Evergy 2021 Integrated Resource Plan Overview

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2021 IRP Introduction

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We are pleased to present our first triennial Integrated Resource Plan (IRP) filing since Evergy was formed in 2018 from a merger between Westar Energy and Great Plains Energy.

This filing details our Preferred Plan (hereafter referenced as Plan), developed through an extensive stakeholder process to meet the diverse needs of our customers and communities. We are committed to meeting our customers' evolving energy needs for years to come, with this 20-year Plan laying that foundation. The Plan balances safety, reliability, affordability, and sustainability to deliver customers the power they need at a competitive cost.

As we developed the Plan, we adhered to four key principles:

1. Unwavering commitment to safety and customer affordability, balancing risk and reliability considerations with a near- and long-term focus on cost
2. Uncompromising fidelity to high standards of environmental stewardship and progress toward a zero-carbon future enabled by technology, regulatory, and policy evolution
3. Technology-enabled transition of our aging fossil generation fleet to more sustainable and cost-competitive generation and demand-side resources
4. Prudent use of existing fossil resources through end-of-life, as these resources provide needed, reliable, cost-effective capacity as technology advances to enable a zero-carbon future

This Plan was selected after careful consideration of more than 50 distinct plans, weighing multiple evaluation criteria, including ongoing operating cost to operate existing generation, expected cost of ongoing environmental compliance, and cost of alternative resources. It incorporates additional investment in cost-effective renewable resources while responsibly managing our existing generation sources through end-of-life. It maintains the focus on reliability that our customers depend on for their lives and livelihoods, while also creating flexibility for them to benefit from generation technology advancement. In addition, investments in cost-effective new technologies create jobs and promote economic development. For example, the Plan recognizes the policy of the state of Missouri to encourage utility generation transition to cleaner energy through ownership of renewable energy resources and represents a measured transition to a more sustainable and lower risk generation profile that balances safety, reliability, affordability, and sustainability.

Market conditions are changing the mission of our fossil generation. Increasingly, plants that once provided baseload capacity are required to act more like the battery back-up for wind and solar resources. Just to cite a recent example, wind resources set a new record by providing more than 80% of the total energy needs across the Southwest Power Pool (SPP) in late March 2021. The record will not last long; more than 78 gigawatts of new renewable energy are in the SPP generation queue. The result is the need for more flexible operations that can better position our generation fleet to react to intraday and intra-hour variability in renewable resources or fluctuations in electricity demand.

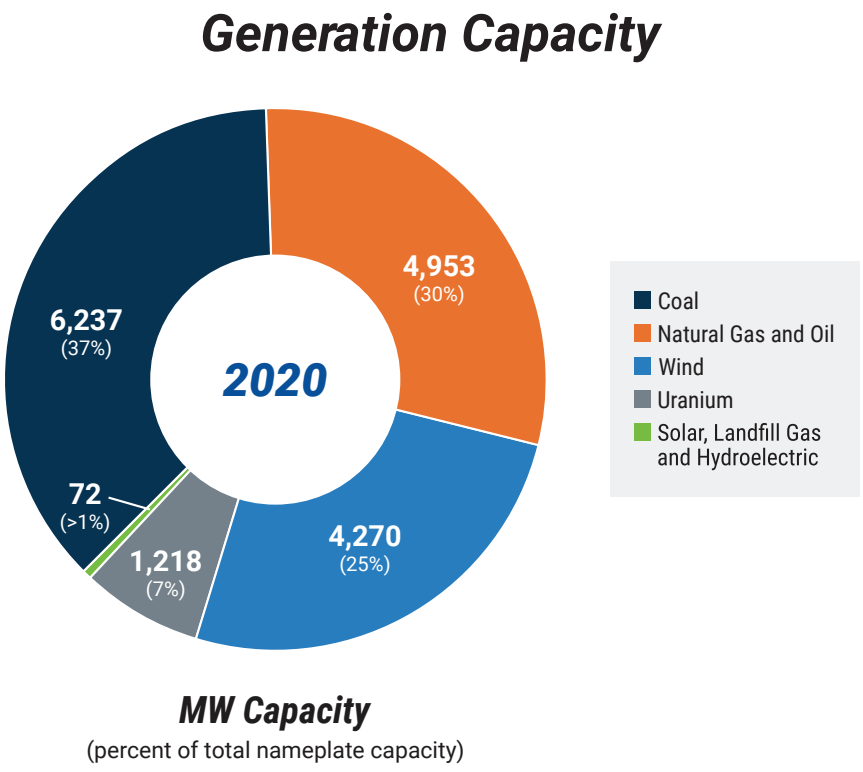
We anticipate these dynamics will continue, with coal plants running fewer hours and their energy increasingly displaced by renewable resources that effectively run at zero marginal costs. At the same time, these coal plants provide a valuable, dispatchable resource for the system, balancing the intermittency of renewables and ensuring reliability for our customers. The Plan allows us to responsibly manage this transition and take advantage of a diverse fuel mix for our customers as renewable and storage technologies continue to evolve – balancing

cost-competitive, clean energy from renewable resources and the reliability benefits of our existing plants. The February 2021 extreme cold weather event that created regional stress on the power grid once again showed the value of having generation with onsite fuel and reminds us that a paced and well-planned transition to a lower carbon future is necessary. In parallel, a phased transition provides the ability to adapt to market, technology, and policy changes.

This Plan is central to our Sustainability Transformation Plan (STP), which is Evergy's strategic plan guiding decisions through 2024, and continues our transition toward becoming a more sustainable energy company. The **Integrated Resource Plan key highlights** are summarized below:

- Results in the most cost effective and lowest risk option for our customers
- Builds on state policy encouragement and our own strong generation transition track record. As of year-end 2020 (Figure 1), Evergy has retired about 2,200 MW of fossil generation, compiled a wind portfolio of more than 4,200 MW, reduced carbon emissions by 51 percent from 2005 levels, and is providing more than half of retail customers' energy needs through emission-free sources.

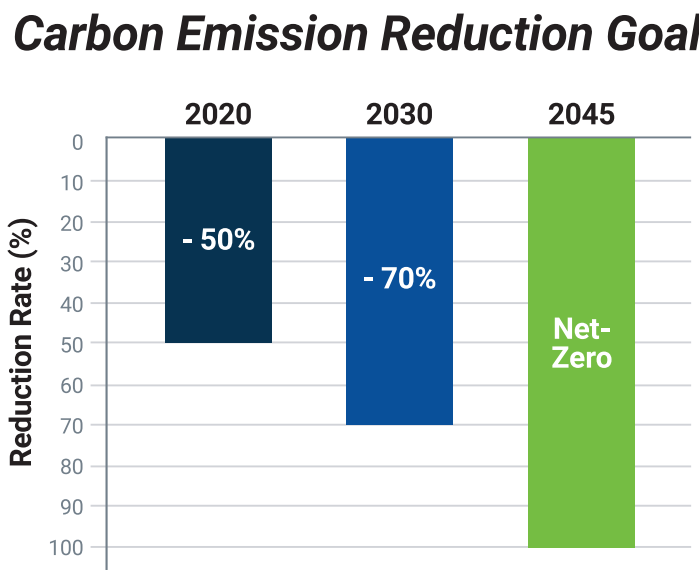
Figure 1. Evergy generation capacity as of 2020



- Reduces carbon emissions by 70% through 2030 (relative to 2005 levels). Building on this trajectory, our goal is to achieve net zero carbon emissions by 2045, assuming key technology, policy, and regulatory enablers are in place. To do this, the Plan includes:
  - Nearly 1,200 MWs of fossil retirements and 3,200 MWs of renewable generation additions including both solar and wind over the next 10 years
  - Continued responsible transition of existing fossil generation from baseload to reliable, flexible back-up capacity, lowering operating costs and carbon emissions

  - Retirement of nearly all remaining coal generation by 2040 with nearly 4,500 MWs of renewable and zero-carbon emitting firm, dispatchable resources added over the second decade of the Plan. Technology advancements will offer the ability to optimize timing and provide the potential to further accelerate generation transition.
- Addresses growing reality of increased insurance, financing, and other costs to customers if Evergy doesn't complete timely transition of its generation portfolio

Figure 2. Carbon emissions reduction trajectory relative to 2005 levels



Plan Summary

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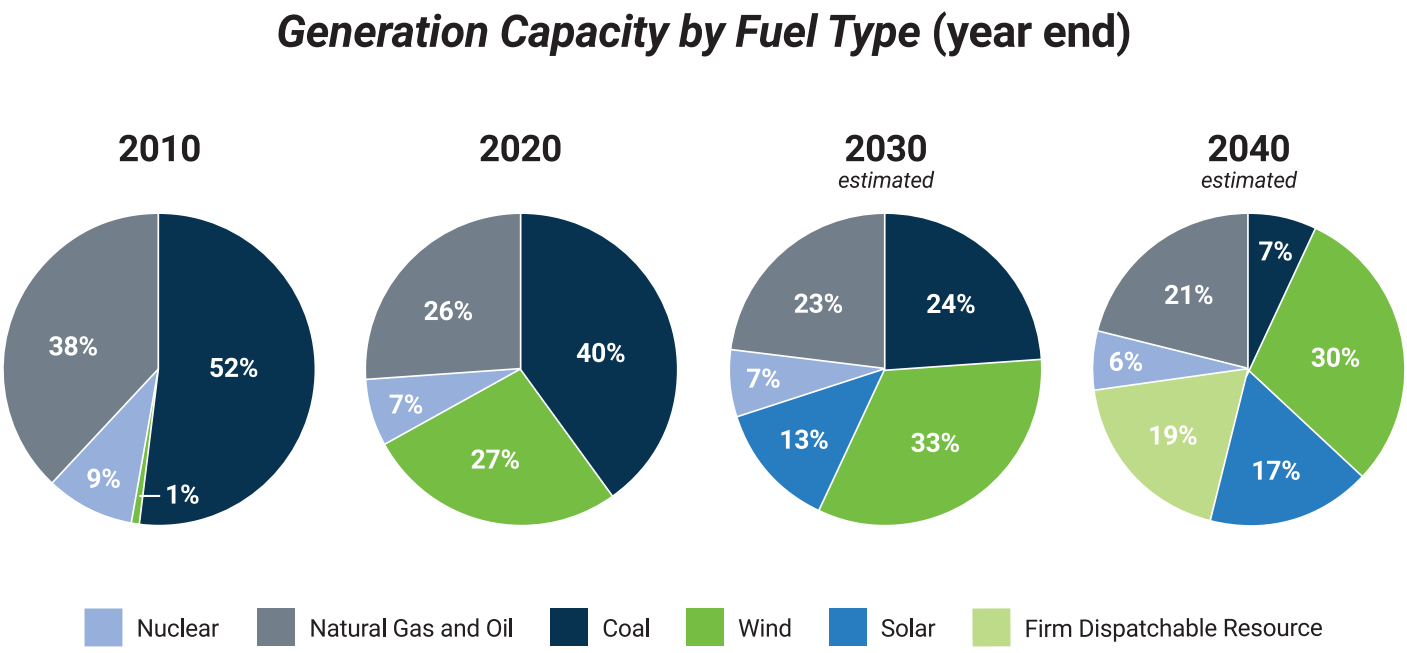
Our Plan was developed to ensure reliability, affordability, safety, flexibility, and environmental stewardship while managing cost impacts and reducing future operating and cost risks to our customers. It will also drive significant economic development in the communities in which we operate through the construction and operation of new generation facilities. As shown below in the summary of capacity evolution over time (Figure 3), the result is a balanced, diversified mix of generation sources that does not rely too heavily on any single fuel type.

Figure 3. Generation capacity by fuel type

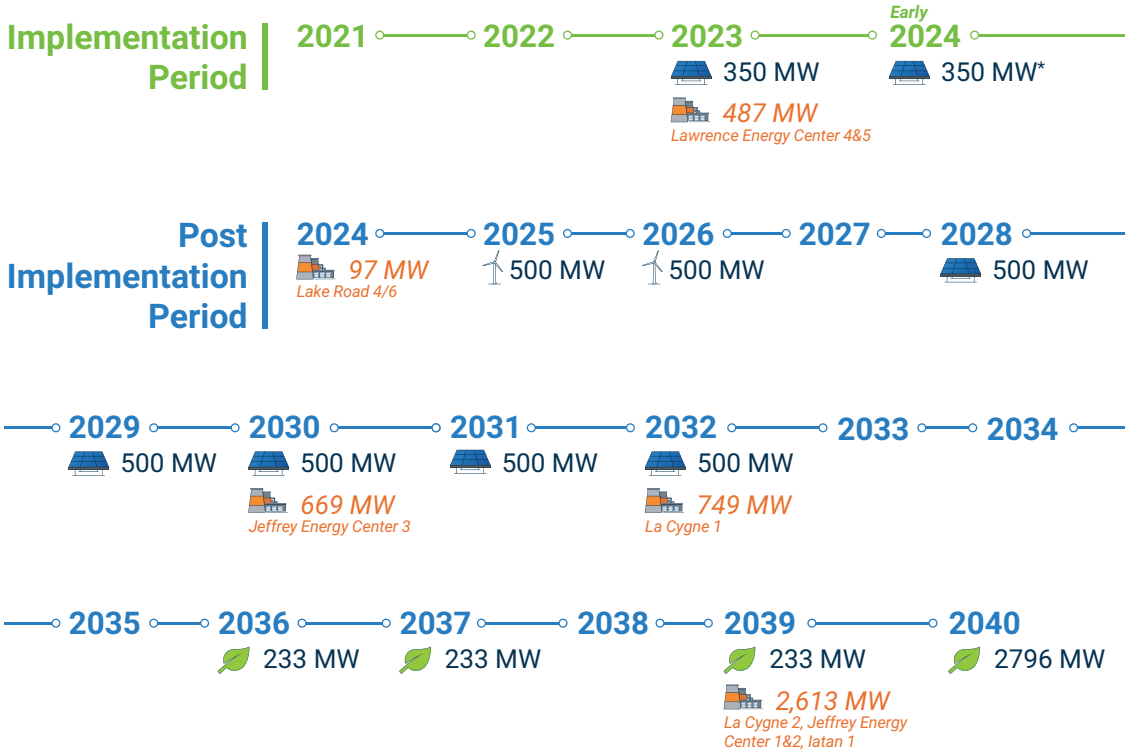


Our goal is to achieve net-zero carbon emissions by 2045.

Generation Transition

As shown below (Figure 4), the Plan outlines capacity retirements and renewable additions for the 2021 to 2040 timeframe.

Figure 4. Evergy planned generation capacity retirements & additions



**Construction of 350 MW of solar will begin prior to filing of next triennial IRP, with in-service date likely later in 2024.*

Renewable Additions

Through 2030, we plan to add 3,200 MWs of renewable generation. This is an increase of 2,700 MWs over our 2020 annual IRP update, based on a new all-source request for proposal (RFP) and comprehensive analysis of the costs and risks associated with available generation sources. The renewable additions will be a combination of solar and wind resources. Solar offers clean energy that more closely aligns with our customers' load demand, with peak generation available around the same time of day when load needs are highest. It adds a new fuel source to our existing portfolio at meaningful levels, increasing diversity. Wind additions continue to take advantage of the tremendous resource we have in our region. These additions of solar and wind allow Evergy to continue taking advantage of federal tax credits, increasing affordability for our customers. Adding renewable generation over time will enable us to benefit from the sustained and ongoing technology and cost improvements for both solar and wind. In addition to reducing our environmental impact and adding new cost-effective resources, renewable resource investments help to mitigate the exposure to potential cost increases for customers that would result from additional environmental compliance standards for fossil plants, carbon pricing, or other future changes in governmental or regulatory policy.

From 2031 through 2040, our Plan adds 4,495 MW of renewable and zero-carbon firm, dispatchable resources to further advance the transition of our generation fleet. These firm, dispatchable resources are currently modeled as natural gas-fired combustion turbines to provide valid financial and operational parameters for calculating revenue requirements. However, because they will only be needed for reliability purposes in the last five years of the planning horizon (2036-2040), the assumption is that new carbon-free generation and/or suitable long-duration energy storage technology will be available to provide capacity by that time period. We expect a continued robust pace of technology change, including improvements to storage capabilities, and will identify specific resources to meet this need through future IRP filings as they near our implementation planning horizon.

Plant Retirements

The decision to retire an existing plant is case specific and many factors are considered and analyzed through the IRP process. Those factors are outlined in the Plan. The most significant generation reduction in the near-term is the planned retirement of the remaining units at Lawrence Energy Center, units 4 and 5 (484 MWs), in late 2023. Lawrence represents aged capacity for Evergy Kansas Central as our oldest remaining coal plant[1], with Unit 4 built in 1960 and Unit 5 in 1971. As this facility reaches the end of its useful life, we will initiate a process for the responsible retirement of the site while evaluating the potential to repurpose existing infrastructure.

From 2024 through 2040, our Plan pursues a measured fossil plant retirement pace, with 4,125 MW of capacity retired at the end of useful life.

Plan Timing

Our Plan comprises two distinct stages of evaluation and execution, shown in Figure 4 as the Implementation and Post-Implementation periods.

Implementation Period

The near-term Implementation Period covers the first three years of the Plan (2021 through the beginning of 2024). It falls between triennial filings, during which time we file annual updates to reflect any substantive changes.

[1] Hawthorn 5 was built in 1969, but substantially rebuilt in 2001.

The Implementation Period offers the highest confidence window of our Plan, given the greater near-term visibility into uncertain factors.

During the Implementation Period, our Plan anticipates:

- Planned retirement of Lawrence units 4 and 5 (484 MWs) in late 2023. As noted above, Lawrence Energy Center represents aged capacity for Evergy Kansas Central as our oldest remaining coal plant.
- Addition of 700 MWs of utility-scale solar, which diversifies our energy portfolio and adds peak capacity and low-cost energy to our system.
    - Evergy is using a competitive contracting process to select specific projects for the planned 350 MW of capacity to be added in 2023 and 2024, for a total of 700 MW, to maximize value for our customers.

Post-Implementation Period

The Post-Implementation Period represents the next 17 years covered within this 20-year IRP (mid-2024 through 2040). In this later window, we will monitor how our customer needs evolve and how uncertain factors such as technology, commodity prices, operating costs, and environmental regulation compared with our prior expectations and scenario assumptions. Through annual updates to this Plan in 2022 and 2023, the fully updated IRP filed in 2024, and the subsequent annual updates and triennial filings, we will continue ongoing analysis and refine plans to ensure safe, affordable, reliable, and sustainable generation for our customers.

Key actions during the Post-Implementation Period include:

- Several additional coal retirements by 2040. We believe this to be the most cost effective and lowest risk option for our customers, based on comprehensive analysis of known and potential developments. Currently slated for retirement are:
    - Lake Road unit 4/6 in late 2024 (97 MW)
    - Jeffrey unit 3 in 2030 (669 MW[2])
    - La Cygne unit 1 in 2032 (746 MW)
    - La Cygne unit 2 (662 MW), Jeffrey units 1 and 2 (1,335 MW[2]), and Iatan unit 1 in 2039 (616 MW).

  These retirement dates are largely consistent with units' current depreciable lives, which are used in customer rates. An exception is the acceleration of the Jeffrey Unit 3 retirement from 2039 to 2030, which is largely driven by the expectation that environmental retrofits for this unit will be required prior to 2039 (the retirement date currently aligned with customer rates). Again, plant retirements are case-specific and multiple factors are considered, as outlined in the Plan.

  The growth of intermittent resources means plants that once provided baseload capacity are now required to act more like the battery back-up for wind and solar resources. Maintaining dispatchable coal capacity, with its on-site fuel storage, also provides a valuable reliability contingency for our customers, particularly when both summer and winter extreme weather scenarios are considered. As we move forward and more information becomes available, our Post-Implementation Period plans remain flexible. We will continue to evaluate the best options for our customers and communities, to ensure a careful balance of safety, reliability, and affordability through this transition.

[2] Represents accredited regulated capacity.

We have evaluated multiple plans with a more accelerated pace of coal retirements – considering 2,500 or more MW of coal retiring before 2030, resulting in carbon reductions of more than 75% by 2030. Based on current policy and technology, this was one of the lower cost approaches considered. However, this has not been selected as the preferred plan at this time in consideration of reliability factors, as well as to allow market conditions, technology advancements, and policy changes to inform the pacing of retirements. Evergy believes this Plan also balances state policy that encourages a meaningful pace of renewable transition with reliability and other aspects that impact customers. Going forward, we will monitor changing conditions and balance safety, reliability, cost, and environmental stewardship. One key factor is policy change, such as federal actions that may result in incremental compliance costs for fossil units, which could accelerate the transition economics for replacement of existing fossil capacity with clean resources. State policy changes, such as the current efforts to advance securitization legislation in the states of Missouri and Kansas, may also have impacts. In the interim, we will evaluate other options – such as seasonal cycling for our coal plants – which have the potential to reduce costs and carbon emissions while also maintaining dispatchable capacity for reliability needs.

- Addition of 2,500 MWs of solar, further diversifying our generation mix with this low-cost renewable resource.
- Addition of 1,000 MWs of wind, taking advantage of both the tremendous resource in our region and federal production tax credits.
- Addition of 3,495 MWs of zero carbon, dispatchable capacity to ensure clean, reliable power for our customers. These resources are currently modeled as natural gas-fired combustion turbines to provide valid financial and operational parameters for calculating revenue requirements. However, because they will only be needed for reliability purposes in the last five years of the planning horizon (2036-2040), the assumption is that new carbon-free generation and/or suitable long-duration energy storage technology will be available to provide capacity by that time period. We expect a continued robust pace of technology change, including improvements to storage capacities, and will identify specific resources to meet this need through future IRP filings as they near our implementation planning horizon.

Planned Outcomes

After extensive analysis and consideration of more than 50 distinct plans, we selected this as the Plan for the outcomes it will deliver to our customers, communities, and other key stakeholders.

Safe, Reliable, Affordable Power

Most importantly, the Plan secures safe, reliable, affordable power for our customers, today and well into the future. It enables a stable base of generation sources, evolving at a pace that lets us extract benefits from existing facilities while leveraging advancing technology and emerging, affordable energy sources and reducing cost and reliability risk through thoughtful portfolio diversification. The Plan's flexibility, especially through the Post-Implementation Period, allows us to focus on reliability and affordability while adapting to environmental, technological, and market opportunities and challenges.

Emission Reductions

The Plan reduces carbon emissions 70% by the end of 2030 (relative to 2005 levels) and allows us to work toward a goal of net-zero carbon emission by 2045. It achieves this through (1) the ongoing diversification of our generation portfolio to include more cost-effective renewables, (2) the continued operation of our zero carbon Wolf Creek nuclear station, and (3) the retirement of ~4,600 MW of fossil plant capacity. This transition to cleaner, more sustainable generation has the added benefit of reducing customers' financial exposure to potential future carbon costs and environmental regulations.

Energy Efficiency

We have been a leader in offering energy efficiency and demand response solutions. Evergy's Plan advances the region's sustainability through investments in renewable energy and additional energy efficiency and demand response management programs in support of our customers' own sustainability plans. These options help our customers reduce their bills while delivering environmental benefits. Our 2021 IRP continues to prioritize such efforts. By 2040, the Plan includes an incremental 1,300 MW of peak demand reduction from energy efficiency and demand response programs. Investments in energy efficiency and strategies to shape the demand curve - lower peaks and fill in valleys - are an integral part of our Plan.

Key Considerations for Developing the Plan

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We developed our Plan to guide generation and demand-side investments and retirement decisions, with the goal of delivering safe, reliable, affordable, sustainable power for stakeholders in a dynamic and uncertain environment.

Planning how to safely, reliably, affordably, and sustainably serve our customers for decades to come required a comprehensive evaluation and extensive collaboration with our stakeholders. Beginning in early April 2020, we involved stakeholders in each step of developing this Plan – refining assumptions and planning uncertainties, gathering inputs, conducting analysis, and reviewing results. We did this through six stakeholder meetings in both Kansas and Missouri, which involved all parties participating in the IRP docket. Beyond the regulatory process, we gathered customer sentiment through ongoing customer research to ensure we understood our customers' priorities, which continue to align with our efforts to provide safe, reliable, affordable power while responsibly transitioning toward sustainable options. We constructed more than 50 different resource plans to evaluate new sources of generation, customer demand-side management programs and retirement dates for our existing generation sources. We considered a variety of factors, including how to:

- Maintain both the reliability and flexibility of our system. We assessed the amount of firm, dispatchable capacity in our system relative to expected demand, while meeting the reserve margin requirements developed by the Southwest Power Pool, our market operator.
- Ensure affordability for our customers, particularly given the growing reality of increased insurance, financing, and other costs that would be passed along to customers if Evergy doesn't complete timely transition of its generation portfolio. We measured affordability by analyzing the net present value of revenue requirements across a range of potential scenarios.
- Pair energy efficiency investments that lower costs for all customers along with supply side investments. Engaging customers in shaping the load curve, enabled by grid modernization investments, will improve integration of distributed resources such as solar and storage; integrate demand flexibility to address extreme weather events; and encourage energy usage (e.g., from electric vehicle charging) during off-peak periods to reduce stress on the grid and improve grid utilization.
- Ensure environmental stewardship while managing financial risk and providing flexibility. Given the changing energy landscape, we paid particular attention to cost risk and environmental impact. Risk assessment focused on the potential for high-cost outcomes based on uncertain factors. We evaluated environmental impact based on each plan's carbon emissions trajectory.
- Maintain a safe operating environment for all employees.

Our evaluation process considered a broad set of potential uncertainties. Three that emerged as most critical to Plan selection were customer load growth, natural gas prices, and the cost of carbon emissions over time. Each has the potential to significantly impact our Plan and was central to creating and testing alternative scenarios. We drew on public and independent third-party data sources and stakeholder input to inform the range of potential outcomes for each.

Evaluation of available generation sources was central to developing our investment plan. We examined both renewable and conventional sources, modeling each one based on responses to an all-source RFP conducted in 2020, public data sources, and expert input.

Through future IRPs, the pace of retirements and type of resource additions will continue to evolve as technology, policy, and our operating environment changes. For example, we are encouraged by current progress to advance securitization legislation in the states of Missouri and Kansas that would allow utilities to refinance the value of older plants at low interest rates and use the funds raised to invest in the grid, including new renewable and dispatchable generation. These types of policy changes, coupled with continued technology advancement, support our goals in continuing to transition our generation fleet. These factors enable us to make resource decisions that are robust and provide benefits for customers across a large variety of potential scenarios while maintaining optionality as conditions evolve.

Conclusion

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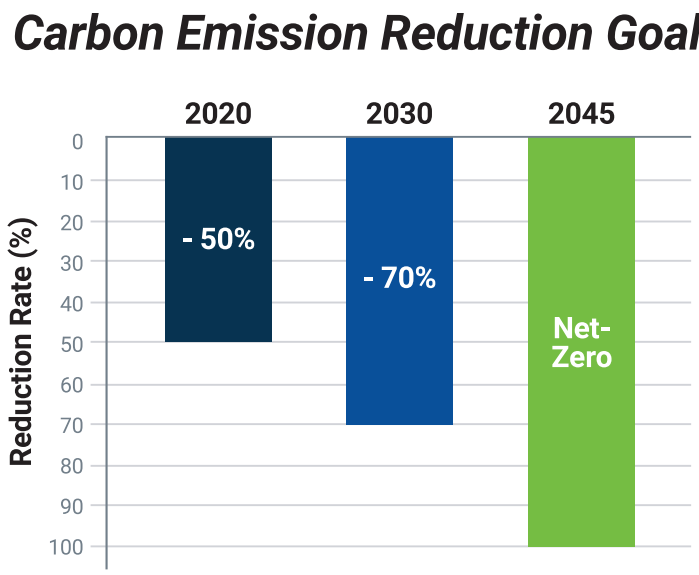
Our Plan ensures **safe, reliable, affordable, and increasingly sustainable power** for our customers. By managing fossil generation through its shift from baseload to flexible resource, and responsibly transitioning end-of-life facilities, we safeguard the system's overall reliability. At the same time, the Plan embraces state policy encouraging continued transition to cleaner sources and delivers customer value through adding cost-competitive renewable resources, while reducing risk in our existing generation assets.

The Plan represents a roadmap for **sustainably transforming** our generation fleet for the benefit of all stakeholders. For over a decade we have been working to reduce carbon emissions and transition to renewable energy. Today, emissions are 51% below 2005 levels, reduction levels that rank near the highest of our peer companies; and one-third of the power used by retail customers is generated from renewable resources. Factoring in our emission-free nuclear energy, our customers receive more than half their energy from carbon-free resources.

The Plan presents a responsible, sustainable approach to accelerating this necessary transformation of our generation portfolio. It delivers **cleaner energy through balanced progress**, targeting 70% through 2030. As Figure 2 highlights, it moves us steadily toward our goal of net-zero carbon emissions by 2045.

Figure 2. Carbon emissions reduction trajectory relative to 2005 levels



The shift toward renewable energy sources **diversifies our generation fleet**, with positive impacts on both cost and reliability. Our Plan adds 3,200 MWs of solar and wind through 2030, and an additional 4,495 MWs of renewable and zero-carbon dispatchable capacity by 2040, progressing us toward our goal of achieving net-zero by 2045. Importantly, the Plan avoids overreliance on any one fuel source, which supports resiliency throughout the system.

Finally, our Plan helps to **drive economic growth** in the communities we serve. Improved cost competitiveness, reliability, and sustainability in the power supply all attract companies to our region and support businesses we already serve.

04/2021