

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

In the Matter of Evergy Metro, Inc. d/b/a Evergy)
Missouri Metro’s 2024 Triennial Compliance Filing) File No. EO-2024-0153
Pursuant to 20 CSR 4240-22)

In the Matter of Evergy Missouri West, Inc. d/b/a)
Evergy Missouri West’s 2024 Triennial Compliance) File No. EO-2024-0154
Filing Pursuant to 20 CSR 4240-22)

NOTICE OF STAKEHOLDER PRESENTATION

COMES NOW, Evergy Metro, Inc. d/b/a Evergy Missouri Metro (“Evergy Missouri Metro”) and Evergy Missouri West, Inc. d/b/a Evergy Missouri West¹ (“Evergy Missouri West”) (collectively, the “Company”) and for their Notice, state as follows:

1. On December 8, 2023, the Company held a presentation for stakeholders related to Evergy Missouri Metro’s and Evergy Missouri West’s forthcoming respective triennial resource plans. A copy of the presentation is attached hereto.

WHEREFORE, the Company files this Notice for the Commission’s information.

WHEREFORE, Evergy Missouri Metro and Evergy Missouri West file this Notice for the Missouri Public Service Commission (“Commission”) information.

Respectfully submitted,

/s/ Roger W. Steiner

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**ATTORNEYS FOR EVERGY MISSOURI
METRO AND EVERGY MISSOURI
WEST**

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing have been mailed, hand-delivered, transmitted by facsimile or electronically mailed to all counsel of record this 11th day of December 2023.

Roger W. Steiner

Roger W. Steiner



Triennial Integrated Resource Plan Stakeholder Meeting

December 8, 2023

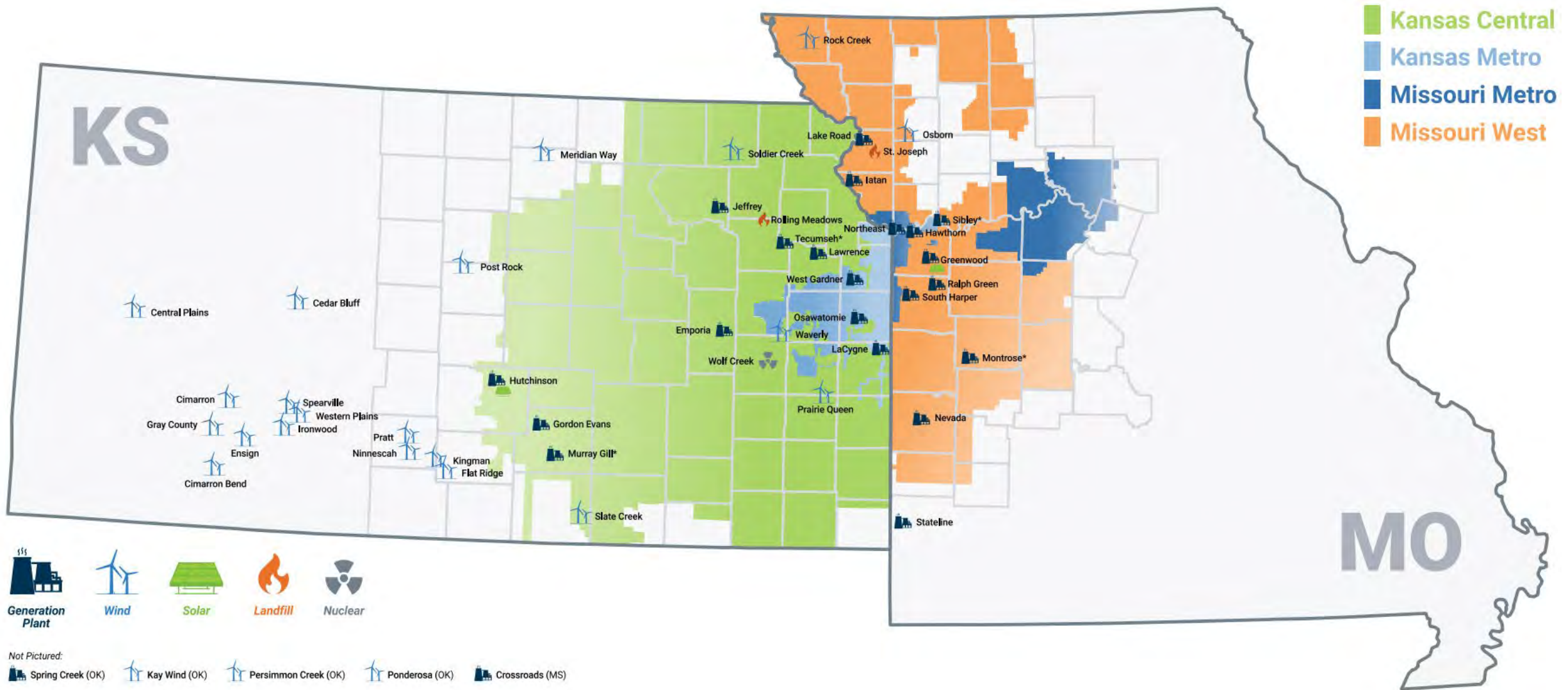




Agenda

- Evergy Overview
- Goals & Timeline for Stakeholder Meetings
- Changes from the 2023 Update
- Load Analysis & Load Forecasting
- Demand-Side Resources
- Supply-Side Resources
- Integrated Planning & Risk Analysis
- Wrap-Up

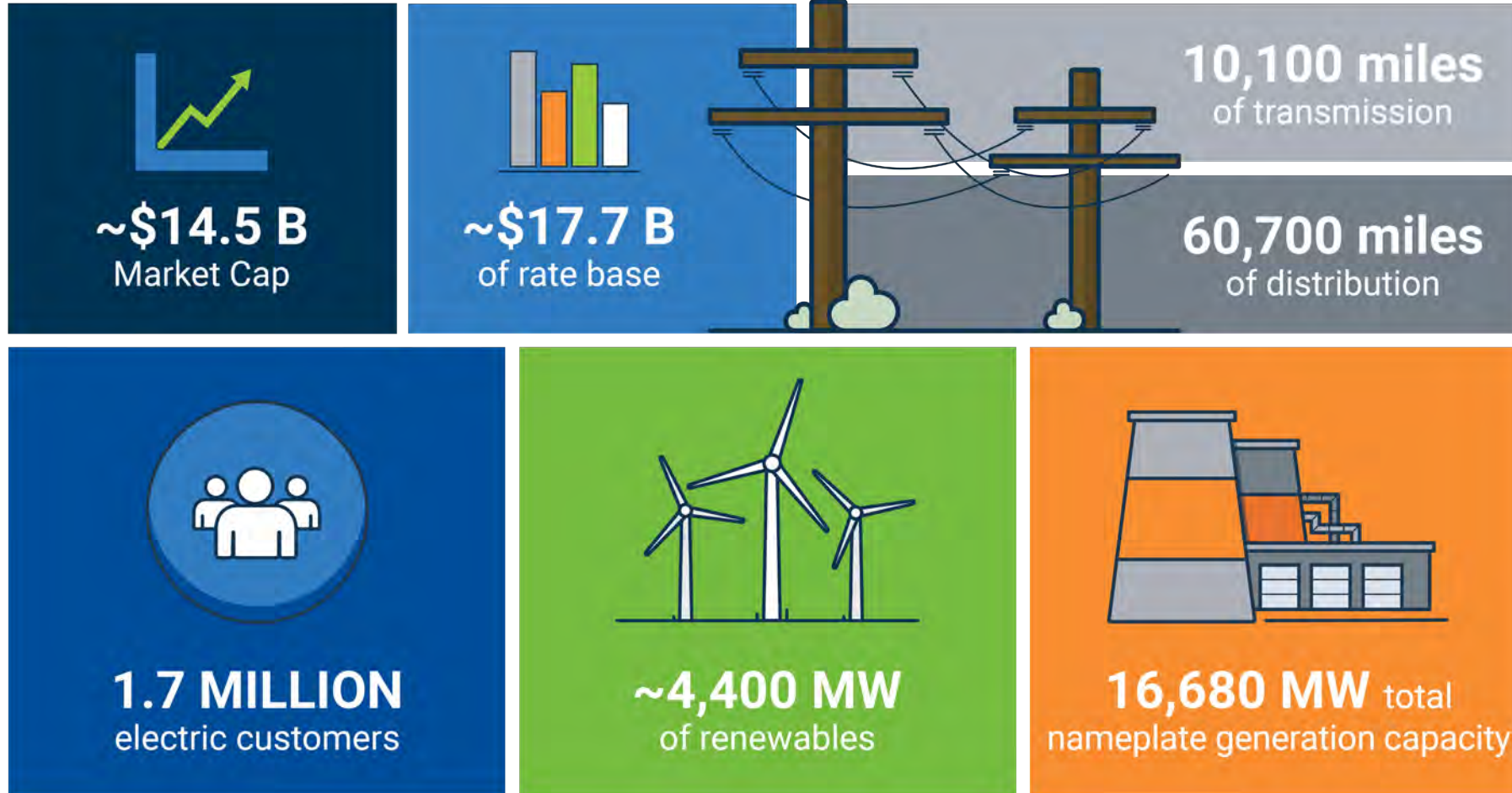
Evergy Overview



Not Pictured:
 Spring Creek (OK) Kay Wind (OK) Persimmon Creek (OK) Ponderosa (OK) Crossroads (MS)

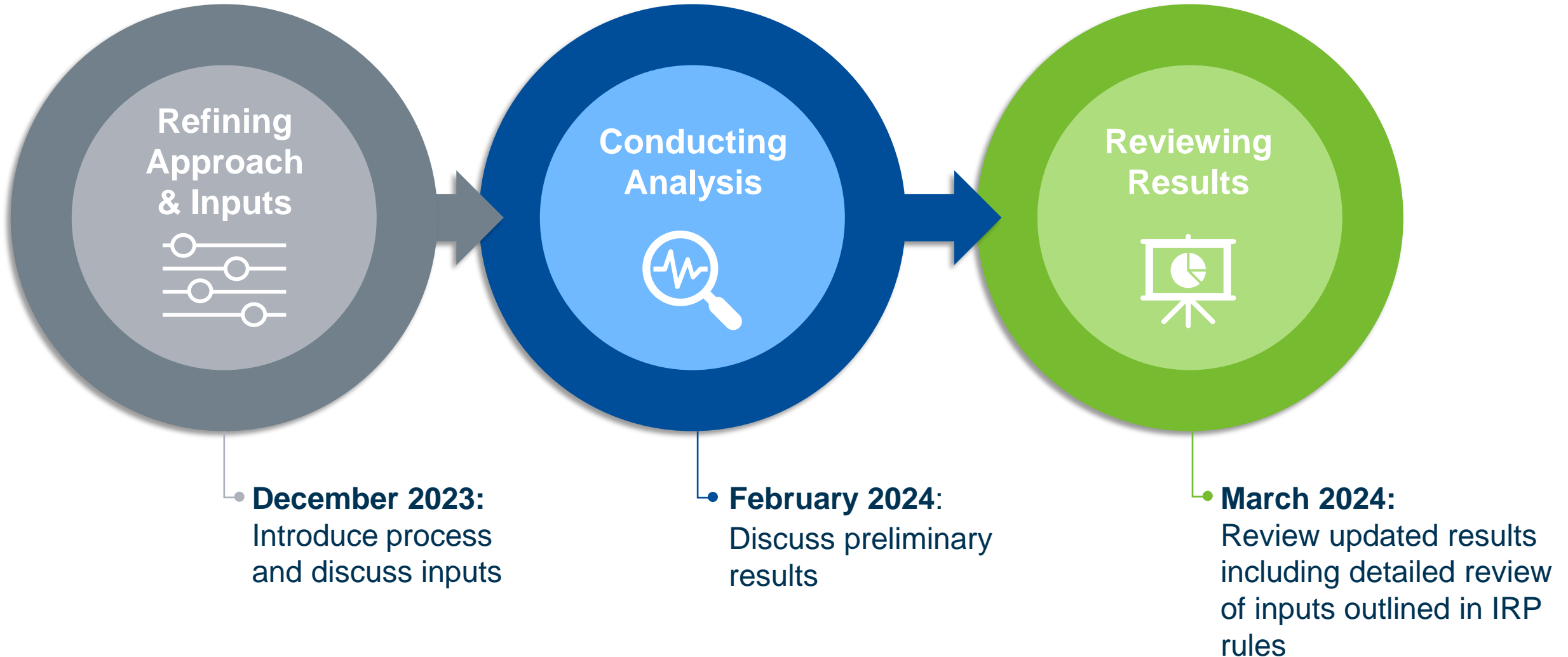
*retired plant

Evergy By the Numbers¹



1. All as of YE 2022

Triennial IRP Development Timeline





Goals for Stakeholder Engagement

Encourage Transparency	Share the IRP methodology, analysis and planning process with stakeholders to build understanding and gain insight
Expand and Enrich Analysis	Engage a variety of viewpoints to expand and enrich the scenarios evaluated through the IRP process
Discuss and Balance Trade-Offs	Understand and balance trade-offs between the different IRP tenets (reliability, value/affordability, safety, flexibility, environmental stewardship)



Changes from the 2023 Update

Big Themes Last Year

Reduction in capacity-long position

- **New loads and economic development**
 - Multiple economic development projects on the horizon, increasing load and capacity need
- **Resource adequacy changes**
 - Higher reserve margin, heading to performance-based accreditation
- **Demand-side management:**
 - Lower volume of DSM capacity primarily due to EISA lighting standard, ongoing KEEIA proceeding

Changes to resource economics

- **Inflation Reduction Act**
 - Improvement in incentives for new resources (solar, wind and batteries) combined with cost increases
- **Changes to environmental policy outlook**
 - Removed carbon tax modeling and aligned with SPP's future plans, which include differing levels of carbon constraints
- **Economic drivers:** higher natural gas prices, inflation and supply chain issues could increase costs

Big Themes This Year

- **Resource adequacy**
 - Estimating winter needs, likely increasing requirements over time, reduced resource accreditation due to performance-based and ELCC methods, and ongoing assessments of new loads and economic development
- **Update modeling assumptions for generation resources**
 - Increase in thermal build costs due to inflation. Analyze risk and sensitivities to near-term resource additions, particularly given further increases in capacity requirements
- **Understand the implications of the federal EPA's proposed GHG rule**
 - Scenario analysis to understand the implications from CO₂ constraints included in proposed GHG rule
 - Include costs associated with carbon capture and other non-emitting technologies needed late in planning horizon



Overview of Inputs for Discussion

Load Analysis & Load Forecasting

- Overview of Load Forecasting methodology
- Evaluating varying levels of electrification impacts

Demand-Side Resources

- Use of Missouri potential study, updated for extension
- Incorporation of new Kansas programs

Supply-Side Resource Analysis

- Refreshing supply-side resource costs
- Including new clean technology options
- Incorporating latest SPP resource adequacy requirements

Integrated Resource Plan & Risk Analysis

- Overall analytical approach
- Uncertain Factor analysis
- Discrete Scenario testing

Load Analysis & Forecasting

AI Bass





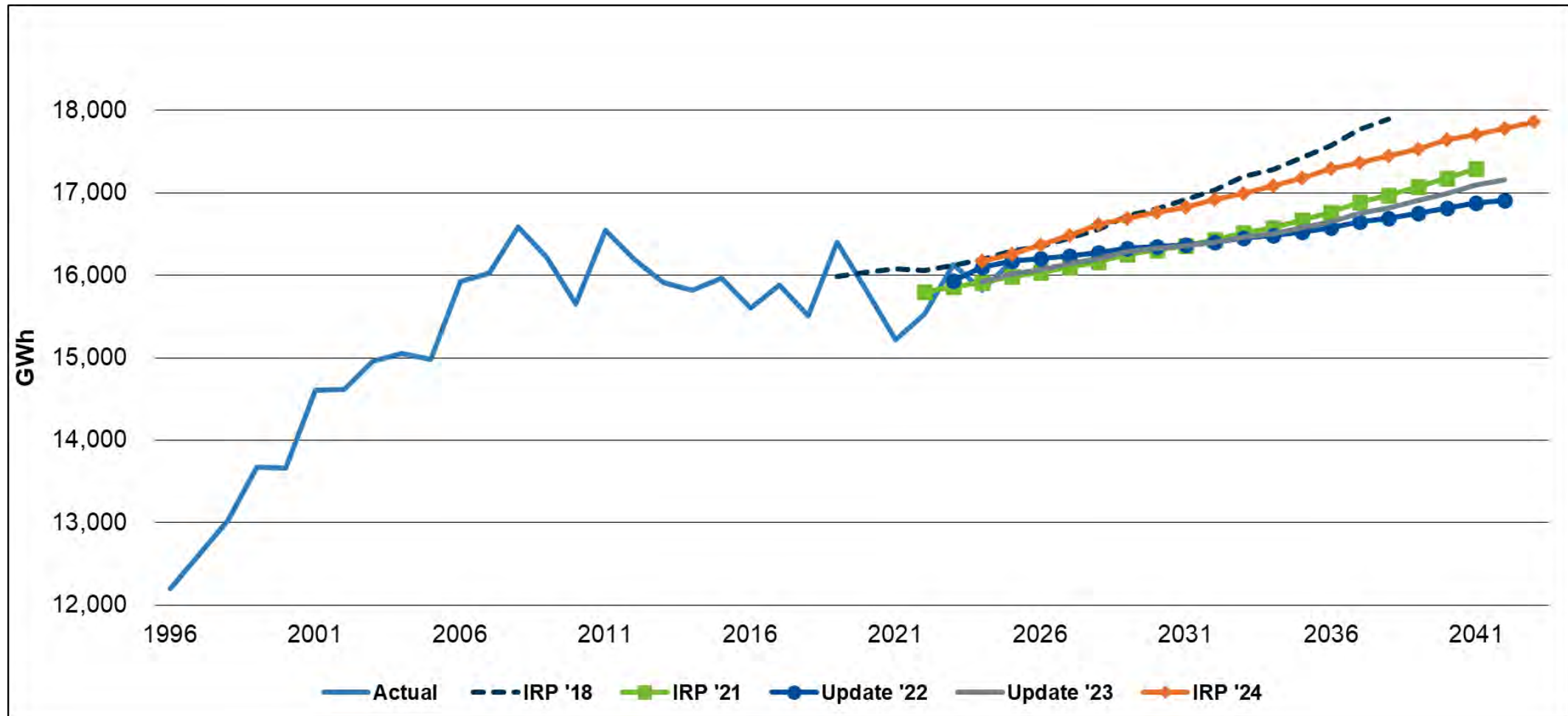
Load Forecasting Models

- Model methodology – Statistical Adjusted End-Use (SAE)
- Historical data for customers, kWh and \$/kWh: ending June 2023
- DOE forecasts of appliance and equipment saturations and kWh/unit: Annual Energy Outlook (“AEO”) 2023
- Updated economic forecasts from Moody’s Analytics. Historical data ending June 2023
- The Company also re-evaluated the output elasticity used in the commercial and industrial models and the elasticity used in the residential model. Adjustments made were to improve the model fit
- Company utilized EPRI electric vehicle study within its modeling for the 2023 IRP Forecast
- The load forecast includes a low scenario, high scenario, significant loss, extreme weather and a High Electrification scenario in addition to the base case forecast
- The low and high scenarios are the product of low and high growth economic forecast assumptions
- The high electrification scenario includes: high growth economic assumptions, EPRI electric vehicle high case adoption, 1898 Electrification Study long-haul trucking electrification forecast and assumptions for increased adoption of electric space heat and electric water heat in residential and commercial buildings
- The Company utilized Google Mobility Reports data to account for load changes resulting from geolocation behaviors induced by the COVID19 pandemic
- EIA data includes EE impact from IRA that relate to tax credits. Currently the impact is very small
- The load forecast does not assume behavioral changes in response to the implementation of new time-of-use rates. This will be evaluated and addressed in the 2025 IRP Update

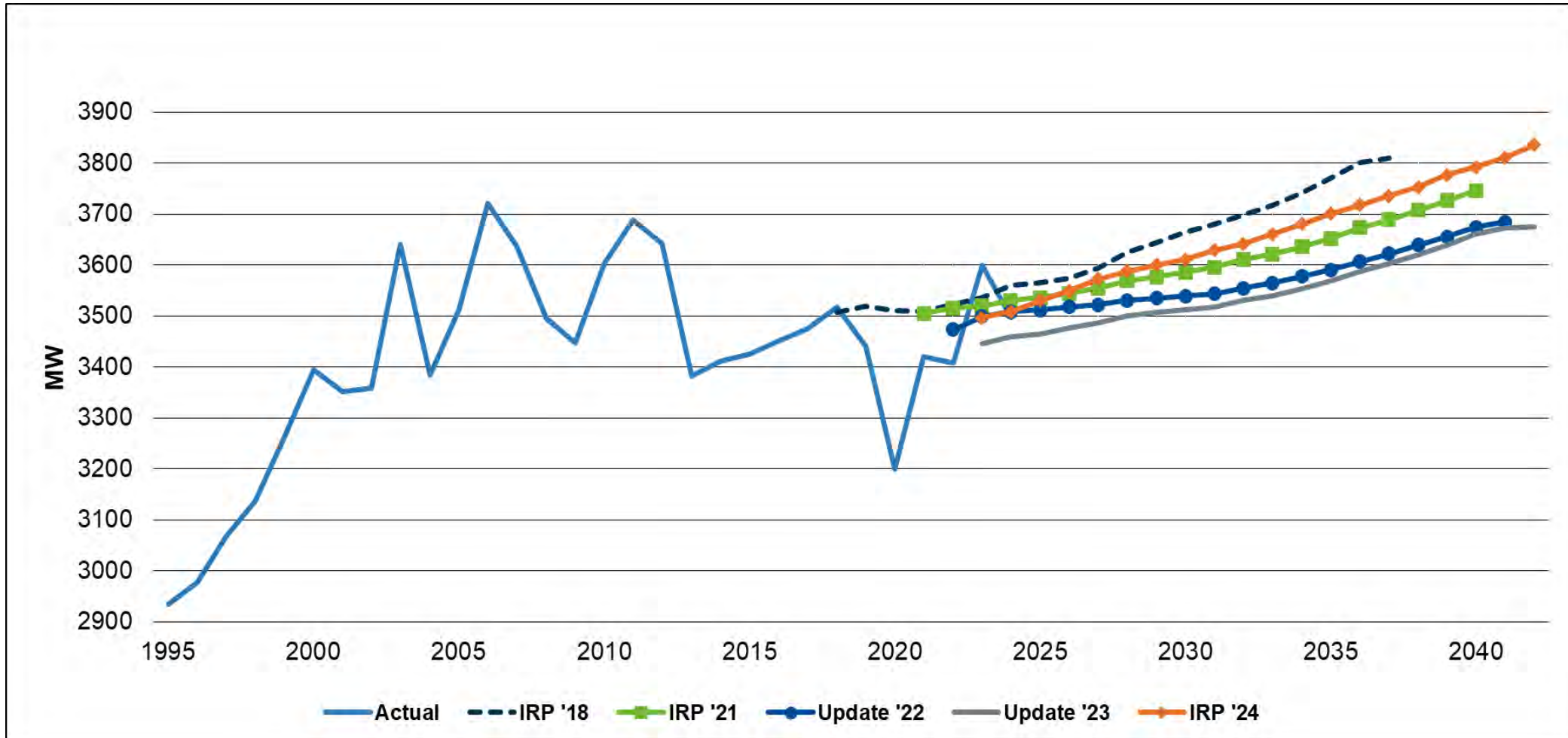


Energy Forecasts – Triennial IRP Scenarios

Energy Metro

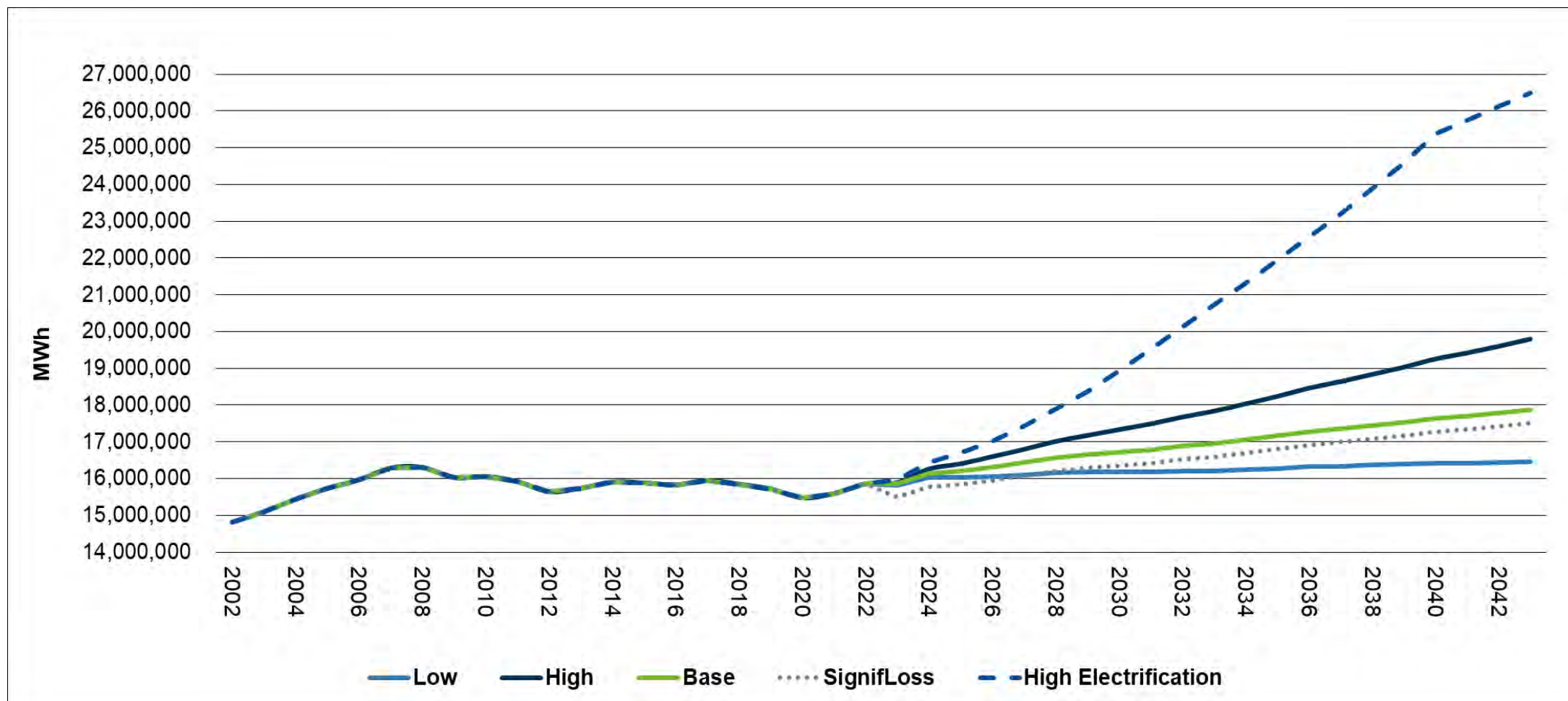


Peak Forecasts – Triennial IRP Scenarios Energy Metro



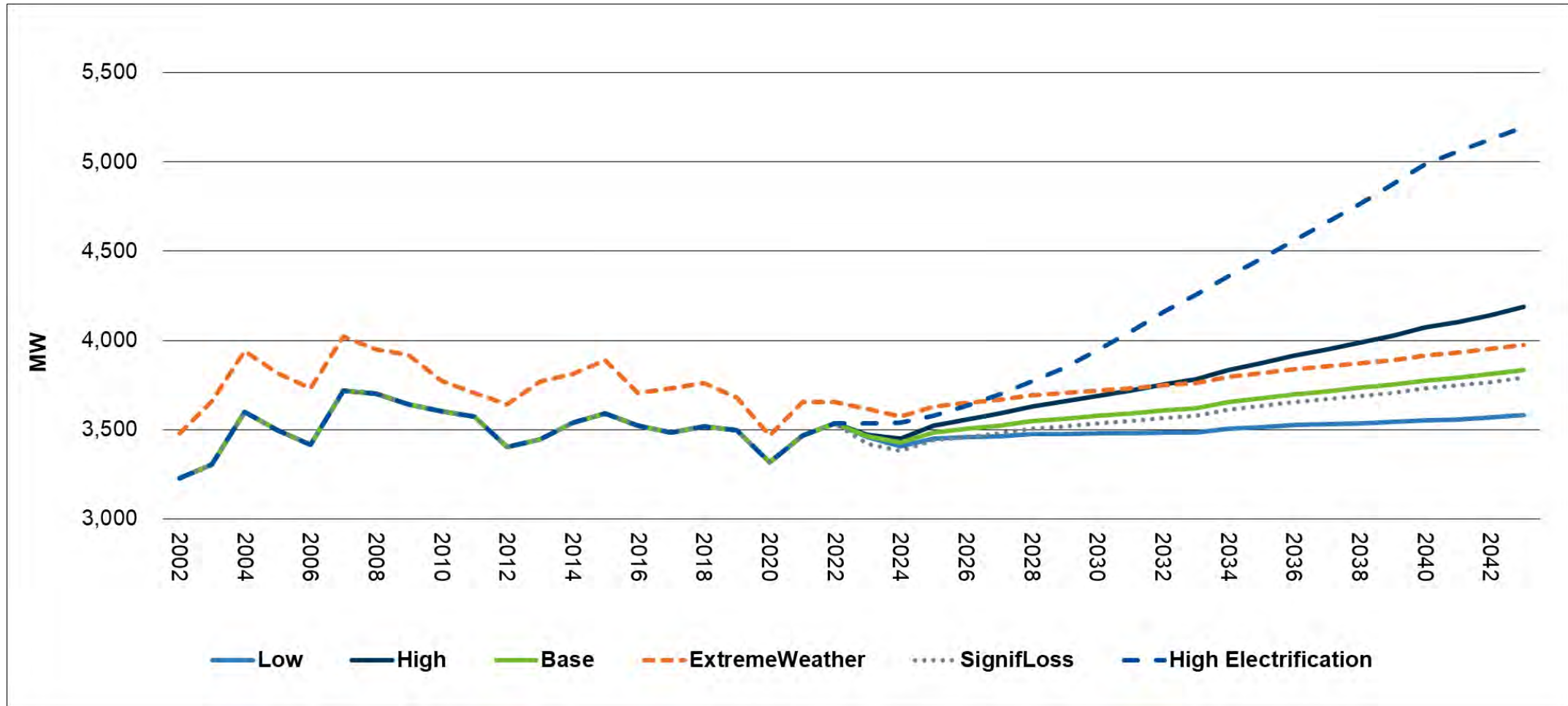


Evergy Metro Historical and Comparison of Mid-Case Forecasts of Net System Input, Excluding future DSM Impacts





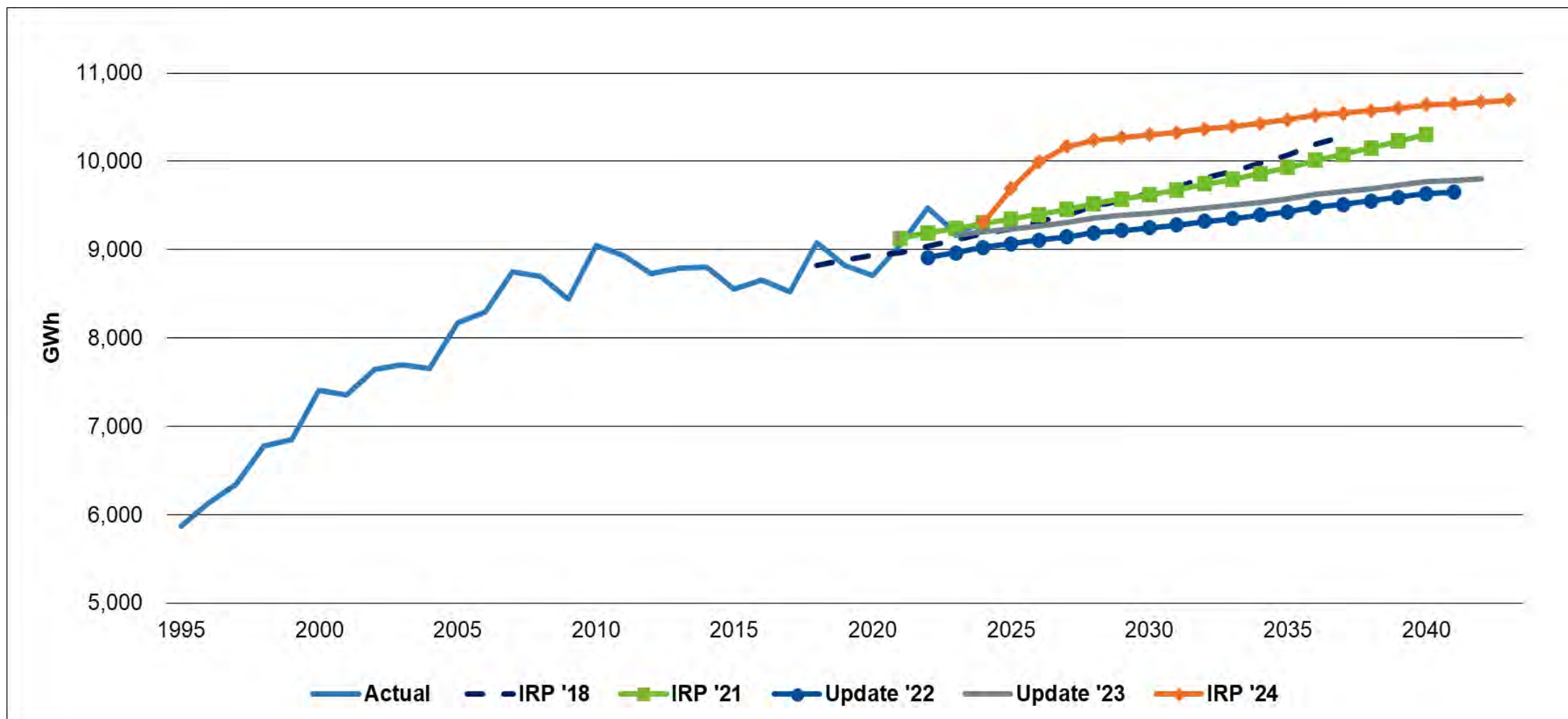
Evergy Metro Historical and Comparison of Mid-Case Forecasts of Demand, Excluding future DSM Impacts



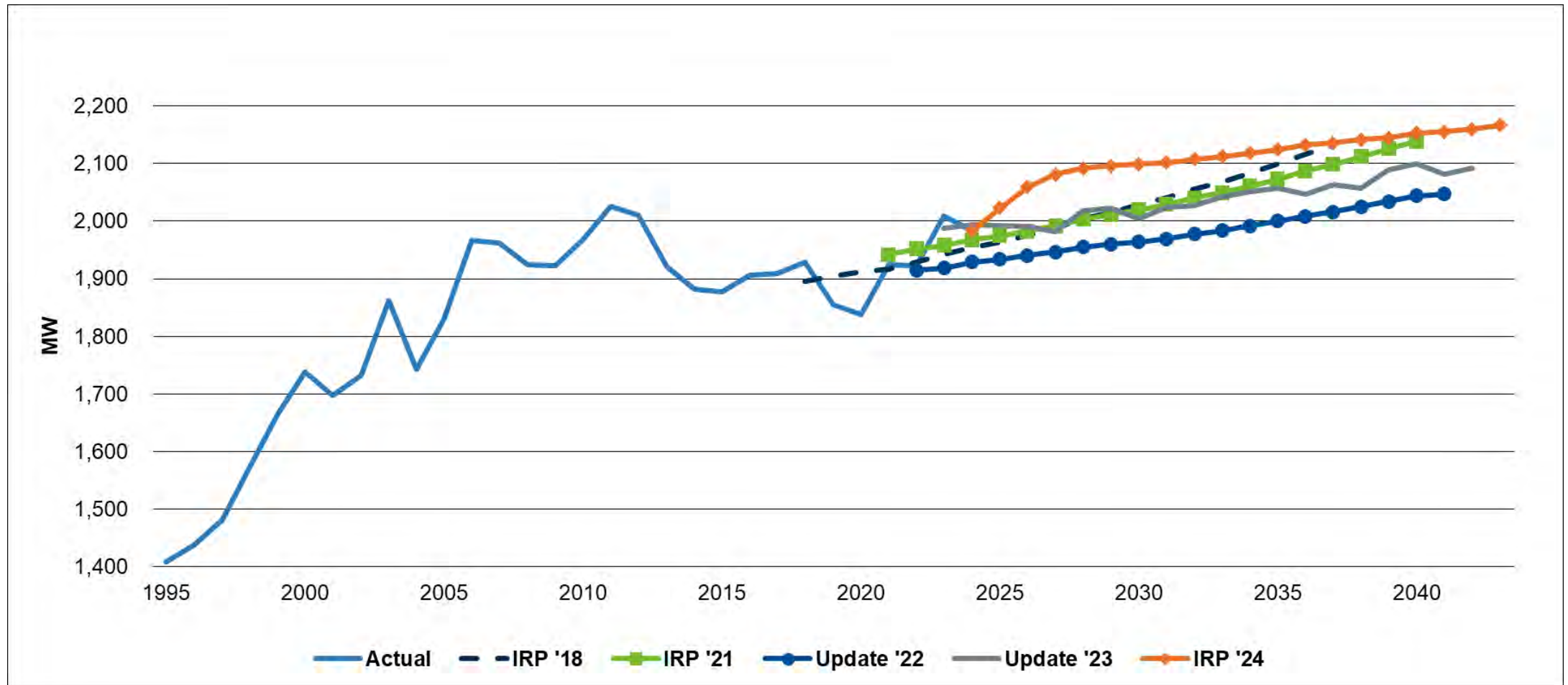


Energy Forecasts – Triennial IRP Scenarios

Energy Missouri West

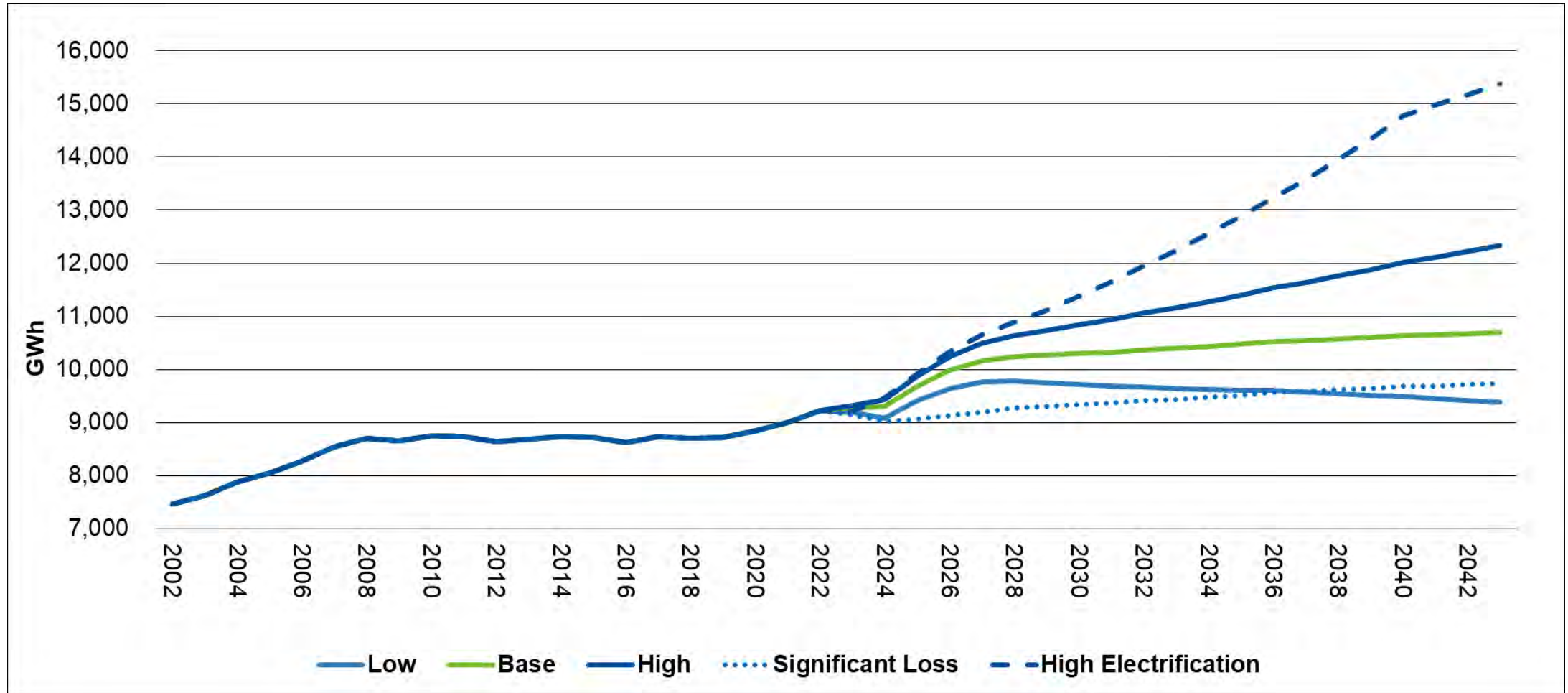


Peak Forecasts – Triennial IRP Scenarios Energy Missouri West



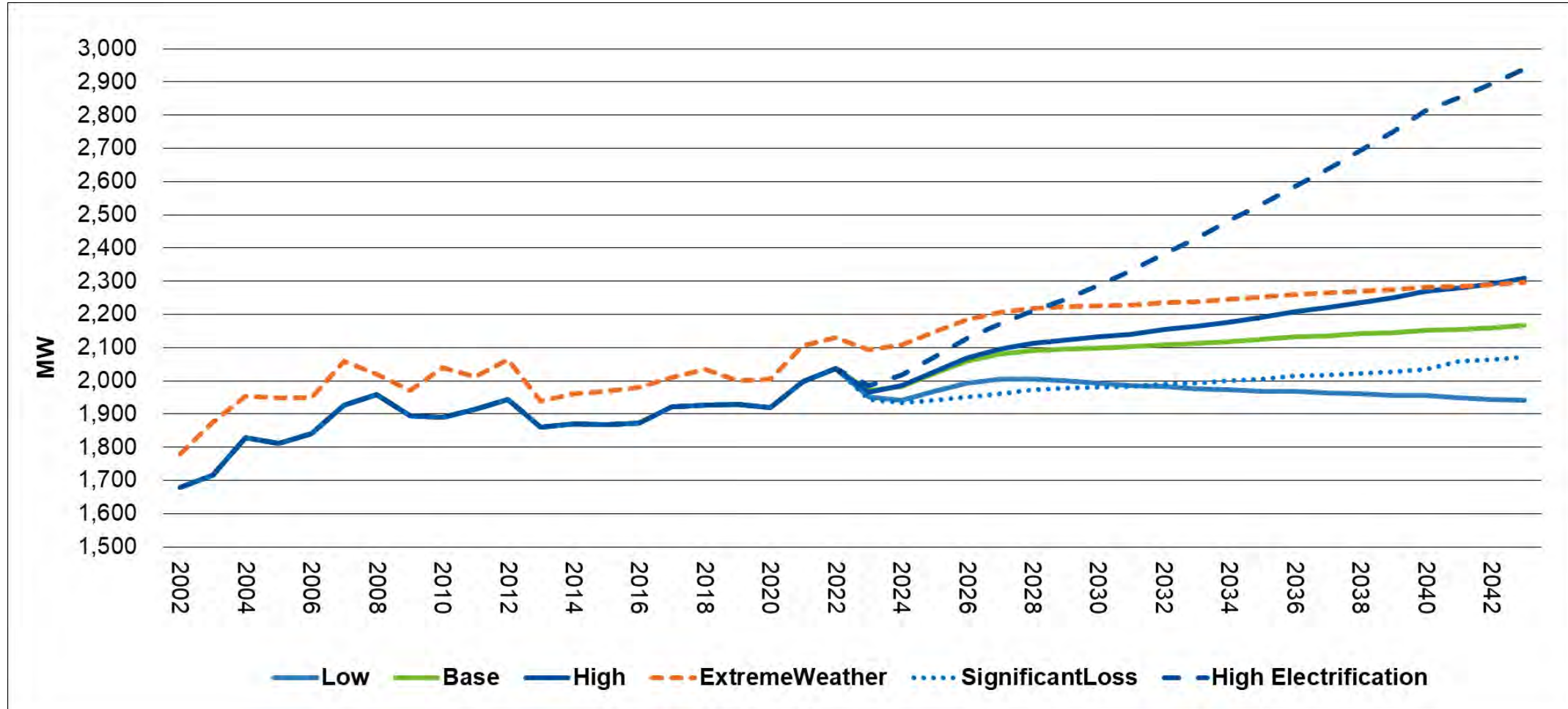


Evergy Missouri West Historical and Comparison of Mid-Case Forecasts of Net System Input, Excluding Future DSM Impacts





Evergy Missouri West Historical and Comparison of Mid-Case Forecasts of Demand, Excluding Future DSM Impacts



Demand-Side Resources

Tim Nelson





DSM Analysis – Missouri

- 2022 DSM Market Potential Study Results were incorporated in IRP 2023 annual updates
- 2022 DSM Market Potential Study assumed new program year starts in 2024
- MEEIA 3 extension approved for 2024
- 2022 DSM Market Potential Study results will be incorporated again in the 2024 Triennial with impacts shifted to begin in 2025
- Includes assumed peak reduction from default Time-of-Use residential rates



DSM Analysis – KS Metro

- KCC conditionally approved DSM programs for 2024 – 2027
- DSM potential was developed based on KCC approved plan for first four years of the planning horizon
- 2022 DSM Potential Study results were used as the reference for continuation of KEEIA in future years (2028 - 2044)

Supply-Side Resource Analysis

Kelli Merwald



Technologies Considered



- Combined cycle advanced class 1x1, hydrogen capable
- Combustion turbine, simple cycle F class, hydrogen capable
- Combined-cycle with 90% carbon capture and sequestration (CCS), or addition of 90% CCS in future year



- Addition of natural gas burn capability to existing resources
- Addition of 90% CCS to existing resources – high carbon restriction scenarios



- Small modular reactor – late in time horizon, high carbon restriction scenarios

Review of Cost Assumption Sources – New Resources



Wind: 2023 All Source Request for Proposal responses, confirmed with offer refresh; adjusted over time based on average cost curve from NREL and EIA



Solar: 2023 All Source Request for Proposal responses, confirmed with offer refresh; adjusted over time based on average cost curve from NREL and EIA



Battery Storage: Average price based on 2023 All Source Request for Proposal responses; adjusted over time based on average cost curve from NREL and EIA



Natural Gas: Composite of publicly available cost estimates (EIA 2023 Annual Energy Outlook & announced projects) & 2023 technology study; carbon capture costs estimates from NREL



Coal: Carbon capture cost estimates from NREL; internal estimates of natural gas conversion costs



Uranium: Composite of vendor and engineering firm estimates, adjusted to reflect cost uncertainty for technology not yet deployed



Availability of Resources for Capacity Expansion by Year

Evergy Metro

Resource	2024	2025	2026	2027	2028+
Wind			150	150	150
Solar				150	150
Battery			150	150	150
Combined Cycle					260
Combustion Turbine					238
Dogwood CC					
Market Capacity	300	300	100	30	30

Evergy Missouri West

Resource	2024	2025	2026	2027	2028+
Wind			150	150	150
Solar			150	150	150
Battery			150	150	150
Combined Cycle					260
Combustion Turbine					238
Dogwood CC	143				
Market Capacity	300	300	100	20	20



Resource Adequacy Requirements Update

- Summer Reserve Margin:
 - Current: 15%
 - Future Indicators: Updated Loss of Load study performed by SPP indicated summer reserve margin could increase to ~17% in 2025/2026
- Winter Reserve Margin:
 - Beginning Winter '24/25: 15%
 - Future Indicators: Studies performed by SPP thus far project that winter reserve margin is likely to significantly increase beyond 2025/2026; stakeholder discussions are ongoing
- Performance-Based Accreditation
 - Expect implementation summer 2026
 - Impact to Evergy will vary based on fleet performance versus SPP resources overall
- Effective Load Carrying Capability
 - Expect implementation summer 2026 – have received accreditation results from 2023 ELCC study for existing renewable resources
 - Accreditation of all ELCC resources will change over time as penetration within SPP changes
- 2024 Triennial Approach: Will incorporate assumed impacts of these policy changes on capacity requirements over time

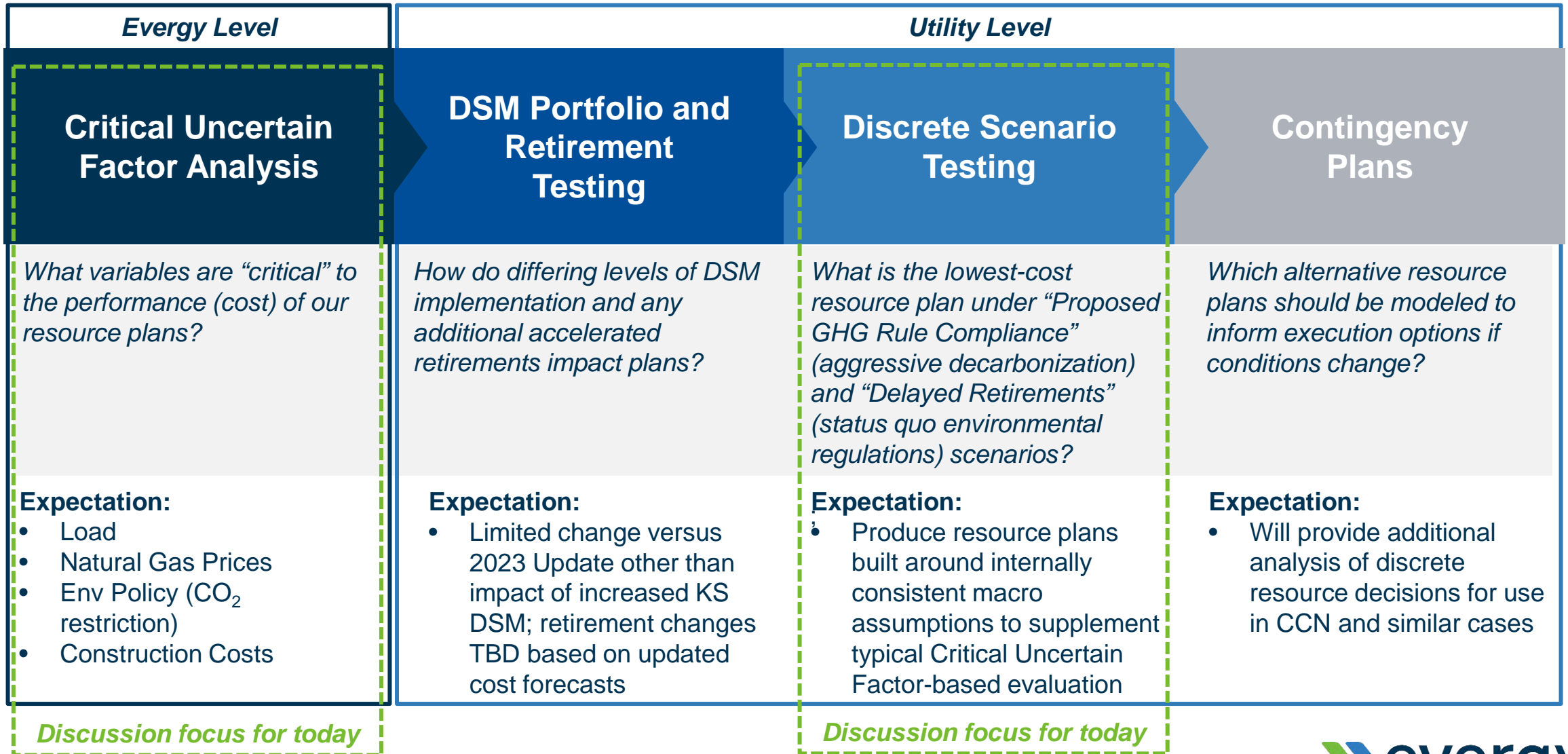
Integrated Resource Plan & Risk Analysis

Kelli Merwald



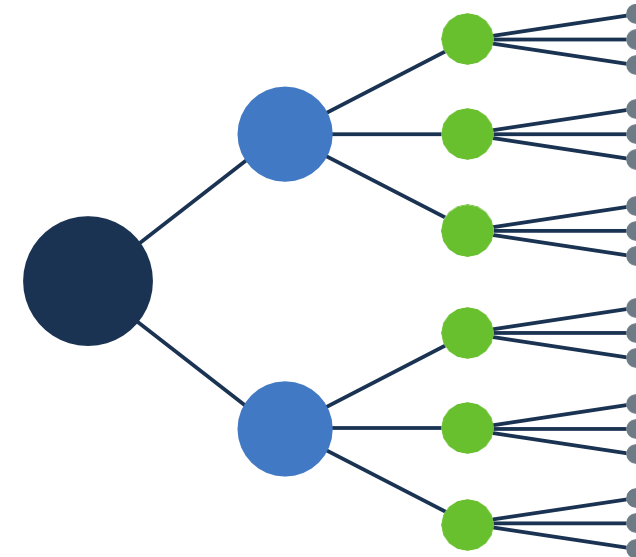


Analytical Approach





Critical Uncertain Factor Approach



Uncertain Factors

Analyzed individually to determine criticality (i.e., impact on Alternative Resource Plan ranking)

Scenarios

Constructed based on combinations of Critical Uncertain Factors (gas price, CO₂ pricing, load forecast, etc.)



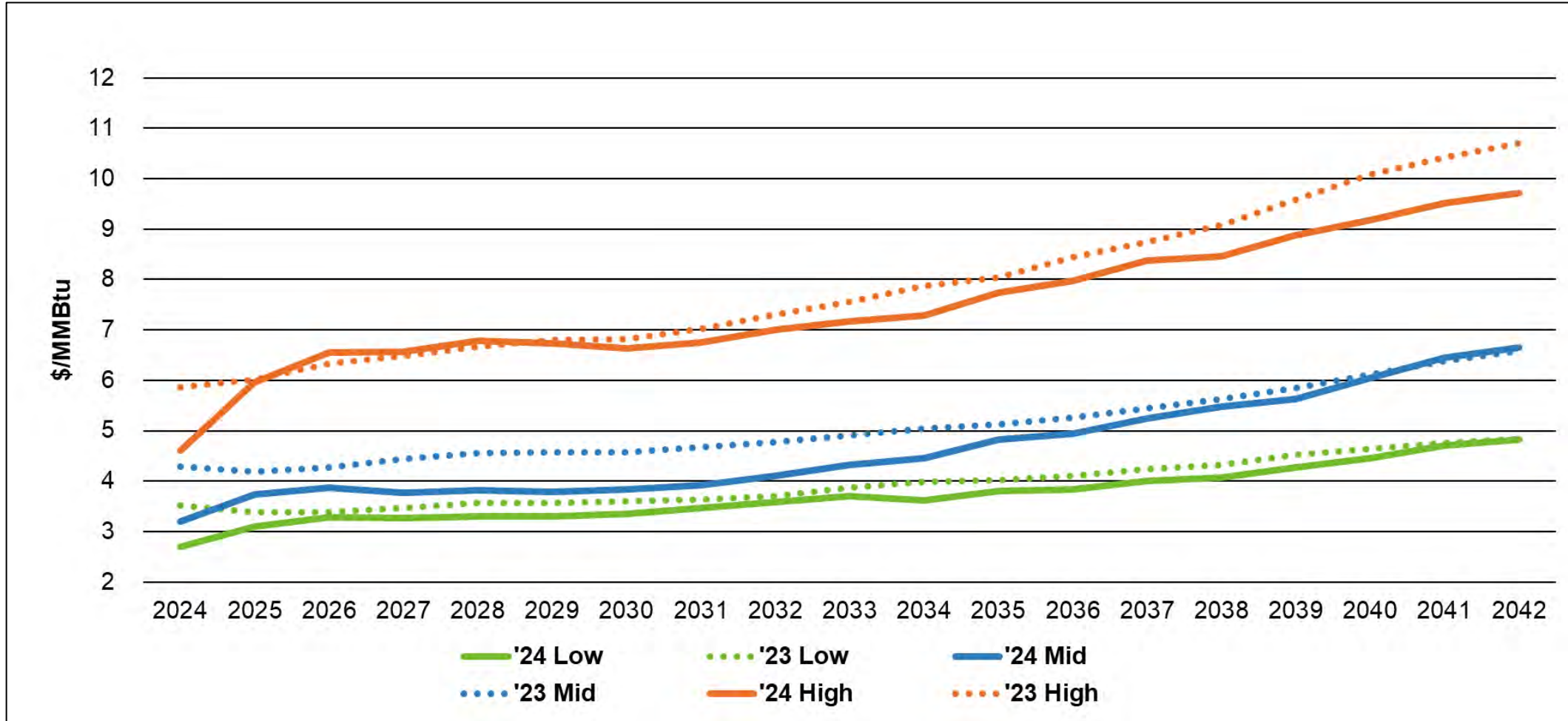
Preliminary Uncertain Factors Evaluation

Uncertain Factor	Evaluated?	Critical?	Comments
Load Growth	✓	✓	
Interest Rate	✓	✗	
Legal Mandates	✓	✓	CO ₂ restriction
Fuel Prices	✓	✓	Only Nat. Gas prices critical
New Gen Construction / Permitting	✓	✓	
Purchased Power	N/A	✗	Purchased Power cost uncertainty assessed using other factors
Emission Allowance Pricing	✓	✗	CO ₂ tax included in legal mandates factor
Gen O&M costs	✓	✗	
Forced Outage Rates	✓	✗	
DSM Load Impacts	✓	✗	
DSM Costs	✓	✗	
Other potential uncertain factors	TBD	TBD	

✓ Currently considered "Critical"

✗ Not currently considered "Critical"

Critical Uncertain Factors – Natural Gas Prices

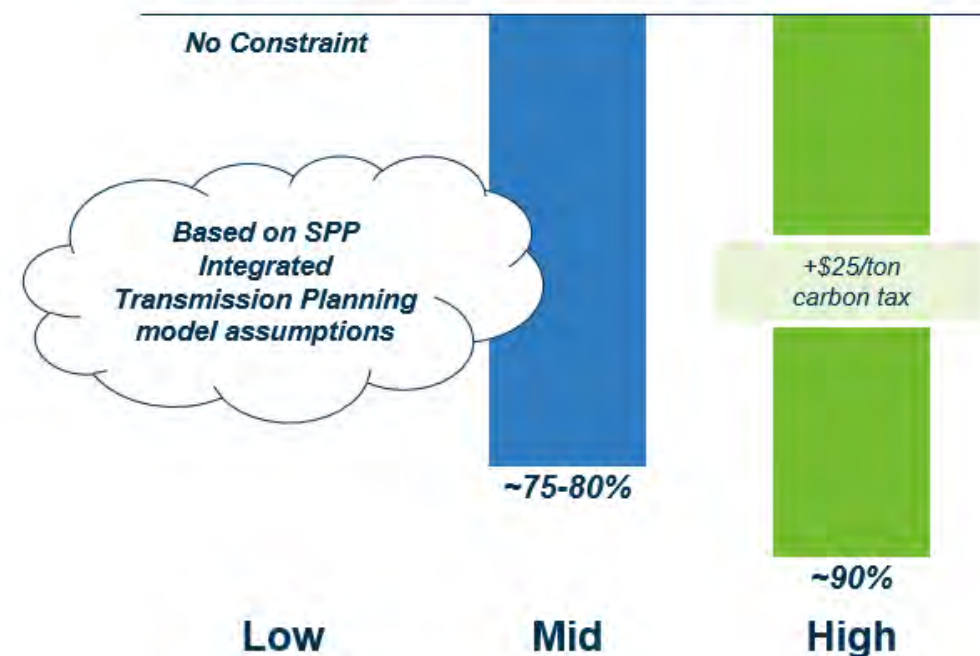




Critical Uncertain Factors – Legal Mandates / CO₂ Restriction

- Includes varying levels of carbon restriction, consistent with SPP assumptions, which impact market prices and dispatch
- High Carbon Restriction scenario includes additional carbon tax
- Will include incremental cost of carbon capture on new natural gas in order to enable non-emitting operations in High restriction scenario (different approach than 2023 Annual Update)

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



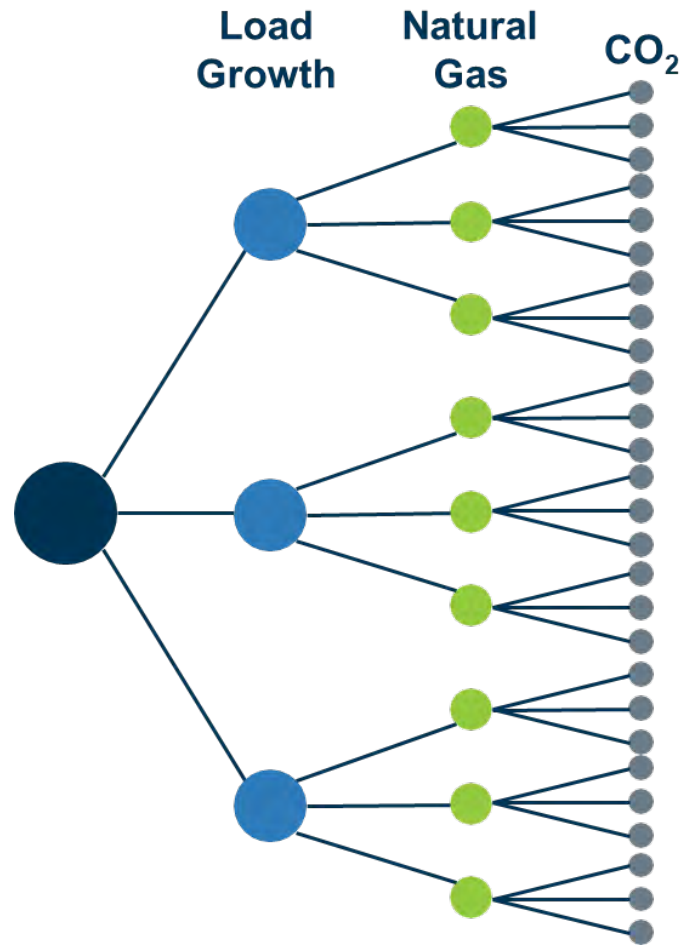


Critical Uncertain Factors – Construction / Permitting / Interconnection Costs

- Construction and Interconnection Costs have been highly volatile past few years impacted by both macroeconomic and industry specific factors
 - Construction uncertainty tested +/- 25% consistent with observed year over year variations seen in past few years
 - Interconnection cost uncertainty based on 2019-2023 study data for SPP
- 2024 IRP build costs
 - Renewables build cost estimates consistent with IRP 2023 for mid scenario, based on price refresh from RFP offers
 - Thermal build cost estimates expected to increase for mid scenario due to inflation



Reminder – Scenario Endpoint Example (2021 Triennial)



Endpoint	Load Growth	Natural Gas	CO ₂	Endpoint Probability
1	High	High	High	1.6%
2	High	High	Mid	3.1%
3	High	High	Low	1.6%
4	High	Mid	High	3.1%
5	High	Mid	Mid	6.3%
6	High	Mid	Low	3.1%
7	High	Low	High	1.6%
8	High	Low	Mid	3.1%
9	High	Low	Low	1.6%
10	Mid	High	High	3.1%
11	Mid	High	Mid	6.3%
12	Mid	High	Low	3.1%
13	Mid	Mid	High	6.3%
14	Mid	Mid	Mid	12.5%
15	Mid	Mid	Low	6.3%
16	Mid	Low	High	3.1%
17	Mid	Low	Mid	6.3%
18	Mid	Low	Low	3.1%
19	Low	High	High	1.6%
20	Low	High	Mid	3.1%
21	Low	High	Low	1.6%
22	Low	Mid	High	3.1%
23	Low	Mid	Mid	6.3%
24	Low	Mid	Low	3.1%
25	Low	Low	High	1.6%
26	Low	Low	Mid	3.1%
27	Low	Low	Low	1.6%

For each factor:
 High – 25%
 Mid – 50%
 Low – 25%

Critical Uncertain Factors – Load



Load is critical in that it determines *how much* capacity is required – which drives the creation of resource plans



Historically, load has been incorporated as an endpoint in evaluating Revenue Requirements, but evaluated resource plans were not adjusted to reflect more/less capacity required



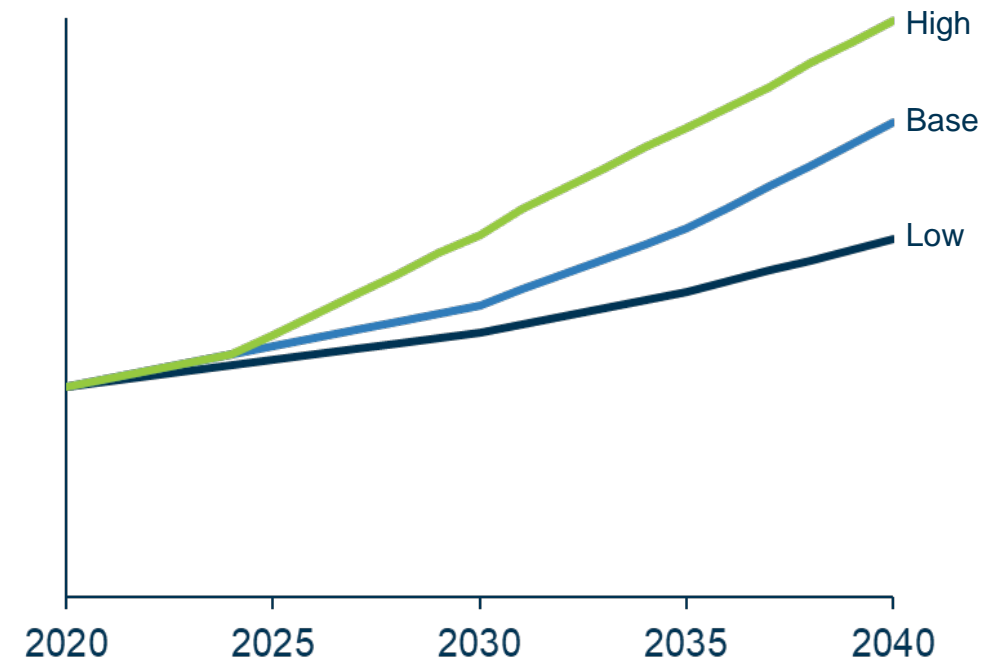
In 2024 Triennial, propose evaluating load as a “contingency plan” to reflect that different resource decisions could be made if load was higher/lower than expected



Will not be factored into “endpoint” analysis of Revenue Requirements

Load Scenarios That Drive Need for More Capacity

Illustrative Example



Contingency Plans:

- What resource plans solve best for high electrification scenario?
- What resources help meet customer demand if load growth slows down?



Discrete Scenario Analysis – For Discussion

“Delayed Retirements” Scenario

- Only retire Lawrence Energy Center – delay all other retirements beyond 20-year period
- Assumes no large environmental retrofits (i.e., SCRs) required
- Capacity Expansion model optimizes for Low gas; Low (No) carbon restriction; Mid construction costs

Proposed GHG Rules / Deep Decarbonization Scenarios

“Prescriptive” (based on compliance options included in proposed GHG rule – details by plant next slide)

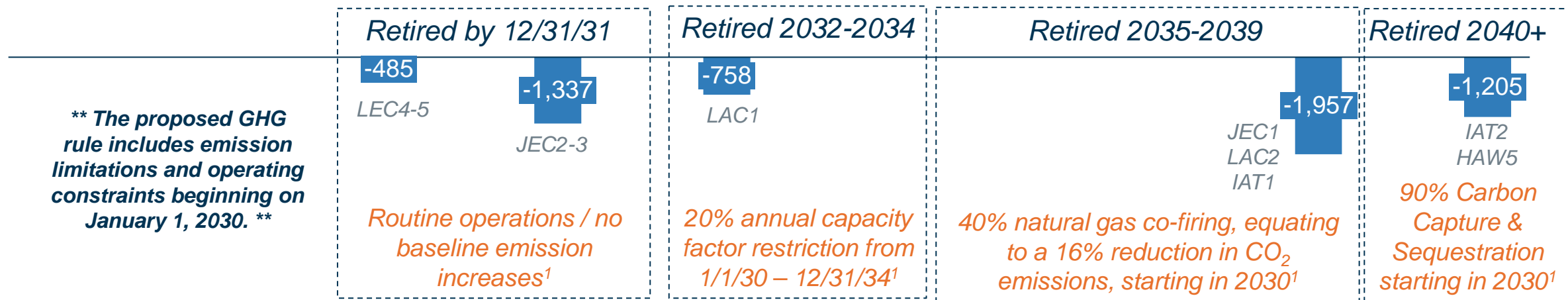
- Capacity factor limits
- Co-firing with natural gas
- Carbon capture
- Hydrogen blending (if cost estimate can be developed)
- Capacity expansion modeling under High gas; High carbon restriction; Mid construction costs

Optimized

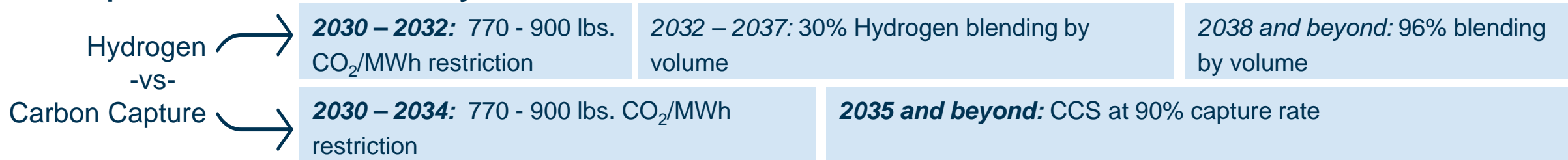
- No prescriptive requirements for compliance paths – dispatch and resource additions optimized based on capacity expansion; include accelerated retirements versus current Preferred Plan
- Capacity expansion modeling under High gas; High carbon restriction; Mid construction costs

Prescriptive GHG Rule Scenario

2023 IRP Update Preferred Plan Coal Retirement Schedule (MW)



Two options for new combined cycles:



Cost estimates for compliance may be challenging

- Hydrogen pricing – need source (preliminary research reveals wide-range)
- Carbon capture – NREL estimates for capture facilities, need source for storage/transport
- Co-firing – internal estimates for natural gas transport costs, facility upgrade needs

1. Actual capacity factor restriction will be a unit specific inquiry, based on design efficiency. States will set resulting performance standards using a unit-specific baseline emissions rate.

Analytical Approach, continued



NPVRR Rankings by Endpoint (\$M)

Costs will be compared across Alternative Resource Plans and endpoints to result in selection of Preferred Plan



Illustrative

■ "Discrete Scenario" Resource Plan ■ Other Alternative Resource Plans

- Evaluation of next-lowest-cost plan if near-term resources (e.g., Dogwood) are removed from plan – similar to comparison plans evaluated in 2023
- Capacity expansion results under High and Low load forecasts
- Comparison of costs for changes in specific plant retirements (e.g., Jeffrey 2)
- Others TBD

Wrap-Up



Next Steps

- Follow up via email ***before January 12th*** with any specific comments to:

 regulatory.affairs@evergy.com

- Next stakeholder meeting to be scheduled for February
- Dockets now open for 2024 Triennial:
 - Evergy Missouri Metro / EO-2024-0153
 - Evergy Missouri West / EO-2024-0154