



# Planning for the Future of Power Generation

*April 17, 2024*

*KU Environmental Engineering Conference*

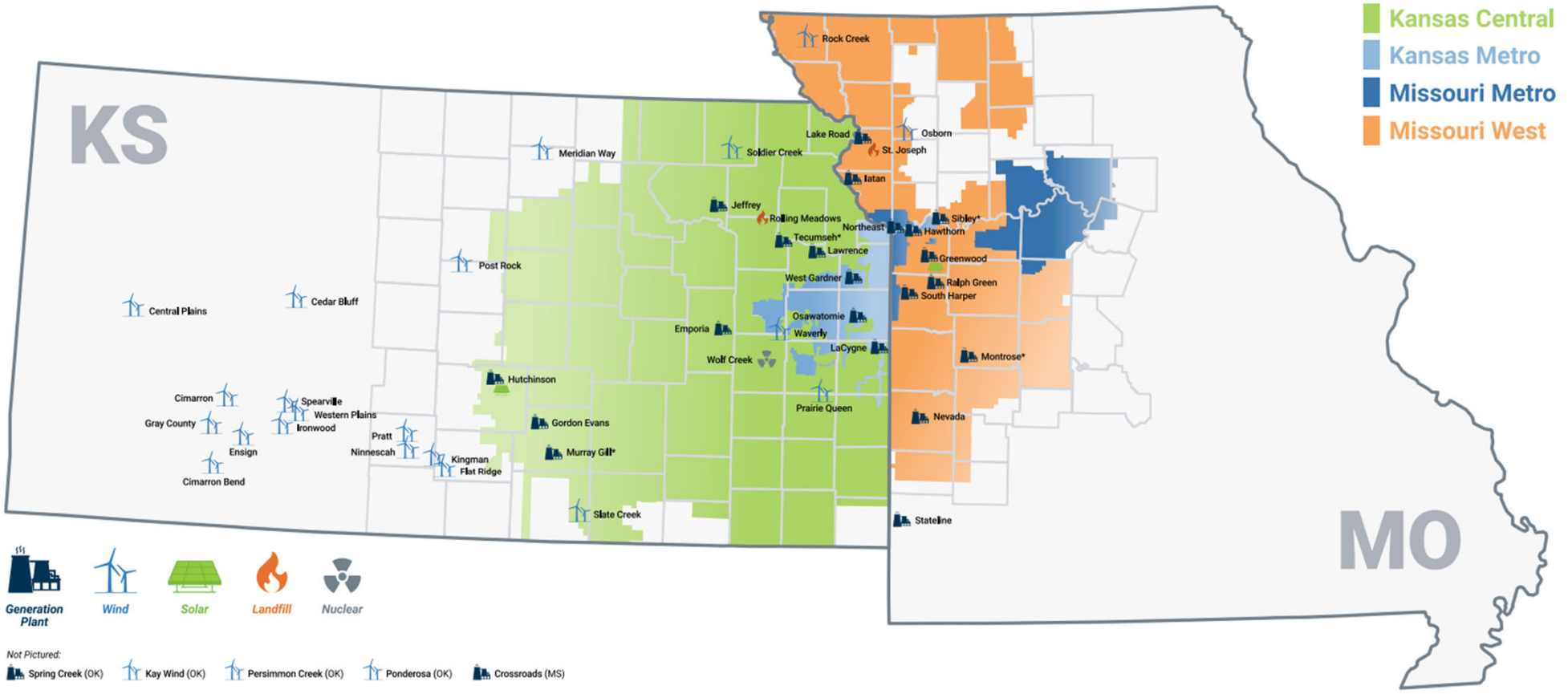




## Agenda

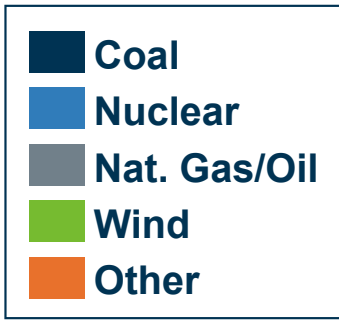
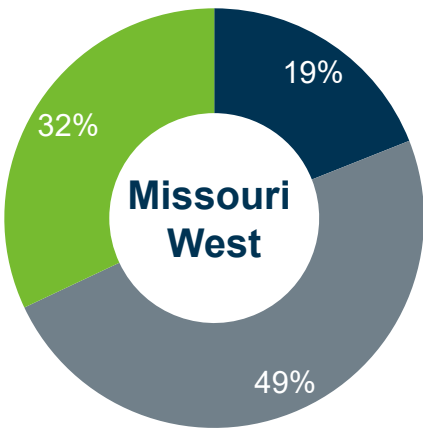
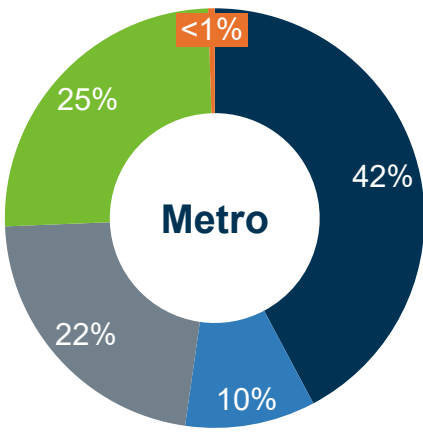
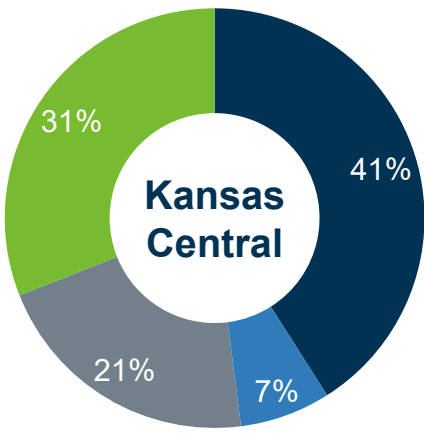
- Energy Overview
- What is an Integrated Resource Plan and how is it built?
- What are capacity and energy requirements and how do they differ?
- How is a Preferred Resource Portfolio selected?
- Energy's Current Preferred Resource Portfolio and Future Considerations

# Evergy's Service Territory

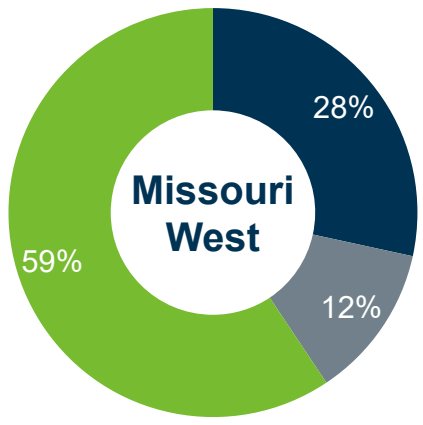
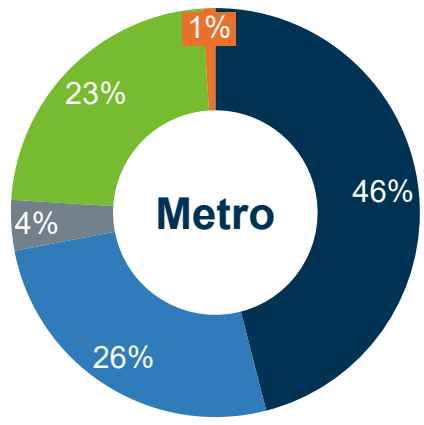
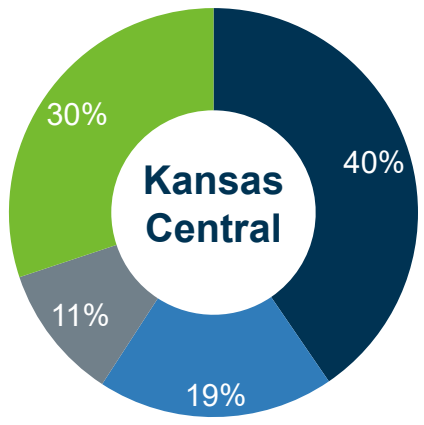


# Capacity & Energy Profiles

Capacity



Energy



# Core Tenets of Evergy's Generation Strategy





## What is an Integrated Resource Plan?

- Regulatory requirement to file a long-term plan for supply- and demand-side resources to meet forecasted customer needs – Triennial Filing every three years with annual updates every year
- The IRP process ultimately results in the selection of a Preferred Portfolio
- Preferred Plan contains expected retirements, demand- and supply-side additions over the 20-year planning horizon
- Preferred Plan is selected with a goal of identifying “the portfolio of resources that meets customer requirements at the lowest reasonable cost given an uncertain future”
- This assessment is informed by risk analysis of potential uncertain factors which could ultimately impact long-run utility costs (e.g., NPVRR is calculated across a variety of market price scenarios which vary based on gas price and carbon restrictions)



## Building the IRP

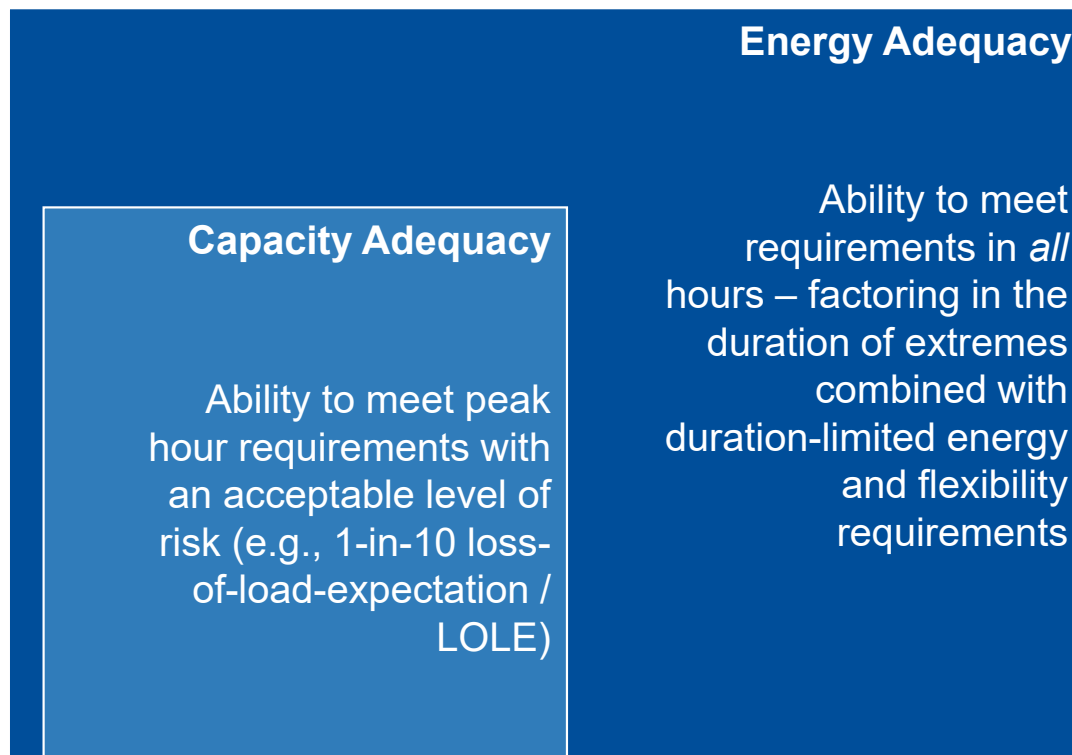
### Evolving Planning Dynamics

- Capacity and Energy Requirements
- Commodity Prices  
*(primarily natural gas)*
- Carbon Restrictions / Other Regulations
- Relative Technology Economics



# Capacity Requirements: Resource Adequacy

## *Defining Resource Adequacy*

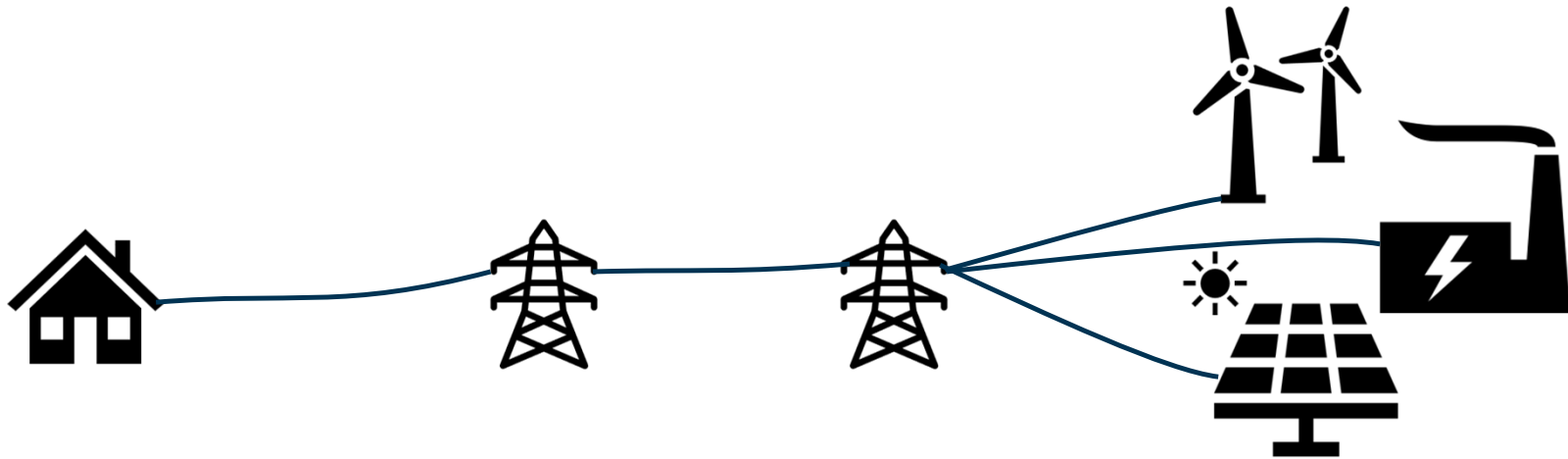




# Factors Impacting Resource Adequacy

NOT EXHAUSTIVE

Duration of Event (i.e., energy vs. peak)



DER/DR Availability

Load

Import Availability

Congestion

Outages

Renewable Resource

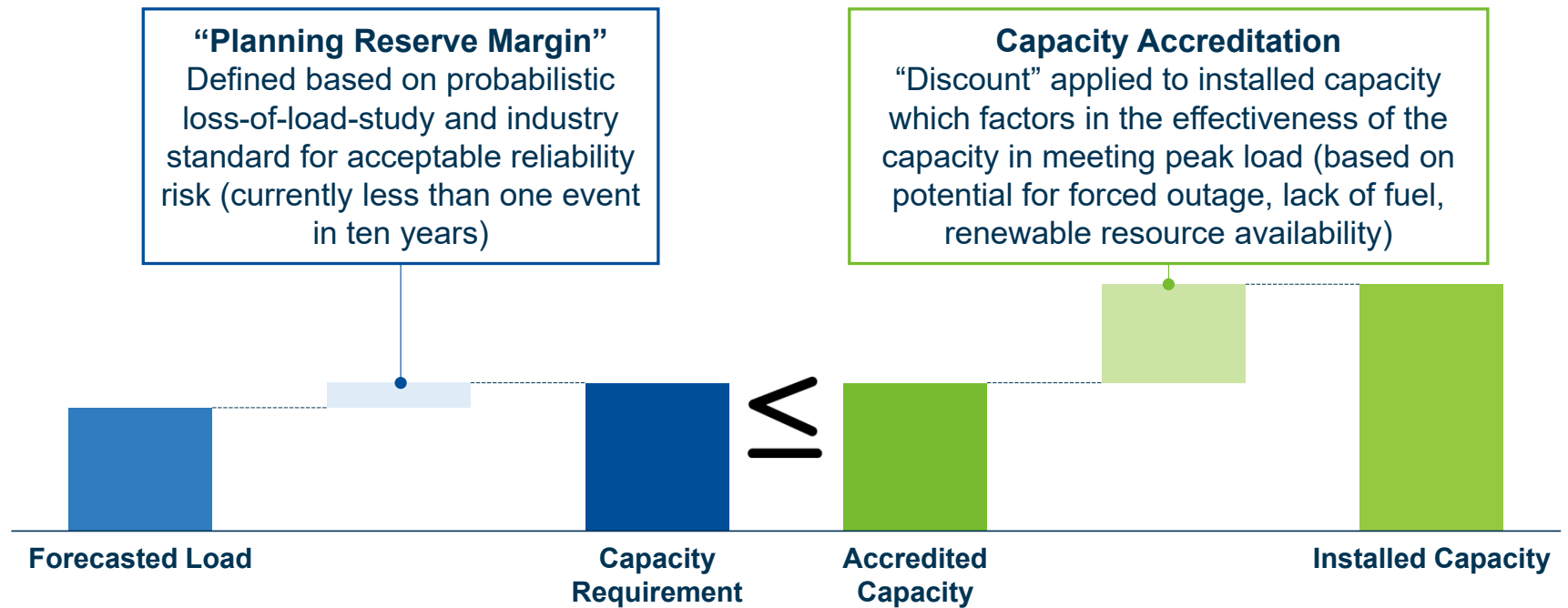
Forced Outage Rate

Fuel Availability

Flexibility

Consistency of Weather-Driven Assumptions

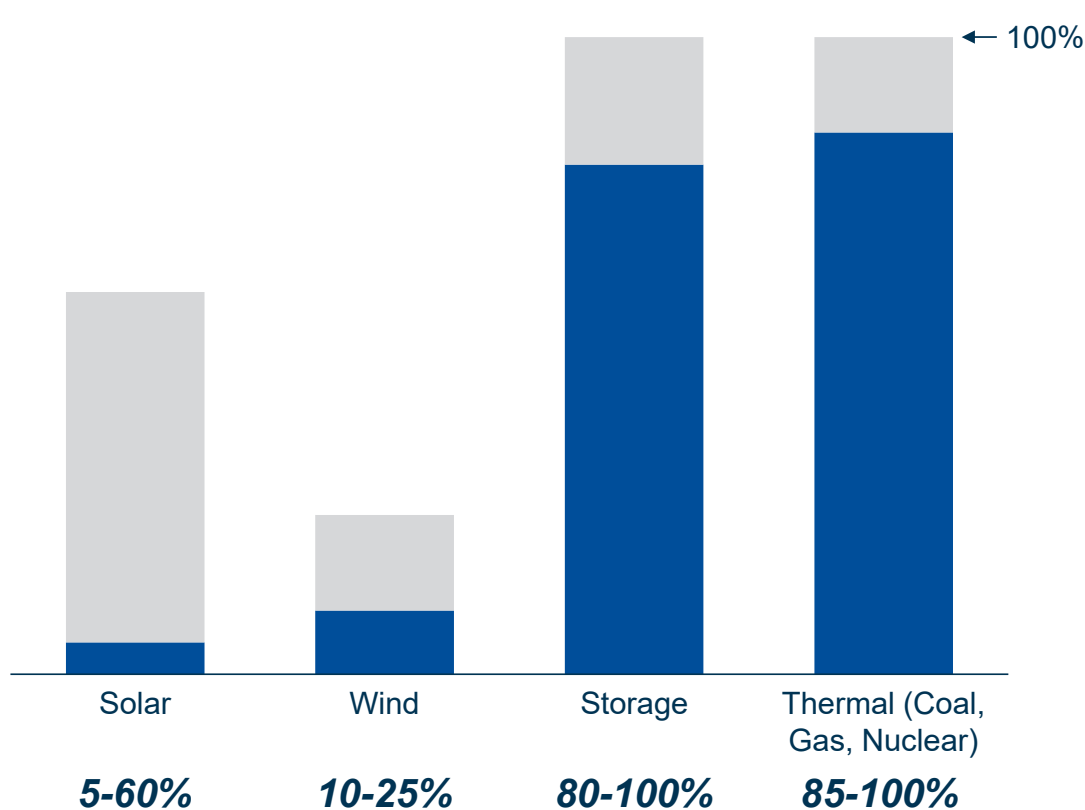
# Capacity Requirements



*Ultimately, capacity requirements (the need for installed capacity) is driven by expected load, but also by a variety of other reliability risk constructs which all combine to create “Resource Adequacy Requirements”*

# Capacity Accreditation

Illustrative Range of Capacity Credit (% of Nameplate)

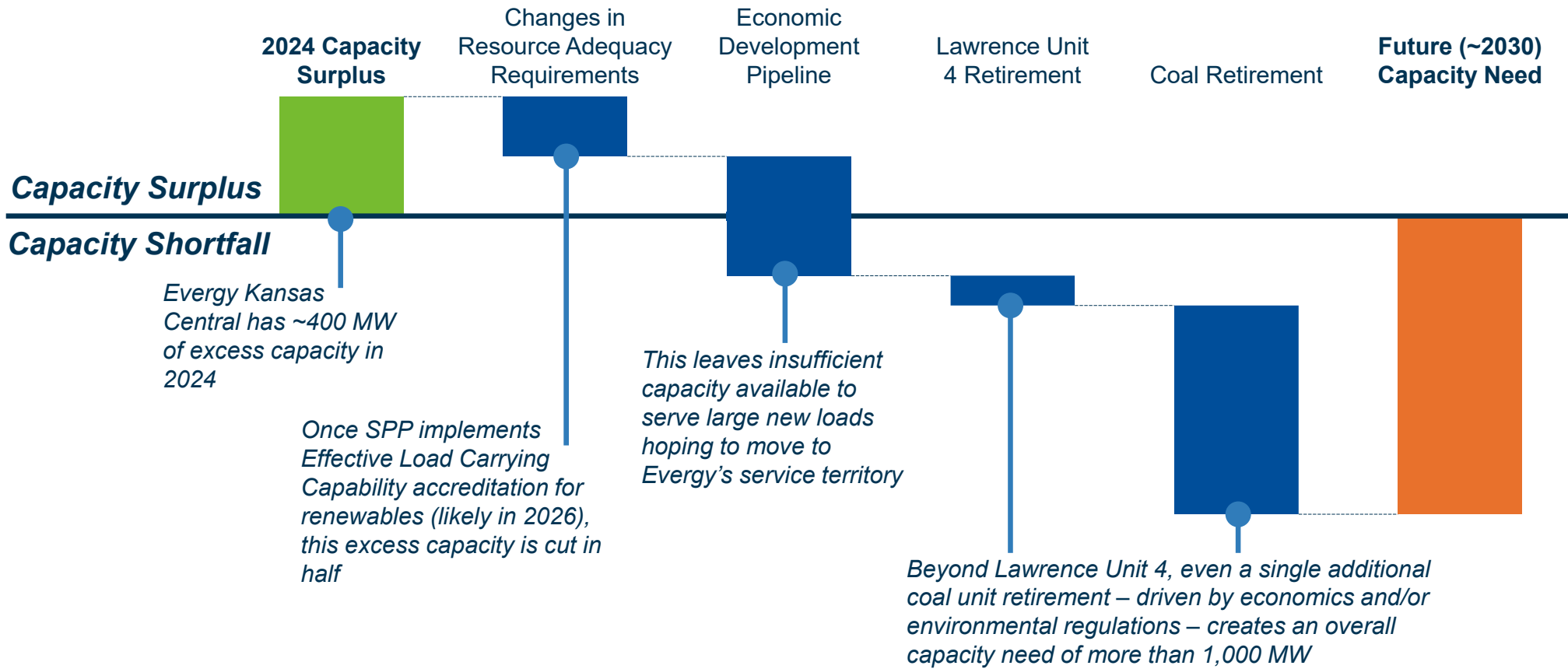


- ➔ Capacity Accreditation rules are established by SPP and are the measure of how much a certain MW of generation “counts” toward capacity requirements (can vary by season)
- ➔ Expectation is that wind, solar, and storage will all be accredited using Effective Load Carrying Capability (ELCC)
- ➔ In parallel, SPP is implementing Performance Based Accreditation for thermal resources which will accredit resources based on their reliability



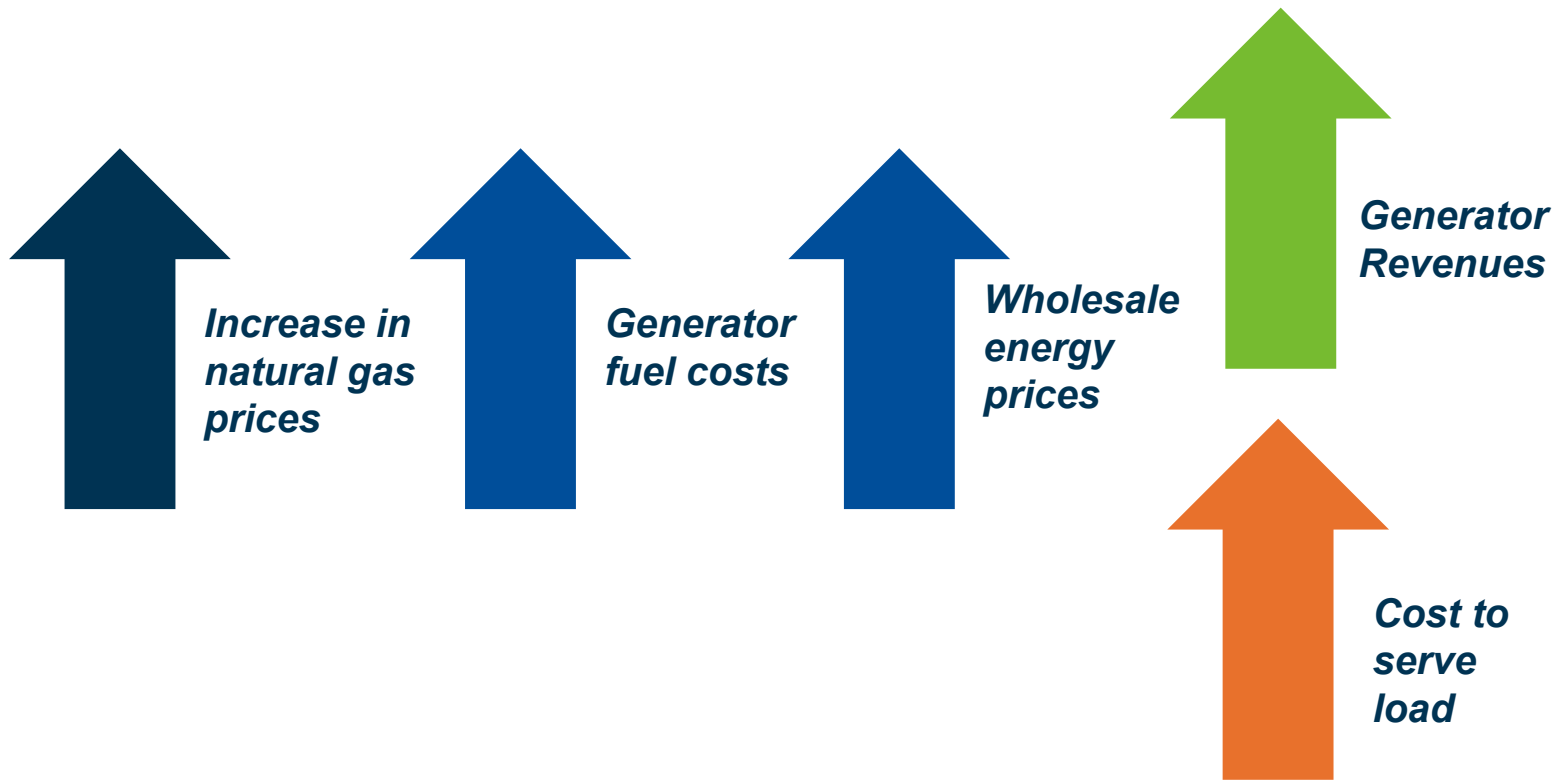
# Future Capacity Needs

*Indicative Capacity Position*

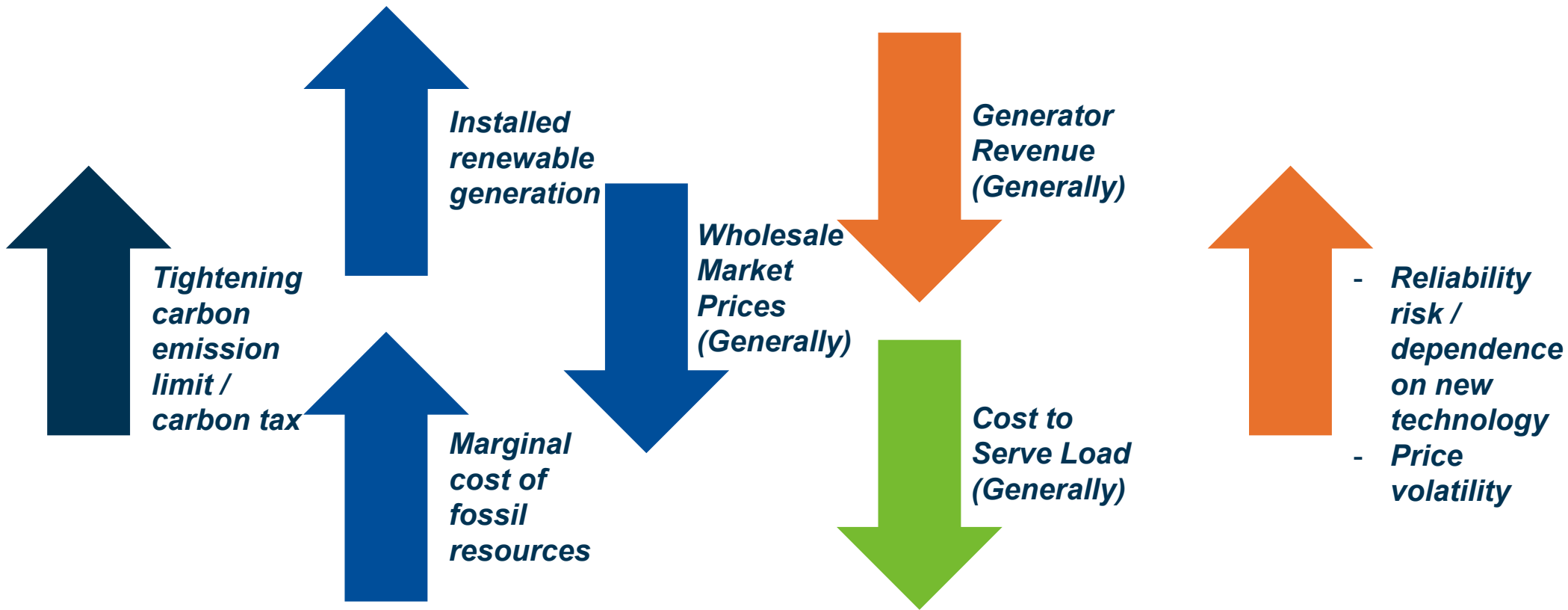




# Impact of Commodity Prices on Generation



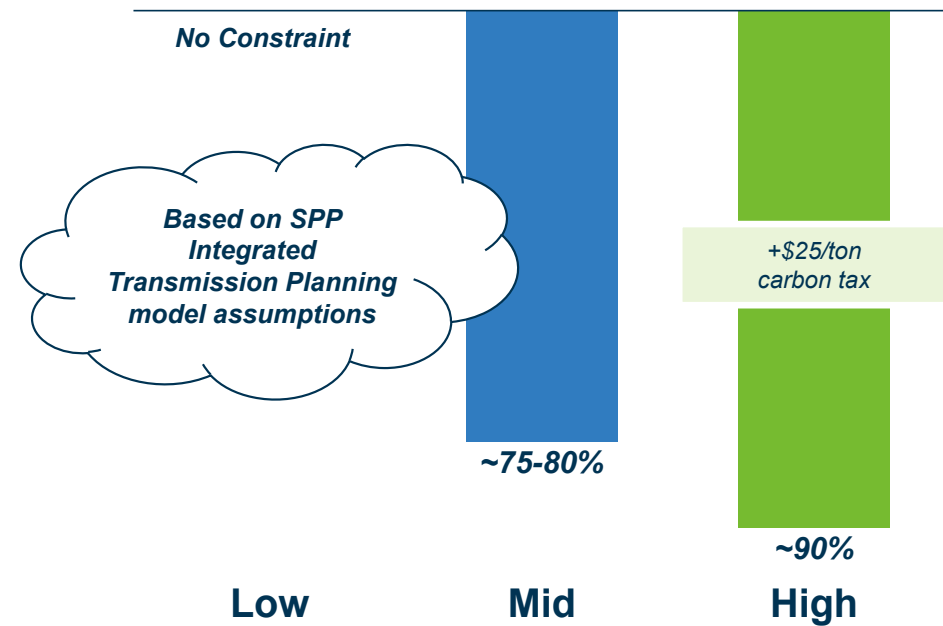
# Impact of Carbon Restrictions on Generation



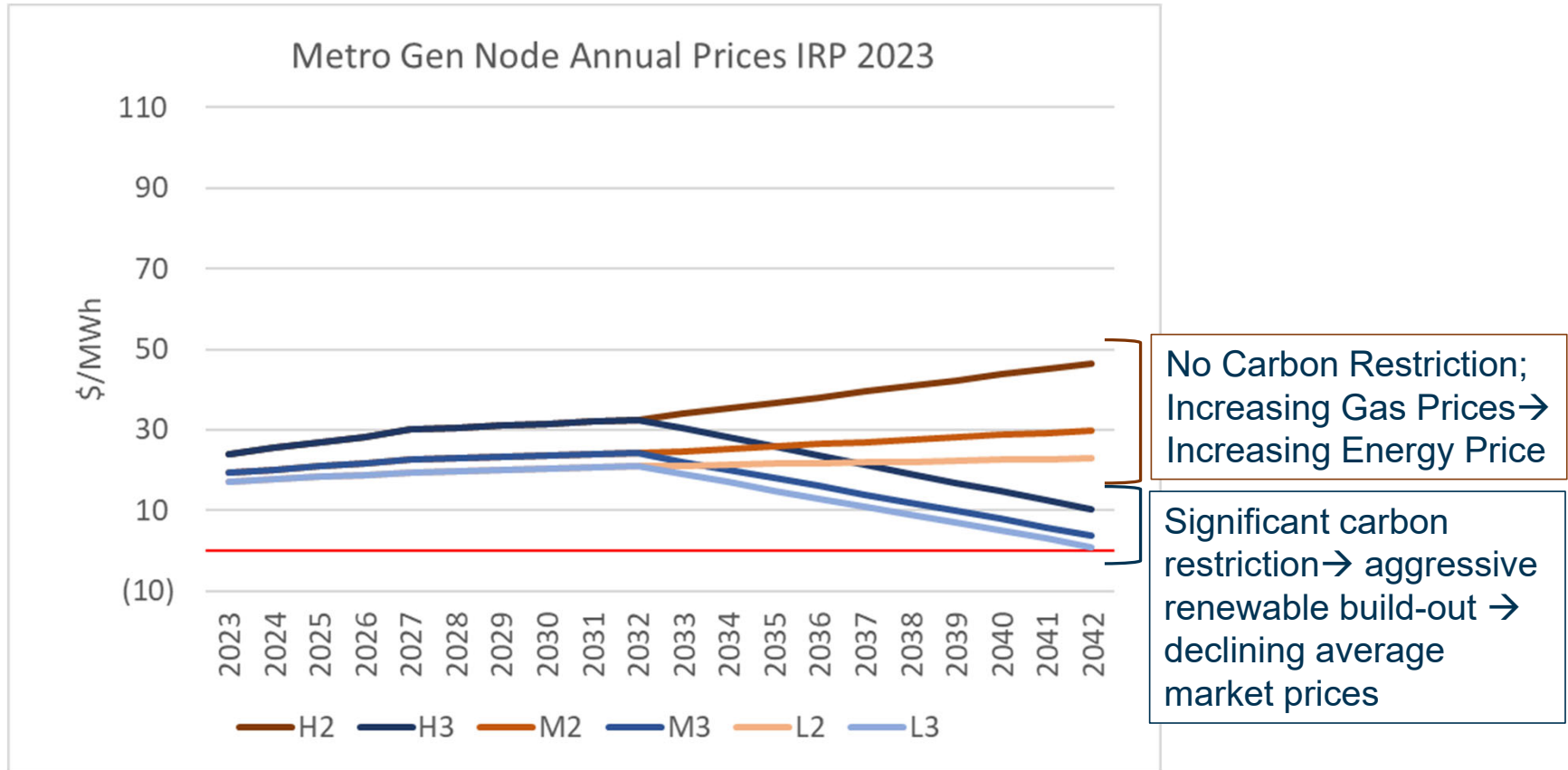
# Carbon Restrictions

- Passage of Inflation Reduction Act signaled that progress toward carbon reductions is likely to be “incentive-focused” (promoting clean energy build-out) for the foreseeable future as opposed to “penalty-focused” (taxing emissions)
- In combination, new and proposed Environmental Protection Agency (EPA) regulations focus on restricting emissions from generators without explicit taxes

## 2024 IRP Carbon Constraint (% Reduction vs 2005 by 2040)



# IRP Market Price Forecasts

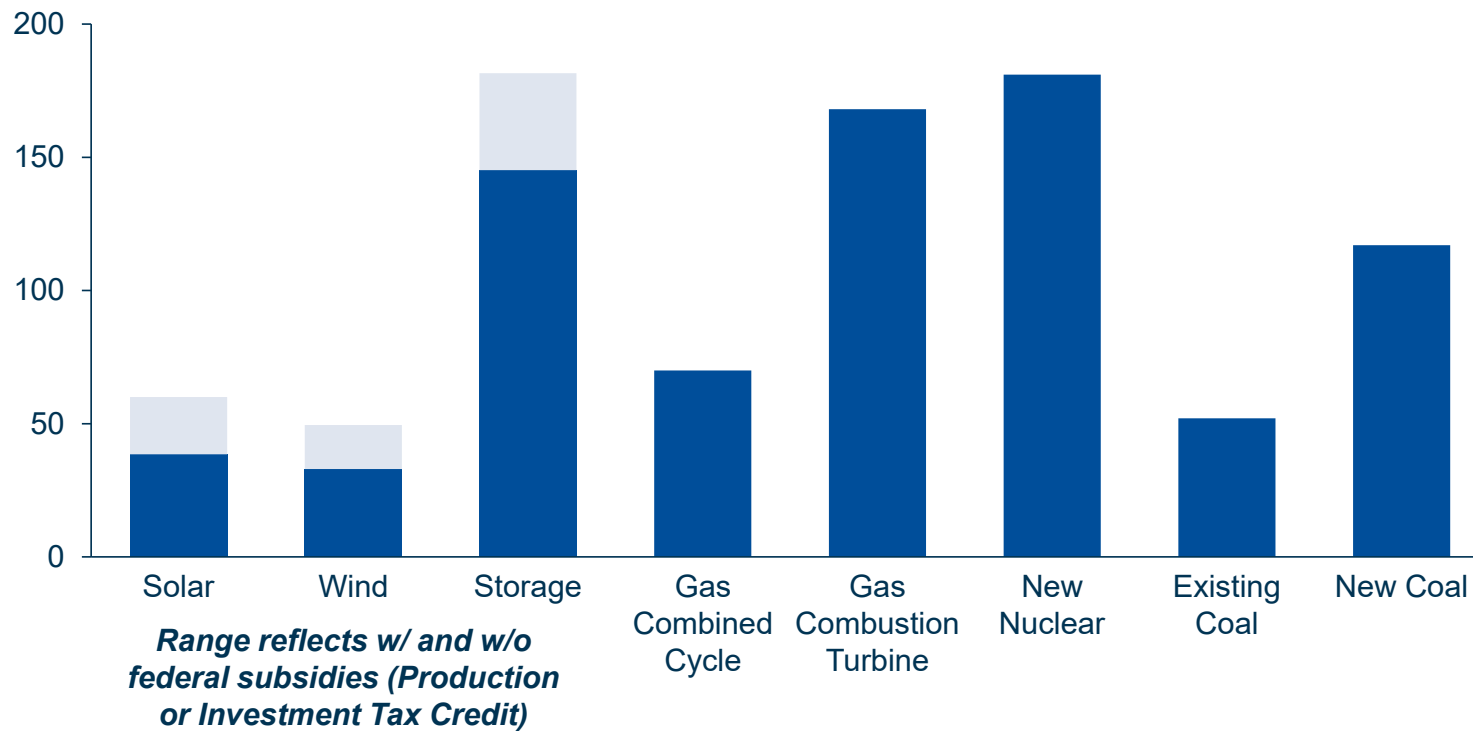






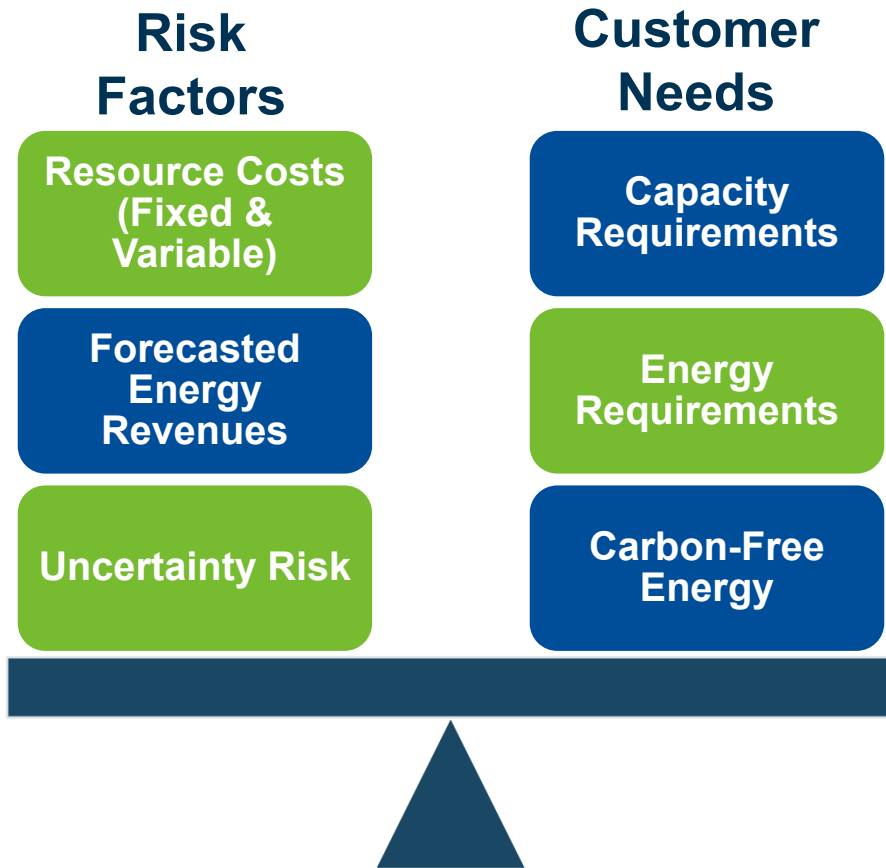
# Relative Technology Economics

**Lazard Levelized Cost of Energy (\$/MWh)**



Source: Lazard 2023 Levelized Cost of Energy Plus Report and Levelized Cost of Storage v 7.0; Values reflect midpoint of Lazard ranges; No subsidized cost for standalone storage was provided so high-level assumption made is that subsidized cost of storage is 80% of unsubsidized cost (after 30% tax credit which impacts a large portion of project costs – consistent with ITC impact to solar costs in Lazard subsidized analysis)

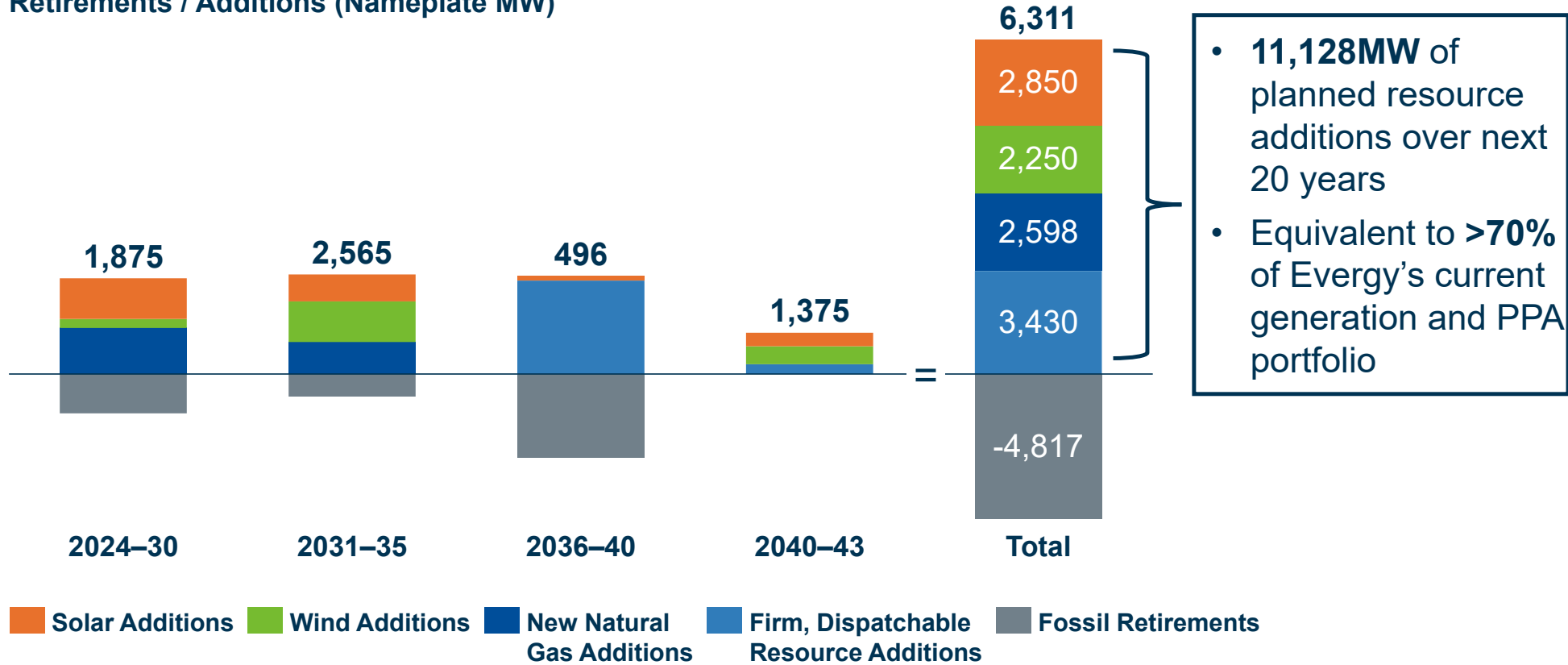
## Selecting a Preferred Portfolio



- In an IRP, portfolios are assessed based on 1) how well they meet future customer needs and 2) how well they perform in a variety of scenarios given an uncertain future
- Plans are constructed with an eye to both quantitative (e.g., market price) and qualitative (e.g., future reliability requirements, fuel diversity) risks

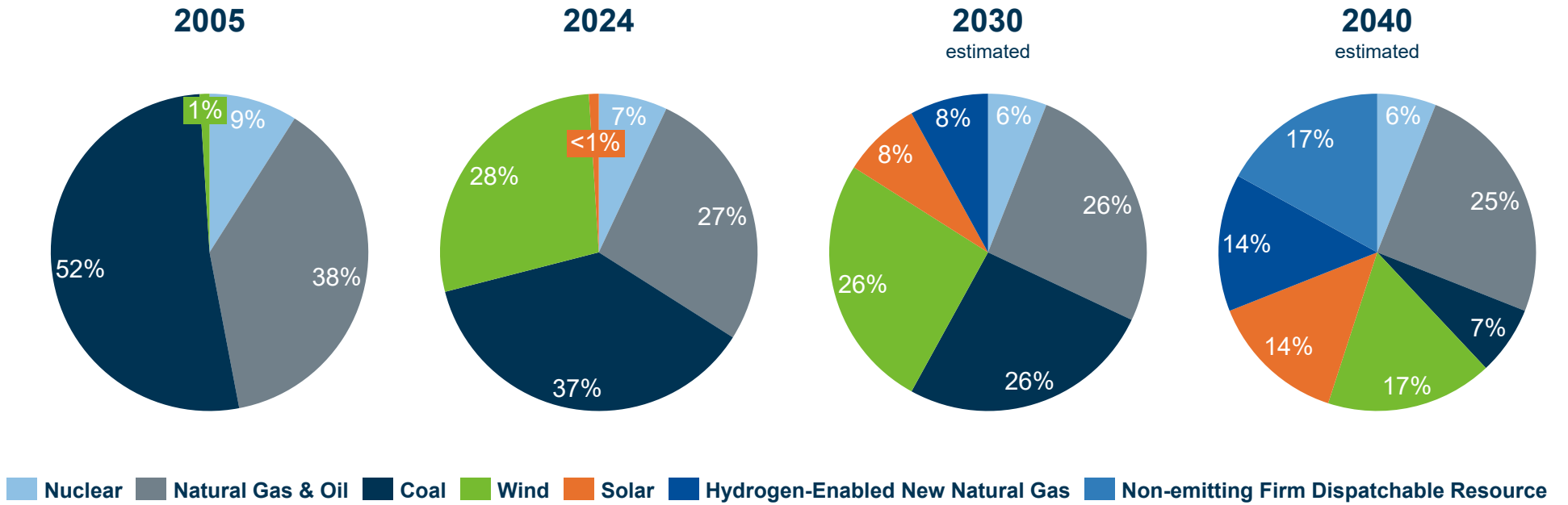
# Evergy's 2024 Preferred Portfolio

Retirements / Additions (Nameplate MW)



- **11,128MW** of planned resource additions over next 20 years
- Equivalent to **>70%** of Evergy's current generation and PPA portfolio

# Evergy's Preferred Portfolio





## Future Considerations

- Near-term execution of renewable and thermal additions will have to manage ongoing supply chain and transmission interconnection-driven delays
- Have seen a significant uptick in renewable pricing – will need to evaluate whether that change is structural or costs will come down in the future
- Continued acceleration of economic development activity could impact ability to retire coal / could require additional new capacity resources
- If new / changing environmental regulations cause acceleration of coal retirements, could drive dependence on new dispatchable non-emitting technologies earlier in the time horizon in order to maintain reliability
- Ongoing monitoring on dispatchable, non-emitting technologies (nuclear, long-duration energy storage, hydrogen) to determine feasibility / economics

Thank You

