The Low/Low No Retirements ARP was developed by extending the operation of all Eversky Metro coal units through the planning horizon and optimizing resource additions for the expectation of a non-CO₂ restricted, low natural gas price future. The plan added solar in 2027 and 2028, consistent with the Preferred Portfolio, but then only added a CT in 2035 and solar in 2043. It did not add any wind resources and filled gaps in capacity in some years through market capacity.

Figure 76: Low/Low No Retirements Plan CFAE



15.3 Expected Costs of Planning for Discrete Scenarios

Both discrete plans are significantly higher cost than the Preferred Portfolio on a weighted-average-risk basis. CFAE is the most costly due to the lack of carbon-free energy available in carbon-restricted futures.

Table 57: NPVRR Comparison of Discrete Scenarios

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		Base planning assumptions
2	CAAD	23,574	430	High/High GHG rules
3	CFAE	25,130	1,986	Low/Low, no retirements

Section 16: Analysis of Evergy Metro Contingency Plans

16.1 Execution Risk of 2027 Solar

If Evergy Metro is unable to execute on the 300 MW of solar planned for 2027 in the Preferred Portfolio, the next best option is for Evergy Metro to add 150 MW of storage in 2026.

Figure 77: Alternative Plan Without 2027 Solar CAAC

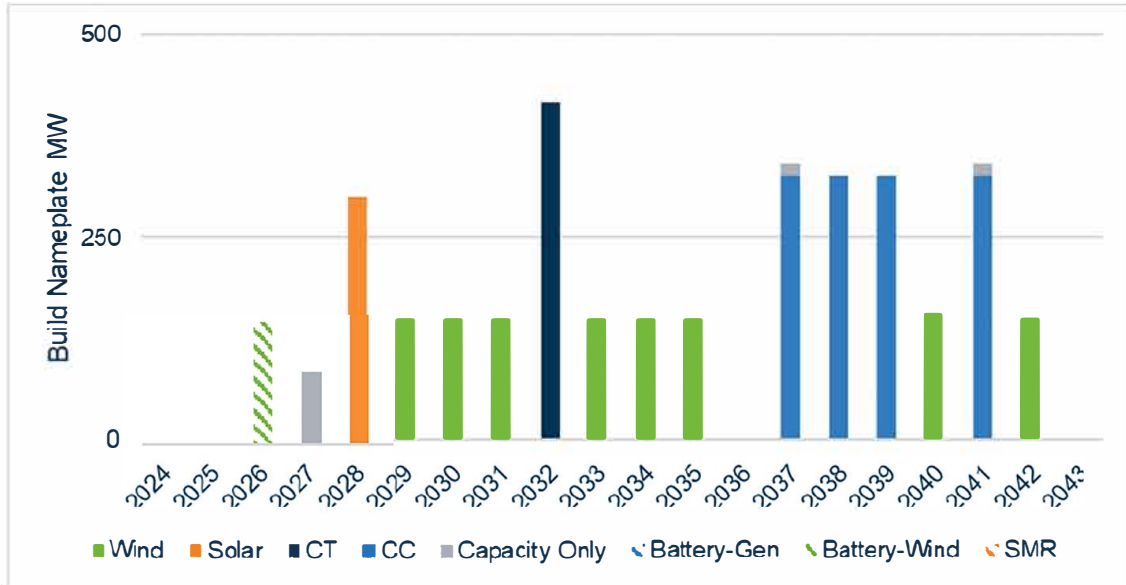


Table 58: NPVRR Comparison Without 2027 Solar

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus
2	CAAC	23,274	130	No 2027 Solar

16.2 Kansas DSM Programs End After KEEIA

The Kansas KEEIA program was approved for 4 years. Evergy Metro’s base planning assumption is that KEEIA programs continue to be approved through the 20-year planning horizon and grow over time. Evergy Metro developed plan GAAB to assess how the need for resource additions would change if Kansas does not approve DSM programs after the 4-year KEEIA programs end. This plan assumes continuation of RAP Plus level programs in Missouri.

Figure 78: Contingency Plan for KEEIA Programs End GAAA

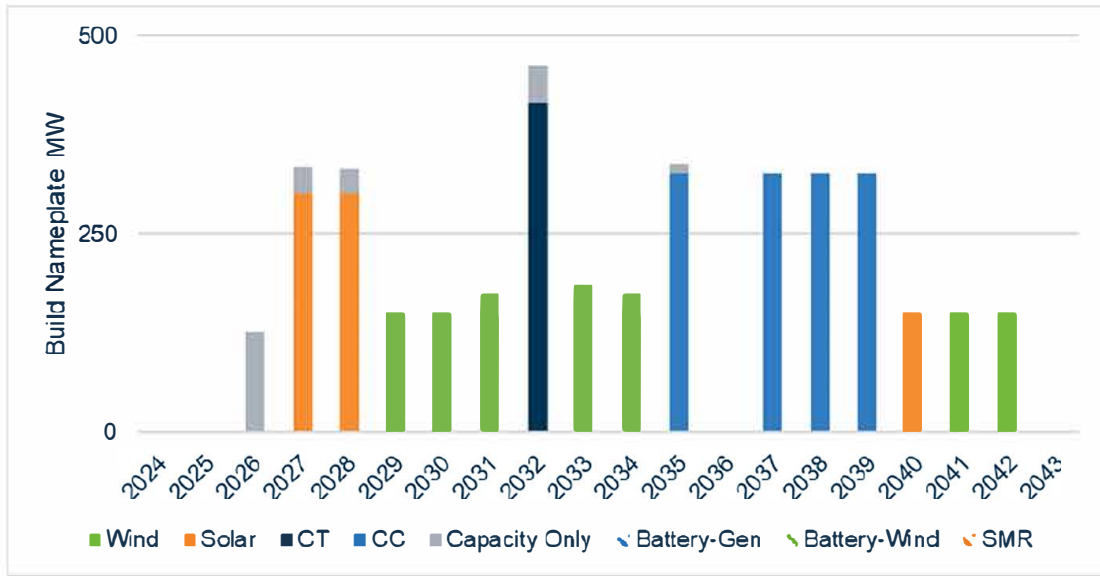


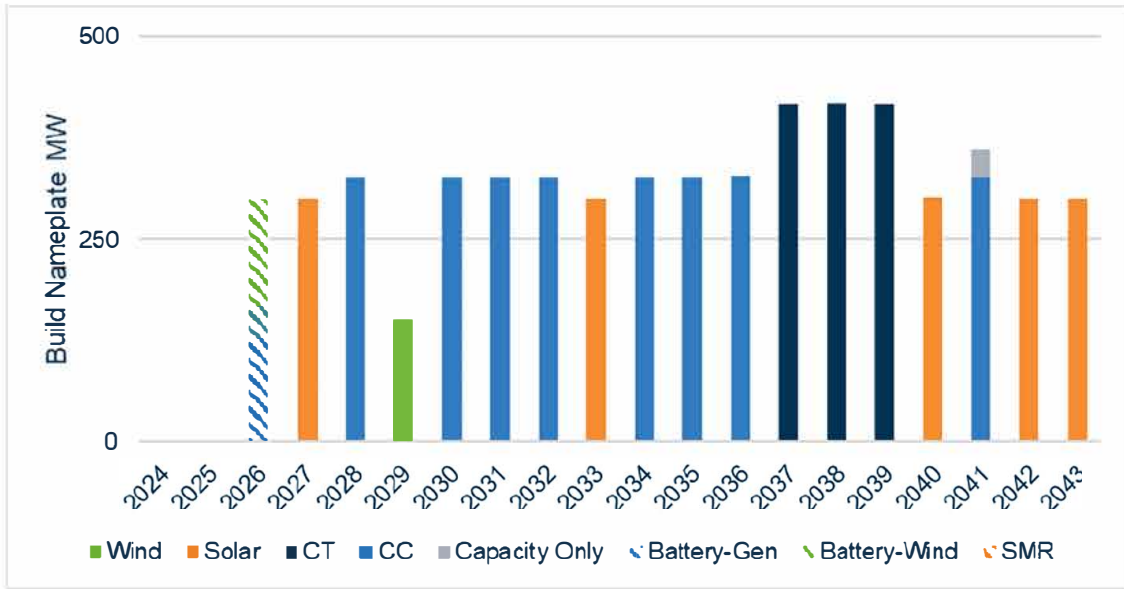
Table 59: NPVRR Comparison KEEIA DSM Ends

Rank	Plan	NPVRR	Difference	Description
1	CAAB	23,144		RAP Plus
2	GAAB	23,271	128	RAP Plus MO, KEEIA Only DSM

16.3 High Load Growth

Everygy Metro developed an ARP using the high load forecast, which includes high economic growth as well as economy-wide electrification. This forecast requires significant energy and capacity additions as compared to the base load forecast. The ARP fully utilizes the capital budget each year in the planning horizon and shifts the resource plan to more firm dispatchable resources. If the pace of electrification and economic growth align with this forecast, Everygy Metro will need to adjust its resource plan to develop more firm dispatchable resources.

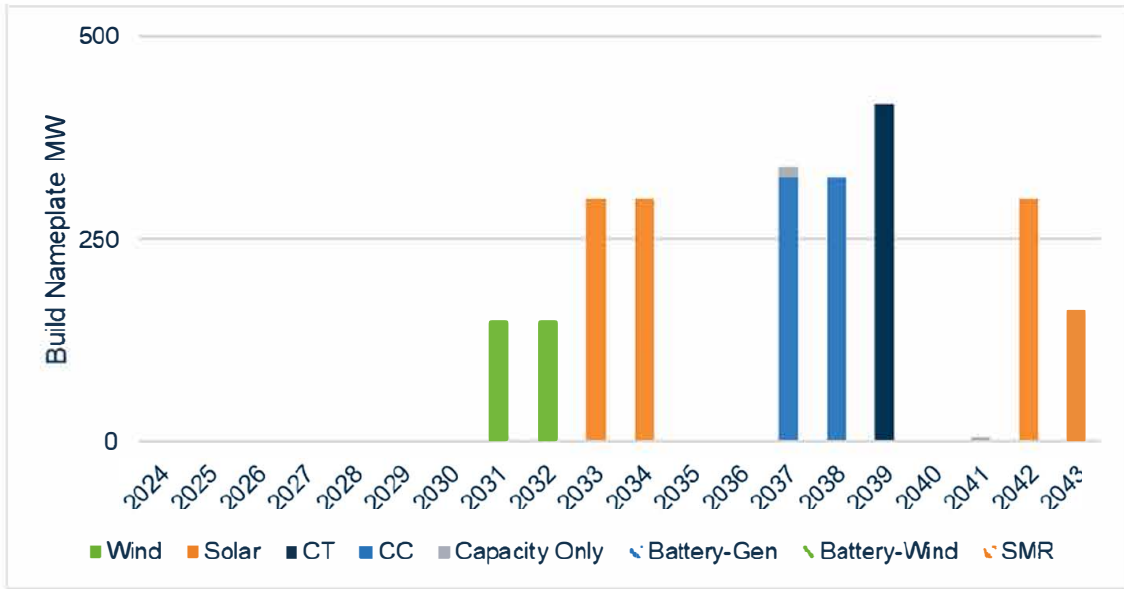
Figure 79: High Load Growth Plan CAAF



16.4 Mid Load – No Economic Development

The high load growth due to economic development has accelerated the need for Evergy Metro to add resources. A plan was created to assess the optimal resource additions if the load growth driven by economic development load does not occur. This scenario is highly unlikely given the mature status of the economic development project included in Metro’s load forecast, but if this rapid load growth does not occur, Evergy Metro’s need for new resources is delayed.

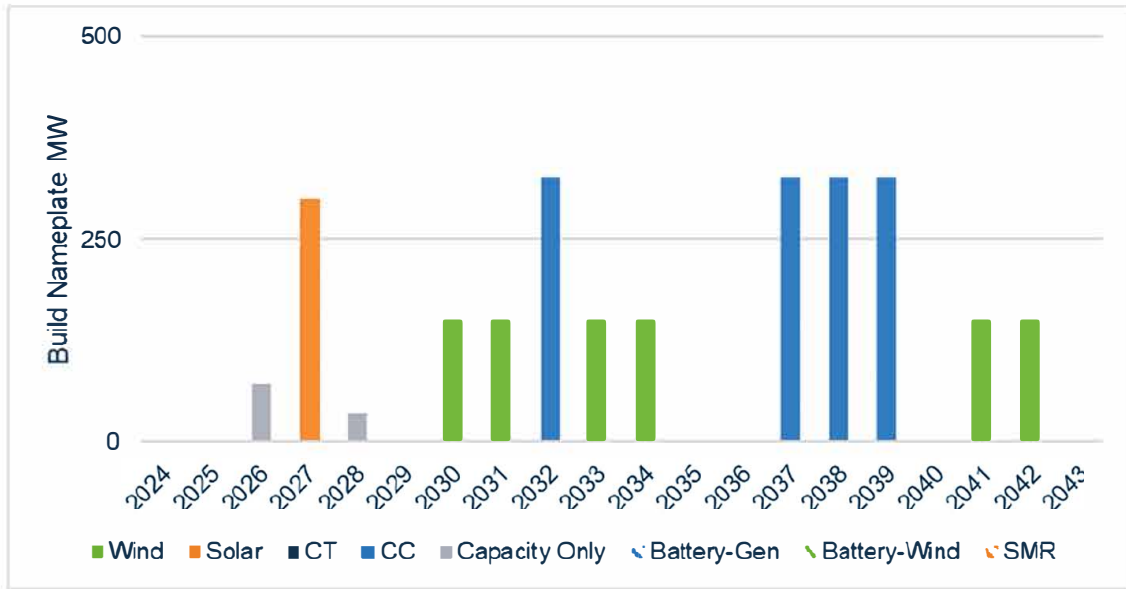
Figure 80: No Economic Development CAAA



16.5 Low Load Growth

Evergy Metro also developed an ARP using the low load forecast. The plan includes fewer resource additions than the Preferred Portfolio. The optimal resource additions would still include 300 MW of solar in 2027, but would not include 2028 solar and 2029 wind additions. Overall the plan includes 300 MW less solar, 150 MW less wind, and no combustion turbine (415 MW), which it moves up a combined cycle build to replace.

Figure 81: Low Load Growth Plan CAAG



16.6 Future Carbon Capture and Nuclear SMR Options

Combined cycles with carbon capture were available resource options for the high CO₂/high natural gas future alternative resource plan and GHG rule alternative resource plans. All plans with combined cycle builds were upgraded to include carbon capture beginning in 2035 for the High CO₂ restriction endpoints (with capital costs and resource modifications included).

Evergy allowed Nuclear SMR as a resource option in the high CO₂/high natural gas future alternative resource plan and in the GHG rule alternative resource plans. The high CO₂/high natural gas resource plan selected an SMR in 2039.

Evergy also tested SMR as a resource option for the Preferred Portfolio, CAAB, when optimizing builds for the mid/mid/mid future. No SMRs were selected.²⁹ This indicates that based on current assumptions of the economics and timing of SMR availability, SMR is not a lower cost option than the resources selected in the plan. However, when the

²⁹ Plans CAAK and CAAL have the same resource plan as CAAB, however the models allowed selection of Nuclear SMR beginning in 2039 and 2038 respectively.

technology becomes more mature and costs and timing are more certain, Eversky Metro will have better information to assess if it may be part of the lowest cost future portfolio.

Section 17: 15 vs 20 Year Planning Horizon Comparisons

Eversky performs capacity expansion planning using a 20-year long-term planning horizon. This long-term view is consistent with the utility industry best practice and reflects the long-lived nature of generation investments. To assess the medium-term performance of alternative plans, Eversky conducted an analysis of NPVRR for 10-year and 15-year periods.

The results for Kansas Central and Metro are presented in the tables below. While the relative rankings for the 15-year evaluation are similar to the 20-year view, the shorter term 10-year analysis magnifies the impact of decisions made early in the plan. Specifically, the 10-year view shows that early retirements (Kansas Central: ADAA, ACAA, and AEAA; Metro: CCAB, CBAB, CDAB, and CEAB) are less favorable versus the longer-term analysis. This reflects the costs associated with retiring coal generators and the front-loading of regulatory recovery for replacement investments in an energy market with slightly increasing prices.

While the ranking of early retirements generally appears less favorable on a shorter evaluation timeline, there is a notable exception. When capacity expansion is allowed to build only renewables and storage, plans with earlier retirements look better on a relative basis. In fact, the plan with all units retiring early (Kansas Central: AEAG; Metro: BEAI) flips from the highest cost in the 20-year evaluation to the lowest cost in Kansas Central and the second lowest cost in Metro on a 10-year basis. This reversal is driven by the investment tax credit associated with building batteries in 2029 and 2030. The upfront 30% tax credit produces a significant benefit that makes these investments appear more favorable to other assets that don't receive this credit.

Table 60: Energy Kansas Central Overall Rankings with Varied Planning Horizons

Portfolio	Description	20- Year			15- Year			10- Year		
		Rank	NPVRR	Diff	Rank	NPVRR	Diff	Rank	NPVRR	Diff
ABAA	Retire Jeffrey 2 2039	1	34,081	0	1	27,111	0	4	19,524	852
AAAA	PP 2023, Extend DSM	2	34,092	10	3	27,267	156	7	19,692	1,020
AAAB	1/2 CC	3	34,109	27	5	27,292	182	8	19,721	1,049
AAAJ	No 2027 Solar	4	34,141	59	2	27,264	154	6	19,642	970
ADAA	Retire La Cygne 2 2032	5	34,213	132	6	27,414	303	10	19,764	1,092
BAAA	KEEIA Only	6	34,514	432	8	27,495	384	11	19,775	1,103
AAAD	Low/Low	7	34,538	457	4	27,290	180	5	19,602	930
ACAA	Retire Jeffrey all 2030	8	34,577	496	9	27,829	718	12	19,983	1,311
AEAA	Retire all earliest	9	34,742	661	12	28,027	916	13	20,078	1,406
AAAC	High/High	10	34,860	778	7	27,459	348	9	19,730	1,058
AFAD	Low/Low, No retirements	11	36,490	2,409	10	27,831	720	3	19,402	731
AAAG	Only renewable/storage build, budget relaxed	12	39,320	5,239	11	27,974	863	2	18,954	283
AEAG	Retire all early, only renewable/storage, budget relaxed	13	39,349	5,268	13	28,373	1,262	1	18,767	0

Table 61: Evergy Metro Overall Rankings with Varied Planning Horizons

Portfolio	Description	20- Year			15- Year			10- Year		
		Rank	NPVRR	Diff	Rank	NPVRR	Diff	Rank	NPVRR	Diff
CAAB	RAP Plus	1	23,144	0	1	18,587	0	5	13,435	244
AAAB	RAP	2	23,190	47	2	18,611	24	8	13,455	263
CCAB	Retire La Cygne 2 2032	3	23,217	73	8	18,701	115	14	13,528	337
GAAB	RAP Plus MO, KEEIA Only DSM	4	23,271	128	3	18,630	43	6	13,438	247
CAAC	No 2027 Solar	5	23,274	130	5	18,670	83	10	13,475	284
CBAB	Retire Iatan 1 2030	6	23,307	163	9	18,770	183	15	13,586	395
DAAB	RAP Minus	7	23,337	193	4	18,655	68	7	13,442	251
BAAB	MAP	8	23,370	226	11	18,800	213	16	13,608	417
EAAB	No DSM MO	9	23,394	250	7	18,701	114	9	13,455	264
FAAB	No TOU, No DSM MO	10	23,516	372	10	18,791	204	11	13,495	304
CAAD	High/High	11	23,574	430	6	18,673	86	13	13,508	317
HAAB	No DSM MO, KEEIA Only DSM	12	23,685	542	12	18,845	258	12	13,507	316
CDAB	Retire Hawthorn 5 2027	13	23,881	738	16	19,151	564	18	13,827	636
CAAE	Low/Low	14	24,936	1,792	14	18,975	389	4	13,398	207
CEAB	All early retirements	15	25,029	1,885	18	20,196	1,609	19	14,365	1,174
EAAJ	RES only	16	25,079	1,935	17	19,300	713	17	13,649	458
CFAE	Low/Low, no retirements	17	25,130	1,986	15	19,061	474	3	13,269	78
CAAI	Only renewable/storage build, no budget	18	26,316	3,172	13	18,970	384	1	13,191	0
BEAI	MAP; Ret all early; Only renewable/storage build, no budget	19	30,424	7,280	19	21,126	2,539	2	13,210	19

Section 18: SERVM Analysis

All tested Alternative Resource Plans were developed in order to meet SPP Resource Adequacy Requirements as well as hourly customer energy needs. There is no unserved energy in production cost modeling analysis performed for this IRP. SPP Resource Adequacy Requirements are designed to maintain loss-of-load expectation (i.e., the expectation of unserved energy) of less than one day in ten years. The analysis performed to develop these requirements – particularly the planning reserve margin and effective load carrying capability, which are developed using probabilistic modeling – incorporates considerations of extreme weather, generator unavailability, and renewable output (among many other factors) and assesses the risk of loss-of-load (i.e., unserved energy) in all modeled hours. Because every modeled resource plan meets these requirements, every resource plan is designed to be able to meet customer energy needs, subject to the allowable level of risk incorporated into SPP requirements.

To supplement the use of SPP requirements, as part of this year's analysis, Eversource also conducted its own probabilistic reliability analysis to assess the reliability of its resource plan. Specifically, Eversource utilized the Strategic Energy and Risk Valuation Model (SERVM) software to assess the performance of future resource portfolios under varying load, weather (including extreme weather), and outage conditions. The purpose of this analysis is to offer relative comparisons of reliability metrics across different resource portfolios. It is important to note that this analysis does not aim to duplicate or directly compare with SPP studies related to future planning reserve margins. However, the general methodology and modeling software used is consistent with SPP and, in subsequent IRPs, efforts will be made to even more closely align Eversource's reliability studies with those conducted by SPP.

The SERVM software evaluates how specific plans align with the industry-standard Loss of Load Expectation (LOLE) metric. According to this metric, a system would experience one day with one or more hours of firm load shedding every 10 years due to a shortage of generating capacity. In simpler terms, the standard LOLE for a system averages 0.1

days per year, as reflected in the SERVM results. Significantly higher LOLE values indicate a system is less reliable in meeting load requirements hourly.

In addition to the Loss of Load Expectation (LOLE) metric, Eversource also monitored the Expected Unserved Energy (EUE) metric while evaluating select plans. This metric quantifies the amount of energy (measured in MWh) that a generating system is unable to supply during loss-of-load events. Specifically, it represents the energy deficit when demand exceeds supply due to system limitations.

In alignment with Eversource's 2024 Preferred Portfolio, 2033 was chosen as the future study period. By that time, several coal units are expected to be retired and replaced with cleaner thermal and renewable energy resources.

The foundational assumption was developed using a 0.1 LOLE standard. Prior to analyzing select plans, the SERVM database was calibrated to ensure that both Eversource and its neighboring regions maintained an average LOLE of approximately 0.1. This calibration ensures that neither Eversource nor its surrounding areas are overly relying on market support to meet their capacity requirements.

Eversource selected a couple resource plans to assess their reliability in meeting load on an hourly basis throughout 2033. These plans include the Preferred Portfolios (KSC AAAB, MET CAAB, and MOW CAAA) and the high renewables plans (KSC AAAG, MET CAAL, and MOW CAAL). Notably, both sets of plans maintained the resource portfolios of Eversource's neighbors at a constant level. The results of this analysis are summarized in the following Table.

Table 62: 2033 SERVM Study Results

Region	Preferred Portfolio		High Renewables Plan	
	LOLE	EUE	LOLE	EUE
Eversource	0.021	10.149	0.339	434.247

With neighboring utilities calibrated to a LOLE of approximately 0.1, SERVVM results reveal that Eversource's Preferred Portfolio has a LOLE metric of 0.021. This indicates that the Eversource region is experiencing a loss of load expectation averaging 0.021 days per year or 0.21 days every 10 years (as compared to the 1 day standard). Conversely, when holding neighbors' resource portfolio constant, Eversource's high renewables plan exhibits a LOLE metric of 0.339, corresponding to an expected loss of load averaging 0.339 days per year or 3.39 days every 10 years. The analysis of these two plans demonstrates that the high renewables plan is less reliable than the Preferred Portfolio in meeting the standard reliability metric for the year 2033.

Additionally, Eversource's Preferred Portfolio exhibits an EUE metric of 10.149 MWh while the high renewables plan exhibits an EUE metric of 434.247 MWh. This implies that the Preferred Portfolio results in the Eversource region being unable to supply an average of 10.149 MWh during the 0.021 days of loss-of-load event, whereas the high renewables plan results in the Eversource region falling short by 434.247 MWh on average during the 0.339 days of loss-of-load event in the same year. The following figures illustrate the percent occurrence of EUE events for the specific month and hour of day in the study year 2033 for both resource portfolios. While LOLE modeling is often used in the development of peak capacity requirements (i.e., planning reserve margin is a percentage of peak load), this modeling is performed for 8,760 hours per year and the risk of loss-of-load is assessed across all hours. This hourly analysis is summarized in the tables below.

Table 63: Energy 2033 Preferred Portfolio 12x24 EUE Percent Occurrence

Hour of Day	Month of Year											
	1	2	3	4	5	6	7	8	9	10	11	12
1	0.0000%	0.0357%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
2	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
3	0.0000%	0.4165%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
4	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
5	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
6	0.0000%	6.2240%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
7	0.0000%	3.7487%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
8	1.0472%	13.1858%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	6.5215%
9	0.0000%	6.7357%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
10	0.0000%	3.4273%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
11	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.6423%
12	0.0000%	2.5229%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
13	0.0000%	0.6664%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
14	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
15	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
16	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.8806%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
17	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	7.1284%	0.0000%	0.0000%	0.0000%	0.0000%
18	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	13.8284%	0.0000%	0.0000%	0.0000%	0.0000%
19	0.1785%	1.3329%	0.0000%	0.0000%	0.0000%	0.0000%	2.4158%	6.2597%	0.0000%	0.0000%	0.0000%	0.0000%
20	0.0000%	0.2856%	0.0000%	0.0000%	0.0000%	0.0000%	4.2128%	2.3206%	0.0000%	0.0000%	0.0000%	0.0000%
21	0.0000%	4.2604%	0.0000%	0.0000%	0.0000%	0.0000%	2.6419%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
22	0.0000%	4.2723%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
23	0.0000%	0.5712%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
24	0.0000%	3.2369%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%

Table 64: Energy 2033 High Renewable Plan 12x24 EUE Percent Occurrence

Hour of Day	Month of Year											
	1	2	3	4	5	6	7	8	9	10	11	12
1	0.0000%	0.0065%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
2	0.0000%	0.0026%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
3	0.0000%	0.0065%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0163%
4	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0098%
5	0.0000%	0.0290%	0.0000%	0.0000%	0.0000%	0.0094%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
6	0.0000%	0.0104%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0681%
7	0.0381%	0.1410%	0.0000%	0.0000%	0.0000%	0.0000%	0.0002%	0.0169%	0.0000%	0.0000%	0.0000%	0.0345%
8	0.1156%	0.3311%	0.0000%	0.0000%	0.0000%	0.0000%	0.0031%	0.0074%	0.0000%	0.0000%	0.0000%	0.2107%
9	0.0738%	0.2967%	0.0000%	0.0000%	0.0000%	0.0000%	0.0026%	0.0000%	0.0000%	0.0000%	0.0000%	0.1985%
10	0.0909%	0.0922%	0.0000%	0.0000%	0.0000%	0.0151%	0.0112%	0.0000%	0.0000%	0.0000%	0.0000%	0.0358%
11	0.1068%	0.1539%	0.0000%	0.0000%	0.0000%	0.0173%	0.0282%	0.0079%	0.0000%	0.0000%	0.0000%	0.1197%
12	0.0609%	0.0531%	0.0000%	0.0000%	0.0000%	0.0154%	0.1803%	0.1233%	0.0000%	0.0000%	0.0000%	0.0855%
13	0.0000%	0.1109%	0.0000%	0.0000%	0.0000%	0.0152%	0.1681%	1.4871%	0.0000%	0.0000%	0.0000%	0.0000%
14	0.0000%	0.0707%	0.0000%	0.0000%	0.0000%	0.0082%	0.3171%	6.1019%	0.0000%	0.0000%	0.0000%	0.0000%
15	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0531%	1.3957%	10.4503%	0.0000%	0.0000%	0.0000%	0.0000%
16	0.0000%	0.0293%	0.0000%	0.0000%	0.0000%	0.0391%	2.5824%	15.0612%	0.0000%	0.0000%	0.0000%	0.0000%
17	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	2.4264%	20.7364%	0.0118%	0.0000%	0.0000%	0.0000%
18	0.0000%	0.1184%	0.0000%	0.0000%	0.0000%	0.0145%	1.6796%	16.9049%	0.0000%	0.0000%	0.0000%	0.0034%
19	0.0000%	0.1879%	0.0000%	0.0000%	0.0000%	0.0000%	1.7887%	9.2203%	0.0000%	0.0000%	0.0000%	0.0000%
20	0.0000%	0.2073%	0.0000%	0.0000%	0.0000%	0.0110%	1.9206%	3.3130%	0.0000%	0.0000%	0.0000%	0.0000%
21	0.0000%	0.2099%	0.0000%	0.0000%	0.0000%	0.0138%	0.1270%	0.2858%	0.0000%	0.0000%	0.0000%	0.0000%
22	0.0000%	0.0580%	0.0000%	0.0000%	0.0000%	0.0000%	0.0058%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
23	0.0000%	0.0301%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
24	0.0000%	0.0088%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%

In summary, the selected Preferred Portfolio has a loss-of-load expectation of well below the industry standard utilized by SPP in developing Resource Adequacy Requirements (LOLE of less than 0.1). Additionally, the unserved energy across these loss-of-load events represents less than 0.1% of Eversource's peak load. By comparison, the loss-of-load expectation in a high renewables plan is three times the industry standard and includes unserved energy of around 4% of Eversource's peak load during each loss-of-load event.

Section 19: Performance Measures

19.1 Eversource Kansas Central Performance Measures

The expected value for each Eversource Kansas Central ARP's performance measures and the standard deviation plan performance measures are provided below:

Table 65: Eversource Kansas Central Expected Value Plan Performance Measures

Plan	NPV Revenue Requirement (\$MM)	NPV Probable Environmental Costs (\$MM)	Average Annual Rates (\$/kW-hr)	Maximum Rate Increase	Meets Financial Metrics
AAAA	34,092	282	0.12	7%	YES
BAAA	34,514	365	0.12	8%	YES
AAAB	34,109	282	0.12	7%	YES
AAAC	34,860	83	0.12	8%	YES
ABAA	34,081	591	0.12	6%	YES
ACAA	34,577	243	0.12	8%	YES
ADAA	34,213	235	0.12	7%	YES
AAAD	34,538	849	0.12	10%	YES
AEAA	34,742	271	0.12	7%	YES
AFAD	36,490	4,299	0.13	11%	YES
AAAG	39,320	89	0.15	61%	NO
AEAG	39,349	88	0.15	105%	NO
AAAJ	34,141	280	0.12	7%	YES

Table 66: Evergy Kansas Central Standard Deviation Plan Performance Measures

Plan	NPV Revenue Requirement (\$MM)	NPV Probable Environmental Costs (\$MM)	Average Annual Rates (\$/kW-hr)	Maximum Rate Increase
AAAA	816	568	0.0036	0.0029
BAAA	869	547	0.0038	0.0036
AAAB	816	567	0.0036	0.0030
AAAC	794	237	0.0035	0.0010
ABAA	869	703	0.0039	0.0031
ACAA	897	588	0.0039	0.0025
ADAA	847	563	0.0037	0.0025
AAAD	957	754	0.0044	0.0056
AEAA	963	660	0.0042	0.0041
AFAD	2,816	2,773	0.0139	0.0066
AAAG	1,913	329	0.0091	0.0068
AEAG	1,959	319	0.0093	0.0095
AAAJ	825	567	0.0037	0.0033

19.2 Evergy Metro Performance Measures

The expected value for each Evergy Metro ARP's performance measures and the standard deviation plan performance measures are provided below:

Table 67: Evergy Metro Expected Value Plan Performance Measures

Plan	NPV Revenue Requirement (\$MM)	NPV Probable Environmental Costs (\$MM)	Average Annual Rates (\$/kW-hr)	Maximum Rate Increase	Meets Financial Metrics
AAAB	23,190	379	0.11	6%	YES
BAAB	23,370	334	0.12	6%	YES
BEAI	30,424	96	0.17	123%	NO
CAAB	23,144	353	0.11	6%	YES
CAAC	23,274	400	0.11	6%	YES
CAAD	23,574	124	0.12	9%	YES
CAAE	24,936	2,451	0.13	13%	YES
CAAI	26,316	105	0.14	33%	NO
CBAB	23,307	438	0.12	5%	YES
CCAB	23,217	347	0.11	6%	YES
CDAB	23,881	301	0.12	10%	YES
CEAB	25,029	221	0.13	18%	YES
CFAE	25,130	3,150	0.13	12%	YES
DAAB	23,337	482	0.12	8%	YES
EAAB	23,394	376	0.12	0%	YES
EAAJ	25,079	1,950	0.13	11%	YES
FAAB	23,516	394	0.12	9%	YES
GAAB	23,271	384	0.12	6%	YES
HAAB	23,685	490	0.12	10%	YES

Table 68: Evergy Metro Standard Deviation Plan Performance Measures

Plan	NPV Revenue Requirement (\$MM)	NPV Probable Environmental Costs (\$MM)	Average Annual Rates (\$/kW-hr)	Maximum Rate Increase
AAAB	651	569	0.0041	0.0024
BAAB	586	476	0.0036	0.0020
BEAI	1,668	349	0.0115	0.0106
CAAB	579	440	0.0036	0.0016
CAAC	601	518	0.0038	0.0031
CAAD	682	242	0.0042	0.0023
CAAE	1,701	1,537	0.0119	0.0094
CAAI	1,120	267	0.0075	0.0048
CBAB	708	706	0.0045	0.0022
CCAB	573	428	0.0036	0.0016
CDAB	655	538	0.0041	0.0028
CEAB	754	544	0.0046	0.0018
CFAE	2,182	2,040	0.0152	0.0103
DAAB	690	696	0.0045	0.0041
EAAB	631	457	0.0039	0.0016
EAJ	1,203	531	0.0087	0.0064
FAAB	621	465	0.0039	0.0017
GAAB	615	457	0.0038	0.0021
HAAB	695	539	0.0044	0.0017

Section 20: Additional Sensitivity Analyses

20.1 Eversky Kansas Central Sensitivities

If each endpoint is considered individually, the lowest NPVRR ARPs are AAAA, ABAA, AFAD and AAAC. AFAD has no retirements of Jeffrey and La Cygne units and optimal builds for the low CO₂, low natural gas future, it ranks highest in all low CO₂ endpoints. In contrast, AAAC, which is optimized for the high CO₂, high natural gas future is the highest ranked plan in three high CO₂ endpoints. The portfolio AAAA (which is the Preferred Portfolio before execution changes accelerating ½ combined cycle build by one year and moving back a solar build) is the highest ranked in 10 endpoints with varying scenarios, except for low CO₂. Plan ABAA, postponing the Jeffrey 2 retirement from 2030 to 2039 is ranked highest in five mid CO₂ endpoints.

Table 69: Evergy Kansas Central Lowest NPVRR Alternative Resource Plan By Endpoint

Endpoint	Weighting	NG	CO ₂	ConCost	ARP
1	0.56%	High	High	High	AAAA
2	2.25%	High	Mid	High	ABAA
3	0.94%	High	Low	High	AFAD
4	1.88%	Mid	High	High	AAAA
5	7.50%	Mid	Mid	High	AAAA
6	3.13%	Mid	Low	High	AFAD
7	1.31%	Low	High	High	AAAA
8	5.25%	Low	Mid	High	AAAA
9	2.19%	Low	Low	High	AFAD
10	1.13%	High	High	Mid	AAAC
11	4.50%	High	Mid	Mid	ABAA
12	1.88%	High	Low	Mid	AFAD
13	3.75%	Mid	High	Mid	AAAC
14	15.00%	Mid	Mid	Mid	AAAA
15	6.25%	Mid	Low	Mid	AFAD
16	2.63%	Low	High	Mid	AAAC
17	10.50%	Low	Mid	Mid	AAAA
18	4.38%	Low	Low	Mid	AFAD
19	0.56%	High	High	Low	AAAA
20	2.25%	High	Mid	Low	ABAA
21	0.94%	High	Low	Low	AFAD
22	1.88%	Mid	High	Low	AAAA
23	7.50%	Mid	Mid	Low	ABAA
24	3.13%	Mid	Low	Low	AFAD
25	1.31%	Low	High	Low	AAAA
26	5.25%	Low	Mid	Low	ABAA
27	2.19%	Low	Low	Low	AFAD

The following tables represent the Evergy Kansas Central sensitivities for the uncertain factors by scenario/endpoint.

Table 70: Evergy Kansas Central Uncertain Factors Sensitivities – High Construction Cost Vs. Natural Gas and CO₂

Rank	CO ₂		High		Mid		Low		CO ₂	High		Mid		Low		CO ₂	High		Mid		Low	
	Nat Gas	Plan	NPV	Plan	NPV	Plan	NPV	Nat Gas		Plan	NPV	Plan	NPV	Plan	NPV		Nat Gas	Plan	NPV	Plan	NPV	Plan
1		AAAA	36,493	ABAA	35,608	AFAD	33,293		AAAA	35,134	AAAA	34,779	AFAD	32,929		AAAA	34,600	AAAA	34,434	AFAD	32,756	
2		AAAB	36,515	AAAA	35,781	ABAA	35,322		AAAB	35,152	AAAB	34,796	AAAD	34,343		AAAB	34,617	AAAB	34,451	AAAD	33,821	
3		AAAJ	36,623	AAAB	35,800	AAAD	35,530		AAAJ	35,212	ABAA	34,802	ABAA	34,612		AAAJ	34,661	ABAA	34,472	AAAA	34,189	
4		ADAA	36,629	AAAJ	35,842	AAAA	35,632		ADAA	35,262	AAAJ	34,824	AAAA	34,634		ADAA	34,725	AAAJ	34,475	AAAB	34,206	
5		ABAA	37,093	ADAA	35,999	AAAB	35,651		BAAA	35,617	ADAA	34,926	AAAB	34,651		BAAA	35,039	ADAA	34,539	AAAJ	34,232	
6		BAAA	37,120	AAAD	36,281	AAAJ	35,695		ABAA	35,670	AAAD	35,168	AAAJ	34,680		AEAA	35,096	AAAD	34,826	ABAA	34,259	
7	High	ACAA	37,159	BAAA	36,344	ADAA	35,944	Mid	ACAA	35,716	BAAA	35,296	ADAA	34,834	Low	ABAA	35,117	ACAA	34,880	ADAA	34,351	
8		AEAA	37,364	ACAA	36,558	BAAA	36,126		AEAA	35,719	ACAA	35,307	BAAA	35,039		ACAA	35,162	AEAA	34,930	BAAA	34,564	
9		AAAC	37,367	AAAC	36,681	ACAA	36,519		AAAD	36,043	AEAA	35,403	ACAA	35,214		AAAD	35,419	BAAA	34,958	ACAA	34,680	
10		AAAD	37,670	AEAA	36,836	AAAC	36,609		AAAC	36,236	AAAC	35,855	AEAA	35,304		AAAC	35,821	AAAC	35,497	AEAA	34,708	
11		AAAG	42,992	AFAD	38,214	AEAA	36,787		AFAD	41,820	AFAD	36,998	AAAC	35,825		AFAD	41,299	AFAD	36,710	AAAC	35,486	
12		AEAG	43,151	AAAG	42,174	AAAG	42,163		AAAG	42,783	AAAG	42,230	AAAG	42,227		AAAG	42,745	AAAG	42,272	AAAG	42,267	
13		AFAD	43,419	AEAG	42,390	AEAG	42,374		AEAG	42,870	AEAG	42,337	AEAG	42,330		AEAG	42,818	AEAG	42,343	AEAG	42,337	

Table 71: Evergy Kansas Central Uncertain Factors Sensitivities – Low Construction Cost Vs. Natural Gas and CO₂

Rank	CO ₂		High		Mid		Low		CO ₂	High		Mid		Low		CO ₂	High		Mid		Low	
	Nat Gas	Plan	NPV	Plan	NPV	Plan	NPV	Nat Gas		Plan	NPV	Plan	NPV	Plan	NPV		Nat Gas	Plan	NPV	Plan	NPV	Plan
1		AAAA	35,083	ABAA	33,990	AFAD	32,762		AAAA	33,724	ABAA	33,184	AFAD	32,398		AAAA	33,189	ABAA	32,854	AFAD	32,224	
2		AAAB	35,108	AAAA	34,370	ABAA	33,704		AAAB	33,745	AAAA	33,369	ABAA	32,994		AAAB	33,210	AAAA	33,024	ABAA	32,641	
3		ADAA	35,141	AAAB	34,394	AAAA	34,222		AAAJ	33,769	AAAJ	33,381	AAAD	33,189		AAAJ	33,218	AAAJ	33,033	AAAD	32,667	
4		AAAJ	35,180	AAAJ	34,399	AAAB	34,245		ADAA	33,774	AAAB	33,390	AAAA	33,224		ADAA	33,238	AAAB	33,044	AAAA	32,779	
5		ABAA	35,475	ADAA	34,512	AAAJ	34,252		ABAA	34,052	ADAA	33,438	AAAJ	33,237		BAAA	33,490	ADAA	33,051	AAAJ	32,790	
6		AAAC	35,498	BAAA	34,796	AAAD	34,376		BAAA	34,069	BAAA	33,747	AAAB	33,244		ABAA	33,499	ACAA	33,380	AAAB	32,799	
7	High	BAAA	35,572	AAAC	34,811	ADAA	34,457	Mid	ACAA	34,215	ACAA	33,806	ADAA	33,347	Low	ACAA	33,661	BAAA	33,409	ADAA	32,863	
8		ACAA	35,658	ACAA	35,057	BAAA	34,578		AEAA	34,355	AAAC	33,986	BAAA	33,491		AEAA	33,731	AEAA	33,566	BAAA	33,015	
9		AEAA	36,000	AAAD	35,127	AAAC	34,740		AAAC	34,367	AAAD	34,014	ACAA	33,713		AAAC	33,952	AAAC	33,628	ACAA	33,179	
10		AAAD	36,516	AEAA	35,472	ACAA	35,018		AAAD	34,889	AEAA	34,038	AEAA	33,939		AAAD	34,265	AAAD	33,673	AEAA	33,344	
11		AAAG	37,709	AAAG	36,891	AEAA	35,422		AEAG	37,462	AFAD	36,467	AAAC	33,956		AEAG	37,410	AFAD	36,178	AAAC	33,617	
12		AEAG	37,743	AEAG	36,982	AAAG	36,880		AAAG	37,501	AEAG	36,929	AEAG	36,922		AAAG	37,463	AEAG	36,935	AEAG	36,929	
13		AFAD	42,888	AFAD	37,682	AEAG	36,966		AFAD	41,289	AAAG	36,948	AAAG	36,944		AFAD	40,767	AAAG	36,989	AAAG	36,984	

Table 72: Evergy Kansas Central Uncertain Factors Sensitivities – High Natural Gas Vs. Construction Cost and CO₂

Rank	CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low	
		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV
1		AAAA	36,493	ABAA	35,608	AFAD	33,293		AAAC	36,207	ABAA	34,689	AFAD	33,019		AAAA	35,083	ABAA	33,990	AFAD	32,762
2		AAAB	36,515	AAAA	35,781	ABAA	35,322		AAAA	36,829	AAAA	34,849	ABAA	34,402		AAAB	35,108	AAAA	34,370	ABAA	33,704
3		AAAJ	36,623	AAAB	35,800	AAAD	35,530		AAAB	36,844	AAAB	34,867	AAAA	34,701		ADAA	35,141	AAAB	34,394	AAAA	34,222
4		ADAA	36,629	AAAJ	35,842	AAAA	35,632		AAAJ	36,910	AAAJ	34,933	AAAB	34,718		AAAJ	35,180	AAAJ	34,399	AAAB	34,245
5		ABAA	37,093	ADAA	35,999	AAAB	35,651		ADAA	36,944	ADAA	35,036	AAAJ	34,786		ABAA	35,475	ADAA	34,512	AAAJ	34,252
6		BAAA	37,120	AAAD	36,281	AAAJ	35,695		ABAA	36,958	BAAA	35,344	AAAD	34,809		AAAC	35,498	BAAA	34,796	AAAD	34,376
7	High	ACAA	37,159	BAAA	36,344	ADAA	35,944	Mid	ACAA	37,366	AAAC	35,520	ADAA	34,981	Low	BAAA	35,572	AAAC	34,811	ADAA	34,457
8		AEAA	37,364	ACAA	36,558	BAAA	36,126		BAAA	37,387	ACAA	35,530	BAAA	35,126		ACAA	35,658	ACAA	35,057	BAAA	34,578
9		AAAC	37,367	AAAC	36,681	ACAA	36,519		AAAD	37,795	AAAD	35,559	AAAC	35,449		AEAA	36,000	AAAD	35,127	AAAC	34,740
10		AAAD	37,670	AEAA	36,836	AAAC	36,609		AEAA	38,030	AEAA	35,825	ACAA	35,492		AAAD	36,516	AEAA	35,472	ACAA	35,018
11		AAAG	42,992	AFAD	38,214	AEAA	36,787		AAAG	39,635	AFAD	37,939	AEAA	35,775		AAAG	37,709	AAAG	36,891	AEAA	35,422
12		AEAG	43,151	AAAG	42,174	AAAG	42,163		AEAG	39,699	AAAG	38,817	AAAG	38,806		AEAG	37,743	AEAG	36,982	AAAG	36,880
13		AFAD	43,419	AEAG	42,390	AEAG	42,374		AFAD	43,145	AEAG	38,938	AEAG	38,922		AFAD	42,888	AFAD	37,682	AEAG	36,966

Table 73: Evergy Kansas Central Uncertain Factors Sensitivities – Low Natural Gas Vs. Construction Cost and CO₂

Rank	CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low	
		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV
1		AAAA	34,600	AAAA	34,434	AFAD	32,756		AAAC	34,661	AAAA	33,503	AFAD	32,481		AAAA	33,189	ABAA	32,854	AFAD	32,224
2		AAAB	34,617	AAAB	34,451	AAAD	33,821		AAAA	34,936	AAAB	33,518	AAAD	33,100		AAAB	33,210	AAAA	33,024	ABAA	32,641
3		AAAJ	34,661	ABAA	34,472	AAAA	34,189		AAAB	34,946	ABAA	33,553	AAAA	33,258		AAAJ	33,218	AAAJ	33,033	AAAD	32,667
4		ADAA	34,725	AAAJ	34,475	AAAB	34,206		AAAJ	34,948	AAAJ	33,567	AAAB	33,273		ADAA	33,238	AAAB	33,044	AAAA	32,779
5		BAAA	35,039	ADAA	34,539	AAAJ	34,232		ABAA	34,982	ADAA	33,576	AAAJ	33,324		BAAA	33,490	ADAA	33,051	AAAJ	32,790
6		AEAA	35,096	AAAD	34,826	ABAA	34,259		ADAA	35,041	ACAA	33,853	ABAA	33,340		ABAA	33,499	ACAA	33,380	AAAB	32,799
7	High	ABAA	35,117	ACAA	34,880	ADAA	34,351	Mid	BAAA	35,306	AEAA	33,919	ADAA	33,388	Low	ACAA	33,661	BAAA	33,409	ADAA	32,863
8		ACAA	35,162	AEAA	34,930	BAAA	34,564		ACAA	35,369	BAAA	33,958	BAAA	33,564		AEAA	33,731	AEAA	33,566	BAAA	33,015
9		AAAD	35,419	BAAA	34,958	ACAA	34,680		AAAD	35,544	AAAD	34,105	ACAA	33,653		AAAC	33,952	AAAC	33,628	ACAA	33,179
10		AAAC	35,821	AAAC	35,497	AEAA	34,708		AEAA	35,762	AAAC	34,337	AEAA	33,697		AAAD	34,265	AAAD	33,673	AEAA	33,344
11		AFAD	41,299	AFAD	36,710	AAAC	35,486		AEAG	39,366	AFAD	36,435	AAAC	34,326		AEAG	37,410	AFAD	36,178	AAAC	33,617
12		AAAG	42,745	AAAG	42,272	AAAG	42,267		AAAG	39,388	AEAG	38,892	AEAG	38,885		AAAG	37,463	AEAG	36,935	AEAG	36,929
13		AEAG	42,818	AEAG	42,343	AEAG	42,337		AFAD	41,024	AAAG	38,914	AAAG	38,909		AFAD	40,767	AAAG	36,989	AAAG	36,984

Table 74: Energy Kansas Central Uncertain Factors Sensitivities – High CO₂ Vs. Construction Costs and Natural Gas

Rank	NG Price Con Costs	High				Mid				Low				NG Price Con Costs	High				Mid				Low			
		Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV
1		AAAA	36,493	AAAA	35,134	AAAA	34,600			AAAC	36,207	AAAC	35,076	AAAC	34,661			AAAA	35,083	AAAA	33,724	AAAA	33,189			
2		AAAB	36,515	AAAB	35,152	AAAB	34,617			AAAA	36,829	AAAA	35,470	AAAA	34,936			AAAB	35,108	AAAB	33,745	AAAB	33,210			
3		AAAJ	36,623	AAAJ	35,212	AAAJ	34,661			AAAB	36,844	AAAB	35,482	AAAB	34,946			ADAA	35,141	AAAJ	33,769	AAAJ	33,218			
4		ADAA	36,629	ADAA	35,262	ADAA	34,725			AAAJ	36,910	AAAJ	35,499	AAAJ	34,948			AAAJ	35,180	ADAA	33,774	ADAA	33,238			
5		ABAA	37,093	BAAA	35,617	BAAA	35,039			ADAA	36,944	ABAA	35,536	ABAA	34,982			ABAA	35,475	ABAA	34,052	BAAA	33,490			
6		BAAA	37,120	ABAA	35,670	AEAA	35,096			ABAA	36,958	ADAA	35,577	ADAA	35,041			AAAC	35,498	BAAA	34,069	ABAA	33,499			
7	High	ACAA	37,159	ACAA	35,716	ABAA	35,117	Mid		ACAA	37,366	BAAA	35,884	BAAA	35,306	Low		BAAA	35,572	ACAA	34,215	ACAA	33,661			
8		AEAA	37,364	AEAA	35,719	ACAA	35,162			BAAA	37,387	ACAA	35,923	ACAA	35,369			ACAA	35,658	AEAA	34,355	AEAA	33,731			
9		AAAC	37,367	AAAD	36,043	AAAD	35,419			AAAD	37,795	AAAD	36,168	AAAD	35,544			AEAA	36,000	AAAC	34,367	AAAC	33,952			
10		AAAD	37,670	AAAC	36,236	AAAC	35,821			AEAA	38,030	AEAA	36,385	AEAA	35,762			AAAD	36,516	AAAD	34,889	AAAD	34,265			
11		AAAG	42,992	AFAD	41,820	AFAD	41,299			AAAG	39,635	AEAG	39,418	AEAG	39,366			AAAG	37,709	AEAG	37,462	AEAG	37,410			
12		AEAG	43,151	AAAG	42,783	AAAG	42,745			AEAG	39,699	AAAG	39,426	AAAG	39,388			AEAG	37,743	AAAG	37,501	AAAG	37,463			
13		AFAD	43,419	AEAG	42,870	AEAG	42,818			AFAD	43,145	AFAD	41,546	AFAD	41,024			AFAD	42,888	AFAD	41,289	AFAD	40,767			

Table 75: Energy Kansas Central Uncertain Factors Sensitivities – Low CO₂ Vs. Construction Costs and Natural Gas

Rank	NG Price Con Costs	High				Mid				Low				NG Price Con Costs	High				Mid				Low			
		Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV
1		AFAD	33,293	AFAD	32,929	AFAD	32,756			AFAD	33,019	AFAD	32,655	AFAD	32,481			AFAD	32,762	AFAD	32,398	AFAD	32,224			
2		ABAA	35,322	AAAD	34,343	AAAD	33,821			ABAA	34,402	AAAD	33,621	AAAD	33,100			ABAA	33,704	ABAA	32,994	ABAA	32,641			
3		AAAD	35,530	ABAA	34,612	AAAA	34,189			AAAA	34,701	ABAA	33,692	AAAA	33,258			AAAA	34,222	AAAD	33,189	AAAD	32,667			
4		AAAA	35,632	AAAA	34,634	AAAB	34,206			AAAB	34,718	AAAA	33,703	AAAB	33,273			AAAB	34,245	AAAA	33,224	AAAA	32,779			
5		AAAB	35,651	AAAB	34,651	AAAJ	34,232			AAAJ	34,786	AAAB	33,718	AAAJ	33,324			AAAJ	34,252	AAAJ	33,237	AAAJ	32,790			
6		AAAJ	35,695	AAAJ	34,680	ABAA	34,259			AAAD	34,809	AAAJ	33,771	ABAA	33,340			AAAD	34,376	AAAB	33,244	AAAB	32,799			
7	High	ADAA	35,944	ADAA	34,834	ADAA	34,351	Mid		ADAA	34,981	ADAA	33,871	ADAA	33,388	Low		ADAA	34,457	ADAA	33,347	ADAA	32,863			
8		BAAA	36,126	BAAA	35,039	BAAA	34,564			BAAA	35,126	BAAA	34,039	BAAA	33,564			BAAA	34,578	BAAA	33,491	BAAA	33,015			
9		ACAA	36,519	ACAA	35,214	ACAA	34,680			AAAC	35,449	ACAA	34,187	ACAA	33,653			AAAC	34,740	ACAA	33,713	ACAA	33,179			
10		AAAC	36,609	AEAA	35,304	AEAA	34,708			ACAA	35,492	AEAA	34,292	AEAA	33,697			ACAA	35,018	AEAA	33,939	AEAA	33,344			
11		AEAA	36,787	AAAC	35,825	AAAC	35,486			AEAA	35,775	AAAC	34,664	AAAC	34,326			AEAA	35,422	AAAC	33,956	AAAC	33,617			
12		AAAG	42,163	AAAG	42,227	AAAG	42,267			AAAG	38,806	AAAG	38,869	AEAG	38,885			AAAG	36,880	AEAG	36,922	AEAG	36,929			
13		AEAG	42,374	AEAG	42,330	AEAG	42,337			AEAG	38,922	AEAG	38,878	AAAG	38,909			AEAG	36,966	AAAG	36,944	AAAG	36,984			

20.2 Energy Metro Sensitivities

If each endpoint is considered individually, the lowest NPVRR ARPs are CAAB, AAAB, CAAD and CFAE. CFAE has no retirements and optimal builds for the low CO₂, low natural gas future, it ranks highest in all low CO₂ endpoints. In contrast, CAAD, which is optimized for the high CO₂, high natural gas future is the highest ranked plan in four high CO₂ endpoints and a mid CO₂, high natural gas endpoint. The Preferred Portfolio CAAB is the highest ranked in 10 endpoints with varying scenarios, except for low CO₂. Plan AAAB with the RAP-level DSM is ranked highest in three mid CO₂ endpoints.

Table 76: Energy Metro Lowest NPVRR Alternative Resource Plan By Endpoint

Endpoint	Weighting	NG	CO ₂	ConCost	ARP
1	0.56%	High	High	High	CAAB
2	2.25%	High	Mid	High	CAAB
3	0.94%	High	Low	High	CFAE
4	1.88%	Mid	High	High	CAAB
5	7.50%	Mid	Mid	High	CAAB
6	3.13%	Mid	Low	High	CFAE
7	1.31%	Low	High	High	CAAB
8	5.25%	Low	Mid	High	CAAB
9	2.19%	Low	Low	High	CFAE
10	1.13%	High	High	Mid	CAAD
11	4.50%	High	Mid	Mid	AAAB
12	1.88%	High	Low	Mid	CFAE
13	3.75%	Mid	High	Mid	CAAD
14	15.00%	Mid	Mid	Mid	CAAB
15	6.25%	Mid	Low	Mid	CFAE
16	2.63%	Low	High	Mid	CAAD
17	10.50%	Low	Mid	Mid	CAAB
18	4.38%	Low	Low	Mid	CFAE
19	0.56%	High	High	Low	CAAD
20	2.25%	High	Mid	Low	CAAD
21	0.94%	High	Low	Low	CFAE
22	1.88%	Mid	High	Low	CAAB
23	7.50%	Mid	Mid	Low	AAAB
24	3.13%	Mid	Low	Low	CFAE
25	1.31%	Low	High	Low	CAAB
26	5.25%	Low	Mid	Low	AAAB
27	2.19%	Low	Low	Low	CFAE

**Table 77: Energy Metro Uncertain Factors Sensitivities – High Construction Costs
Vs. Natural Gas and CO₂**

Rank	CO ₂						CO ₂						CO ₂								
	Nat Gas	High		Mid		Low		Nat Gas	High		Mid		Low		Nat Gas	High		Mid		Low	
	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	
1	CAAB	25,041	CAAB	24,158	CFAE	22,292	CAAB	24,191	CAAB	23,727	CFAE	22,184	CAAB	23,885	CAAB	23,551	CFAE	22,129			
2	CCAB	25,047	AAAB	24,193	CAAE	23,089	CCAB	24,207	CCAB	23,795	CAAE	22,789	CCAB	23,907	CCAB	23,603	CAAE	22,634			
3	GAAB	25,176	CCAB	24,271	CAAB	23,557	GAAB	24,330	AAAB	23,818	CAAB	23,416	GAAB	24,022	CAAC	23,637	EAAJ	23,270			
4	AAAB	25,304	CAAC	24,280	CAAC	23,617	CAAC	24,431	CAAC	23,822	EAAJ	23,441	CAAC	24,109	AAAB	23,649	CAAB	23,336			
5	FAAB	25,308	CBAB	24,345	DAAB	23,620	EAAB	24,493	DAAB	23,871	CAAC	23,476	EAAB	24,186	DAAB	23,676	CCAB	23,393			
6	EAAB	25,336	BAAB	24,345	AAAB	23,631	FAAB	24,501	CBAB	23,879	DAAB	23,477	FAAB	24,209	CBAB	23,679	CAAC	23,397			
7	BAAB	25,337	DAAB	24,355	CCAB	23,671	BAAB	24,517	GAAB	23,900	CCAB	23,489	BAAB	24,227	GAAB	23,714	DAAB	23,398			
8	CAAC	25,344	GAAB	24,368	GAAB	23,708	AAAB	24,597	BAAB	23,948	AAAB	23,512	AAAB	24,344	BAAB	23,767	AAAB	23,438			
9	CAAD	25,373	EAAB	24,536	CBAB	23,746	DAAB	24,865	EAAB	24,067	CBAB	23,542	DAAB	24,561	EAAB	23,872	CBAB	23,443			
10	High	CBAB	25,694	CAAD	24,599	EAAJ	23,782	Mid	CAAD	24,876	FAAB	24,165	GAAB	23,557	Low	CBAB	24,613	FAAB	23,964	GAAB	23,471
11		DAAB	25,766	FAAB	24,670	BAAB	23,794		CBAB	24,892	HAAB	24,395	BAAB	23,668		HAAB	24,708	HAAB	24,224	BAAB	23,596
12		HAAB	25,945	HAAB	24,901	EAAB	23,866		HAAB	25,032	CAAD	24,480	EAAB	23,732		CAAD	24,715	CDAB	24,316	EAAB	23,652
13		CDAB	26,087	CDAB	25,028	FAAB	23,944		CDAB	25,210	CDAB	24,513	FAAB	23,812		EAAJ	24,811	CAAD	24,424	FAAB	23,734
14		EAAJ	26,856	CAAE	26,214	HAAB	24,086		EAAJ	25,344	CAAE	25,484	HAAB	23,949		CDAB	24,905	CEAB	25,268	HAAB	23,867
15		CEAB	27,479	CFAE	26,408	CAAD	24,428		CEAB	26,239	CEAB	25,569	CDAB	24,305		CEAB	25,840	CAAE	25,343	CDAB	24,155
16		CAAI	28,711	CEAB	26,688	CDAB	24,654		CAAE	27,904	CFAE	25,637	CAAD	24,402		CAAE	27,554	CFAE	25,510	CAAD	24,375
17		CAAE	29,015	EAAJ	26,748	CEAB	26,642		CAAI	28,438	EAAJ	25,977	CEAB	25,498		CAAI	28,383	EAAJ	25,898	CEAB	25,080
18		CFAE	30,043	CAAI	27,944	CAAI	27,837		CFAE	29,021	CAAI	27,994	CAAI	27,950		CFAE	28,715	CAAI	28,037	CAAI	28,006
19		BEAI	33,725	BEAI	32,930	BEAI	32,914		BEAI	33,588	BEAI	33,004	BEAI	32,998		BEAI	33,613	BEAI	33,075	BEAI	33,069

**Table 78: Energy Metro Uncertain Factors Sensitivities – Low Construction Costs
Vs. Natural Gas and CO₂**

Rank	CO ₂		High		Mid		Low		CO ₂		High		Mid		Low		CO ₂		High		Mid		Low		
	Nat Gas	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Nat Gas	Plan	NPV	Plan	NPV	Plan	NPV	Nat Gas	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV
1		CAAD	23,520	CAAD	22,746	CFAE	21,895			CAAB	23,022	AAAB	22,479	CFAE	21,787			CAAB	22,716	AAAB	22,310	CFAE	21,732		
2		CAAB	23,872	AAAB	22,854	AAAB	22,293			CAAD	23,023	CAAB	22,558	AAAB	22,174			CCAB	22,772	CAAB	22,382	CAAE	22,078		
3		CCAB	23,912	CAAB	22,989	CAAB	22,388			CCAB	23,072	CBAB	22,588	CAAE	22,233			GAAB	22,783	CBAB	22,388	AAAB	22,100		
4		GAAB	23,936	CBAB	23,054	DAAB	22,453			GAAB	23,090	CAAD	22,627	CAAB	22,247			CAAD	22,862	CCAB	22,468	CBAB	22,152		
5		AAAB	23,965	GAAB	23,129	CBAB	22,455			EAAB	23,187	CCAB	22,659	CBAB	22,251			EAAB	22,880	GAAB	22,475	CAAB	22,167		
6		EAAB	24,029	CCAB	23,136	GAAB	22,469			AAAB	23,259	GAAB	22,661	DAAB	22,310			CAAC	23,002	DAAB	22,509	DAAB	22,231		
7		FAAB	24,103	BAAB	23,151	CAAC	22,510			FAAB	23,296	DAAB	22,704	GAAB	22,318			FAAB	23,005	CAAC	22,530	GAAB	22,232		
8		BAAB	24,142	CAAC	23,173	CAAE	22,532			BAAB	23,323	CAAC	22,715	CCAB	22,354			AAAB	23,006	EAAB	22,566	CCAB	22,258		
9		CAAC	24,237	DAAB	23,188	CCAB	22,535			CAAC	23,324	BAAB	22,754	CAAC	22,369			BAAB	23,033	CAAD	22,571	CAAC	22,290		
10	High	CBAB	24,403	EAAB	23,230	EAAB	22,559	Mid		CBAB	23,601	EAAB	22,760	EAAB	22,425	Low		CBAB	23,322	BAAB	22,573	EAAB	22,345		
11		HAAB	24,567	FAAB	23,466	CAAD	22,575			HAAB	23,654	FAAB	22,961	BAAB	22,474			HAAB	23,330	FAAB	22,759	BAAB	22,402		
12		DAAB	24,599	HAAB	23,523	BAAB	22,600			DAAB	23,698	HAAB	23,017	CAAD	22,549			DAAB	23,394	HAAB	22,846	HAAB	22,489		
13		CDAB	24,732	CDAB	23,673	HAAB	22,709			CDAB	23,855	CDAB	23,158	HAAB	22,572			CDAB	23,551	CDAB	22,962	CAAD	22,522		
14		CAAI	25,641	CAAI	24,873	FAAB	22,740			EAAJ	24,954	CEAB	24,303	FAAB	22,608			EAAJ	24,421	CEAB	24,003	FAAB	22,529		
15		CEAB	26,214	CEAB	25,423	CDAB	23,300			CEAB	24,973	CAAI	24,923	CDAB	22,951			CEAB	24,574	CAAE	24,786	CDAB	22,800		
16		EAAJ	26,466	CAAE	25,657	EAAJ	23,392			CAAI	25,367	CAAE	24,927	EAAJ	23,051			CAAI	25,313	CAAI	24,967	EAAJ	22,880		
17		CAAE	28,458	CFAE	26,011	CAAI	24,767			CAAE	27,347	CFAE	25,240	CEAB	24,232			CAAE	26,997	CFAE	25,114	CEAB	23,814		
18		BEAI	29,202	EAAJ	26,358	CEAB	25,376			CFAE	28,624	EAAJ	25,587	CAAI	24,880			CFAE	28,318	EAAJ	25,508	CAAI	24,935		
19		CFAE	29,647	BEAI	28,407	BEAI	28,391			BEAI	29,064	BEAI	28,481	BEAI	28,474			BEAI	29,090	BEAI	28,552	BEAI	28,546		

Table 79: Energy Metro Uncertain Factors Sensitivities – High Natural Gas Vs. Construction Costs and CO₂

Rank	CO ₂ High		Mid		Low		Con Costs	CO ₂ High		Mid		Low		Con Costs	CO ₂ High		Mid		Low		
	Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV	Plan
1	CAAB	25,041	CAAB	24,158	CFAE	22,292		CAAD	24,406	AAAB	23,476	CFAE	22,089		CAAD	23,520	CAAD	22,746	CFAE	21,895	
2	CCAB	25,047	AAAB	24,193	CAAE	23,089		CAAB	24,930	CAAB	23,504	CAAE	22,777		CAAB	23,872	AAAB	22,854	AAAB	22,293	
3	GAAB	25,176	CCAB	24,271	CAAB	23,557		AAAB	24,937	CCAB	23,613	CAAB	22,903		CCAB	23,912	CAAB	22,989	CAAB	22,388	
4	AAAB	25,304	CAAC	24,280	CAAC	23,617		CCAB	24,994	CAAD	23,632	AAAB	22,914		GAAB	23,936	CBAB	23,054	DAAB	22,453	
5	FAAB	25,308	CBAB	24,345	DAAB	23,620		BAAB	25,125	CAAC	23,641	DAAB	22,971		AAAB	23,965	GAAB	23,129	CBAB	22,455	
6	EAAB	25,336	BAAB	24,345	AAAB	23,631		GAAB	25,147	CBAB	23,652	CAAC	22,979		EAAB	24,029	CCAB	23,136	GAAB	22,469	
7	BAAB	25,337	DAAB	24,355	CCAB	23,671		CAAC	25,221	GAAB	23,663	GAAB	23,003		FAAB	24,103	BAAB	23,151	CAAC	22,510	
8	CAAC	25,344	GAAB	24,368	GAAB	23,708		EAAB	25,253	BAAB	23,690	CCAB	23,012		BAAB	24,142	CAAC	23,173	CAAE	22,532	
9	CAAD	25,373	EAAB	24,536	CBAB	23,746		CBAB	25,354	DAAB	23,705	CBAB	23,053		CAAC	24,237	DAAB	23,188	CCAB	22,535	
10	High	CBAB	25,694	CAAD	24,599	EAAJ	23,782	Mid	FAAB	25,437	EAAB	23,778	EAAB	23,107	Low	CBAB	24,403	EAAB	23,230	EAAB	22,559
11		DAAB	25,766	FAAB	24,670	BAAB	23,794		DAAB	25,466	FAAB	23,908	BAAB	23,138		HAAB	24,567	FAAB	23,466	CAAD	22,575
12		HAAB	25,945	HAAB	24,901	EAAB	23,866		HAAB	25,692	HAAB	24,098	FAAB	23,182		DAAB	24,599	HAAB	23,523	BAAB	22,600
13		CDAB	26,087	CDAB	25,028	FAAB	23,944		CDAB	25,737	CDAB	24,256	HAAB	23,283		CDAB	24,732	CDAB	23,673	HAAB	22,709
14		EAAJ	26,856	CAAE	26,214	HAAB	24,086		CAAI	26,762	CEAB	25,889	EAAJ	23,369		CAAI	25,641	CAAI	24,873	FAAB	22,740
15		CEAB	27,479	CFAE	26,408	CAAD	24,428		CEAB	27,240	CAAE	25,903	CAAD	23,461		CEAB	26,214	CEAB	25,423	CDAB	23,300
16		CAAI	28,711	CEAB	26,688	CDAB	24,654		EAAJ	27,479	CAAI	25,995	CDAB	23,882		EAAJ	26,466	CAAE	25,657	EAAJ	23,392
17		CAAE	29,015	EAAJ	26,748	CEAB	26,642		CAAE	28,935	CFAE	26,206	CEAB	25,843		CAAE	28,458	CFAE	26,011	CAAI	24,767
18		CFAE	30,043	CAAI	27,944	CAAI	27,837		CFAE	29,841	EAAJ	26,335	CAAI	25,888		BEAI	29,202	EAAJ	26,358	CEAB	25,376
19		BEAI	33,725	BEAI	32,930	BEAI	32,914		BEAI	30,623	BEAI	29,827	BEAI	29,812		CFAE	29,647	BEAI	28,407	BEAI	28,391

Table 80: Energy Metro Uncertain Factors Sensitivities – Low Natural Gas Vs. Construction Costs and CO₂

Rank	CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low		CO ₂ Con Costs	High		Mid		Low	
		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV		Plan	NPV	Plan	NPV	Plan	NPV
1		CAAB	23,885	CAAB	23,551	CFAE	22,129		CAAD	23,748	CAAB	22,897	CFAE	21,926		CAAB	22,716	AAAB	22,310	CFAE	21,732
2		CCAB	23,907	CCAB	23,603	CAAE	22,634		CAAB	23,774	AAAB	22,932	CAAE	22,323		CCAB	22,772	CAAB	22,382	CAAE	22,078
3		GAAB	24,022	CAAC	23,637	EAAJ	23,270		CCAB	23,854	CCAB	22,944	CAAB	22,682		GAAB	22,783	CBAB	22,388	AAAB	22,100
4		CAAC	24,109	AAAB	23,649	CAAB	23,336		AAAB	23,978	CBAB	22,986	AAAB	22,721		CAAD	22,862	CCAB	22,468	CBAB	22,152
5		EAAB	24,186	DAAB	23,676	CCAB	23,393		CAAC	23,986	CAAC	22,999	CCAB	22,734		EAAB	22,880	GAAB	22,475	CAAB	22,167
6		FAAB	24,209	CBAB	23,679	CAAC	23,397		GAAB	23,993	GAAB	23,010	DAAB	22,748		CAAC	23,002	DAAB	22,509	DAAB	22,231
7		BAAB	24,227	GAAB	23,714	DAAB	23,398		BAAB	24,016	DAAB	23,026	CBAB	22,750		FAAB	23,005	CAAC	22,530	GAAB	22,232
8		AAAB	24,344	BAAB	23,767	AAAB	23,438		EAAB	24,103	BAAB	23,112	CAAC	22,759		AAAB	23,006	EAAB	22,566	CCAB	22,258
9		DAAB	24,561	EAAB	23,872	CBAB	23,443		DAAB	24,262	EAAB	23,113	GAAB	22,766		BAAB	23,033	CAAD	22,571	CAAC	22,290
10	High	CBAB	24,613	FAAB	23,964	GAAB	23,471	Mid	CBAB	24,273	FAAB	23,201	EAAJ	22,858	Low	CBAB	23,322	BAAB	22,573	EAAB	22,345
11		HAAB	24,708	HAAB	24,224	BAAB	23,596		FAAB	24,339	HAAB	23,421	EAAB	22,893		HAAB	23,330	FAAB	22,759	BAAB	22,402
12		CAAD	24,715	CDAB	24,316	EAAB	23,652		HAAB	24,455	CAAD	23,457	BAAB	22,941		DAAB	23,394	HAAB	22,846	HAAB	22,489
13		EAAJ	24,811	CAAD	24,424	FAAB	23,734		CDAB	24,555	CDAB	23,544	FAAB	22,971		CDAB	23,551	CDAB	22,962	CAAD	22,522
14		CDAB	24,905	CEAB	25,268	HAAB	23,867		EAAJ	25,434	CEAB	24,469	HAAB	23,063		EAAJ	24,421	CEAB	24,003	FAAB	22,529
15		CEAB	25,840	CAAE	25,343	CDAB	24,155		CEAB	25,601	CAAE	25,031	CDAB	23,383		CEAB	24,574	CAAE	24,786	CDAB	22,800
16		CAAE	27,554	CFAE	25,510	CAAD	24,375		CAAI	26,434	CFAE	25,308	CAAD	23,408		CAAI	25,313	CAAI	24,967	EAAJ	22,880
17		CAAI	28,383	EAAJ	25,898	CEAB	25,080		CAAE	27,474	EAAJ	25,486	CEAB	24,281		CAAE	26,997	CFAE	25,114	CEAB	23,814
18		CFAE	28,715	CAAI	28,037	CAAI	28,006		CFAE	28,512	CAAI	26,088	CAAI	26,056		CFAE	28,318	EAAJ	25,508	CAAI	24,935
19		BEAI	33,613	BEAI	33,075	BEAI	33,069		BEAI	30,511	BEAI	29,972	BEAI	29,967		BEAI	29,090	BEAI	28,552	BEAI	28,546

Table 81: Energy Metro Uncertain Factors Sensitivities – High CO₂ Vs. Construction Costs and Natural Gas

Rank	NG Price		High		Mid		Low		NG Price		High		Mid		Low		NG Price		High		Mid		Low	
	Con Costs	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Con Costs	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Con Costs	Plan	NPV	Plan	NPV	Plan
1		CAAB	25,041	CAAB	24,191	CAAB	23,885			CAAD	24,406	CAAD	23,909	CAAD	23,748			CAAD	23,520	CAAB	23,022	CAAB	22,716	
2		CCAB	25,047	CCAB	24,207	CCAB	23,907			CAAB	24,930	CAAB	24,080	CAAB	23,774			CAAB	23,872	CAAD	23,023	CCAB	22,772	
3		GAAB	25,176	GAAB	24,330	GAAB	24,022			AAAB	24,937	CCAB	24,154	CCAB	23,854			CCAB	23,912	CCAB	23,072	GAAB	22,783	
4		AAAB	25,304	CAAC	24,431	CAAC	24,109			CCAB	24,994	AAAB	24,231	AAAB	23,978			GAAB	23,936	GAAB	23,090	CAAD	22,862	
5		FAAB	25,308	EAAB	24,493	EAAB	24,186			BAAB	25,125	GAAB	24,300	CAAC	23,986			AAAB	23,965	EAAB	23,187	EAAB	22,880	
6		EAAB	25,336	FAAB	24,501	FAAB	24,209			GAAB	25,147	BAAB	24,306	GAAB	23,993			EAAB	24,029	AAAB	23,259	CAAC	23,002	
7		BAAB	25,337	BAAB	24,517	BAAB	24,227			CAAC	25,221	CAAC	24,308	BAAB	24,016			FAAB	24,103	FAAB	23,296	FAAB	23,005	
8		CAAC	25,344	AAAB	24,597	AAAB	24,344			EAAB	25,253	EAAB	24,410	EAAB	24,103			BAAB	24,142	BAAB	23,323	AAAB	23,006	
9		CAAD	25,373	DAAB	24,865	DAAB	24,561			CBAB	25,354	CBAB	24,553	DAAB	24,262			CAAC	24,237	CAAC	23,324	BAAB	23,033	
10	High	CBAB	25,694	CAAD	24,876	CBAB	24,613	Mid		FAAB	25,437	DAAB	24,566	CBAB	24,273	Low		CBAB	24,403	CBAB	23,601	CBAB	23,322	
11		DAAB	25,766	CBAB	24,892	HAAB	24,708			DAAB	25,466	FAAB	24,630	FAAB	24,339			HAAB	24,567	HAAB	23,654	HAAB	23,330	
12		HAAB	25,945	HAAB	25,032	CAAD	24,715			HAAB	25,692	HAAB	24,779	HAAB	24,455			DAAB	24,599	DAAB	23,698	DAAB	23,394	
13		CDAB	26,087	CDAB	25,210	EAAJ	24,811			CDAB	25,737	CDAB	24,860	CDAB	24,555			CDAB	24,732	CDAB	23,855	CDAB	23,551	
14		EAAJ	26,856	EAAJ	25,344	CDAB	24,905			CAAI	26,762	EAAJ	25,966	EAAJ	25,434			CAAI	25,641	EAAJ	24,954	EAAJ	24,421	
15		CEAB	27,479	CEAB	26,239	CEAB	25,840			CEAB	27,240	CEAB	26,000	CEAB	25,601			CEAB	26,214	CEAB	24,973	CEAB	24,574	
16		CAAI	28,711	CAAE	27,904	CAAE	27,554			EAAJ	27,479	CAAI	26,489	CAAI	26,434			EAAJ	26,466	CAAI	25,367	CAAI	25,313	
17		CAAE	29,015	CAAI	28,438	CAAI	28,383			CAAE	28,935	CAAE	27,824	CAAE	27,474			CAAE	28,458	CAAE	27,347	CAAE	26,997	
18		CFAE	30,043	CFAE	29,021	CFAE	28,715			CFAE	29,841	CFAE	28,818	CFAE	28,512			BEAI	29,202	CFAE	28,624	CFAE	28,318	
19		BEAI	33,725	BEAI	33,588	BEAI	33,613			BEAI	30,623	BEAI	30,485	BEAI	30,511			CFAE	29,647	BEAI	29,064	BEAI	29,090	

Table 82: Energy Metro Uncertain Factors Sensitivities – Low CO₂ Vs. Construction Costs and Natural Gas

Rank	NG Price		High		Mid		Low		NG Price		High		Mid		Low		NG Price		High		Mid		Low		
	Con Costs	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Con Costs	Plan	NPV	Plan	NPV	Plan	NPV	Plan	NPV	Con Costs	Plan	NPV	Plan	NPV	Plan	NPV
1		CFAE	22,292	CFAE	22,184	CFAE	22,129			CFAE	22,089	CFAE	21,981	CFAE	21,926			CFAE	21,895	CFAE	21,787	CFAE	21,732		
2		CAAE	23,089	CAAE	22,789	CAAE	22,634			CAAE	22,777	CAAE	22,478	CAAE	22,323			AAAB	22,293	AAAB	22,174	CAAE	22,078		
3		CAAB	23,557	CAAB	23,416	EAAJ	23,270			CAAB	22,903	CAAB	22,762	CAAB	22,682			CAAB	22,388	CAAE	22,233	AAAB	22,100		
4		CAAC	23,617	EAAJ	23,441	CAAB	23,336			AAAB	22,914	AAAB	22,795	AAAB	22,721			DAAB	22,453	CAAB	22,247	CBAB	22,152		
5		DAAB	23,620	CAAC	23,476	CCAB	23,393			DAAB	22,971	DAAB	22,827	CCAB	22,734			CBAB	22,455	CBAB	22,251	CAAB	22,167		
6		AAAB	23,631	DAAB	23,477	CAAC	23,397			CAAC	22,979	CCAB	22,830	DAAB	22,748			GAAB	22,469	DAAB	22,310	DAAB	22,231		
7		CCAB	23,671	CCAB	23,489	DAAB	23,398			GAAB	23,003	CAAC	22,838	CBAB	22,750			CAAC	22,510	GAAB	22,318	GAAB	22,232		
8		GAAB	23,708	AAAB	23,512	AAAB	23,438			CCAB	23,012	CBAB	22,849	CAAC	22,759			CAAE	22,532	CCAB	22,354	CCAB	22,258		
9		CBAB	23,746	CBAB	23,542	CBAB	23,443			CBAB	23,053	GAAB	22,852	GAAB	22,766			CCAB	22,535	CAAC	22,369	CAAC	22,290		
10	High	EAAJ	23,782	GAAB	23,557	GAAB	23,471	Mid		EAAJ	23,107	EAAJ	22,973	EAAJ	22,858	Low		EAAJ	22,559	EAAJ	22,425	EAAJ	22,345		
11		BAAB	23,794	BAAB	23,668	BAAB	23,596			BAAB	23,138	BAAB	23,013	EAAJ	22,893			CAAD	22,575	BAAB	22,474	BAAB	22,402		
12		EAAJ	23,866	EAAJ	23,732	EAAJ	23,652			FAAB	23,182	EAAJ	23,029	BAAB	22,941			BAAB	22,600	CAAD	22,549	HAAB	22,489		
13		FAAB	23,944	FAAB	23,812	FAAB	23,734			HAAB	23,283	FAAB	23,050	FAAB	22,971			HAAB	22,709	HAAB	22,572	CAAD	22,522		
14		HAAB	24,086	HAAB	23,949	HAAB	23,867			EAAJ	23,369	HAAB	23,146	HAAB	23,063			FAAB	22,740	FAAB	22,608	FAAB	22,529		
15		CAAD	24,428	CDAB	24,305	CDAB	24,155			CAAD	23,461	CAAD	23,435	CDAB	23,383			CDAB	23,300	CDAB	22,951	CDAB	22,800		
16		CDAB	24,654	CAAD	24,402	CAAD	24,375			CDAB	23,882	CDAB	23,533	CAAD	23,408			EAAJ	23,392	EAAJ	23,051	EAAJ	22,880		
17		CEAB	26,642	CEAB	25,498	CEAB	25,080			CEAB	25,843	CEAB	24,699	CEAB	24,281			CAAI	24,767	CEAB	24,232	CEAB	23,814		
18		CAAI	27,837	CAAI	27,950	CAAI	28,006			CAAI	25,888	CAAI	26,001	CAAI	26,056			CEAB	25,376	CAAI	24,880	CAAI	24,935		
19		BEAI	32,914	BEAI	32,998	BEAI	33,069			BEAI	29,812	BEAI	29,895	BEAI	29,967			BEAI	28,391	BEAI	28,474	BEAI	28,546		