# EVERGY KANSAS CENTRAL

# AND

# EVERGY METRO

# 2021 INTEGRATED RESOURCE PLAN

## MAY 2021

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**Appendix 5D: ICF 2020 DSM Potential Study – Vol 4 – Program Descriptions.pdf**

**Appendix 5E: ICF 2020 DSM Potential Study – Vol 5 – Appendices - Confidential.pdf**

**Appendix 5F: ICF 2020 DSM Potential Study – Vol 5 – Appendices.pdf**

**Appendix 5G: ICF 2020 Evergy BTM Solar & Storage Potential Study.pdf**

**Appendix 7A: 2020 SPP Integrated Transmission Planning Assessment Report.pdf**

**Appendix 7B: 2021 SPP Transmission Expansion Plan Report.pdf**

**Appendix 7C: 2021 SPP Transmission Expansion Plan Report.xls**

# SECTION 1: INTRODUCTION

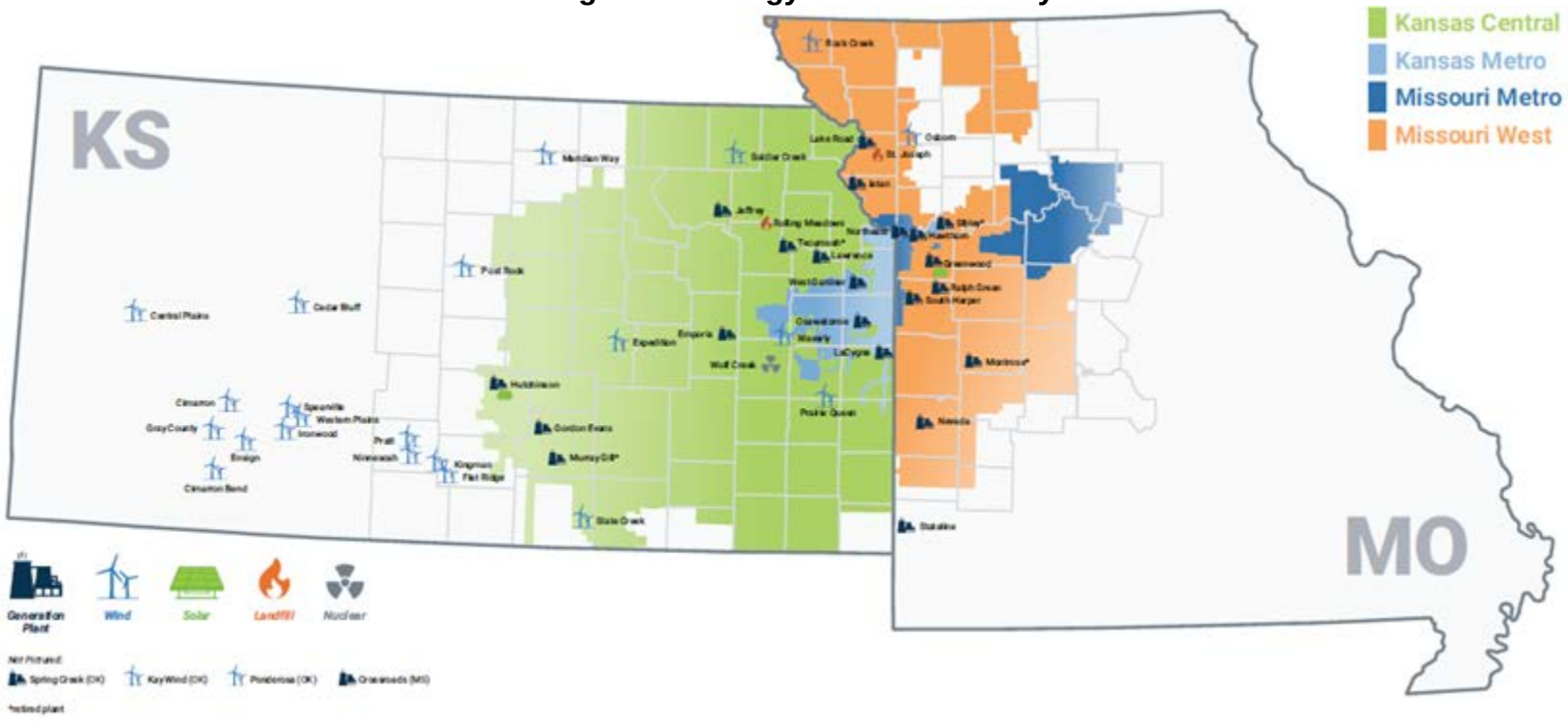
The purpose of the IRP process is to present the Evergy Kansas Central and Evergy Metro Preferred Portfolios of resources to customers and the Commission. The resource modeling identifies the portfolio of resources that meets customer requirements at the lowest reasonable cost given an uncertain future. The optimal portfolio of resources will vary based on the modeling assumptions. The flexibility and robustness of an optimal portfolio is determined by input sensitivity analysis and contingent scenario analysis.

# SECTION 2: EVERGY KANSAS CENTRAL AND EVERGY METRO SYSTEM OVERVIEWS

Evergy Kansas Central is an integrated, mid-sized electric utility serving customers in the eastern third of Kansas including the cities of Wichita, Topeka and portions of the Kansas City metropolitan area. Evergy Metro is an integrated, mid-sized electric utility serving the region surrounding the Kansas City, Missouri metropolitan area including customers in Kansas and Missouri.

A map of the Evergy service territory which includes Evergy Kansas Central and Evergy Metro is provided in Figure 1 below:

**Figure 1: Evergy Service Territory**



Evergy Kansas Central is significantly impacted by seasonality with approximately one-third of its retail revenues recorded in the third quarter. Table 1 provides a snapshot of the number of customers served, retail sales and peak demand based upon 2020 data.

**Table 1: Evergy Kansas Central 2020 Customers, Retail Sales and Peak Demand**

| Jurisdiction | Number of Retail Customers | Retail Sales (MWh) | Net Peak Demand (MW) |
|---|---|---|---|
| **Evergy Kansas Central** | **720,527** | **18,648,800** | **4,942** |

Evergy Kansas Central (EKC) owns and operates a diverse generating portfolio and Power Purchase Agreements (PPA) to meet customer energy requirements. Three recent renewable generation projects that were procured for EKC are Ponderosa Wind, Cimarron Bend III, and Flat Ridge III. The 200 MW Ponderosa Wind facility reached commercial operation in November, 2020 with EKC being an offtaker of 78 MW of the facility. The 150 MW Cimarron Bend III facility reached commercial operation in December, 2020 with EKC being an offtaker of 20 MW of the facility. The 128 MW Flat Ridge III is expected to reach commercial operation in the 2nd quarter of 2021 with EKC being the offtaker of the entire facility.

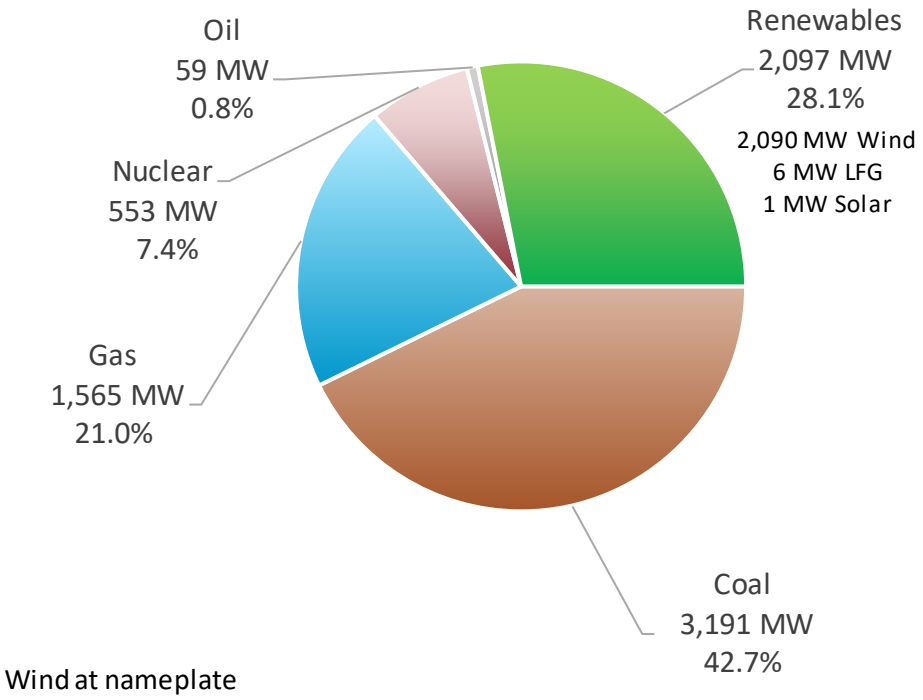
Table 2, Figure 2, and Figure 3 reflect Evergy Kansas Central's generation assets operating in 2020.

**Table 2: Evergy Kansas Central Capacity and Energy by Resource Type**

| Capacity By Fuel Type | Capacity (MW) | % of Total Capacity | Energy (MWh) | % of Annual Energy |
|---|---|---|---|---|
| Coal | 3,191 | 42.7% | 11,089,734 | 45.3% |
| Nat. Gas | 1,565 | 21.0% | 1,673,201 | 6.8% |
| Nuclear | 553 | 7.4% | 4,973,724 | 20.3% |
| Oil | 59 | 0.8% | 10 | 0.00004% |
| Wind | 2,090 | 28.0% | 6,688,389 | 27.3% |
| LFG | 6 | 0.1% | 45,977 | 0.2% |
| Solar | 1 | 0.01% | 2,264 | 0.009% |
| | **7,465** | **100%** | **24,473,299** | **100%** |

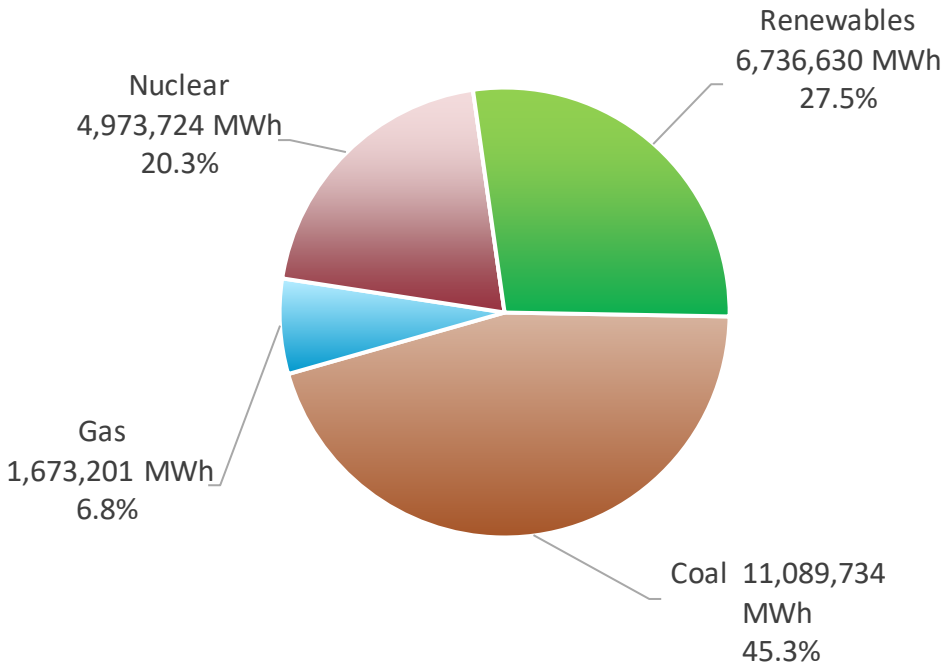
* Wind capacity is based upon nameplate

**Figure 2: Evergy Kansas Central Capacity by Resource Type**




Wind at nameplate

**Figure 3: Evergy Kansas Central Energy by Resource Type**



Evergy Metro is significantly impacted by seasonality with approximately one-third of its retail revenues recorded in the third quarter. Table 3 provides a snapshot of the number of customers served, retail sales, and peak demand based upon 2020.

**Table 3: Evergy Metro 2020 Customers, Retail Sales, and Peak Demand**

| Jurisdiction | Number of Retail Customers | Retail Sales (MWh) | Net Peak Demand (MW) |
|---|---|---|---|
| Evergy Missouri Metro | 295,550 | 8,053,770 | 1,725 |
| Evergy Kansas Metro | 265,630 | 6,170,121 | 1,575 |
| Evergy Metro | 561,180 | 14,223,891 | 3,300 |

Evergy Metro owns and operates a diverse generating portfolio and Power Purchase Agreements (PPA) to meet customer energy requirements. In October 2019, Evergy executed a PPA for Ponderosa Wind, a 178 MW wind farm located in northwest Oklahoma. Evergy Metro is the offtaker of 100 MW of the energy output from Ponderosa Wind which reached commercial operation in December 2020. Table 4, Figure 4, and Figure 5 below reflect Evergy Metro's generation assets including PPAs.

**Table 4: Evergy Metro Capacity and Energy By Resource Type**

| Capacity By Fuel Type | Capacity (MW) | Capacity (%) | Energy (MWh) | Energy (%) |
|---|---|---|---|---|
| Coal | 2,249 | 42% | 9,232,744 | 48% |
| Nat. Gas | 767 | 14% | 327,681 | 2% |
| Nuclear | 553 | 10% | 4,973,855 | 26% |
| Oil | 393 | 7% | 6,375 | 0% |
| Wind | 1,330 | 25% | 4,540,861 | 23% |
| Hydro | 60 | 1% | 329,976 | 2% |
| Total | 5,352 | 100% | 19,411,492 | 100% |

**Figure 4: Evergy Metro Capacity by Resource Type**

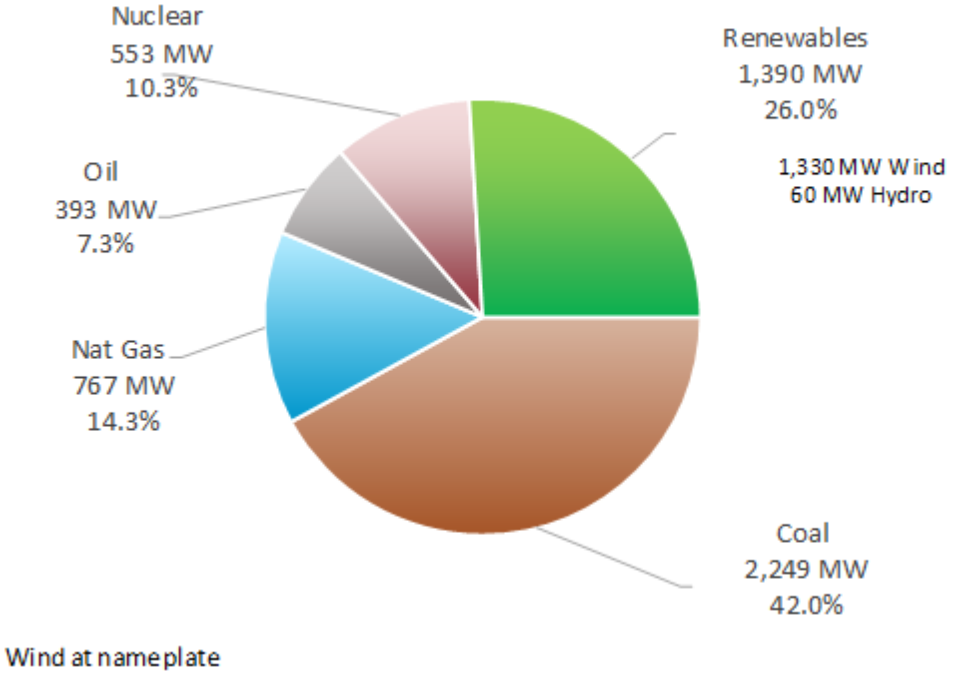
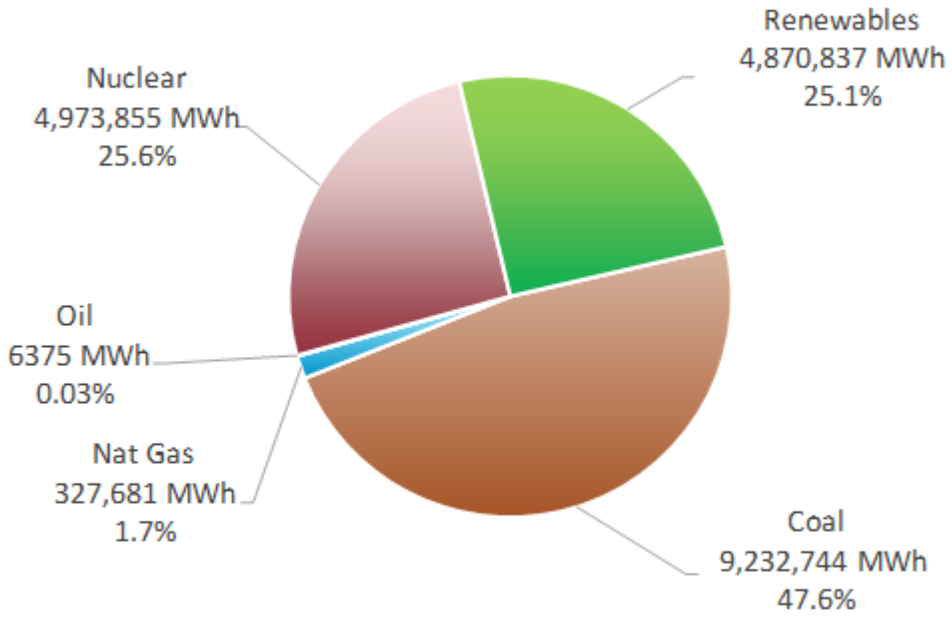



**Figure 5: Evergy Metro Energy by Resource Type**

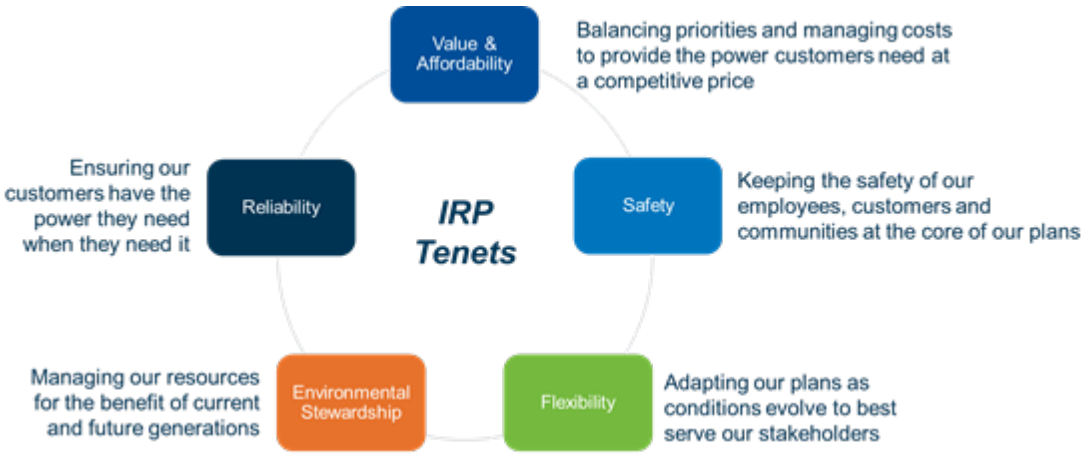


## SECTION 3: FUNDAMENTAL OBJECTIVES

As outlined in the Kansas IRP rules, the purpose of the IRP is to identify a "portfolio of resources that meets customer requirements at the lowest reasonable cost given an uncertain future". Additionally, there is a focus on assessing the flexibility and robustness of this portfolio through "input sensitivity analysis and contingent scenario analysis"

Throughout this process, Evergy seeks to balance a variety of considerations in order to determine which portfolio should be selected as the "Preferred Portfolio" as outlined in Table 5 below:

**Table 5: IRP Tenets**




Evergy conducts modeling at the individual utility level and the combined level to ensure optimal plans are selected.

# SECTION 4: LOAD ANALYSIS AND LOAD FORECASTING

## 4.1 LOAD ANALYSIS

Included in the Load Analysis and Load Forecasting section is a summary of historical and forecasted load, including alternative forecast scenarios and the methodology used to produce each forecast. The raw numbers for the historical load information as well as each forecast scenario are included in workpapers:

Evergy Metro_KS_IRP\MetroKS_EnergyPeak_KansasIRP.xlsx and

Evergy KS Central_KS_IRP\KS Central_NL_Peak Monthly_Annual.xlsx.

### 4.1.1 HISTORY OF ANNUAL AND SEASONAL LOAD REQUIREMENTS (LAST 15 YEARS)

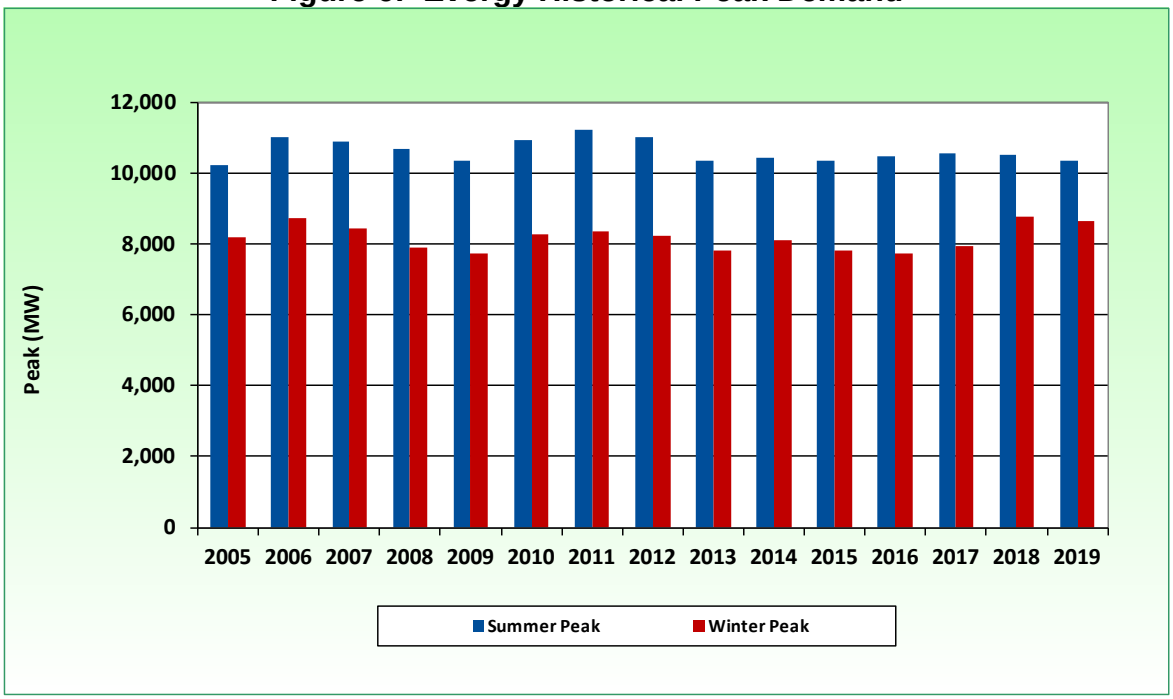
Annual Peak Demand for all Evergy service territories has trended flat over the past 15 years with annual peaks occurring in the Summer. While the Summer seasonal peak demand has been largely steady, with little growth or decline, Winter seasonal peak demand has increased slightly over the last 15 years for Kansas Metro due to a modest increase in electric space heat saturation. Historical Summer and Winter Peak Demand for Evergy total as well as Evergy Kansas Central and Every Kansas Metro are represented in the figures below. Raw numbers for annual and seasonal peak demand are included in workpapers:

Evergy Metro_KS_IRP\MetroKS_EnergyPeak_KansasIRP.xlsx and

Evergy KS Central_KS_IRP\KSCentral_NL_Peak Monthly_Annual.xlsx.

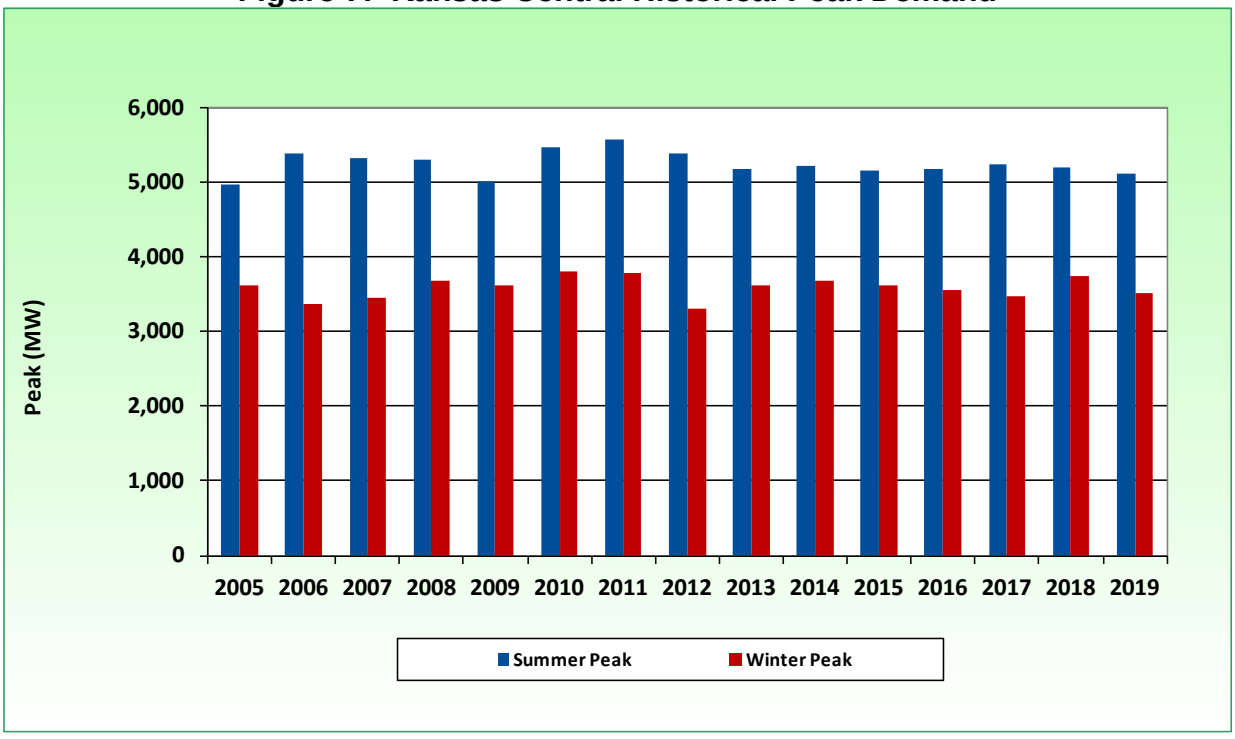
### 4.1.2 EVERGY OVERALL

**Figure 6: Evergy Historical Peak Demand**



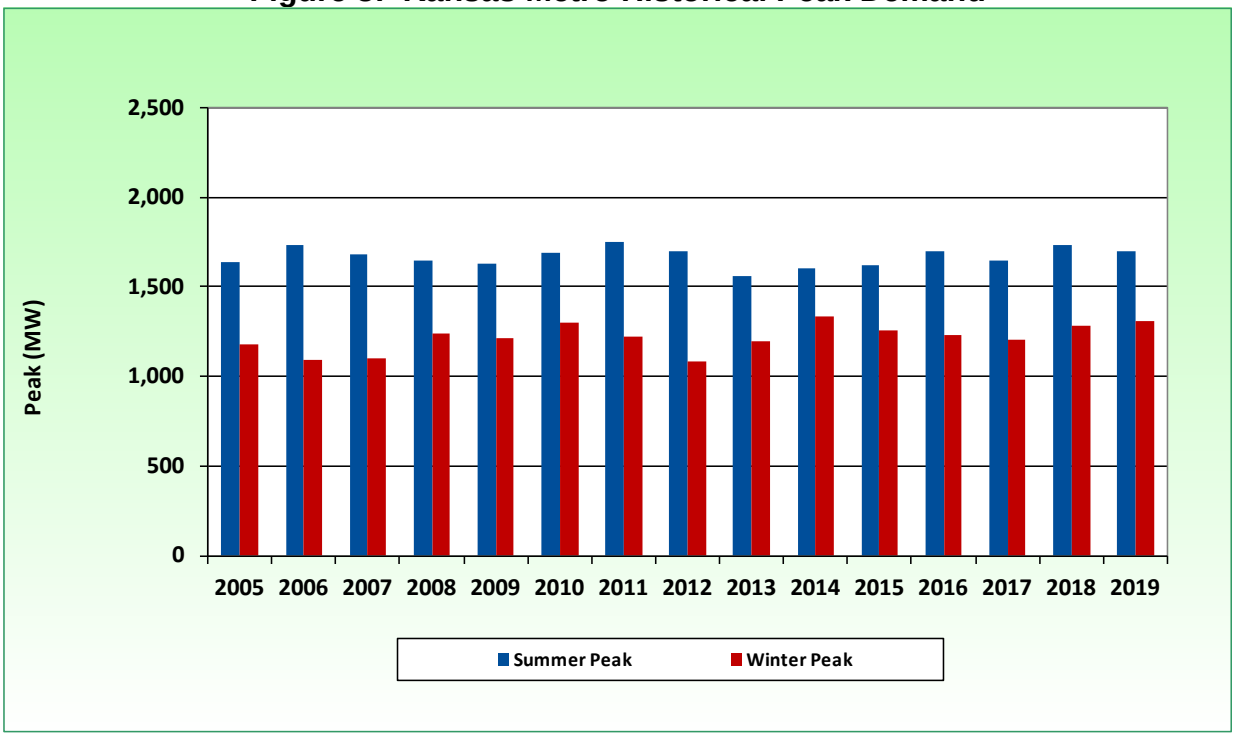

### 4.1.3 KANSAS CENTRAL

**Figure 7: Kansas Central Historical Peak Demand**



### 4.1.4 KANSAS METRO

**Figure 8: Kansas Metro Historical Peak Demand**




### 4.1.5 SERVICE TERRITORY AREAS OF DECLINE AND GROWTH

The Evergy service territory has experienced a slightly positive load trajectory over the last decade. The slight increase in load is primarily the result of an increase in customers partially offset by reduced average use due to several electric end-use products becoming more efficient.

Evergy Kansas Metro load on a weather-adjusted basis (estimated based on 30-year normal cooling degree days [CDD] and heating degree days [HDD]) grew 0.1% annually from 2010-2019, while Evergy Kansas Central grew 0.3% annually from 2010-2019. In both jurisdictions, the positive customer growth was mostly offset by a decline in average use per customer.

Evergy Kansas Metro experienced customer growth of 0.9% 2010-2019. Customer growth in total is largely the result of the residential class since it has the largest customer count. Residential customers grew by 0.8% annually, while Commercial

customers grew by 1.8% annually and Industrial customers declined by -1.1% annually from 2010 to 2019. Customer count growth coincides with growth in area Economic figures. Household growth for the Kansas City Metro area grew 1.1% from 2010 to 2019 and employment grew 1.4%.

Evergy Kansas Central saw customer growth of 0.5% 2010-2019. Like Evergy Kansas Metro, the growth was largely driven by the residential class growth, which was 0.5% annually. Commercial customers grew by 0.5% annually and Industrial customers declined by -0.9% annually. For the Kansas Central jurisdiction, the customer count growth also mirrors area Economic figures, with Household growth of 0.6% from 2019-2019, and employment growth 0.7%.

In both jurisdictions, growth in customers has been largely offset by the adoption of more efficient end-use products such as air conditioners, refrigerators and light bulbs. As a simple example, a 12W LED light bulb may replace a 60W incandescent bulb and the LED bulb uses 20% of the energy used by the incandescent bulb. A list of federal energy efficiency legislation and the products associated with them are located in the work papers Evergy Metro\Documentation\DOE\DOE standards table.xlsx. The adoption of these more efficient products has resulted in declining average use for Evergy customers. On a weather-adjusted basis, Evergy Kansas Metro Residential average use per customer declined by -0.8% from 2013 to 2019, Commercial average use per customer declined by -0.7%, and Industrial average use increased by 1.5%. For Evergy Kansas Central, Residential average use per customer declined by -0.8% from 2013 to 2019, Commercial average use per customer declined by -0.5%, and Industrial average use increased by 1.6%. (Historical weather adjusted customer class energy usage per customer begins in 2013.)

## 4.2 LOAD FORECASTING

Evergy's load forecast is estimated on a monthly basis and aggregated or disaggregated to obtain annual, seasonal or hourly load forecasts. The methodology used is described briefly below. Additional details are available in the referenced workpapers.

### 4.2.1 FOUNDATION METHODOLOGY

Evergy used the Statistically Adjusted End Use (SAE) modeling framework to forecast energy use and peak demand. Following is a brief description of the SAE method. More detailed explanations, including functional form equations are located in workpapers “2020CommercialSAE.pdf”, “2020ResidentialSAE.pdf”, and “SAEOverview_IndustrialIntro.pptm” in workpapers folder Evergy Metro\Documentation\SAE.

The traditional approach to forecasting monthly sales for a customer class is to develop an econometric model that relates monthly sales to weather, seasonal variables, and economic conditions. From a forecasting perspective, econometric models are well suited to identifying historical trends and to projecting these trends into the future. In contrast, end-use models can incorporate the end-use factors driving energy use. By including end-use structure in an econometric model, the SAE modeling framework exploits the strengths of both approaches.

There are several advantages to this approach.

- The equipment efficiency and saturation trends, dwelling square footage, and thermal integrity changes embodied in the long-run end-use forecasts are introduced explicitly into the short-term monthly sales forecast. This provides a strong bridge between the short-term and long-term sections of the forecast period.

- By explicitly incorporating trends in equipment saturations, equipment efficiency, dwelling square footage, and thermal integrity levels, it is easier to explain changes in usage levels and changes in weather-sensitivity over time.

- Data for short-term models are often not sufficiently robust to support estimation of a full set of price, economic, and demographic effects. By bundling these factors with equipment-oriented drivers, a rich set of elasticities can be incorporated into the final model.

Evergy receives end-use estimate worksheets in consultation with Itron. The main source of the residential and commercial SAE end-use worksheets is the 2020 Annual Energy Outlook (AEO) database produced by the Energy Information Administration (EIA). Due to utilization of Econometric methods, which are effective for short-term forecasting, in combination with structural and end-use estimates, which are important medium-term and long-term drivers of electric consumption, the SAE modeling framework produces a forecast that is suitable for the short-term through the long-term. Evergy uses this single set of load forecasts for short-term as well as medium-term and long-term forecasts.

#### 4.2.1.1 Load Forecast Base Case

The following is a broadly described list of inputs to the Load Forecast:

- Historical data for customers, kWh and $/kWh: January 2006 – June 2020 (the exact dates used in the estimation equation may vary by customer class).
- EIA forecasts of appliance and equipment saturations and kwh/unit via the Annual Energy Outlook (AEO) 2020.
- Forecasts of regional Economic variables from Moody's Analytics: Population, Households, Employment, Gross Product, Income, Consumer Price Index.
- Temperature is incorporated via Cooling Degree Days (CDD) and Heating Degree Days (HDD). Degree days are computed from National Oceanic and Atmospheric Administration (NOAA) average daily temperature for Kansas City International Airport, Topeka Billard Airport and Dwight D. Eisenhower Airport in Wichita. Normal CDD and HDD are calculated for the 30 year period 1989-2018. Normal CDD and HDD for the peak forecast are calculated using historical CDD and HDD occurring on each monthly peak 2000-2019.
- Forecast models are specified for these classes:
    - Kansas Metro: residential, small commercial, big commercial (medium, large, large power) and industrial, lighting, sales for resale.
    - Kansas Central: residential, commercial, Industrial, lighting, sales for resale.
- Elasticities for price, output, household size and household income, are specified to optimize model fit. See SAE workpapers for description of elasticities.

- The Company's electric vehicle study completed in partnership with EPRI was utilized for electric vehicle load in the forecast, including low, mid and high case electric vehicle adoption scenarios.

- EIA West North Central Residential and Commercial end-use saturations were calibrated to Evergy end-use survey results to represent end-use consumption in the Evergy service territory.

- Commercial end-use intensity / sq. ft. from the EIA West North Central division were calibrated to the conditional demand outputs from Evergy's potential studies.

- Multiple Alternative Scenarios were produced based on Low/Mid/High scenario Economic Forecasts and Low/Mid/High scenario electric vehicle adoption forecasts.

#### 4.2.1.2 Load Forecast Base Case

Evergy Load Forecast Base Case employs the base (mid) case forecast for all input variables. The Base case forecast for both Evergy Kansas Metro and Evergy Kansas Central projects a slight increase in both energy and peak demand over the forecast period. Customer growth is expected to be offset by continued adoption of energy efficient products, with a particular impact to Commercial lighting use. The growth in the forecast is primarily due to increased adoption of electric vehicles. See Figure 9 through Figure 14 for historical and base case forecast charts of energy and peak demand. The raw numbers for the base case load forecast as well as the alternative scenario load forecasts are available in workpapers Evergy Metro_KS_IRP\ MetroKS_EnergyPeak_KansasIRP.xlsx and Evergy KS Central_KS_IRP\ KS_Central_EnergyPeak_KansasIRP.xlsx.

4.2.1.2.1 "Base" Load Forecast for 15 years

**Figure 9: Evergy Base Case Peak Demand Forecast**

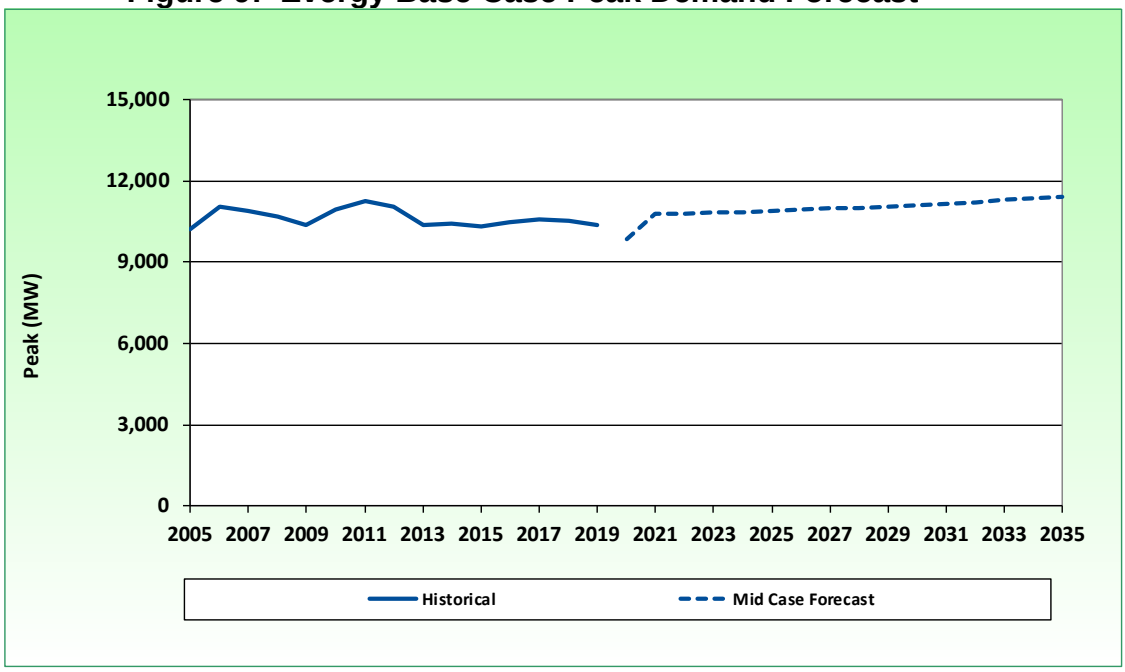



**Figure 10: Evergy Base Case Energy Forecast**

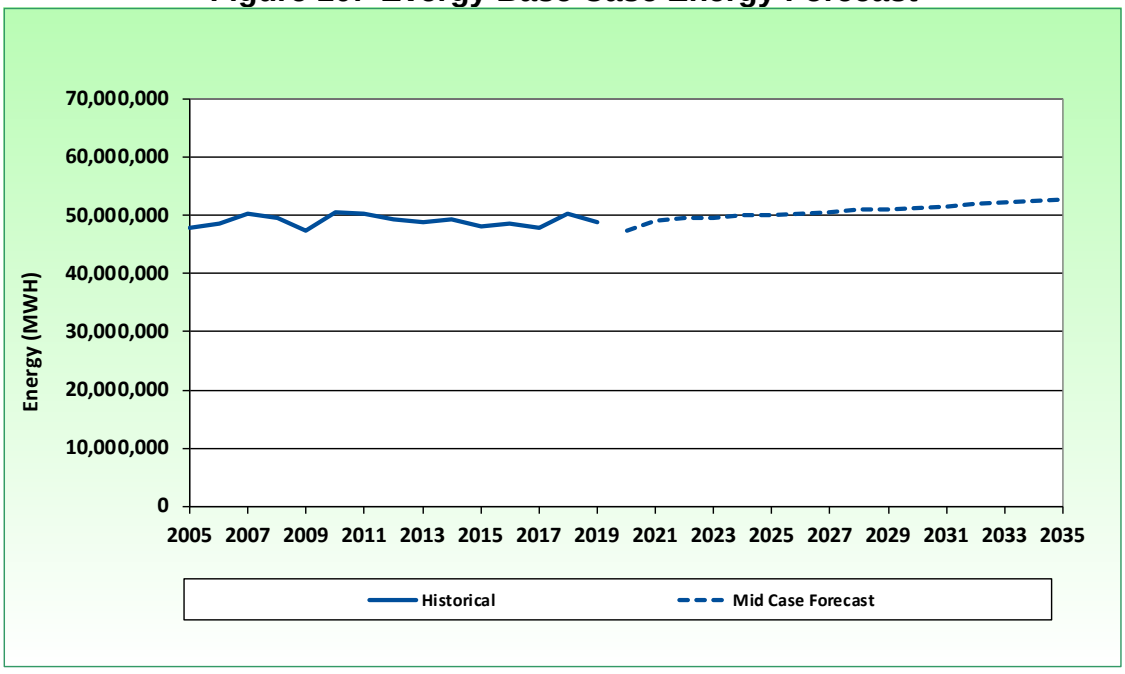


**Figure 11: Kansas Central Base Case Peak Demand Forecast**

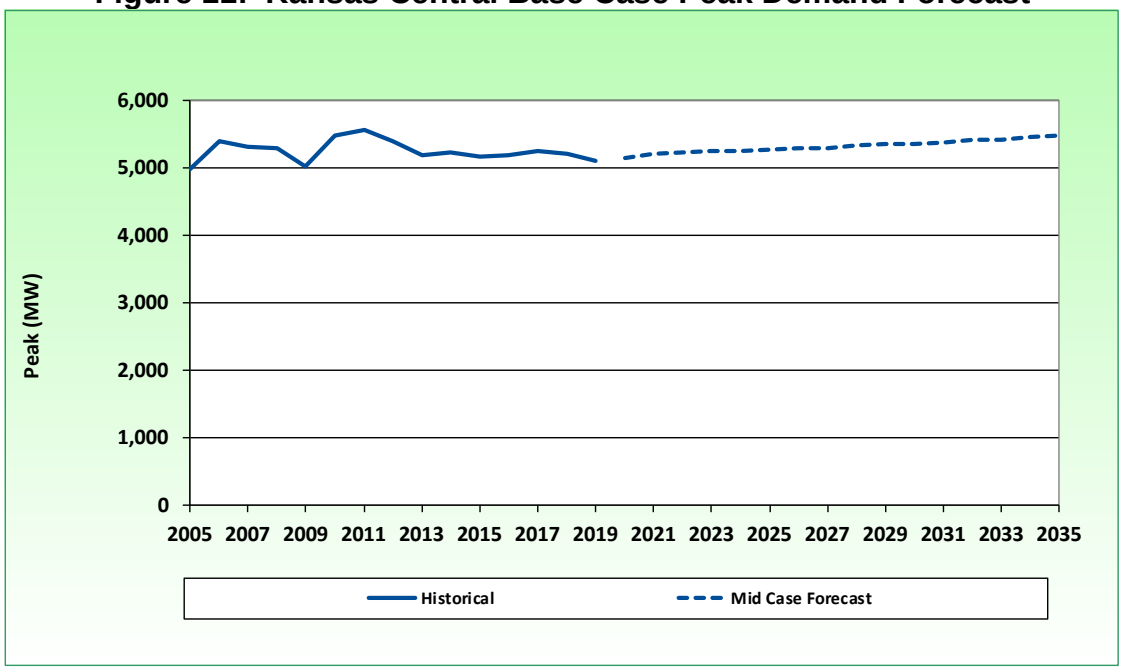



**Figure 12: Kansas Central Base Case Energy Forecast**

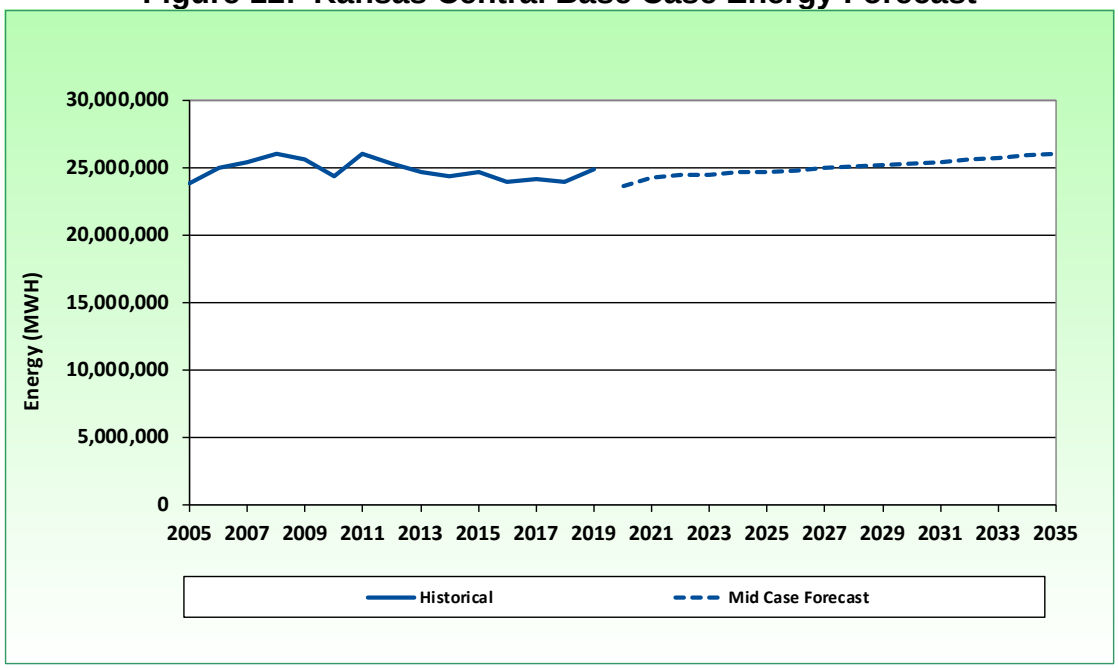


**Figure 13: Kansas Metro Base Case Peak Demand Forecast**

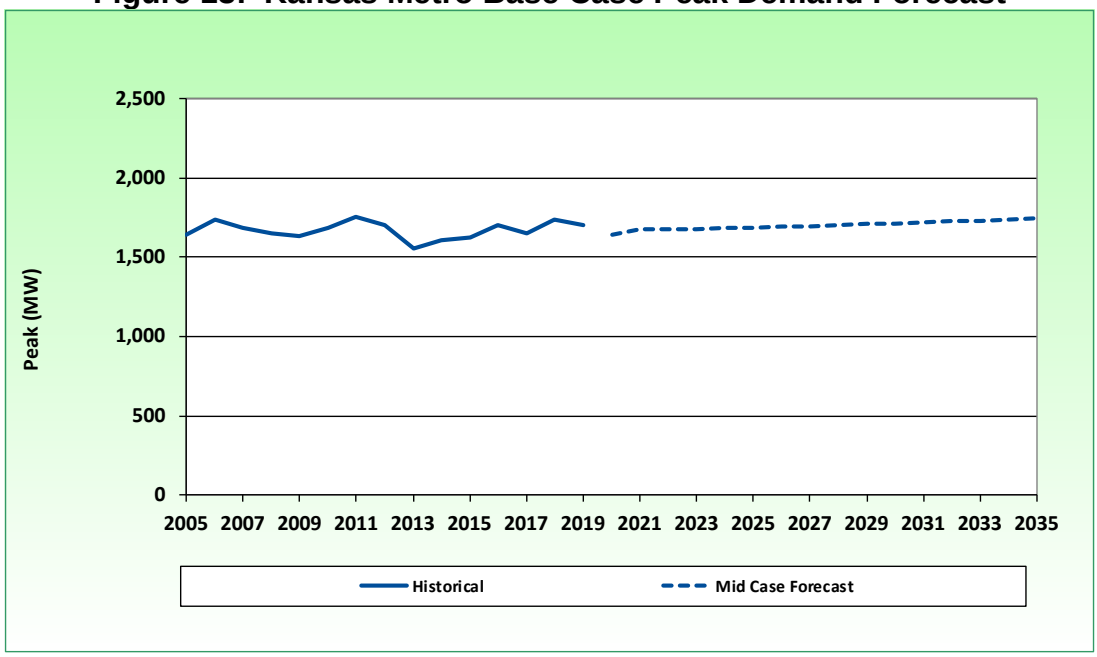
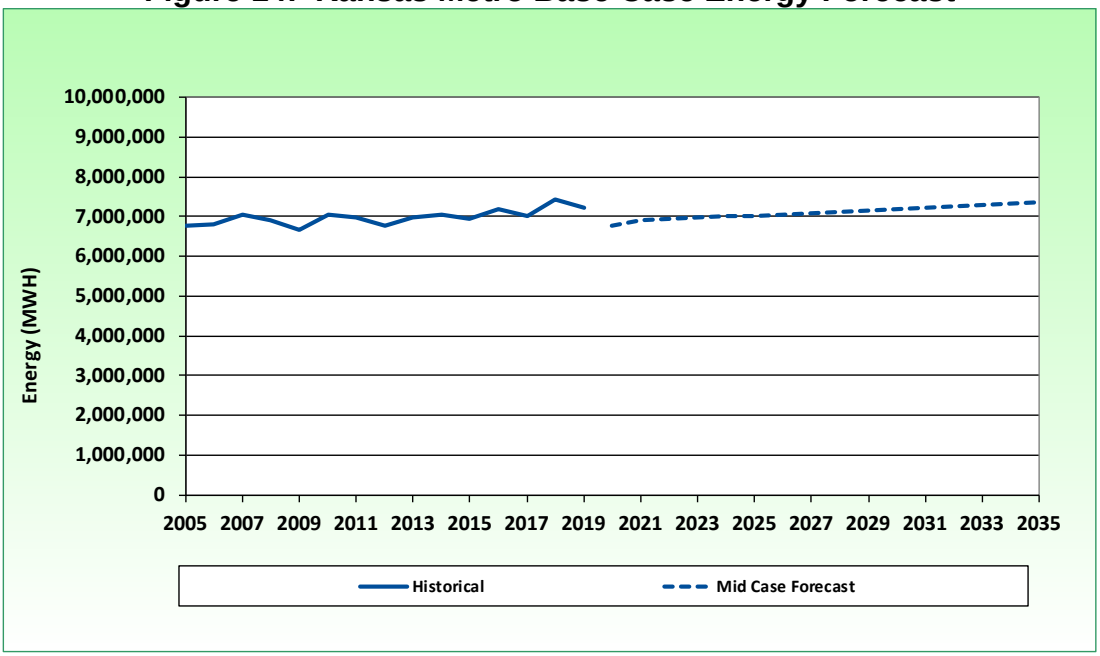



**Figure 14: Kansas Metro Base Case Energy Forecast**



#### 4.2.1.3 Load Forecast Sensitivities

Several alternative load forecast scenarios are produced based on alternate estimates of various forecast inputs. Those inputs with alternative scenario estimates include economic variables, significant customer loss, electric vehicle adoption, an extreme temperature scenario as well as an electrification scenario, which includes increased adoption of several products that consume electric power. The alternate scenarios for both the economic forecast and the electric vehicle adoption forecast include a low case and a high case. As mentioned above, the economic forecast is provided by Moody's Analytics and the electric vehicle adoption forecast is produced in partnership with EPRI for the Evergy service territory. The extreme temperature scenario is a peak forecast scenario with simulated temperatures based on the 4 warmest summers of the last 40 years. The forecast scenarios for each of these end uses is included in the workpapers

- Evergy Metro\Models\Data\Economics\KC hi_lo_0520.xls
- Evergy KS Central\Models\Data\Economics\KSCentral hi_lo_0520 Models\Data\Indices\EV_PV\EPRI EV Study\EPRI 2020 EV Adoption Summary.xlsx
- Evergy Metro\Models\NSI_Peak\PeakWhtrNrm.xlsx, Evergy KS Central\Models\NSI_Peak\PeakWhtrNrm.xlsx

The electrification scenario is the result of an electrification study; details on the study, including the methodology and output of the study are included below in Section 5 Demand-Side Resource Analysis. Each of the high case scenarios include annual growth of greater than 0.5% in both energy and peak while the low case forecast scenarios include declining energy and peak demand.

The Figures below include scenarios for Low Economics, Low EV, Base Case, High Economics, High EV, Electrification and Extreme Summer Temperature.

Additional scenarios for loss of significant customers and Low/High end-use intensity are included in workpapers

- Metro\MetroKS_EnergyPeak_KansasIRP.xlsx
- Evergy KS Central\KS Central_NL_Peak Monthly_Annual.xlsx.

**Figure 15: Kansas Central Peak Demand Forecast Alternative Scenarios**

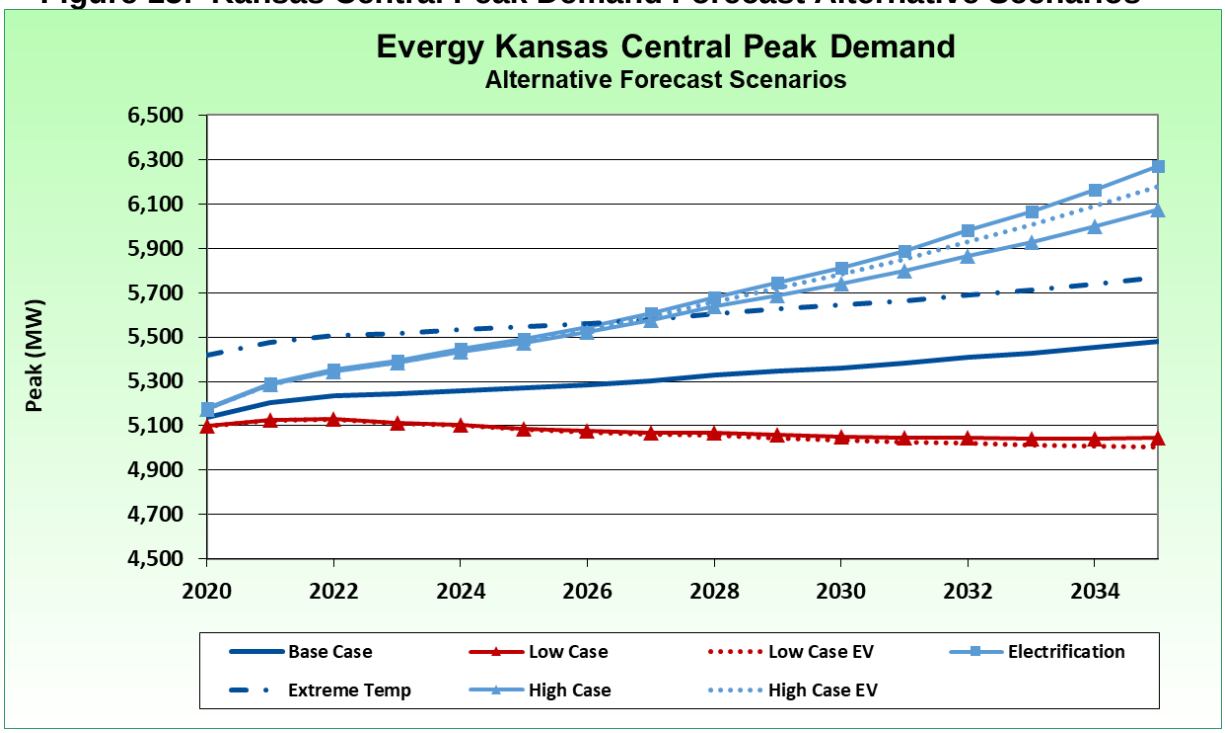



**Figure 16: Kansas Central Energy Forecast Alternative Scenarios**

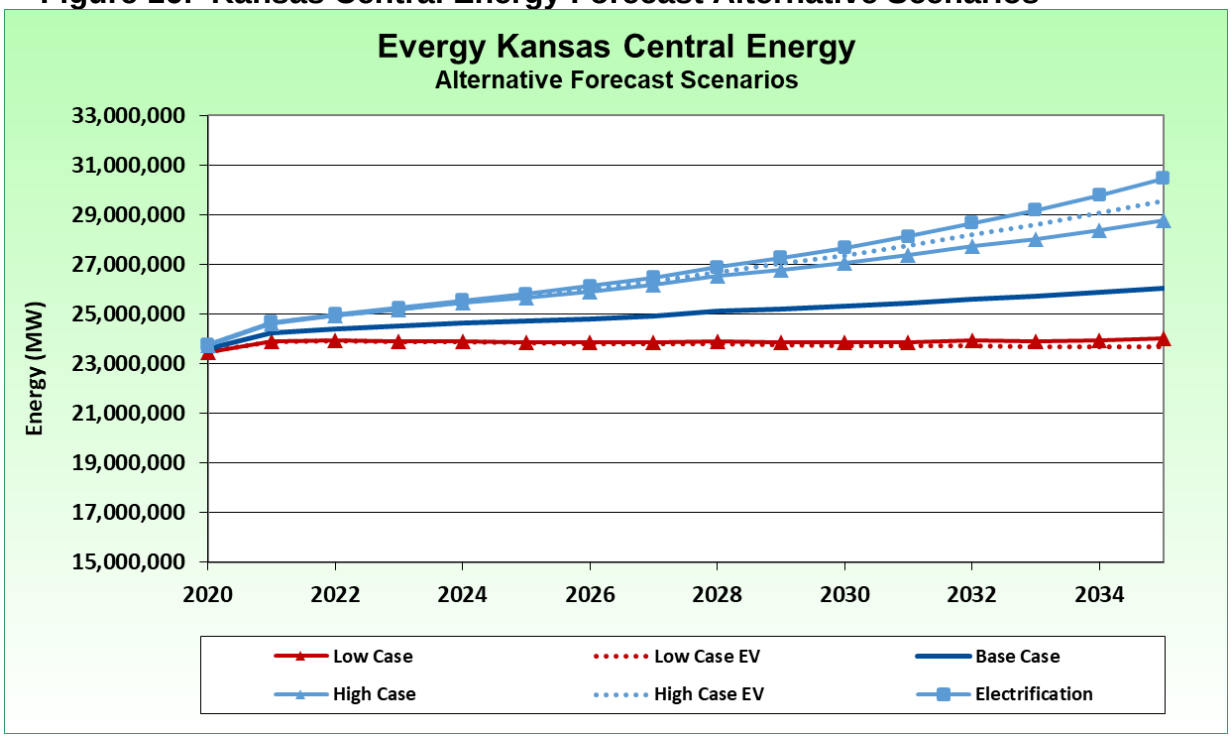


**Table 6: Kansas Central Forecast Alternative Scenarios Growth Rate Summary**

| Annual Growth Rate 2019-2035 | | |
|---|---|---|
| **Scenario** | **Energy** | **Peak Demand** |
| Low Case EV | -0.3% | -0.1% |
| Low Case | -0.2% | -0.1% |
| Base Case | 0.3% | 0.4% |
| High Case | 0.9% | 1.1% |
| High Case EV | 1.1% | 1.2% |
| High Case Electrification | 1.3% | 1.3% |

**Figure 17: Kansas Metro Peak Demand Forecast Alternative Scenarios**

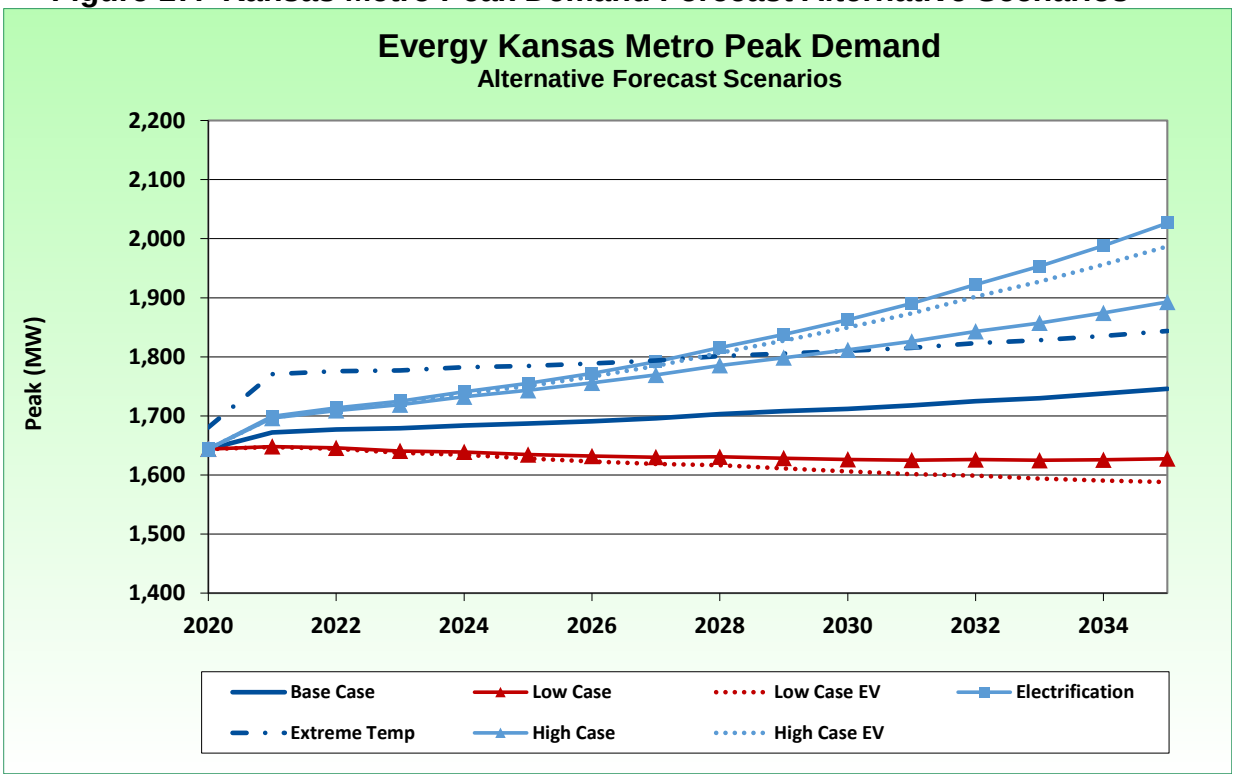


**Figure 18: Kansas Metro Energy Forecast Alternative Scenarios**

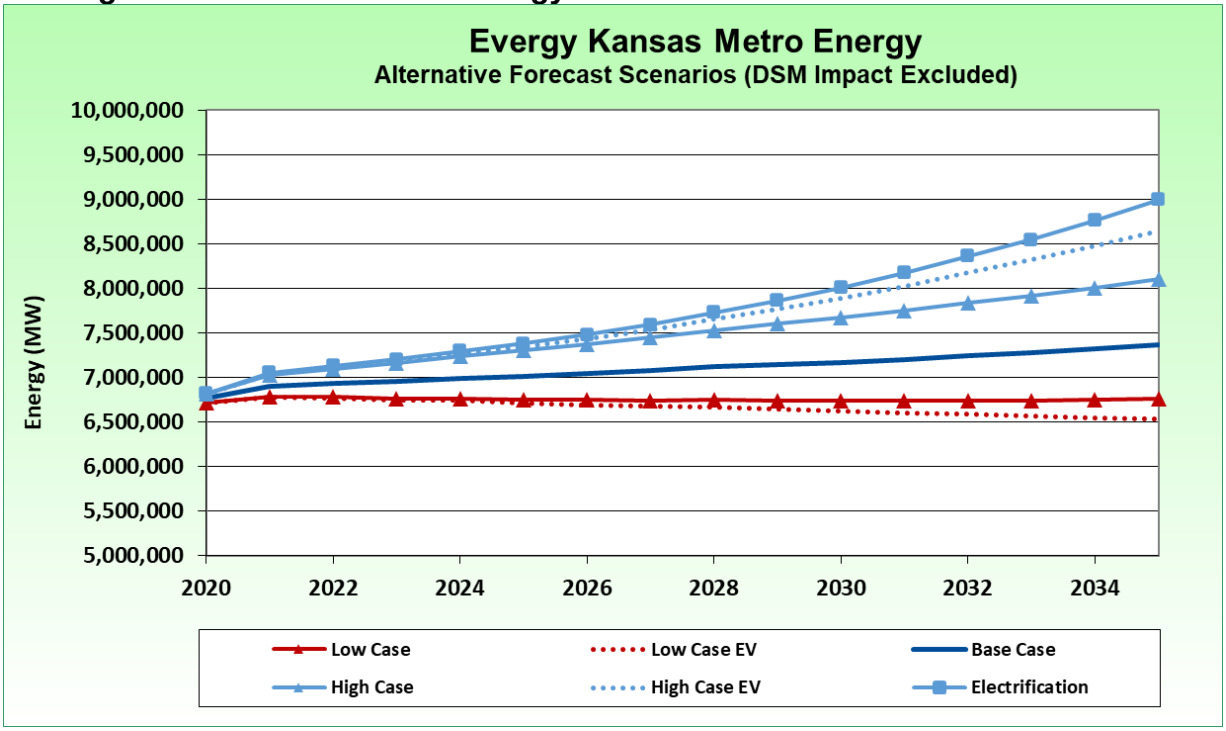



**Table 7: Kansas Metro Load Forecast Alternative Scenario Growth Rate Summary**

| Annual Growth Rate 2019-2035 | | |
|---|---|---|
| **Scenario** | **Energy** | **Peak Demand** |
| Low Case EV | -0.6% | -0.4% |
| Low Case | -0.4% | -0.3% |
| Base Case | 0.1% | 0.2% |
| High Case | 0.7% | 0.7% |
| High Case EV | 1.1% | 1.0% |
| High Case Electrification | 1.4% | 1.1% |

#### 4.2.1.3.1 Distributed Generation Scenario

The load forecast includes customer distributed generation solar photovoltaic in the base case forecast. Customer solar generation is one of the end-uses in the SAE model for both residential and commercial customers. Forecasted customer solar generation is derived by calibrating the EIA's forecast of customer solar adoption in the AEO 2020 to the Company's historical solar installation rates. This adapted customer solar forecast is included as an end-use in each service territory's base case load forecast. Additional Distributed Generation products and scenarios will be evaluated and included as it becomes pragmatic to do so.

#### 4.2.1.4 Load Forecast Sensitivity Analysis

A sensitivity analysis is performed for each of the customer revenue classes, Residential, Commercial and Industrial. For each customer class, MWh sales were regressed on important driver variables and degree days and the standardized coefficients are used to show the relative importance of each explanatory variable. The sensitivity analysis was run using the revenue class groups with monthly data available from 2000 to 2020.

Below is a brief description of the variables included in the sensitivity analysis.

- BDays = billing days
- Population = population in 1,000
- GP_Non_Man = Non-manufacturing Gross Product for the corresponding metro area(s)
- Emp_Man = Manufacturing Employment for the corresponding metro area(s)
- HDDPriceRatio = Heating Degree Days * (Natural Gas Price / Electric Price)
- PrElec = Electric Price index
- ResCusCDD65 = Residential Customer Count * Cooling Degree Days at 65 degrees
    - The formula is similar for the other iterations of this variable in each model (e.g. “HDD” = heating degree days, “com” = Commercial, etc.)
- IndCus = Industrial Customers
- CDDtrend = A trend variable capturing efficiency trend of cooling load.
- HDDtrend = A trend variable capturing saturation and efficiency trend of space heating load.
- BaseEffTrend = A trend variable capturing efficiency trend of non-HVAC load.

Any other variables are used to capture load pattern changes that do not correlate well with available data on drivers of electric usage.

Table 8 shows the results of the sensitivity analysis for Kansas Central residential. Among the driving variables, the cooling degree days' variable has the largest standardized coefficient, followed by the heating degree days variable.

**Table 8: Kansas Central Residential Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| BDays | 6,357,592 | 9.6 |
| Population | 3,239,402 | 2.0 |
| hddPriceRatio | 6,822,783 | 1.4 |
| resCusCDD65 | 78,549,823 | 37.4 |
| resCusHdd55 | 27,640,093 | 3.5 |
| CDDtrend | -8,143,699 | -3.8 |
| HDDtrend | 7,250,429 | 1.8 |
| COVID | 2,009,931 | 2.1 |
| calib | -2,539,574 | -2.1 |

Table 9 provides the results for Kansas Central commercial. The variable with the largest standardized coefficient is cooling degree days. Several economic drivers were tested and were significant, including Non-Manufacturing Gross Metro Product.

**Table 9: Kansas Central Commercial Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| GP_Non_Man | 15,619,589 | 9.6 |
| BDays | 3,718,199 | 8.7 |
| HDDpriceRatio | 4,659,998 | 1.3 |
| comCusCDD60 | 29,276,589 | 35.9 |
| comCusHdd55 | 4,673,136 | 0.9 |
| HDDtrend | 7,454,334 | 3.1 |
| BaseEffTrend | -3,495,392 | -2.3 |
| COVID | -2,700,629 | -3.7 |
| Sept18 | -2,052,985 | -5.3 |

The Kansas Central industrial model results are shown in Table 10. Electric Price has the largest standardized coefficient while, the cooling degree variable has the largest positive standardized coefficient, followed by manufacturing employment and industrial customers.

**Table 10: Kansas Central Industrial Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| Emp_Man | 1,471,037 | 4.4 |
| indCus | 1,119,161 | 5.7 |
| prElec | -2,703,036 | -15.8 |
| indCusCDD60 | 1,859,982 | 14.2 |
| May02 | 457,679 | 7.8 |

Table 11 shows the results for residential in Kansas Metro. The variables with the largest standardized coefficients are degree days followed by the hddPriceRatio.

**Table 11: Kansas Metro Residential Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| BDays | 8,232,349 | 12.4 |
| Population | 5,209,709 | 3.1 |
| hddPriceRatio | 15,019,442 | 3.5 |
| resCusCDD65 | 74,910,462 | 35.9 |
| resCusHdd55 | 13,943,633 | 2.0 |
| CDDtrend | -4,413,423 | -2.1 |
| HDDtrend | 12,155,100 | 3.3 |
| Jun18 | 2,571,833 | 4.6 |
| Aug18 | -2,192,072 | -3.9 |
| COVID | 3,146,651 | 3.6 |
| calib | -4,813,786 | -6.0 |

Table 12 shows the results for commercial in Kansas Metro. The degree day variables represented the variables with the largest coefficients, with the heating trend saturation supporting heating degree day overall impact.

**Table 12: Kansas Metro Commercial Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| GP_Non_Man | 9,988,482 | 7.2 |
| BDays | 4,620,416 | 14.2 |
| HDDpriceRatio | 5,499,419 | 1.6 |
| comCusCDD60 | 29,213,148 | 41.8 |
| comCusHdd55 | 1,648,713 | 0.3 |
| HDDtrend | 9,441,269 | 3.3 |
| BaseEffTrend | -4,504,459 | -3.3 |
| Oct08 | 904,722 | 2.5 |
| Sep18 | -1,843,585 | -5.2 |
| COVID | -3,265,215 | -5.3 |

Table 13 reports the results of the sensitivity analysis for manufacturing in Kansas Metro. The largest coefficients are from Industrial customers CDD60 and Manufacturing Employment variables.

**Table 13: Kansas Metro Industrial Sensitivity Coefficients**

| VARIABLE | Standardized Coefficient | t- Statistic |
|---|---|---|
| Emp_Man | 1,705,845 | 6.0 |
| indCus | 728,895 | 3.6 |
| prElec | -533,586 | -4.6 |
| indCusCDD60 | 2,341,933 | 19.9 |
| Sep00 | -139,633 | -2.9 |
| Dec00 | 162,640 | 3.4 |

# SECTION 5: DEMAND-SIDE RESOURCE ANALYSIS

## 5.1 CURRENT PENETRATION OF DSM

Demand Side Management (DSM) programs for Evergy (KCP&L at the time) began in earnest in 2005 in Kansas as a result of the Stipulation and Agreement in Docket No. 04-KCPE-1025-GIE (04-1025 S&A) and in Missouri, Case No. EO-2005-0329 (0329 S&A), both of which established the Comprehensive Energy Plans for the respective States. At that time, the portfolio of programs established within the Comprehensive Energy Plan in each state represented a significant commitment on the part of Evergy to promote DSM to ensure that all classes of customers had programs in which they could participate. This commitment to DSM by a Kansas or Missouri utility was unprecedented at the time of the 04-1025 S&A and the 0329 S&A. The Company remained committed to these programs even after the conclusion of the 04-1025 S&A and 0329 S&A and the original $53 million Comprehensive Energy Plan commitment in its legacy KCP&L-KS and KCP&L-MO service territories (the Kansas jurisdictional share of this amount was approximately $24 million). Concurrently, in Evergy's former Westar territory, the Company put into place efforts in demand response, financing and energy efficiency education programs during the same time period to deliver on customers desires for demand-side management. A few of those legacy Westar programs have continued to be invested in through today in support of customer's needs. While a broad-based demand-side management portfolio has not been approved in Kansas since those prior dockets, Evergy has continued with some offerings from both prior Companies as discussed below.

Evergy's current Commission-approved demand-side management programs in Kansas are comprised of financing, income-qualified, education and demand response programs.

*Financing:*

Evergy KS Central customers that participated in the American Recovery and Reinvestment Act (ARRA) funded Simple Savings program are currently finishing

out the terms of their original tariff agreement for energy efficient home upgrades at no up-front cost to them. Evergy will maintain the existing agreements through their expiration in 2027.

*Income qualified:*

For our residential customers in KS Metro, Evergy partners with Kansas Housing Resources Center who uses local community action agencies to offer income-qualified support, through our Income Eligible Weatherization program. This program provides a free energy audit along with free home weatherization upgrade measures that pass benefit-cost tests. The average investment for the home upgrades is $3,500.

*Education:*

Across all Kansas customers, Evergy offers the Home Energy Analyzer – which provides customers with specific recommendations for how they can improve their energy usage. The tool's recommendations are based on customers actual home features that they personalize themselves by inputting information about their residences.

For our KS Metro business customers, Evergy offers the Business Energy Analyzer. Similar to the residential program, this tool offers customers specific personalized recommendations for how they can improve their energy usage, based on their actual business features they input themselves.

Evergy also partners with the Midwest Energy Efficiency Alliance to offer an education class program called Building Operator Certification. This program delivers participants a nationally recognized certification with the purpose of focusing on energy efficient building operations and preventive maintenance procedures. For our businesses located in the KS Metro territory, Evergy will offset the cost of attendance by $500/person upon successful completion.

*Demand Response:*

For Evergy's Kansas Metro and Kansas Central territories, the Company maintains our partnership with existing Thermostat program customers to call demand response events. The program mitigates system annual peaks by calling thermostats to reduce peak usage during summer months. This program is in "maintenance mode" only and does not accept new participants. For existing participants who incur any issues needing maintenance, Evergy will repair and fix if possible and replace with another thermostat if not possible, free of charge.

Additionally, in Kansas Central, a large customer participates in the Energy Efficiency Demand Response Program Rider (Schedule EEDR) in which they can be called upon to reduce usage when demand reduction is needed to support grid reliability in exchange for annual payment.

*Demand Side Rates*

Evergy currently offers Time of Use (TOU) rate plan across its four service territories in both Missouri and Kansas.

Program Description – KS Metro TOU

Time of Use (TOU) rates constitute rate plans in which the energy charges vary with the time of day. The KS Metro TOU rate structure is three periods comprising of peak, off-peak, and super off-peak periods. The rate structure does not vary based on season. The peak has the highest price while the super off-peak has the lowest price. Peak periods are defined for weekdays, excluding holidays. Customers must have AMI meters to determine their peak and off-peak usage and to bill them according to the tariff plan.

Program Description – KS Central TOU

Time of Use (TOU) rates constitute rate plans in which the energy charges vary with the time of day. The KS Central TOU rate structure varies based on season. During the winter season, the rate structure is two periods comprising of peak

and off-peak periods, with peak being the highest price and off-peak being the lowest. During the summer season, the rate structure is three periods comprising of peak, intermediate-peak, and off-peak. The peak has the highest price while the off-peak has the lowest price. Peak periods are defined for weekdays, excluding holidays. Customers must have AMI meters to determine their peak and off-peak usage and to bill them according to the tariff plan.

Evergy does not have any pending applications for demand-side management programs in Kansas. As for planning, this IRP includes demand-side management impacts (energy and demand reduction) with the anticipation of potential utility provided energy efficiency and demand response programs that will provide benefits to Kansas customers. As of April 2021, no specific programs have been developed to meet those impact targets.

### 5.1.1 DSM POTENTIAL STUDY METHODOLOGY

Evergy engaged ICF Resources, LLC to conduct a Demand-Side Management (DSM) Potential Study. The DSM study encompassed the Evergy Missouri Metro and Evergy Missouri West service territories and was delivered to Evergy in October 2020 and included both a Realistic Achievable Potential (RAP) and a Maximum Achievable Potential (MAP) level of DSM, as defined in the IRP Rules of Missouri. This Potential Study was used as the basis for the scenarios evaluated in this integrated analysis.

ICF assessed five achievable potential scenarios including RAP, RAP-, RAP+, Missouri Energy Efficiency Investment Act (MEEIA), and Maximum Achievable Potential (MAP) for energy efficiency, demand response and demand-side rates. ICF modeled additional stand-alone scenarios for demand response and demand-side rates.

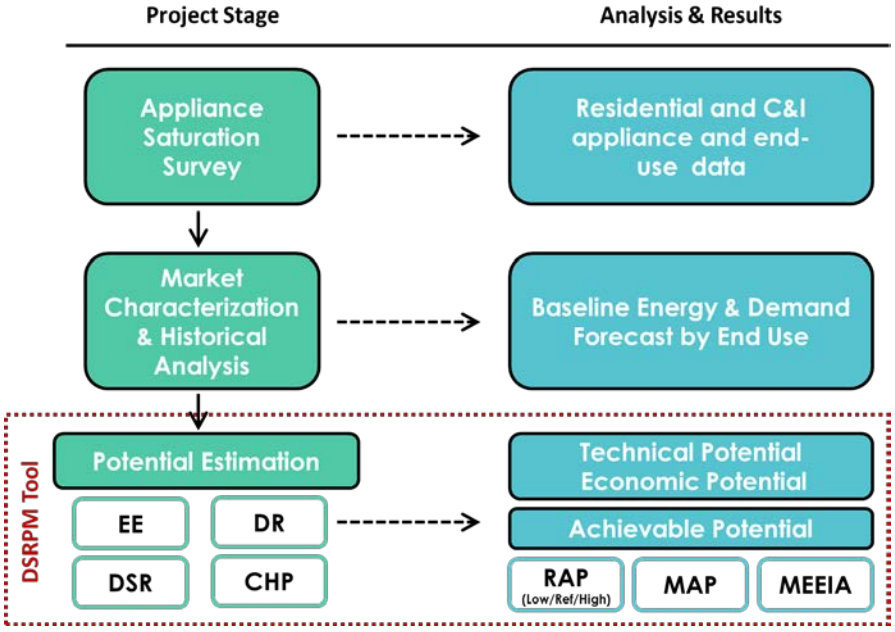
As part of the study, ICF conducted an appliance saturation analysis to collect a variety of appliance and end-use data from customers across all of Evergy's service territories in Missouri and Kansas, including residential, commercial, and industrial accounts. It included a web and mail survey of residential customers and a computer-assisted telephone interviewing (CATI) survey of business customers. The results of this analysis

were used in the market characterization and baseline electricity load analysis in the study.

#### 5.1.1.1 Analysis Overview

The analysis consisted of three stages: survey of appliance saturation, market characterization and load forecast, and potential estimation for energy efficiency, demand response, demand-side rates, and combined heat and power programs. An overview of the project flow and the corresponding outcomes at each stage is shown in Figure 19.

**Figure 19 Overall Analysis Flowchart**



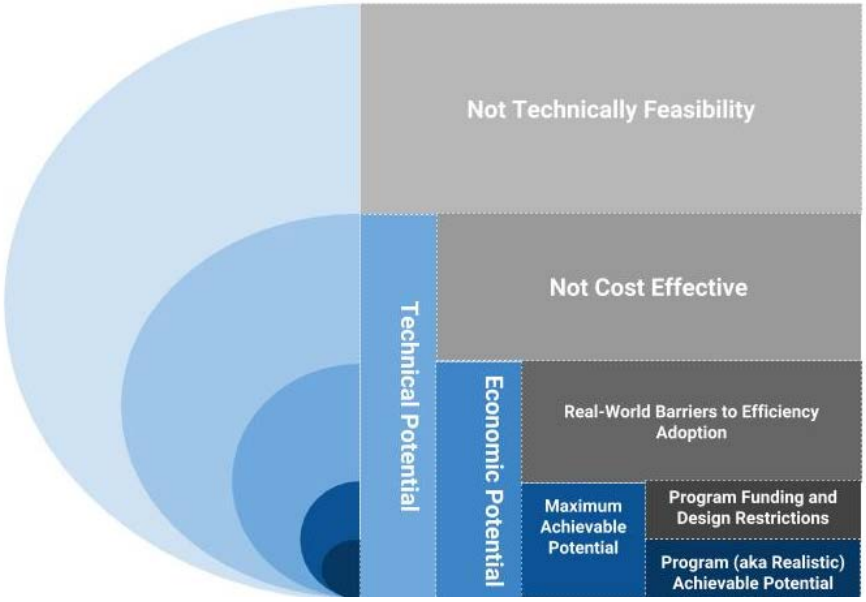

#### 5.1.1.2 Technical, Economic and Achievable Potential Definitions

Figure 20 represents the types of potentials evaluated in this study, the definitions of which directly correspond to the potentials outlined by National Action Plan for Energy Efficiency (NAPEE) in their Guide for Conducting Energy Efficiency Potential Studies. The technical potential quantifies an upper bound of how much energy and demand could be reduced, subject to the feasibility constraint such as the best that the market currently has to offer. The economic potential is also a theoretical maximum, but within the boundaries of cost-effectiveness. The

achievable potential applies various real-world barriers and constraints to the economic potential.

Five achievable potential scenarios were developed: RAP, RAP-, RAP+, Missouri Energy Efficiency Investment Act (MEEIA), and MAP. RAP is the reference case for expected levels of program performance, and RAP- and RAP+ are variants of RAP that assume lower and higher performance levels. In the MEEIA scenario, Evergy has energy savings targets of 1.9% of sales and one percent of incremental demand savings each year. MAP is the upper limit of achievable potential.

**Figure 20 Technical, Economic and Various Levels of Achievable Potential**



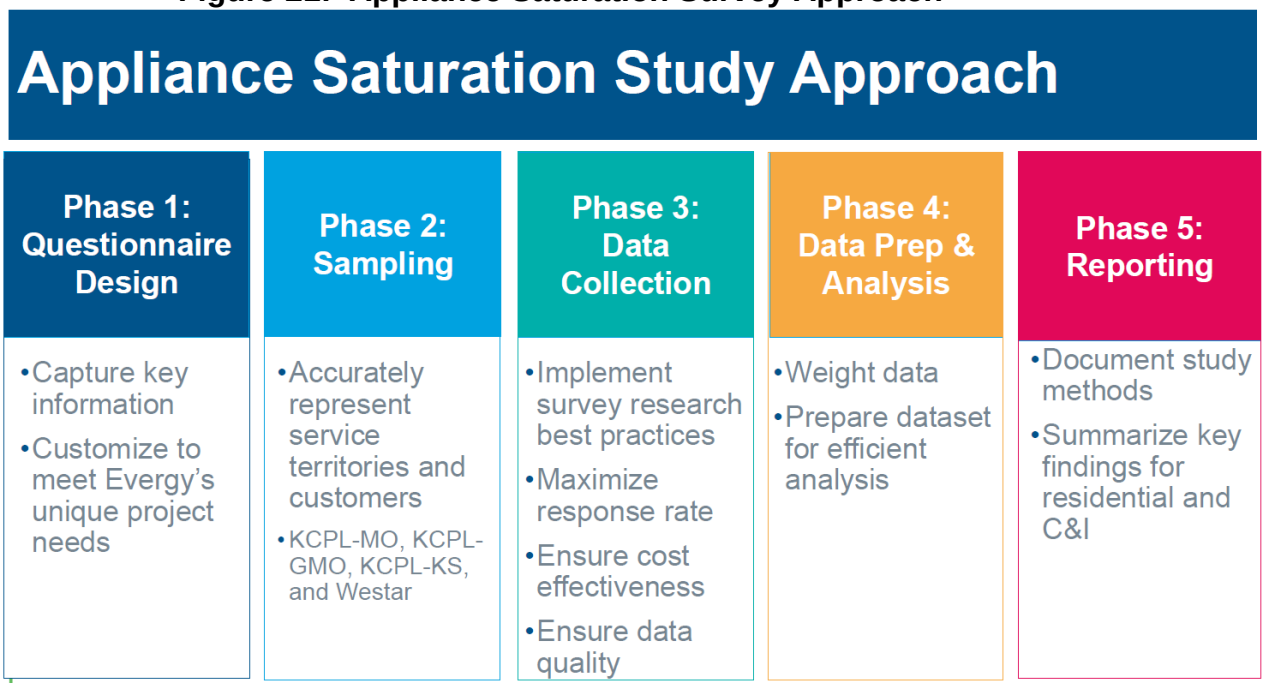

### 5.1.1.3 Appliance Saturation Analysis

The Appliance Saturation Study was designed to collect a variety of appliance and end-use data from residential, commercial and industrial customers across four Evergy service territories in Missouri and Kansas. It included a web and mail survey of residential customers and a computer-assisted telephone interviewing (CATI) survey of business customers between August and October 2019.

These parallel data collection efforts were part of a larger Demand-Side Management (DSM) Market Potential Study. The results of the Appliance Saturation Study feed into the later steps of the study, which resulted in a DSM market potential study for Evergy's Missouri territories for the residential, commercial, and industrial sectors.

The survey project included five phases, as shown in Figure 21, with tasks for the Residential and Commercial & Industrial (C&I) studies occurring concurrently.

**Figure 21: Appliance Saturation Survey Approach**




The results of Appliance Saturation Study for all four Evergy service territories in both Missouri and Kansas can be found in Appendix 5B.

#### 5.1.1.4 DSM Potential Study

The study developed a market characterization as a first step for forecasting energy use and end use intensities. The market characterization estimated sectoral energy use and the related energy end-uses.

For energy efficiency potential, ICF first calculated electricity use baselines in Evergy's Missouri service areas using primary data gathered during the study

and secondary data from the U.S. Department of Energy (DOE). Baseline analyses were performed for each sector and end use. This baseline data was combined with measure data to calculate the eligible stock, which is the market size for each efficiency measure. Technical and economic potential were then estimated. Technical potential was calculated as the savings resulting from implementing the most technically efficient measures. Economic potential was calculated as the cost-effective subset of technical potential.

The RAP scenarios are as defined in the previous section. In the MEEIA scenario, Evergy has an energy savings target of 1.9% of sales and the portfolio is optimized to check if that target can be reached. MAP is the upper limit of achievable potential, where customer incentives equal 100% of measure incremental costs.

The demand response (DR) and demand-side rate (DSR) component of this potential study assessed technical, economic, and achievable potential in the residential, commercial, and industrial sectors within Evergy's Missouri service areas. While technical and economic potential are theoretical concepts for DR and DSR, the achievable potential scenarios provide a comprehensive view of the potential that can be achieved under various assumptions.

The study framework for DR and DSR potential follows the same basic outline as energy efficiency, but the details of the methodology adopted vary significantly for DR and DSR. Appliance Saturation Analysis data was the primary source to estimate the market size for the DR programs, while AMI saturation (at 100%) determined the market size for the rates. The baseline kW usage was guided by the energy usage and simulations for various building types, and the peaks were approximated at various breakdowns— building type and end use.

Five achievable potential scenarios were developed for DR and DSR, with the additional scenario being "Stand-Alone Potential". As in the case of energy efficiency, RAP is the reference case, and RAP- and RAP+ are variants of RAP assuming lower/higher participation levels. The MEEIA scenario was modeled to

meet the target of 1% incremental demand each year, in conjunction with the energy efficiency portfolio. MAP is the upper limit of achievable potential when programs are implemented in the hierarchy assumed, while the Stand-Alone Potential aims to provide the absolute maximum potential if the programs were implemented independently and individually.

The entire DSM Potential Study can be found in Appendix 5A through Appendix 5F.

#### 5.1.1.5 Application of Missouri Study to Kansas

Based on the 2020 DSM Potential Study conducted by ICF Resources LLC for Evergy Missouri jurisdictions, Evergy developed methodologies for the estimation of DSM potentials for Kansas Metro and Kansas Central using same demand-side resources. Instead of five achievable potential scenarios developed in the potential study for Missouri jurisdictions, one scenario was developed for KS jurisdictions.

For energy efficiency potentials, RAP scenario from the 2020 DSM Potential Study was utilized as the basis. Evergy evaluated the annual system peak load of the each jurisdiction in Missouri and Kansas. A factor was then found as the ratio of Kansas Metro and Kansas Central to the total of Missouri jurisdictions respectively. The factors later were applied to the calculation of energy and demand savings of Kansas Metro and Kansas Central. Calculations of the load ratio factor for Kansas Metro and Kansas Central can be found in workpapers "PeakForecast & Load Ratio Factor.xlsx".

Considering the history of DR programs carried out in Missouri Metro and Missouri West compared to Kansas, the estimation of DR and DSR potentials for Kansas Metro and Kansas Central started with the RAP- scenarios from the 2020 DSM Potential Study with the application of the load ratio factor derived for estimating the energy efficiency potentials for Kansas Metro and Kansas Central individually. Furthermore, various adjustments were applied to certain programs to reflect the reality of the historical programs. Business Demand Response

(BDR) program was adjusted to have a five year ramp rate to achieve the full estimated savings in Kansas from the start at 50% of the savings. Smart Thermostat program potentials were developed by assuming that the programs were starting from zero participants in Kansas Metro and Kansas Central. The potentials were then calculated based on forecasted new participants which was derived from 2020 DSM Potential Study with application of their individual load ratio factor used in estimating the energy efficiency potentials to apply to Kansas Metro and Kansas Central.

Similar to DR programs, DSR program potentials were also developed from RAP-scenario from the 2020 DSM Potential Study. The load ratio factors were then utilized to calculated DSR potentials in Kansas Metro and Kansas Central. Evergy evaluated the energy solution situation in Kansas compared to Missouri and applied an additional 50% factor to DSR program potentials in Kansas jurisdictions.

Table 14, and Table 15 shows the summary of cumulative energy (MWH) savings, demand (MW) savings and program spends estimated for Kansas Metro and Kansas Central service territories.

**Table 14: Cumulative Energy and Demand Savings and Program Spend - Kansas Metro**

| Year | Energy Savings (MWH) | Demand Savings (MW) | Program Spend (000's) |
|---|---|---|---|
| **2023** | 47,590 | 31 | $ 14,899 |
| **2024** | 98,336 | 55 | $ 13,979 |
| **2025** | 140,362 | 76 | $ 15,704 |
| **2026** | 175,597 | 93 | $ 16,094 |
| **2027** | 206,260 | 109 | $ 16,806 |
| **2028** | 233,125 | 124 | $ 15,735 |
| **2029** | 256,866 | 134 | $ 15,637 |
| **2030** | 277,788 | 143 | $ 15,169 |
| **2031** | 295,171 | 150 | $ 14,976 |
| **2032** | 310,671 | 157 | $ 15,311 |
| **2033** | 319,251 | 160 | $ 15,098 |
| **2034** | 322,252 | 163 | $ 14,830 |
| **2035** | 321,518 | 164 | $ 15,145 |
| **2036** | 322,226 | 165 | $ 15,545 |
| **2037** | 326,471 | 168 | $ 16,519 |
| **2038** | 331,878 | 171 | $ 15,520 |
| **2039** | 335,446 | 173 | $ 15,809 |
| **2040** | 337,229 | 175 | $ 15,637 |
| **2041** | 340,152 | 177 | $ 15,534 |
| **2042** | 343,112 | 178 | $ 15,977 |

**Table 15: Cumulative Energy and Demand Savings and Program Spend - Kansas Central**

| Year | Energy Savings (MWH) | Demand Savings (MW) | Program Spend (000's) |
|---|---|---|---|
| **2023** | 151,347 | 98 | $ 47,405 |
| **2024** | 312,755 | 176 | $ 44,477 |
| **2025** | 446,393 | 241 | $ 50,232 |
| **2026** | 558,413 | 296 | $ 51,782 |
| **2027** | 655,887 | 347 | $ 54,104 |
| **2028** | 741,283 | 394 | $ 50,927 |
| **2029** | 816,801 | 427 | $ 50,660 |
| **2030** | 883,359 | 456 | $ 49,192 |
| **2031** | 938,663 | 479 | $ 48,512 |
| **2032** | 987,977 | 499 | $ 49,497 |
| **2033** | 1,015,273 | 511 | $ 48,738 |
| **2034** | 1,024,821 | 518 | $ 47,832 |
| **2035** | 1,022,482 | 521 | $ 48,810 |
| **2036** | 1,024,733 | 526 | $ 50,083 |
| **2037** | 1,038,236 | 534 | $ 53,184 |
| **2038** | 1,055,440 | 543 | $ 50,004 |
| **2039** | 1,066,788 | 551 | $ 50,924 |
| **2040** | 1,072,458 | 558 | $ 50,377 |
| **2041** | 1,081,759 | 562 | $ 50,051 |
| **2042** | 1,091,178 | 565 | $ 51,459 |

The entire 2020 DSM Potential Study conducted by ICF can be found in Appendices 5A-5F.

Summary of DSM potentials estimated for Kansas Metro and Kansas Central can be found in workpapers “KS DSM Potentials Summary- 2021 IRP.xlsx”. More details on estimated cumulative energy and demand savings as well as program costs for Kansas Metro and Kansas Central can also be found in workpapers “KS EE-Achievable – 2021 IRP.xlsx”, “KS DR-DSR-Achievable 2021 IRP.xlsx”, and “KS Program Costs – 2021 IRP.xlsx.

## 5.2 DISTRIBUTED GENERATION

### 5.2.1 CURRENT STATUS OF DISTRIBUTED GENERATION IN KANSAS

Evergy has seen steady growth and adoption of customer owned solar over the past 5 years in our Kansas service territories. In addition, there has been consistent growth in the number of solar companies operating in the state. In 2016 there were 596 Kansas customers generating a portion of their own power and roughly 4 installation companies supporting solar adoption. Year end 2020 the number of installations grew to over 2,000 installations with ten primary solar installation companies supporting growth and adoption.

**Figure 22: Kansas Number of Interconnections 2016 – 2020**

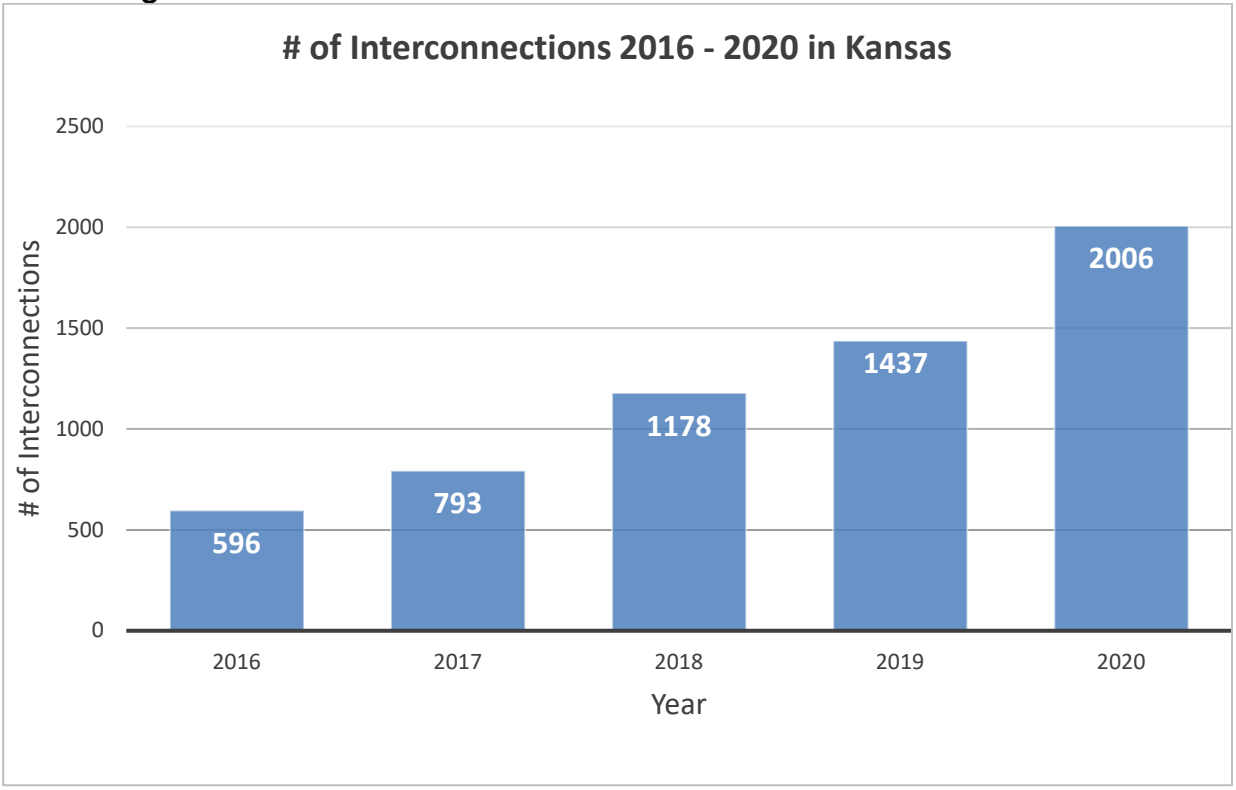



Figure 22 reflects the incremental year over year growth the state has seen over this timeframe. Solar installations have been clustered primarily in the Kansas Metro and Topeka portions of Evergy's service jurisdiction.

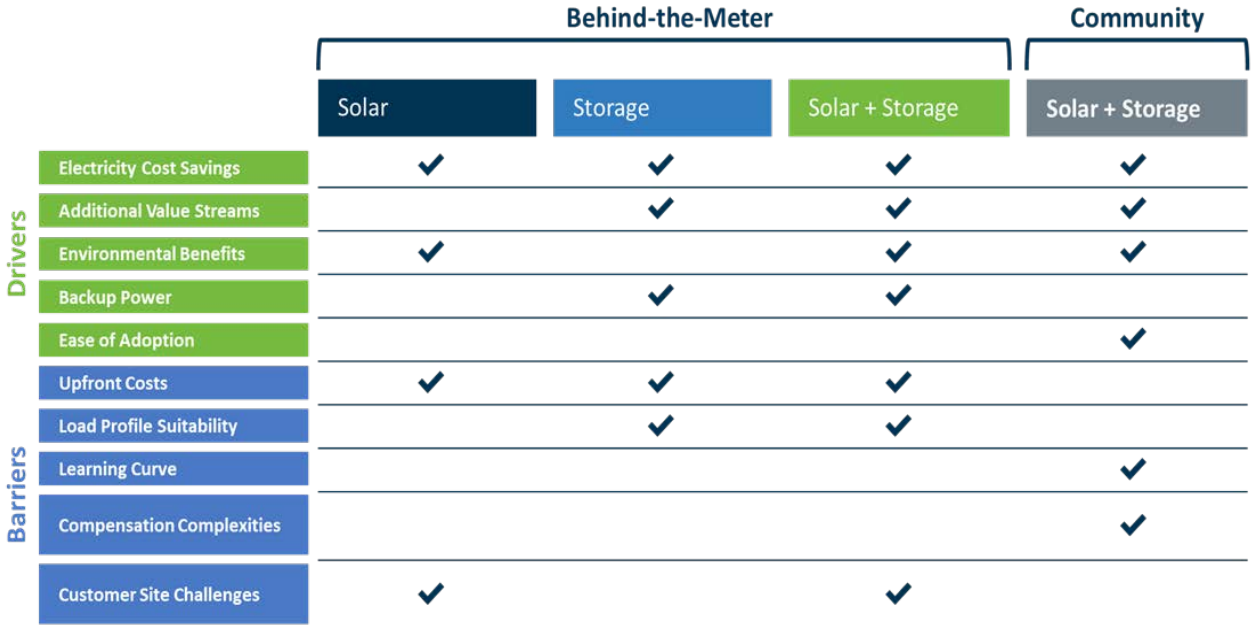
### 5.2.2 BEHIND THE METER POTENTIAL STUDY METHODOLOGY

Evergy recently conducted a Behind the Meter (BTM) Potential Study to gain insights into the adoption of Distributed Energy Resources (DER). The study provided a supplement to the Company's awareness of existing solar adoption known through the Missouri solar rebate program.

A Forecast Summary was developed to report on both the current penetration rates and future potential within Evergy's service territories and when that adoption might occur. It is divided into two parts:

- Technology Inventory: Evergy identified and analyzed the key BTM solar and storage technologies, including customer drivers and barriers, utility best practices, and forward-looking trends. Figure 23 shows the technology overview.

**Figure 23: Behind the Meter Technology Overview**



- 30-Year Forecast: Evergy conducted 30-year forecasts of three adoption Scenarios (Low, Mid, and High) for four technologies/technology combinations, each of which was performed for each of the four Evergy service territories and for three different customer classes (residential, commercial, and industrial) within them. This resulted in 144 discrete output combinations (e.g., high adoption of community solar + storage among residential customers in Kansas Metro) for each of the 30 years in question, which were then recombined in various ways to analyze the results. Figure 24 shows the approach and parameters utilized and Figure 25 shows the scenarios analyzed in this study.

**Figure 24 Behind the Meter Approach and Parameters**

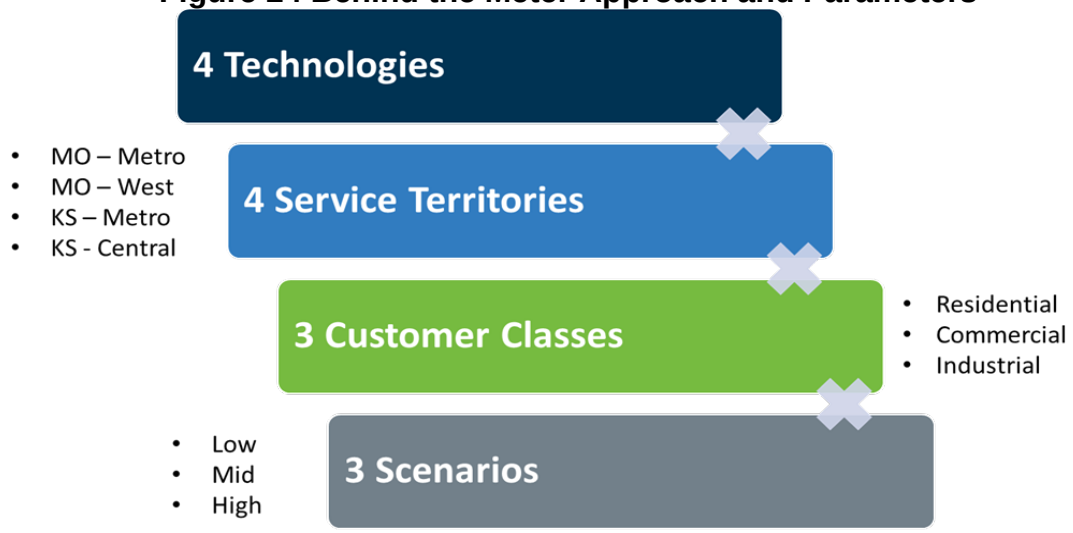


**Figure 25: Behind the Meter Scenarios Analyzed**

| | Low | Mid | High |
|---|---|---|---|
| **Adoption Curve** | *Slow* adoption curve | *Moderate* adoption curve based on similar trends nationwide | *Aggressive* adoption curve, but capped below leading markets |
| | NREL ATB 2020 *Conservative* forecast | NREL ATB 2020 *Moderate* forecast | NREL ATB 2020 *Advanced* forecast |
| **Tariffs / Rates** | EAAGS Scenario 6 (*High Load, Low Gas, No CO2 Restrictions*) | EAAGS "Expected Value" | EAAGS Scenario 15 (*Low Load, Mid Gas, with CO2 Restrictions*) |
| | *No* new or extended incentives included | *No* new or extended incentives included | *No* new or extended incentives included |

Forecast Summary

The section below summarizes the modeled outputs, summarized on a consolidated basis by service territory and then organized by each technology combinations. The forecast summaries for each Evergy jurisdiction are shown in Table 16, Table 17, Table 18, and Table 19.

**Table 16: Missouri Metro Forecast Summary (kW Capacity)**

| | | Low | | Mid | | High | |
|---|---|---|---|---|---|---|---|
| | | PV | Storage | PV | Storage | PV | Storage |
| 2025 | BTM PV | 59,690 | | 92,193 | | 107,970 | |
| | BTM Storage | | 348 | | 1,818 | | 2,720 |
| | BTM PV + Storage | - | - | 568 | 488 | 2,486 | 2,298 |
| | Adjustment for BTM Forecast Overlap | - | - | (568) | (49) | (1,451) | (287) |
| | Community Solar + Storage | 1,050 | 134 | 3,525 | 469 | 6,775 | 956 |
| | **Totals** | **60,740** | **482** | **95,718** | **2,726** | **115,780** | **5,687** |
| 2035 | BTM PV | 106,533 | | 190,555 | | 232,536 | |
| | BTM Storage | | 4,260 | | 27,898 | | 80,834 |
| | BTM PV + Storage | 3,363 | 3,316 | 15,231 | 14,684 | 25,598 | 24,555 |
| | Adjustment for BTM Forecast Overlap | (636) | (483) | (5,022) | (2,036) | (9,227) | (3,365) |
| | Community Solar + Storage | 10,570 | 3,704 | 34,625 | 12,131 | 87,200 | 30,570 |
| | **Totals** | **119,830** | **10,796** | **235,389** | **52,677** | **336,107** | **132,594** |
| 2050 | BTM PV | 155,471 | | 268,706 | | 336,936 | |
| | BTM Storage | | 6,525 | | 60,714 | | 190,476 |
| | BTM PV + Storage | 4,475 | 4,332 | 31,240 | 29,791 | 56,305 | 53,706 |
| | Adjustment for BTM Forecast Overlap | (1,362) | (606) | (12,383) | (4,027) | (22,234) | (7,263) |
| | Community Solar + Storage | 13,210 | 5,288 | 53,425 | 23,411 | 142,000 | 60,143 |
| | **Totals** | **171,795** | **15,538** | **340,988** | **109,890** | **513,007** | **297,061** |

## Table 17: Missouri West Forecast Summary (kW Capacity)

| | | Low | | Mid | | High | |
|---|---|---|---|---|---|---|---|
| | | PV | Storage | PV | Storage | PV | Storage |
| 2025 | BTM PV | 77,341 | | 100,640 | | 115,097 | |
| | BTM Storage | | 348 | | 1,776 | | 2,720 |
| | BTM PV + Storage | - | - | 600 | 515 | 1,690 | 1,487 |
| | Adjustment for BTM Forecast Overlap | - | - | (600) | (52) | (1,465) | (161) |
| | Community Solar + Storage | 1,300 | 165 | 3,725 | 484 | 7,125 | 994 |
| | **Totals** | **78,641** | **513** | **104,365** | **2,724** | **122,447** | **5,040** |
| 2035 | BTM PV | 128,291 | | 106,290 | | 261,728 | |
| | BTM Storage | | 4,074 | | 26,474 | | 78,954 |
| | BTM PV + Storage | 429 | 369 | 7,866 | 7,252 | 24,856 | 23,688 |
| | Adjustment for BTM Forecast Overlap | (429) | (37) | (4,711) | (900) | (9,948) | (3,197) |
| | Community Solar + Storage | 10,920 | 3,773 | 36,675 | 12,840 | 96,425 | 33,896 |
| | **Totals** | **139,211** | **8,179** | **146,120** | **45,666** | **373,061** | **133,341** |
| 2050 | BTM PV | 187,304 | | 172,516 | | 406,836 | |
| | BTM Storage | | 6,527 | | 61,100 | | 201,985 |
| | BTM PV + Storage | 1,402 | 1,205 | 19,864 | 17,975 | 57,812 | 54,438 |
| | Adjustment for BTM Forecast Overlap | (1,402) | (120) | (14,055) | (2,120) | (27,338) | (7,137) |
| | Community Solar + Storage | 13,770 | 5,483 | 58,175 | 25,740 | 156,825 | 66,458 |
| | **Totals** | **201,074** | **13,094** | **236,500** | **102,695** | **594,135** | **315,744** |

## Table 18: Kansas Metro Forecast Summary (kW Capacity)

| | | Low | | Mid | | High | |
|---|---|---|---|---|---|---|---|
| | | PV | Storage | PV | Storage | PV | Storage |
| 2025 | BTM PV | 14,220 | | 26,537 | | 35,856 | |
| | BTM Storage | | 332 | | 1,755 | | 2,600 |
| | BTM PV + Storage | - | - | 836 | 810 | 5,634 | 5,566 |
| | Adjustment for BTM Forecast Overlap | - | - | (251) | (113) | (999) | (814) |
| | Community Solar + Storage | 1,050 | 134 | 3,625 | 484 | 6,550 | 923 |
| | **Totals** | **15,270** | **465** | **30,747** | **2,935** | **47,041** | **8,274** |
| 2035 | BTM PV | 43,506 | | 83,537 | | 109,956 | |
| | BTM Storage | | 2,532 | | 13,681 | | 38,994 |
| | BTM PV + Storage | 214 | 184 | 19,930 | 19,635 | 57,082 | 56,488 |
| | Adjustment for BTM Forecast Overlap | (214) | (18) | (3,879) | (2,855) | (9,501) | (8,292) |
| | Community Solar + Storage | 10,480 | 3,670 | 35,625 | 12,484 | 86,500 | 30,375 |
| | **Totals** | **53,986** | **6,368** | **135,213** | **42,944** | **244,037** | **117,565** |
| 2050 | BTM PV | 101,850 | | 201,037 | | 262,706 | |
| | BTM Storage | | 4,630 | | 39,869 | | 128,726 |
| | BTM PV + Storage | 1,100 | 945 | 54,169 | 52,480 | 162,401 | 159,161 |
| | Adjustment for BTM Forecast Overlap | (1,100) | (95) | (16,213) | (7,357) | (36,940) | (22,886) |
| | Community Solar + Storage | 13,120 | 5,254 | 55,025 | 24,124 | 140,700 | 59,588 |
| | **Totals** | **114,970** | **10,735** | **294,018** | **109,116** | **528,867** | **324,589** |

**Table 19: Kansas Central Forecast Summary (kW Capacity)**

| | | Low | | Mid | | High | |
|---|---|---|---|---|---|---|---|
| | | PV | Storage | PV | Storage | PV | Storage |
| 2025 | BTM PV | 30,394 | | 43,129 | | 52,457 | |
| | BTM Storage | | - | | 3,040 | | 10,308 |
| | BTM PV + Storage | - | - | 2,145 | 2,110 | 5,786 | 5,696 |
| | Adjustment for BTM Forecast Overlap | - | - | (435) | (306) | (1,151) | (827) |
| | Community Solar + Storage | 1,030 | 131 | 3,438 | 456 | 6,663 | 939 |
| | **Totals** | **31,424** | **131** | **48,277** | **5,300** | **63,754** | **16,116** |
| 2035 | BTM PV | 77,824 | | 114,255 | | 144,606 | |
| | BTM Storage | | - | | 3,525 | | 34,397 |
| | BTM PV + Storage | 3,467 | 3,431 | 22,626 | 22,273 | 59,221 | 58,509 |
| | Adjustment for BTM Forecast Overlap | (573) | (504) | (4,517) | (3,233) | (10,473) | (8,559) |
| | Community Solar + Storage | 8,640 | 2,984 | 33,288 | 11,649 | 83,863 | 29,372 |
| | **Totals** | **89,357** | **5,912** | **165,651** | **34,214** | **277,218** | **113,719** |
| 2050 | BTM PV | 175,281 | | 254,255 | | 325,106 | |
| | BTM Storage | | - | | 5,726 | | 74,896 |
| | BTM PV + Storage | 7,001 | 6,819 | 63,075 | 61,141 | 171,016 | 167,305 |
| | Adjustment for BTM Forecast Overlap | (1,864) | (967) | (18,664) | (8,581) | (40,811) | (23,964) |
| | Community Solar + Storage | 10,860 | 4,316 | 51,488 | 22,569 | 136,763 | 57,939 |
| | **Totals** | **191,278** | **10,168** | **350,153** | **80,855** | **592,074** | **276,176** |

The 2020 BTM Solar & Storage Potential Study can be found in Appendix 5G.

# SECTION 6: SUPPLY-SIDE RESOURCES

## 6.1 SUMMARY OF EVERGY'S GENERATING RESOURCES

| Name | Location | # of Units | Year Installed | Fuel type | Evergy Missouri & Kansas Metro (MW) | Evergy Missouri West (MW) | Evergy Kansas Central (MW) | Evergy (MW) |
|---|---|---|---|---|---|---|---|---|
| Wolf Creek | Burlington, KS | 1 | 1985 | Nuclear | 554 | | 554 | 1,108 |
| Iatan Station | Iatan, MO | 2 | 1980/2010 | Coal | 974 | 284 | | 1,258 |
| La Cygne Station | LaCygne, KS | 2 | 1973/1977 | Coal | 713 | | 713 | 1,426 |
| Jeffrey Energy Center | St Mary's, KS | 3 | 1978/1980/1983 | Coal | | 175 | 2011 | 2,186 |
| Lawrence Energy Center | Lawrence, KS | 2 | 1960/1971 | Coal | | | 485 | 485 |
| Hawthorn 5 | Kansas City, MO | 1 | 2001 | Coal | 564 | | | 564 |
| Hawthorn 6&9, 7, 8 | Kansas City, MO | 4 | Various | Gas | 378 | | | 378 |
| West Gardner | Edgerton, KS | 4 | 2003 | Gas | 313 | | | 313 |
| Osawatomie | Paola, KS | 1 | 2003 | Gas | 76 | | | 76 |
| Greenwood | Greenwood, MO | 4 | 1975-1979 | Gas | | 242 | | 242 |
| Ralph Green 3 | Pleasant Hill MO | 1 | 2006 | Gas | | 69 | | 69 |
| South Harper | Peculiar, MO | 3 | 2005 | Gas | | 313 | | 313 |
| Cross Roads Station | Clarksdale, MS | 4 | 2002 | Gas | | 295 | | 295 |
| State Line | Joplin, MO | 1 | 2012 | Gas | | | 200 | 200 |
| Emporia | Emporia, KS | 7 | 2008-2009 | Gas | | | 654 | 654 |
| Spring Creek | Edmond, OK | 4 | 2001 | Gas | | | 270 | 270 |
| Lake Road Station | St Joseph, MO | 7 | 1950-1990 | Gas/Oil | | 228 | | 228 |
| Gordon Evans | Colwich, KS | 3 | 2000-2001 | Gas/Oil | | | 292 | 292 |
| Hutchison | Hutchison, KS | 4 | 1974-1975 | Gas/Oil | | | 216 | 216 |
| Nevada | Nevada, MO | 1 | 1974 | Oil | | 18 | | 18 |
| Northeast Station | Kansas City, MO | 9 | 1972-1985 | Oil | 380 | | | 380 |
| CNPPID Hydro^ | Holdrege, NB | n/a | 2014 | Hydro | 64 | | | 64 |
| St Joseph Landfill Gas* | St Joseph, MO | n/a | 2012 | LFG | | 1.6 | | 1.6 |
| Rolling Meadows Landfill Gas*^ | Topeka, KS | n/a | 2010 | LFG | | 5.6 | | 5.6 |
| Greenwood Solar* | Greenwood, MO | n/a | 2016 | Solar | | 3 | | 3 |
| Hutchison Solar* | Hutchison, KS | n/a | 2016 | Solar | | | 1.2 | 1.2 |
| Spearville 1&2* | Spearville, KS | n/a | 2006/2010 | Wind | 148.5 | | | 148.5 |
| Flat Ridge* | Nashville, KS | n/a | 2009 | Wind | | | 50 | 50 |
| Central Plains* | Marienthal, KS | n/a | 2009 | Wind | | | 99 | 99 |
| Western Plains* | Spearville, KS | n/a | 2017 | Wind | | | 280 | 280 |
| Cimarron II*^ | Cimarron, KS | n/a | 2012 | Wind | 131 | | | 131 |
| Spearville 3*^ | Spearville, KS | n/a | 2012 | Wind | 100.8 | | | 100.8 |
| Waverly*^ | Waverly, KS | n/a | 2016 | Wind | 200 | | | 200 |
| Slate Creek*^ | Geuda Springs, KS | n/a | 2015 | Wind | 150 | | | 150 |
| Rock Creek*^ | Atchison County, MO | n/a | 2017 | Wind | 180 | 120 | | 300 |
| Osborn*^ | DeKalb County, MO | n/a | 2016 | Wind | 120 | 80 | | 200 |
| Pratt Wind*^ | Pratt, KS | n/a | 2018 | Wind | 110 | 134 | | 244 |
| Prairie Queen*^ | Moran, KS | n/a | 2019 | Wind | 90 | 110 | | 200 |
| Gray County*^ | Gray County, KS | n/a | 2001 | Wind | | 110 | | 110 |
| Ensign*^ | Ensign, KS | n/a | 2012 | Wind | | 99 | | 99 |
| Flat Ridge*^ | Zenda, KS | n/a | 2009 | Wind | | | 50 | 50 |
| Cedar Bluff*^ | Brownell, KS | n/a | 2015 | Wind | | | 199 | 199 |
| Ironwood*^ | Spearville, KS | n/a | 2012 | Wind | | | 168 | 168 |
| Kay Wind*^ | Newkirk, OK | n/a | 2016 | Wind | | | 200 | 200 |
| Meridian Way*^ | Concordia. KS | n/a | 2008 | Wind | | | 96 | 96 |
| Post Rock*^ | Ellsworth, KS | n/a | 2012 | Wind | | | 201 | 201 |
| Ninnescah*^ | Pratt, KS | n/a | 2016 | Wind | | | 208 | 208 |
| Kingman I*^ | Cunningham, KS | n/a | 2016 | Wind | | | 37 | 37 |
| Kingman II*^ | Cunningham, KS | n/a | 2016 | Wind | | | 103 | 103 |
| Soldier Creek*^ | Nemaha County, KS | n/a | 2020 | Wind | | | 300 | 300 |
| Ponderosa*^ | Beaver County, OK | n/a | 2020 | Wind | 100 | | 78 | 178 |
| Cimarron Bend III*^ | Clark County, KS | n/a | 2020 | Wind | | 130 | 20 | 150 |
| Total - Nuclear | | | | | | | | 1,108 |
| Total - Coal | | | | | | | | 5,919 |
| Total - Gas/Oil | | | | | | | | 3,944 |
| Total - Wind/Solar/Hydro\LFG | | | | | | | | 4,278 |
| **Grand Total** | | | | | | | | 15,249 |

* Nameplate
^ PPA

No retirements were included between 2020 and 2039 in the 2020 IRP Annual Update for Evergy Kansas Central or Metro. However, each unit currently has a retirement date used to set its depreciable (book) life which is used in the 2021 IRP modeling and is illustrated in Figure 26 provided in Section 7.3 below. The current capital expenditure budget for Evergy's generating resources is included in Kansas Corporation Commission Docket No. 19-KCPE-096-CPL.

## 6.2 TRANSMISSION COMMITMENTS

Evergy is a member of the Southwest Power Pool (SPP) regional transmission organization and, as such, SPP is responsible for expansion planning, generation interconnection, and transmission service on Evergy's transmission system. Evergy participates in the various SPP planning processes, providing valuable feedback on our local system and suggesting solution for identified needs.

### 6.2.1 REGIONAL TRANSMISSION ORGANIZATION EXPANSION PLANNING PROCESS

SPP's Integrated Transmission Planning Process (ITP) is an annual planning cycle that assesses near- and long-term economic and reliability transmission needs. The ITP produces a ten-year transmission expansion plan each year, combining near-term, ten-year, and North American Electric Reliability Corporation transmission planning (TPL-001-4) compliance assessments into one study. A 20-year assessment is performed once every five years unless otherwise directed by the SPP Board of Directors. The ITP process seeks to target a reasonable balance between long-term transmission investments and congestion costs to customers.

The 2020 SPP Integrated Transmission Planning looks ahead 10 years to ensure the SPP region could deliver energy reliably and economically, facilitate public policy objectives, seek solutions with neighboring regions and maximize benefits to end-use customers. Three distinct scenarios were considered to account for variations in system conditions over ten years. These scenarios considered requirements to support firm deliverability of capacity for reliability while exploring rapidly evolving technology that may influence the transmission system and energy industry. The scenarios included

varied wind projections, utility-scale and distributed solar, energy storage resources, generation retirements and electric vehicles. Ultimately, the analysis resulted in the approval of a portfolio of 54 transmission projects across the SPP region at a cost of approximately $532 million.

### 6.2.2 CURRENT ITP PORTFOLIO

The 2020 SPP Integrated Transmission Planning Assessment report is described in Section 6.2.1 above. The four projects identified in the EKC area are listed in Table 20: RTO-Directed Transmission Projects from 2020 ITP.

**Table 20: RTO-Directed Transmission Projects from 2020 ITP**

| Transmission Project | Cost Estimate | Need Date |
|---|---|---|
| Circleville-Goff 115kV Ckt 1 Rebuild | $12,114,772 | 6/1/2025 |
| Goff-Kelly 115kV Ckt 1 Rebuild | $7,108,395 | 6/1/2025 |
| Meadowlark-Tower 33 115kV Ckt 1 Rebuild | $1,342,588 | 6/1/2023 |

The 2021 SPP Transmission Expansion Plan (STEP) Report and Project List summarize 2020 activities that impact future development of the SPP transmission grid. Six distinct areas of transmission planning are discussed in this report: Transmission Services, Generation Interconnection, Integrated Transmission Planning, High Priority Studies, Sponsored Upgrades, and Interregional Coordination.

The following SPP regional transmission planning reports are provided as attachments to this report.

Appendix 7A: 2020 SPP Integrated Transmission Planning Assessment Report

Appendix 7B: 2021 SPP Transmission Expansion Plan Report

Appendix 7C: 2021 SPP Transmission Expansion Plan Report

## 6.3 DISTRIBUTION REQUIREMENTS

The various Evergy planning groups (Supply, Transmission, and Distribution) assimilate a broad set of engineering inputs to determine how the company will invest in improving the respective systems to meet ongoing load growth, system reliability, operational efficiency and asset optimization needs. The Distribution Planning group analyzes data, identifies patterns, develops electrical models representative of the Evergy distribution system, and performs studies to understand and prioritize system improvement needs.

The Distribution Planning group is tasked with elevating the highest priority and highest-risk projects to a point where investments are made earlier than those with lower priorities and risk profiles. Many years of constant review have provided the group with a robust set of criteria within which these problems are evaluated, and process improvements continue to be made to further analyze how to build out the distribution system to assure cost-effectiveness.

Furthermore, the Long-Term Planning component handled by Distribution Planning assures strategic long-term investments are made. Solutions are selected based upon how well they fit into an area-plan and not just the cost-effectiveness for the immediate need. Between the robust planning criteria and the strategic long-term vision, Distribution Planning will continue to construct the distribution system capable of serving tomorrow's needs by making appropriate investments when they are needed.

It is the goal of Distribution Planning to assure that every investment optimizes capital spend and balances risk, meets current and future needs, and is built strategically when and where they are needed. Many tools and a great deal of information is processed and analyzed to develop these strategic plans.

### 6.3.1 ANNUAL SCOPE OF WORK

Throughout each year, Distribution Planning prepares several system studies to determine weaknesses or risks to reliability and to assess the overall adequacy of our distribution system. Much of the work focuses on increasing reliability and prioritizing work based upon cost, scope, impact, and effectiveness. This work is centered around five (5) specific areas: capacity, contingency, voltage, condition and compliance. The table below illustrates the various deliverables associated with each focus area:

**Table 21: Distribution Planning - Annual Scope of Work**

| Category | Study Name | Deliverable |
|---|---|---|
| **Capacity** | Load Preservation, 5-Year System Expansion-Load, Peak Load Study, 15-Year Forecast, Circuit Rating Study | Black Start Plan, Budgetary Recommendations, Distribution Load Book, Forecasted Substation Loads, Circuit Rating utilized for Operational Guidance |
| **Contingency** | 5-Year System Expansion-Contingency, N-1 Contingency, N-1 Transformer Contingency, Fault Location Isolation Service Restoration (FLISR) | Budgetary Recommendations, Circuit Contingency Plan, Transformer Contingency Plan, Grid Modernization |
| **Voltage & Losses** | Phase Balancing, Voltage Drop, System Efficiency Studies, Capacitor, Voltage Regulation | Load-Swap Recommendations, Voltage Management Schemes, System Loss Studies, Capacitor Installations, Substation Tap Settings |
| **Condition** | Worst Performing Circuits, Circuit Review, Short Circuit, Other Reviews | Budgetary Recommendations, Grid Modernization, Customer-Required Special Studies |
| **Compliance** | MO/KS Load Split, EIA 861 Annual Circuit Count | Non-metered Power flow Across State lines, Circuit Count for Voltages 35 kV & below |

# SECTION 7: INTEGRATED RESOURCE ANALYSIS

## 7.1 CANDIDATE SUPPLY-SIDE RESOURCE OPTIONS

Each of the supply-side resource options identified were ranked in terms of a 'utility cost' estimate and a 'utility cost plus probable environmental cost' estimate. Cost estimates are expressed in dollars per megawatt-hour, and comprised of fixed O&M, variable O&M, fuel cost, and a levelized carrying cost applied to the capital costs incurred for the technology installation.

### 7.1.1 DESCRIPTION OF RANKING SUPPLY-SIDE TECHNOLOGIES

The development of the costs for each of the potential new supply-side resource options were calculated utilizing 2020 EIA AEO data as well as assumptions and financials developed by Evergy. Rankings were developed for these technologies for both the 'utility cost' and the 'utility plus probable environmental cost'. The difference between the two rankings is driven primarily by the potential of $CO_2$ emissions cost anticipated to commence in 2026. The LCOE rankings of the supply-side resource options are shown below in Table 22. LCOE rankings including probable environmental costs are shown in Table 23 below. Additionally, Table 24, Table 25, and Table 26 provide cost of electricity based upon capacity factor.

**Table 22: Supply Side Candidates Ranking by Levelized Cost of Electricity**

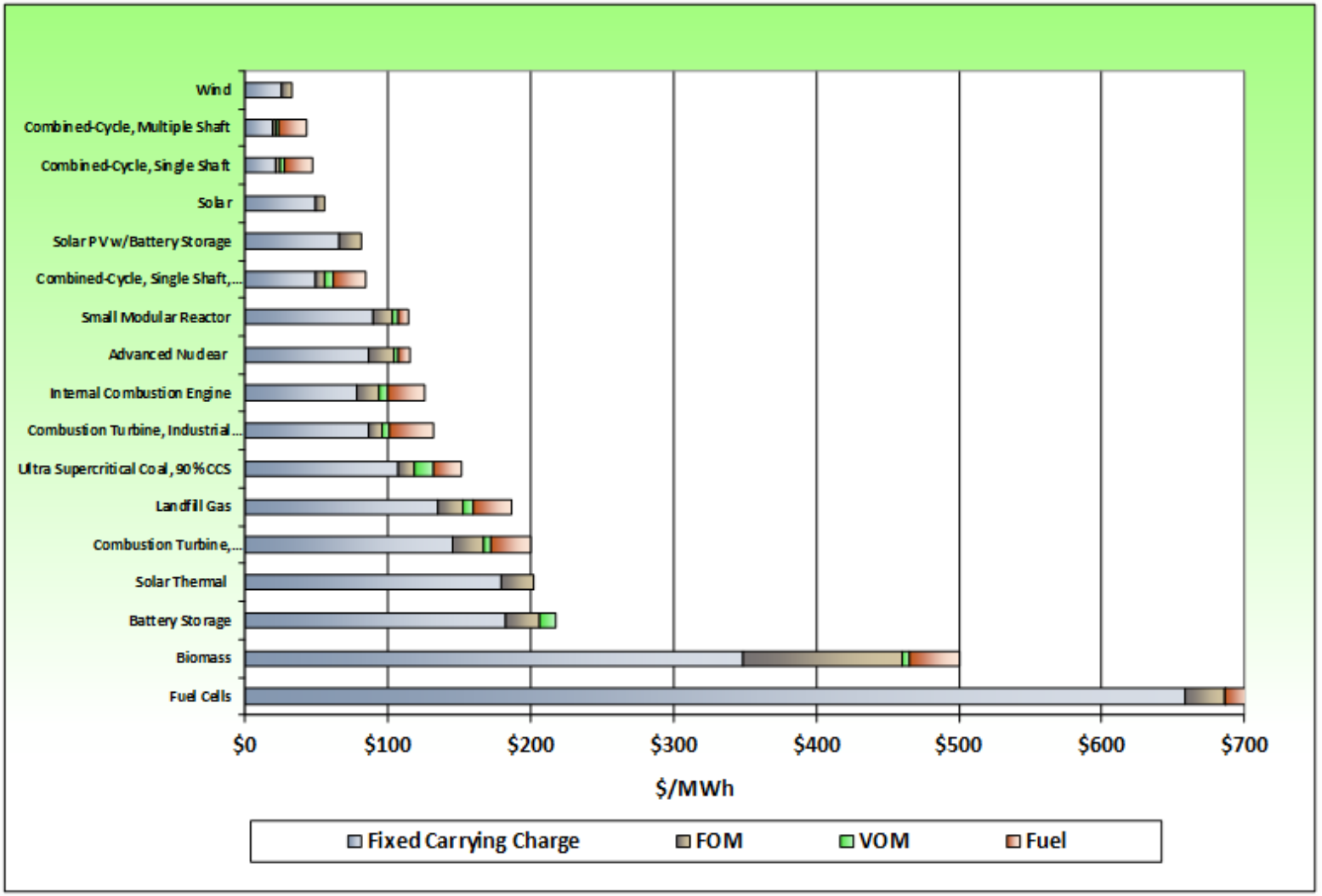


**Table 23: Supply Side Candidates Ranking by Levelized Cost of Electricity including Environmental Cost**

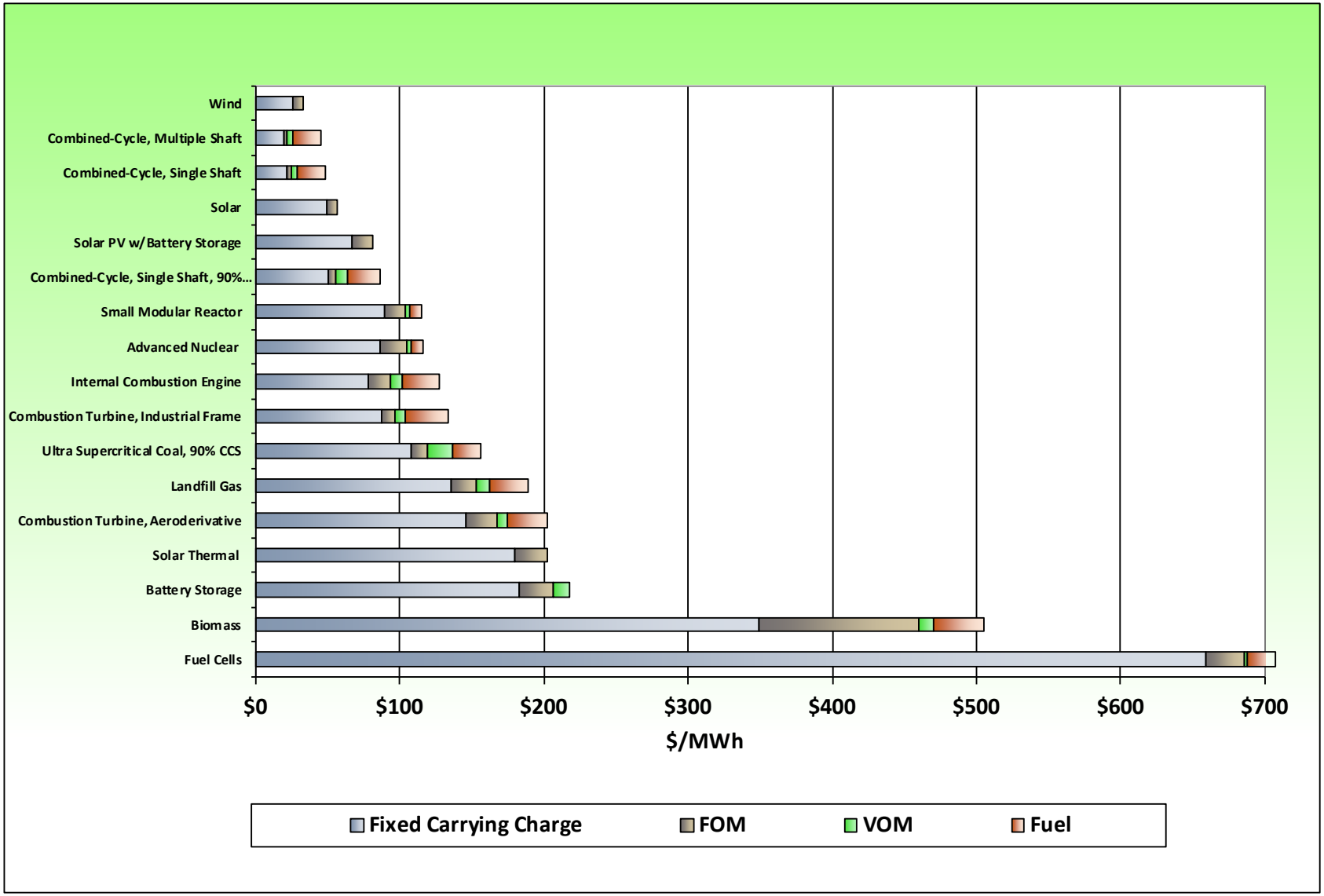


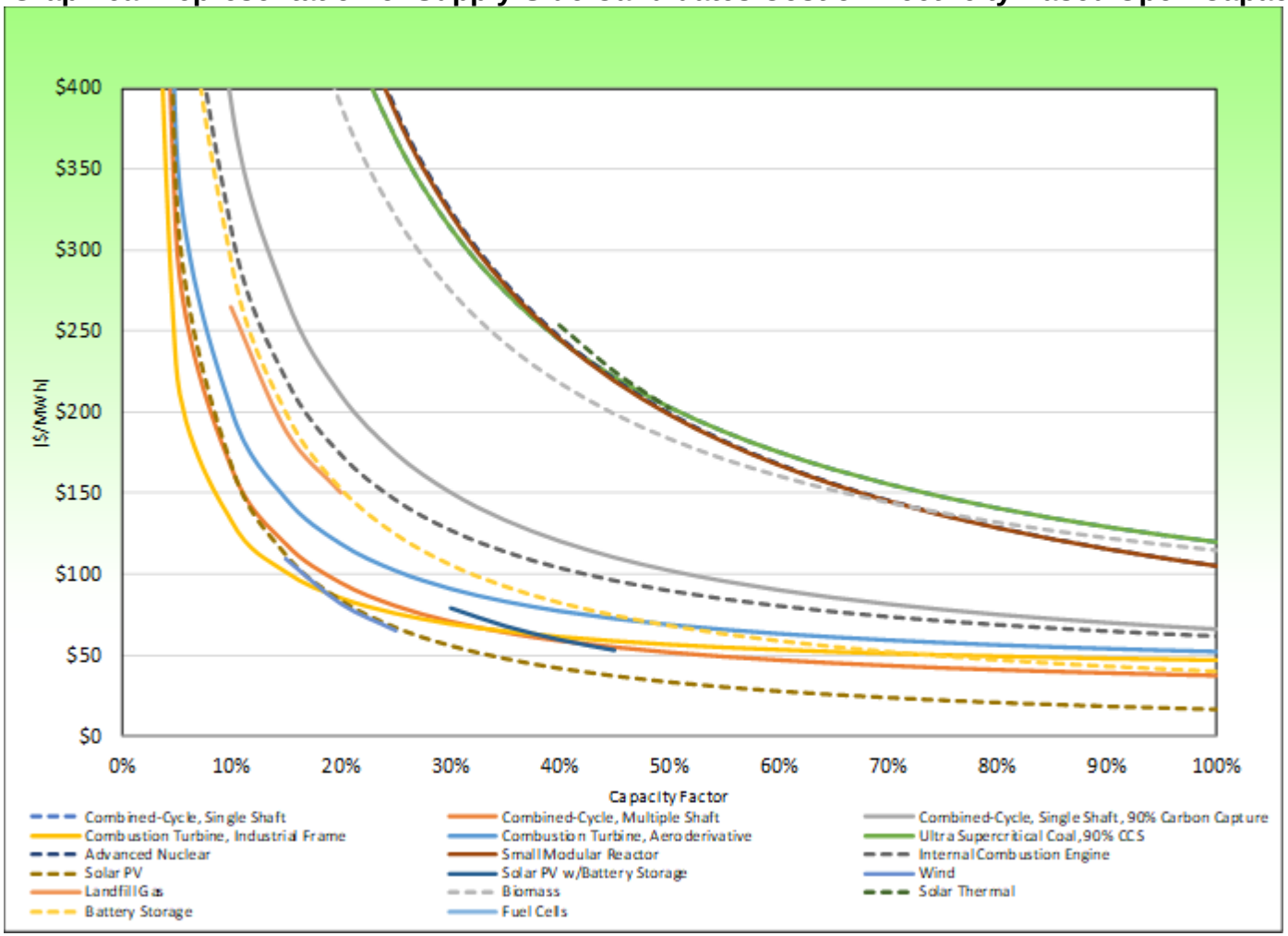
**Table 24: Supply-Side Candidates Cost of Electricity Based Upon Capacity Factor**

| Technology | 1% | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% |
|---|---|---|---|---|---|---|---|---|---|---|
| Combined-Cycle, Single Shaft | $ 1,629 | $ 345 | $ 185 | $ 131 | $ 104 | $ 88 | $ 78 | $ 70 | $ 64 | $ 60 |
| Combined-Cycle, Multiple Shaft | $ 1,460 | $ 310 | $ 167 | $ 119 | $ 95 | $ 81 | $ 71 | $ 64 | $ 59 | $ 55 |
| Combined-Cycle, Single Shaft, 90% Carbon Capture | $ 3,658 | $ 756 | $ 393 | $ 272 | $ 212 | $ 175 | $ 151 | $ 134 | $ 121 | $ 111 |
| Combustion Turbine, Industrial Frame | $ 1,000 | $ 230 | $ 134 | $ 102 | $ 86 | $ 76 | $ 70 | $ 65 | $ 62 | $ 59 |
| Combustion Turbine, Aeroderivative | $ 1,706 | $ 370 | $ 203 | $ 147 | $ 119 | $ 102 | $ 91 | $ 83 | $ 77 | $ 73 |
| Ultra Supercritical Coal, 90% CCS | $ 8,370 | $ 1,704 | $ 870 | $ 593 | $ 454 | $ 370 | $ 315 | $ 275 | $ 245 | $ 222 |
| Advanced Nuclear | $ 9,441 | $ 1,897 | $ 954 | $ 640 | $ 483 | $ 388 | $ 325 | $ 281 | $ 247 | $ 221 |
| Small Modular Reactor | $ 9,356 | $ 1,880 | $ 946 | $ 634 | $ 479 | $ 385 | $ 323 | $ 278 | $ 245 | $ 219 |
| Internal Combustion Engine | $ 2,845 | $ 596 | $ 315 | $ 221 | $ 175 | $ 146 | $ 128 | $ 114 | $ 104 | $ 96 |
| Solar PV | $ 1,688 | $ 338 | $ 169 | $ 113 | $ 84 | $ 68 | $ 56 | $ 48 | $ 42 | $ 38 |
| Solar PV w/Battery Storage | $ 2,375 | $ 475 | $ 237 | $ 158 | $ 119 | $ 95 | $ 79 | $ 68 | $ 59 | $ 53 |
| Solar Thermal | $ 10,135 | $ 2,027 | $ 1,013 | $ 676 | $ 507 | $ 405 | $ 338 | $ 290 | $ 253 | $ 225 |
| Wind | $ 1,641 | $ 328 | $ 164 | $ 109 | $ 82 | $ 66 | $ 55 | $ 47 | $ 41 | $ 36 |
| Landfill Gas | $ 2,334 | $ 495 | $ 265 | $ 188 | $ 150 | $ 127 | $ 112 | $ 101 | $ 93 | $ 86 |
| Biomass | $ 6,943 | $ 1,425 | $ 735 | $ 505 | $ 390 | $ 321 | $ 275 | $ 243 | $ 218 | $ 199 |
| Battery Storage | $ 2,840 | $ 577 | $ 294 | $ 200 | $ 153 | $ 125 | $ 106 | $ 92 | $ 82 | $ 74 |
| Fuel Cells | $ 10,309 | $ 2,079 | $ 1,050 | $ 708 | $ 536 | $ 433 | $ 365 | $ 316 | $ 279 | $ 251 |

**Table 25: Supply-Side Candidates Cost of Electricity Based Upon Capacity Factor (continued)**

| Technology | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% | 90% | 95% | 100% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Combined-Cycle, Single Shaft | $ 56 | $ 53 | $ 51 | $ 49 | $ 47 | $ 46 | $ 44 | $ 43 | $ 42 | $ 41 | $ 40 |
| Combined-Cycle, Multiple Shaft | $ 52 | $ 49 | $ 47 | $ 45 | $ 44 | $ 42 | $ 41 | $ 40 | $ 39 | $ 38 | $ 37 |
| Combined-Cycle, Single Shaft, 90% Carbon Capture | $ 103 | $ 96 | $ 91 | $ 86 | $ 82 | $ 79 | $ 76 | $ 73 | $ 71 | $ 68 | $ 67 |
| Combustion Turbine, Industrial Frame | $ 57 | $ 55 | $ 54 | $ 53 | $ 52 | $ 51 | $ 50 | $ 49 | $ 48 | $ 48 | $ 47 |
| Combustion Turbine, Aeroderivative | $ 69 | $ 66 | $ 63 | $ 61 | $ 59 | $ 58 | $ 56 | $ 55 | $ 54 | $ 53 | $ 52 |
| Ultra Supercritical Coal, 90% CCS | $ 204 | $ 189 | $ 176 | $ 165 | $ 156 | $ 148 | $ 141 | $ 135 | $ 130 | $ 125 | $ 120 |
| Advanced Nuclear | $ 200 | $ 183 | $ 168 | $ 156 | $ 146 | $ 137 | $ 129 | $ 122 | $ 116 | $ 110 | $ 105 |
| Small Modular Reactor | $ 198 | $ 181 | $ 167 | $ 155 | $ 145 | $ 136 | $ 128 | $ 121 | $ 115 | $ 110 | $ 105 |
| Internal Combustion Engine | $ 90 | $ 85 | $ 81 | $ 77 | $ 74 | $ 71 | $ 69 | $ 67 | $ 65 | $ 64 | $ 62 |
| Solar PV | $ 34 | $ 31 | $ 28 | $ 26 | $ 24 | $ 23 | $ 21 | $ 20 | $ 19 | $ 18 | $ 17 |
| Solar PV w/Battery Storage | $ 47 | $ 43 | $ 40 | $ 37 | $ 34 | $ 32 | $ 30 | $ 28 | $ 26 | $ 25 | $ 24 |
| Solar Thermal | $ 203 | $ 184 | $ 169 | $ 156 | $ 145 | $ 135 | $ 127 | $ 119 | $ 113 | $ 107 | $ 101 |
| Wind | $ 33 | $ 30 | $ 27 | $ 25 | $ 23 | $ 22 | $ 21 | $ 19 | $ 18 | $ 17 | $ 16 |
| Landfill Gas | $ 81 | $ 77 | $ 74 | $ 71 | $ 68 | $ 66 | $ 64 | $ 62 | $ 61 | $ 59 | $ 58 |
| Biomass | $ 183 | $ 171 | $ 161 | $ 152 | $ 144 | $ 138 | $ 132 | $ 127 | $ 122 | $ 118 | $ 115 |
| Battery Storage | $ 68 | $ 63 | $ 59 | $ 55 | $ 52 | $ 49 | $ 47 | $ 45 | $ 43 | $ 41 | $ 40 |
| Fuel Cells | $ 228 | $ 209 | $ 193 | $ 180 | $ 169 | $ 159 | $ 151 | $ 143 | $ 136 | $ 130 | $ 125 |

**Table 26: Graphical Representation of Supply-Side Candidates Cost of Electricity Based Upon Capacity Factor**



### 7.1.2 SELECTED TECHNOLOGIES FOR EVALUATION

Based on the estimated capacity required over the planning period the supply-side technologies passed on to the integrated resource analysis as candidate resource options are listed in Table 27 below. Cost and operating data for the technologies that moved on to the integrated resource analysis came from the 2020 U.S. Energy Information Administration Annual Energy Outlook and responses from the April 2020 Request for Proposals (RFP).

**Table 27: Candidate Resource Options**

| Generation Category | Technology |
|---|---|
| Combined Cycle | Combined-Cycle, Single Shaft |
| Combustion Turbine | Combustion Turbine, Industrial Frame |
| Renewables | Solar PV |
| | Wind |
| Other | Battery Storage |

## 7.2 ALTERNATIVE RESOURCE PLAN METHODOLOGY

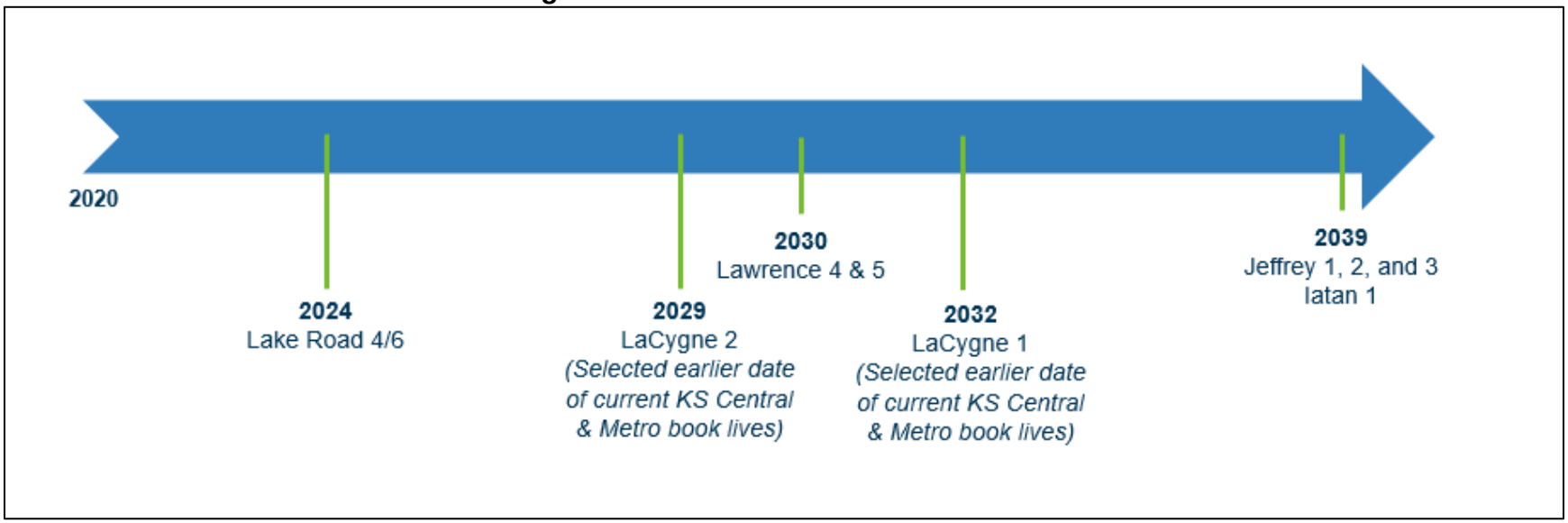
Alternative Resource Plans were developed using a combination of various supply-side resources, demand-side resources, and resource addition and retirement timings in order to meet forecasted peak load and reserve margin requirements. Each resource plan includes relevant capital, O&M, and operational parameters for the demand- and supply-side resources assumed.

## 7.3 ALTERNATIVE RESOURCE PLANS MODELED

Alternative Resource Plans for Evergy, Evergy Metro, and Evergy Kansas Central were modeled and analyzed with respect to net present value revenue requirement (NPVRR).

Alternative Resource Plans (ARP) EAAGA and EAAGS represents the initial Evergy ARPs that assumes the generating units modeled are retired at the current book life - Lake Road 4/6: Dec 31, 2024, LaCygne-2: Oct 1, 2029, Lawrence 4&5: Dec 31, 2030, LaCygne-1: Dec 31, 2032, Jeffrey 1, 2 & 3: Dec 31, 2039, and Iatan-1: Dec 31, 2039. See Figure 26 below illustrating coal units and one natural gas unit with respect to book life retirement dates.

**Figure 26: Book Life Retirement Dates**




Note: Retirement dates included in rates for Hawthorn 5 and Iatan 2 are 2055 and 2070, respectively. Lake Road 4/6 retirement date based upon the 2020 Evergy Missouri IRP Preferred Plan.

## 7.4 ALTERNATIVE RESOURCE PLANS EVALUATED – EVERGY

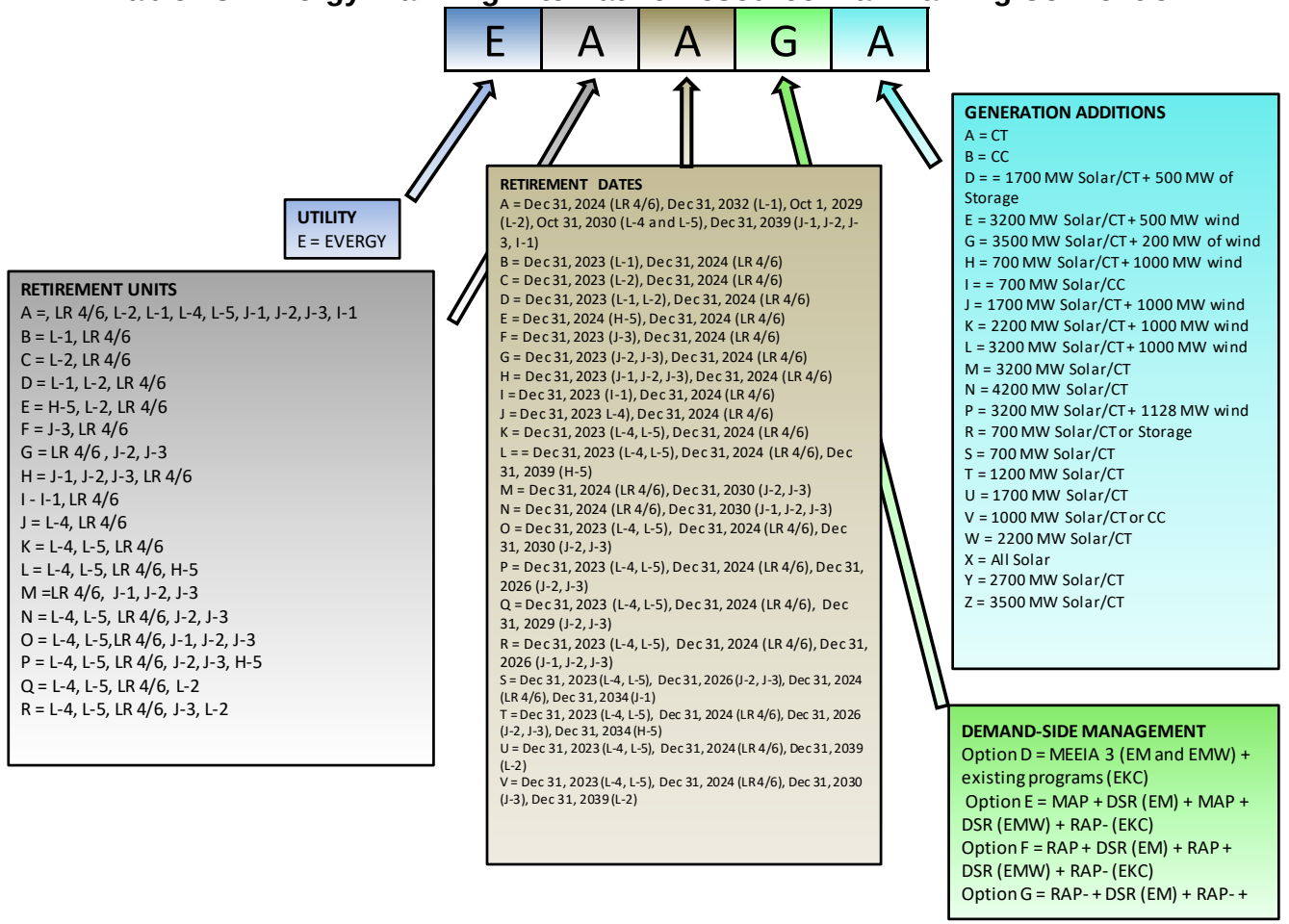
Evergy considers it prudent resource planning to develop and analyze alternative resource plans that are based upon Evergy Metro, Evergy Missouri West, and Evergy Kansas Central combined resources.

Joint planning Alternative Resource Plans were developed to reflect combinations of the Evergy Metro, Evergy Missouri West, and Evergy Kansas Central ARPs which utilize a combination of supply-side sources, demand-side resources and resource additions timing.

The NPVRR for each joint planning ARP was determined under the same 27 scenarios analyzed for the standalone companies. For example, electricity market prices, natural gas prices, $CO_2$ allowance prices, etc. were unchanged from the stand-alone company scenarios.

The plan naming convention utilized for the joint planning ARPs developed is shown in Table 28 and an overview of the joint planning ARPs is shown in Table 29 thorough Table 34 below.

## Table 28: Evergy Planning Alternative Resource Plan Naming Convention




**Definitions:**

| | | | |
|---|---|---|---|
| **L-1: LaCygne-1** | **LR 4/6: Lake Road 4/6** | | **CT - Combustion Turbine** |
| **L-2: LaCygne-2** | **I-1: Iatan-1** | | **CC - Combined Cycle** |
| **H-5: Hawthorn-5** | **J-1: Jeffrey-1** | **RAP-: Realistic Achievable Potential Minus** | |
| **L-4: Lawrence-4** | **J-2: Jeffrey-2** | **DSR: Demand-Side Rates** | |
| **L-5: Lawrence-5** | **J-3: Jeffrey-3** | | |

## Table 29: Overview of Evergy Planning Alternative Resource Plans

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| EAAGA | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 10 MW of Solar in 2027 and 13 MW in 2028 | 1 CT (233 MW) in 2031<br>1 CT (233 MW) in 2032<br>3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| EAAGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EBBGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *LaCygne-1: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 3 CT (699 MW) in 2031<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| ECCGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *LaCygne-2: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EDDGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *LaCygne 1&2: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>Lawrence 4&5: Dec 31, 2030<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 1 CT (233 MW) in 2024<br>1 CT (233 MW) in 2031<br>1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EEEGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Hawthorn-5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>' LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| EFFFI | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Jeffrey 3: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 1 CC (409 MW) in 2031<br>4 CT (932 MW) in 2033<br>2 CT (466 MW) in 2036<br>1 CT (233 MW) in 2038<br>1 CT (233 MW) in 2039<br>9 CT (2097 MW) in 2040 |
| EFFFR | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Jeffrey 3: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>233 MW of Storage in 2031 | 1 CT (233 MW) in 2031<br>4 CT (932 MW) in 2033<br>2 CT (466 MW) in 2036<br>1 CT (233 MW) in 2038<br>10 CT (2330 MW) in 2040 |

## Table 30: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| EFFFS | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Jeffrey 3: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 2 CT (466 MW) in 2031<br>4 CT (932 MW) in 2033<br>2 CT (466 MW) in 2036<br>1 CT (233 MW) in 2038<br>10 CT (2330 MW) in 2040 |
| EFFGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | Jeffrey 3: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>9 CT (2097 MW) in 2040 |
| EGGGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Jeffrey 2&3: Dec 31, 2023*<br>'Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 1 CT (233 MW) in 2024<br>2 CT (466 MW) in 2030<br>2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |
| EGMES | MAP + DSR (EM) + MAP + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 2&3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 3 CT (699 MW) in 2031<br>1 CT (233 MW) in 2032<br>3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |
| EGMFU | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 2&3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 3 CT (699 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>6 CT (1398 MW) in 2040 |
| EGMGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 2&3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 5 CT (1165 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |
| EHHGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Jeffrey 1,2,3: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 4 CT (932 MW) in 2024<br>2 CT (466 MW) in 2030<br>2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>3 CT (699 MW) in 2040 |
| EIIGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Iatan-1: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (466 MW) in 2036<br>1 CT (466 MW) in 2037<br>1 CT (466 MW) in 2039<br>9 CT (2097 MW) in 2040 |

## Table 31: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| EJGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Lawrence-4: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EKKFS | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 3 CT (699 MW) in 2033<br>2 CT (466 MW) in 2036<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EKKGS | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EKKGT | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 | 3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| EKKGU | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| ELLGT | RAP- + DSR (EM) + RAP- + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*Hawthorn-5: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 | 3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>14 CT (3262 MW) in 2040 |
| EMNFU | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 1,2&3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 6 CT (1398 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>4 CT (932 MW) in 2040 |
| ENOFD | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>*Jeffrey 2 & 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Storage in 2031<br>500 MW of Solar in 2031 and 2036 | 1 CT (233 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |

## Table 32: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| ENOFS | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>*Jeffrey 2 & 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 5 CT (1165 MW) in 2031<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |
| ENOFU | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>*Jeffrey 2 & 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 3 CT (699 MW) in 2031<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |
| ENOFX | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>*Jeffrey 2 & 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 1000 MW Solar in 2031<br>4000 MW Solar in 2032<br>8000 MW Solar in 2033<br>1000 MW Solar in 2034<br>2000 MW Solar in 2036<br>2000 MW Solar in 2037<br>2000 MW Solar in 2038<br>1000 MW Solar in 2039<br>14000 MW Solar in 2040 |
| ENPFG | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>'Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021<br>200 MW of Wind in 2025 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 1 CT (233 MW) in 2030<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |
| ENPFU | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>'Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2027<br>3 CT (699 MW) in 2030<br>3 CT (699 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>6 CT (1398 MW) in 2040 |
| ENPFZ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>'Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2030<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |

## Table 33: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| ENQFZ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-2: Oct 1, 2029<br>*Jeffrey 2 & 3: Dec 31, 2029*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2030<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>6 CT (1398 MW) in 2040 |
| EORFE | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 1, 2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 500 MW of Storage in 2027<br>500 MW of Storage in 2030<br>1 CT (233 MW) in 2032<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>3 CT (699 MW) in 2040 |
| EORFZ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Lawrence-4&5: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 1,2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2027<br>3 CT (699 MW) in 2030<br>4 CT (932 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>3 CT (699 MW) in 2040 |
| EOSFZ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | Lawrence-4&5: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>Jeffrey 2 & 3: Dec 31, 2026<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2034<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2030<br>4 CT (932 MW) in 2033<br>3 CT (699 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>3 CT (699 MW) in 2040 |
| EPTFZ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 2 & 3: Dec 31, 2026*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>*Hawthorn-5: Dec 31, 2034*<br>Jeffrey 1: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>600 MW of Solar in 2025, 2026, and 2027<br>500 MW of Solar in 2031 and 2036 | 2 CT (466 MW) in 2030<br>4 CT (932 MW) in 2033<br>3 CT (699 MW) in 2035<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |
| EQUFH | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024 | 1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>14 CT (3262 MW) in 2040 |
| EQUFJ | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2035 and 2036 | 15 CT (3495 MW) in 2040 |

## Table 34: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| EQUFK | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2030, 2031, and 2032 | 15 CT (3495 MW) in 2040 |
| EQUFS | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>14 CT (3262 MW) in 2040 |
| EQUFW | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2030, 2031, and 2032 | 1 CT (233 MW) in 2038<br>15 CT (3495 MW) in 2040 |
| ERVDL | MEEIA 3 (EM) + MEEIA 3 (EMW) + Existing Programs (EKC) | Lawrence-4&5: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>Jeffrey 3: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>LaCygne-2: Dec 31, 2039 | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 4 CTs (932 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| ERVFL | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| ERVFM | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| ERVFN | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, 2032, 2036, and 2036 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |

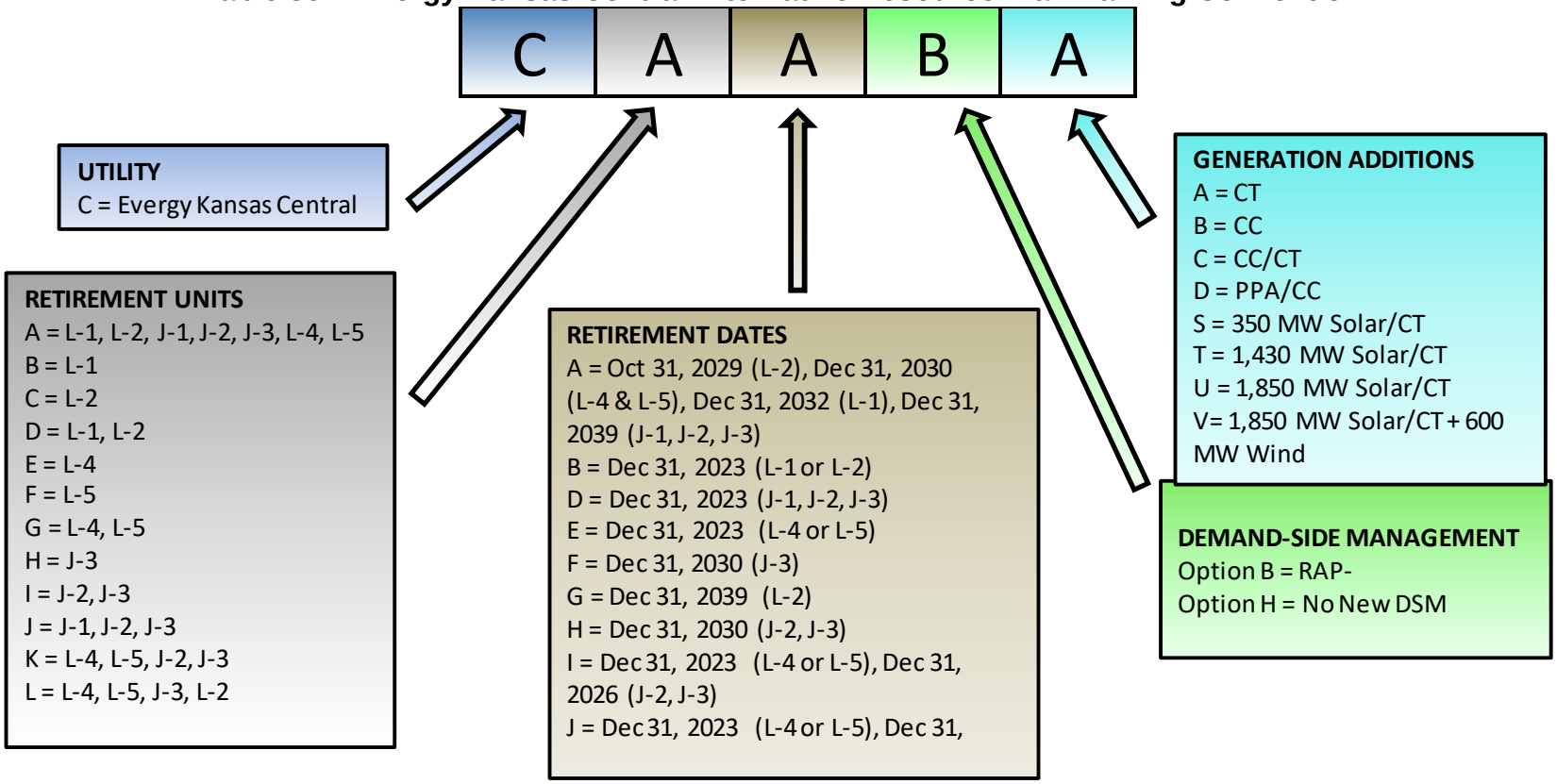
## Table 35: Overview of Evergy Planning Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| EQUFK | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2030, 2031, and 2032 | 15 CT (3495 MW) in 2040 |
| EQUFS | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>14 CT (3262 MW) in 2040 |
| EQUFW | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2030, 2031, and 2032 | 1 CT (233 MW) in 2038<br>15 CT (3495 MW) in 2040 |
| ERVDL | MEEIA 3 (EM) + MEEIA 3 (EMW) + Existing Programs (EKC) | Lawrence-4&5: Dec 31, 2023<br>Lake Road 4/6: Dec 31, 2024<br>Jeffrey 3: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>LaCygne-2: Dec 31, 2039 | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 4 CTs (932 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |
| ERVFL | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021<br>500 MW of Wind in 2025 and 2026 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| ERVFM | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, and 2032 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>12 CT (2796 MW) in 2040 |
| ERVFN | RAP + DSR (EM) + RAP + DSR (EMW) + RAP- (EKC) | *Lawrence-4&5: Dec 31, 2023*<br>Lake Road 4/6: Dec 31, 2024<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW of Wind in 2021 | 350 MW of Solar in 2023 and 2024<br>500 MW of Solar in 2028, 2029, 2030, 2031, 2032, 2035, and 2036 | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2038<br>12 CT (2796 MW) in 2040 |

## 7.5 ALTERNATIVE RESOURCE PLANS EVALUATED – EVERGY KANSAS CENTRAL

Alternative Resource Plans were developed using a combination of various supply-side resources, demand-side resources, and resource addition timings. The Alternative Resource Plans (ARP) CAABA, CAABS, and CAAHS represents the initial Evergy Kansas Central ARPs that assumes the generating units modeled are retired at the current book life - LaCygne-2: Oct 1, 2029, Lawrence 4&5: Dec 31, 2030, LaCygne-1: Dec 31, 2032, and Jeffrey 1, 2 & 3: Dec 31, 2039. The plan naming convention utilized for Evergy Kansas Central's Alternative Resource Plans developed is shown in Table 36 below:

**Table 36: Evergy Kansas Central Alternative Resource Plan Naming Convention**




| | | | |
|---|---|---|---|
| **Definitions:** | **L-4: Lawrence-4** | **RAP: Realistic Achievable Potential** | **CT - Combustion Turbine** |
| **L-1: LaCygne-1** | **L-5: Lawrence-5** | | **CC - Combined Cycle** |
| **L-2: LaCygne-2** | **J-2: Jeffrey-2** | | |
| **J-1: Jeffrey-1** | **J-3: Jeffrey-3** | | |

Several Alternative Resource Plans were developed for Evergy Kansas Central integrated resource analysis. The following tables, Table 37 and Table 38, provide an overview of the Alternative Resource Plans. Note that wind and solar additions shown are based on nameplate capacity. Each individual plan is shown in Table 39 through Table 61 below.

## Table 37: Evergy Kansas Central Overview of Alternative Resource Plans

| Plan Name | DSM Level | Retire | Renewable Additions - Wind | Renewable Additions - Solar | Generation Additions (if needed) |
|---|---|---|---|---|---|
| CAABA | RAP- | LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | n/a | 1 CT (322 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (322 MW) in 2036<br>1 CT (322 MW) in 2039<br>8 CT (1864 MW) in 2040 |
| CAABS | RAP- | LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CAAHS | RAP- | LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 3 CT (699 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>1 CT (233 MW) in 2039<br>8 CT (1864 MW) in 2040 |
| CBBBS | RAP- | *LaCygne-1: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CCBBS | RAP- | *LaCygne-2: Dec 31, 2023*<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CCGBS | RAP- | Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039<br>*LaCygne-2: Dec 31, 2039* | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>10 CT (2330 MW) in 2040 |
| CDBBS | RAP- | *LaCygne-1: Dec 31, 2023*<br>*LaCygne-2: Dec 31, 2023*<br>Lawrence 4&5: Dec 31, 2030<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CEEBS | RAP- | *Lawrence 4: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CFEBS | RAP- | *Lawrence 5: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CGEBS | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CGEBT | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1, 2 & 3: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023)<br>180 MW Solar (2025, 2026, 2027) | 1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CHDBS | RAP- | *Jeffrey 3: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2030<br>2 CT (466 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2036<br>6 CT (1398 MW) in 2040 |

## Table 38: Evergy Kansas Central Overview of Alternative Resource Plans (continued)

| Plan Name | DSM Level | Retire | Renewable Additions - Wind | Renewable Additions - Solar | Generation Additions (if needed) |
|---|---|---|---|---|---|
| CHFBV | RAP- | Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>*Jeffrey 1 & 2: Dec 31, 2039*<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021)<br>300 MW Wind (2025, 2026) | 350 MW Solar (2023)<br>300 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |
| CIDBS | RAP- | *Jeffrey 2&3: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 3 CT (699 MW) in 2024<br>3 CT (699 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>3 CT (699 MW) in 2040 |
| CIHBS | RAP- | LaCygne-2: Oct 1, 2029<br>*Jeffrey 2&3: Dec 31, 2030*<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 6 CT (1398 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>3 CT (699 MW) in 2040 |
| CJDBS | RAP- | *Jeffrey 1,2&3: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Lawrence 4&5: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032 | 128 MW Wind (2021) | 350 MW Solar (2023) | 5 CT (1165 MW) in 2024<br>1 CT (233 MW) in 2030<br>2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2038 |
| CKIBS | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>Jeffrey 2 & 3: Dec 31, 2026<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 4 CT (932 MW) in 2027<br>2 CT (466 MW) in 2030<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>3 CT (699 MW) in 2040 |
| CKIBT | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>Jeffrey 2 & 3: Dec 31, 2026<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1: Dec 31, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023)<br>360 MW Solar (2025, 2026, 2027) | 3 CT (699 MW) in 2027<br>1 CT (233 MW) in 2030<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>3 CT (699 MW) in 2040 |
| CLJBA | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021) | n/a | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>7 CT (1631 MW) in 2040 |
| CLJBS | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023) | 1 CT (233 MW) in 2032<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CLJBU | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021) | 350 MW Solar (2023)<br>300 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>8 CT (1864 MW) in 2040 |
| CLJBV | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021)<br>300 MW Wind (2025, 2026) | 350 MW Solar (2023)<br>300 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2038<br>7 CT (1631 MW) in 2040 |
| CLJHV | No New DSM | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021)<br>300 MW Wind (2025, 2026) | 350 MW Solar (2023)<br>300 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2031<br>2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2036<br>8 CT (1864 MW) in 2040 |

**Table 39: Evergy Kansas Central Alternative Resource Plan CAABA**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | | 306 | |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 233 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 233 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 233 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CAABA assumes retirements of LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, DSM Option B, 1 CT (233 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2036, 1 CT (233 MW) in 2039, 8 CTs (1,864 MW) in 2040.

**Table 40: Evergy Kansas Central Alternative Resource Plan CAABS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 0 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CAABS assumes retirements of LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 41: Evergy Kansas Central Alternative Resource Plan CAAHS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 208 | |
| 2024 | 0 | | | 207 | |
| 2025 | 0 | | | 206 | |
| 2026 | 0 | | | 206 | |
| 2027 | 0 | | | 205 | |
| 2028 | 0 | | | 205 | |
| 2029 | 0 | | | 204 | 331 |
| 2030 | 0 | | | 203 | 487 |
| 2031 | 699 | | | 203 | |
| 2032 | 0 | | | 202 | 373 |
| 2033 | 466 | | | 202 | |
| 2034 | 0 | | | 201 | |
| 2035 | 0 | | | 200 | |
| 2036 | 0 | | | 200 | |
| 2037 | 233 | | | 199 | |
| 2038 | 0 | | | 199 | |
| 2039 | 233 | | | 198 | 1830 |
| 2040 | 1864 | | | 198 | |

Plan CAAHS assumes retirements of LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option H, 3 CTs (699 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 1 CT (233 MW) in 2039, 8 CTs (1,864 MW) in 2040.

**Table 42: Evergy Kansas Central Alternative Resource Plan CBBBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 373 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 466 | | | 681 | |
| 2032 | 0 | | | 701 | |
| 2033 | 0 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CBBBS assumes retirements of LaCygne-1 in 2023, LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 2 CTs (466 MW) in 2031, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 43: Evergy Kansas Central Alternative Resource Plan CCBBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 331 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 0 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CCBBS assumes retirements of LaCygne-2 in 2023, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 44: Evergy Kansas Central Alternative Resource Plan CCGBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 0 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 233 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 2161 |
| 2040 | 2330 | | | 756 | |

Plan CCGBS assumes retirements of Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2036, 10 CTs (2,330 MW) in 2040.

**Table 45: Evergy Kansas Central Alternative Resource Plan CDBBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 704 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 466 | | | 681 | |
| 2032 | 0 | | | 701 | |
| 2033 | 0 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CDBBS assumes retirements of LaCygne-1 & 2 in 2023, Lawrence 4 & 5 in 2030, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 2 CTs (466 MW) in 2031, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 46: Evergy Kansas Central Alternative Resource Plan CEEBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 112 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 375 |
| 2031 | 0 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CEEBS assumes retirements of Lawrence 4 in 2023, LaCygne-2 in 2029, Lawrence 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2031, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 47: Evergy Kansas Central Alternative Resource Plan CFEBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 375 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 112 |
| 2031 | 0 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CFEBS assumes retirements of Lawrence 5 in 2023, LaCygne-2 in 2029, Lawrence 4 in 2030, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 48: Evergy Kansas Central Alternative Resource Plan CGEBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | |
| 2031 | 0 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 233 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CGEBS assumes retirements of Lawrence 4 & 5 in 2023, LaCygne-2 in 2029, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 49: Evergy Kansas Central Alternative Resource Plan CGEBT**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | 360 | 447 | |
| 2026 | 0 | | 360 | 502 | |
| 2027 | 0 | | 360 | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | |
| 2031 | 0 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1830 |
| 2040 | 1864 | | | 756 | |

Plan CGEBT assumes retirements of Lawrence 4 & 5 in 2023, LaCygne-2 in 2029, LaCygne-1 in 2032, and Jeffrey 1, 2, and 3 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, 360 MW of new solar in 2025, 2026, 2027, DSM Option B, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040.

**Table 50: Evergy Kansas Central Alternative Resource Plan CHDBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 661 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 233 | | | 659 | 487 |
| 2031 | 466 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 233 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1219 |
| 2040 | 1398 | | | 756 | |

Plan CHDBS assumes retirements of Jeffrey 3 in 2023, LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 1 CT (233 MW) in 2030, 2 CTs (466 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2036, 6 CTs (1,398 MW) in 2040.

**Table 51: Evergy Kansas Central Alternative Resource Plan CHFBV**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | 300 | | 447 | |
| 2026 | 0 | 300 | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | 300 | 598 | |
| 2029 | 0 | | 300 | 631 | |
| 2030 | 0 | | 300 | 659 | 1098 |
| 2031 | 0 | | 300 | 681 | |
| 2032 | 0 | | 300 | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 233 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1631 | | | 756 | |

Plan CHFBV assumes retirements of Lawrence 4 & 5 in 2030, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 300 MW of new wind in 2025 and 2026, 350 MW of new solar in 2023, 300 MW of solar in 2028, 2029, 2030, 2031, and 2032, DSM Option B, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2038, 7 CTs (1,631 MW) in 2040.

**Table 52: Evergy Kansas Central Alternative Resource Plan CIDBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 1225 |
| 2024 | 699 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 487 |
| 2031 | 699 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 605 |
| 2040 | 699 | | | 756 | |

Plan CIDBS assumes retirements of Jeffrey 2 & 3 in 2023, LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, LaCygne-1 in 2032, and Jeffrey 1 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 3 CTs (699 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 3 CTs (699 MW) in 2040.

**Table 53: Evergy Kansas Central Alternative Resource Plan CIHBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 0 | | | 659 | 1712 |
| 2031 | 1398 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 605 |
| 2040 | 699 | | | 756 | |

Plan CIHBS assumes retirements of LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, Jeffrey 2 & 3 in 2030, LaCygne-1 in 2032, and Jeffrey 1 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 6 CTs (1,398 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 3 CTs (699 MW) in 2040.

**Table 54: Evergy Kansas Central Alternative Resource Plan CJDBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 1830 |
| 2024 | 1165 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 233 | | | 659 | 487 |
| 2031 | 466 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 233 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 233 | | | 741 | |
| 2039 | 0 | | | 748 | |
| 2040 | 0 | | | 756 | |

Plan CJDBS assumes retirements of Jeffrey 1, 2 & 3 in 2023, LaCygne-2 in 2029, Lawrence 4 & 5 in 2030, and LaCygne-1 in 2032, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 5 CTs (1,165 MW) in 2024, 1 CT (233 MW) in 2030, 2 CTs (466 MW) in 2031, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2036, 1 CT (233 MW) in 2038.

**Table 55: Evergy Kansas Central Alternative Resource Plan CKIBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | 175 | 208 | |
| 2023 | 0 | | 175 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | 1225 |
| 2027 | 932 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 466 | | | 659 | |
| 2031 | 0 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 605 |
| 2040 | 699 | | | 756 | |

Plan CKIBS assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 2 & 3 in 2026, LaCygne-2 in 2029, LaCygne-1 in 2032, and Jeffrey 1 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 4 CTs (932 MW) in 2027, 2 CTs (466 MW) in 2030, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 3 CTs (699 MW) in 2040

**Table 56: Evergy Kansas Central Alternative Resource Plan CKIBT**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | 360 | 447 | |
| 2026 | 0 | | 360 | 502 | 1225 |
| 2027 | 699 | | 360 | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | 331 |
| 2030 | 233 | | | 659 | |
| 2031 | 0 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 605 |
| 2040 | 699 | | | 756 | |

Plan CKIBT assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 2 & 3 in 2026, LaCygne-2 in 2029, LaCygne-1 in 2032, and Jeffrey 1 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, 360 MW of new solar in 2025, 2026, and 2027, DSM Option B, 3 CTs (699 MW) in 2027, 1 CT (233 MW) in 2030, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 3 CTs (699 MW) in 2040

**Table 57: Evergy Kansas Central Alternative Resource Plan CLJBA**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | |
| 2030 | 0 | | | 659 | 611 |
| 2031 | 466 | | | 681 | |
| 2032 | 233 | | | 701 | 373 |
| 2033 | 233 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 233 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1631 | | | 756 | |

Plan CLJBA assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, DSM Option B, 2 CTs (466 MW) in 2031, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2036, 1 CT (233 MW) in 2037, 7 CTs (1,631 MW) in 2040

**Table 58: Evergy Kansas Central Alternative Resource Plan CLJBS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | | 598 | |
| 2029 | 0 | | | 631 | |
| 2030 | 0 | | | 659 | 611 |
| 2031 | 466 | | | 681 | |
| 2032 | 0 | | | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1631 | | | 756 | |

Plan CLJBS assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, DSM Option B, 2 CTs (466 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 7 CTs (1,631 MW) in 2040

**Table 59: Evergy Kansas Central Alternative Resource Plan CLJBU**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | | | 447 | |
| 2026 | 0 | | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | 300 | 598 | |
| 2029 | 0 | | 300 | 631 | |
| 2030 | 0 | | 300 | 659 | 611 |
| 2031 | 0 | | 300 | 681 | |
| 2032 | 0 | | 300 | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 233 | | | 733 | |
| 2038 | 0 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1864 | | | 756 | |

Plan CLJBU assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 350 MW of new solar in 2023, 300 MW of new solar in 2028, 2029, 2030, 2031, and 2032, DSM Option B, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2037, 8 CTs (1,864 MW) in 2040

**Table 60: Evergy Kansas Central Alternative Resource Plan CLJBV**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | 300 | | 447 | |
| 2026 | 0 | 300 | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | 300 | 598 | |
| 2029 | 0 | | 300 | 631 | |
| 2030 | 0 | | 300 | 659 | 611 |
| 2031 | 0 | | 300 | 681 | |
| 2032 | 0 | | 300 | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 233 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1631 | | | 756 | |

Plan CLJBV assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 300 MW of new wind in 2025 and 2026, 350 MW of new solar in 2023, 300 MW of new solar in 2028, 2029, 2030, 2031, and 2032, DSM Option B, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2038, 7 CTs (1,631 MW) in 2040

**Table 61: Evergy Kansas Central Alternative Resource Plan CLJHV**

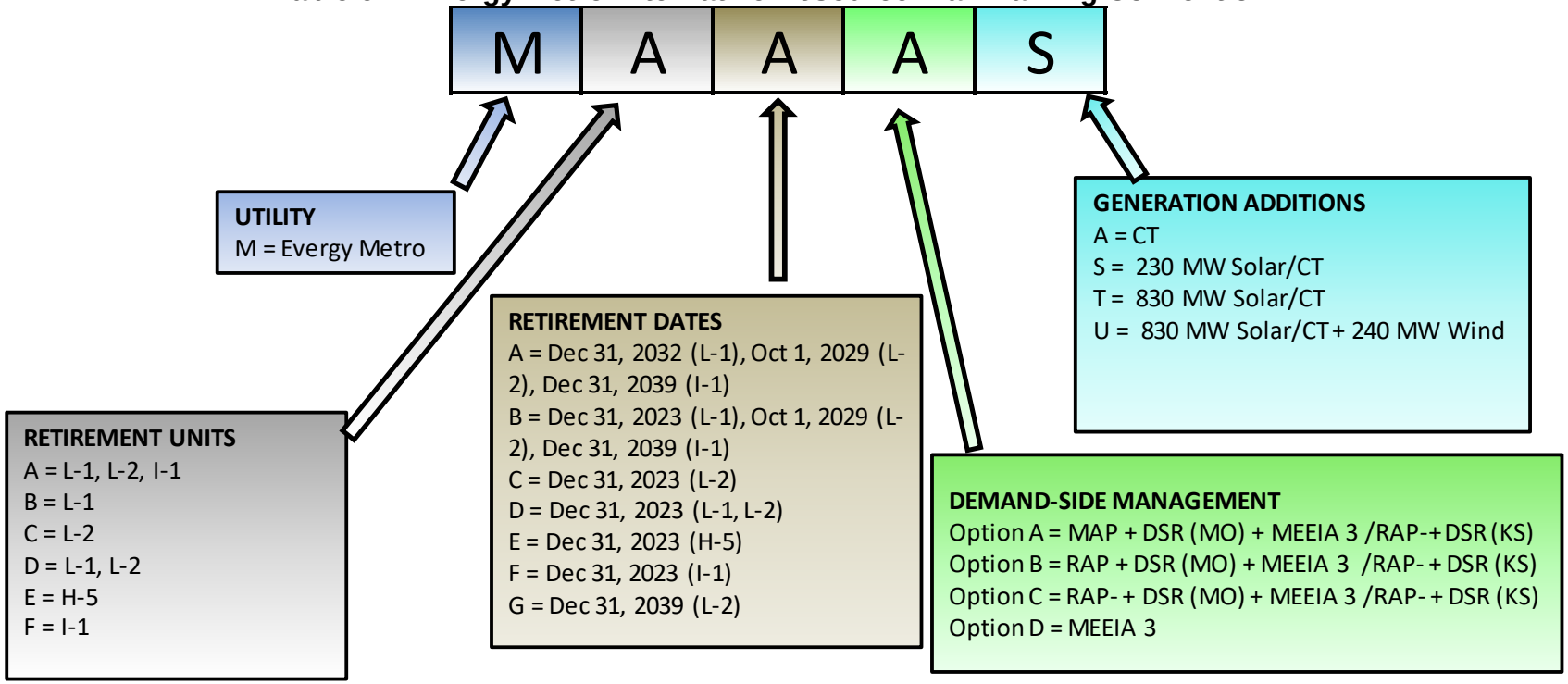
| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 208 | 487 |
| 2024 | 0 | | | 207 | |
| 2025 | 0 | 300 | | 206 | |
| 2026 | 0 | 300 | | 206 | |
| 2027 | 0 | | | 205 | |
| 2028 | 0 | | 300 | 205 | |
| 2029 | 0 | | 300 | 204 | |
| 2030 | 0 | | 300 | 203 | 611 |
| 2031 | 466 | | 300 | 203 | |
| 2032 | 0 | | 300 | 202 | 373 |
| 2033 | 466 | | | 202 | |
| 2034 | 0 | | | 201 | |
| 2035 | 0 | | | 200 | |
| 2036 | 233 | | | 200 | |
| 2037 | 0 | | | 199 | |
| 2038 | 0 | | | 199 | |
| 2039 | 0 | | | 198 | 1550 |
| 2040 | 1864 | | | 198 | |

Plan CLJHV assumes retirements of Lawrence 4 & 5 in 2023, Jeffrey 3 in 2030, LaCygne-1 in 2032, LaCygne-2 in 2039, and Jeffrey 1 & 2 in 2039, 128 MW of wind in 2021, 300 MW of new wind in 2025 and 2026, 350 MW of new solar in 2023, 300 MW of new solar in 2028, 2029, 2030, 2031, and 2032, DSM Option H, 2 CTs (466 MW) in 2031, 2 CTs (466 MW) in 2033, 1 CT (233 MW) in 2036, 8 CTs (1,864 MW) in 2040

## 7.6 ALTERNATIVE RESOURCE PLANS EVALUATED – EVERGY METRO

Alternative Resource Plans were developed using a combination of various supply-side resources, demand-side resources, and resource addition timings. The Alternative Resource Plans (ARP) MAAAS, MAABS, MAACA, and MAACS represents the initial Evergy Metro ARPs that assumes the generating units modeled are retired at the current book life - LaCygne-2: Oct 1, 2029, LaCygne-1: Dec 31, 2032, and Iatan-1 Dec 31, 2039. The plan naming convention utilized for Evergy Metro's Alternative Resource Plans developed is shown in Table 62 below:

**Table 62: Evergy Metro Alternative Resource Plan Naming Convention**




**Definitions:**

| | | |
|---|---|---|
| **L-1: LaCygne-1** | **MEEIA: Missouri Energy Efficiency Investment Act** | **MAP: Maximum Achievable Potential** |
| **L-2: LaCygne-2** | **RAP: Realistic Achievable Potential** | **RAP-: Realistic Achievable Potential Minus** |
| **H-5: Hawthorn-5** | **CT - Combustion Turbine** | **DSR: Demand-Side Rates** |
| **I-1: Iatan-1** | | |

Several Alternative Resource Plans were developed for Evergy Metro integrated resource analysis. The following tables, Table 63 and Table 64 provide an overview of the Alternative Resource Plans. Note that wind and solar additions shown are based on nameplate capacity. Each individual plan is shown in Table 65 through Table 79 below.

## Table 63: Evergy Metro Overview of Alternative Resource Plans

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| MAAAS | MAP + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Oct 1, 2029<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 3 CT (699 MW) in 2040 |
| MAABS | RAP + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Oct 1, 2029<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2038<br>2 CT (466 MW) in 2040 |
| MAACA | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Oct 1, 2029<br>Iatan-1: Dec 31, 2039 | | 13 MW Solar (2028) | 1 CT (233 MW) in 2035<br>1 CT (233 MW) in 2039<br>2 CT (466 MW) in 2040 |
| MAACS | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Oct 1, 2029<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2036<br>3 CT (699 MW) in 2040 |
| MBBCS | RAP- + DSR (MO) /RAP- + DSR (KS) | *LaCygne-1: Dec 31, 2023*<br>LaCygne-2: Oct 1, 2029<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2036<br>3 CT (699 MW) in 2040 |
| MCCCS | RAP + DSR (MO) /RAP + DSR (KS) | LaCygne-2: Dec 31, 2023<br>LaCygne-1: Dec 31, 2032<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2036<br>3 CT (699 MW) in 2040 |
| MCGBU | RAP + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 120 MW Wind (2025, 2026) | 230 MW Solar (2024)<br>120 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2040 |

## Table 64: Evergy Metro Overview of Alternative Resource Plans (cont.)

| Plan Name | DSM Level | Retire | Renewable Additions | | Generation Addition (if needed) |
|---|---|---|---|---|---|
| MCGCS | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 4 CT (932 MW) in 2040 |
| MCGCT | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024)<br>120 MW Solar (2028, 2029, 2030, 2031, 2032) | 3 CT (699 MW) in 2040 |
| MCGCU | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 120 MW Wind (2025, 2026) | 230 MW Solar (2024)<br>120 MW Solar (2028, 2029, 2030, 2031, 2032) | 3 CT (699 MW) in 2040 |
| MCGDS | MEEIA 3 | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2039<br>3 CT (699 MW) in 2040 |
| MCGDU | MEEIA 3 | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 120 MW Wind (2025, 2026) | 230 MW Solar (2024)<br>120 MW Solar (2028, 2029, 2030, 2031, 2032) | 1 CT (233 MW) in 2039<br>4 CT (932 MW) in 2040 |
| MDDCS | RAP- + DSR (MO) /RAP- + DSR (KS) | *LaCygne-1: Dec 31, 2023*<br>*LaCygne-2: Dec 31, 2023*<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2036<br>3 CT (699 MW) in 2040 |
| MEECS | RAP- + DSR (MO) /RAP- + DSR (KS) | Hawthorn-5: Dec 31, 2023<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032<br>*Iatan-* 1: Dec 31, 2039 | | 230 MW Solar (2024) | 1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2039<br>2 CT (466 MW) in 2040 |
| MFFCS | RAP- + DSR (MO) /RAP- + DSR (KS) | Iatan-1: Dec 31, 2023<br>LaCygne-2: Oct 1, 2029<br>LaCygne-1: Dec 31, 2032 | | 230 MW Solar (2024) | 2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2036 |

**Table 65: Evergy Metro Alternative Resource Plan MAAAS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 252 | |
| 2024 | 0 | | 230 | 328 | |
| 2025 | 0 | | | 382 | |
| 2026 | 0 | | | 429 | |
| 2027 | 0 | | | 470 | |
| 2028 | 0 | | | 506 | |
| 2029 | 0 | | | 536 | 331 |
| 2030 | 0 | | | 563 | |
| 2031 | 0 | | | 578 | |
| 2032 | 0 | | | 584 | 373 |
| 2033 | 0 | | | 587 | |
| 2034 | 0 | | | 591 | |
| 2035 | 0 | | | 593 | |
| 2036 | 0 | | | 599 | |
| 2037 | 0 | | | 607 | |
| 2038 | 0 | | | 616 | |
| 2039 | 0 | | | 624 | 490 |
| 2040 | 699 | | | 629 | |

Plan MAAAS assumes retirements of LaCygne-2 in 2029, LaCygne-1 in 2032, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option A, 3 CT's (699 MW) in 2040.

**Table 66: Evergy Metro Alternative Resource Plan MAABS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 151 | |
| 2024 | 0 | | 230 | 209 | |
| 2025 | 0 | | | 256 | |
| 2026 | 0 | | | 298 | |
| 2027 | 0 | | | 335 | |
| 2028 | 0 | | | 369 | |
| 2029 | 0 | | | 398 | 331 |
| 2030 | 0 | | | 421 | |
| 2031 | 0 | | | 431 | |
| 2032 | 0 | | | 432 | 373 |
| 2033 | 0 | | | 432 | |
| 2034 | 0 | | | 434 | |
| 2035 | 0 | | | 434 | |
| 2036 | 0 | | | 436 | |
| 2037 | 0 | | | 439 | |
| 2038 | 233 | | | 444 | |
| 2039 | 0 | | | 447 | 490 |
| 2040 | 466 | | | 449 | |

Plan MAABS assumes retirements of LaCygne-2 in 2029, LaCygne-1 in 2032, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option B, 1 CT (233 MW) in 2038, 2 CT's (466 MW) in 2040.

**Table 67: Evergy Metro Alternative Resource Plan MAACA**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | 13 | 333 | |
| 2029 | 0 | | | 357 | 331 |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 233 | | | 377 | |
| 2036 | 0 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 233 | | | 379 | 490 |
| 2040 | 466 | | | 379 | |

Plan MAACA assumes retirements of LaCygne-2 in 2029, LaCygne-1 in 2032, and Iatan-1 in 2039, 13 MW of new solar in 2028, DSM Option C, 1 CT (233 MW) in 2035, 1 CT (233 MW) in 2039, 2 CT's (466 MW) in 2040.

**Table 68: Evergy Metro Alternative Resource Plan MAACS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | 331 |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 490 |
| 2040 | 699 | | | 379 | |

Plan MAACS assumes retirements of LaCygne-2 in 2029, LaCygne-1 in 2032, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 1 CT (233 MW) in 2036, 3 CT's (699 MW) in 2040.

**Table 69: Evergy Metro Alternative Resource Plan MBBCS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | 373 |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | 331 |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 490 |
| 2040 | 699 | | | 379 | |

Plan MBBCS assumes retirements of LaCygne-1 in 2023, LaCygne-2 in 2029, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 1 CT (233 MW) in 2036, 3 CT's (699 MW) in 2040.

**Table 70: Evergy Metro Alternative Resource Plan MCCCS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | 331 |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 490 |
| 2040 | 699 | | | 379 | |

Plan MCCCS assumes retirements of LaCygne-2 in 2023, LaCygne-1 in 2032, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 1 CT (233 MW) in 2036, 3 CT's (699 MW) in 2040.

**Table 71: Evergy Metro Alternative Resource Plan MCGBU**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 151 | |
| 2024 | 0 | | 230 | 209 | |
| 2025 | 0 | 120 | | 256 | |
| 2026 | 0 | 120 | | 298 | |
| 2027 | 0 | | | 335 | |
| 2028 | 0 | | 120 | 369 | |
| 2029 | 0 | | 120 | 398 | |
| 2030 | 0 | | 120 | 421 | |
| 2031 | 0 | | 120 | 431 | |
| 2032 | 0 | | 120 | 432 | 373 |
| 2033 | 0 | | | 432 | |
| 2034 | 0 | | | 434 | |
| 2035 | 0 | | | 434 | |
| 2036 | 0 | | | 436 | |
| 2037 | 0 | | | 439 | |
| 2038 | 0 | | | 444 | |
| 2039 | 0 | | | 447 | 821 |
| 2040 | 466 | | | 449 | |

Plan MCGBU assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, 120 MW of new solar in 2028, 2029, 2030, 2031, and 2032, 120 MW of new wind in 2025 and 2026. DSM Option B, 2 CT's (466 MW) in 2040.

**Table 72: Evergy Metro Alternative Resource Plan MCGCS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 0 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 821 |
| 2040 | 932 | | | 379 | |

Plan MCGCS assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 4 CT's (932 MW) in 2040.

**Table 73: Evergy Metro Alternative Resource Plan MCGCT**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | 120 | 333 | |
| 2029 | 0 | | 120 | 357 | |
| 2030 | 0 | | 120 | 377 | |
| 2031 | 0 | | 120 | 384 | |
| 2032 | 0 | | 120 | 382 | 331 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 0 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 821 |
| 2040 | 699 | | | 379 | |

Plan MCGCT assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, 120 MW of new solar in 2028, 2029, 2030, 2031, and 2032. DSM Option C, 3 CT's (699 MW) in 2040.

**Table 74: Evergy Metro Alternative Resource Plan MCGCU**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | 120 | | 237 | |
| 2026 | 0 | 120 | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | 120 | 333 | |
| 2029 | 0 | | 120 | 357 | |
| 2030 | 0 | | 120 | 377 | |
| 2031 | 0 | | 120 | 384 | |
| 2032 | 0 | | 120 | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 0 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 821 |
| 2040 | 699 | | | 379 | |

Plan MCGCU assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, 120 MW of new solar in 2028, 2029, 2030, 2031, and 2032, 120 MW of new wind in 2025 and 2026. DSM Option C, 3 CT's (699 MW) in 2040.

**Table 75: Evergy Metro Alternative Resource Plan MCGDS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 40 | |
| 2024 | 0 | | 230 | 41 | |
| 2025 | 0 | | | 41 | |
| 2026 | 0 | | | 41 | |
| 2027 | 0 | | | 40 | |
| 2028 | 0 | | | 39 | |
| 2029 | 0 | | | 40 | |
| 2030 | 0 | | | 40 | |
| 2031 | 0 | | | 32 | |
| 2032 | 0 | | | 18 | 373 |
| 2033 | 0 | | | 10 | |
| 2034 | 0 | | | 8 | |
| 2035 | 0 | | | 7 | |
| 2036 | 233 | | | 6 | |
| 2037 | 0 | | | 5 | |
| 2038 | 0 | | | 5 | |
| 2039 | 233 | | | 3 | 821 |
| 2040 | 699 | | | 1 | |

Plan MCGDS assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option D, 1 CT (233 MW) in 2036, 1 CT (233 MW) in 2039, 3 CT's (699 MW) in 2040.

**Table 76: Evergy Metro Alternative Resource Plan MCGDU**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 40 | |
| 2024 | 0 | | 230 | 41 | |
| 2025 | 0 | 120 | | 41 | |
| 2026 | 0 | 120 | | 41 | |
| 2027 | 0 | | | 40 | |
| 2028 | 0 | | 120 | 39 | |
| 2029 | 0 | | 120 | 40 | |
| 2030 | 0 | | 120 | 40 | |
| 2031 | 0 | | 120 | 32 | |
| 2032 | 0 | | 120 | 18 | 373 |
| 2033 | 0 | | | 10 | |
| 2034 | 0 | | | 8 | |
| 2035 | 0 | | | 7 | |
| 2036 | 0 | | | 6 | |
| 2037 | 0 | | | 5 | |
| 2038 | 0 | | | 5 | |
| 2039 | 233 | | | 3 | 821 |
| 2040 | 932 | | | 1 | |

Plan MCGDU assumes retirements of LaCygne-1 in 2032, LaCygne-2 in 2039, and Iatan-1 in 2039, 230 MW of new solar in 2024, 120 MW of new solar in 2028, 2029, 2030, 2031, and 2032, 120 MW of new wind in 2025 and 2026. DSM Option D, 1 CT (233 MW) in 2039, 4 CT's (932 MW) in 2040.

**Table 77: Evergy Metro Alternative Resource Plan MDDCS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | 704 |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 490 |
| 2040 | 699 | | | 379 | |

Plan MDDCS assumes retirements of LaCygne-1 and LaCygne-2 in 2023, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 1 CT (233 MW) in 2036, 3 CT's (699 MW) in 2040.

**Table 78: Evergy Metro Alternative Resource Plan MEECS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | 564 |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | 331 |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 233 | | | 382 | 373 |
| 2033 | 233 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 233 | | | 379 | 490 |
| 2040 | 466 | | | 379 | |

Plan MEECS assumes retirements of Hawthorn-5 in 2023, LaCygne-2 in 2029, LaCygne-1 in 2032, and Iatan-1 in 2039, 230 MW of new solar in 2024, DSM Option C, 1 CT (233 MW) in 2032, 1 CT (233 MW) in 2033, 1 CT (233 MW) in 2036, 2 CT's (466 MW) in 2040.

**Table 79: Evergy Metro Alternative Resource Plan MFFCS**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | 490 |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | | | 237 | |
| 2026 | 0 | | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | | 333 | |
| 2029 | 0 | | | 357 | 331 |
| 2030 | 0 | | | 377 | |
| 2031 | 0 | | | 384 | |
| 2032 | 0 | | | 382 | 373 |
| 2033 | 466 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 233 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | |
| 2040 | 0 | | | 379 | |

Plan MFFCS assumes retirements of Iatan-1 in 2023, LaCygne-2 in 2029, LaCygne-1 in 2032, 230 MW of new solar in 2024, DSM Option C, 2 CT (466 MW) in 2033, 1 CT (233 MW) in 2036.

## 7.7 DETERMINATION OF CRITICAL UNCERTAIN FACTORS FOR SENSITIVITY & CONTINGENCY ANALYSIS

Evergy utilizes “critical uncertain factors” in order to test the robustness and cost-effectiveness of different ARPs. To identify these factors, Evergy begins with a variety of “uncertain factors” which include Regulatory, Macroeconomic, Technology, and Operational uncertainties.

### 7.7.1 LIST OF UNCERTAIN FACTORS

The following table shows the consolidated list of uncertain factors evaluated.

**Table 80: Uncertain Factors Evaluated**

| Uncertain Factor | Evaluated? | Critical? |
|---|---|---|
| Load Growth | ✓ | ✓ |
| Interest Rate | ✓ | ✗ |
| Legal Mandates | ✓ | ✗ |
| Fuel Prices | ✓ | ✓ |
| New Gen Construction / Permitting | ✓ | ✗ |
| Purchase Power | ✓ | ✗ |
| Emission Allowance Pricing | ✓ | ✓ |
| Gen O&M costs | ✓ | ✗ |
| Force Outage Rates | ✓ | ✗ |
| DSM / DSR Load Impacts | ✓ | ✗ |
| DSM / DSR Costs | ✓ | ✗ |
| SPP Renewable Penetration | ✓ | ✗ |
| SPP Coal Retirements | ✓ | ✗ |

### 7.7.2 METHOD FOR ASSESSING CRITICALITY

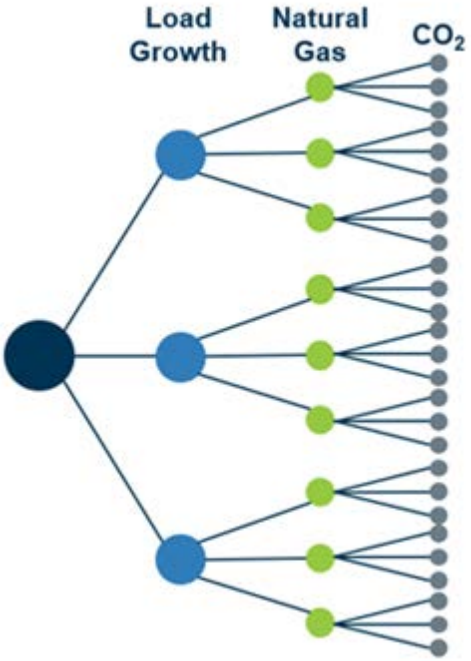
The company analyzed the uncertain factors individually listed in Table 80 above, to determine which were critical – meaning that a factor would impact Alternative Resource Plan ranking results. Three uncertain factors were determined to be critical uncertain factors - load growth, natural gas prices and $CO_2$ credit prices.

## 7.8 SCENARIO ANALYSIS OF ALTERNATIVE RESOURCE PLANS

### 7.8.1 CRITICAL UNCERTAIN FACTORS AND PROBABILITIES

As noted above, three uncertain factors were determined to be critical uncertain factors - load growth, natural gas prices and $CO_2$ credit prices. Once identified, these three critical uncertain factors were utilized to construct scenarios as shown in Figure 27 below:

**Figure 27: Critical Uncertain Factor Scenarios**




The three critical uncertain factors were assigned the following probability distributions:

**Figure 28: Critical Uncertain Factor Probability Distribution**

| | Low | Mid | High |
|---|---|---|---|
| Load Growth | 35% | 50% | 15% |
| Natural Gas | 35% | 50% | 15% |
| $CO_2$ Price | 20% | 60% | 20% |

For each of the twenty-seven endpoint scenarios, the weighted endpoint probability is the product of the probability distribution assignments and is shown in Figure 29 below:

**Figure 29: Scenario Weighted Endpoint Probabilities**

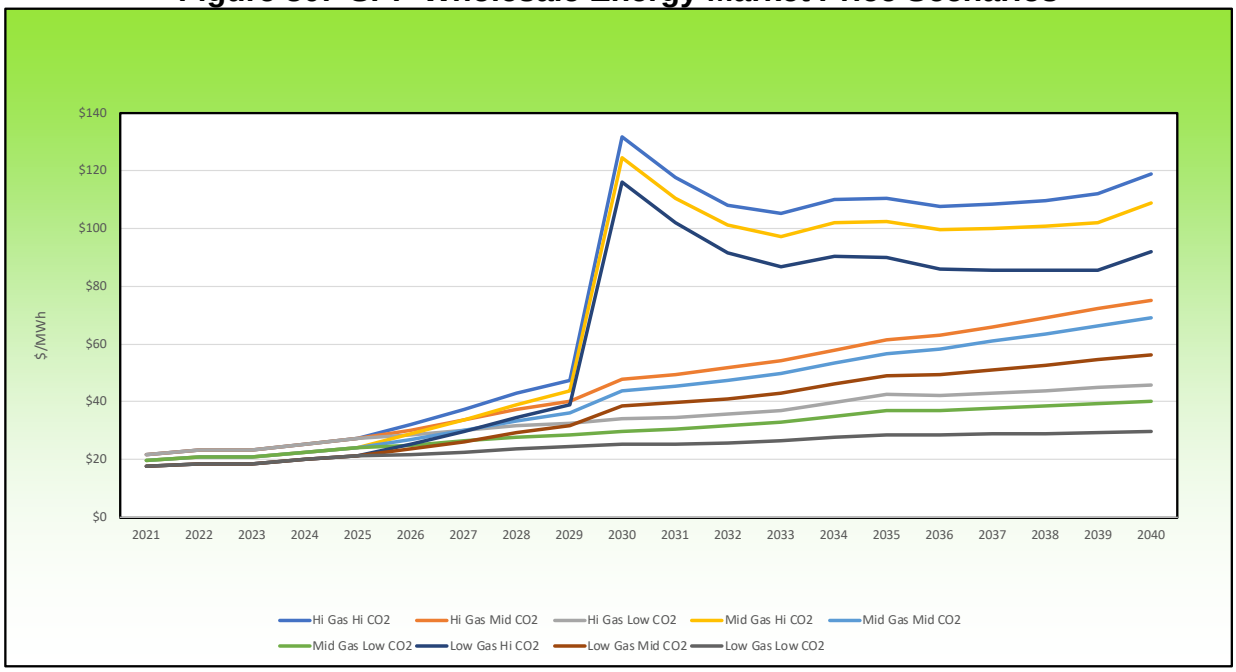
| Endpoint | Load Growth | Natural Gas | $CO_2$ | Endpoint Probability |
|---|---|---|---|---|
| 1 | High | High | High | 0.5% |
| 2 | High | High | Mid | 1.4% |
| 3 | High | High | Low | 0.5% |
| 4 | High | Mid | High | 1.5% |
| 5 | High | Mid | Mid | 4.5% |
| 6 | High | Mid | Low | 1.5% |
| 7 | High | Low | High | 1.1% |
| 8 | High | Low | Mid | 3.2% |
| 9 | High | Low | Low | 1.1% |
| 10 | Mid | High | High | 1.5% |
| 11 | Mid | High | Mid | 4.5% |
| 12 | Mid | High | Low | 1.5% |
| 13 | Mid | Mid | High | 5.0% |
| 14 | Mid | Mid | Mid | 15.0% |
| 15 | Mid | Mid | Low | 5.0% |
| 16 | Mid | Low | High | 3.5% |
| 17 | Mid | Low | Mid | 10.5% |
| 18 | Mid | Low | Low | 3.5% |
| 19 | Low | High | High | 1.1% |
| 20 | Low | High | Mid | 3.2% |
| 21 | Low | High | Low | 1.1% |
| 22 | Low | Mid | High | 3.5% |
| 23 | Low | Mid | Mid | 10.5% |
| 24 | Low | Mid | Low | 3.5% |
| 25 | Low | Low | High | 2.5% |
| 26 | Low | Low | Mid | 7.4% |
| 27 | Low | Low | Low | 2.5% |

### 7.8.2 MARKET PRICES

Figure 30 below shows the average annual SPP wholesale energy market price scenarios developed for the 2021 IRP analysis. These include nine price curves based on the combination of the three gas price and three $CO_2$ cost scenarios.

These nine price curves in combination with the three retail load forecast scenarios comprise the 27 scenarios used to evaluate the Alternative Resource Plans.

**Figure 30: SPP Wholesale Energy Market Price Scenarios**



### 7.8.3 RESULTS – NPVRR RANKED BASED UPON EXPECTED VALUE

Evergy level results are provided based upon 20-year NPVRR and Evergy Metro and Evergy Kansas Central results are provided based upon 15-year and 20-year NPVRR.

### 7.8.3.1 Evergy

**Table 81: Evergy 20-Year Expected Value NPVRR**

| Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta | Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta |
|---|---|---|---|---|---|---|---|
| 1 | ERVFL | $58,984 | $0 | 23 | EFFFI | $59,993 | $1,008 |
| 2 | ERVDL | $59,021 | $37 | 24 | EGGGS | $60,005 | $1,021 |
| 3 | ENPFG | $59,223 | $239 | 25 | EFFFS | $60,027 | $1,043 |
| 4 | ENPFZ | $59,308 | $324 | 26 | EKKGT | $60,027 | $1,043 |
| 5 | ERVFN | $59,329 | $344 | 27 | EGMGS | $60,045 | $1,061 |
| 6 | EOSFZ | $59,388 | $404 | 28 | EFFGS | $60,046 | $1,062 |
| 7 | EQUFK | $59,388 | $404 | 29 | ELLGT | $60,050 | $1,065 |
| 8 | EORFZ | $59,389 | $405 | 30 | EQUFS | $60,064 | $1,080 |
| 9 | ERVFM | $59,391 | $407 | 31 | EFFFR | $60,125 | $1,140 |
| 10 | ENQFZ | $59,402 | $418 | 32 | EKKFS | $60,142 | $1,158 |
| 11 | EPTFZ | $59,464 | $480 | 33 | ECCGS | $60,158 | $1,174 |
| 12 | EQUFJ | $59,503 | $519 | 34 | EKKGS | $60,165 | $1,180 |
| 13 | EQUFH | $59,631 | $647 | 35 | EBBGS | $60,183 | $1,199 |
| 14 | ENOFU | $59,716 | $732 | 36 | EDDGS | $60,206 | $1,222 |
| 15 | EGMFU | $59,773 | $789 | 37 | EAAGS | $60,206 | $1,222 |
| 16 | EQUFW | $59,777 | $793 | 38 | EJJGS | $60,224 | $1,240 |
| 17 | ENPFU | $59,789 | $805 | 39 | EHHGS | $60,229 | $1,245 |
| 18 | EMNFU | $59,794 | $810 | 40 | EIIGS | $60,334 | $1,349 |
| 19 | EORFE | $59,875 | $891 | 41 | EEEGS | $60,400 | $1,416 |
| 20 | EKKGU | $59,951 | $967 | 42 | EGMES | $60,411 | $1,426 |
| 21 | ENOFD | $59,956 | $972 | 43 | EAAGA | $60,465 | $1,481 |
| 22 | ENOFS | $59,976 | $992 | 44 | ENOFX | $61,928 | $2,944 |

### 7.8.3.2 Evergy Kansas Central

**Table 82: Evergy Kansas Central 15-Year Expected Value NPVRR**

| Rank (L-H) | Plan | 15-Yr NPVRR ($mm) | Delta |
|---|---|---|---|
| 1 | CLJBV | $25,408 | $0 |
| 2 | CLJHV | $25,412 | $4 |
| 3 | CHFBV | $25,445 | $37 |
| 4 | CLJBU | $25,570 | $162 |
| 5 | CGEBT | $25,701 | $293 |
| 6 | CKIBT | $25,717 | $308 |
| 7 | CLJBS | $25,731 | $323 |
| 8 | CLJBA | $25,755 | $347 |
| 9 | CHDBS | $25,778 | $370 |
| 10 | CIHBS | $25,794 | $386 |
| 11 | CCGBS | $25,805 | $397 |
| 12 | CGEBS | $25,817 | $409 |
| 13 | CCBBS | $25,822 | $414 |
| 14 | CDBBS | $25,826 | $418 |
| 15 | CBBBS | $25,842 | $434 |
| 16 | CAABS | $25,844 | $436 |
| 17 | CFEBS | $25,844 | $436 |
| 18 | CEEBS | $25,849 | $441 |
| 19 | CAAHS | $25,869 | $461 |
| 20 | CAABA | $25,877 | $469 |
| 21 | CKIBS | $25,942 | $534 |
| 22 | CIDBS | $26,002 | $594 |
| 23 | CJDBS | $26,099 | $691 |

**Table 83: Evergy Kansas Central 20-Year Expected Value NPVRR**

| Rank (L-H) | Plan | 20-Yr NPVRR ($mm) | Delta |
|---|---|---|---|
| 1 | CLJBV | $30,468 | $0 |
| 2 | CHFBV | $30,514 | $46 |
| 3 | CLJHV | $30,610 | $143 |
| 4 | CLJBU | $30,719 | $251 |
| 5 | CKIBT | $30,825 | $357 |
| 6 | CGEBT | $30,918 | $450 |
| 7 | CLJBS | $31,054 | $587 |
| 8 | CIHBS | $31,116 | $648 |
| 9 | CHDBS | $31,126 | $659 |
| 10 | CLJBA | $31,164 | $697 |
| 11 | CCGBS | $31,183 | $716 |
| 12 | CKIBS | $31,215 | $747 |
| 13 | CGEBS | $31,221 | $753 |
| 14 | CDBBS | $31,223 | $756 |
| 15 | CCBBS | $31,232 | $764 |
| 16 | CBBBS | $31,245 | $778 |
| 17 | CFEBS | $31,255 | $787 |
| 18 | CAABS | $31,258 | $790 |
| 19 | CEEBS | $31,263 | $796 |
| 20 | CIDBS | $31,274 | $807 |
| 21 | CJDBS | $31,353 | $885 |
| 22 | CAABA | $31,357 | $889 |
| 23 | CAAHS | $31,410 | $943 |

### 7.8.3.3 Evergy Metro

**Table 84: Evergy Metro 15-Year Expected Value NPVRR**

| Rank (L-H) | Plan | 15-Year NPVRR ($mm) | Delta |
|---|---|---|---|
| 1 | MCGDU | $15,682 | $0 |
| 2 | MCGDS | $15,685 | $4 |
| 3 | MDDCS | $15,692 | $10 |
| 4 | MBBCS | $15,711 | $29 |
| 5 | MCCCS | $15,729 | $47 |
| 6 | MAACS | $15,747 | $65 |
| 7 | MCGCT | $15,760 | $79 |
| 8 | MFFCS | $15,767 | $85 |
| 9 | MAACA | $15,770 | $88 |
| 10 | MAABS | $15,771 | $89 |
| 11 | MCGCS | $15,771 | $90 |
| 12 | MCGCU | $15,779 | $97 |
| 13 | MEECS | $15,793 | $111 |
| 14 | MCGBU | $15,807 | $125 |
| 15 | MAAAS | $16,031 | $349 |

**Table 85: Evergy Metro 20-Year Expected Value NPVRR**

| Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta |
|---|---|---|---|
| 1 | MCGDU | $18,655 | $0 |
| 2 | MCGCU | $18,702 | $47 |
| 3 | MCGBU | $18,716 | $61 |
| 4 | MCGCT | $18,724 | $69 |
| 5 | MDDCS | $18,728 | $74 |
| 6 | MBBCS | $18,754 | $99 |
| 7 | MCCCS | $18,774 | $119 |
| 8 | MCGDS | $18,784 | $129 |
| 9 | MAABS | $18,787 | $132 |
| 10 | MCGCS | $18,789 | $134 |
| 11 | MAACS | $18,795 | $140 |
| 12 | MFFCS | $18,840 | $186 |
| 13 | MAACA | $18,855 | $201 |
| 14 | MEECS | $18,908 | $253 |
| 15 | MAAAS | $19,058 | $403 |

### 7.8.4 15 VS 20 YEAR PLANNING HORIZON COMPARISONS

Given the differences in the Kansas and Missouri IRP requirements, Evergy has evaluated the Alternative Resource Plans on both a 15-year and 20-year basis. Under many of the scenarios analyzed, the conclusions are the same. However, under certain scenarios they are not. In general, the shorter view can show that future renewable generation additions are less economic (i.e., do not decrease the NPVRR as much) since the benefits of the zero marginal cost energy and potential future avoided generation capacity additions are truncated as compared to a longer-term analysis period. The same can be seen with DSM programs. For the 2021 IRP analysis, DSM program costs were generally assumed to be recovered in the year incurred. Since the DSM program benefits occur over subsequent years, a shorter analysis period can truncate the benefits, but still incur the full program costs making the programs look less economic.

Table 86 through Table 89 below compare the Evergy Kansas Central results for the 15- and 20-year analysis periods. In general, the conclusions for the 15- and 20-year periods are the same when looking at the expected value results over the 27 scenarios analyzed. The same is true for the high $CO_2$ cost scenario (mid-gas and mid-load forecast). Results start to diverge under the mid-$CO_2$ cost scenarios. Under the mid-$CO_2$, mid-gas, mid-load scenario, the assumed DSM programs increase NPVRR under a 15-year view. Under the 20-year view, DSM programs are economic (i.e., reduce NPVRR). The 2023 solar addition and Lawrence retirements remain economic decisions under the 15 or 20-year view.

Results for the 15- vs. 20-year view diverge further under the low-$CO_2$ cost scenarios. In the 15-year view, under the low-$CO_2$ cost scenario, DSM programs, the 2023 Lawrence 4&5 retirements and solar addition increase revenue requirements. Under the 20-year view, DSM programs, the Lawrence retirements and the solar addition are economic.

**Table 86: Evergy Kansas Central - 15 vs 20 Year Results - 27 Scenario Expected Value**

| 27 Scenario Expected Value | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | CLJBV | CLJBV | CLJHV has no new DSM, CLJBV is the Preferred Plan |
| 2023 Solar Addition | Decreases NPVRR | Decreases NPVRR | CAABS (Solar) vs. CAABA (no Solar) |
| DSM Programs | Decreases NPVRR | Decreases NPVRR | CLJHV (no DSM) vs. CLJBV (DSM) |
| LEC 2023 Retirement | Decreases NPVRR | Decreases NPVRR | CLJBV (LEC in 23) vs. CHFBV (LEC in 30) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | CLJBV (Wind) vs. CLJBU (no Wind) |

**Table 87: Evergy Kansas Central - 15 vs 20 Year Results – High $CO_2$, Mid-Nat Gas, Mid Load**

| High $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | CLJBV | CLJBV | CLJHV has no new DSM, CLJBV is the Preferred Plan |
| 2023 Solar Addition | Decreases NPVRR | Decreases NPVRR | CAABS (Solar) vs. CAABA (no Solar) |
| DSM Programs | Decreases NPVRR | Decreases NPVRR | CLJHV (no DSM) vs. CLJBV (DSM) |
| LEC 2023 Retirement | Decreases NPVRR | Decreases NPVRR | CLJBV (LEC in 23) vs. CHFBV (LEC in 30) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | CLJBV (Wind) vs. CLJBU (no Wind) |

**Table 88: Evergy Kansas Central - 15 vs 20 Year Results – Mid $CO_2$, Mid-Nat Gas, Mid Load**

| Mid $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | CLJHV | CLJBV | CLJHV has no new DSM, CLJBV is the Preferred Plan |
| 2023 Solar Addition | Decreases NPVRR | Decreases NPVRR | CAABS (Solar) vs. CAABA (no Solar) |
| DSM Programs | Increases NPVRR | Decreases NPVRR | CLJHV (no DSM) vs. CLJBV (DSM) |
| LEC 2023 Retirement | Decreases NPVRR | Decreases NPVRR | CLJBV (LEC in 23) vs. CHFBV (LEC in 30) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | CLJBV (Wind) vs. CLJBU (no Wind) |

**Table 89: Evergy Kansas Central - 15 vs 20 Year Results – Low $CO_2$, Mid-Nat Gas, Mid Load**

| Low $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | CLJHV | CLJBV | CLJHV has no new DSM, CLJBV is the Preferred Plan |
| 2023 Solar Addition | Increases NPVRR | Decreases NPVRR | CAABS (Solar) vs. CAABA (no Solar) |
| DSM Programs | Increases NPVRR | Decreases NPVRR | CLJHV (no DSM) vs. CLJBV (DSM) |
| LEC 2023 Retirement | Increases NPVRR | Decreases NPVRR | CLJBV (LEC in 23) vs. CHFBV (LEC in 30) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | CLJBV (Wind) vs. CLJBU (no Wind) |

There are larger differences in the conclusions reached for Evergy Metro than Evergy Kansas Central when comparing a 15-year view to a 20-year view. Table 90 through Table 93 below compare the Metro results for the 15- and 20-year analysis periods. Under the expected value results over the 27 scenarios analyzed, the conclusions are different for both the delayed LaCygne 2 retirement and the 2025 and 2026 wind resource additions. Under the 15-year view, these decisions are projected to increase the expected value NPVRR while under the 20-year view, these decisions are projected to decrease NPVRR. Given the 15-year view includes roughly 10 years of wind generation operations for these facilities that should operate for 20-30 years, the long-term benefits are not being recognized under this view.

The conclusions differ under the high-$CO_2$ cost scenarios as well. Under the high-$CO_2$ cost, mid-gas and mid-load scenario on 15-year NPVRR basis, Metro DSM programs increase NPVRR where under the 20-year view NPVRR is reduced. As mentioned earlier, this is driven at least in part by the assumption that DSM cost are recovered as incurred and the benefits follow in subsequent years. Limiting the analysis period to 15 years truncates these benefits while incurring most of the full program costs.

Results diverge further under the mid-$CO_2$ cost scenarios. Under a 15-year view, DSM programs, the delay in the LaCygne 2 retirement, and the 2025/2026 wind additions increase NPVRR where under the 20-year view, only DSM programs increase NPVRR. In addition, as can be seen in the table below, the conclusions reached under the low-CO2 cost scenario is dependent on the analysis period as well.

**Table 90: Evergy Metro - 15 vs 20 Year Results - 27 Scenario Expected Value**

| 27 Scenario Expected Value | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | MAACS | MCGCU | MCGCU is the Preferred Plan, MAACS only adds 2024 solar |
| 2024 Solar Addition | Decreases NPVRR | Decreases NPVRR | MAACS (Solar) vs. MAACA (no Solar) |
| DSM Programs | Increases NPVRR | Increases NPVRR | MCGCU (DSM) vs. MCGDU (no new DSM) |
| LAC 2 2039 Retirement | Increases NPVRR | Decreases NPVRR | MAACS (LaC 2029) vs. MCGCS (LaC 2039) |
| Wind Additions 2025 and 2026 | Increases NPVRR | Decreases NPVRR | MCGCU (Wind) vs. MCGCT (no Wind) |

**Table 91: Evergy Metro - 15 vs 20 Year Results – High $CO_2$, Mid-Nat Gas, Mid Load**

| High $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | MCGCU | MCGCU | MCGCU is the Preferred Plan |
| 2024 Solar Addition | Decreases NPVRR | Decreases NPVRR | MAACS (Solar) vs. MAACA (no Solar) |
| DSM Programs | Increases NPVRR | Decreases NPVRR | MCGCU (DSM) vs. MCGDU (no new DSM) |
| LAC 2 2039 Retirement | Increases NPVRR | Increases NPVRR | MAACS (LaC 2029) vs. MCGCS (LaC 2039) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | MCGCU (Wind) vs. MCGCT (no Wind) |

**Table 92: Evergy Metro - 15 vs 20 Year Results – Mid $CO_2$, Mid-Nat Gas, Mid Load**

| Mid $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | MAACS | MCGCU | MCGCU is the Preferred Plan, MAACS only adds 2024 solar |
| 2024 Solar Addition | Decreases NPVRR | Decreases NPVRR | MAACS (Solar) vs. MAACA (no Solar) |
| DSM Programs | Increases NPVRR | Increases NPVRR | MCGCU (DSM) vs. MCGDU (no new DSM) |
| LAC 2 2039 Retirement | Increases NPVRR | Decreases NPVRR | MAACS (LaC 2029) vs. MCGCS (LaC 2039) |
| Wind Additions 2025 and 2026 | Increases NPVRR | Decreases NPVRR | MCGCU (Wind) vs. MCGCT (no Wind) |

**Table 93: Evergy Metro - 15 vs 20 Year Results – Low $CO_2$, Mid-Nat Gas, Mid Load**

| Low $CO_2$, Mid Gas, Mid Load | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | MCGCS | MCGCS | MCGCS inc. only 2024 solar |
| 2024 Solar Addition | Increases NPVRR | Decreases NPVRR | MAACS (Solar) vs. MAACA (no Solar) |
| DSM Programs | Increases NPVRR | Increases NPVRR | MCGCU (DSM) vs. MCGDU (no new DSM) |
| LAC 2 2039 Retirement | Decreases NPVRR | Decreases NPVRR | MAACS (LaC 2029) vs. MCGCS (LaC 2039) |
| Wind Additions 2025 and 2026 | Increases NPVRR | Increases NPVRR | MCGCU (Wind) vs. MCGCT (no Wind) |

In addition to comparing results of the stand-alone utility systems Alternative Resource Plans on a 15- and 20-year NPVRR basis, this analysis was also conducted at a combined utility level (i.e., total Evergy). The results on an expected value basis over the 27 scenarios analyzed in this IRP are shown in Table 94 below.

Note that the conclusions are generally similar except for the impact of DSM programs. Consistent with the results in some of the stand-alone utility results, truncating the analysis period reduces the benefits of these programs such that the NPVRR increases.

Given that the decisions made in an IRP typically involve long-lived assets that may be part of a utility's supply portfolio for multiple decades, it is important to evaluate the options over a long-term period. Given the primary objective to minimize the expected value NPVRR, this IRP shows similar results for the 15- and 20-year analysis periods, except for DSM program impacts. Given the 20-year results show reductions in the expected value NPVRR and the growing importance of managing customer demand, DSM is included in both the Evergy Kansas Central and Evergy Metro Preferred Portfolio.

**Table 94: Evergy - 15 vs 20 Year Results - 27 Scenario Expected Value**

| 27 Scenario Expected Value | 15 Year | 20 Year | Plan Compares |
|---|---|---|---|
| Scenario Preferred Plan | ERVDL | ERVFL | ERVFL is the Preferred Plan, ERVDL is Preferred Plan w/o DSM |
| 2023 and 2024 Solar Additions | Decreases NPVRR | Decreases NPVRR | EAAGS (23,24 Solar) vs. EAAGA (no Solar) |
| DSM Programs | Increases NPVRR | Decreases NPVRR | ERVFL (RAP) vs. ERVDL (MEEIA 3) |
| LAC 2 2039 Retirement | Decreases NPVRR | Decreases NPVRR | EQUFS (LaC2 2039) vs. EKKFS (LaC2 2029) |
| Wind Additions 2025 and 2026 | Decreases NPVRR | Decreases NPVRR | ERVFL (Wind) vs. ERVFM (no Wind) |
| LEC 2023 Retirement | Decreases NPVRR | Decreases NPVRR | EKKGS (LEC 2023) vs. EAAGS (LEC 2030) |

### 7.8.5 RESULTS – NPVRR RANKING BASED UPON $CO_2$ ASSUMPTIONS

The ARPs are also ranked by their sub-sets of results, representing a known state of $CO_2$. The first set of NPVRR results represent the nine endpoints assuming no future $CO_2$ costs. The second set of NPVRR results represent the mid-priced $CO_2$ costs scenarios. The third set of NPVRR results represent the high-priced $CO_2$ cost scenarios. Both 20-year NPVRR and 15-year NPVRR results are provided in Table 95 through Table 98 below.

**Table 95: Evergy Kansas Central Alternative Resource Plan Ranking Based upon $CO_2$ Assumptions – 20-Year NPVRR**

| No $CO_2$ | | | | Mid $CO_2$ | | | | High $CO_2$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta | Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta | Rank (L-H) | Plan | 20-Year NPVRR ($mm) | Delta |
| 1 | CLJBS | $29,238 | $0 | 1 | CLJBV | $30,294 | $0 | 1 | CLJBV | $32,203 | $0 |
| 2 | CCGBS | $29,248 | $10 | 2 | CHFBV | $30,343 | $49 | 2 | CHFBV | $32,268 | $65 |
| 3 | CLJBV | $29,253 | $15 | 3 | CLJHV | $30,407 | $113 | 3 | CLJHV | $32,534 | $331 |
| 4 | CLJBA | $29,253 | $15 | 4 | CLJBU | $30,490 | $196 | 4 | CLJBU | $32,873 | $670 |
| 5 | CLJBU | $29,253 | $15 | 5 | CKIBT | $30,573 | $279 | 5 | CKIBT | $32,877 | $674 |
| 6 | CHFBV | $29,271 | $33 | 6 | CGEBT | $30,681 | $387 | 6 | CGEBT | $33,172 | $969 |
| 7 | CLJHV | $29,296 | $58 | 7 | CLJBS | $30,740 | $446 | 7 | CKIBS | $33,761 | $1,558 |
| 8 | CGEBT | $29,372 | $134 | 8 | CIHBS | $30,788 | $494 | 8 | CIHBS | $33,785 | $1,582 |
| 9 | CCBBS | $29,373 | $135 | 9 | CHDBS | $30,806 | $512 | 9 | CLJBS | $33,814 | $1,611 |
| 10 | CGEBS | $29,378 | $140 | 10 | CLJBA | $30,824 | $530 | 10 | CHDBS | $33,830 | $1,627 |
| 11 | CHDBS | $29,382 | $144 | 11 | CCGBS | $30,882 | $588 | 11 | CJDBS | $33,836 | $1,633 |
| 12 | CAABS | $29,387 | $149 | 12 | CKIBS | $30,894 | $600 | 12 | CIDBS | $33,870 | $1,667 |
| 13 | CAABA | $29,392 | $153 | 13 | CGEBS | $30,907 | $613 | 13 | CDBBS | $33,983 | $1,780 |
| 14 | CEEBS | $29,399 | $161 | 14 | CDBBS | $30,911 | $617 | 14 | CGEBS | $34,004 | $1,801 |
| 15 | CDBBS | $29,402 | $164 | 15 | CCBBS | $30,920 | $626 | 15 | CBBBS | $34,014 | $1,811 |
| 16 | CFEBS | $29,405 | $167 | 16 | CBBBS | $30,934 | $640 | 16 | CCGBS | $34,021 | $1,818 |
| 17 | CBBBS | $29,412 | $174 | 17 | CFEBS | $30,942 | $648 | 17 | CCBBS | $34,025 | $1,822 |
| 18 | CIHBS | $29,431 | $193 | 18 | CAABS | $30,947 | $653 | 18 | CFEBS | $34,042 | $1,839 |
| 19 | CAAHS | $29,440 | $202 | 19 | CIDBS | $30,949 | $655 | 19 | CAABS | $34,060 | $1,857 |
| 20 | CKIBT | $29,527 | $289 | 20 | CEEBS | $30,952 | $658 | 20 | CEEBS | $34,062 | $1,859 |
| 21 | CKIBS | $29,629 | $391 | 21 | CJDBS | $31,021 | $727 | 21 | CLJBA | $34,095 | $1,892 |
| 22 | CIDBS | $29,657 | $419 | 22 | CAABA | $31,022 | $728 | 22 | CAABA | $34,326 | $2,124 |
| 23 | CJDBS | $29,862 | $624 | 23 | CAAHS | $31,071 | $777 | 23 | CAAHS | $34,399 | $2,196 |

**Table 96: Evergy Kansas Central Alternative Resource Plan Ranking Based upon $CO_2$ Assumptions – 15-Year NPVRR**

| No $CO_2$ | | | | Mid $CO_2$ | | | | High $CO_2$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank (L-H) | Plan | 15-Year NPVRR ($mm) | Delta | Rank (L-H) | Plan | 15-Year NPVRR ($mm) | Delta | Rank (L-H) | Plan | 15-Year NPVRR ($mm) | Delta |
| 1 | CLJBA | $24,615 | $0 | 1 | CLJHV | $25,278 | $0 | 1 | CLJBV | $26,457 | $0 |
| 2 | CLJHV | $24,642 | $27 | 2 | CLJBV | $25,294 | $16 | 2 | CHFBV | $26,512 | $56 |
| 3 | CCGBS | $24,642 | $27 | 3 | CLJBU | $25,410 | $133 | 3 | CLJHV | $26,583 | $127 |
| 4 | CLJBS | $24,656 | $42 | 4 | CLJBS | $25,506 | $228 | 4 | CLJBU | $26,918 | $462 |
| 5 | CAAHS | $24,684 | $70 | 5 | CLJBA | $25,509 | $231 | 5 | CKIBT | $26,929 | $473 |
| 6 | CAABA | $24,691 | $77 | 6 | CGEBT | $25,536 | $259 | 6 | CGEBT | $27,092 | $636 |
| 7 | CLJBV | $24,701 | $86 | 7 | CKIBT | $25,550 | $273 | 7 | CIHBS | $27,479 | $1,022 |
| 8 | CLJBU | $24,701 | $87 | 8 | CHDBS | $25,551 | $274 | 8 | CLJBS | $27,484 | $1,027 |
| 9 | CCBBS | $24,710 | $96 | 9 | CIHBS | $25,566 | $288 | 9 | CHDBS | $27,486 | $1,030 |
| 10 | CHFBV | $24,710 | $96 | 10 | CCGBS | $25,586 | $308 | 10 | CKIBS | $27,504 | $1,048 |
| 11 | CAABS | $24,721 | $106 | 11 | CGEBS | $25,589 | $312 | 11 | CDBBS | $27,580 | $1,123 |
| 12 | CGEBS | $24,721 | $106 | 12 | CCBBS | $25,597 | $319 | 12 | CGEBS | $27,594 | $1,137 |
| 13 | CEEBS | $24,731 | $117 | 13 | CDBBS | $25,600 | $322 | 13 | CBBBS | $27,605 | $1,148 |
| 14 | CFEBS | $24,742 | $127 | 14 | CBBBS | $25,617 | $339 | 14 | CCBBS | $27,609 | $1,152 |
| 15 | CHDBS | $24,751 | $137 | 15 | CFEBS | $25,618 | $340 | 15 | CIDBS | $27,613 | $1,157 |
| 16 | CDBBS | $24,752 | $137 | 16 | CAABS | $25,620 | $342 | 16 | CJDBS | $27,614 | $1,158 |
| 17 | CBBBS | $24,756 | $141 | 17 | CEEBS | $25,624 | $346 | 17 | CCGBS | $27,625 | $1,169 |
| 18 | CIHBS | $24,793 | $179 | 18 | CAAHS | $25,626 | $348 | 18 | CFEBS | $27,626 | $1,169 |
| 19 | CGEBT | $24,802 | $188 | 18 | CHFBV | $25,626 | $348 | 19 | CLJBA | $27,632 | $1,175 |
| 20 | CKIBT | $25,003 | $388 | 20 | CAABA | $25,634 | $356 | 20 | CAABS | $27,641 | $1,184 |
| 21 | CKIBS | $25,041 | $426 | 21 | CKIBS | $25,722 | $444 | 21 | CEEBS | $27,642 | $1,185 |
| 22 | CIDBS | $25,069 | $454 | 22 | CIDBS | $25,776 | $499 | 22 | CAAHS | $27,784 | $1,328 |
| 23 | CJDBS | $25,255 | $641 | 23 | CJDBS | $25,876 | $598 | 23 | CAABA | $27,793 | $1,336 |

**Table 97: Evergy Metro Alternative Resource Plan Ranking Based upon $CO_2$ Assumptions – 20-Year NPVRR**

| No $CO_2$ | | | Mid $CO_2$ | | | High $CO_2$ | | |
|---|---|---|---|---|---|---|---|---|
| Plan | 20-Year NPVRR ($mm) | Delta | Plan | 20-Year NPVRR ($mm) | Delta | Plan | 20-Year NPVRR ($mm) | Delta |
| MCGDS | $17,441 | $0 | MCGDU | $18,535 | $0 | MCGBU | $20,034 | $0 |
| MCGCS | $17,505 | $64 | MDDCS | $18,552 | $16 | MCGCU | $20,052 | $18 |
| MDDCS | $17,552 | $111 | MBBCS | $18,578 | $42 | MCGDU | $20,111 | $77 |
| MCGDU | $17,557 | $117 | MCGCT | $18,597 | $62 | MCGCT | $20,245 | $210 |
| MCCCS | $17,564 | $124 | MCGCU | $18,597 | $62 | MDDCS | $20,435 | $401 |
| MBBCS | $17,565 | $125 | MCCCS | $18,601 | $66 | MBBCS | $20,470 | $436 |
| MAACA | $17,572 | $131 | MCGDS | $18,607 | $71 | MFFCS | $20,485 | $451 |
| MAACS | $17,572 | $131 | MCGBU | $18,616 | $81 | MAABS | $20,491 | $457 |
| MAABS | $17,580 | $139 | MAABS | $18,621 | $86 | MCCCS | $20,502 | $467 |
| MCGCT | $17,584 | $143 | MAACS | $18,624 | $89 | MAACS | $20,532 | $498 |
| MCGCU | $17,664 | $224 | MCGCS | $18,628 | $93 | MEECS | $20,537 | $503 |
| MCGBU | $17,697 | $256 | MFFCS | $18,664 | $129 | MCGCS | $20,557 | $523 |
| MFFCS | $17,724 | $284 | MAACA | $18,669 | $134 | MCGDS | $20,660 | $626 |
| MEECS | $17,828 | $387 | MEECS | $18,725 | $190 | MAAAS | $20,694 | $660 |
| MAAAS | $17,889 | $448 | MAAAS | $18,903 | $367 | MAACA | $20,698 | $663 |

**Table 98: Evergy Metro Alternative Resource Plan Ranking Based upon $CO_2$ Assumptions – 15-Year NPVRR**

| No $CO_2$ | | | Mid $CO_2$ | | | High $CO_2$ | | |
|---|---|---|---|---|---|---|---|---|
| Plan | 15-Year NPVRR ($mm) | Delta | Plan | 15-Year NPVRR ($mm) | Delta | Plan | 15-Year NPVRR ($mm) | Delta |
| MCGDS | $14,883 | $0 | MCGDS | $15,558 | $0 | MCGDU | $16,572 | $0 |
| MAACA | $15,005 | $122 | MDDCS | $15,565 | $7 | MCGCU | $16,594 | $22 |
| MCGCS | $15,009 | $126 | MBBCS | $15,585 | $27 | MCGBU | $16,600 | $28 |
| MDDCS | $15,015 | $131 | MCGDU | $15,602 | $43 | MCGCT | $16,699 | $127 |
| MCCCS | $15,018 | $135 | MCCCS | $15,607 | $48 | MDDCS | $16,748 | $176 |
| MBBCS | $15,021 | $138 | MAACS | $15,626 | $68 | MBBCS | $16,777 | $205 |
| MAACS | $15,022 | $139 | MAACA | $15,637 | $78 | MFFCS | $16,787 | $215 |
| MCGDU | $15,032 | $148 | MFFCS | $15,643 | $85 | MEECS | $16,805 | $233 |
| MAABS | $15,058 | $174 | MAABS | $15,654 | $95 | MCCCS | $16,806 | $234 |
| MCGCT | $15,083 | $200 | MCGCS | $15,656 | $98 | MAACS | $16,833 | $261 |
| MFFCS | $15,116 | $232 | MEECS | $15,667 | $108 | MAABS | $16,835 | $263 |
| MEECS | $15,160 | $277 | MCGCT | $15,673 | $115 | MCGDS | $16,868 | $296 |
| MCGCU | $15,169 | $285 | MCGCU | $15,711 | $152 | MCGCS | $16,878 | $306 |
| MCGBU | $15,208 | $325 | MCGBU | $15,742 | $184 | MAACA | $16,934 | $362 |
| MAAAS | $15,339 | $456 | MAAAS | $15,921 | $363 | MAAAS | $17,052 | $480 |

### 7.8.6 RESULTS – PERFORMANCE MEASURES

The expected value for each Evergy Kansas Central ARP's performance measures and the standard deviation plan performance measures are provided in Table 99 and Table 100 respectively below:

**Table 99: Evergy Kansas Central Expected Value Plan Performance Measures**

| Plan | NPVRR ($MM) | DSM Performance Incentive Costs ($MM) | Levelized Annual Rates ($/KW-hr) | Maximum Rate Increase | Times Interest Earned | Total Debt to Capital |
|---|---|---|---|---|---|---|
| CLJBV | 25,408 | 37.50 | 0.116 | 5.38% | 4.99 | 49.50 |
| CLJHV | 25,412 | 0.00 | 0.113 | 5.98% | 4.97 | 49.50 |
| CHFBV | 25,445 | 37.50 | 0.116 | 5.58% | 4.99 | 49.50 |
| CLJBU | 25,570 | 37.50 | 0.117 | 7.13% | 5.07 | 49.39 |
| CGEBT | 25,701 | 37.50 | 0.118 | 5.56% | 5.02 | 49.49 |
| CKIBT | 25,717 | 37.50 | 0.118 | 5.59% | 5.03 | 49.65 |
| CLJBS | 25,731 | 37.50 | 0.118 | 8.05% | 5.12 | 49.59 |
| CLJBA | 25,755 | 37.50 | 0.118 | 8.73% | 5.12 | 49.94 |
| CHDBS | 25,778 | 37.50 | 0.118 | 8.85% | 5.12 | 49.55 |
| CIHBS | 25,794 | 37.50 | 0.119 | 8.32% | 5.13 | 49.56 |
| CCGBS | 25,805 | 37.50 | 0.118 | 8.19% | 5.09 | 49.59 |
| CGEBS | 25,817 | 37.50 | 0.119 | 7.88% | 5.10 | 49.52 |
| CCBBS | 25,822 | 37.50 | 0.119 | 8.11% | 5.10 | 49.53 |
| CDBBS | 25,826 | 37.50 | 0.119 | 8.04% | 5.10 | 49.47 |
| CBBBS | 25,842 | 37.50 | 0.119 | 7.94% | 5.10 | 49.51 |
| CAABS | 25,844 | 37.50 | 0.119 | 7.91% | 5.10 | 49.51 |
| CFEBS | 25,844 | 37.50 | 0.119 | 7.91% | 5.10 | 49.49 |
| CEEBS | 25,849 | 37.50 | 0.119 | 7.87% | 5.09 | 49.54 |
| CAAHS | 25,869 | 0.00 | 0.116 | 8.73% | 5.08 | 49.45 |
| CAABA | 25,877 | 37.50 | 0.119 | 8.59% | 5.12 | 49.66 |
| CKIBS | 25,942 | 37.50 | 0.119 | 8.25% | 5.08 | 49.72 |
| CIDBS | 26,002 | 37.50 | 0.119 | 7.19% | 5.08 | 49.70 |
| CJDBS | 26,099 | 37.50 | 0.120 | 7.40% | 5.05 | 49.88 |

**Table 100: Evergy Kansas Central Standard Deviation Plan Performance Measures**

| Plan | NPVRR ($MM) | DSM Performance Incentive Costs ($MM) | Levelized Annual Rates ($/KW-hr) | Maximum Rate Increase | Times Interest Earned | Total Debt to Capital |
|---|---|---|---|---|---|---|
| CLJBV | 954 | 0.00 | 0.006 | 1.24% | 0.00 | 0.00 |
| CLJHV | 1,028 | 0.00 | 0.006 | 1.28% | 0.00 | 0.00 |
| CHFBV | 972 | 0.00 | 0.006 | 1.25% | 0.00 | 0.00 |
| CLJBU | 1,133 | 0.00 | 0.007 | 1.52% | 0.00 | 0.00 |
| CGEBT | 1,161 | 0.00 | 0.007 | 1.58% | 0.00 | 0.00 |
| CKIBT | 1,033 | 0.00 | 0.007 | 1.43% | 0.00 | 0.00 |
| CLJBS | 1,376 | 0.00 | 0.008 | 1.88% | 0.00 | 0.00 |
| CLJBA | 1,453 | 0.00 | 0.009 | 1.99% | 0.00 | 0.00 |
| CHDBS | 1,341 | 0.00 | 0.008 | 1.85% | 0.00 | 0.00 |
| CIHBS | 1,321 | 0.00 | 0.008 | 1.77% | 0.00 | 0.00 |
| CCGBS | 1,433 | 0.00 | 0.009 | 1.96% | 0.00 | 0.00 |
| CGEBS | 1,393 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CCBBS | 1,402 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CDBBS | 1,377 | 0.00 | 0.008 | 1.92% | 0.00 | 0.00 |
| CBBBS | 1,383 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CAABS | 1,409 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CFEBS | 1,396 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CEEBS | 1,405 | 0.00 | 0.009 | 1.92% | 0.00 | 0.00 |
| CAAHS | 1,485 | 0.00 | 0.009 | 1.95% | 0.00 | 0.00 |
| CAABA | 1,483 | 0.00 | 0.009 | 2.02% | 0.00 | 0.00 |
| CKIBS | 1,248 | 0.00 | 0.008 | 1.74% | 0.00 | 0.00 |
| CIDBS | 1,276 | 0.00 | 0.008 | 1.75% | 0.00 | 0.00 |
| CJDBS | 1,218 | 0.00 | 0.008 | 1.69% | 0.00 | 0.00 |

The expected value for each Evergy Metro ARP's performance measures and the standard deviation plan performance measures are provided in Table 101 and Table 102 respectively below:

**Table 101: Evergy Metro Expected Value Plan Performance Measures**

| Plan | NPVRR ($MM) | DSM Performance Incentive Costs ($MM) | Levelized Annual Rates ($/KW-hr) | Maximum Rate Increase | Times Interest Earned | Total Debt to Capital |
|---|---|---|---|---|---|---|
| MCGDU | 15,682 | 6.37 | 0.109 | 6.46% | 4.17 | 49.26 |
| MCGDS | 15,685 | 6.37 | 0.109 | 8.61% | 3.98 | 49.26 |
| MDDCS | 15,692 | 25.05 | 0.111 | 7.60% | 3.96 | 49.26 |
| MBBCS | 15,711 | 25.05 | 0.112 | 7.55% | 3.97 | 49.26 |
| MCCCS | 15,729 | 25.05 | 0.112 | 7.76% | 3.97 | 49.26 |
| MAACS | 15,747 | 25.05 | 0.112 | 7.53% | 3.98 | 49.26 |
| MCGCT | 15,760 | 25.05 | 0.112 | 7.14% | 4.10 | 49.26 |
| MFFCS | 15,767 | 25.05 | 0.112 | 7.27% | 4.00 | 49.26 |
| MAACA | 15,770 | 25.05 | 0.112 | 8.24% | 3.94 | 49.26 |
| MAABS | 15,771 | 30.86 | 0.113 | 7.35% | 3.98 | 49.26 |
| MCGCS | 15,771 | 25.05 | 0.112 | 8.00% | 3.99 | 49.26 |
| MCGCU | 15,779 | 25.05 | 0.112 | 5.88% | 4.18 | 49.26 |
| MEECS | 15,793 | 25.05 | 0.112 | 7.50% | 4.01 | 49.26 |
| MCGBU | 15,807 | 30.86 | 0.113 | 5.70% | 4.18 | 49.26 |
| MAAAS | 16,031 | 63.47 | 0.116 | 6.94% | 4.00 | 49.26 |

**Table 102: Evergy Metro Standard Deviation Plan Performance Measures**

| Plan | NPVRR ($MM) | DSM Performance Incentive Costs ($MM) | Levelized Annual Rates ($/KW-hr) | Maximum Rate Increase | Times Interest Earned | Total Debt to Capital |
|---|---|---|---|---|---|---|
| MCGDU | 826 | 0.00 | 0.007 | 1.05% | 0.00 | 0.00 |
| MCGDS | 985 | 0.00 | 0.009 | 1.43% | 0.00 | 0.00 |
| MDDCS | 880 | 0.00 | 0.008 | 1.42% | 0.00 | 0.00 |
| MBBCS | 891 | 0.00 | 0.008 | 1.43% | 0.00 | 0.00 |
| MCCCS | 905 | 0.00 | 0.008 | 1.46% | 0.00 | 0.00 |
| MAACS | 917 | 0.00 | 0.008 | 1.46% | 0.00 | 0.00 |
| MCGCT | 852 | 0.00 | 0.008 | 1.33% | 0.00 | 0.00 |
| MFFCS | 856 | 0.00 | 0.008 | 1.42% | 0.00 | 0.00 |
| MAACA | 960 | 0.00 | 0.009 | 1.60% | 0.00 | 0.00 |
| MAABS | 905 | 0.00 | 0.008 | 1.48% | 0.00 | 0.00 |
| MCGCS | 943 | 0.00 | 0.009 | 1.50% | 0.00 | 0.00 |
| MCGCU | 788 | 0.00 | 0.007 | 1.12% | 0.00 | 0.00 |
| MEECS | 843 | 0.00 | 0.008 | 1.42% | 0.00 | 0.00 |
| MCGBU | 777 | 0.00 | 0.007 | 1.13% | 0.00 | 0.00 |
| MAAAS | 882 | 0.00 | 0.008 | 1.55% | 0.00 | 0.00 |

## 7.9 EVERGY KANSAS CENTRAL - ADDITIONAL SENSITIVITY ANALYSES

In the Evergy Kansas Central rankings below, more than half of the low ranking ARPs all share the same retirement scenarios - retiring Lawrence 4 and 5 by December 31, 2023 and Jeffrey 3 by December 31, 2030. Evergy Kansas Central's 373 MW share of LaCygne-1 in 2032 which coincides with the book life retirement date for the Evergy Kansas Central share of the generating unit and extending the book life of Evergy Kansas Central's 331 MW share of LaCygne-2 from 2029 to 2039.

**Table 103: Evergy Kansas Central Lowest NPVRR Alternative Resource Plan By Endpoint**

| Endpoint | ARP | Load Growth | Natural Gas | $CO_2$ | Endpoint Probability |
|---|---|---|---|---|---|
| 1 | CLJBV | High | High | High | 0.5% |
| 2 | CHFBV | High | High | Mid | 1.4% |
| 3 | CHFBV | High | High | Low | 0.5% |
| 4 | CLJBV | High | Mid | High | 1.5% |
| 5 | CLJBV | High | Mid | Mid | 4.5% |
| 6 | CCGBS | High | Mid | Low | 1.5% |
| 7 | CLJBV | High | Low | High | 1.1% |
| 8 | CLJHV | High | Low | Mid | 3.2% |
| 9 | CLJBA | High | Low | Low | 1.1% |
| 10 | CLJBV | Mid | High | High | 1.5% |
| 11 | CHFBV | Mid | High | Mid | 4.5% |
| 12 | CHFBV | Mid | High | Low | 1.5% |
| 13 | CLJBV | Mid | Mid | High | 5.0% |
| 14 | CLJHV | Mid | Mid | Mid | 15.0% |
| 15 | CCGBS | Mid | Mid | Low | 5.0% |
| 16 | CLJBV | Mid | Low | High | 3.5% |
| 17 | CLJHV | Mid | Low | Mid | 10.5% |
| 18 | CLJBA | Mid | Low | Low | 3.5% |
| 19 | CLJBV | Low | High | High | 1.1% |
| 20 | CHFBV | Low | High | Mid | 3.2% |
| 21 | CCGBS | Low | High | Low | 1.1% |
| 22 | CLJBV | Low | Mid | High | 3.5% |
| 23 | CLJHV | Low | Mid | Mid | 10.5% |
| 24 | CCGBS | Low | Mid | Low | 3.5% |
| 25 | CLJBV | Low | Low | High | 2.5% |
| 26 | CLJHV | Low | Low | Mid | 7.4% |
| 27 | CLJBA | Low | Low | Low | 2.5% |

The following tables, Table 104 through Table 109, represent the Evergy Kansas Central sensitivities for the uncertain factors by scenario/endpoint.

## Table 104: Evergy Kansas Central Uncertain Factors Sensitivities – High Load Growth Vs. Natural Gas and $CO_2$

| | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | | | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | | | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Endpoint | 1 | Endpoint | 2 | Endpoint | 3 | | Endpoint | 4 | Endpoint | 5 | Endpoint | 6 | | Endpoint | 7 | Endpoint | 8 | Endpoint | 9 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| HIGH GAS | CLJBV | 27,857 | CHFBV | 25,920 | CHFBV | 24,997 | MID GAS | CLJBV | 27,686 | CLJBV | 25,996 | CCGBS | 25,098 | LOW GAS | CLJBV | 27,326 | CLJHV | 25,751 | CLJBA | 25,022 |
| | CHFBV | 27,864 | CLJBV | 25,945 | CCGBS | 25,005 | | CHFBV | 27,736 | CLJHV | 25,999 | CLJHV | 25,106 | | CHFBV | 27,412 | CLJBV | 25,794 | CLJBS | 25,088 |
| | CLJHV | 28,046 | CLJHV | 25,973 | CLJHV | 25,041 | | CLJHV | 27,838 | CHFBV | 26,027 | CLJBA | 25,108 | | CLJHV | 27,436 | CLJBU | 25,873 | CLJHV | 25,144 |
| | CLJBU | 28,423 | CLJBU | 26,132 | CLJBV | 25,059 | | CLJBU | 28,186 | CLJBU | 26,136 | CLJBS | 25,143 | | CKIBT | 27,712 | CHFBV | 25,874 | CHDBS | 25,149 |
| | CKIBT | 28,502 | CGEBT | 26,229 | CAABS | 25,123 | | CKIBT | 28,204 | CLJBS | 26,254 | CHFBV | 25,150 | | CLJBU | 27,742 | CLJBA | 25,890 | CAAHS | 25,163 |
| | CGEBT | 28,585 | CCGBS | 26,270 | CAAHS | 25,125 | | CGEBT | 28,359 | CGEBT | 26,258 | CLJBV | 25,153 | | CGEBT | 27,922 | CLJBS | 25,911 | CAABA | 25,165 |
| | CIHBS | 29,055 | CLJBS | 26,295 | CLJBU | 25,126 | | CIHBS | 28,769 | CLJBA | 26,262 | CAAHS | 25,163 | | CKIBS | 28,206 | CKIBT | 25,919 | CDBBS | 25,171 |
| | CLJBS | 29,089 | CLJBA | 26,331 | CAABA | 25,131 | | CLJBS | 28,778 | CKIBT | 26,301 | CAABA | 25,166 | | CLJBS | 28,236 | CHDBS | 25,938 | CGEBS | 25,172 |
| | CHDBS | 29,099 | CAABS | 26,332 | CLJBA | 25,146 | | CHDBS | 28,778 | CHDBS | 26,303 | CLJBU | 25,173 | | CHDBS | 28,241 | CIHBS | 25,957 | CCGBS | 25,175 |
| | CCGBS | 29,171 | CEEBS | 26,348 | CEEBS | 25,148 | | CKIBS | 28,808 | CCGBS | 26,314 | CCBBS | 25,188 | | CIHBS | 28,250 | CDBBS | 25,995 | CCBBS | 25,180 |
| | CAABS | 29,190 | CCBBS | 26,349 | CLJBS | 25,152 | | CDBBS | 28,875 | CIHBS | 26,323 | CAABS | 25,189 | | CJDBS | 28,293 | CGEBS | 26,008 | CLJBU | 25,183 |
| | CCBBS | 29,192 | CIHBS | 26,360 | CCBBS | 25,153 | | CGEBS | 28,887 | CGEBS | 26,332 | CGEBS | 25,201 | | CDBBS | 28,322 | CGEBT | 26,016 | CIHBS | 25,189 |
| | CGEBS | 29,193 | CGEBS | 26,365 | CGEBT | 25,187 | | CBBBS | 28,896 | CCBBS | 26,337 | CEEBS | 25,202 | | CIDBS | 28,327 | CKIBS | 26,022 | CFEBS | 25,204 |
| | CBBBS | 29,196 | CHDBS | 26,370 | CGEBS | 25,194 | | CCBBS | 28,900 | CDBBS | 26,347 | CFEBS | 25,220 | | CGEBS | 28,352 | CCBBS | 26,029 | CBBBS | 25,204 |
| | CKIBS | 29,197 | CAAHS | 26,380 | CFEBS | 25,199 | | CCGBS | 28,912 | CAABS | 26,354 | CBBBS | 25,239 | | CLJBA | 28,356 | CBBBS | 26,037 | CAABS | 25,221 |
| | CEEBS | 29,199 | CFEBS | 26,380 | CBBBS | 25,225 | | CIDBS | 28,913 | CFEBS | 26,358 | CDBBS | 25,244 | | CBBBS | 28,367 | CFEBS | 26,046 | CLJBV | 25,222 |
| | CDBBS | 29,205 | CAABA | 26,381 | CDBBS | 25,262 | | CFEBS | 28,917 | CBBBS | 26,358 | CHDBS | 25,248 | | CCBBS | 28,377 | CAAHS | 26,050 | CEEBS | 25,223 |
| | CFEBS | 29,214 | CBBBS | 26,388 | CHDBS | 25,291 | | CJDBS | 28,919 | CEEBS | 26,358 | CGEBT | 25,265 | | CFEBS | 28,389 | CCGBS | 26,063 | CHFBV | 25,280 |
| | CLJBA | 29,280 | CKIBT | 26,410 | CIHBS | 25,319 | | CAABS | 28,928 | CAABA | 26,374 | CIHBS | 25,298 | | CCGBS | 28,416 | CAABA | 26,065 | CKIBS | 25,314 |
| | CIDBS | 29,291 | CDBBS | 26,412 | CKIBT | 25,619 | | CEEBS | 28,929 | CAAHS | 26,378 | CKIBT | 25,522 | | CEEBS | 28,425 | CEEBS | 26,077 | CGEBT | 25,314 |
| | CJDBS | 29,357 | CKIBS | 26,668 | CKIBS | 25,746 | | CLJBA | 28,935 | CKIBS | 26,497 | CKIBS | 25,578 | | CAABS | 28,428 | CAABS | 26,078 | CKIBT | 25,336 |
| | CAABA | 29,387 | CIDBS | 26,703 | CIDBS | 25,750 | | CAABA | 29,090 | CIDBS | 26,546 | CIDBS | 25,597 | | CAAHS | 28,549 | CIDBS | 26,094 | CIDBS | 25,365 |
| | CAAHS | 29,394 | CJDBS | 26,901 | CJDBS | 26,079 | | CAAHS | 29,092 | CJDBS | 26,662 | CJDBS | 25,813 | | CAABA | 28,551 | CJDBS | 26,131 | CJDBS | 25,453 |

## Table 105: Evergy Kansas Central Uncertain Factors Sensitivities – Low Load Growth Vs. Natural Gas and $CO_2$

| HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | | | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | | | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Endpoint | 19 | Endpoint | 20 | Endpoint | 21 | | Endpoint | 22 | Endpoint | 23 | Endpoint | 24 | | Endpoint | 25 | Endpoint | 26 | Endpoint | 27 |
| PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| CLJBV | 25,996 | CHFBV | 24,856 | CCGBS | 24,157 | MID GAS | CLJBV | 25,957 | CLJHV | 25,023 | CCGBS | 24,357 | LOW GAS | CLJBV | 25,766 | CLJHV | 24,898 | CLJBA | 24,410 |
| CHFBV | 26,001 | CLJBV | 24,881 | CHFBV | 24,163 | | CHFBV | 26,006 | CLJBV | 25,030 | CLJBA | 24,368 | | CHFBV | 25,853 | CLJBV | 24,950 | CLJBS | 24,476 |
| CLJHV | 26,161 | CLJHV | 24,898 | CLJHV | 24,195 | | CLJHV | 26,087 | CHFBV | 25,061 | CLJHV | 24,371 | | CLJHV | 25,856 | CLJBU | 25,014 | CLJHV | 24,536 |
| CLJBU | 26,527 | CLJBU | 25,050 | CLJBV | 24,225 | | CLJBU | 26,426 | CLJBU | 25,153 | CLJBS | 24,403 | | CKIBT | 26,125 | CLJBA | 25,029 | CHDBS | 24,538 |
| CKIBT | 26,606 | CGEBT | 25,147 | CAAHS | 24,268 | | CKIBT | 26,443 | CLJBS | 25,269 | CAAHS | 24,417 | | CLJBU | 26,154 | CHFBV | 25,031 | CAAHS | 24,549 |
| CGEBT | 26,688 | CCGBS | 25,186 | CAABS | 24,273 | | CGEBT | 26,598 | CGEBT | 25,276 | CHFBV | 24,423 | | CGEBT | 26,334 | CLJBS | 25,050 | CAABA | 24,554 |
| CIHBS | 27,151 | CLJBS | 25,210 | CLJBU | 24,280 | | CIHBS | 27,002 | CLJBA | 25,279 | CAABA | 24,425 | | CKIBS | 26,614 | CKIBT | 25,061 | CDBBS | 24,559 |
| CLJBS | 27,186 | CAABS | 25,246 | CAABA | 24,280 | | CHDBS | 27,010 | CKIBT | 25,318 | CLJBV | 24,426 | | CLJBS | 26,644 | CHDBS | 25,079 | CGEBS | 24,561 |
| CHDBS | 27,194 | CLJBA | 25,247 | CLJBA | 24,297 | | CLJBS | 27,010 | CHDBS | 25,318 | CLJBU | 24,435 | | CHDBS | 26,648 | CIHBS | 25,097 | CCGBS | 24,564 |
| CCGBS | 27,266 | CEEBS | 25,261 | CEEBS | 24,298 | | CKIBS | 27,040 | CCGBS | 25,329 | CCBBS | 24,446 | | CIHBS | 26,658 | CDBBS | 25,134 | CCBBS | 24,568 |
| CAABS | 27,285 | CCBBS | 25,264 | CLJBS | 24,303 | | CDBBS | 27,108 | CIHBS | 25,337 | CAABS | 24,447 | | CJDBS | 26,700 | CGEBS | 25,147 | CLJBU | 24,573 |
| CCBBS | 27,288 | CIHBS | 25,273 | CCBBS | 24,303 | | CGEBS | 27,119 | CGEBS | 25,348 | CEEBS | 24,460 | | CDBBS | 26,729 | CGEBT | 25,158 | CIHBS | 24,577 |
| CGEBS | 27,289 | CGEBS | 25,280 | CGEBT | 24,341 | | CBBBS | 27,129 | CCBBS | 25,352 | CGEBS | 24,460 | | CIDBS | 26,734 | CKIBS | 25,162 | CFEBS | 24,592 |
| CBBBS | 27,292 | CHDBS | 25,285 | CGEBS | 24,345 | | CCBBS | 27,132 | CDBBS | 25,362 | CFEBS | 24,479 | | CGEBS | 26,758 | CCBBS | 25,168 | CBBBS | 24,592 |
| CKIBS | 27,293 | CAAHS | 25,290 | CFEBS | 24,351 | | CCGBS | 27,144 | CAABS | 25,369 | CBBBS | 24,499 | | CLJBA | 26,762 | CBBBS | 25,177 | CAABS | 24,609 |
| CEEBS | 27,294 | CAABA | 25,295 | CBBBS | 24,376 | | CIDBS | 27,146 | CEEBS | 25,373 | CDBBS | 24,503 | | CBBBS | 26,774 | CFEBS | 25,185 | CEEBS | 24,611 |
| CDBBS | 27,302 | CFEBS | 25,296 | CDBBS | 24,412 | | CFEBS | 27,150 | CBBBS | 25,373 | CHDBS | 24,509 | | CCBBS | 26,783 | CAAHS | 25,185 | CLJBV | 24,620 |
| CFEBS | 27,310 | CBBBS | 25,304 | CHDBS | 24,442 | | CJDBS | 27,152 | CFEBS | 25,374 | CGEBT | 24,527 | | CFEBS | 26,796 | CCGBS | 25,203 | CHFBV | 24,679 |
| CLJBA | 27,375 | CDBBS | 25,327 | CIHBS | 24,469 | | CAABS | 27,160 | CAAHS | 25,389 | CIHBS | 24,557 | | CCGBS | 26,823 | CAABA | 25,206 | CKIBS | 24,701 |
| CIDBS | 27,386 | CKIBT | 25,327 | CKIBT | 24,771 | | CEEBS | 27,161 | CAABA | 25,391 | CKIBT | 24,784 | | CEEBS | 26,832 | CEEBS | 25,217 | CGEBT | 24,704 |
| CJDBS | 27,454 | CKIBS | 25,582 | CKIBS | 24,895 | | CLJBA | 27,166 | CKIBS | 25,512 | CKIBS | 24,837 | | CAABS | 26,836 | CAABS | 25,218 | CKIBT | 24,724 |
| CAAHS | 27,476 | CIDBS | 25,616 | CIDBS | 24,899 | | CAAHS | 27,311 | CIDBS | 25,560 | CIDBS | 24,856 | | CAAHS | 26,943 | CIDBS | 25,233 | CIDBS | 24,752 |
| CAABA | 27,480 | CJDBS | 25,811 | CJDBS | 25,225 | | CAABA | 27,321 | CJDBS | 25,674 | CJDBS | 25,069 | | CAABA | 26,958 | CJDBS | 25,270 | CJDBS | 24,838 |

## Table 106: Evergy Kansas Central Uncertain Factors Sensitivities – High Natural Gas Vs. Load and $CO_2$

| | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 1 | Endpoint | 2 | Endpoint | 3 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 27,857 | CHFBV | 25,920 | CHFBV | 24,997 |
| | CHFBV | 27,864 | CLJBV | 25,945 | CCGBS | 25,005 |
| | CLJHV | 28,046 | CLJHV | 25,973 | CLJHV | 25,041 |
| | CLJBU | 28,423 | CLJBU | 26,132 | CLJBV | 25,059 |
| | CKIBT | 28,502 | CGEBT | 26,229 | CAABS | 25,123 |
| | CGEBT | 28,585 | CCGBS | 26,270 | CAAHS | 25,125 |
| | CIHBS | 29,055 | CLJBS | 26,295 | CLJBU | 25,126 |
| | CLJBS | 29,089 | CLJBA | 26,331 | CAABA | 25,131 |
| | CHDBS | 29,099 | CAABS | 26,332 | CLJBA | 25,146 |
| | CCGBS | 29,171 | CEEBS | 26,348 | CEEBS | 25,148 |
| | CAABS | 29,190 | CCBBS | 26,349 | CLJBS | 25,152 |
| | CCBBS | 29,192 | CIHBS | 26,360 | CCBBS | 25,153 |
| | CGEBS | 29,193 | CGEBS | 26,365 | CGEBT | 25,187 |
| | CBBBS | 29,196 | CHDBS | 26,370 | CGEBS | 25,194 |
| | CKIBS | 29,197 | CAAHS | 26,380 | CFEBS | 25,199 |
| | CEEBS | 29,199 | CFEBS | 26,380 | CBBBS | 25,225 |
| | CDBBS | 29,205 | CAABA | 26,381 | CDBBS | 25,262 |
| | CFEBS | 29,214 | CBBBS | 26,388 | CHDBS | 25,291 |
| | CLJBA | 29,280 | CKIBT | 26,410 | CIHBS | 25,319 |
| | CIDBS | 29,291 | CDBBS | 26,412 | CKIBT | 25,619 |
| | CJDBS | 29,357 | CKIBS | 26,668 | CKIBS | 25,746 |
| | CAABA | 29,387 | CIDBS | 26,703 | CIDBS | 25,750 |
| | CAAHS | 29,394 | CJDBS | 26,901 | CJDBS | 26,079 |

| | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 10 | Endpoint | 11 | Endpoint | 12 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 26,673 | CHFBV | 25,252 | CHFBV | 24,480 |
| | CHFBV | 26,678 | CLJBV | 25,276 | CCGBS | 24,482 |
| | CLJHV | 26,842 | CLJHV | 25,296 | CLJHV | 24,514 |
| | CLJBU | 27,220 | CLJBU | 25,454 | CLJBV | 24,542 |
| | CKIBT | 27,300 | CGEBT | 25,552 | CAAHS | 24,593 |
| | CGEBT | 27,382 | CCGBS | 25,593 | CAABS | 24,598 |
| | CIHBS | 27,849 | CLJBS | 25,617 | CLJBU | 24,603 |
| | CLJBS | 27,884 | CLJBA | 25,653 | CAABA | 24,606 |
| | CHDBS | 27,893 | CAABS | 25,654 | CLJBA | 24,621 |
| | CCGBS | 27,964 | CEEBS | 25,670 | CEEBS | 24,624 |
| | CAABS | 27,983 | CCBBS | 25,671 | CLJBS | 24,627 |
| | CCBBS | 27,985 | CIHBS | 25,681 | CCBBS | 24,629 |
| | CGEBS | 27,986 | CGEBS | 25,687 | CGEBT | 24,664 |
| | CBBBS | 27,990 | CHDBS | 25,692 | CGEBS | 24,670 |
| | CKIBS | 27,991 | CAAHS | 25,698 | CFEBS | 24,675 |
| | CEEBS | 27,993 | CFEBS | 25,702 | CBBBS | 24,701 |
| | CDBBS | 27,999 | CAABA | 25,703 | CDBBS | 24,738 |
| | CFEBS | 28,008 | CBBBS | 25,711 | CHDBS | 24,766 |
| | CLJBA | 28,073 | CKIBT | 25,732 | CIHBS | 24,794 |
| | CIDBS | 28,085 | CDBBS | 25,734 | CKIBT | 25,094 |
| | CJDBS | 28,151 | CKIBS | 25,989 | CKIBS | 25,220 |
| | CAAHS | 28,173 | CIDBS | 26,024 | CIDBS | 25,225 |
| | CAABA | 28,178 | CJDBS | 26,218 | CJDBS | 25,550 |

| | HIGH $CO_2$ | | MID $CO_2$ | | LOW $CO_2$ | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 19 | Endpoint | 20 | Endpoint | 21 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 25,996 | CHFBV | 24,856 | CCGBS | 24,157 |
| | CHFBV | 26,001 | CLJBV | 24,881 | CHFBV | 24,163 |
| | CLJHV | 26,161 | CLJHV | 24,898 | CLJHV | 24,195 |
| | CLJBU | 26,527 | CLJBU | 25,050 | CLJBV | 24,225 |
| | CKIBT | 26,606 | CGEBT | 25,147 | CAAHS | 24,268 |
| | CGEBT | 26,688 | CCGBS | 25,186 | CAABS | 24,273 |
| | CIHBS | 27,151 | CLJBS | 25,210 | CLJBU | 24,280 |
| | CLJBS | 27,186 | CAABS | 25,246 | CAABA | 24,280 |
| | CHDBS | 27,194 | CLJBA | 25,247 | CLJBA | 24,297 |
| | CCGBS | 27,266 | CEEBS | 25,261 | CEEBS | 24,298 |
| | CAABS | 27,285 | CCBBS | 25,264 | CLJBS | 24,303 |
| | CCBBS | 27,288 | CIHBS | 25,273 | CCBBS | 24,303 |
| | CGEBS | 27,289 | CGEBS | 25,280 | CGEBT | 24,341 |
| | CBBBS | 27,292 | CHDBS | 25,285 | CGEBS | 24,345 |
| | CKIBS | 27,293 | CAAHS | 25,290 | CFEBS | 24,351 |
| | CEEBS | 27,294 | CAABA | 25,295 | CBBBS | 24,376 |
| | CDBBS | 27,302 | CFEBS | 25,296 | CDBBS | 24,412 |
| | CFEBS | 27,310 | CBBBS | 25,304 | CHDBS | 24,442 |
| | CLJBA | 27,375 | CDBBS | 25,327 | CIHBS | 24,469 |
| | CIDBS | 27,386 | CKIBT | 25,327 | CKIBT | 24,771 |
| | CJDBS | 27,454 | CKIBS | 25,582 | CKIBS | 24,895 |
| | CAAHS | 27,476 | CIDBS | 25,616 | CIDBS | 24,899 |
| | CAABA | 27,480 | CJDBS | 25,811 | CJDBS | 25,225 |

## Table 107: Evergy Kansas Central Uncertain Factors Sensitivities – Low Natural Gas Vs. Load and $CO_2$

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 7 | Endpoint | 8 | Endpoint | 9 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 27,326 | CLJHV | 25,751 | CLJBA | 25,022 |
| | CHFBV | 27,412 | CLJBV | 25,794 | CLJBS | 25,088 |
| | CLJHV | 27,436 | CLJBU | 25,873 | CLJHV | 25,144 |
| | CKIBT | 27,712 | CHFBV | 25,874 | CHDBS | 25,149 |
| | CLJBU | 27,742 | CLJBA | 25,890 | CAAHS | 25,163 |
| | CGEBT | 27,922 | CLJBS | 25,911 | CAABA | 25,165 |
| | CKIBS | 28,206 | CKIBT | 25,919 | CDBBS | 25,171 |
| | CLJBS | 28,236 | CHDBS | 25,938 | CGEBS | 25,172 |
| | CHDBS | 28,241 | CIHBS | 25,957 | CCGBS | 25,175 |
| | CIHBS | 28,250 | CDBBS | 25,995 | CCBBS | 25,180 |
| | CJDBS | 28,293 | CGEBS | 26,008 | CLJBU | 25,183 |
| | CDBBS | 28,322 | CGEBT | 26,016 | CIHBS | 25,189 |
| | CIDBS | 28,327 | CKIBS | 26,022 | CFEBS | 25,204 |
| | CGEBS | 28,352 | CCBBS | 26,029 | CBBBS | 25,204 |
| | CLJBA | 28,356 | CBBBS | 26,037 | CAABS | 25,221 |
| | CBBBS | 28,367 | CFEBS | 26,046 | CLJBV | 25,222 |
| | CCBBS | 28,377 | CAAHS | 26,050 | CEEBS | 25,223 |
| | CFEBS | 28,389 | CCGBS | 26,063 | CHFBV | 25,280 |
| | CCGBS | 28,416 | CAABA | 26,065 | CKIBS | 25,314 |
| | CEEBS | 28,425 | CEEBS | 26,077 | CGEBT | 25,314 |
| | CAABS | 28,428 | CAABS | 26,078 | CKIBT | 25,336 |
| | CAAHS | 28,549 | CIDBS | 26,094 | CIDBS | 25,365 |
| | CAABA | 28,551 | CJDBS | 26,131 | CJDBS | 25,453 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 16 | Endpoint | 17 | Endpoint | 18 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 26,334 | CLJHV | 25,213 | CLJBA | 24,644 |
| | CHFBV | 26,420 | CLJBV | 25,263 | CLJBS | 24,710 |
| | CLJHV | 26,428 | CLJBU | 25,334 | CLJHV | 24,766 |
| | CKIBT | 26,707 | CHFBV | 25,342 | CHDBS | 24,771 |
| | CLJBU | 26,735 | CLJBA | 25,351 | CAAHS | 24,783 |
| | CGEBT | 26,916 | CLJBS | 25,371 | CAABA | 24,788 |
| | CKIBS | 27,198 | CKIBT | 25,381 | CDBBS | 24,793 |
| | CLJBS | 27,229 | CHDBS | 25,399 | CGEBS | 24,794 |
| | CHDBS | 27,232 | CIHBS | 25,418 | CCGBS | 24,797 |
| | CIHBS | 27,242 | CDBBS | 25,456 | CCBBS | 24,802 |
| | CJDBS | 27,285 | CGEBS | 25,469 | CLJBU | 24,805 |
| | CDBBS | 27,313 | CGEBT | 25,478 | CIHBS | 24,810 |
| | CIDBS | 27,319 | CKIBS | 25,483 | CFEBS | 24,826 |
| | CGEBS | 27,343 | CCBBS | 25,490 | CBBBS | 24,827 |
| | CLJBA | 27,347 | CBBBS | 25,499 | CAABS | 24,842 |
| | CBBBS | 27,358 | CFEBS | 25,507 | CEEBS | 24,845 |
| | CCBBS | 27,368 | CAAHS | 25,507 | CLJBV | 24,848 |
| | CFEBS | 27,381 | CCGBS | 25,524 | CHFBV | 24,906 |
| | CCGBS | 27,407 | CAABA | 25,526 | CKIBS | 24,935 |
| | CEEBS | 27,417 | CEEBS | 25,538 | CGEBT | 24,936 |
| | CAABS | 27,420 | CAABS | 25,539 | CKIBT | 24,957 |
| | CAAHS | 27,527 | CIDBS | 25,555 | CIDBS | 24,987 |
| | CAABA | 27,541 | CJDBS | 25,592 | CJDBS | 25,073 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 25 | Endpoint | 26 | Endpoint | 27 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 25,766 | CLJHV | 24,898 | CLJBA | 24,410 |
| | CHFBV | 25,853 | CLJBV | 24,950 | CLJBS | 24,476 |
| | CLJHV | 25,856 | CLJBU | 25,014 | CLJHV | 24,536 |
| | CKIBT | 26,125 | CLJBA | 25,029 | CHDBS | 24,538 |
| | CLJBU | 26,154 | CHFBV | 25,031 | CAAHS | 24,549 |
| | CGEBT | 26,334 | CLJBS | 25,050 | CAABA | 24,554 |
| | CKIBS | 26,614 | CKIBT | 25,061 | CDBBS | 24,559 |
| | CLJBS | 26,644 | CHDBS | 25,079 | CGEBS | 24,561 |
| | CHDBS | 26,648 | CIHBS | 25,097 | CCGBS | 24,564 |
| | CIHBS | 26,658 | CDBBS | 25,134 | CCBBS | 24,568 |
| | CJDBS | 26,700 | CGEBS | 25,147 | CLJBU | 24,573 |
| | CDBBS | 26,729 | CGEBT | 25,158 | CIHBS | 24,577 |
| | CIDBS | 26,734 | CKIBS | 25,162 | CFEBS | 24,592 |
| | CGEBS | 26,758 | CCBBS | 25,168 | CBBBS | 24,592 |
| | CLJBA | 26,762 | CBBBS | 25,177 | CAABS | 24,609 |
| | CBBBS | 26,774 | CFEBS | 25,185 | CEEBS | 24,611 |
| | CCBBS | 26,783 | CAAHS | 25,185 | CLJBV | 24,620 |
| | CFEBS | 26,796 | CCGBS | 25,203 | CHFBV | 24,679 |
| | CCGBS | 26,823 | CAABA | 25,206 | CKIBS | 24,701 |
| | CEEBS | 26,832 | CEEBS | 25,217 | CGEBT | 24,704 |
| | CAABS | 26,836 | CAABS | 25,218 | CKIBT | 24,724 |
| | CAAHS | 26,943 | CIDBS | 25,233 | CIDBS | 24,752 |
| | CAABA | 26,958 | CJDBS | 25,270 | CJDBS | 24,838 |

## Table 108: Evergy Kansas Central Uncertain Factors Sensitivities – High $CO_2$ Vs. Load and Natural Gas

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 1 | Endpoint | 4 | Endpoint | 7 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 27,857 | CLJBV | 27,686 | CLJBV | 27,326 |
| | CHFBV | 27,864 | CHFBV | 27,736 | CHFBV | 27,412 |
| | CLJHV | 28,046 | CLJHV | 27,838 | CLJHV | 27,436 |
| | CLJBU | 28,423 | CLJBU | 28,186 | CKIBT | 27,712 |
| | CKIBT | 28,502 | CKIBT | 28,204 | CLJBU | 27,742 |
| | CGEBT | 28,585 | CGEBT | 28,359 | CGEBT | 27,922 |
| | CIHBS | 29,055 | CIHBS | 28,769 | CKIBS | 28,206 |
| | CLJBS | 29,089 | CLJBS | 28,778 | CLJBS | 28,236 |
| | CHDBS | 29,099 | CHDBS | 28,778 | CHDBS | 28,241 |
| | CCGBS | 29,171 | CKIBS | 28,808 | CIHBS | 28,250 |
| | CAABS | 29,190 | CDBBS | 28,875 | CJDBS | 28,293 |
| | CCBBS | 29,192 | CGEBS | 28,887 | CDBBS | 28,322 |
| | CGEBS | 29,193 | CBBBS | 28,896 | CIDBS | 28,327 |
| | CBBBS | 29,196 | CCBBS | 28,900 | CGEBS | 28,352 |
| | CKIBS | 29,197 | CCGBS | 28,912 | CLJBA | 28,356 |
| | CEEBS | 29,199 | CIDBS | 28,913 | CBBBS | 28,367 |
| | CDBBS | 29,205 | CFEBS | 28,917 | CCBBS | 28,377 |
| | CFEBS | 29,214 | CJDBS | 28,919 | CFEBS | 28,389 |
| | CLJBA | 29,280 | CAABS | 28,928 | CCGBS | 28,416 |
| | CIDBS | 29,291 | CEEBS | 28,929 | CEEBS | 28,425 |
| | CJDBS | 29,357 | CLJBA | 28,935 | CAABS | 28,428 |
| | CAABA | 29,387 | CAABA | 29,090 | CAAHS | 28,549 |
| | CAAHS | 29,394 | CAAHS | 29,092 | CAABA | 28,551 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 10 | Endpoint | 13 | Endpoint | 16 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 26,673 | CLJBV | 26,585 | CLJBV | 26,334 |
| | CHFBV | 26,678 | CHFBV | 26,634 | CHFBV | 26,420 |
| | CLJHV | 26,842 | CLJHV | 26,720 | CLJHV | 26,428 |
| | CLJBU | 27,220 | CLJBU | 27,069 | CKIBT | 26,707 |
| | CKIBT | 27,300 | CKIBT | 27,087 | CLJBU | 26,735 |
| | CGEBT | 27,382 | CGEBT | 27,242 | CGEBT | 26,916 |
| | CIHBS | 27,849 | CIHBS | 27,649 | CKIBS | 27,198 |
| | CLJBS | 27,884 | CHDBS | 27,658 | CLJBS | 27,229 |
| | CHDBS | 27,893 | CLJBS | 27,658 | CHDBS | 27,232 |
| | CCGBS | 27,964 | CKIBS | 27,687 | CIHBS | 27,242 |
| | CAABS | 27,983 | CDBBS | 27,755 | CJDBS | 27,285 |
| | CCBBS | 27,985 | CGEBS | 27,767 | CDBBS | 27,313 |
| | CGEBS | 27,986 | CBBBS | 27,776 | CIDBS | 27,319 |
| | CBBBS | 27,990 | CCBBS | 27,780 | CGEBS | 27,343 |
| | CKIBS | 27,991 | CCGBS | 27,792 | CLJBA | 27,347 |
| | CEEBS | 27,993 | CIDBS | 27,793 | CBBBS | 27,358 |
| | CDBBS | 27,999 | CFEBS | 27,797 | CCBBS | 27,368 |
| | CFEBS | 28,008 | CJDBS | 27,799 | CFEBS | 27,381 |
| | CLJBA | 28,073 | CAABS | 27,807 | CCGBS | 27,407 |
| | CIDBS | 28,085 | CEEBS | 27,809 | CEEBS | 27,417 |
| | CJDBS | 28,151 | CLJBA | 27,814 | CAABS | 27,420 |
| | CAAHS | 28,173 | CAAHS | 27,958 | CAAHS | 27,527 |
| | CAABA | 28,178 | CAABA | 27,968 | CAABA | 27,541 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 19 | Endpoint | 22 | Endpoint | 25 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CLJBV | 25,996 | CLJBV | 25,957 | CLJBV | 25,766 |
| | CHFBV | 26,001 | CHFBV | 26,006 | CHFBV | 25,853 |
| | CLJHV | 26,161 | CLJHV | 26,087 | CLJHV | 25,856 |
| | CLJBU | 26,527 | CLJBU | 26,426 | CKIBT | 26,125 |
| | CKIBT | 26,606 | CKIBT | 26,443 | CLJBU | 26,154 |
| | CGEBT | 26,688 | CGEBT | 26,598 | CGEBT | 26,334 |
| | CIHBS | 27,151 | CIHBS | 27,002 | CKIBS | 26,614 |
| | CLJBS | 27,186 | CHDBS | 27,010 | CLJBS | 26,644 |
| | CHDBS | 27,194 | CLJBS | 27,010 | CHDBS | 26,648 |
| | CCGBS | 27,266 | CKIBS | 27,040 | CIHBS | 26,658 |
| | CAABS | 27,285 | CDBBS | 27,108 | CJDBS | 26,700 |
| | CCBBS | 27,288 | CGEBS | 27,119 | CDBBS | 26,729 |
| | CGEBS | 27,289 | CBBBS | 27,129 | CIDBS | 26,734 |
| | CBBBS | 27,292 | CCBBS | 27,132 | CGEBS | 26,758 |
| | CKIBS | 27,293 | CCGBS | 27,144 | CLJBA | 26,762 |
| | CEEBS | 27,294 | CIDBS | 27,146 | CBBBS | 26,774 |
| | CDBBS | 27,302 | CFEBS | 27,150 | CCBBS | 26,783 |
| | CFEBS | 27,310 | CJDBS | 27,152 | CFEBS | 26,796 |
| | CLJBA | 27,375 | CAABS | 27,160 | CCGBS | 26,823 |
| | CIDBS | 27,386 | CEEBS | 27,161 | CEEBS | 26,832 |
| | CJDBS | 27,454 | CLJBA | 27,166 | CAABS | 26,836 |
| | CAAHS | 27,476 | CAAHS | 27,311 | CAAHS | 26,943 |
| | CAABA | 27,480 | CAABA | 27,321 | CAABA | 26,958 |

## Table 109: Evergy Kansas Central Uncertain Factors Sensitivities – Low $CO_2$ Vs. Load and Natural Gas

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 3 | Endpoint | 6 | Endpoint | 9 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CHFBV | 24,997 | CCGBS | 25,098 | CLJBA | 25,022 |
| | CCGBS | 25,005 | CLJHV | 25,106 | CLJBS | 25,088 |
| | CLJHV | 25,041 | CLJBA | 25,108 | CLJHV | 25,144 |
| | CLJBV | 25,059 | CLJBS | 25,143 | CHDBS | 25,149 |
| | CAABS | 25,123 | CHFBV | 25,150 | CAAHS | 25,163 |
| | CAAHS | 25,125 | CLJBV | 25,153 | CAABA | 25,165 |
| | CLJBU | 25,126 | CAAHS | 25,163 | CDBBS | 25,171 |
| | CAABA | 25,131 | CAABA | 25,166 | CGEBS | 25,172 |
| | CLJBA | 25,146 | CLJBU | 25,173 | CCGBS | 25,175 |
| | CEEBS | 25,148 | CCBBS | 25,188 | CCBBS | 25,180 |
| | CLJBS | 25,152 | CAABS | 25,189 | CLJBU | 25,183 |
| | CCBBS | 25,153 | CGEBS | 25,201 | CIHBS | 25,189 |
| | CGEBT | 25,187 | CEEBS | 25,202 | CFEBS | 25,204 |
| | CGEBS | 25,194 | CFEBS | 25,220 | CBBBS | 25,204 |
| | CFEBS | 25,199 | CBBBS | 25,239 | CAABS | 25,221 |
| | CBBBS | 25,225 | CDBBS | 25,244 | CLJBV | 25,222 |
| | CDBBS | 25,262 | CHDBS | 25,248 | CEEBS | 25,223 |
| | CHDBS | 25,291 | CGEBT | 25,265 | CHFBV | 25,280 |
| | CIHBS | 25,319 | CIHBS | 25,298 | CKIBS | 25,314 |
| | CKIBT | 25,619 | CKIBT | 25,522 | CGEBT | 25,314 |
| | CKIBS | 25,746 | CKIBS | 25,578 | CKIBT | 25,336 |
| | CIDBS | 25,750 | CIDBS | 25,597 | CIDBS | 25,365 |
| | CJDBS | 26,079 | CJDBS | 25,813 | CJDBS | 25,453 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 12 | Endpoint | 15 | Endpoint | 18 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CHFBV | 24,480 | CCGBS | 24,639 | CLJBA | 24,644 |
| | CCGBS | 24,482 | CLJHV | 24,647 | CLJBS | 24,710 |
| | CLJHV | 24,514 | CLJBA | 24,650 | CLJHV | 24,766 |
| | CLJBV | 24,542 | CLJBS | 24,685 | CHDBS | 24,771 |
| | CAAHS | 24,593 | CHFBV | 24,697 | CAAHS | 24,783 |
| | CAABS | 24,598 | CAAHS | 24,700 | CAABA | 24,788 |
| | CLJBU | 24,603 | CLJBV | 24,701 | CDBBS | 24,793 |
| | CAABA | 24,606 | CAABA | 24,707 | CGEBS | 24,794 |
| | CLJBA | 24,621 | CLJBU | 24,715 | CCGBS | 24,797 |
| | CEEBS | 24,624 | CCBBS | 24,729 | CCBBS | 24,802 |
| | CLJBS | 24,627 | CAABS | 24,730 | CLJBU | 24,805 |
| | CCBBS | 24,629 | CEEBS | 24,743 | CIHBS | 24,810 |
| | CGEBT | 24,664 | CGEBS | 24,743 | CFEBS | 24,826 |
| | CGEBS | 24,670 | CFEBS | 24,761 | CBBBS | 24,827 |
| | CFEBS | 24,675 | CBBBS | 24,781 | CAABS | 24,842 |
| | CBBBS | 24,701 | CDBBS | 24,786 | CEEBS | 24,845 |
| | CDBBS | 24,738 | CHDBS | 24,790 | CLJBV | 24,848 |
| | CHDBS | 24,766 | CGEBT | 24,808 | CHFBV | 24,906 |
| | CIHBS | 24,794 | CIHBS | 24,839 | CKIBS | 24,935 |
| | CKIBT | 25,094 | CKIBT | 25,065 | CGEBT | 24,936 |
| | CKIBS | 25,220 | CKIBS | 25,119 | CKIBT | 24,957 |
| | CIDBS | 25,225 | CIDBS | 25,138 | CIDBS | 24,987 |
| | CJDBS | 25,550 | CJDBS | 25,352 | CJDBS | 25,073 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 21 | Endpoint | 24 | Endpoint | 27 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | CCGBS | 24,157 | CCGBS | 24,357 | CLJBA | 24,410 |
| | CHFBV | 24,163 | CLJBA | 24,368 | CLJBS | 24,476 |
| | CLJHV | 24,195 | CLJHV | 24,371 | CLJHV | 24,536 |
| | CLJBV | 24,225 | CLJBS | 24,403 | CHDBS | 24,538 |
| | CAABS | 24,268 | CAAHS | 24,417 | CAAHS | 24,549 |
| | CAABS | 24,273 | CHFBV | 24,423 | CAABA | 24,554 |
| | CLJBU | 24,280 | CAABA | 24,425 | CDBBS | 24,559 |
| | CAABA | 24,280 | CLJBV | 24,426 | CGEBS | 24,561 |
| | CLJBA | 24,297 | CLJBU | 24,435 | CCGBS | 24,564 |
| | CEEBS | 24,298 | CCBBS | 24,446 | CCBBS | 24,568 |
| | CLJBS | 24,303 | CAABS | 24,447 | CLJBU | 24,573 |
| | CCBBS | 24,303 | CEEBS | 24,460 | CIHBS | 24,577 |
| | CGEBT | 24,341 | CGEBS | 24,460 | CFEBS | 24,592 |
| | CGEBS | 24,345 | CFEBS | 24,479 | CBBBS | 24,592 |
| | CFEBS | 24,351 | CBBBS | 24,499 | CAABS | 24,609 |
| | CBBBS | 24,376 | CDBBS | 24,503 | CEEBS | 24,611 |
| | CDBBS | 24,412 | CHDBS | 24,509 | CLJBV | 24,620 |
| | CHDBS | 24,442 | CGEBT | 24,527 | CHFBV | 24,679 |
| | CIHBS | 24,469 | CIHBS | 24,557 | CKIBS | 24,701 |
| | CKIBT | 24,771 | CKIBT | 24,784 | CGEBT | 24,704 |
| | CKIBS | 24,895 | CKIBS | 24,837 | CKIBT | 24,724 |
| | CIDBS | 24,899 | CIDBS | 24,856 | CIDBS | 24,752 |
| | CJDBS | 25,225 | CJDBS | 25,069 | CJDBS | 24,838 |

## 7.10 EVERGY METRO - ADDITIONAL SENSITIVITY ANALYSES

In the Evergy Metro rankings below, the majority of the low ranking ARPs all share the same retirement scenarios - retiring Evergy Metro's 373 MW share of LaCygne-1 in 2032 which coincides with the book life retirement date for the Evergy Kansas Central share of the generating unit and extending the book life of Evergy Metro's 331 MW share of LaCygne-2 from 2029 to 2039. Additionally, Evergy Metro's 490 MW share of Iatan-1 is expected to be retired in 2039.

**Table 110: Evergy Metro Lowest NPVRR Alternative Resource Plan By Endpoint**

| Endpoint | ARP | Load Growth | Natural Gas | $CO_2$ | Endpoint Probability |
|---|---|---|---|---|---|
| 1 | MCGBU | High | High | High | 0.5% |
| 2 | MCGDU | High | High | Mid | 1.4% |
| 3 | MCGDS | High | High | Low | 0.5% |
| 4 | MCGBU | High | Mid | High | 1.5% |
| 5 | MCGDU | High | Mid | Mid | 4.5% |
| 6 | MCGDS | High | Mid | Low | 1.5% |
| 7 | MCGBU | High | Low | High | 1.1% |
| 8 | MDDCS | High | Low | Mid | 3.2% |
| 9 | MDDCS | High | Low | Low | 1.1% |
| 10 | MCGBU | Mid | High | High | 1.5% |
| 11 | MCGDU | Mid | High | Mid | 4.5% |
| 12 | MCGDS | Mid | High | Low | 1.5% |
| 13 | MCGBU | Mid | Mid | High | 5.0% |
| 14 | MCGDU | Mid | Mid | Mid | 15.0% |
| 15 | MCGDS | Mid | Mid | Low | 5.0% |
| 16 | MCGBU | Mid | Low | High | 3.5% |
| 17 | MDDCS | Mid | Low | Mid | 10.5% |
| 18 | MDDCS | Mid | Low | Low | 3.5% |
| 19 | MCGBU | Low | High | High | 1.1% |
| 20 | MCGDU | Low | High | Mid | 3.2% |
| 21 | MCGDS | Low | High | Low | 1.1% |
| 22 | MCGBU | Low | Mid | High | 3.5% |
| 23 | MCGDU | Low | Mid | Mid | 10.5% |
| 24 | MCGDS | Low | Mid | Low | 3.5% |
| 25 | MCGBU | Low | Low | High | 2.5% |
| 26 | MDDCS | Low | Low | Mid | 7.4% |
| 27 | MDDCS | Low | Low | Low | 2.5% |

## Table 111: Evergy Metro Uncertain Factors Sensitivities – High Load Growth Vs. Natural Gas and $CO_2$

| | With CO2 | | MID CO2 | | LOW CO2 | | | HIGH CO2 | | MID CO2 | | LOW CO2 | | | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Endpoint | 1 | Endpoint | 2 | Endpoint | 3 | | Endpoint | 4 | Endpoint | 5 | Endpoint | 6 | | Endpoint | 7 | Endpoint | 8 | Endpoint | 9 |
| HIGH GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | MID GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | LOW GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 21,802 | MCGDU | 19,233 | MCGDS | 17,842 | | MCGBU | 21,714 | MCGDU | 19,471 | MCGDS | 17,995 | | MCGBU | 21,428 | MDDCS | 19,420 | MDDCS | 18,242 |
| | MCGCU | 21,830 | MCGCU | 19,270 | MCGDU | 17,877 | | MCGCU | 21,735 | MDDCS | 19,525 | MCGCS | 18,052 | | MCGCU | 21,440 | MBBCS | 19,473 | MCGDS | 18,246 |
| | MCGDU | 21,922 | MCGBU | 19,282 | MCGCS | 17,880 | | MCGDU | 21,802 | MCGCU | 19,528 | MCGDU | 18,091 | | MCGDU | 21,478 | MFFCS | 19,490 | MBBCS | 18,287 |
| | MCGCT | 22,078 | MCGCT | 19,307 | MCGCT | 17,912 | | MCGCT | 21,942 | MCGCT | 19,538 | MCGCT | 18,120 | | MCGCT | 21,592 | MEECS | 19,499 | MCCCS | 18,309 |
| | MAABS | 22,377 | MCGCS | 19,380 | MCGCU | 17,958 | | MDDCS | 22,156 | MBBCS | 19,544 | MCCCS | 18,138 | | MDDCS | 21,686 | MCCCS | 19,507 | MAACA | 18,322 |
| | MBBCS | 22,403 | MCGDS | 19,387 | MCGBU | 17,984 | | MBBCS | 22,186 | MCGBU | 19,544 | MAACS | 18,141 | | MFFCS | 21,740 | MCGDS | 19,533 | MCGCS | 18,327 |
| | MDDCS | 22,405 | MAABS | 19,403 | MAACS | 18,010 | | MAABS | 22,203 | MCCCS | 19,567 | MDDCS | 18,146 | | MBBCS | 21,743 | MCGDU | 19,534 | MAACS | 18,342 |
| | MAACS | 22,428 | MAACS | 19,416 | MAABS | 18,012 | | MFFCS | 22,205 | MCGDS | 19,569 | MAACA | 18,146 | | MEECS | 21,776 | MAACS | 19,554 | MAABS | 18,356 |
| | MCCCS | 22,430 | MBBCS | 19,430 | MAACA | 18,037 | | MCCCS | 22,218 | MAABS | 19,579 | MAABS | 18,148 | | MCCCS | 21,777 | MAABS | 19,560 | MFFCS | 18,388 |
| | MFFCS | 22,443 | MCCCS | 19,433 | MCCCS | 18,039 | | MAACS | 22,246 | MCGCS | 19,582 | MBBCS | 18,149 | | MAABS | 21,794 | MAACA | 19,576 | MEECS | 18,417 |
| | MCGCS | 22,453 | MDDCS | 19,446 | MBBCS | 18,071 | | MEECS | 22,263 | MAACS | 19,587 | MCGCU | 18,192 | | MAACS | 21,827 | MCGCS | 19,583 | MCGDU | 18,426 |
| | MEECS | 22,518 | MAACA | 19,489 | MDDCS | 18,098 | | MCGCS | 22,272 | MAACA | 19,640 | MCGBU | 18,222 | | MCGCS | 21,854 | MCGCT | 19,589 | MCGCT | 18,442 |
| | MAAAS | 22,560 | MFFCS | 19,598 | MFFCS | 18,301 | | MCGDS | 22,381 | MFFCS | 19,661 | MFFCS | 18,328 | | MCGDS | 21,934 | MCGCU | 19,619 | MCGCU | 18,550 |
| | MCGDS | 22,587 | MAAAS | 19,666 | MAAAS | 18,305 | | MAAAS | 22,399 | MEECS | 19,737 | MAAAS | 18,452 | | MAACA | 21,967 | MCGBU | 19,644 | MCGBU | 18,588 |
| | MAACA | 22,629 | MEECS | 19,714 | MEECS | 18,471 | | MAACA | 22,420 | MAAAS | 19,852 | MEECS | 18,464 | | MAAAS | 22,011 | MAAAS | 19,853 | MAAAS | 18,675 |

## Table 112: Evergy Metro Uncertain Factors Sensitivities – Low Load Growth Vs. Natural Gas and $CO_2$

| | HIGH CO2 | | MID CO2 | | LOW CO2 | | | HIGH CO2 | | MID CO2 | | LOW CO2 | | | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Endpoint | 19 | Endpoint | 20 | Endpoint | 21 | | Endpoint | 22 | Endpoint | 23 | Endpoint | 24 | | Endpoint | 25 | Endpoint | 26 | Endpoint | 27 |
| HIGH GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | MID GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR | LOW GAS | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 19,271 | MCGDU | 17,739 | MCGDS | 16,766 | | MCGBU | 19,373 | MCGDU | 18,104 | MCGDS | 17,057 | | MCGBU | 19,370 | MDDCS | 18,247 | MDDCS | 17,495 |
| | MCGCU | 19,298 | MCGCU | 17,776 | MCGDU | 16,802 | | MCGCU | 19,393 | MDDCS | 18,154 | MCGCS | 17,116 | | MCGCU | 19,381 | MBBCS | 18,301 | MCGDS | 17,498 |
| | MCGDU | 19,385 | MCGBU | 17,788 | MCGCS | 16,806 | | MCGDU | 19,458 | MCGCU | 18,159 | MCGDU | 17,154 | | MCGDU | 19,415 | MFFCS | 18,308 | MBBCS | 17,539 |
| | MCGCT | 19,540 | MCGCT | 17,812 | MCGCT | 16,839 | | MCGCT | 19,598 | MCGCT | 18,169 | MCGCT | 17,183 | | MCGCT | 19,531 | MEECS | 18,325 | MCCCS | 17,562 |
| | MAABS | 19,843 | MCGCS | 17,885 | MCGCU | 16,885 | | MDDCS | 19,813 | MBBCS | 18,174 | MCCCS | 17,201 | | MDDCS | 19,627 | MCCCS | 18,334 | MAACA | 17,575 |
| | MBBCS | 19,870 | MCGDS | 17,892 | MCGBU | 16,911 | | MBBCS | 19,844 | MCGBU | 18,175 | MAACS | 17,201 | | MFFCS | 19,680 | MCGDS | 18,360 | MCGCS | 17,582 |
| | MDDCS | 19,871 | MAABS | 17,906 | MAACS | 16,933 | | MAABS | 19,880 | MCCCS | 18,197 | MDDCS | 17,206 | | MBBCS | 19,683 | MCGDU | 18,362 | MAACS | 17,595 |
| | MAACS | 19,893 | MAACS | 17,918 | MAABS | 16,933 | | MFFCS | 19,884 | MCGDS | 18,202 | MAACA | 17,207 | | MEECS | 19,715 | MAACS | 18,380 | MAABS | 17,608 |
| | MCCCS | 19,896 | MBBCS | 17,934 | MAACA | 16,960 | | MCCCS | 19,875 | MAABS | 18,206 | MAABS | 17,208 | | MCCCS | 19,717 | MAABS | 18,387 | MFFCS | 17,640 |
| | MFFCS | 19,911 | MCCCS | 17,936 | MCCCS | 16,964 | | MAACS | 19,902 | MCGCS | 18,212 | MBBCS | 17,210 | | MAABS | 19,734 | MAACA | 18,402 | MEECS | 17,668 |
| | MCGCS | 19,916 | MDDCS | 17,949 | MBBCS | 16,994 | | MEECS | 19,921 | MAACS | 18,215 | MCGCU | 17,256 | | MAACS | 19,766 | MCGCS | 18,410 | MCGDU | 17,679 |
| | MEECS | 19,985 | MAACA | 17,991 | MDDCS | 17,021 | | MCGCS | 19,927 | MAACA | 18,268 | MCGBU | 17,286 | | MCGCS | 19,792 | MCGCT | 18,417 | MCGCT | 17,697 |
| | MAAAS | 20,027 | MFFCS | 18,101 | MFFCS | 17,223 | | MCGDS | 20,037 | MFFCS | 18,292 | MFFCS | 17,388 | | MCGDS | 19,870 | MCGCU | 18,447 | MCGCU | 17,805 |
| | MCGDS | 20,050 | MAAAS | 18,175 | MAAAS | 17,230 | | MAAAS | 20,057 | MEECS | 18,366 | MAAAS | 17,514 | | MAACA | 19,905 | MCGBU | 18,470 | MCGBU | 17,844 |
| | MAACA | 20,094 | MEECS | 18,217 | MEECS | 17,392 | | MAACA | 20,076 | MAAAS | 18,496 | MEECS | 17,525 | | MAAAS | 19,951 | MAAAS | 18,682 | MAAAS | 17,929 |

## Table 113: Evergy Metro Uncertain Factors Sensitivities – High Natural Gas Vs. Load and $CO_2$

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 1 | Endpoint | 2 | Endpoint | 3 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 21,802 | MOGDU | 19,233 | MCGDS | 17,842 |
| | MCGCU | 21,830 | MOGCU | 19,270 | MCGDU | 17,877 |
| | MCGDU | 21,922 | MOGBU | 19,282 | MCGCS | 17,880 |
| | MCGCT | 22,078 | MOGCT | 19,307 | MCGCT | 17,912 |
| | MAABS | 22,377 | MCGCS | 19,380 | MCGCU | 17,958 |
| | MBBCS | 22,403 | MOGDS | 19,387 | MCGBU | 17,984 |
| | MDDCS | 22,405 | MAABS | 19,403 | MAACS | 18,010 |
| | MAACS | 22,428 | MAACS | 19,416 | MAABS | 18,012 |
| | MCCCS | 22,430 | MBBCS | 19,430 | MAACA | 18,037 |
| | MFFCS | 22,443 | MCCCS | 19,433 | MCCCS | 18,039 |
| | MCGCS | 22,453 | MDDCS | 19,446 | MBBCS | 18,071 |
| | MEECS | 22,518 | MAACA | 19,489 | MDDCS | 18,098 |
| | MAAAS | 22,560 | MFFCS | 19,598 | MFFCS | 18,301 |
| | MCGDS | 22,587 | MAAAS | 19,666 | MAAAS | 18,305 |
| | MAACA | 22,629 | MEECS | 19,714 | MEECS | 18,471 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 10 | Endpoint | 11 | Endpoint | 12 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MOGBU | 20,020 | MCGDU | 18,188 | MOGDS | 17,100 |
| | MOGCU | 20,047 | MCGCU | 18,224 | MOGDU | 17,135 |
| | MOGDU | 20,136 | MCGBU | 18,236 | MOGCS | 17,140 |
| | MOGCT | 20,291 | MCGCT | 18,260 | MOGCT | 17,173 |
| | MAABS | 20,593 | MCGCS | 18,333 | MOGCU | 17,219 |
| | MBBCS | 20,620 | MCGDS | 18,342 | MOGBU | 17,244 |
| | MDDCS | 20,622 | MAABS | 18,355 | MAACS | 17,267 |
| | MAACS | 20,644 | MAACS | 18,367 | MAABS | 17,268 |
| | MCCCS | 20,647 | MBBCS | 18,382 | MAACA | 17,294 |
| | MFFCS | 20,662 | MCCCS | 18,385 | MCCCS | 17,297 |
| | MOGCS | 20,667 | MDDCS | 18,397 | MBBCS | 17,327 |
| | MEECS | 20,736 | MAACA | 18,439 | MDDCS | 17,355 |
| | MAAAS | 20,777 | MFFCS | 18,550 | MFFCS | 17,557 |
| | MOGDS | 20,801 | MAAAS | 18,623 | MAAAS | 17,563 |
| | MAACA | 20,845 | MEECS | 18,666 | MEECS | 17,726 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 19 | Endpoint | 20 | Endpoint | 21 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 19,271 | MOGDU | 17,739 | MCGDS | 16,786 |
| | MCGCU | 19,298 | MOGCU | 17,776 | MCGDU | 16,802 |
| | MCGDU | 19,385 | MOGBU | 17,788 | MCGCS | 16,806 |
| | MCGCT | 19,540 | MOGCT | 17,812 | MCGCT | 16,839 |
| | MAABS | 19,843 | MCGCS | 17,885 | MCGCU | 16,885 |
| | MBBCS | 19,870 | MOGDS | 17,892 | MCGBU | 16,911 |
| | MDDCS | 19,871 | MAABS | 17,906 | MAACS | 16,933 |
| | MAACS | 19,893 | MAACS | 17,918 | MAABS | 16,933 |
| | MCCCS | 19,896 | MBBCS | 17,934 | MAACA | 16,960 |
| | MFFCS | 19,911 | MCCCS | 17,936 | MCCCS | 16,964 |
| | MCGCS | 19,916 | MDDCS | 17,949 | MBBCS | 16,994 |
| | MEECS | 19,985 | MAACA | 17,991 | MDDCS | 17,021 |
| | MAAAS | 20,027 | MFFCS | 18,101 | MFFCS | 17,223 |
| | MCGDS | 20,050 | MAAAS | 18,175 | MAAAS | 17,230 |
| | MAACA | 20,094 | MEECS | 18,217 | MEECS | 17,392 |

## Table 114: Evergy Metro Uncertain Factors Sensitivities – Low Natural Gas Vs. Load and $CO_2$

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 7 | Endpoint | 8 | Endpoint | 9 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 21,428 | MDDCS | 19,420 | MDDCS | 18,242 |
| | MCGCU | 21,440 | MBBCS | 19,473 | MCGDS | 18,246 |
| | MCGDU | 21,478 | MFFCS | 19,480 | MBBCS | 18,287 |
| | MCGCT | 21,592 | MEECS | 19,499 | MCCCS | 18,309 |
| | MDDCS | 21,686 | MCCCS | 19,507 | MAACA | 18,322 |
| | MFFCS | 21,740 | MOGDS | 19,533 | MCGCS | 18,327 |
| | MBBCS | 21,743 | MOGDU | 19,534 | MAACS | 18,342 |
| | MEECS | 21,776 | MAACS | 19,554 | MAABS | 18,356 |
| | MCCCS | 21,777 | MAABS | 19,560 | MFFCS | 18,388 |
| | MAABS | 21,794 | MAACA | 19,576 | MEECS | 18,417 |
| | MAACS | 21,827 | MOGCS | 19,583 | MCGDU | 18,426 |
| | MCGCS | 21,854 | MOGCT | 19,589 | MCGCT | 18,442 |
| | MCGDS | 21,934 | MOGCU | 19,619 | MCGCU | 18,550 |
| | MAACA | 21,967 | MOGBU | 19,644 | MCGBU | 18,588 |
| | MAAAS | 22,011 | MAAAS | 19,853 | MAAAS | 18,675 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 16 | Endpoint | 17 | Endpoint | 18 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MOGBU | 19,983 | MDDCS | 18,599 | MDDCS | 17,729 |
| | MOGCU | 19,994 | MBBCS | 18,653 | MOGDS | 17,733 |
| | MOGDU | 20,031 | MFFCS | 18,660 | MBBCS | 17,773 |
| | MOGCT | 20,148 | MEECS | 18,677 | MCCCS | 17,796 |
| | MDDCS | 20,241 | MCCCS | 18,686 | MAACA | 17,808 |
| | MFFCS | 20,295 | MOGDS | 18,714 | MOGCS | 17,815 |
| | MBBCS | 20,297 | MCGDU | 18,715 | MAACS | 17,826 |
| | MEECS | 20,329 | MAACS | 18,732 | MAABS | 17,843 |
| | MCCCS | 20,332 | MAABS | 18,739 | MFFCS | 17,874 |
| | MAABS | 20,348 | MAACA | 18,755 | MEECS | 17,901 |
| | MAACS | 20,381 | MCGCS | 18,763 | MOGDU | 17,914 |
| | MOGCS | 20,407 | MCGCT | 18,789 | MOGCT | 17,930 |
| | MOGDS | 20,486 | MCGCU | 18,796 | MOGCU | 18,038 |
| | MAACA | 20,520 | MCGBU | 18,824 | MOGBU | 18,077 |
| | MAAAS | 20,566 | MAAAS | 19,034 | MAAAS | 18,163 |

| | HIGH CO2 | | MID CO2 | | LOW CO2 | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 25 | Endpoint | 26 | Endpoint | 27 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 19,370 | MDDCS | 18,247 | MDDCS | 17,495 |
| | MCGCU | 19,381 | MBBCS | 18,301 | MCGDS | 17,498 |
| | MCGDU | 19,415 | MFFCS | 18,308 | MBBCS | 17,539 |
| | MCGCT | 19,531 | MEECS | 18,325 | MCCCS | 17,562 |
| | MDDCS | 19,627 | MCCCS | 18,334 | MAACA | 17,575 |
| | MFFCS | 19,680 | MOGDS | 18,360 | MCGCS | 17,582 |
| | MBBCS | 19,683 | MOGDU | 18,362 | MAACS | 17,595 |
| | MEECS | 19,715 | MAACS | 18,380 | MAABS | 17,608 |
| | MCCCS | 19,717 | MAABS | 18,387 | MFFCS | 17,640 |
| | MAABS | 19,734 | MAACA | 18,402 | MEECS | 17,668 |
| | MAACS | 19,766 | MOGCS | 18,410 | MCGDU | 17,679 |
| | MCGCS | 19,792 | MOGCT | 18,417 | MCGCT | 17,697 |
| | MCGDS | 19,870 | MOGCU | 18,447 | MCGCU | 17,805 |
| | MAACA | 19,905 | MOGBU | 18,470 | MCGBU | 17,844 |
| | MAAAS | 19,951 | MAAAS | 18,682 | MAAAS | 17,929 |

## Table 115: Evergy Metro Uncertain Factors Sensitivities – High $CO_2$ Vs. Load and Natural Gas

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 1 | Endpoint | 4 | Endpoint | 7 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 21,802 | MCGBU | 21,714 | MCGBU | 21,428 |
| | MCGCU | 21,830 | MCGCU | 21,735 | MCGCU | 21,440 |
| | MCGDU | 21,922 | MCGDU | 21,802 | MCGDU | 21,478 |
| | MCGCT | 22,078 | MCGCT | 21,942 | MCGCT | 21,592 |
| | MAABS | 22,377 | MDDCS | 22,156 | MDDCS | 21,686 |
| | MBBCS | 22,403 | MBBCS | 22,186 | MFFCS | 21,740 |
| | MDDCS | 22,405 | MAABS | 22,203 | MBBCS | 21,743 |
| | MAACS | 22,428 | MFFCS | 22,205 | MEECS | 21,776 |
| | MCCCS | 22,430 | MCCCS | 22,218 | MCCCS | 21,777 |
| | MFFCS | 22,443 | MAACS | 22,246 | MAABS | 21,794 |
| | MCGCS | 22,453 | MEECS | 22,263 | MAACS | 21,827 |
| | MEECS | 22,518 | MCGCS | 22,272 | MCGCS | 21,854 |
| | MAAAS | 22,560 | MCGDS | 22,381 | MCGDS | 21,934 |
| | MCGDS | 22,587 | MAAAS | 22,399 | MAACA | 21,967 |
| | MAACA | 22,629 | MAACA | 22,420 | MAAAS | 22,011 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 10 | Endpoint | 13 | Endpoint | 16 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 20,020 | MCGBU | 20,066 | MCGBU | 19,963 |
| | MCGCU | 20,047 | MCGCU | 20,087 | MCGCU | 19,994 |
| | MCGDU | 20,136 | MCGDU | 20,153 | MCGDU | 20,031 |
| | MCGCT | 20,291 | MCGCT | 20,293 | MCGCT | 20,146 |
| | MAABS | 20,593 | MDDCS | 20,508 | MDDCS | 20,241 |
| | MBBCS | 20,620 | MBBCS | 20,539 | MFFCS | 20,295 |
| | MDDCS | 20,622 | MAABS | 20,554 | MBBCS | 20,297 |
| | MAACS | 20,644 | MFFCS | 20,559 | MEECS | 20,329 |
| | MCCCS | 20,647 | MCCCS | 20,570 | MCCCS | 20,332 |
| | MFFCS | 20,662 | MAACS | 20,597 | MAABS | 20,348 |
| | MCGCS | 20,667 | MEECS | 20,615 | MAACS | 20,381 |
| | MEECS | 20,736 | MCGCS | 20,622 | MCGCS | 20,407 |
| | MAAAS | 20,777 | MCGDS | 20,732 | MCGDS | 20,486 |
| | MCGDS | 20,801 | MAAAS | 20,752 | MAACA | 20,520 |
| | MAACA | 20,845 | MAACA | 20,771 | MAAAS | 20,566 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 19 | Endpoint | 22 | Endpoint | 25 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGBU | 19,271 | MCGBU | 19,373 | MCGBU | 19,370 |
| | MCGCU | 19,298 | MCGCU | 19,393 | MCGCU | 19,381 |
| | MCGDU | 19,385 | MCGDU | 19,458 | MCGDU | 19,415 |
| | MCGCT | 19,540 | MCGCT | 19,598 | MCGCT | 19,531 |
| | MAABS | 19,843 | MDDCS | 19,813 | MDDCS | 19,627 |
| | MBBCS | 19,870 | MBBCS | 19,844 | MFFCS | 19,680 |
| | MDDCS | 19,871 | MAABS | 19,860 | MBBCS | 19,683 |
| | MAACS | 19,893 | MFFCS | 19,864 | MEECS | 19,715 |
| | MCCCS | 19,896 | MCCCS | 19,875 | MCCCS | 19,717 |
| | MFFCS | 19,911 | MAACS | 19,902 | MAABS | 19,734 |
| | MCGCS | 19,916 | MEECS | 19,921 | MAACS | 19,766 |
| | MEECS | 19,985 | MCGCS | 19,927 | MCGCS | 19,792 |
| | MAAAS | 20,027 | MCGDS | 20,037 | MCGDS | 19,870 |
| | MCGDS | 20,050 | MAAAS | 20,057 | MAACA | 19,905 |
| | MAACA | 20,094 | MAACA | 20,076 | MAAAS | 19,951 |

## Table 116: Evergy Metro Uncertain Factors Sensitivities – Low CO2 Vs. Load and Natural Gas

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| HIGH LOAD | Endpoint | 3 | Endpoint | 6 | Endpoint | 9 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGDS | 17,842 | MCGDS | 17,995 | MDDCS | 18,242 |
| | MCGDU | 17,877 | MCGCS | 18,052 | MCGDS | 18,246 |
| | MCGCS | 17,880 | MCGDU | 18,091 | MBBCS | 18,287 |
| | MCGCT | 17,912 | MCGCT | 18,120 | MCCCS | 18,309 |
| | MCGCU | 17,958 | MCCCS | 18,138 | MAACA | 18,322 |
| | MCGBU | 17,984 | MAACS | 18,141 | MCGCS | 18,327 |
| | MAACS | 18,010 | MDDCS | 18,146 | MAACS | 18,342 |
| | MAABS | 18,012 | MAACA | 18,146 | MAABS | 18,356 |
| | MAACA | 18,037 | MAABS | 18,148 | MFFCS | 18,388 |
| | MCCCS | 18,039 | MBBCS | 18,149 | MEECS | 18,417 |
| | MBBCS | 18,071 | MCGCU | 18,192 | MCGDU | 18,426 |
| | MDDCS | 18,098 | MCGBU | 18,222 | MCGCT | 18,442 |
| | MFFCS | 18,301 | MFFCS | 18,328 | MCGCU | 18,550 |
| | MAAAS | 18,305 | MAAAS | 18,452 | MCGBU | 18,588 |
| | MEECS | 18,471 | MEECS | 18,464 | MAAAS | 18,675 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| MID LOAD | Endpoint | 12 | Endpoint | 15 | Endpoint | 18 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGDS | 17,100 | MCGDS | 17,348 | MDDCS | 17,729 |
| | MCGDU | 17,135 | MCGCS | 17,407 | MCGDS | 17,733 |
| | MCGCS | 17,140 | MCGDU | 17,444 | MBBCS | 17,773 |
| | MCGCT | 17,173 | MCGCT | 17,475 | MCCCS | 17,796 |
| | MCGCU | 17,219 | MCCCS | 17,492 | MAACA | 17,808 |
| | MCGBU | 17,244 | MAACS | 17,493 | MCGCS | 17,815 |
| | MAACS | 17,267 | MDDCS | 17,497 | MAACS | 17,828 |
| | MAABS | 17,268 | MAACA | 17,499 | MAABS | 17,843 |
| | MAACA | 17,294 | MAABS | 17,499 | MFFCS | 17,874 |
| | MCCCS | 17,297 | MBBCS | 17,500 | MEECS | 17,901 |
| | MBBCS | 17,327 | MCGCU | 17,547 | MCGDU | 17,914 |
| | MDDCS | 17,355 | MCGBU | 17,576 | MCGCT | 17,930 |
| | MFFCS | 17,557 | MFFCS | 17,679 | MCGCU | 18,038 |
| | MAAAS | 17,563 | MAAAS | 17,805 | MCGBU | 18,077 |
| | MEECS | 17,726 | MEECS | 17,816 | MAAAS | 18,163 |

| | HIGH GAS | | MID GAS | | LOW GAS | |
|---|---|---|---|---|---|---|
| LOW LOAD | Endpoint | 21 | Endpoint | 24 | Endpoint | 27 |
| | PLAN | NPVRR | PLAN | NPVRR | PLAN | NPVRR |
| | MCGDS | 16,766 | MCGDS | 17,057 | MDDCS | 17,495 |
| | MCGDU | 16,802 | MCGCS | 17,116 | MCGDS | 17,498 |
| | MCGCS | 16,806 | MCGDU | 17,154 | MBBCS | 17,539 |
| | MCGCT | 16,839 | MCGCT | 17,183 | MCCCS | 17,562 |
| | MCGCU | 16,885 | MCCCS | 17,201 | MAACA | 17,575 |
| | MCGBU | 16,911 | MAACS | 17,201 | MCGCS | 17,582 |
| | MAACS | 16,933 | MDDCS | 17,206 | MAACS | 17,595 |
| | MAABS | 16,933 | MAACA | 17,207 | MAABS | 17,608 |
| | MAACA | 16,960 | MAABS | 17,208 | MFFCS | 17,640 |
| | MCCCS | 16,964 | MBBCS | 17,210 | MEECS | 17,668 |
| | MBBCS | 16,994 | MCGCU | 17,256 | MCGDU | 17,679 |
| | MDDCS | 17,021 | MCGBU | 17,286 | MCGCT | 17,697 |
| | MFFCS | 17,223 | MFFCS | 17,388 | MCGCU | 17,805 |
| | MAAAS | 17,230 | MAAAS | 17,514 | MCGBU | 17,844 |
| | MEECS | 17,392 | MEECS | 17,525 | MAAAS | 17,929 |

### 7.10.1 BEHIND THE METER SOLAR AND BATTERY STORAGE ADOPTION IMPACTS

#### 7.10.1.1 Evergy Kansas Central

As part of the 2021 IRP analysis, the Company evaluated the impact from a potential increase in customer-installed distributed solar and battery storage systems on average rates. The solar and battery storage installations and impacts were taken from a recently completed behind-the-meter solar and battery storage potential study conducted for the Company by ICF. The Company engaged ICF in 2020 to evaluate the potential for retail customers to install solar and battery storage systems on the customer side of the meter. The complete study can be found in Appendix 5G. Three different adoption scenarios were developed. The High adoption scenario results were used to effectively modify the 20-year total Central hourly load profile to account for this solar and battery storage adoption. The annual revenue requirements were then estimated for selected Evergy Kansas Central Alternative Resource Plans based on these modifications. Average customer rates where then calculated and compared to the same plan's average rates without the increase in distributed solar and battery storage. This was done for each combination of natural gas price and $CO_2$ cost assumptions (nine scenarios in total). The expected value of the average rate impacts is shown in Table 117 below. Given the minimal change in rates, this was not considered a critical uncertain factor.

**Table 117: Behind the Meter Solar and Battery Storage Impacts on Average Rates for Selected Evergy Kansas Central Plans**

| Year | CAABS | | CHFBV | | CKIBT | | CLJBU | | CLJHV | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $/MWh | % Change | $/MWh | % Change | $/MWh | % Change | $/MWh | % Change | $/MWh | % Change |
| 2021 | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% |
| 2022 | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% | 0.1 | 0.1% |
| 2023 | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% |
| 2024 | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% |
| 2025 | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% | 0.2 | 0.2% |
| 2026 | 0.3 | 0.2% | 0.3 | 0.2% | 0.3 | 0.2% | 0.3 | 0.2% | 0.2 | 0.2% |
| 2027 | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.2% |
| 2028 | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% |
| 2029 | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% |
| 2030 | 0.3 | 0.2% | 0.3 | 0.2% | 0.3 | 0.2% | 0.3 | 0.2% | 0.3 | 0.2% |
| 2031 | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% | 0.3 | 0.3% |
| 2032 | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% | 0.3 | 0.3% |
| 2033 | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% |
| 2034 | 0.5 | 0.3% | 0.4 | 0.4% | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% |
| 2035 | 0.5 | 0.4% | 0.5 | 0.4% | 0.4 | 0.3% | 0.4 | 0.3% | 0.4 | 0.3% |
| 2036 | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.3% |
| 2037 | 0.6 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% |
| 2038 | 0.6 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% | 0.5 | 0.4% |
| 2039 | 0.6 | 0.4% | 0.5 | 0.4% | 0.6 | 0.4% | 0.6 | 0.4% | 0.5 | 0.4% |
| 2040 | 0.7 | 0.5% | 0.6 | 0.4% | 0.6 | 0.4% | 0.6 | 0.4% | 0.6 | 0.4% |

#### 7.10.1.2 Evergy Metro

As part of the 2021 IRP analysis, the Company evaluated the impact from a potential increase in customer-installed distributed solar and battery storage systems on average rates. The solar and battery storage installations and impacts were taken from a recently completed behind-the-meter solar and battery storage potential study conducted for the Company by ICF. The Company engaged ICF in 2020 to evaluate the potential for retail customers to install solar and battery storage systems on the customer side of the meter. The complete study can be found in Appendix 5G. Three different adoption scenarios were developed. The High adoption scenario results were used to effectively modify the 20-year total Metro hourly load profile to account for this solar and battery storage adoption. The annual revenue requirements were then estimated for selected Evergy Metro Alternative Resource Plans based on these modifications. Average customer rates where then calculated and compared to the same plan's average rates without the increase in distributed solar and battery storage. This was done for each combination of natural gas price and $CO_2$ cost assumptions (nine scenarios in total). The expected value of the average rate impacts is shown in Table 118 below. Given the minimal change in rates, this was not considered a critical uncertain factor.

**Table 118: Behind the Meter Solar and Battery Storage Impacts on Average Rates for Selected Evergy Metro Plans**

| Year | MAABS | | MCGBU | |
|---|---|---|---|---|
| | $/MWh | % | $/MWh | % |
| 2021 | $ 0.48 | 0.4% | $ 0.48 | 0.4% |
| 2022 | $ 0.60 | 0.5% | $ 0.60 | 0.5% |
| 2023 | $ 0.76 | 0.7% | $ 0.76 | 0.7% |
| 2024 | $ 0.89 | 0.8% | $ 0.90 | 0.8% |
| 2025 | $ 1.04 | 1.0% | $ 1.05 | 1.0% |
| 2026 | $ 1.17 | 1.1% | $ 1.20 | 1.1% |
| 2027 | $ 1.26 | 1.2% | $ 1.28 | 1.2% |
| 2028 | $ 1.34 | 1.2% | $ 1.37 | 1.2% |
| 2029 | $ 1.40 | 1.3% | $ 1.43 | 1.3% |
| 2030 | $ 1.18 | 1.0% | $ 1.18 | 1.0% |
| 2031 | $ 1.24 | 1.1% | $ 1.26 | 1.1% |
| 2032 | $ 1.25 | 1.1% | $ 1.28 | 1.1% |
| 2033 | $ 1.27 | 1.1% | $ 1.28 | 1.1% |
| 2034 | $ 1.15 | 1.0% | $ 1.13 | 1.0% |
| 2035 | $ 0.97 | 0.8% | $ 0.93 | 0.8% |
| 2036 | $ 1.05 | 0.9% | $ 0.98 | 0.8% |
| 2037 | $ 0.94 | 0.8% | $ 0.85 | 0.7% |
| 2038 | $ 0.79 | 0.6% | $ 0.64 | 0.5% |
| 2039 | $ 0.70 | 0.5% | $ 0.54 | 0.4% |
| 2040 | $ 0.64 | 0.5% | $ 0.47 | 0.4% |

# SECTION 8: PREFERRED PORTFOLIO SELECTION AND RESOURCE ACQUISITION STRATEGY

## 8.1 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.

### 8.1.1 EVERGY

The overall Alternative Resource Plan (ARP) at the Evergy planning level that reflects each of the individual utilities is ARP ERVFL and is shown in Table 119 below:

**Table 119: Evergy Preferred Portfolio**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 306 | |
| 2022 | 0 | | | 345 | |
| 2023 | 0 | | 350 | 594 | 487 |
| 2024 | 0 | | 350 | 758 | 97 |
| 2025 | 0 | 500 | | 893 | |
| 2026 | 0 | 500 | | 1014 | |
| 2027 | 0 | | | 1125 | |
| 2028 | 0 | | 500 | 1224 | |
| 2029 | 0 | | 500 | 1307 | |
| 2030 | 0 | | 500 | 1376 | 669 |
| 2031 | 0 | | 500 | 1413 | |
| 2032 | 0 | | 500 | 1432 | 746 |
| 2033 | 0 | | | 1443 | |
| 2034 | 0 | | | 1452 | |
| 2035 | 0 | | | 1457 | |
| 2036 | 233 | | | 1465 | |
| 2037 | 233 | | | 1480 | |
| 2038 | 0 | | | 1495 | |
| 2039 | 233 | | | 1506 | 2613 |
| 2040 | 2796 | | | 1515 | |

### 8.1.2 EVERGY KANSAS CENTRAL

The Preferred Portfolio CLJBV has been selected for Evergy Kansas Central is shown in Table 120 below:

**Table 120: Evergy Kansas Central Preferred Portfolio**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | 128 | | 209 | |
| 2022 | 0 | | | 208 | |
| 2023 | 0 | | 350 | 306 | 487 |
| 2024 | 0 | | | 383 | |
| 2025 | 0 | 300 | | 447 | |
| 2026 | 0 | 300 | | 502 | |
| 2027 | 0 | | | 552 | |
| 2028 | 0 | | 300 | 598 | |
| 2029 | 0 | | 300 | 631 | |
| 2030 | 0 | | 300 | 659 | 611 |
| 2031 | 0 | | 300 | 681 | |
| 2032 | 0 | | 300 | 701 | 373 |
| 2033 | 466 | | | 712 | |
| 2034 | 0 | | | 719 | |
| 2035 | 0 | | | 722 | |
| 2036 | 0 | | | 726 | |
| 2037 | 0 | | | 733 | |
| 2038 | 233 | | | 741 | |
| 2039 | 0 | | | 748 | 1550 |
| 2040 | 1631 | | | 756 | |

The Preferred Portfolio includes the following renewable additions: 350 MW of solar generation in year 2023, and 300 MW of solar generation in each of the years 2028 – 2032. The 128 MW Flat Ridge 3 wind asset which was procured from a PPA executed in 2019 is expected to be in service in the 3rd quarter of 2021. Additionally, 300 MW of wind generation in years 2025 and 2026. Demand Side Management (DSM) resources levels are based upon a combination of the Realistic Achievable Potential (RAP) and RAP- scenarios.

### 8.1.3 EVERGY METRO

The Preferred Portfolio MCGCU has been selected for Evergy Metro is shown in Table 121 below:

**Table 121: Evergy Metro Preferred Portfolio**

| Year | CT's (MW) | Wind (MW) | Solar (MW) | DSM (MW) | Retire (MW) |
|---|---|---|---|---|---|
| 2021 | 0 | | | 29 | |
| 2022 | 0 | | | 48 | |
| 2023 | 0 | | | 146 | |
| 2024 | 0 | | 230 | 196 | |
| 2025 | 0 | 120 | | 237 | |
| 2026 | 0 | 120 | | 273 | |
| 2027 | 0 | | | 305 | |
| 2028 | 0 | | 120 | 333 | |
| 2029 | 0 | | 120 | 357 | |
| 2030 | 0 | | 120 | 377 | |
| 2031 | 0 | | 120 | 384 | |
| 2032 | 0 | | 120 | 382 | 373 |
| 2033 | 0 | | | 380 | |
| 2034 | 0 | | | 379 | |
| 2035 | 0 | | | 377 | |
| 2036 | 0 | | | 376 | |
| 2037 | 0 | | | 376 | |
| 2038 | 0 | | | 378 | |
| 2039 | 0 | | | 379 | 821 |
| 2040 | 699 | | | 379 | |

This Preferred Portfolio includes the following renewable additions: 230 MW of solar generation in year 2024, and 120 MW of solar generation in each of the years 2028 – 2032. Additionally, 120 MW of wind generation in years 2025 and 2026. Demand Side Management (DSM) resources levels are based upon a combination of the Realistic Achievable Potential (RAP) and RAP- scenarios. Evergy will develop specific energy efficiency and demand response programs for the Kansas Metro jurisdiction later in 2021.

The Preferred Portfolio was not the lowest cost plan from a Net Present Value of Revenue Requirement (NPVRR) perspective. On an expected value basis, the lowest cost Alternative Resource Plan (ARP) was $47 Million lower over the twenty-year planning period. The single difference between the Preferred Portfolio and the lowest cost ARP was due to the difference in DSM assumptions between the plans. The Preferred Portfolio utilized the RAP- level of DSM programs whereas the lowest cost ARP, MCGDU utilizes Missouri Energy Efficient Investment Act (MEEIA) 3 programs only. While the selected Preferred Portfolio for Evergy Metro is the second lowest cost plan on an expected value basis over the 27 scenarios evaluated, the lowest cost plan for Evergy as a combined company, which is also our Preferred Portfolio for Evergy, includes the continuation of DSM programs in Evergy Missouri Metro service territory. This Preferred Portfolio not only shows a reduction in overall Evergy (all territories combined) revenue requirements, but it also maintains current customer program offerings and consistency across Evergy's Missouri service territories. Additional analysis will be conducted during the next Integrated Resource Planning process, DSM potential study and the next MEEIA application filing to minimize any negative impacts on Metro customers.

## 8.2 IMPLEMENTATION PLAN AND ONGOING REVIEW

### 8.2.1 LOAD FORECASTING

Evergy plans to conduct its next Residential Appliance Saturation Survey during the next implementation period. The last survey was completed in 2019. 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. Evergy also plans to match the responses with the customers' billing records and to conduct a conditional demand study to measure the unit energy consumption (UEC) for each major appliance.

Evergy plans to look at conducting a price elasticity study during the implementation period.

Evergy will continue to develop and improve its framework of incorporating photovoltaic (PV) and electric vehicle (EV) impacts into the energy forecast to capture PV and EV energy impacts.

Evergy plans to look at developing a new industrial model that will allow the utility to create an industrial intensity index which would be calibrated to the Evergy service areas C&I survey data.

### 8.2.2 DEMAND-SIDE MANAGEMENT

Evergy is currently developing a preliminary proposal for its DSM programs to reflect the level of programs selected in the Preferred Portfolio. Evergy plans to share progress with stakeholders as the plans progress and expects to file its application in late 2021.

### 8.2.3 SUPPLY-SIDE

The Preferred Portfolio also includes acquiring approximately 350 MW of company-owned solar generation expected to reach commercial operation by December 31, 2023. A draft schedule of the major milestones expected to be undertaken for the construction of this large-scale solar project is provided in Table 122 below. In addition, Evergy also plans to retire the Lawrence Energy Center at the end of 2023.

**Table 122: Solar Acquisition Milestones**

| Milestone Description | Expected Completion |
|---|---|
| Site Control Completed | October 2021 |
| Environmental and Land Permitting Finalized | December 2021 |
| Development Complete | March, 2022 |
| Design and Engineering | April 2022 |
| Interconnection Agreement | August 2022 |
| EPC Agreement Execution | September 2022 |
| Equipment Acquisition and Delivery | February 2023 |
| Construction Complete | October 2023 |
| Testing and Commissioning | October 2023 |
| Commercial Operation | December 2023 |

### 8.2.4 IRP ANALYSIS TOOLS

Evergy is in the process of evaluating and implementing new analytical tools that will enhance its IRP process. Such tools include a capacity expansion optimization tool currently under development.

### 8.2.5 CONTINGENCY RESOURCE PLANS

Evergy has identified Alternative Resource Plans that become preferred if the critical uncertain factors exceed the limits developed in Section 8.2.6 for Evergy Kansas Central and Section 8.2.7 for Evergy Metro.

#### 8.2.5.1 Evergy Kansas Central Contingency Plans

Evergy Kansas Central has identified two contingency plans under conditions where certain critical uncertain factors deviate significantly from the mid-case expectations. The contingency resource plans are shown in the table below:

**Table 123: Evergy Kansas Central Contingency Resource Plan**

| Plan Name | DSM Level | Retire | Renewable Additions - Wind | Renewable Additions - Solar | Generation Additions (if needed) |
|---|---|---|---|---|---|
| CHFBV | RAP- | Lawrence 4&5: Dec 31, 2030<br>*Jeffrey 3: Dec 31, 2030*<br>LaCygne-1: Dec 31, 2032<br>*Jeffrey 1 & 2: Dec 31, 2039*<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021)<br>300 MW Wind (2025, 2026) | 350 MW Solar (2023)<br>300 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2033<br>1 CT (233 MW) in 2037<br>7 CT (1631 MW) in 2040 |
| CLJBA | RAP- | *Lawrence 4: Dec 31, 2023*<br>*Lawrence 5: Dec 31, 2023*<br>Jeffrey 3: Dec 31, 2030<br>LaCygne-1: Dec 31, 2032<br>Jeffrey 1 & 2: Dec 31, 2039<br>LaCygne-2: Oct 1, 2039 | 128 MW Wind (2021) | n/a | 2 CT (466 MW) in 2031<br>1 CT (233 MW) in 2032<br>1 CT (233 MW) in 2033<br>1 CT (233 MW) in 2036<br>1 CT (233 MW) in 2037<br>7 CT (1631 MW) in 2040 |

These contingency plans were identified through evaluation of the relative cost performance of each alternative resource plan under different combinations of the critical uncertain factors. The combination of critical uncertain factors under which the contingency plans are projected to be lower cost than the Preferred Portfolio are as follows:

**Low and Mid $CO_2$ Costs with High Natural Gas Prices**

Under these combinations of critical uncertain factors, Alternative Resource Plan CHFBV is expected to have a lower 20-year NPVRR than the Preferred Portfolio. This Plan is similar to the Preferred Portfolio with the exception that the Lawrence 4 & 5 retirements are delayed until 2030.

**Low $CO_2$ Costs with Low Natural Gas Prices**

Under this combination of critical uncertain factors, Alternative Resource Plan CLJBA is expected to have a lower 20-year NPVRR than the Preferred Portfolio. This Plan includes the same plant retirements and DSM programs as the Preferred Portfolio, however it does not include additional renewables resources.

#### 8.2.5.2 Evergy Metro Contingency Plans

Evergy Metro has identified two contingency plans under conditions where certain critical uncertain factors deviate significantly from the mid-case expectations. The contingency resource plans are shown in the table below:

**Table 124: Evergy Metro Contingency Resource Plan**

| Plan Name | DSM Level | Retire | Renewable Additions Wind | Renewable Additions Solar | Generation Additions |
|---|---|---|---|---|---|
| MCGCS | RAP- + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | | 230 MW Solar (2024) | 4 CT (932 MW) in 2040 |
| MCGBU | RAP + DSR (MO) /RAP- + DSR (KS) | LaCygne-1: Dec 31, 2032<br>LaCygne-2: Dec 31, 2039<br>Iatan-1: Dec 31, 2039 | 120 MW Wind (2025, 2026) | 230 MW Solar (2024)<br>120 MW Solar (2028, 2029, 2030, 2031, 2032) | 2 CT (466 MW) in 2040 |

These contingency plans were identified through evaluation of the relative cost performance of each alternative resource plan under different combinations of the critical uncertain factors. The critical uncertain factor conditions under which the contingency plans are projected to be lower cost than the Preferred Portfolio are as follows:

**Low $CO_2$ Costs**

Under the low $CO_2$ scenarios, Alternative Resource Plan MCGCS is expected to have a lower 20-year NPVRR than the Preferred Portfolio. It also ranks 2$^{nd}$ out of the plans analyzed on an expected value basis under the nine low $CO_2$ cost scenarios. The highest ranked plan on an expected value basis over the nine low $CO_2$ cost scenarios, MCGDS, was not selected as the contingency plan under these conditions as it discontinues DSM programs after the current MEEIA cycle.

**High $CO_2$ Costs**

Under the high $CO_2$ scenarios, Alternative Resource Plan MCGBU is expected to have a lower 20-year NPVRR than the Preferred Portfolio. MCGBU is the lowest cost plan under all high $CO_2$ cost scenarios modeled.

### 8.2.6 EVERGY KANSAS CENTRAL UNCERTAINTY FACTOR RANGES

Evergy has evaluated the ranges and combinations of outcomes for the critical uncertain factors that define the limits within which the Preferred Portfolio for Evergy Kansas Central is judged to be appropriate.

The ranges of critical uncertain factors are calculated by finding the value at which the critical uncertain factor needs to change in order for the Preferred Portfolio to no longer be preferred. The values of the NPVRR for the Preferred Portfolio and the lowest cost plan under extreme conditions are compared and by using linear interpolation a crossover point value is found and expressed as a percent of the range of the critical uncertain factor. These percentages are superimposed on the high, mid and low forecasts for each critical uncertain factor to develop the resulting ranges. The results are described below.

#### 8.2.6.1 Evergy Kansas Central - Natural Gas Uncertainty Ranges Under Low $CO_2$ Cost Scenarios

Under the Low $CO_2$ scenarios, the contingency plan CHFBV or CLJBA becomes lower cost than the Preferred Portfolio depending on the natural gas price assumption.

Using the NPVRR results shown in the Tables below, linear interpolation was used to determine the change in gas prices necessary for the NPVRR for CHFBV or CLJBA to become lower than the Preferred Portfolio CLJBV. As natural gas prices increase from the Mid scenario towards the High scenario, CHFBV becomes the lowest cost plan. As natural gas price decrease from the Mid scenario towards the Low scenario, CLJBA becomes the lowest cost plan.

From these results, as natural gas prices move 10.2% of the distance from the Mid scenario towards the High scenario, CHFBV becomes the lower cost plan.

| Gas and Low $CO_2$ | | |
|---|---|---|
| Plan | Mid | High |
| CLJBV | 29,277 | 29,158 |
| CHFBV | 29,283 | 29,105 |
| Percent | from Mid | |
| Upper % | 10.2% | |

From these results, as natural gas prices move 24.3% of the distance from the Mid scenario towards the Low scenario, CLJBA becomes the lower cost plan.

| Gas and Low $CO_2$ | | |
|---|---|---|
| Plan | Mid | Low |
| CLJBV | 29,277 | 29,325 |
| CLJBA | 29,339 | 29,132 |
| Percent | from Mid | |
| Upper % | 24.3% | |

#### 8.2.6.2 Evergy Kansas Central - Natural Gas Uncertainty Range Under Mid $CO_2$ Cost Scenarios

Under the Mid $CO_2$ scenarios, the contingency plan CHFBV becomes lower cost than the Preferred Portfolio depending on the natural gas price assumption.

Using the NPVRR results shown in the Tables below, linear interpolation was used to determine the change in gas prices necessary for the NPVRR for CHFBV to become lower than the Preferred Portfolio CLJBV. As natural gas prices increase from the Mid scenario towards the High scenario, CHFBV becomes the lowest cost plan.

From these results, as natural gas prices move 72.7% of the distance from the Mid scenario towards the High scenario, CHFBV becomes the lower cost plan.

| Gas and Mid $CO_2$ | | |
|---|---|---|
| Plan | Mid | High |
| CLJBV | 30,473 | 30,433 |
| CHFBV | 30,513 | 30,418 |
| Percent | from Mid | |
| Upper % | 72.7% | |

### 8.2.7 EVERGY METRO UNCERTAINTY FACTOR RANGES

Evergy has evaluated the ranges and combinations of outcomes for the critical uncertain factors that define the limits within which the Preferred Portfolio for Evergy Metro is judged to be appropriate.

The ranges of critical uncertain factors are calculated by finding the value at which the critical uncertain factor needs to change in order for the Preferred Portfolio to no longer be preferred. The values of the NPVRR for the Preferred Portfolio and the lowest cost plan under extreme conditions are compared and by using linear interpolation a crossover point value is found and expressed as a percent of the range of the critical uncertain factor. These percentages are superimposed on the high, mid and low forecasts for each critical uncertain factor to develop the resulting ranges. The results are described below.

#### 8.2.7.1 Evergy Metro - $CO_2$ Cost Uncertainty Ranges

Under all nine High $CO_2$ scenarios, plan MCGBU becomes lower cost than the Preferred Portfolio. Using the NPVRR results shown in the Table below, linear interpolation was used to determine the change in $CO_2$ prices necessary for MCGBU NPVRR to become lower than the Preferred Portfolio MCGCU NPVRR. As $CO_2$ costs increase from the Mid scenario towards the High scenario, MCGBU becomes the lowest cost plan.

From these results, $CO_2$ costs need to move 44.7% of the distance towards the High $CO_2$ cost scenario for MCGBU to become the lower cost plan.

| CO2 and Mid Gas | | |
|---|---|---|
| Plan | Mid | High |
| MCGCU | 18,568 | 20,087 |
| MCGBU | 18,585 | 20,066 |
| Percent | from Mid | |
| Upper % | 44.7% | |

Under all nine Low $CO_2$ scenarios, plan MCGCS becomes lower cost than the Preferred Portfolio. Using the NPVRR results shown in the Table below, linear interpolation was used to determine the change in $CO_2$ prices necessary for MCGCS NPVRR to become

lower than the Preferred Portfolio MCGCU NPVRR. As $CO_2$ costs decrease from the Mid scenario towards the Low scenario, MCGCS becomes the lower cost plan.

From these results, $CO_2$ costs need to move 27.5% of the distance towards the Low $CO_2$ cost scenario for MCGCS to become the lower cost plan.

| CO2 and Mid Gas | | |
|---|---|---|
| Plan | Mid | Low |
| MCGCU | 18,568 | 17,547 |
| MCGCS | 18,621 | 17,407 |
| Percent | from Mid | |
| Upper % | 27.5% | |

#### 8.2.7.2 Evergy Metro - Gas Price Uncertainty Range

Under the three Mid $CO_2$ with Low Gas price scenarios, plan MCGCS becomes lower cost than the Preferred Portfolio. Using the NPVRR results shown in the Table below, linear interpolation was used to determine the change in Gas prices necessary for MCGCS NPVRR to become lower than the Preferred Portfolio MCGCU NPVRR. As gas prices decrease from the Mid scenario towards the Low scenario, MCGCS becomes the lower cost plan.

From these results, gas prices need to move 60.2% of the distance towards the Low scenario for MCGCS to become the lower cost plan.

| Gas and Mid CO2 | | |
|---|---|---|
| Plan | Mid | Low |
| MCGCU | 18,568 | 18,798 |
| MCGCS | 18,621 | 18,763 |
| Percent | from Mid | |
| Upper % | 60.2% | |

### 8.2.8 MONITORING CRITICAL UNCERTAIN FACTORS

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 Vice President, Safety and Operations Planning.

**Critical Uncertain Factor: $CO_2$**

$CO_2$ credit prices are reviewed on a continual basis. The data sources used are third party views predicting the price of the credits. Most of these third party studies are sparked by proposed legislation or are updated up to a quarterly basis. This review and update is conducted by the Fuels department with a full review conducted on an annual basis.

**Critical Uncertain Factor: Load**

Load forecasts are updated on an annual basis as part of the company's annual budgeting process.

**Critical Uncertain Factor: Natural Gas**

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

### 8.2.9 PREFERRED PORTFOLIO ROBUSTNESS AND FLEXIBILITY

The robustness of the Preferred Portfolio for Evergy Kansas Central can be gauged by the NPVRR ranking across the 27 scenarios analyzed. In 24 of the 27 scenarios analyzed, the Preferred Portfolio, CLJBV, ranked as one of the two lowest NPVRR plans. It ranked as the lowest cost plan in 18 of the 27 scenarios. In general, it is in scenarios with low $CO_2$ restrictions combined with lower than expected natural gas prices where the Preferred Portfolio does not rank as a low-cost plan. Given the wide range of scenarios where the Preferred Portfolio ranks well, it is generally a robust plan.

The flexibility of the Preferred Portfolio can be viewed from a few perspectives:

Plant Retirements: Coal plants that have fewer environmental retrofits are being retired first. Lawrence 4 and 5 are the next coal plants planned for retirement, followed by Jeffery Unit 3. Given these units have fewer environmental retrofits than other Evergy coal units, this helps prevent the future scenario where other Evergy coal plants have been retired and future environmental regulations force the economic retirement of Lawrence 4 and 5 and/or Jeffrey 3 leaving Evergy with less generating capacity than expected.

In addition, Lawrence 4 and 5 retirement are not planned until late 2023. This will allow for further evaluation should conditions change.

Demand Side Management Programs (DSM): In certain respects, DSM programs provide flexibility that new generating resources cannot. DSM programs have the flexibility to be implemented over the course of many years where generally new generating resource are added in larger single capacity amounts. DSM's flexibility allows for adjustments over time as conditions change.

Renewable Additions. The renewable additions to the Evergy supply portfolio are planned to occur each year from 2023-2032, except for 2027. This allows for adjustments to be made as conditions change.

The robustness of the Preferred Portfolio for Evergy Metro, MCGCU, can also be gauged by the NPVRR ranking across the 27 scenarios analyzed. In the nine low $CO_2$ scenarios, Alternative Resource Plan MCGCS becomes preferred over the selected Preferred Portfolio. MCGCS is similar to the Preferred Portfolio with the exception that the only future renewable resource addition is the 2024 solar addition. Given that the 2024 solar addition is part of the Preferred Portfolio and all contingency plans, this makes this next planned resource addition a robust decision. In the nine high $CO_2$ scenarios, Alternative Resource Plan MCGBU become preferred over the selected Preferred Portfolio. MCGBU is similar to the Preferred Plan with the exception of increased DSM program implementation. Given that DSM programs could be increased if and when significant $CO_2$ restrictions were implemented, this flexibility helps make the Preferred Plan a robust decision.

In addition to the flexibility of adjusting DSM program implementation as conditions warrant, the Preferred Portfolio has significant flexibility in that the next major resource addition does not occur until 2024, allowing time to re-evaluate the current Preferred Portfolio as part of the next IRP update.

### 8.2.10 MONITORING PREFERRED PORTFOLIO

#### 8.2.10.1 Plant Retirement Initiatives

As discussed in Section 8.2.9 above, the earliest a coal-fired power plant is expected to be retired is Lawrence 4 and 5 by December 31, 2023 which allows for further evaluation should conditions change. Given that the retirement of Lawrence 4 and 5 reduces revenue requirements in most modeled scenarios, however, a change in the decision to retire this plant is relatively unlikely.

#### 8.2.10.2 Solar Initiative

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. Note that the IRP NPVRR analysis assumes that all future renewable additions will be able to obtain firm transmission service and as such do not include transmission congestion basis risk. This risk will be evaluated on a project-specific basis at the time each resource decision is made.

This solar development is actively monitored by an internal team on an ongoing basis and will eventually receive monthly progress reports from the solar developer(s) ultimately selected to develop ~350 MW of solar generation. As part of future contract negotiations anticipated to occur over the next several weeks, conditions will be established for the final Notice to Proceed for the project(s). These terms will define the critical point(s) of commitment and associated financial implications. It is anticipated that significant financial commitments for this addition will occur in Q1 2022 with the Notice to Proceed. Given the relatively short construction cycle for solar facilities, abandoning the project(s) after that point is unlikely.

#### 8.2.10.3 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.

#### 8.2.10.4 Existing Generation Retrofit Initiatives

Ongoing environmental projects including the dry-bottom ash handing project, partial zero liquid discharge (ZLD) system installation, fly ash landfill closure and cover, bottom ash handling system projects at the Jeffrey Energy Center, partial ZLD system installation and ash pond removal projects at Lawrence Energy Center, storm water pond and discharge construction and upper and lower AQC pond closure and cover at LaCygne Station are monitored and continuing.

## 8.3 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.

**EVERGY KANSAS CENTRAL, INC., EVERGY KANSAS SOUTH, INC. AND EVERGY METRO, INC.**

**INTEGRATED RESOURCE PLAN – 2021 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.

Kevin Noblet

Vice President Safety and Operations Planning

David Campbell

President and Chief Executive Officer