BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

DIRECT TESTIMONY OF

CODY VANDEVELDE

ON BEHALF OF EVERGY METRO, INC., EVERGY KANSAS CENTRAL, INC. AND EVERGY KANSAS SOUTH, INC.

IN THE MATTER OF THE PETITION OF EVERGY KANSAS CENTRAL, INC., EVERGY KANSAS SOUTH, INC., AND EVERGY METRO, INC. FOR DETERMINATION OF THE RATEMAKING PRINCIPLES AND TREATMENT THAT WILL APPLY TO THE RECOVERY IN RATES OF THE COST TO BE INCURRED FOR CERTAIN ELECTRIC GENERATION FACILITIES UNDER K.S.A. 66-117.

Docket No. 25-EKCE-207-PRE

November 6, 2024

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Cody VandeVelde. My business address is 818 S. Kansas Avenue, Topeka, Kansas.

Q. By whom and in what capacity are you employed?

A. I am employed by Evergy Metro, Inc. and serve as Senior Director, Strategy and Long-Term Planning - Energy Resource Management for Evergy Metro, Inc. d/b/a as Evergy Missouri Metro ("Evergy Missouri Metro"), Evergy Missouri West, Inc. d/b/a Evergy Missouri West ("Evergy Missouri West"), Evergy Metro, Inc. d/b/a Evergy Kansas Metro ("Evergy Kansas Metro"), and Evergy Kansas Central, Inc. and Evergy Kansas South, Inc., collectively d/b/a as Evergy Kansas Central ("Evergy Kansas Central"), the operating utilities of Evergy, Inc. ("Evergy").

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Evergy Kansas Central ("EKC") and Evergy Kansas Metro ("EKM").

Q. What are your responsibilities in your current position?

A. My responsibilities include developing Evergy's corporate strategy and overseeing Evergy's long-term planning functions. Our corporate strategy team monitors Evergy's execution of strategic initiatives, one of which is the advancement of transitioning Evergy's generation portfolio, including new resource development and preparation for future plant retirements. This work is done in collaboration with Evergy's Energy Resource Management team, which is responsible for conducting our integrated resource planning.

Q. Please summarize your relevant education, experience, and employment history.

A. I earned a Bachelor of Business Administration from Washburn University. Since joining Evergy in 2007, I have worked in leadership roles across Evergy's power marketing, investor relations, corporate strategy, and long-term planning departments.

Q. Have you previously testified in proceedings before the Kansas Corporation Commission ("Commission" or "KCC") or before other utility regulatory bodies?

A. I have not testified before the KCC, but I have provided testimony in proceedings before the Missouri Public Service Commission ("MPSC") and the Federal Energy Regulatory Commission ("FERC").

Q. What is the purpose of your testimony in this docket?

A. The purpose of my testimony is to:

- Provide a high-level overview of Evergy's integrated resource planning ("IRP") process;
- Describe EKC's 2024 Triennial IRP Preferred Portfolio Selection and Resource Acquisition Strategy;
- Explain how the triennial IRP filing supports EKC's predetermination request in this docket;
- Describe, from an IRP perspective, the system and customer impacts of the planned natural gas and solar additions under review in this docket;
- Discuss the close connection between the IRP process and predetermination process; and
- Explain the IRP analysis we conducted after our 2024 IRP filing to incorporate the cost estimates for the natural gas generation additions.

Q. Please identify the planned generation additions under review in this docket.

Evergy plans to add two new advanced-class combined cycle natural gas turbine generating facilities. These projects are known as the Viola Generating Station and the McNew Generating Station. Evergy also plans to add 200 MW_{DC} (159 MW_{AC}) of solar from a project known as the Kansas Sky solar project ("Kansas Sky").

Q. Are you sponsoring any exhibits?

A. Yes. Attached as **Exhibit CV-1** is the Evergy Kansas Central and Evergy Metro Preferred Portfolio Selection and Resource Acquisition Strategy - Integrated Resource Plan, which is included as Volume 6 of in Evergy's May 17, 2024 Triennial IRP filing.

II. INTEGRATED RESOURCE PLANNING OVERVIEW

Q. In general terms, what is integrated resource planning?

A. Integrated resource planning is a proactive, data-driven process designed to ensure sufficient resources are available to meet forecasted customer needs at all times in a cost-effective manner, taking into consideration a variety of supply- and demand-side resources. The goal is to arrive at the optimal mix of resources that will ensure safe, reliable, affordable, and efficient service that complies with state and federal energy and environmental policy mandates.

Q. What tools are utilized by resource planners in pursuit of this goal?

A. The IRP process relies on power system planning models that incorporate forecasts of future electricity demand, new generating capacity, fuel prices, transmission improvements, renewable energy resource integration, and other relevant factors. These models are used to evaluate competing investment decisions to optimally meet the service needs of our customers.

Q. Please explain how utility resource planners adjust to changing market conditions and industry trends?

A. The IRP process, by its nature, is forward looking. This means the process is rooted in assumptions and data that reflect our best understanding of the future at the time the IRP is developed. That is why resource planning is a dynamic process that requires continuous monitoring and adjustments. In selecting a preferred portfolio, it is important to evaluate whether near-term actions are sufficiently robust to maintain flexibility for adjustments that may be warranted because of changing conditions within the medium- and long-term horizons. Any resource added (or not added) today has an impact on future resource decisions in the same way that past resource decisions impact decisions going forward.

Q. How does uncertainty play into the planning process?

A. The IRP process requires planners to make assumptions about the state of future operations, industry and macroeconomic trends, and federal and state regulatory policy, all of which introduce levels of uncertainty into the planning process. To minimize the risk of failing to meet energy demands, we test these assumptions through sensitivity analysis, which considers key variables under different future conditions. The flexibility and robustness of an optimal portfolio is determined by input sensitivity analysis and contingent scenario analysis.

Q. What was the genesis of the IRP process.

A. The Commission first approved the IRP process in a compliance docket arising out of the 2018 merger between Westar Energy, Inc. and Kansas Gas and Electric Company ("Westar") and Great Plains Energy Incorporated ("Great Plains") and Kansas City Power & Light Company ("KCP&L"), which culminated in the formation of Evergy. As a stipulation of the

merger, the Commission required Evergy to develop an IRP framework and to submit an IRP report every three years and an IRP update annually.[1]

Q. Please describe the IRP framework.

A. Under the IRP framework, Evergy produces a holistic overview of the company's current and near-term operations, including:

- A history of annual seasonal load requirements;
- A geographic overview of its service territory, with observations surrounding areas of service decline or growth;
- Current load forecasts, generation portfolios, and transmission and distribution requirements, noting planned generation retirements and penetration of existing demand-side management and distributed generation programs; and
- The capital expenditure budget corresponding to the analysis period.

The framework also includes requirements for the analysis of short-run demand and supply of energy as well as medium-run demand and supply of energy under alternative scenarios with different assumptions on significant variables. Analytical expectations for informing longer-term planning commitments are included in the framework as well.

Q. What is the ultimate planning objective of the IRP process?

A. The ultimate planning objective is to present a preferred portfolio of resources to customers and to the Commission. This is done through resource modeling which identifies the portfolio of resources that is projected to meet customer needs at the lowest reasonable cost given an uncertain future. To that end, as part of the planning process, Evergy matches the load forecast with a supply plan; considers demand-side resources, renewable energy, and supply-

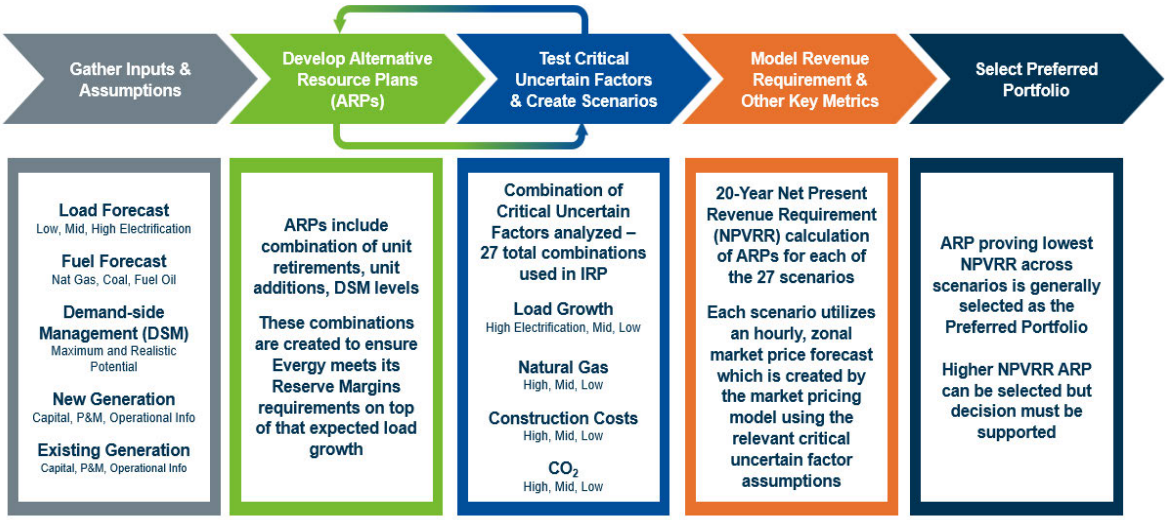
[1] *Order Approving IRP and Capital Plan Framework*, Docket No. 19-KCPE-096-CPL (Feb. 6, 2020).

side resources on an equivalent basis; uses minimization of the present worth of long-run utility costs as the primary selection criteria; and identifies – and where possible quantifies – any other considerations critical to meeting the fundamental objectives of the planning process.

Q. Please describe the analytical steps in the IRP process.

A. The analytical steps in the IRP process are outlined in Figure 1 below.

Figure 1: IRP Analytical Process



Q. Please describe the "load forecasts" input.

A. IRP load forecasting extrapolates years of historical energy use data within our service territory to the end of the planning horizon. Evergy develops long-range load forecasts for its service territory based on both econometric and end-use inputs. A baseline (mid-case) load forecast is created as well as high and low forecasts based on different assumptions about key variables that affect load growth such as economic development, regional growth, electrification, and the effectiveness of demand-side management programs.

Q. Please describe the "fuel forecasts" input?

A. IRP fuel forecasting involves analyzing all fuel commodities that impact Evergy's generating fleet (uranium, coal, natural gas, and fuel oil). We develop baseline (mid-case) forecasts for these fuel commodities using a blend of proprietary and public sources. Based on the potential variation in fundamental market drivers, a high and low forecast for each commodity is also developed.

Q. Please describe the "demand side management ("DSM") forecasts" input.

A. Evergy conducts a DSM potential study every three years to support triennial filings. Various portfolios of DSM program forecasts are developed through these studies, with accompanying implementation costs and load/energy impacts.

Q. Please describe the "new generation" input.

A. Evergy performs an initial screening of resource options based on technology viability utilizing levelized cost of energy ("LCOE") analysis, potential environmental costs, and technology maturity to select a subset of technologies for evaluation in the IRP. For these technologies, cost and performance data are utilized from multiple sources including the Electric Power Research Institute and the Department of Energy.

Q. Please describe the "existing generation" input.

A. Under Evergy's existing generation analysis, inputs such as expected maintenance capital costs (both environmental and non-environmental), expected operations and maintenance ("O&M") costs, and key performance parameters are evaluated.

Q. What is an alternative resource plan?

A. Integrated resource planning analysis involves the development of numerous portfolios of complementary resources called alternative resource plans ("ARPs"), which emerge from

preliminary screening and include sufficient generating capacity to meet SPP reserve margin requirements within a 20-year horizon based on expected load growth. ARPs consider the financial and operational implications of different resource mixes, different timelines for bringing new resources on line or retiring existing resources, among other things.

Q. How many ARPs were developed in EKC's 2024 IRP?

A. Thirteen ARPs were developed in the EKC 2024 IRP.

Q. How is reliability factored into the development of the Alternative Resource Plans?

A. All tested Alternative Resource Plans were developed to ensure the plan met SPP Resource Adequacy Requirements as well as hourly customer energy needs. 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 in Evergy's 2024 IRP met these requirements, was developed using probabilistic modeling, and included considerations of extreme weather, generator unavailability, and renewable output. To supplement the use of SPP requirements, as part of this year's analysis Evergy also conducted its own probabilistic reliability analysis to assess the reliability of its resource plan. Specifically, Evergy 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. A full explanation of Evergy's reliability modeling can be found in Volume 5 Section 18 of the 2024 IRP.

Q. Please explain what "test critical uncertain factors" means in Figure 1?

A. An uncertain factor is any assumption that if changed could materially impact the outcome of the resource plan selection. This includes factors that utility planners and decision-makers have incomplete or inadequate information at the time the decision is made. If a change in uncertain factor causes a meaningful impact, it is deemed a critical uncertain factor.

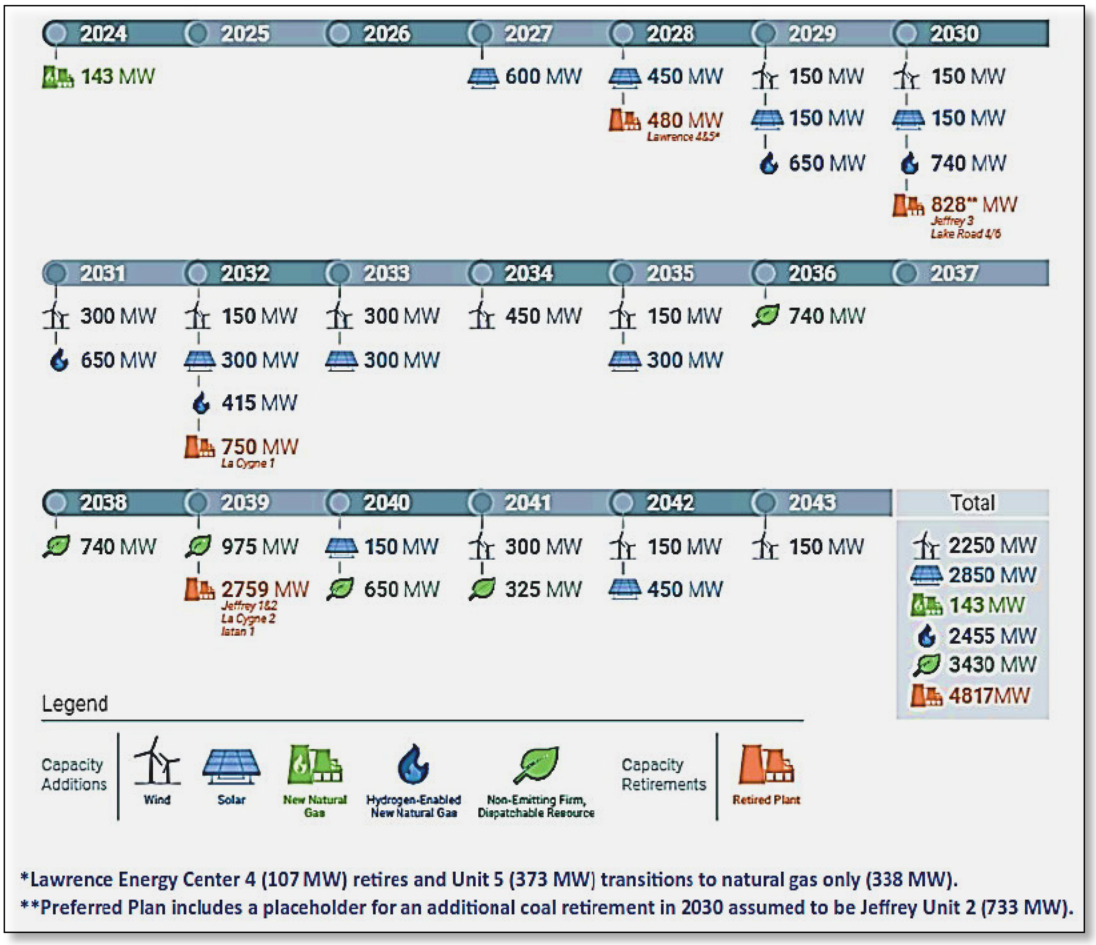
Q. Please explain the process of revenue requirement modeling.

A. Evergy evaluates the economics of each ARP by calculating the net present value of revenue requirement ("NPVRR") under multiple variations of each uncertain factor deemed critical. We then use the probabilities for each scenario to calculate a weighted average NPVRR across all scenarios and resource plans. These calculations take the results of production cost modeling for a given scenario and resource plan and combine those results with operating costs and capital carrying costs to arrive at total revenue requirements under that scenario and resource plan. Typically, the ARP with the lowest NPVRR across the scenarios is selected as the preferred portfolio; however, an ARP with a higher NPVRR may be selected if there is support for the selection.

Q. Does Evergy perform a consolidated IRP analysis?

A. Evergy does not perform a full integrated resource analysis at the consolidated level. Our analysis is completed at the individual utility level. Nevertheless, Evergy does produce a consolidated preferred portfolio, which is an aggregation of Evergy Kansas Central's, Evergy Metro's, and Evergy Missouri West's preferred portfolios. The 2024 consolidated preferred portfolio is shown in Figure 2, below.

Figure 2 – Evergy Consolidated Preferred Portfolio



Q. Is taking a consolidated view of Evergy's preferred portfolio useful?

A. Yes. Consolidated portfolios can be informative, particularly given that many of Evergy's generating resources are jointly owned by different Evergy utilities.

Q. Please describe how Evergy's 2024 consolidated preferred portfolio is different from the 2023 consolidated preferred portfolio.

A. The biggest difference is that the overall combined cycle additions by the early 2030s are higher in the 2024 portfolio. The reason that is the case is because all of Evergy's utilities need more accredited capacity due to higher load growth and more stringent reserve margin requirements.

III. PREFERRED PLAN CONSISTENCY

Q. Please identify the document that contains EKC's most recent Preferred Plan.

A. EKC's most recent preferred plan is contained in the Evergy Kansas Central and Evergy Metro Preferred Portfolio Selection and Resource Acquisition Strategy - Integrated Resource Plan, which is included in Evergy's May 17, 2024 triennial filing. The preferred plan includes EKC's updated preferred portfolio, which is summarized in Table 1 below.

Table 1 – EKC 2024 Preferred Plan

Year	Wind (MW)	Solar (MW)	Battery (MW)	Thermal (MW)	Capacity Only (Summer MW)	DSM (Summer MW)	Retirements (MW)
2024	0	0	0	0	0	103	0
2025	0	0	0	0	0	154	0
2026	0	0	0	0	5	197	0
2027	0	150	0	0	0	255	0
2028	0	300	0	0	0	320	0
2029	0	150	0	663	0	348	480
2030	0	150	0	325	0	393	0
2031	0	0	0	650	0	429	1349
2032	0	300	0	0	0	445	0
2033	0	300	0	0	0	459	375
2034	150	0	0	0	37	478	0
2035	0	300	0	0	0	496	0
2036	0	0	0	415	0	506	0
2037	0	0	0	0	0	512	0
2038	0	0	0	415	0	515	0
2039	0	0	0	650	0	525	0
2040	0	0	0	650	0	541	1007
2041	150	0	0	0	0	559	0
2042	0	300	0	0	0	576	0
2043	150	0	0	0	0	589	0

Q. Please summarize the resource additions included in the preferred portfolio.

A. The preferred portfolio contains both renewable additions and firm dispatchable additions. The renewable additions include:

- 150 MW and 300 MW of solar generation in 2027 and 2028, respectively;
- 150 MW of solar generation in 2029 and 2030;

- 300 MW of solar in 2032, 2033, 2035 and 2042; and
- 150 MW of wind in 2034, 2041, and 2043.

Firm dispatchable additions include:

- 338 MW of fuel-switching from to coal to natural gas at Lawrence Energy Center;
- 325 MW of combined cycle natural gas resources in 2029 and 2030;
- 650 MW of combined cycle natural gas resources in 2031, 2039 and 2040; and
- 415 MW of combustion turbines in 2036 and 2038.

Q. Does the preferred portfolio include plant transitions or retirements?

A. Yes. The preferred portfolio includes the following:

- Transitioning to gas and ceasing coal operation of Lawrence 5 and retiring Lawrence 4 in 2028;
- Retiring EKC's 1,349 MW share of Jeffrey 2 and 3 in 2030;
- Retiring EKC's 375 MW share of LaCygne 1 and 2 in 2032 and 2039, respectively; and
- Retiring EKC's 673 MW share of Jeffrey 1 in 2039.

I would note, however, that given the significant increase in economic development activity in the Evergy territory, ongoing changes to the SPP Resource Adequacy requirements, and the finalization of the Environmental Protection Agency's (EPA) Greenhouse Gas (GHG) Rule, there could be modifications to our plant retirement schedule.

Q. Is the preferred plan consistent with Evergy's long-term resource planning strategy?

A. Yes. The preferred plan advances Evergy's long-term strategy for responsibly transitioning our generation fleet away from coal over time while maintaining a diverse fuel mix and sufficient flexibility to make appropriate planning adjustments. The plan's flexibility allows us to focus on reliability and affordability while adapting to environmental, technological, and market

opportunities and challenges. As reflected in our triennial IRP filing, Evergy's strategy includes the measured retirement of coal plants over time and the replacement of this generation capacity and energy with a mix of highly efficient dispatchable thermal resources, renewable resources, and demand-side management programs. Based on our integrated analysis, our plan is designed to be robust across a variety of critical uncertainties, which mitigates reliability risk and customer costs. Nevertheless, because the future is inherently uncertain, maintaining flexibility and continuing to monitor and make adjustments to our plan is imperative.

Q. Please summarize the risk analysis performed by Evergy.

A. In conducting the risk analysis, we identified and evaluated twelve uncertain factors and deemed four of those uncertain factors to be critical uncertain factors. As shown in Table 2 below, the critical uncertain factors were natural gas prices, CO2 restrictions, construction costs (including build and interconnection costs), and load growth.

Table 2 – Critical Uncertain Factors

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

Q. How did Evergy utilize the alternative resource plans and scenarios to analyze the revenue requirements associated with each different plan?

A. Alternative resource plans were developed to consider base planning options, varying future demand-side management portfolios, retirement dates, and resource additions. These resource plans were evaluated economically based on their performance in future scenarios with varied levels of the identified critical uncertain factors. Contingency plans also were developed. Contingency plans address planning alternatives under changing conditions and provide next-best resource additions in the short term if execution challenges should occur, along with longer-term variation in resource decisions tied directly to higher and lower than expected load growth scenarios. Ultimately, plans were ranked based on the NPVRR metric in different future scenarios and on a weighted-average risk basis.

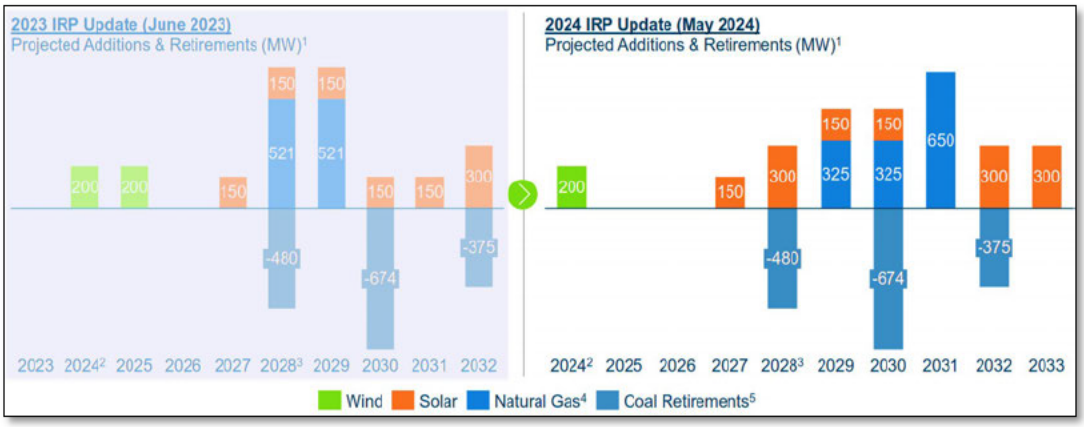
Q. Did the IRP process select the lowest NPVRR alternative?

A. No, it did not. The selected preferred portfolio was the third lowest NPVRR alternative resource portfolio on an expected value basis. The only plans that had lower NPVRR estimates were a plan that included a delayed retirement of Jeffrey 2 (from 2032 to 2039) and a plan that did not reflect the manual adjustment accelerating the addition of a one-half combined cycle unit by one year to sync up with Evergy Missouri West's execution of a one-half combined cycle unit.

Q. Please compare Evergy's 2024 IRP filing with its 2023 IRP update.

A. As would be expected, certain adjustments were made in the 2024 IRP filing to account for evolving planning dynamics such as the growing need for physical capacity, physical energy, and a hedge against the SPP energy market. These adjustments are shown in Figure 3, below.

Figure 3 – IRP Comparison (2023 and 2024)



[1]Reflects January 1 in-service and December 31 retirement date in each respective year
[2] Reflects Persimmon Creek acquisition completed in 2023
[3] Lawrence Unit 4 (107 MW) retires and Unit 5 (373 MW) transitions to gas only (338 MW)
[4] Preferred plan includes a placeholder for an additional coal unit retirement in 2030
[5] Forecasted natural gas additions across 2029-2032 are hydrogen-enabled

The 2024 preferred plan accelerates resource additions relative to the 2023 portfolio. This acceleration is driven largely by higher forecasted load growth from economic development. Forecasted increases in capacity needs tied to expected increases in summer reserve margin requirements and the introduction of binding winter capacity requirements also prompts earlier capacity resource builds.

Still, while there are timing differences and some variations in capacity plans, both IRP filings are in keeping with Evergy's commitment to securing reliability and affordability for our customers while reducing environmental impacts over time. We are maintaining a stable base of generation sources, which reduces cost and reliability risk through thoughtful portfolio diversification. And, as company witness Jason Humphrey explains in his direct testimony, the combined cycle natural gas additions under review in this docket fall within the scope of both the 2023 and 2024 IRP filings.

Q. Are the projects under predetermination review in this case important to EKC's implementing the preferred portfolio as outlined above?

A. Yes. The resources in this predetermination case are vital to meeting EKC's capacity and energy requirements as identified in EKC's 2024 preferred plan.

- The 159 MW Kansas Sky solar addition corresponds with the 150 MW of additional solar identified for EKC in 2027.
- The Viola CCGT addition corresponds with the additional 325 MW (half combined cycle) of additional thermal generation called for in 2029. As previously noted, the other half of that facility, and its costs, will be allocated to Evergy's Missouri West utility.
- The McNew CCGT addition corresponds with the 325 MW (half combined cycle) of thermal generation addition called for in 2030. As previously noted, Evergy expects the remaining half of that facility to be allocated to an Evergy affiliate.

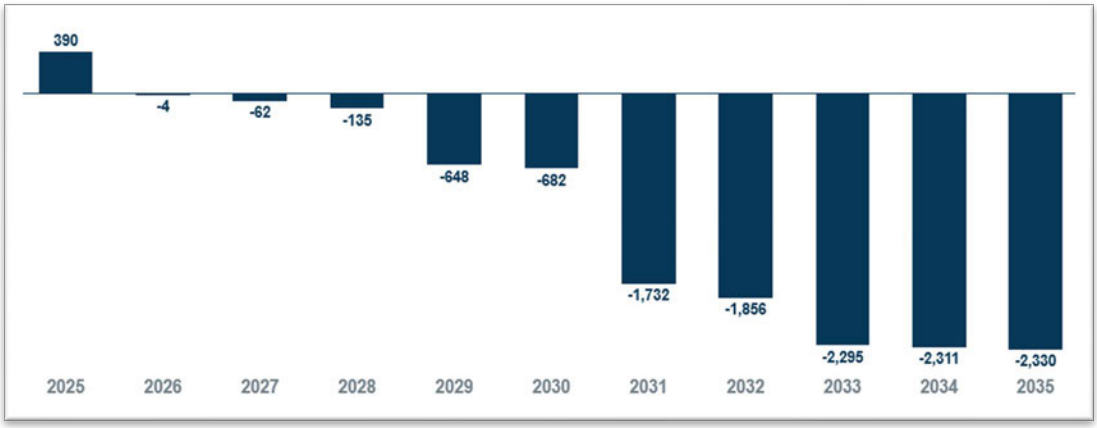
IV. MEETING CUSTOMER AND SYSTEM NEEDS

Q. Please discuss the Company's need for capacity resources and how these Projects help fulfill that need.

A. Table 3 below reflects EKC's 2024 IRP near-term capacity need before adding any new supply- or demand-side resources in the base load forecast scenario. As discussed in Section 5 of Volume 5 in EKC's 2024 IRP, EKC is forecasted to need summer capacity starting in 2026.

Capacity needs are expected to grow over time, primarily due to load growth, increasing SPP reserve margin requirements, expiring capacity contracts, and retirements of coal resources.

Table 3 - EKC's Forecasted Capacity Position Before Resource Additions (MW)



As demonstrated through IRP analysis,[2] the solar and CCGT projects included in this predetermination request are forecasted to reduce the costs for EKC customers to meet the capacity requirements over the 20-year planning horizon. When fully commissioned and on line, the Kansas Sky solar project will help meet EKC's near-term requirement for capacity starting in 2027, and the Viola and McNew CCGT projects will help meet capacity requirements in 2029 and beyond.

Q. What is the company's need for energy resources?

A. Capacity is essentially the ability to produce energy when called upon. Therefore, any time that a market participant is short on capacity, it is also short on energy capability. As a result, the forecasted reserve balance in the 2024 IRP (graphic above) is an indication of the near-term need for energy generating resources to serve EKC customers.

[2] *See* Volume 5: Integrated Resource Plan and Risk Analysis in EKC's 2024 IRP.

Q. Why is Kansas Sky the right resource to meet the Company's near-term capacity and energy needs?

A. This resource will provide long-term low-cost energy, which provides a hedge against fuel price-driven market price volatility or regulation-driven (e.g., EPA's Greenhouse Gas Rule) market price increases. EKC's current renewable portfolio is almost exclusively comprised of wind facilities, so there is a need for the diversity of solar as the renewables portfolio grows. Additionally, there is currently very little solar in the SPP resource mix, and incremental solar resources are expected to have high summer accreditation and provide peak-correlated energy. These characteristics generally allow solar energy to be a hedge to market prices during times of peak conditions. These attributes, as well as the availability of solar production tax credit incentives from the Inflation Reduction Act make these solar projects attractive to meet customer needs at lowest cost. While solar resources have lower relative winter capacity and energy benefits, as compared to the summer season, the 2024 Preferred Plan still selected 2027 solar rather than other resources (such as wind or batteries) to meet EKC customer obligations. Section 5 in Volume 5 of the 2024 IRP Report explains that EKC is a summer peaking utility and includes further detail about EKC's evolving winter capacity requirements.

Q. Why are the natural gas additions the right resources to meet the company's near-term capacity and energy needs?

A. As Evergy plans for a future that relies on less coal generation, EKC has a need to replace the coal capacity with dispatchable capacity that has cost-effective energy availability. Affordable, dispatchable technologies that are emission-free are not currently commercially available. Natural gas is the best-positioned bridge technology as the utility industry waits

for advancements in other sources, including hydrogen, long-duration energy storage, and small module nuclear reactors.

The two natural gas additions in this predetermination case are aligned with CCGT assumptions in the 2024 IRP. The advanced-class turbines that we are proposing are the most efficient and flexible available on the market today. They are also consistent with the nameplate MW size, heat rate efficiency, and operating characteristic flexibility. They are also both sited at very advantageous locations, in close proximity to EKC's customer load, and are attractive to other sites because they are near natural gas pipeline access, which will limit upfront infrastructure capital investment and provide natural gas pipeline flexibility going forward.

Q. EKC's 2024 IRP called for only half of the second CCGT addition. Why should the Commission provide predetermination for the entire second CCGT?

A. As described above, EKC has a need for capacity over the near- and long-term. These growing needs are created by the revised resource adequacy requirements established by Southwest Power Pool, Inc. ("SPP") attributable to increased reserve margin requirements and changes in capacity accreditation standards, and the growth already occurring on EKC's system related to large-load customers like Panasonic. Currently, Kansas is experiencing record levels of economic development opportunities, both from local business expansions and new business interests. Aside from Panasonic, Evergy is currently experiencing significant interest from datacenters and other large customers interested in locating in the EKC territory. Based on our analysis, the addition of just one of these large customers would create an additional capacity need for Evergy Kansas Central above and beyond what was reflected in the 2024 IRP. The second half of the second CCGT addition

could be used to meet that capacity need. We believe the addition of one or more of these large customers is highly likely within the next three years. As a result, to be prepared to meet our obligation to serve these customers when they request service and to encourage and foster the economic development benefits for Kansas from the addition of such a customer, and because the timeframe for construction of new generation is at least three years, Evergy is requesting predetermination from the Commission for the entire second CCGT at this time. Mr. Ives provides additional detail regarding our request for the second half of the second CCGT in his direct testimony.

V. ROLE OF IRP ANALYSIS IN PREDETERMINATION PROCEEDINGS

Q. What is your understanding of the standard of review applied in KCC predetermination proceedings?

A. The Commission reviews predetermination requests under the statutory "reasonable, reliable and efficient" standard. In other words, the Commission is tasked with determining whether, based on the record evidence, the investment plan proposed by the applicant represents a prudent utility management decision.

Q. Is the IRP process designed to assist utility planners in making prudent resource investment decisions?

A. Yes. That is its overarching purpose. The IRP process is designed to provide a prudent portfolio management strategy to assist utility planners in identifying a portfolio of resources that ensures adequate and affordable electric service to customers while minimizing net present value system cost, meeting system reliability requirements, and complying with state and federal policy mandates. The IRP process produces well-documented and credible plans that articulate why selected investments are reasonable, reliable and efficient in relation to

a wide array of competing alternatives. IRP models use data to measure the value of proposed investments, accounting for the full range of associated uncertainty and risks as well as the availability of alternative power sources, including demand-side management options. There is a close link between the IRP process and the predetermination process. In fact, the goals and objectives of the two processes are virtually the same. I am not a lawyer; however, based on my experience and expertise, it is my opinion that a prudently executed investment decision made in accordance with prescribed IRP protocols should in most cases satisfy the "reasonable, reliable, and efficient" standard.

Q. Did Evergy follow the prescribed IRP framework?

A. Yes. Under the IRP framework we produced a holistic overview of the company's current and near-term operations (including a history of annual seasonal load requirements); a geographic overview of its service territory, with observations surrounding areas of service decline or growth; current load forecasts, generation portfolios, and transmission and distribution requirements (noting planned generation retirements and penetration of existing demand-side management and distributed generation programs); and the capital expenditure budget corresponding to the analysis period. We also conducted an analysis of short-run demand and supply of energy and medium-run demand and supply of energy under alternative scenarios, with different assumptions on significant variables. Our IRP filings are also in keeping with the analytical expectations for informing longer-term planning commitments:

- We used multiple methodologies to develop robust load forecasts, such as econometric and structural models, forecasted on a daily or monthly basis;

- We established a clear business-as-usual baseline case and developed several scenarios to measure how supply- and demand-side resource needs may deviate from the baseline case. These scenarios were built on a strong understanding of macroeconomic and industry trends;
- We tested all preliminary assumptions while developing load forecasts and resource scenarios tested through sensitivity analysis. Uncertainties surrounding changes in the federal and state regulatory environment and market penetration of emerging technologies were modeled and informed identification of a contingency plan for each scenario; and
- We thoroughly documented the rationale for our selection of a preferred resource plan that did not exhibit the lowest present value of revenue requirements.

Q: How does the installation cost of Kansas Sky's compare to the solar construction cost used in the 2024 IRP?

A: The 2024 Triennial IRP model assumption used $1,965/kW for installed solar generation resources in 2027. As described in Company witness John Carlson's testimony, the anticipated project cost for the 159 MW Sunflower Sky solar project is ** [redacted] ** (or ** [redacted] **) which is below the cost of 2027 solar that was modeled and selected as the least cost resource addition in the 2024 IRP.

Q: Does this mean replacing the generic solar assumptions in the 2024 IRP with the specific costs and operating characteristics of Kansas Sky would lower the overall expected net present value of revenue requirement ("NPVRR")?

A: Yes. Evergy ran a new resource planning scenario to analyze the impact of the Kansas Sky solar resource on EKC's Preferred Plan. The new scenario used the preferred plan with

the only change being a substitution of Kansas Sky in place of the 150 MW of generic solar. This new scenario resulted in a 20-year NVPRR of approximately $34.006 billion, which is $43 million lower than EKC's Preferred Plan (AAAB), as detailed in Figure 3 below.

Figure 3 - Updated Overall Kansas Central Resource Plan Rankings

Rank	Plan	NPVRR	Difference	Description
1	KSS	34,066		Preferred Plan w/ Kansas Sky Solar
2	ABAA	34,081	15	Retire Jeffrey 2 2039
3	AAAA	34,092	26	PP 2023; Extend DSM
4	AAAB	34,109	43	1/2 CC
5	AAAJ	34,141	75	No 2027 Solar
6	ADAA	34,213	147	Retire La Cygne 2 2032
7	BAAA	34,514	448	KEEIA Only
	AAAD	34,538	472	Low/Low
9	ACAA	34,577	511	Retire Jeffrey all 2030
10	AEAA	34,742	676	Retire all earliest
11	AAAC	34,860	794	High/High
12	AFAD	36,490	2,424	Low/Low, No retirements
13	AAAG	39,320	5,254	Only renewable/storage build, budget relaxed
14	AEAG	39,349	5,283	Retire all early, only renewable/storage, budget relaxed

Table 19 from EKC's 2024 IRP Volume 5; updated to include Kansas Sky alternative resource plan

Q. Does the cost estimate for the two CCGTs provided by Mr. Olson vary from the cost estimate used in the 2024 IRP analysis for the addition of combined cycle natural gas generation?

A. Yes. As a result of inflation and the significant demand for construction of natural gas generation right now, the costs for the construction of the two CCGTs has increased significantly since we performed the 2024 IRP analysis. In the IRP, we utilized an estimate of $1,271/kW for the construction cost of a CCGT coming online in 2029. As Mr. Olson

explains, our current estimate of the average cost of the two resources is approximately **[redacted]**, an increase of approximately **[redacted]** percent.

Q. How have you accounted for this significant change in input with respect to the IRP and how it supports EKC's request in this proceeding?

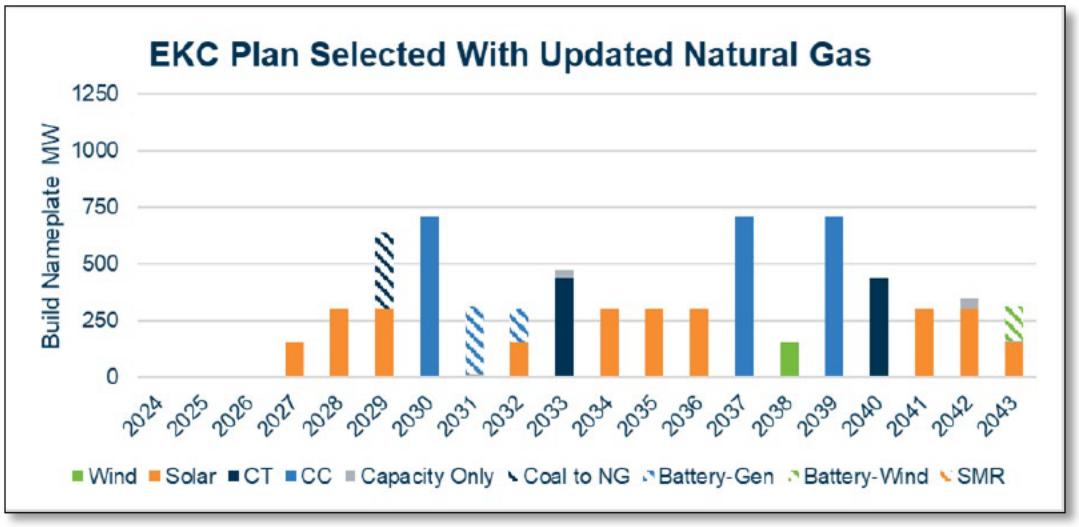
A. We performed an updated IRP analysis, using all of the same inputs that were used in the 2024 IRP triennial filing, but changing only the cost, heat rate, and installed size characteristics of new natural gas generation to be consistent with the estimates provided by Mr. Olson.

Q. What were the results of your updated analysis?

A. The resource plan optimized with the new natural gas estimates selected the same resources through 2030, including 150 MW of solar and a full CCGT (consistent with our plan for EKC to invest in 50% of two separate CCGTs and the solar project), as is reflected in Figure 4 below.

After 2030, the CCGT that had been identified for 2031 in the preferred plan in the 2024 IRP, but is not part of this Predetermination filing, is substituted for storage and an earlier CT build, and there were other changes to the timing and types of resources selected over the balance of the 20-year planning horizon. We will continue to evaluate the impact of these changes, including whether storage and an earlier CT meets the capacity and energy needs of EKC customers – and other changes that will occur between now and our next annual update to the IRP – and determine the impact they have on our generation construction plan in the future.

Figure 4 – Updated EKC Plan Selection



Q. Does the updated IRP analysis continue to support EKC's plan related to the two CCGTs proposed in this docket?

A. Yes. Even after adjusting our IRP analysis to match the cost estimates and other specific details provided by Mr. Olson regarding the CCGTs, the generation investments proposed in this filing are still supported by the IRP analysis. As previously noted, the fact is that EKC must add generation that provides capacity and energy to ensure the continued reliability of its system and to meet needs related to load growth, increasing SPP reserve margin requirements, and retirements of coal resources. Even with the changed assumption related to cost, the addition of the two CCGTs in this predetermination filing is the best approach for EKC to meet the needs identified in the 2024 IRP and to maintain system reliability for its customers.

Q. Does this conclude your testimony?

A. Yes.

STATE OF KANSAS)
) ss:
COUNTY OF SHAWNEE)

VERIFICATION

Cody VandeVelde, being duly sworn upon his oath deposes and states that he is the Sr Director Strategy and LT Planning, for Evergy, Inc., that he has read and is familiar with the foregoing Testimony, and attests that the statements contained therein are true and correct to the best of his knowledge, information and belief.

Cody VandeVelde

Subscribed and sworn to before me this 6th day of November 2024.

Notary Public

My Appointment Expires: May 30, 2026

NOTARY PUBLIC - State of Kansas
LESLIE R. WINES
MY APPT. EXPIRES 5/30/2026

Evergy Kansas Central

and

Evergy Metro

Volume 6

Preferred Portfolio Selection and

Resource Acquisition Strategy

Integrated Resource Plan

May 2024

evergy™

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Volume 6: Preferred Portfolio Selection and Resource Acquisition Strategy

Highlights

- By 2030, Kansas Central's Preferred Portfolio adds 750 MW of solar and 650 MW of thermal resource additions.
- By 2030, Evergy Metro's Preferred Portfolio adds 450MW of solar and 300MW of wind resource additions.
- In the second half of 2024, Evergy expects to apply for Predetermination for large-scale solar project(s) identified in its 2023 RFP. To meet the 2026 in-service timeline detailed in the Kansas Central and Metro Preferred Portfolios, Evergy needs to receive regulatory approval by mid-2025 and the project developer needs to complete construction, testing, and commissioning by November 2026.
- For Kansas Central's thermal additions, Evergy is pursuing development of a combined cycle gas turbine plant and targeting in-service by early 2029. In order to start construction by 2026, Evergy expects to submit its SPP interconnection application and Predetermination by late 2024 or early 2025, receive environmental and land permitting and regulatory approval by mid-2025, complete design and engineering work by late 2025.

Section 1: Preferred Portfolio Selection

Resource modeling results identified the portfolio of resources that meets customer requirements at the lowest reasonable cost utilizing the expected value of net present value revenue requirement (NPVRR) of each Alternative Resource Plan (ARP) analyzed.

1.1 Evergy Kansas Central

The Preferred Portfolio AAAB has been selected for Evergy Kansas Central is shown in Table 1 below:

Table 1: Evergy Kansas Central Preferred Portfolio

Year	Wind (MW)	Solar (MW)	Battery (MW)	Thermal (MW)	Capacity Only (Summer MW)	DSM (Summer MW)	Retirements (MW)
2024	0	0	0	0	0	103	0
2025	0	0	0	0	0	154	0
2026	0	0	0	0	5	197	0
2027	0	150	0	0	0	255	0
2028	0	300	0	0	0	320	0
2029	0	150	0	663	0	348	480
2030	0	150	0	325	0	393	0
2031	0	0	0	650	0	429	1349
2032	0	300	0	0	0	445	0
2033	0	300	0	0	0	459	375
2034	150	0	0	0	37	478	0
2035	0	300	0	0	0	496	0
2036	0	0	0	415	0	506	0
2037	0	0	0	0	0	512	0
2038	0	0	0	415	0	515	0
2039	0	0	0	650	0	525	0
2040	0	0	0	650	0	541	1007
2041	150	0	0	0	0	559	0
2042	0	300	0	0	0	576	0
2043	150	0	0	0	0	589	0

The Preferred Portfolio includes the following renewable additions: 150 MW and 300 MW of solar generation in years 2027 and 2028, respectively, and 150 MW of solar in 2029 and 2030, 300 MW of solar in 2032, 2033, 2035 and 2042, and 150 MW of wind in 2034, 2041, and 2043. Firm dispatchable additions include 325 MW of combined cycle resources in 2029 and 2030, 650 MW of combined cycles in 2031, 2039 and 2040, and

415 MW combustion turbines in 2036 and 2038. The Preferred Portfolio assumes KEEIA DSM programs are implemented and continued through the planning horizon.

The Preferred Portfolio also includes transitioning to gas and ceasing coal operation of Lawrence 5 in 2028, and retiring Lawrence 4 in 2028, Kansas Central's 1,349 MW share of Jeffrey 2 & 3 in 2030, Kansas Central's 375 MW share of LaCygne 1 in 2032, and Kansas Central's 334 MW share of LaCygne 2 and 673 MW share of Jeffrey 1 in 2039.

1.2 Evergy Metro

The Preferred Portfolio CAAB has been selected for Evergy Metro and is shown in Table 2 below:

Table 2: Evergy Metro Preferred Portfolio

Year	Wind (MW)	Solar (MW)	Battery (MW)	Thermal (MW)	Capacity Only (Summer MW)	DSM (Summer MW)	Retirements (MW)
2024	0	0	0	0	0	65	0
2025	0	0	0	0	0	130	0
2026	0	0	0	0	126	181	0
2027	0	300	0	0	34	231	0
2028	0	150	0	0	26	272	0
2029	150	0	0	0	0	294	0
2030	150	0	0	0	0	326	0
2031	150	0	0	0	0	355	0
2032	0	0	0	415	0	375	0
2033	150	0	0	0	0	395	375
2034	150	0	0	0	0	417	0
2035	150	0	0	0	0	435	0
2036	0	0	0	325	10	451	0
2037	0	0	0	0	0	464	0
2038	0	0	0	325	0	476	0
2039	0	0	0	325	0	491	0
2040	0	150	0	0	34	508	832
2041	0	0	0	325	47	524	0
2042	150	0	0	0	0	539	0
2043	0	0	0	0	0	552	0

The Preferred Portfolio for 2024 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 summer reserve margin requirements and the introduction of binding winter capacity requirements, also prompt earlier capacity resource build.

The Preferred Portfolio includes the following renewable additions: 300 MW and 150 MW of solar generation in years 2027 and 2028, respectively, and 150 MW of solar in 2040. Additionally, 150 MW of wind generation in years 2029-2031, 2033-2035, and 2042. Firm dispatchable additions include a 415 MW combustion turbine in 2032, followed by 325 MW combined cycles in 2036, 2038, 2039, and 2041. The Preferred Portfolio assumes KEEIA DSM programs are implemented and continued through the planning horizon. Consistent with the 2023 Preferred Portfolio, Missouri DSM resources are based upon a RAP+ level which consists of a suite of nine residential and seven commercial programs three of which are demand response programs, four are demand side rates, and nine are energy efficiency programs.

The Preferred Portfolio, denoted as Alternative Resource Portfolio CAAB, also includes retiring Evergy Metro's 375 MW share of LaCygne-1 in 2032, Evergy Metro's 334 MW share of LaCygne-2 in 2039, and Evergy Metro's 492 MW share of Iatan-1 in 2039.

Section 2: Implementation Plan and Ongoing Review

2.1 Load Forecasting

The last Residential Appliance Saturation survey was completed in 2022. The results were used to calculate appliance saturations and these saturations were used to calibrate DOE forecasts of appliance saturations for use in Evergy's load forecasting models.

The methods for forecasting both photovoltaic (PV) and electric vehicle (EV) end-uses were modified since the 2021 load forecast to produce an hourly forecast representative of end-use energy consumption during different day parts.

Evergy plans to review an additional forecast scenario from the Energy Information Administration (EIA) with alternative Inflation Reduction Act assumptions to determine if that scenario would produce a meaningful alternative scenario load forecast.

2.2 Demand-Side Management

Evergy filed a proposal for demand side management programs in Kansas under the KEEIA statute in docket No. 22-EKME-254-TAR. The Commission conditionally approved a portfolio of programs and recovery mechanism on September 1, 2023 subject to a modification and certain conditions. Evergy has met the conditions and the Commission approved tariffs effective March 1, 2024. The term of the DSM portfolio offering 4-years, or through December 31, 2027. Description of the programs and the expected impacts to energy and demand can be found in Vol. 4, Demand-Side Resources, Section 1 Demand-Side Resource Analysis and Section 2 DSM Potential Study Methodology.

2.3 Supply-Side

2.3.1 Wind Additions

In the near term, there are no wind additions in the portfolio. Evergy Kansas Central and Evergy Metro plan to add wind to the portfolio in 2034 and 2029 respectively. We anticipate an approximately three-year development period for wind at that time.

2.3.2 Solar Additions

The Preferred Portfolio includes acquiring approximately 900 MW of company-owned solar generation to support Kansas Central and Evergy Metro by 2028. The portfolio calls for approximately 450 MW in project(s) to reach commercial operation by December 31, 2026, with approximately 150 MW for Kansas Central and 300 MW for Metro. Additionally, approximately 450 MW in project(s) are called for to reach commercial operation by December 31, 2027, with 300 MW for Kansas Central and 150 MW for Metro. It is anticipated that one or more projects brought out of the 2023 All-Source RFP will be pursued for Predetermination later this year. Draft schedules of major milestones expected to be undertaken for the construction of these large-scale solar projects are provided in Tables 3 and 4 below.

Table 3: EOY 2026 Solar Project Milestone Schedule

Milestone Description	Expected Completion
Site Control Complete	2023
Major Commercial Agreements Complete	First half of 2024
Environmental and Land Permitting Complete	First half of 2025
Regulatory Approvals	First half of 2025
Detailed Design and Engineering	End of 2025
Equipment Acquisition and Delivery	January 2026
Construction Complete	October 2026
Testing and Commissioning	November 2026
Commercial Operation	End of 2026

Table 4: EOY 2027 Solar Project Milestone Schedule

Milestone Description	Expected Completion
Site Control Complete	2024
Major Commercial Agreements Complete	First half of 2025
Environmental and Land Permitting Complete	First half of 2026
Regulatory Approvals	First half of 2026
Detailed Design and Engineering	End of 2026
Equipment Acquisition and Delivery	January 2027
Construction Complete	October 2027
Testing and Commissioning	November 2027
Commercial Operation	End of 2027

2.3.3 Combined Cycle Gas Turbine Additions

The Preferred Portfolio also includes construction of a Combined Cycle Gas Turbine(CCGT) plant. Capacity for this plant will be approximately 650 MW of summertime capacity. This capacity will support multiple Evergy jurisdictions with approximately 325 MW of capacity being allocated for Kansas Central. This facility is expected to become commercially operational by April 2029. A draft schedule of major milestones expected to be undertaken for the construction of a CCGT plant is provided in the Table below.

Table 5: CCGT Project Milestone Schedule

Milestone Description	Expected Completion
Site Selection Complete	December 2023
SPP Large Generator Interconnection Application	October 2024
Environmental and Land Permitting Complete	2025
Design Spec & Engineering, Procurement, and Construction Award	First Half 2025
State Utility Regulatory Approvals (CCN and/or Predetermination)	First Half 2025
Detailed Design and Engineering	Second Half 2025
Construction Begins	2026
Major Equipment Delivery	2027
Construction Complete	2029
Testing and Commissioning Complete	2029
Commercial Operation	April 2029

2.4 Contingency Resource Plans

Evergy Kansas Central and Evergy Metro developed a number of ARPs to address specific planning contingencies. The plans were developed through capacity expansion to determine the optimal resource additions given the contingencies assessed. All ARPs are described in more detail in Volume 5.

As discussed in Volume 5 and shown in the critical uncertain factor analysis workpaper, future emissions restrictions have a relatively significant effect on the economics of resource plans.

The plans utilize DSM that conforms to legal mandates and each of the plans modeled indicated no unserved energy in production cost modeling analysis. The plans comply

with all current and proposed SPP Resource Adequacy Requirements which are designed to maintain loss-of-load expectation (i.e., the expectation of unserved energy) of less than one day in ten years. Probabilistic consideration of extreme weather is included in the analysis. Additional analysis of extreme weather is provided in Volume 5.

2.4.1 Evergy Kansas Central Contingency Plans

In Kansas Central, plan AAAC was developed as the optimal plan with High CO_2 restrictions and High Natural Gas prices, and it was also identified as the optimal plan for potential future GHG rule compliance. The plans AAAD and AFAD were developed for Low (No) CO_2 restrictions and Low Natural Gas prices.

Kansas Central contingency plans were also developed for execution risk of near-term solar (AAAJ), and for high load growth (AAAE) and low load growth (AAAF).

2.4.2 Evergy Metro Contingency Plans

In Evergy Metro, plan CAAD was developed as the optimal plan with High CO_2 restrictions and High Natural Gas prices, and it was also identified as the optimal plan for potential future GHG rule compliance. The plan CFAE and CAAE were developed for Low (No) CO_2 restrictions and Low Natural Gas prices.

Evergy Metro contingency plans were also developed for execution risk of near-term solar (CAAC), and for high load growth (CAAF) and low load growth (CAAG).

2.5 Monitoring Critical Uncertain Factors

Evergy Kansas Central and Evergy Metro analyzed several uncertain factors individually to determine which were critical – meaning that a factor is critical to the performance of a resource plan. Four uncertain factors were determined to be critical uncertain factors – natural gas prices, CO_2 restrictions, construction costs (including build and interconnection costs), and load growth. Each critical uncertain factor is reviewed on an individual basis due to the varied nature of the information sources used in its review. This

IRP analysis will be updated on an annual basis reflecting any changes to these critical uncertain factors. Results will be distributed to the Operations Leadership Team.

Critical Uncertain Factor: CO_2

The passage of the Inflation Reduction Act and the EPA publishing several more stringent draft rules for fossil plants have demonstrated it is more likely that carbon reductions will be realized through a mix of renewable incentives (e.g., Production Tax Credits), carbon emission caps, and other stringent emission restrictions on fossil plants which drive the need for new retrofits. As a result of these changes, Evergy moved away from exclusively using a carbon tax (which was used in historical IRPs, including the 2022 Annual Update) to utilize carbon restriction scenarios instead, which are aligned with carbon restriction scenarios developed through the SPP economic model development process. As a result of this change, a higher level of carbon restrictions actually drives down average SPP energy market prices (as renewables are built out aggressively based on incentives and the need for carbon-free energy) and drives up fixed costs as fossil plants must be retrofitted or replaced with other non-emitting resources. As opposed to a carbon tax, which is a variable cost that impacts a resource's market offer cost, these fixed costs are not recoverable in the SPP energy market and thus do not drive-up energy prices. It is possible that ultimately a CO_2 tax may become the more likely scenario again, thus Evergy continues to monitor policy developments to determine whether an adjustment is necessary, but for this IRP, an "incentives plus restrictions" approach is more representative of Evergy's expectations for the future. In parallel with Evergy's ongoing monitoring of environmental policy, SPP and its members will also continue to make changes to modeling assumptions related to carbon restrictions in future Integrated Transmission Planning processes and Evergy will be actively engaged in these discussions.

Critical Uncertain Factor: Natural Gas

Natural Gas forecasts are updated weekly with executive updates provided monthly.

Critical Uncertain Factor: Construction Costs

Expectations for future construction and interconnection are reviewed at least annually based on the latest publicly available cost information as well as up-to-date information from Evergy's ongoing construction efforts related to the implementation of its Preferred Resource Plans. Construction and interconnection costs related to specific projects are also monitored on an ongoing basis throughout project development.

Critical Uncertain Factor: Load

Load forecasts are updated on an annual basis as part of the company's annual budgeting and IRP process. In addition, updated forecasts for economics, end-use efficiency and saturations, electrification and distributed energy resources are incorporated into these load forecasts whenever they become available.

2.6 Monitoring Changing Conditions and Maintaining Flexibility

The primary goals in selecting a Preferred Portfolio are to evaluate whether near-term actions are robust across various future market scenarios and to maintain as much flexibility as possible to adjust to changing market conditions in the medium- and long-term horizon. The planning environment has continued to evolve and become more dynamic – creating an increased value for maintaining flexibility. Some of the additional sources of uncertainty related to Evergy Kansas Central and Evergy Metro's resource plans (beyond the critical uncertain factors described above) are described below, as well as a discussion of how this uncertainty has been and will be factored into planning processes and resource planning decision-making.

2.6.1 Commodity Prices

As expected, the dramatic increase in natural gas prices seen in late 2021 and 2022 has subsided and natural gas prices have now returned to levels seen in 2020 and prior. The experience of those elevated prices, however, demonstrated the value of considering a wide range of potential price scenarios in resource planning analysis given the large amount of uncertainty inherent in forecasting commodity prices. To that end, Evergy utilizes a range of natural gas price forecasts, created based on both publicly available

and proprietary third-party forecasts. The Preferred Portfolio has been tested across this range of potential commodity price futures, as described in the Integrated Risk Analysis section.

2.6.2 Renewable Resource Construction Costs

Driven by tight supply chains, increasing incentives for "onshoring" of manufacturing, and increased demand driven by the Inflation Reduction Act, there has been an increase in the construction cost for new renewable generation. Evergy has incorporated this increase into the cost assumptions utilized for this IRP based on the results of its early 2023 All-Source Request for Proposal (RFP). Based on these near-term prices for renewable projects, a third-party cost curve is then used to forecast future cost reductions and to create a long-term forecast for renewable resource costs. Consistent with Evergy's methodology of treating construction costs as a critical uncertain factor for all resources, renewables projects were studied with a plus and minus twenty-five percent range around the mid-level estimates. This allows Evergy to study plan costs based on a range of renewables construction cost environments.

2.6.3 SPP Interconnection Queue

The SPP Interconnection Queue continues to be backlogged, although SPP is making significant progress in addressing this issue and redesigning its processes to mitigate the risk of future backlogs. In addition, there is continued uncertainty around upgrade costs which will be assigned to specific projects once they complete the interconnection study process, which can create cost uncertainty depending on the maturity of individual projects. Evergy believes that the ratable approach to renewables included in this Preferred Portfolio allow it to better manage this risk and make adjustments as needed but will continue to monitor SPP's efforts to mitigate the existing backlog and determine cost allocation methods which will effectively share costs between renewable interconnection customers and the rest of the Pool, as appropriate. Evergy is closely monitoring SPP's development of the Consolidated Planning Process, the Capacity Resource Interconnection Service product, and the Joint Targeted Interconnection Queue, which all should serve to provide improved schedule and upgrade cost certainty

for future resource additions. In addition, Evergy has explicitly factored interconnection cost uncertainty into the 2024 IRP through the construction / interconnection cost uncertain factor.

2.6.4 Distributed Energy Resources (DERs)

While Evergy has not yet seen significant penetration of distributed energy resources to the point that it impacts our long-term plan, the continued expansion of electrification, DER aggregation driven by FERC Order 2222, and other policy changes which could influence DER adoption will all continue to be monitored and factored into Evergy's long-term plans as needed. This uncertainty is implicitly considered in the range of load forecasts assessed through contingency plans in this IRP because behind-the-meter generation and electrification can either reduce or increase the Company's need for resources, respectively.

2.6.5 Electrification

Across Evergy's system, the potential for broad electrification (e.g., vehicles, space / water heating) will continue to be an uncertainty in the development of load forecasts and long-term plans. Evergy incorporates forecasts for electric vehicle adoption into its load forecasts used in IRP planning and these forecasts are updated regularly. Evergy also performed a broader electrification potential study for the 2021 Triennial IRP which was included as the "high" case in this 2024 IRP as well. Going forward, Evergy will continue to monitor actual electrification activity in its service territory and update load forecasts for IRP filings. This monitoring and forecasting activity will also be informed by the availability of programs and technology which can mitigate the impact of electrification on peak demand (and thus Evergy's capacity requirements).

2.6.6 Economic Development

Evergy continues to see robust economic development activity with large new customer loads evaluating locating in the service territory. Given the magnitude of potential new loads, they represent an uncertainty which is monitored continuously and incorporated into Evergy's load forecasts as they come to fruition. In the 2024 IRP, Evergy has

incorporated announced economic development projects – specifically focused on large projects greater than 100 MW – into its load forecasts for planning purposes for each of its utilities. Specific to Kansas Central and Metro, the announced Panasonic manufacturing plant has been incorporated into the low, mid, and high load forecasts for Evergy Kansas Central and the load associated with the announced Google data center has been incorporated into the low, mid, and high load forecasts for Evergy Metro. The current pipeline for potential economic development which could be online by 2026 or 2027 is significantly larger than these two projects, but planning to serve the full economic development pipeline could result in procuring / building capacity for a level of load which may not ultimately materialize. As a result, the full pipeline of potential new customers is not included in the load forecast. However, it is critical to ensure sufficient capacity is being built for customers who have announced their intent to locate in Evergy's service territory and who are farther along in the project development process. In parallel, the "high" load forecast incorporated as a contingency plan in this IRP provides a sensitivity on how additional load growth and/or additional changes in resource adequacy requirements could change Kansas Central or Metro's resource portfolio if they materialized.

2.6.7 Reliability and Resource Adequacy

As discussed, and agreed with parties following the 2021 IRP, Evergy has incorporated more detailed reliability risk analysis into this IRP in Volume 5 Section 18. Beyond this specific analysis, there also continues to be significant uncertainty regarding SPP's resource adequacy requirements and, ultimately, how reliability risk should be evaluated and incorporated into planning processes – not just for Evergy or for SPP, but for the entire electric utility industry. Following Winter Storm Uri in 2021, SPP, other Regional Transmission Organizations (RTOs), NERC, and FERC have all initiated efforts to promote changes in resource adequacy processes and requirements so they can be better tailored to a low-carbon resource mix given an increasing dependence of customers on electricity as the economy continues to electrify. It is still uncertain what the ultimate impact of these efforts will be in terms of new Standards and Requirements, but some of the potential impacts are described below. Given the significant amount of

uncertainty in these areas and the potential for significant impacts to Evergy's resource planning, Evergy is participating actively in both SPP and NERC activities related to these topics. Many of these items, and how they are incorporated into this IRP, are described in detail in Volume 5, Section 1.5. They are also summarized at a high-level below.

Multi-Season Adequacy

Across the US, RTOs are modifying their resource adequacy constructs to change how they evaluate adequacy in, at the very least, the summer and winter seasons and, in many cases, all four seasons. Evergy has historically focused on planning for the summer season given our status as a summer-peaking utility. However, as SPP's requirements change, Evergy's planning processes also need to change. SPP has proposed two-season (winter and summer) performance-based accreditation (discussed below) and is also in the process of developing a planning reserve margin specific to the winter season (in addition to the summer reserve margin). SPP is currently expecting to implement an interim winter resource adequacy requirement for the 2025/2026 winter season (based on applying the summer reserve margin to winter load), with the implementation of a standalone winter requirement in the following winter. It is still uncertain how this requirement will be implemented, thus Evergy continues to participate actively in SPP policy development. However, as described in Volume 5 and below, Evergy has incorporated the current expected impact of winter resource adequacy requirements in modeling for this 2024 Triennial.

Resource Accreditation

In 2023, FERC rejected SPP's proposal to implement the Effective Load Carrying Capability (ELCC) methodology for renewable accreditation, which would reduce the capacity credit given to renewable resources. ELCC remains the industry standard for renewable accreditation and FERC's stated rationale for rejecting the proposal was based largely on the discrepancy between accreditation approaches for renewable and thermal generators. In response to this feedback, SPP has filed a new request with FERC to implement ELCC and Performance-Based Accreditation for thermal generators at the same time in 2026. This parallel implementation creates significant uncertainty around

capacity accreditation which will be received beginning in 2026 given these two methodologies are more "black box" and they create variability in the credit a resource will receive from season to season and year to year. To factor in this risk and uncertainty, capacity expansion modeling in the 2024 IRP allowed a lower level of market capacity purchases beginning in 2026. This reflects the expectation that excess capacity available in SPP will decline and other Load-Responsible Entities (LRE) will be less willing to sell their excess in order to manage their own resource adequacy risk. In addition, the expected impact of these accreditation methodologies was incorporated into the integrated analysis performed in the 2024 IRP as described in Volume 5.

Fuel Supply Requirements

Given challenges with natural gas supply during Winter Storm Uri and similar extreme winter events, many RTOs and NERC are evaluating how the firmness of fuel supply should be considered in determining a resource's contribution to meeting Adequacy requirements. Changes in this area could potentially materialize in the form of on-site fuel or firm transport requirements for individual generators or minimum reliability attributes at the overall RTO level in terms of on-site fuel availability. SPP continues to evaluate this requirement in the context of other Resource Adequacy Requirement changes (particularly for the winter). The current expectation is that fuel security will be assessed through resource accreditation (described above) as opposed to a standalone requirement. As a result, no specific requirement is currently included in IRP modeling.

Reserve Margin

Soon after the 2022 Annual Update was filed, SPP increased the Planning Reserve Margin (i.e., the amount of accredited capacity that an LRE must maintain in excess of its load) from 12% to 15% beginning with the summer 2023 season. SPP has also indicated that they expect future increases to the Reserve Margin as the resource mix continues to become more intermittent and we see more extreme weather. At this time, it is uncertain when the next increase will be implemented, but it's possible it could be as soon as 2025 or 2026 summer. Based on SPP's preliminary evaluations of potential winter Resource Adequacy Requirements, it is also likely that the winter Reserve Margin will be much

higher than the summer Reserve Margin. SPP has also indicated that the expected reserve margins will continue increasing in the future (beyond the 2025/2026 increase). As a result, Evergy has incorporated a slowly increasing reserve margin for both winter and summer in its integrated analysis for the 2024 IRP as described in Volume 5.

Energy Adequacy (As Opposed to Capacity Adequacy)

A relatively new concept in this space is the distinction being made between "energy adequacy" and the more traditional view of "resource adequacy" or "capacity adequacy", with the more traditional view being focused on maintaining sufficient capacity to meet peak hour requirements, plus a level of reserves to mitigate risk (with risk being driven by load uncertainty and resource performance, generally). A key focus of NERC over the last couple of years has been on exploring additional / modified Reliability Standards which expand that traditional focus to a broader view of "Energy Adequacy" which takes into account all hours – not just peaks – and incorporates a greater range of uncertainties given the quickly-changing resource mix (both supply- and demand-side resources). NERC has established Standard Drafting Teams to develop new Reliability Standards which will require the performance of Energy Assessments. It is uncertain how these potential Standards will ultimately impact SPP analysis and requirements, but Evergy continues to monitor them closely. Given the loss of load expectation modeling which SPP performs to establish reserve margin requirements already assesses reliability risks in all hours (8,760 hours) and not just peaks, it is most likely that SPP will begin supplementing loss of load expectation metrics with expected unserved energy (EUE) metrics. The addition of EUE allows the duration and magnitude of loss-of-load events to be assessed in addition to just the frequency (which is assessed through LOLE). An example of the use of EUE is included in the SERVM reliability analysis in Volume 5.

2.6.8 Maintaining Flexibility – Monitoring Preferred Portfolio

In each IRP, Evergy works to take an integrated view of the need for changes to its prior Preferred Portfolio. Specifically, the IRP process utilizes the latest understanding of the inputs outlined below in order to confirm the prior Preferred Portfolio or identify a new Preferred Portfolio through the risk analysis framework outlined in the IRP rules. Note that

not all of the detailed items listed below will have updates in or appear specifically in every IRP, but these types of items are monitored on an ongoing basis and changes will be incorporated as they arise.

Existing Resource Portfolio

- Expected ongoing capital and O&M costs, including the cost of life extension projects, where relevant.
- Potential alternative retirement dates, often based on the potential to avoid significant retrofits or overhaul costs.

Available Supply-Side Resource Options

- Assessment of current costs and risks associated with new resources.
- Potential for changes (i.e., extensions) to Power Purchase Agreements or Capacity Sales.
- Options for “non-traditional” new resources, including existing facility expansions.

Available Demand-Side Resource Options

- Latest forecast for DSM adoption and costs, informed by actual adoption data, where available, and program approval.

Alternative Resource Plans

- Each IRP, which includes the evaluation of changing conditions, will include the assessment of alternative resource plans, which include Evergy’s long-term load forecast and long-term capacity plan designed to meet capacity requirements (factoring in potential retirement dates and replacement resource options).
- These ARPs will be built based on the latest Resource Adequacy Requirements and supplemented by qualitative or quantitative assessments of reliability / resiliency risk where needed.

2.6.9 Near-Term Conditions and Points of Commitment

Finally, the Company monitors conditions which could specifically impact its near-term Implementation Plan to determine whether portions of the portfolio should be reevaluated and/or changed. These near-term actions have varying "points of commitment" which impact when and how they should be monitored by the Company prior to reaching these points.

Plant Retirements

From a system perspective, a plant retirement decision can be changed up until the point when the unit is unregistered from the SPP market. There are interim steps (for example, beginning the SPP retirement study process at least 12 months in advance, regulatory filings, workforce changes) which can complicate changes in retirement plans, but flexibility still exists up until the point the unit is removed from the SPP market. There is generally minimal cost obligation associated with retirement prior to the unit's retirement and the beginning of decommissioning/dismantling. Through the process leading up to the retirement, the primary considerations which can impact a final decision are:

Macroeconomic Drivers

Significant, structural (long-term) changes in the policy and market environment (e.g., natural gas or CO_2 restrictions) could trigger a reevaluation of a retirement.

Environmental Regulations

Specifically, the expectation / certainty around necessary environmental retrofits (and the timing of when these retrofits will be needed)

Conversion Options

In some cases (such as Lawrence 5), an option may be available to maintain or convert to natural gas operations at a site as opposed to retiring the unit. These opportunities can be evaluated based on the long-term capacity value they provide and the cost of continued gas operations. In recent IRPs, Evergy has evaluated additional potential natural gas conversions at Jeffrey Energy Center and Hawthorn Unit 5. At this stage,

retiring Jeffrey Units 2 and 3 is more economic than converting them to natural gas and retaining Hawthorn Unit 5 as a coal plant is more economic than converting to gas given the high cost of natural gas firm service required for capacity accreditation and the very low expected capacity factor of converted coal units. In addition, Evergy has recently begun to evaluate the potential to operate both Lawrence units on natural gas (as opposed to only unit 5), but has not yet formally evaluated / made a change to the Unit 4 retirement currently included in the Preferred Portfolio. Going forward, Evergy will continue to evaluate these options as an alternative to retirement given the potential conversion offers to retain accredited capacity, reduce the need for environmental retrofits, and reduce operating costs.

Long-Term Seasonal Cycling

In some cases, seasonal cycling (i.e., operating only during winter and summer) could be an alternative to retirement which creates significant cost savings while maintaining valuable capacity when it's needed most. These opportunities can be evaluated based on the long-term capacity value they provide and the cost of continued operations. Evergy has begun evaluating the potential for seasonal cycling on a short-term basis to inform our understanding of future longer-term seasonal cycling options. The decision-making around short-term seasonal cycling is based on near-term market dynamics (e.g., expected demand, expected renewable output, gas prices) which will vary from season to season.

Other Investment Needs

As a plant retirement date nears, significant emergent investment needs can impact the ultimate retirement decision (i.e., a large equipment failure can trigger a retirement acceleration).

Maintenance of Interconnection Rights

Given the uncertainty referenced above in the SPP Interconnection Queue, the maintenance of interconnection rights becomes a very important factor in managing plant retirements in conjunction with new resource additions. SPP's Replacement process

allows new resources to utilize the interconnection rights of a retiring unit so, ultimately, a retirement decision could be impacted by the ability to use the unit's interconnection point for a new resource and thus "repower" the site with an alternative generating facility.

Increases in Load Forecast and/or Resource Adequacy Requirements

As described above, Evergy has seen increased economic development activity and ongoing changes to SPP Resource Adequacy requirements. Either of these factors could cause a change to a retirement decision if, for example, a unit needs to be retained to serve a new large load or to meet an increased capacity requirement.

Resource Additions

Typically, resource additions include a "notice-to-proceed" (NTP) date which would be the "point of commitment" for that resource. Often these NTPs are conditioned on certain approvals (e.g., tied to regulatory proceedings) which enables flexibility to respond to changing conditions. There is typically minimal cost obligation prior to the NTP point. From that point, costs would be incurred based on the payment and/or construction schedule associated with the project. Primary considerations when making final resource additions decisions are outlined below.

Construction Costs

Through the negotiation process with developers or suppliers, expected resource costs are often updated multiple times prior to NTP. This allows for continued reevaluation of projects based on up-to-date cost expectations.

Tax Credit Eligibility

Changes to tax credit eligibility of specific projects or all renewable projects can ultimately impact economics and trigger reevaluation of resource additions.

Project Maturity

A key consideration in evaluating near-term resource additions is project maturity because a relatively mature project provides greater certainty in timeline and cost. Key

factors which indicate project maturity are site control and equipment (e.g., panels, turbines) availability.

Interconnection Queue Status

Due to the current backlog of interconnection queue requests, the availability of projects with favorable queue positions is a key consideration in selecting and procuring new resources. For most Generator Interconnect queue clusters, the study process has well-defined milestones that allow visibility into when study results and an Interconnection Agreement could be expected. Given the current backlog in the Interconnect queue, this timeline is less clear for some clusters, which is why queue status is such a critical consideration in the evaluation of new projects.

Location and Transmission Risk

There can be significant variability in the locational value of different resources (e.g., expected locational marginal price and/or curtailment risk). Additionally, a resource's location on the transmission (or distribution, in some cases) influences the expected cost of incremental system upgrades to support the interconnection. As a result, this is assessed in comparing different potential resource additions and determining the ultimate expected attractiveness of the options available.

Demand-Side Management

The implementation of DSM programs is managed through the MEEIA and KEEIA processes and thus points of commitment align with those regulatory approvals. These approval processes, and the potential studies and stakeholder processes which support them, are the primary driver of ultimate DSM implementation.

2.7 Monitoring Preferred Portfolio Implementation

2.7.1 Plant Retirement Initiatives

The earliest a coal-fired power plant is expected to be retired is Lawrence 4 in 2028 which allows for further evaluation should conditions change. Specifically, ongoing evaluation is

in process of whether Lawrence 4 could also be transitioned to gas-only operations as opposed to retiring in order to retain the capacity from the unit at a lower cost.

2.7.2 Supply-Side Resource Additions

As part of the Preferred Portfolio, work is currently underway on the first tranche of solar to be added to Evergy's supply portfolio. Analysis is underway to evaluate specific proposed projects based on several factors including the levelized cost of energy, project location, transmission interconnection status, impact on locational marginal energy market prices, etc.

The implementation activities related to supply-side resource additions are described in Section 2.3. These activities are continuously monitored by the Development team, with Project Managers tracking the scope, schedule and budget of each project. Any deviations and corresponding mitigations are first reported to / reviewed by the Director of Project Management and Controls or the Director of Conventional Generation Projects and then the Vice President of Development, the Chief Financial Officer and other Officers as needed.

2.7.3 DSM Initiatives

Evergy Kansas Central and Evergy Metro have processes in place to monitor its Demand-Side Management programs and track and report their performance compared to the planned implementation schedule.

2.7.4 Existing Generation Retrofit Initiatives

Ongoing environmental projects including zero liquid discharge (ZLD) system installation, fly ash landfill closure and cover, bottom ash handling system projects at the Jeffrey Energy Center, ZLD system installation and groundwater remediation at Lawrence Energy Center, upper and lower AQC pond closure and cover at La Cygne Station are monitored and continuing.

Section 3: Preferred Portfolio Approval

The following statement is the formal approval by officers of Evergy committing Evergy Kansas Central and Evergy Metro to the course of action described in the resource acquisition strategy.

Figure 1: Evergy Kansas Central and Evergy Metro Corporate Approval and Statement of Commitment for Resource Acquisition Strategy

Evergy Kansas Central, Inc., Evergy Kansas South, Inc., and Evergy Metro, Inc.
Integrated Resource Plan – 2024 Triennial Filing
Corporate Approval and Statement of Commitment for Resource Acquisition Strategy

In accordance with the Order Adopting Integrated Resource Plan and Capital Plan Framework in Docket No.19-KCPE-096-CPL (Feb. 6, 2020), Evergy Kansas Central, Inc., Evergy Kansas South, Inc. (together as "Evergy Kansas Central"), and Evergy Metro, Inc. ("Evergy Kansas Metro") now officially adopt for implementation the resource acquisition strategy contained in this Triennial filing.

With the objective of providing the public with energy services that are safe, reliable, and efficient at just and reasonable rates, Evergy Kansas Central and Evergy Kansas Metro are committed to the full implementation of the Resource Acquisition Strategy contained herein.

DocuSigned by:
Jason Humphrey
0D22279D46074DA...
Jason Humphrey
Vice President Development

DocuSigned by:
David Campbell
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President and Chief Executive Officer