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

In the Matter of Evergy Metro, Inc. d/b/a Evergy Missouri Metro's 2023 Integrated Resource Plan Annual Update Filing	)))	File No. EO-2023-0212
In the Matter of Evergy Missouri West, Inc. d/b/a Evergy Missouri West's 2023 Integrated Resource Plan Annual Update Filing	)))	File No. EO-2023-0213

<u>**NOTICE OF STAKEHOLDER PRESENTATION**</u>

  COMES NOW, Evergy Metro, Inc. d/b/a Evergy Missouri Metro ("Evergy Missouri Metro") and Evergy Missouri West, Inc. d/b/a Evergy Missouri West[1] ("Evergy Missouri West") (collectively, the "Company") and for their Notice, state as follows:

  1. On July 6, 2023, the Company held a presentation for stakeholders related to Evergy Missouri Metro's and Evergy Missouri West's respective annual resource plans previously filed in the above-captioned dockets. 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

       Roger W. Steiner, #39586
       Evergy, Inc.
       1200 Main Street
       Kansas City, MO 64105
       Phone: (816) 556-2314
       roger.steiner@evergy.com

       **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 12th day of July 2023.

Roger W. Steiner

Roger W. Steiner

2023 Evergy Metro and Evergy Missouri West
Annual Update Stakeholder Meeting

Evergy Metro
Case No. EO-2023-0212
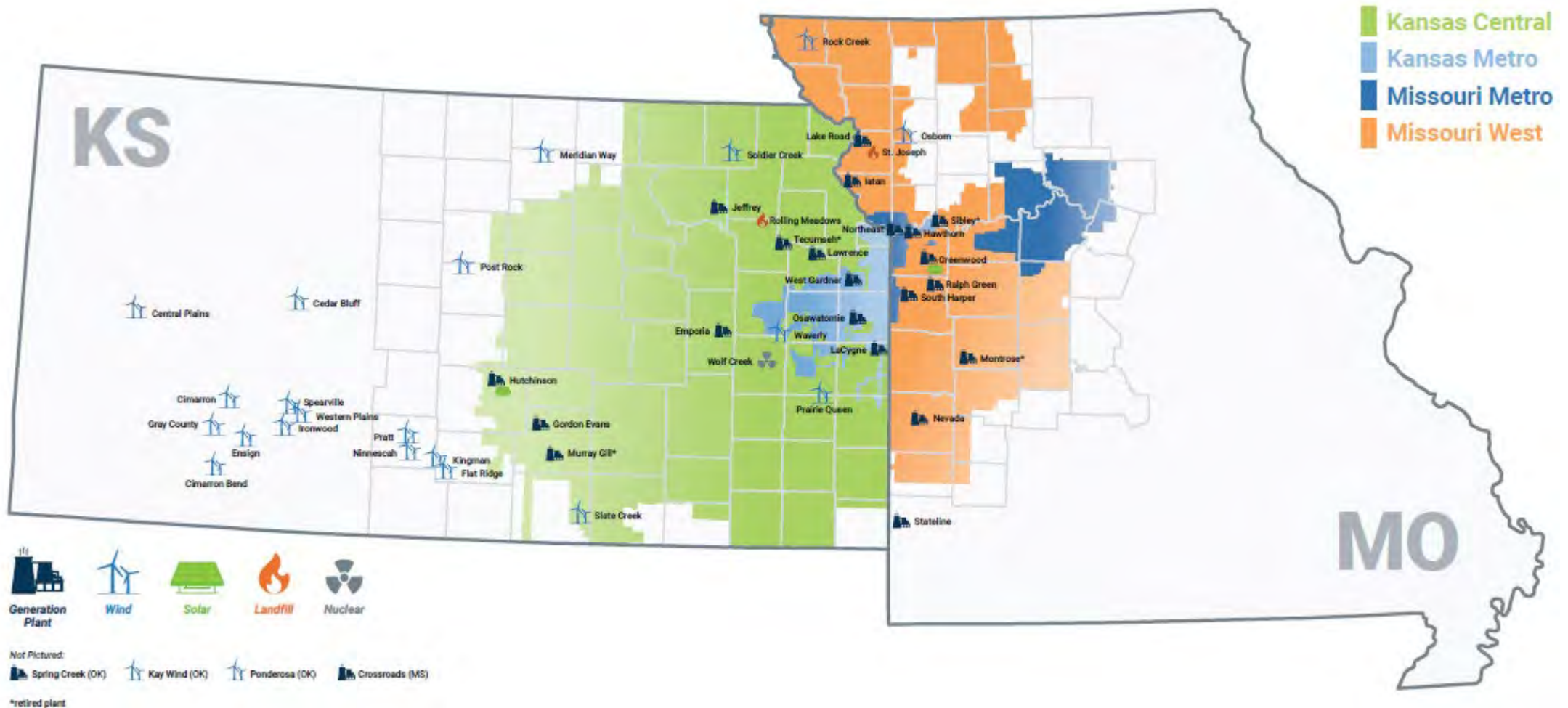**Evergy Missouri West**
Case No. EO-2023-0213

evergy

Agenda

- Evergy Overview

- Changes since 2022 Annual Update

- Load Forecasting

- Demand-Side Resources

- Supply-Side Resources
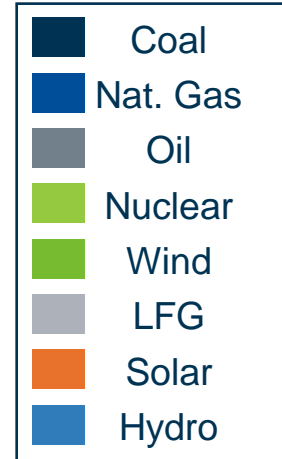
- Integrated Resource Analysis and Preferred Plan

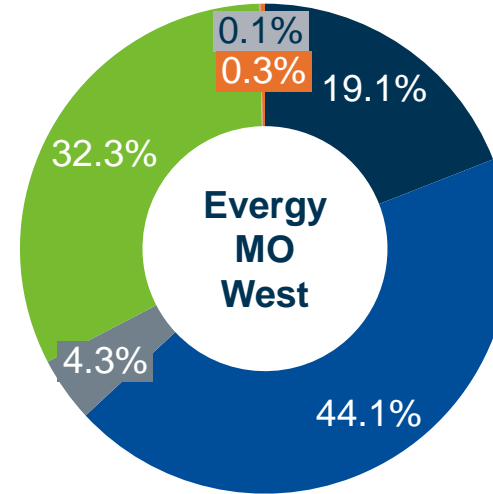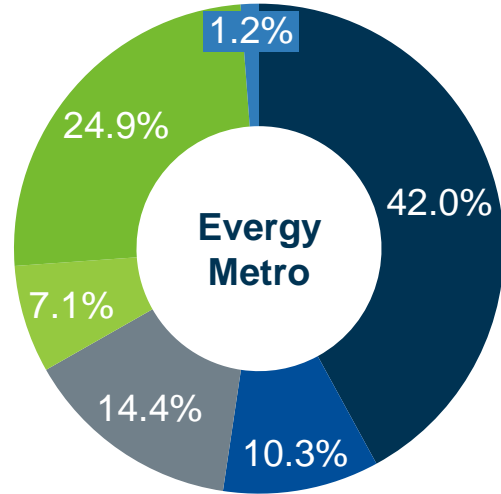- Resource Acquisition Strategy

- Next Steps

Evergy's Service Territory

Capacity & Energy Profiles

Capacity

Evergy Metro: Coal 42.0%, Nat. Gas 10.3%, Oil 14.4%, Nuclear 7.1%, Wind 24.9%, Hydro 1.2%

Evergy MO West: Coal 19.1%, Nat. Gas 44.1%, Oil 4.3%, Wind 32.3%, Solar 0.3%, LFG 0.1%

Energy

Evergy Metro: Coal 50.5%, Nat. Gas 2.8%, Oil 0.1%, Nuclear 21.5%, Wind 24.3%, Hydro 0.8%

Evergy MO West: Coal 33.1%, Nat. Gas 8.9%, Oil 0.4%, Wind 57.3%, Solar 0.1%

Legend: Coal, Nat. Gas, Oil, Nuclear, Wind, LFG, Solar, Hydro

2023 Annual Update Stakeholder Meeting

Changes since 2022 Annual Update

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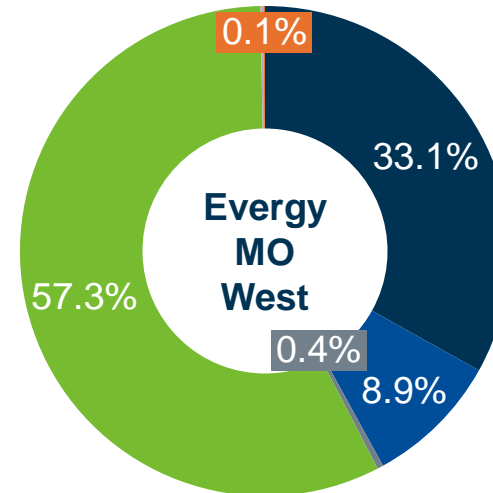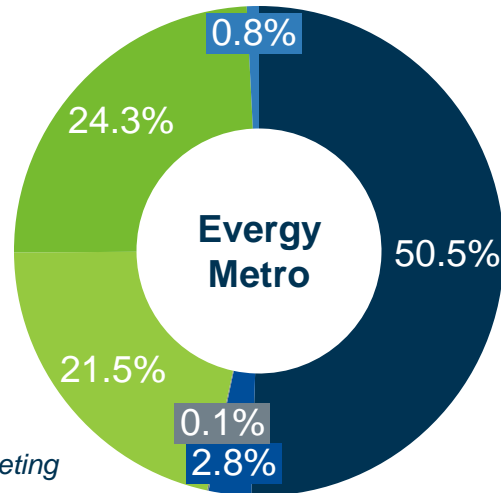
Changes since 2022 Annual Update

- Updated market pricing reflecting latest SPP transmission planning model assumptions of future resource mix and potential transmission congestion

- Updated fuel price forecasts, including high, mid, and low natural gas price scenarios

- Carbon Dioxide emissions limitations scenarios reflecting future environmental risks, including high, mid, and low (no) restrictions

- Updated cost estimates and timing assumptions for resource additions based on First Quarter 2023 Request for Proposal (RFP) results

- Modeling of battery storage and hybrid resources as supply-side options

- Inclusion of incentives for new renewable and storage resources based on Inflation Reduction Act

- Updated load forecasts including large new customers in both Missouri and Kansas, and considerations for future large customer growth based on existing economic development pipeline

- Updated demand side management potential study, including four Missouri program options

- Included possible reductions in peak demand from Missouri Commission-ordered mandatory time of use rates

- Updated planning reserve margin consistent with SPP rule changes enacted in 2022

- Increased focus on planning for utility-level (as opposed to Evergy-level) resource needs to better identify each utility's specific energy and capacity needs in the future, reduced level of assumed market availability (for both capacity and energy) and reliance on other Evergy affiliates to meet long-term customer needs

- Removal of Persimmon Creek wind farm (due to the company not advancing the project further in the Missouri West jurisdiction)

- Expanded use of PLEXOS software for production cost modeling and capacity expansion, which was first implemented for 2022 IRP

- Annual refresh of data for existing generators (Capital and Operations & Maintenance costs)

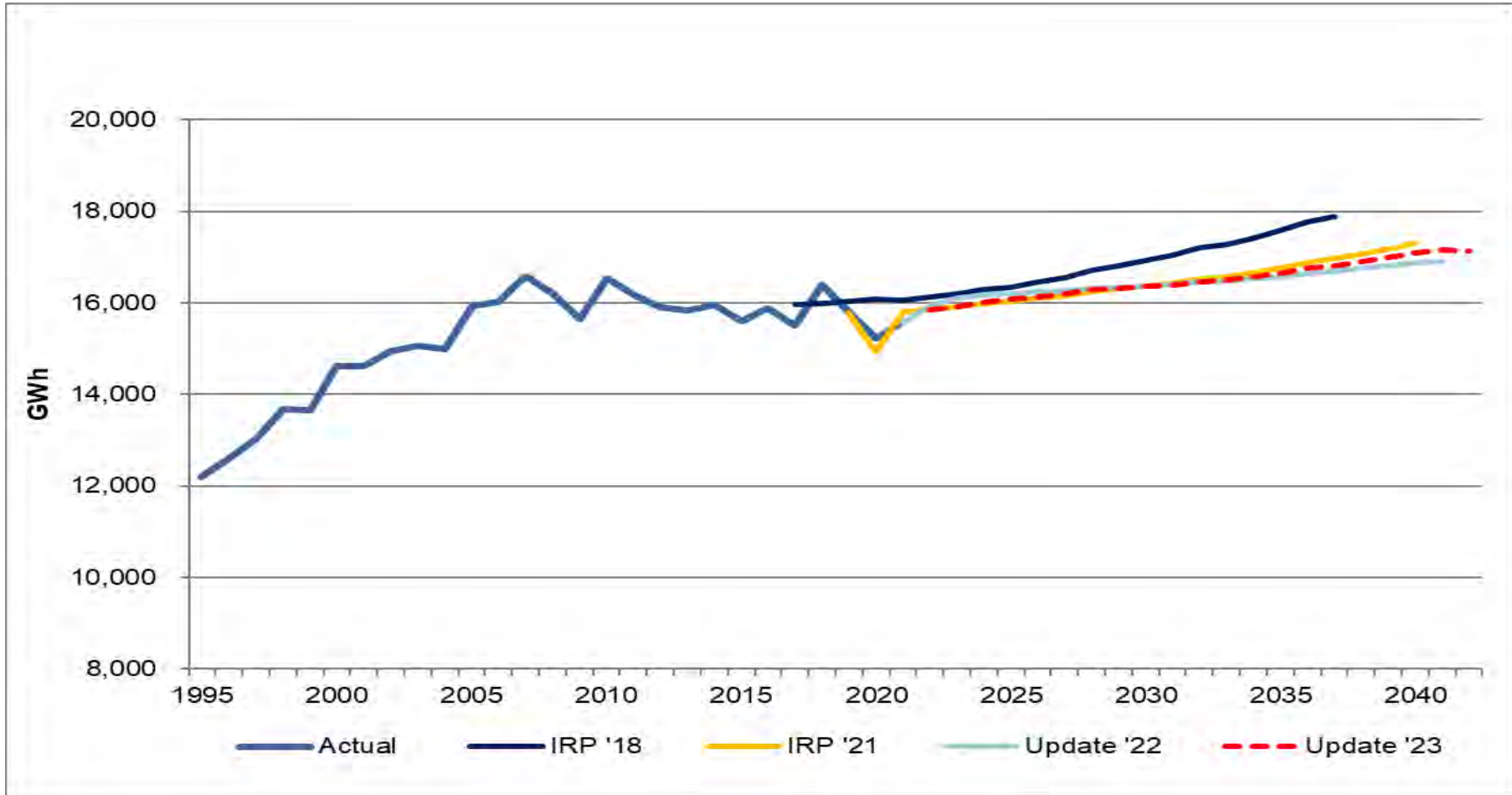*2023 Annual Update Stakeholder Meeting*

Load Forecasting

Changes in Inputs to Load Forecasting Models

- Historical data for customers, kwh and $/kwh: ending June 2022 vs ending June 2020

- DOE forecasts of appliance and equipment saturations and kwh/unit: Annual Energy Outlook (AEO) 2022 vs AEO 2020

- Economic forecasts from Moody's Analytics: June 2022 vs June 2020

- 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 2023 Update filing.

- The Company utilized Google Mobility Reports data through June of 2022 to account for load changes resulting from geolocation behaviors induced by the COVID19 pandemic.

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

2023 Annual Update Stakeholder Meeting

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

2023 Annual Update Stakeholder Meeting
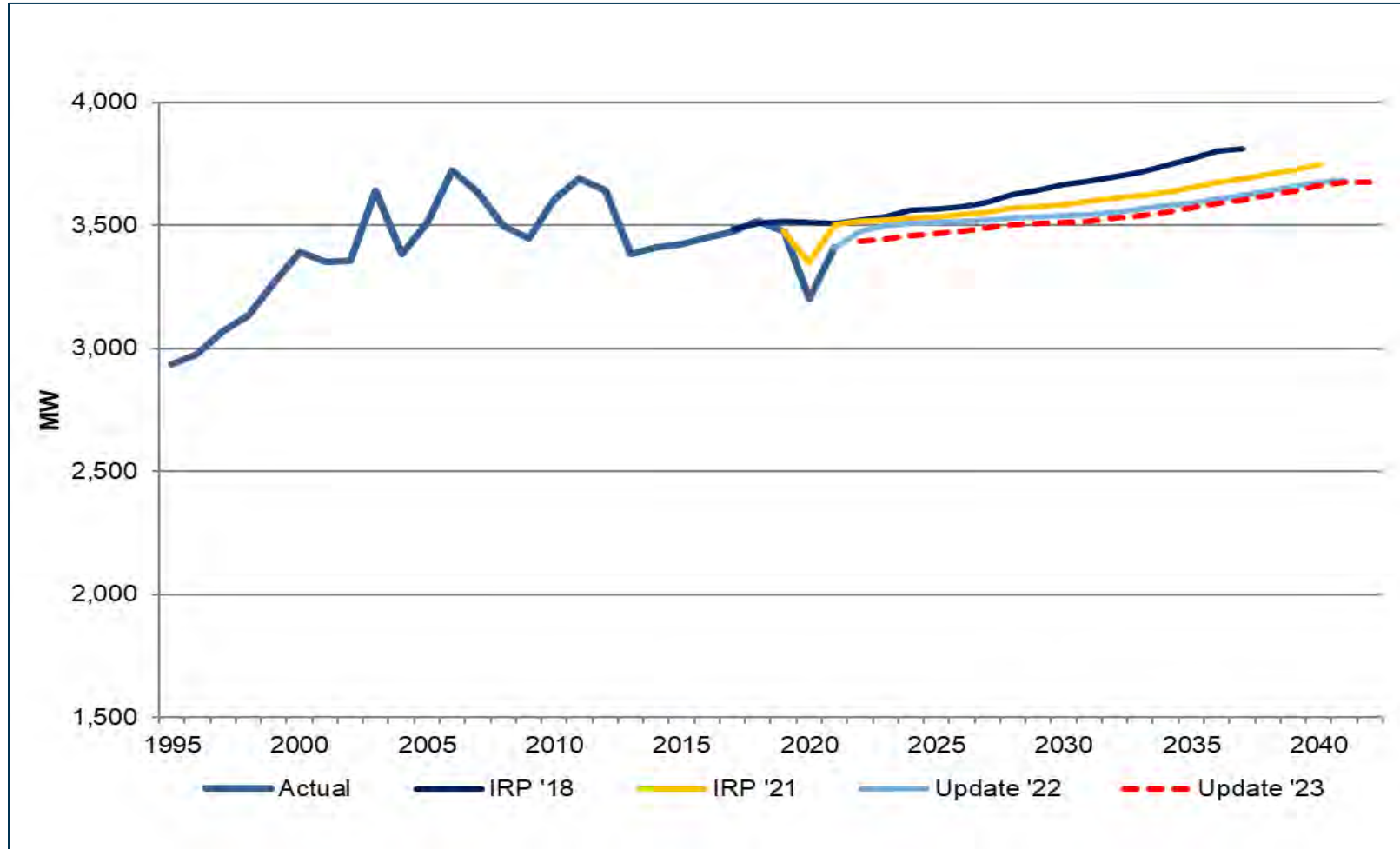
Evergy Metro Mid-Case Forecast

Base Annual 2023-2042 Net System Input (NSI) and Peak Forecast

Date	Gross NSI (MWh)	DSM		Net NSI (MWh)		Gross Peak (MW)		DSM	DVC	Net Peak (MW)		Gross LF
2002	14,810,168			14,810,168		3,229				3,229		0.5236
2003	15,100,010	2.0%		15,100,010	2.0%	3,307	2.4%			3,307	2.4%	0.5212
2004	15,434,710	2.2%		15,434,710	2.2%	3,600	8.9%			3,600	8.9%	0.4894
2005	15,735,417	1.9%		15,735,417	1.9%	3,496	-2.9%			3,496	-2.9%	0.5138
2006	15,960,834	1.4%		15,960,834	1.4%	3,416	-2.3%			3,416	-2.3%	0.5334
2007	16,286,867	2.0%		16,286,867	2.0%	3,718	8.8%			3,718	8.8%	0.5001
2008	16,306,299	0.1%		16,306,299	0.1%	3,703	-0.4%			3,703	-0.4%	0.5027
2009	16,024,573	-1.7%		16,024,573	-1.7%	3,642	-1.6%			3,642	-1.6%	0.5023
2010	16,057,247	0.2%		16,057,247	0.2%	3,605	-1.0%			3,605	-1.0%	0.5084
2011	15,918,871	-0.9%		15,918,871	-0.9%	3,573	-0.9%			3,573	-0.9%	0.5086
2012	15,642,354	-1.7%		15,642,354	-1.7%	3,401	-4.8%			3,401	-4.8%	0.5250
2013	15,733,616	0.6%		15,733,616	0.6%	3,444	1.3%			3,444	1.3%	0.5215
2014	15,908,170	1.1%		15,908,170	1.1%	3,540	2.8%			3,540	2.8%	0.5130
2015	15,882,360	-0.2%		15,882,360	-0.2%	3,591	1.4%			3,591	1.4%	0.5193
2016	15,827,972	-0.3%		15,827,972	-0.3%	3,524	-1.9%			3,524	-1.9%	0.5127
2017	15,951,842	0.8%		15,951,842	0.8%	3,485	-1.1%			3,485	-1.1%	0.5225
2018	15,849,039	-0.6%		15,849,039	-0.6%	3,518	1.0%			3,518	1.0%	0.5143
2019	15,742,056	-0.7%		15,742,056	-0.7%	3,498	-0.6%			3,498	-0.6%	0.5137
2020	15,475,646	-1.7%		15,475,646	-1.7%	3,317	-5.2%			3,317	-5.2%	0.5326
2021	15,479,695	0.0%		15,479,695	0.0%	3,466	4.5%		0	3,466	4.5%	0.5098
2022	15,838,433	2.3%	(9,061)	15,829,371	2.3%	3,453	-0.4%	0	0	3,453	-0.4%	0.5236
2023	15,921,373	0.5%	(41,773)	15,879,600	0.3%	3,446	-0.2%	(31)	0	3,415	-1.1%	0.5274
2024	16,021,075	0.6%	(74,444)	15,946,631	0.4%	3,459	0.4%	(22)	0	3,437	0.6%	0.5287
2025	16,071,451	0.3%	(73,298)	15,998,153	0.3%	3,465	0.2%	(25)	0	3,440	0.1%	0.5295
2026	16,139,820	0.4%	(71,844)	16,067,976	0.4%	3,477	0.3%	(25)	0	3,452	0.3%	0.5299
2027	16,204,184	0.4%	(71,353)	16,132,832	0.4%	3,488	0.3%	(25)	0	3,463	0.3%	0.5303
2028	16,284,357	0.5%	(69,082)	16,215,275	0.5%	3,501	0.4%	(24)	0	3,477	0.4%	0.5310
2029	16,324,342	0.2%	(64,149)	16,260,192	0.3%	3,508	0.2%	(22)	0	3,486	0.3%	0.5312
2030	16,359,456	0.2%	(60,680)	16,298,776	0.2%	3,513	0.1%	(21)	0	3,492	0.2%	0.5316
2031	16,398,438	0.2%	(59,263)	16,339,175	0.2%	3,518	0.1%	(20)	0	3,498	0.2%	0.5321
2032	16,464,312	0.4%	(52,516)	16,411,796	0.4%	3,531	0.4%	(19)	0	3,512	0.4%	0.5323
2033	16,504,820	0.2%	(40,275)	16,464,545	0.3%	3,539	0.2%	(10)	0	3,529	0.5%	0.5324
2034	16,575,481	0.4%	(29,221)	16,546,261	0.5%	3,554	0.4%	(6)	0	3,548	0.6%	0.5324
2035	16,652,675	0.5%	(19,074)	16,633,601	0.5%	3,570	0.5%	(4)	0	3,566	0.5%	0.5325
2036	16,752,964	0.6%	(14,057)	16,738,907	0.6%	3,588	0.5%	(3)	0	3,585	0.5%	0.5330
2037	16,816,559	0.4%	(11,940)	16,804,618	0.4%	3,603	0.4%	(3)	0	3,600	0.4%	0.5328
2038	16,905,106	0.5%	(8,182)	16,896,924	0.5%	3,621	0.5%	(3)	0	3,618	0.5%	0.5329
2039	16,995,309	0.5%	(6,420)	16,988,889	0.5%	3,639	0.5%	(2)	0	3,637	0.5%	0.5331
2040	17,100,125	0.6%	(5,089)	17,095,036	0.6%	3,661	0.6%	(2)	0	3,659	0.6%	0.5332
2041	17,159,548	0.3%	(3,273)	17,156,275	0.4%	3,673	0.3%	(1)	0	3,672	0.4%	0.5333
2042	17,144,485	-0.1%	(2,279)	17,142,206	-0.1%	3,675	0.1%	(0)	0	3,675	0.1%	0.5326

Historical Gross NSI is Historical WNNSI
2022 - first 6 months are Historical WNNSI
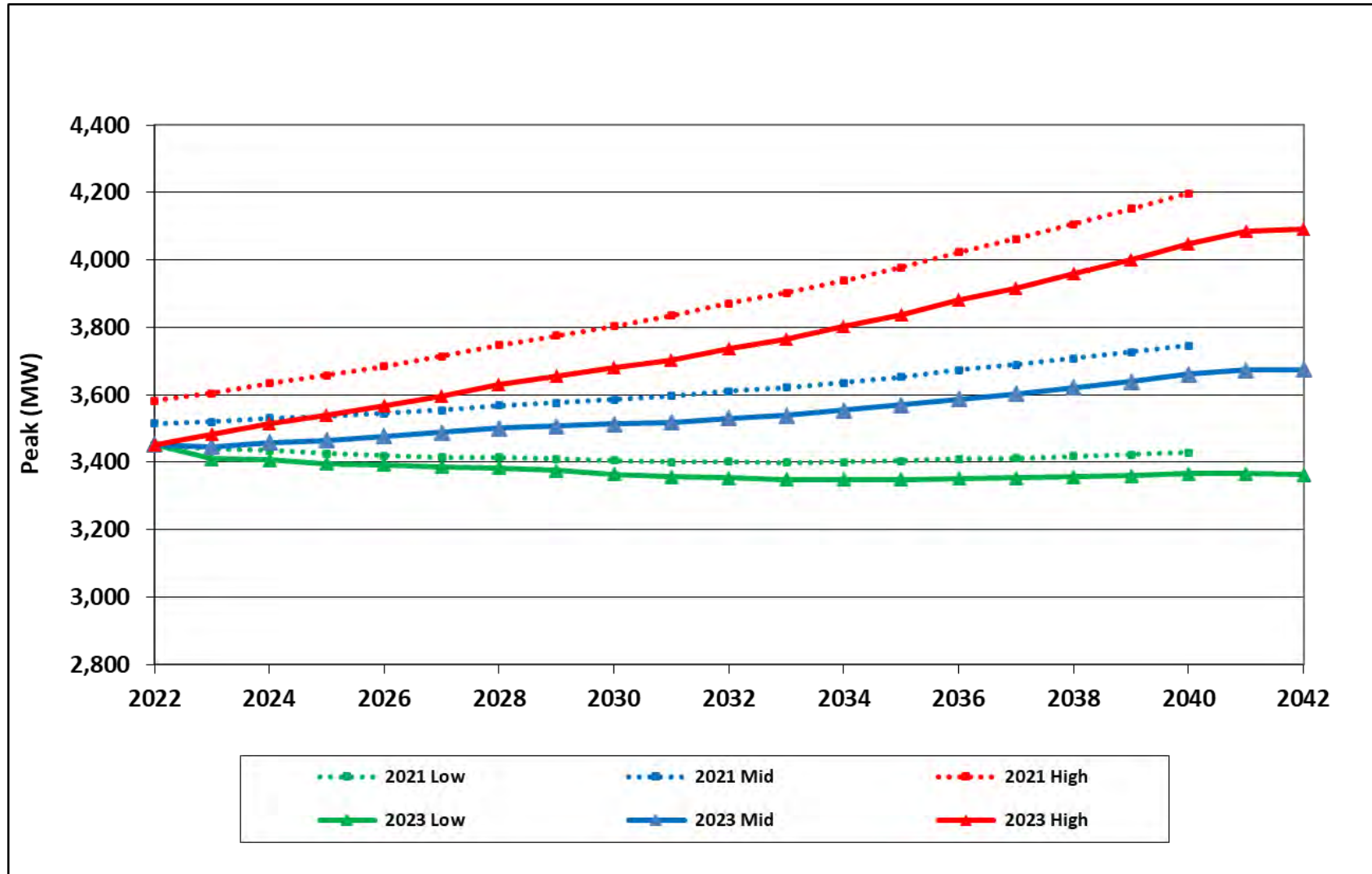
Gross NSI (MWh) - Forecast

Forecast Year	2023 IRP Update	2021
5 Yrs	0.46%	1.07%
10 Yrs	0.39%	0.74%
15 Yrs	0.40%	0.65%
20 Yrs	0.40%	0.65%

Gross Peak (MW) - Forecast

Forecast Year	2023 IRP Update	2021 IRP
5 Yrs	0.20%	1.10%
10 Yrs	0.22%	0.69%
15 Yrs	0.28%	0.58%
20 Yrs	0.31%	0.56%

Peak Forecasts – 2023 Annual Update Vs. 2021 Triennial IRP Evergy Metro

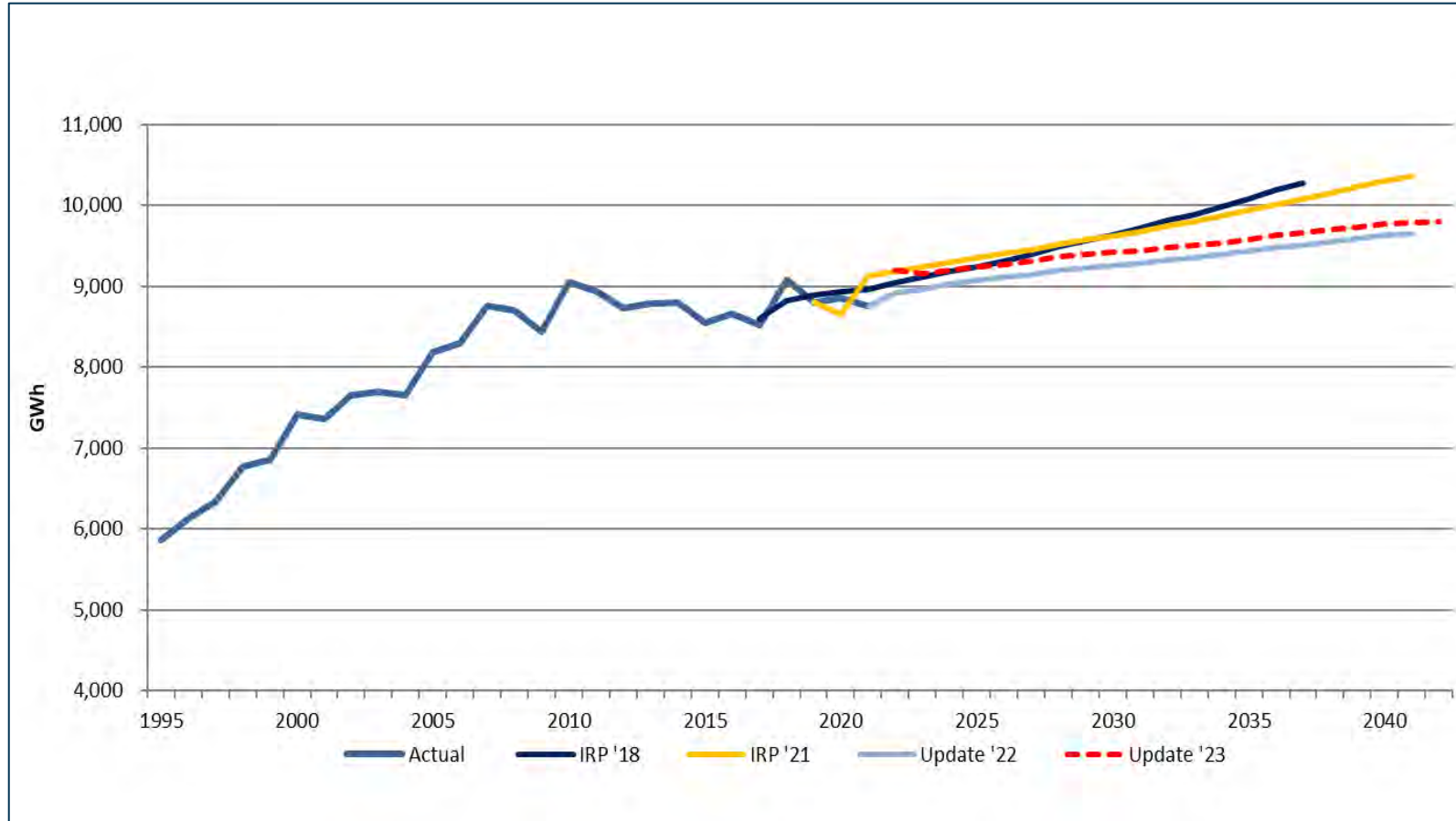*2023 Annual Update Stakeholder Meeting*

Energy Forecasts – 2023 Annual Update Vs. 2021 Triennial IRP Evergy Metro

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

2023 Annual Update Stakeholder Meeting
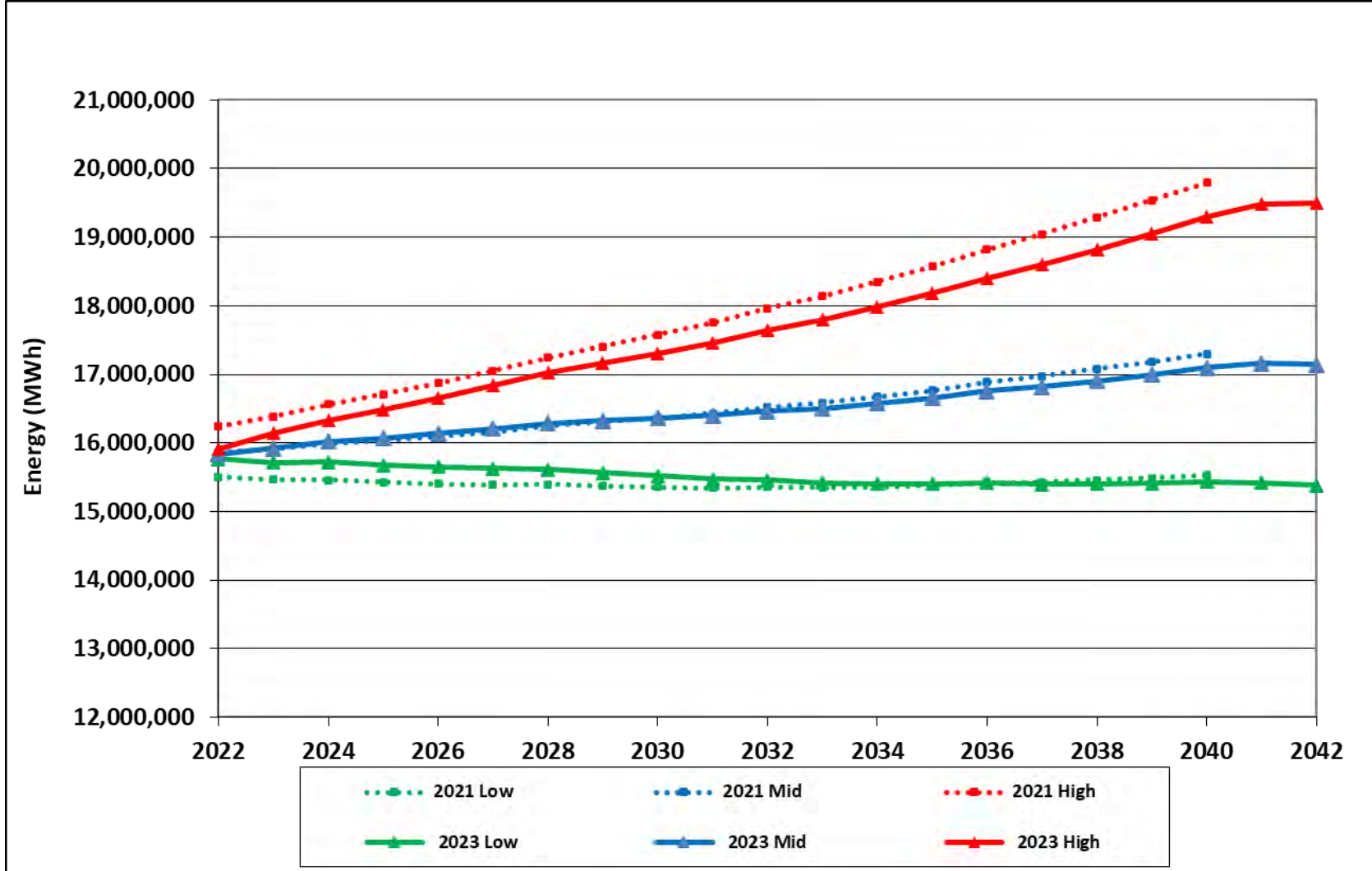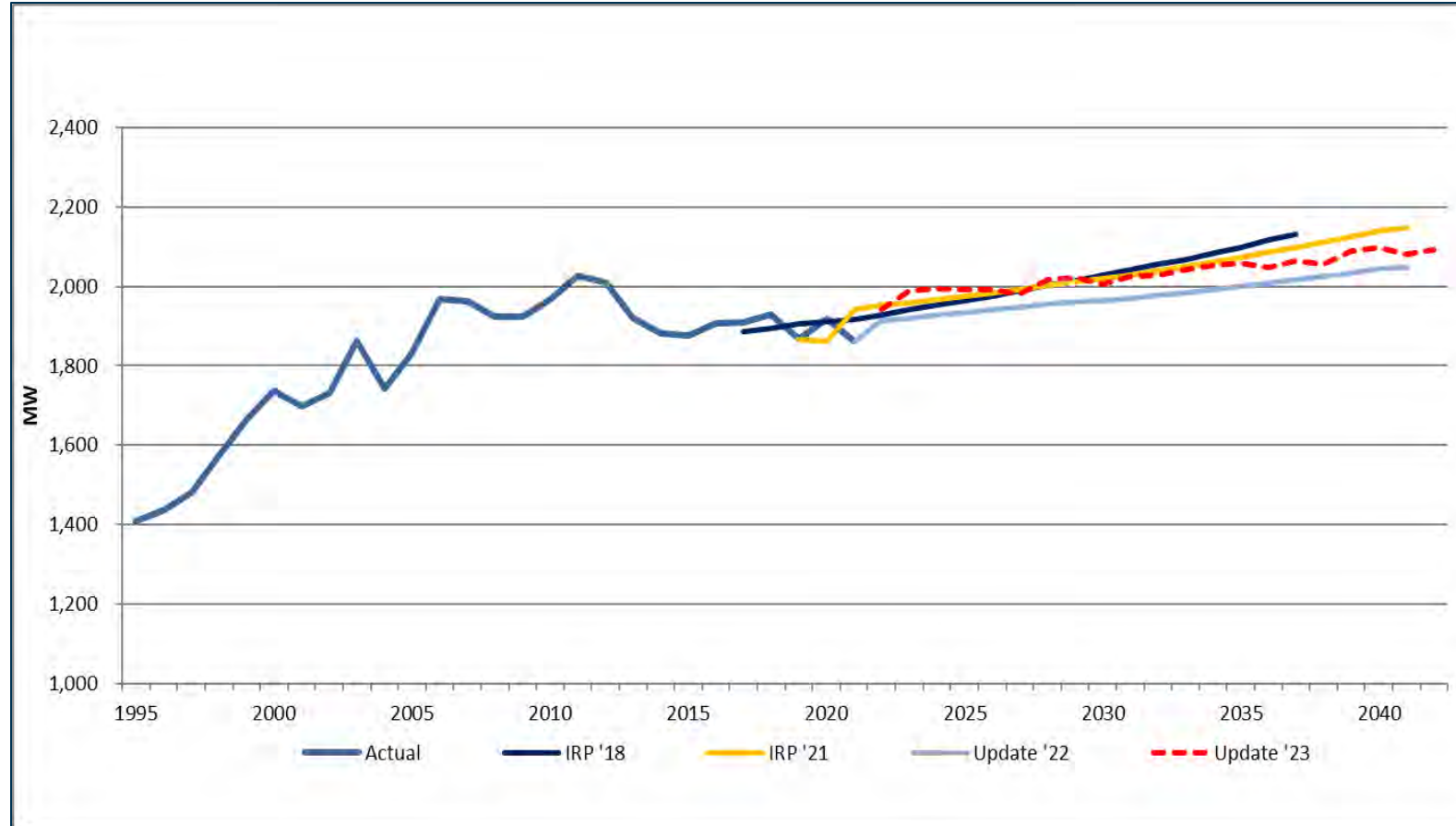
Evergy Missouri West Historical and Comparison of Mid-Case Forecasts of Demand, Excluding future DSM Impacts

Evergy MO West Mid-Case Forecast

Base Annual 2023-2042 Net System Input (NSI) and Peak Forecast

Date	Gross NSI (MWh)	DSM	Net NSI (MWh)		Gross Peak (MW)		DSM	DVC	Net Peak (MW)		Gross LF
2002	7,472,196		7,472,196		1,680				1,680		0.5077
2003	7,621,565	2.0%	7,621,565	2.0%	1,716	2.1%			1,716	2.1%	0.5070
2004	7,881,521	3.4%	7,881,521	3.4%	1,828	6.5%			1,828	6.5%	0.4922
2005	8,049,913	2.1%	8,049,913	2.1%	1,812	-0.9%			1,812	-0.9%	0.5071
2006	8,271,620	2.8%	8,271,620	2.8%	1,842	1.7%			1,842	1.7%	0.5126
2007	8,552,828	3.4%	8,552,828	3.4%	1,926	4.6%			1,926	4.6%	0.5069
2008	8,708,764	1.8%	8,708,764	1.8%	1,958	1.7%			1,958	1.7%	0.5077
2009	8,650,524	-0.7%	8,650,524	-0.7%	1,896	-3.2%			1,896	-3.2%	0.5208
2010	8,754,972	1.2%	8,754,972	1.2%	1,890	-0.3%			1,890	-0.3%	0.5288
2011	8,732,993	-0.3%	8,732,993	-0.3%	1,914	1.3%			1,914	1.3%	0.5209
2012	8,640,687	-1.1%	8,640,687	-1.1%	1,945	1.6%			1,945	1.6%	0.5072
2013	8,694,450	0.6%	8,694,450	0.6%	1,861	-4.3%			1,861	-4.3%	0.5333
2014	8,737,596	0.5%	8,737,596	0.5%	1,870	0.5%			1,870	0.5%	0.5335
2015	8,717,003	-0.2%	8,717,003	-0.2%	1,869	0.0%			1,869	0.0%	0.5193
2016	8,623,847	-1.1%	8,623,847	-1.1%	1,873	0.2%			1,873	0.2%	0.5257
2017	8,743,444	1.4%	8,743,444	1.4%	1,923	2.7%			1,923	2.7%	0.5190
2018	8,709,034	-0.4%	8,709,034	-0.4%	1,926	0.2%			1,926	0.2%	0.5162
2019	8,718,677	0.1%	8,718,677	0.1%	1,930	0.2%			1,930	0.2%	0.5157
2020	8,854,282	1.6%	8,854,282	1.6%	1,919	-0.6%			1,919	-0.6%	0.5267
2021	9,007,618	1.7%	9,007,618	1.7%	2,011	4.8%			2,011	4.8%	0.5113
2022	9,201,415	2.2%	(7,797)	9,193,618 2.1%	1,943	-3.4%	(46)	0	1,897	-5.7%	0.5406
2023	9,160,177	-0.4%	(33,416)	9,126,762 -0.7%	1,988	2.3%	(57)	0	1,931	1.8%	0.5260
2024	9,202,531	0.5%	(79,103)	9,123,428 0.0%	1,994	0.3%	(23)	0	1,971	2.1%	0.5268
2025	9,231,930	0.3%	(78,171)	9,153,759 0.3%	1,993	-0.1%	(26)	0	1,967	-0.2%	0.5288
2026	9,270,508	0.4%	(76,949)	9,193,559 0.4%	1,991	-0.1%	(26)	0	1,965	-0.1%	0.5315
2027	9,308,912	0.4%	(76,509)	9,232,404 0.4%	1,982	-0.5%	(26)	0	1,956	-0.5%	0.5362
2028	9,361,638	0.6%	(73,662)	9,287,976 0.6%	2,018	1.8%	(25)	0	1,993	1.9%	0.5296
2029	9,389,567	0.3%	(68,099)	9,321,468 0.4%	2,023	0.2%	(23)	0	2,000	0.4%	0.5298
2030	9,414,054	0.3%	(64,854)	9,349,200 0.3%	2,005	-0.9%	(22)	0	1,983	-0.8%	0.5360
2031	9,438,473	0.3%	(63,798)	9,374,675 0.3%	2,024	0.9%	(21)	0	2,003	1.0%	0.5323
2032	9,477,506	0.4%	(58,809)	9,418,697 0.5%	2,027	0.1%	(21)	0	2,006	0.2%	0.5337
2033	9,499,726	0.2%	(47,492)	9,452,233 0.4%	2,042	0.7%	(12)	0	2,030	1.2%	0.5311
2034	9,535,835	0.4%	(36,569)	9,499,266 0.5%	2,052	0.5%	(7)	0	2,045	0.7%	0.5305
2035	9,575,446	0.4%	(23,561)	9,551,885 0.6%	2,058	0.3%	(5)	0	2,053	0.4%	0.5311
2036	9,626,833	0.5%	(15,772)	9,611,061 0.6%	2,047	-0.5%	(4)	0	2,043	-0.5%	0.5369
2037	9,653,657	0.3%	(13,942)	9,639,716 0.3%	2,063	0.8%	(4)	0	2,059	0.8%	0.5342
2038	9,693,073	0.4%	(10,084)	9,682,988 0.4%	2,057	-0.3%	(4)	0	2,053	-0.3%	0.5379
2039	9,731,188	0.4%	(8,007)	9,723,181 0.4%	2,089	1.6%	(3)	0	2,086	1.6%	0.5318
2040	9,771,256	0.4%	(5,832)	9,765,424 0.4%	2,099	0.5%	(2)	0	2,097	0.5%	0.5314
2041	9,783,586	0.1%	(3,060)	9,780,527 0.2%	2,081	-0.9%	(1)	0	2,080	-0.8%	0.5367
2042	9,801,707	0.2%	(2,079)	9,799,628 0.2%	2,092	0.5%	(0)	0	2,092	0.6%	0.5349

Historical NSI is weather normal, first 6 months of 2022 are weather normal
Historical Peak is weather normal, first 6 months of 2022 are weather normal

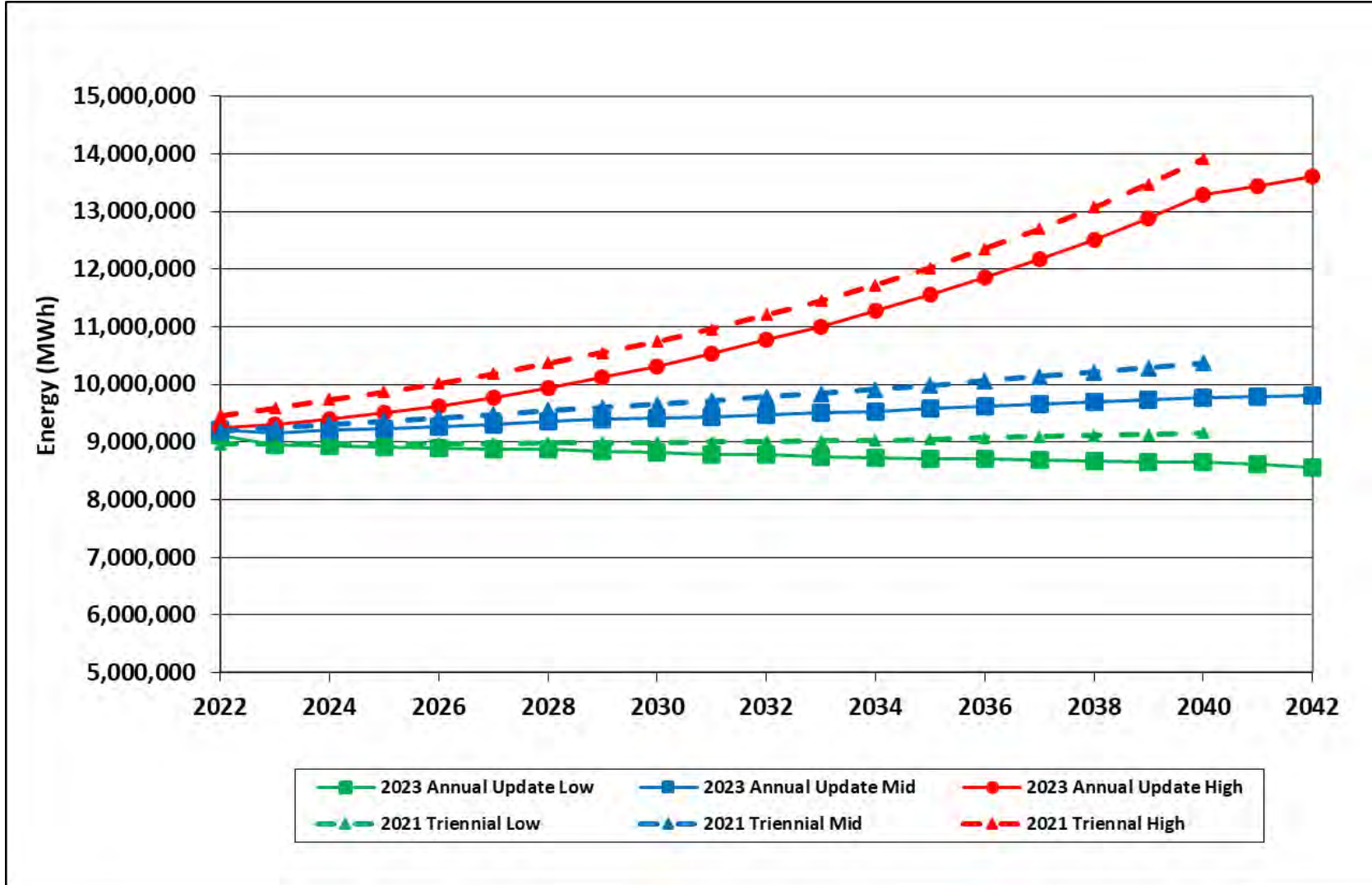| Gross NSI (MWh) - Forecast		
Forecast Year	2023 Update	2021 IRP
5 Yrs	0.23%	1.13%
10 Yrs	0.30%	0.87%
15 Yrs	0.32%	0.80%
20 Yrs	0.32%	0.79%

Gross Peak (MW) - Forecast		
Forecast Year	2023 Update	2021 IRP
5 Yrs	0.40%	0.83%
10 Yrs	0.42%	0.66%
15 Yrs	0.40%	0.62%
20 Yrs	0.37%	0.62%

Peak Forecasts – 2023 Annual Update Vs. 2021 Triennial IRP Evergy Missouri West

2023 Annual Update Stakeholder Meeting

Energy Forecasts – 2023 Annual Update Vs. 2021 Triennial IRP Evergy Missouri West
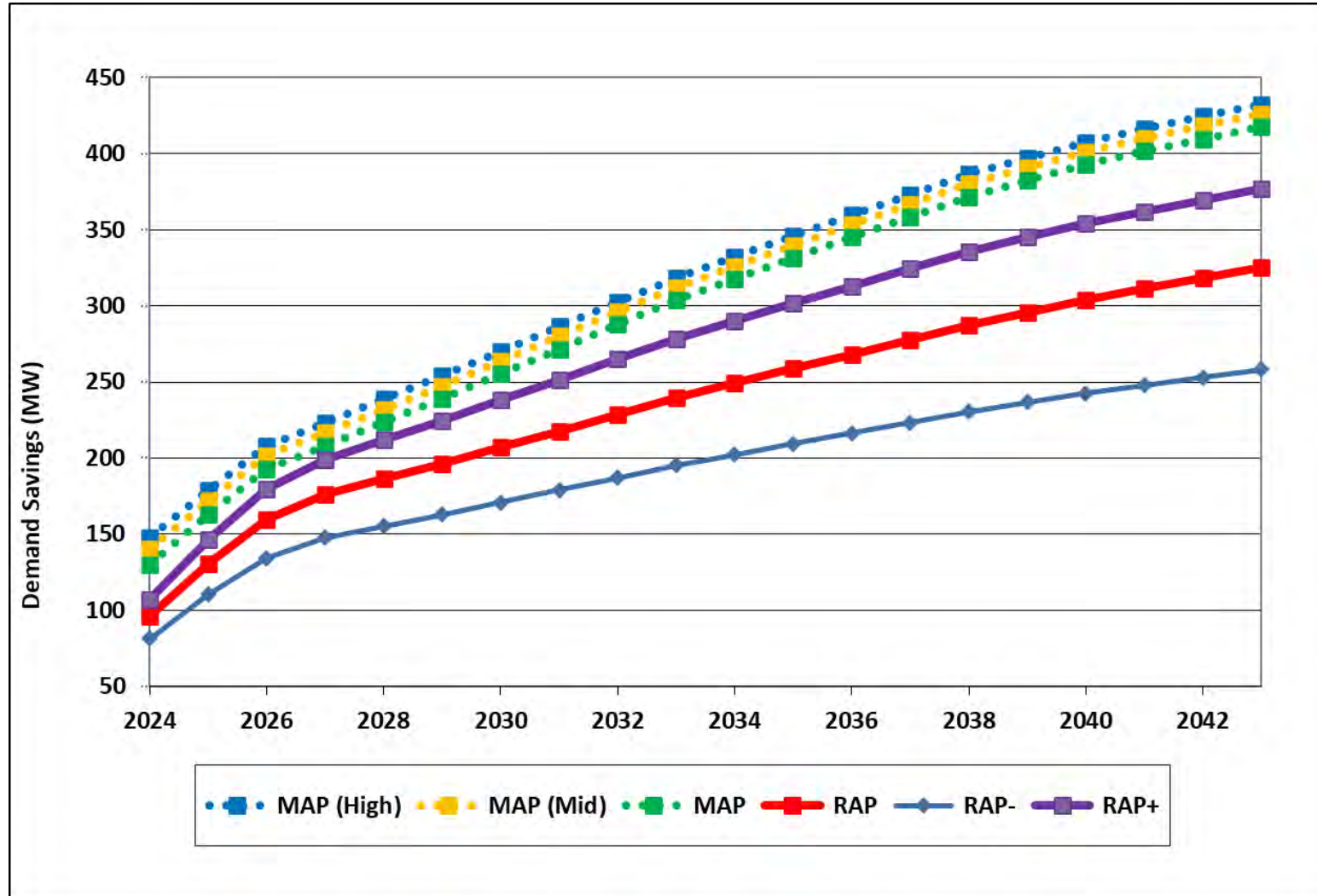
2023 Annual Update Stakeholder Meeting

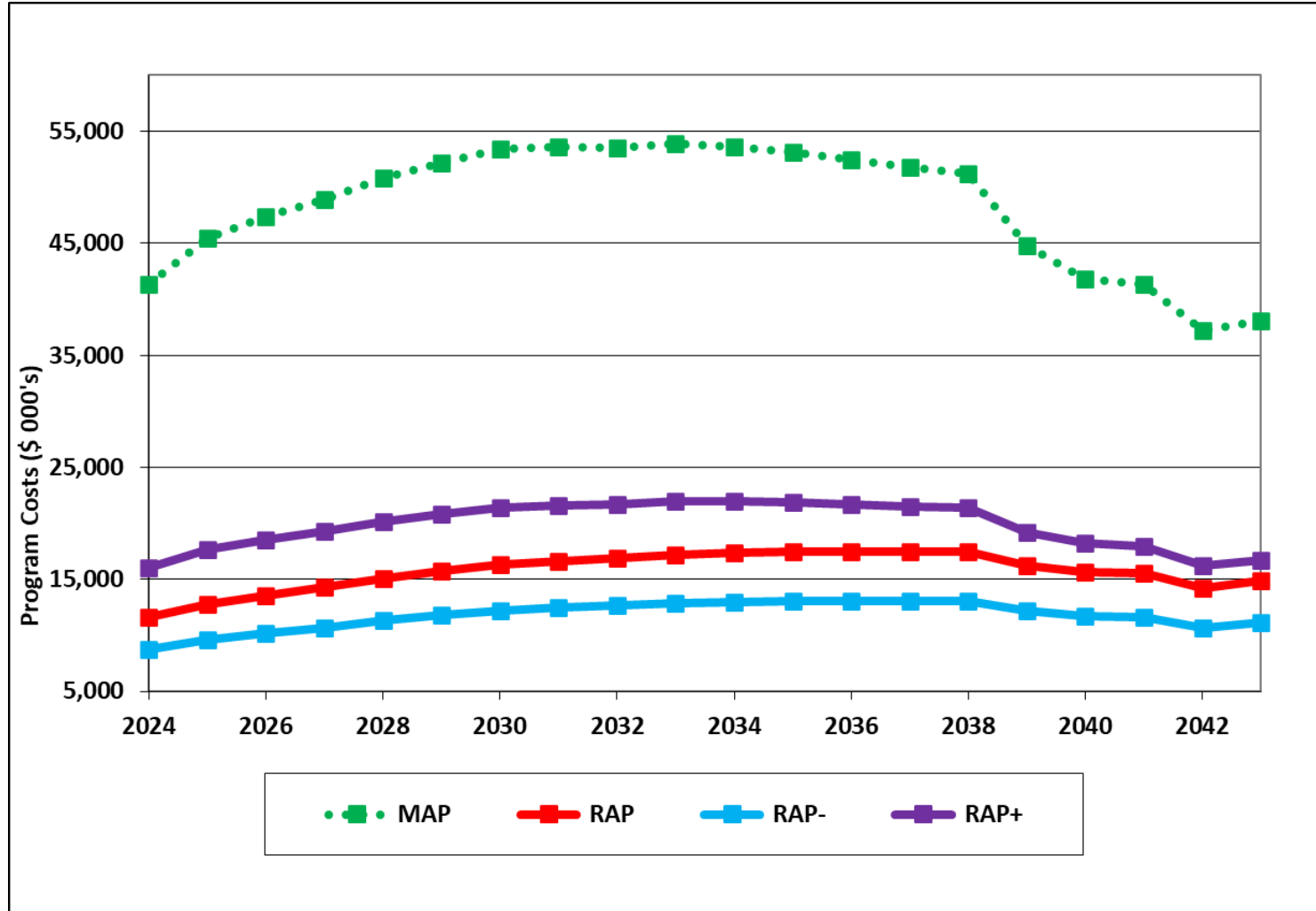Demand-Side Resources

Evergy Missouri Metro Energy Savings (MWH)
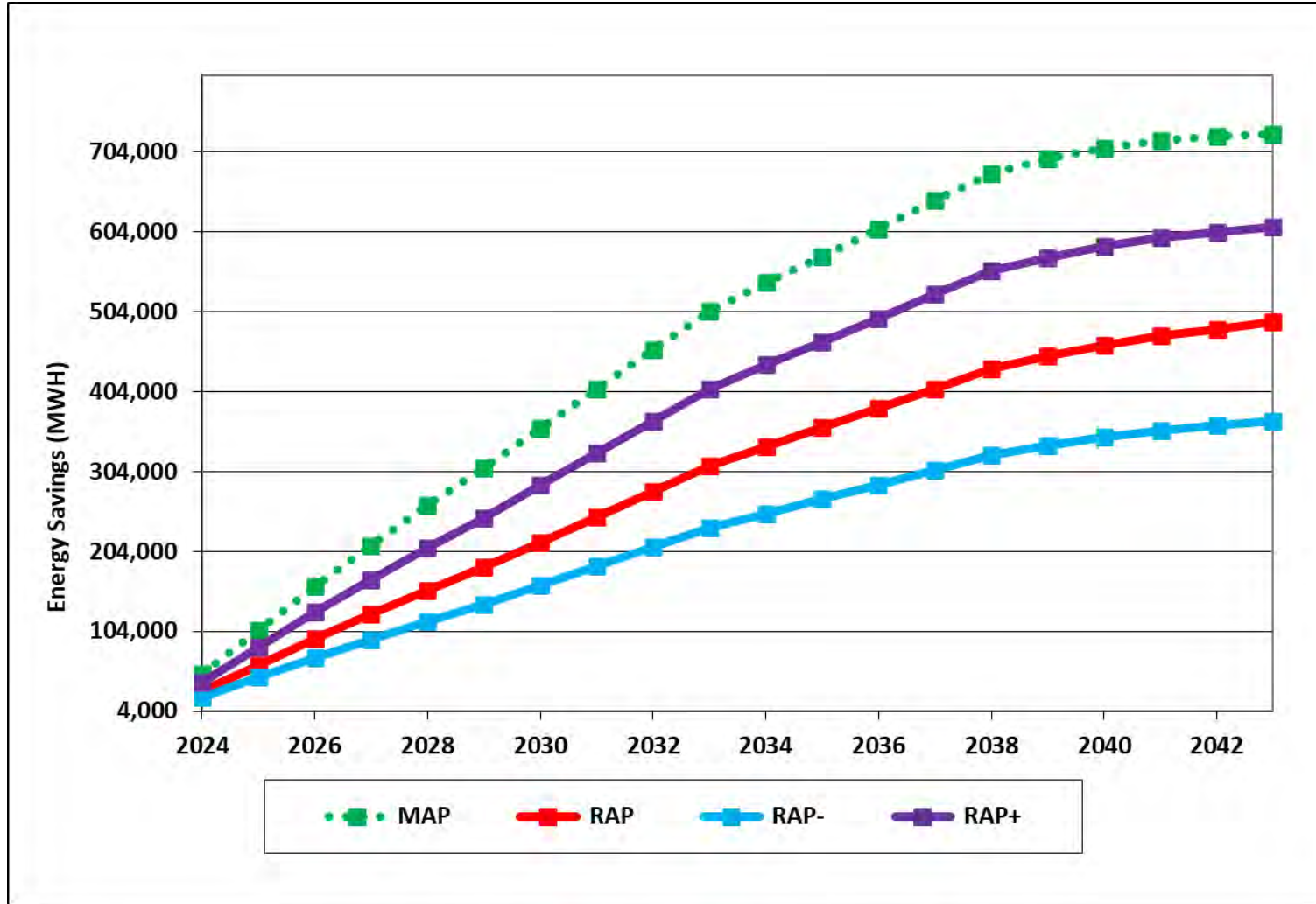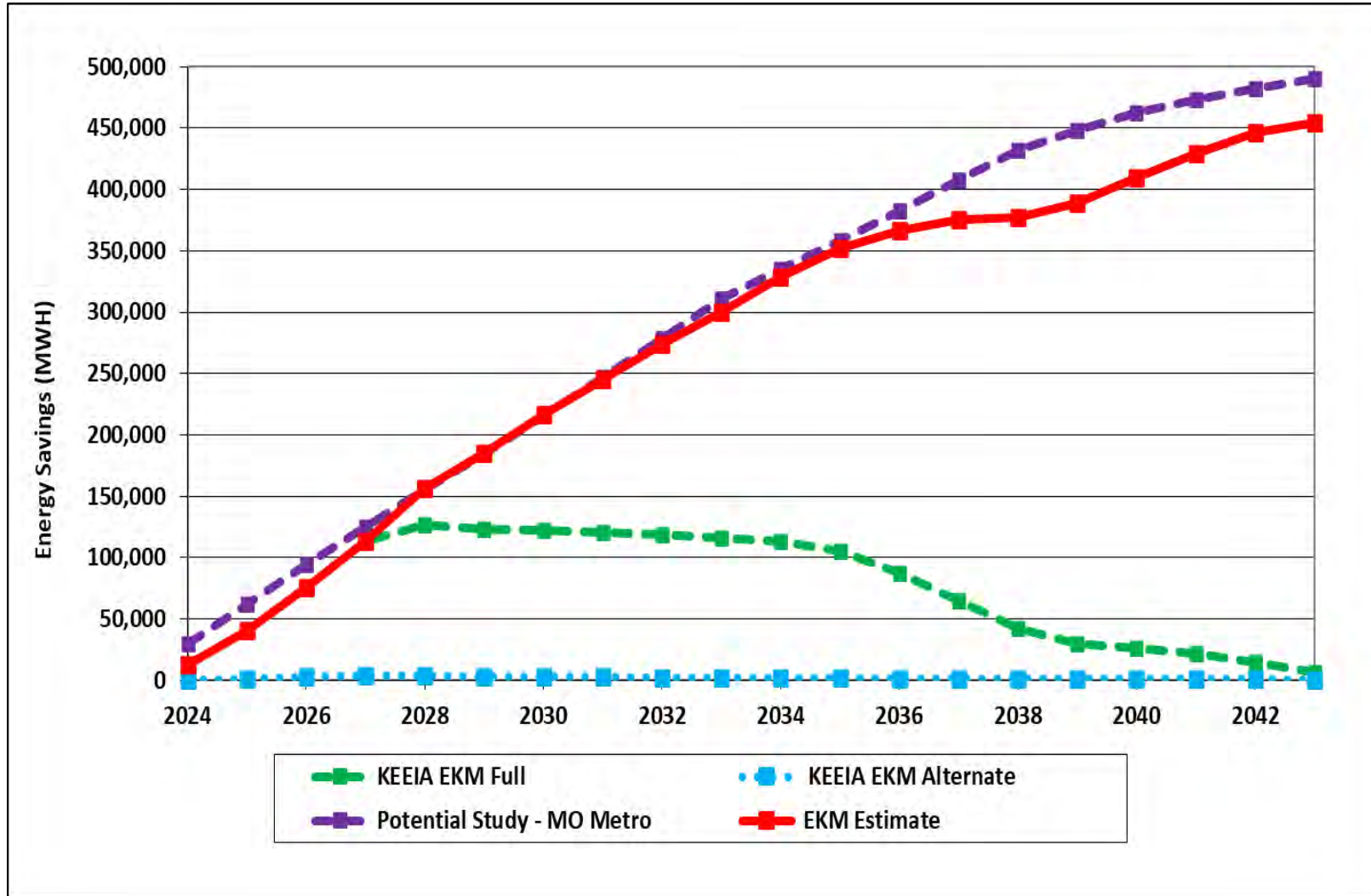
Evergy Missouri Metro Demand Savings (MW)

Evergy Missouri Metro Program Costs ($ 000's)
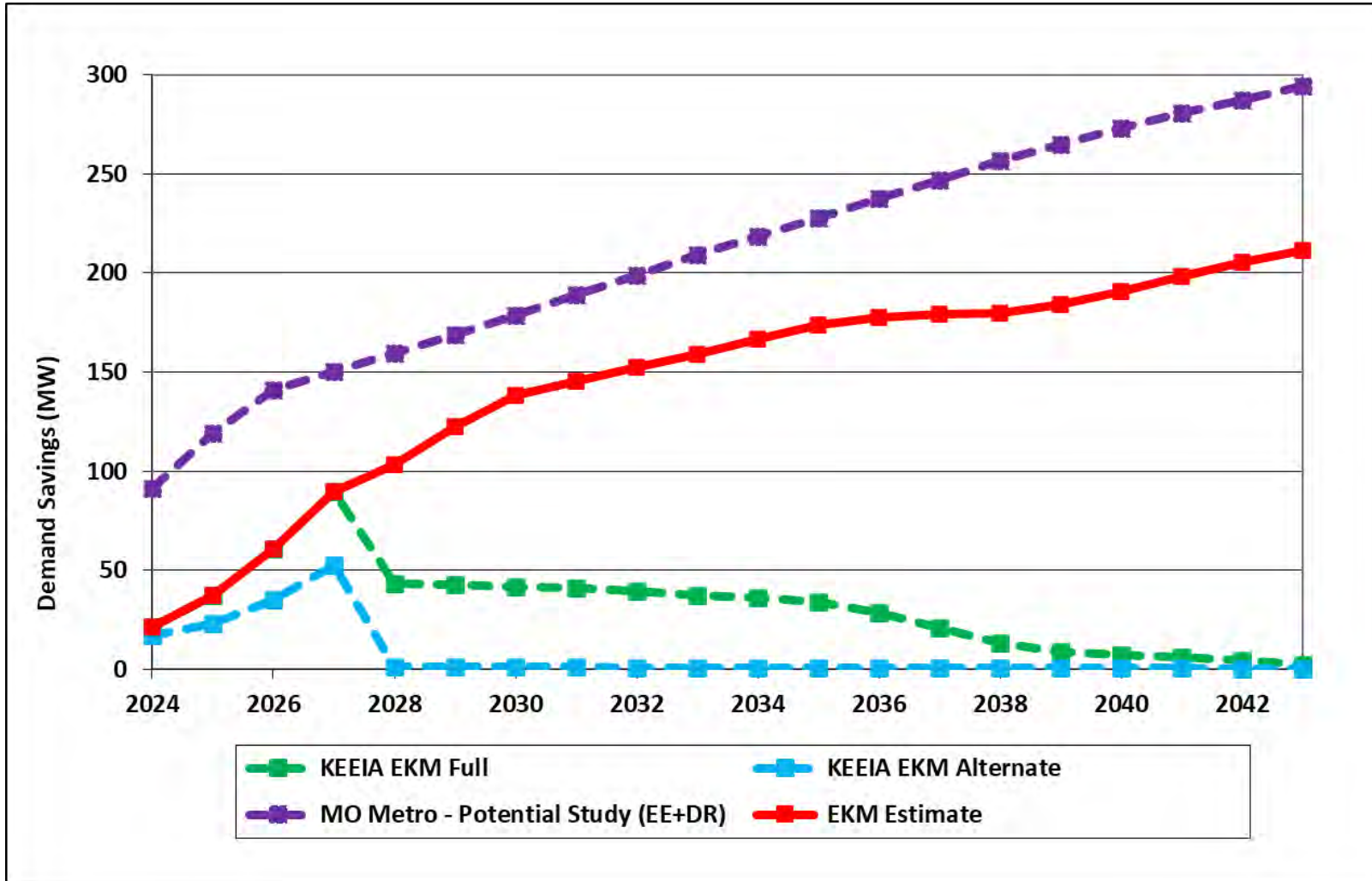
Evergy Kansas Metro Energy Savings (MWH)

2023 Annual Update Stakeholder Meeting
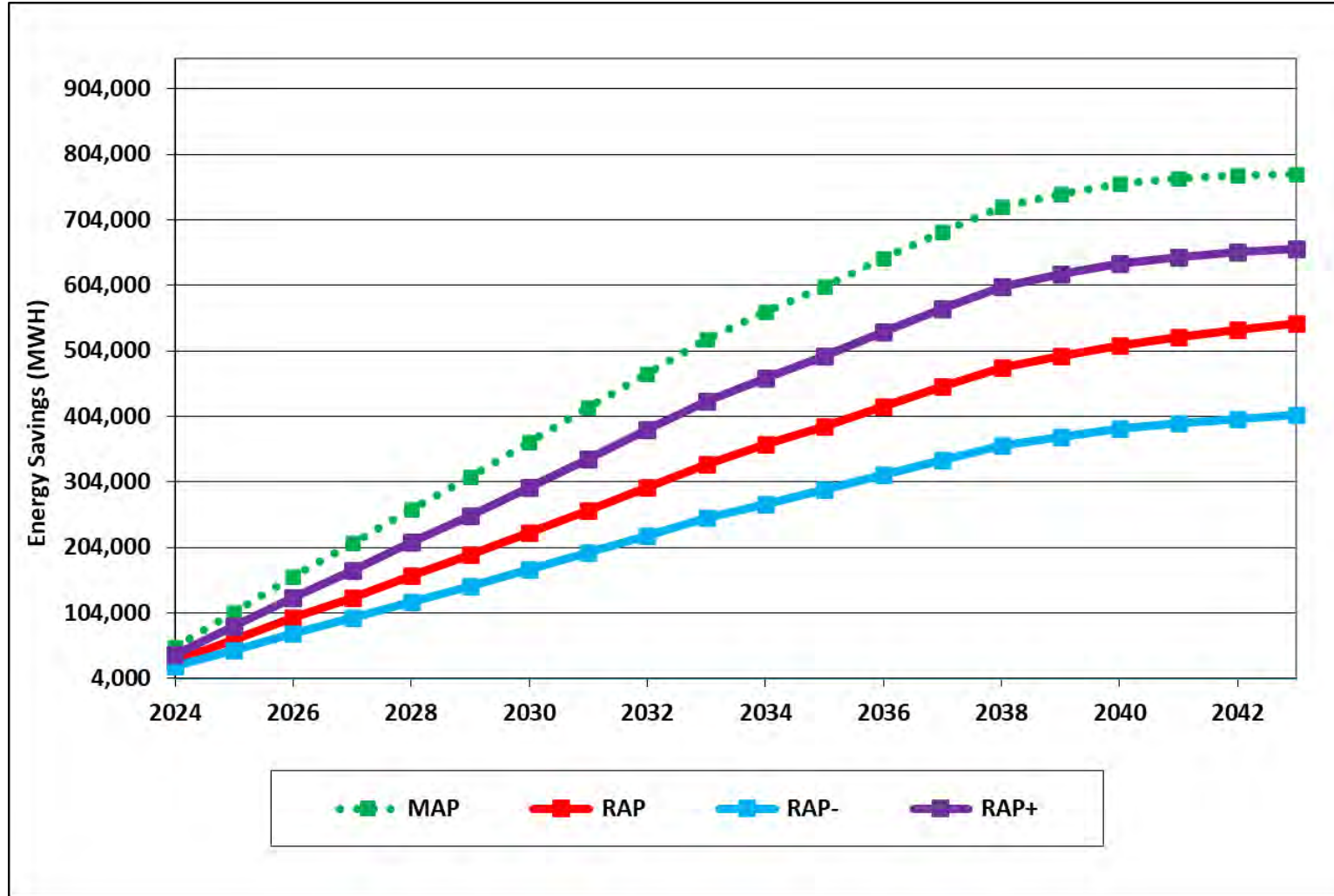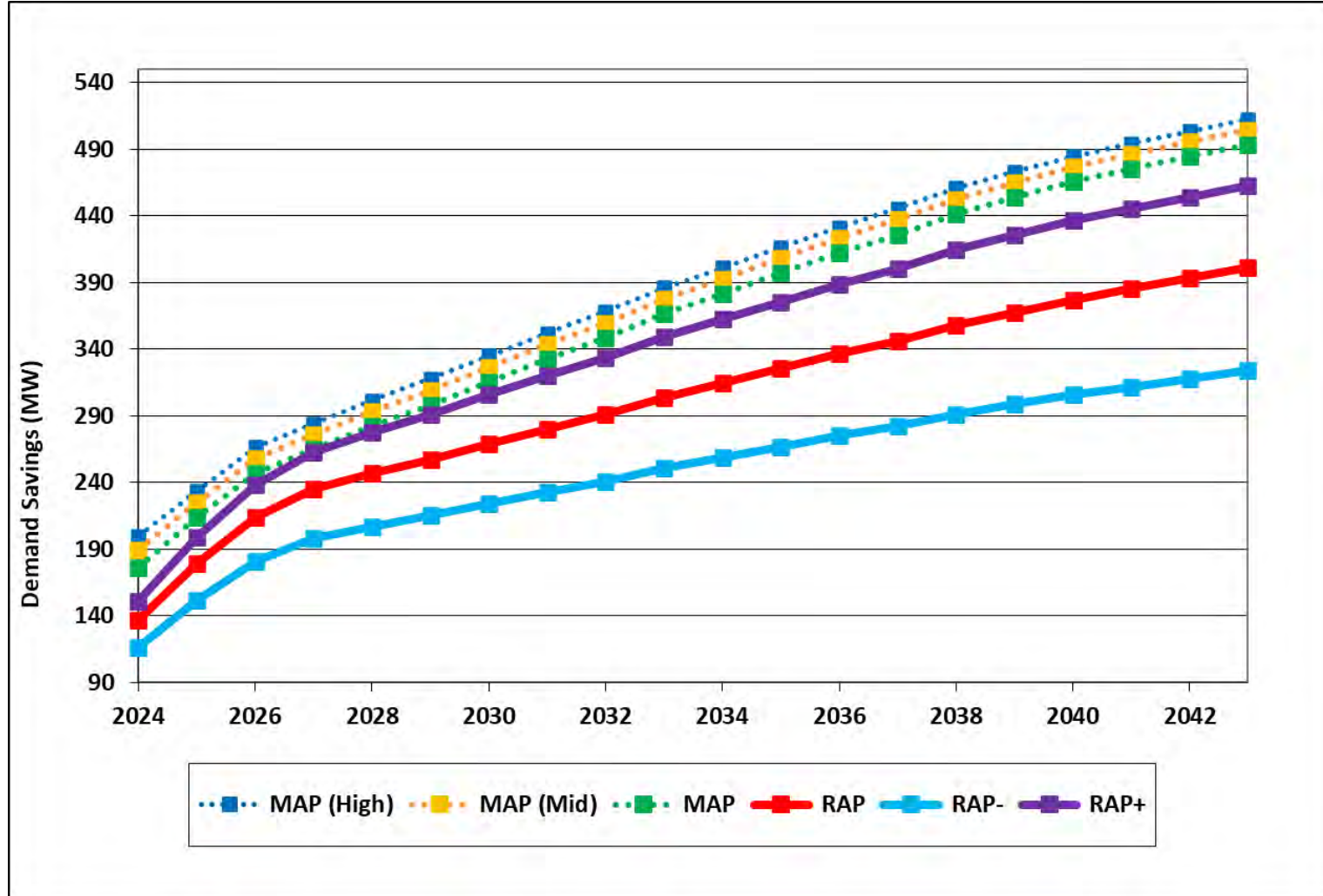
Evergy Kansas Metro Demand Savings (MW)

Evergy Missouri West Energy Savings (MWH)

Evergy Missouri West Demand Savings (MW)

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Evergy Missouri West Program Costs ($ 000's)
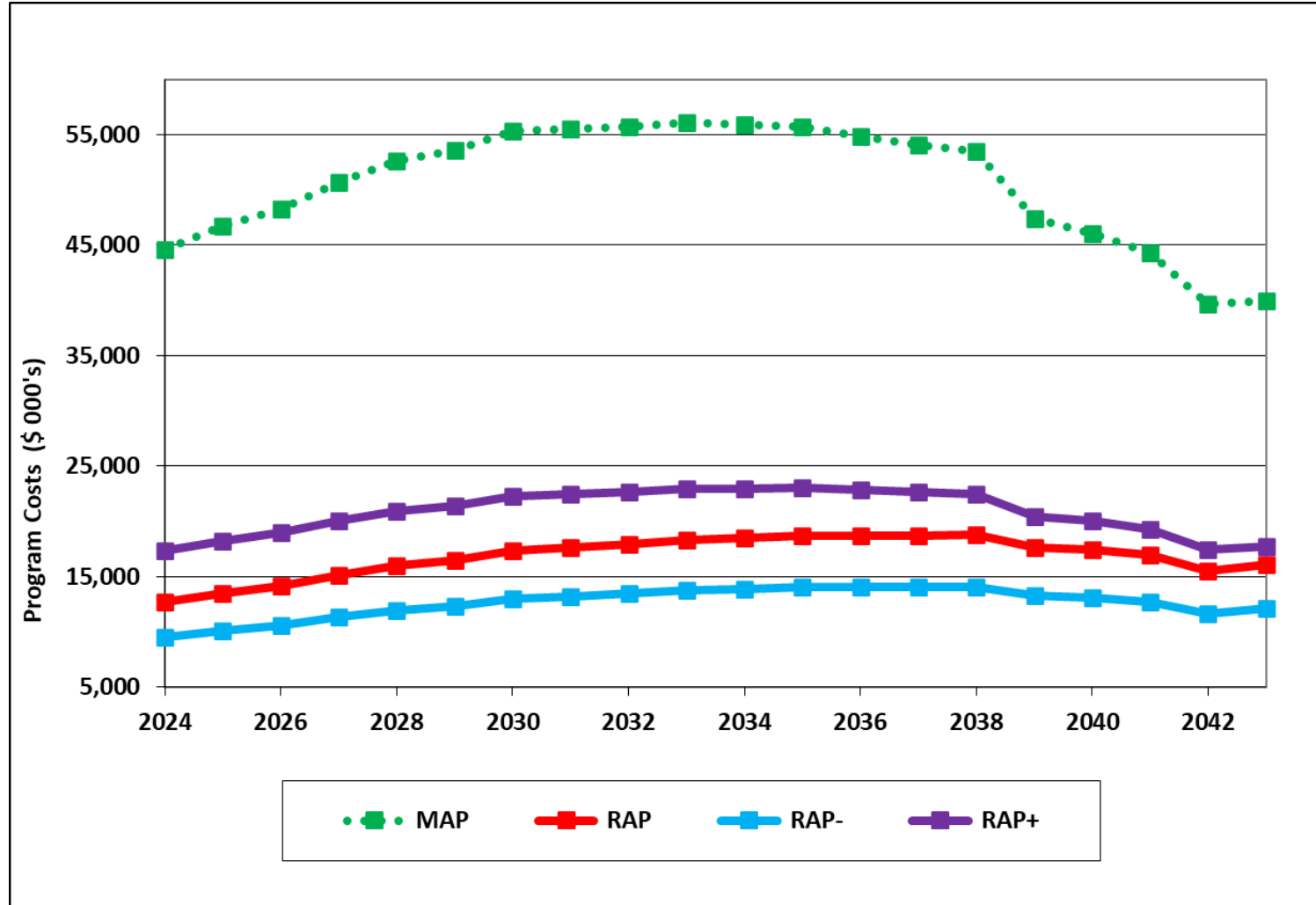
Supply-Side Analysis

evergy

Endpoint Probability Distribution

Endpoint distribution summary:

	Low	Mid	High
Load Growth	35%	50%	15%
Natural Gas	35%	50%	15%
CO$_2$ Restrictions	20%	60%	20%

All 27 endpoint scenarios:

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%

2023 Annual Update Stakeholder Meeting

Natural Gas Price Forecasts

2023 Annual Update Stakeholder Meeting
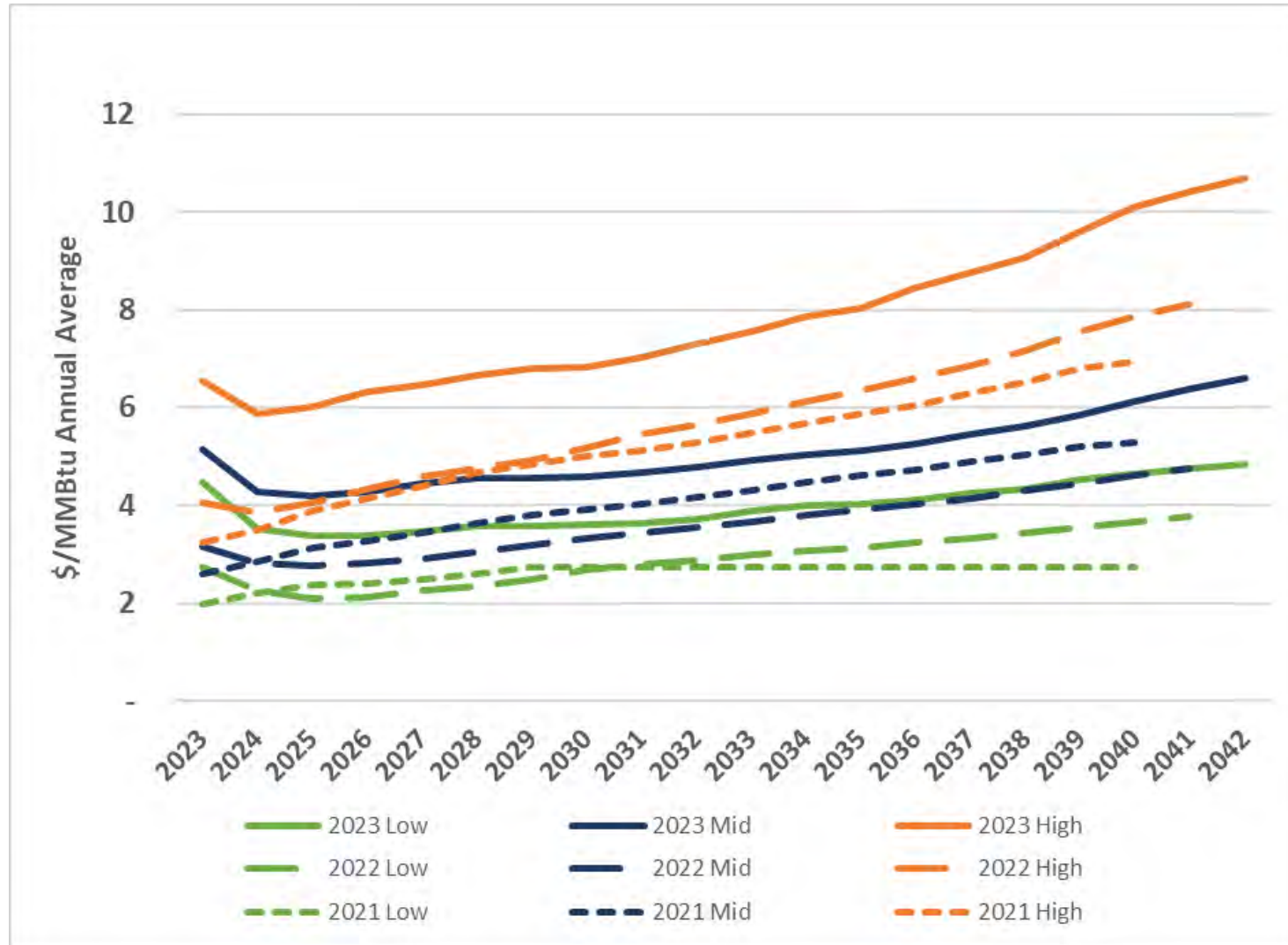
2021 / 2022 IRP Carbon Price Assumptions
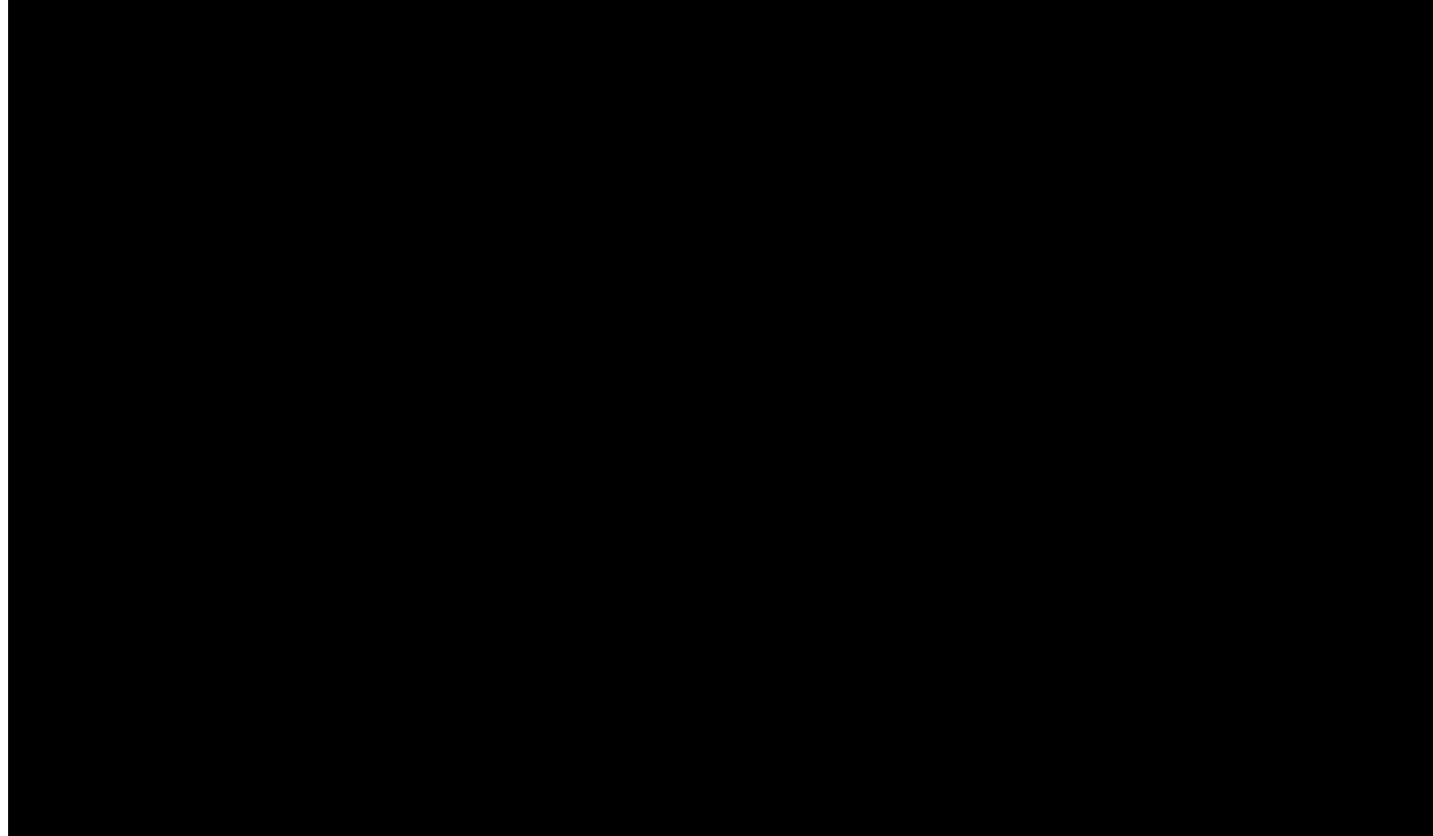
2023 Annual Update Stakeholder Meeting

Carbon Constraint by Endpoint | Metro

2023 Annual Update Stakeholder Meeting

Carbon Constraint by Endpoint | MO West

2023 Annual Update Stakeholder Meeting
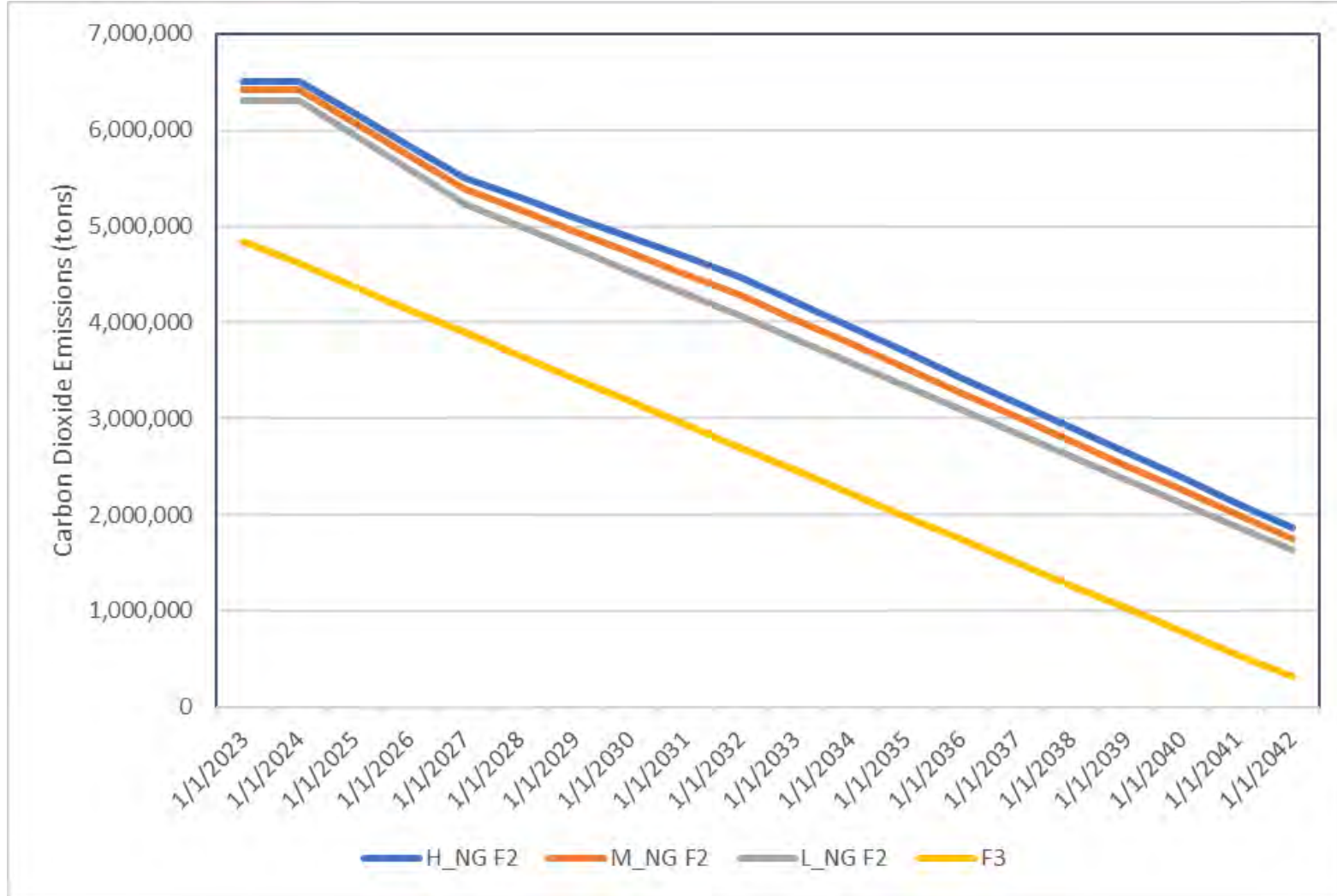
Proposed Greenhouse Gas Rule Overview

- Proposal for *existing* coal units:
  - **Imminent Retirement** – Coal units retiring by 2032 – maintain current emission rate beginning on January 1, 2030
  - **Near Term Retirement** – Coal units retiring between 2032 and 2035 – annual capacity factor would be limited to 20 percent beginning January 1, 2030
  - **Medium Term Retirement** – Coal units retiring between 2035 and 2040 – 40 percent cofiring with natural gas beginning on January 1, 2030
  - **Long Term Retirement** – Coal units retiring after 2040 – full CCS operational by January 1, 2030, with 90 percent reduction in annual CO_2 emissions
- Proposal for *existing* natural gas fired combined cycle combustion turbines:
  - Applicable to units greater than 300 Megawatts (MWs) and operating at a capacity factor of 50% or greater
  - Would require the addition of either hydrogen blending by 2032 or the use CCS by 2035

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Proposed Greenhouse Gas Rule Overview, cont.

- Proposal for *new* simple cycle and combined cycle combustion turbines:
  - Requires the use of either hydrogen blending by 2032 or CCS by 2035 for new combined cycle combustion turbines
  - Less frequently run combined cycle and more frequently run simple cycle combustion turbines may require hydrogen blending by 2032
  - In the interim, lower CO_2 emission rates must be met
  - For traditional simple cycle combustion turbines (i.e., "peaking units") no additional control requirements or limitations
- Emission limits for new units are applicable on the date of publication
- EPA targeting finalization of proposed regulation by April 2024

Metro Market Price Comparison – 2022 IRP and 2023 IRP

Metro Gen Node Annual Prices IRP 2022

Metro Gen Node Annual Prices IRP 2023

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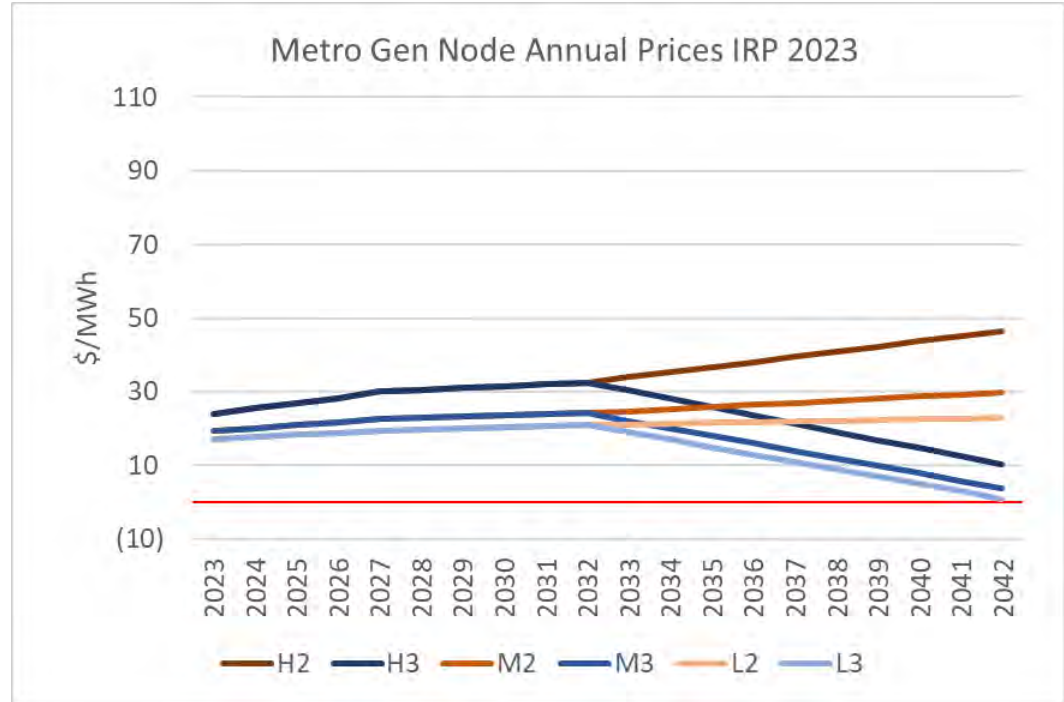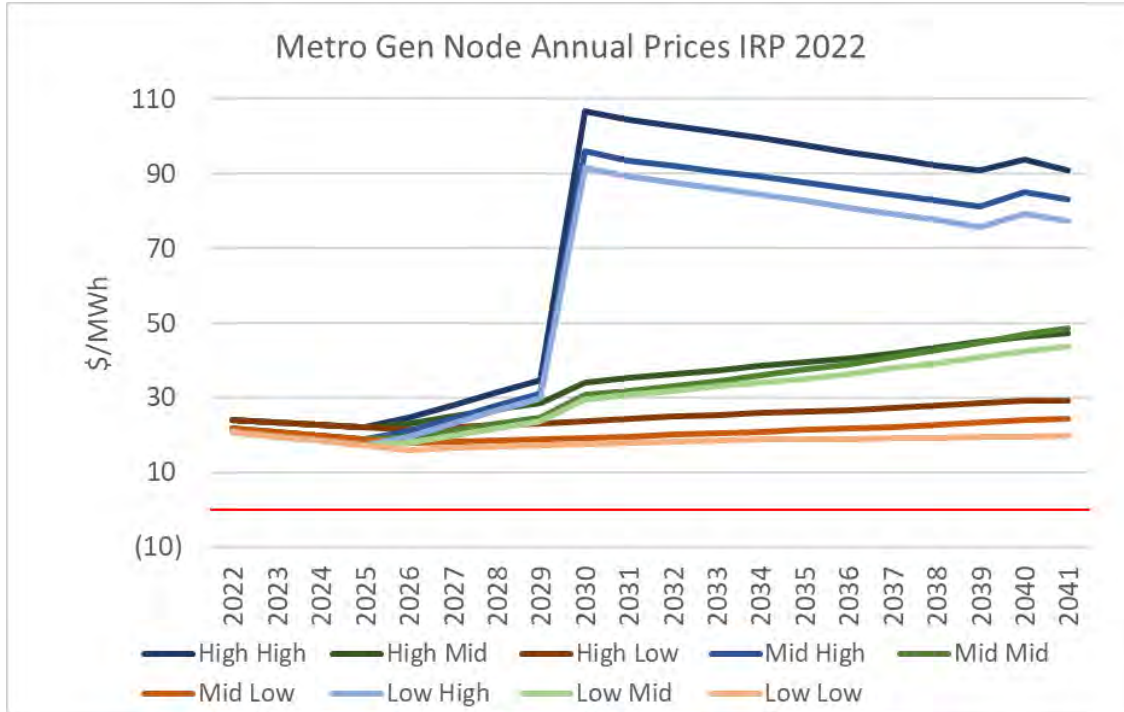
Market Prices | Metro Mid NG / Future 2
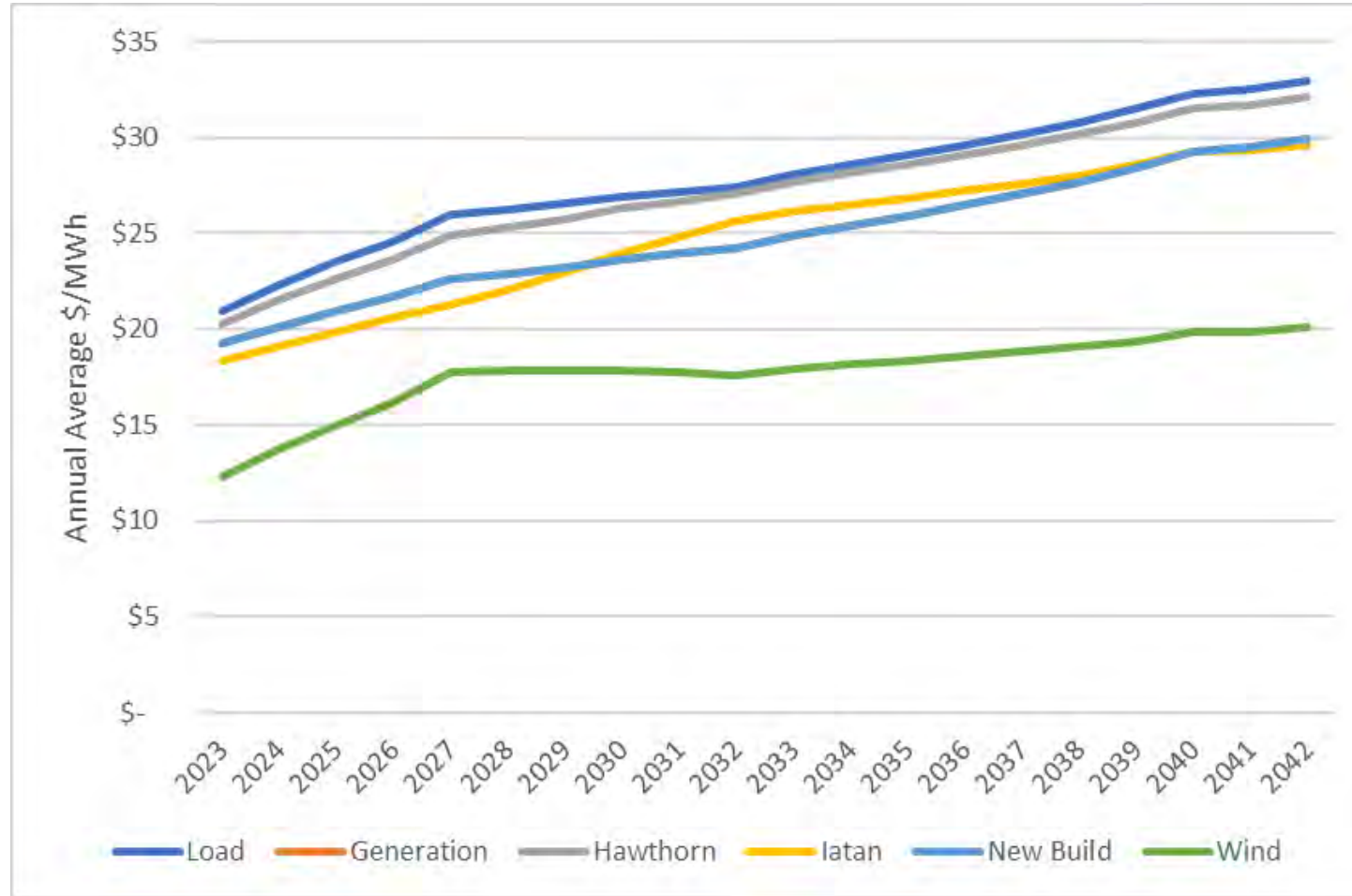
Market Prices | MO West Mid NG / Future 2

Market Prices | Metro Mid NG / Future 3

2023 Annual Update Stakeholder Meeting

Market Prices | MO West Mid NG / Future 3

2023 Annual Update Stakeholder Meeting
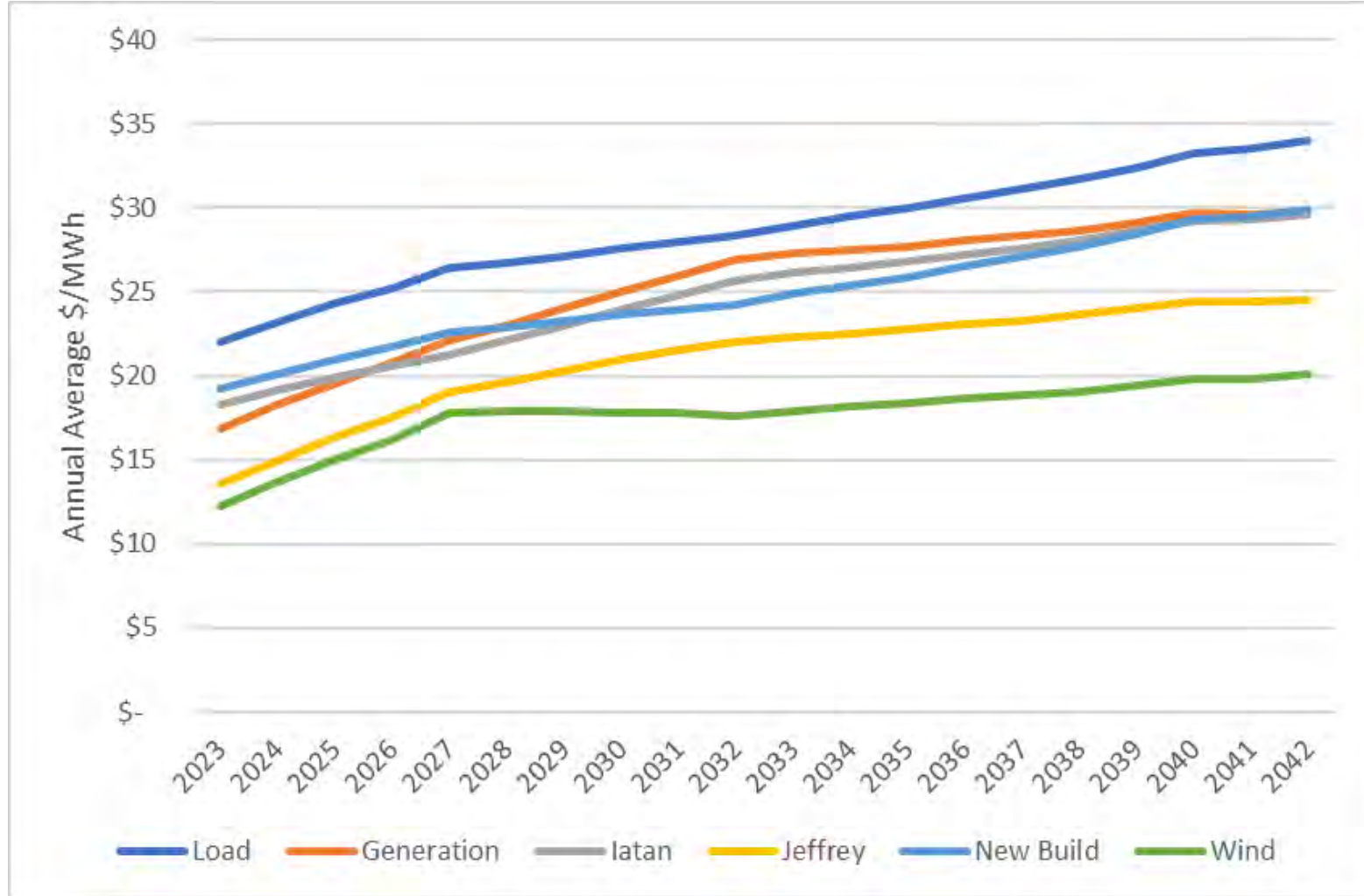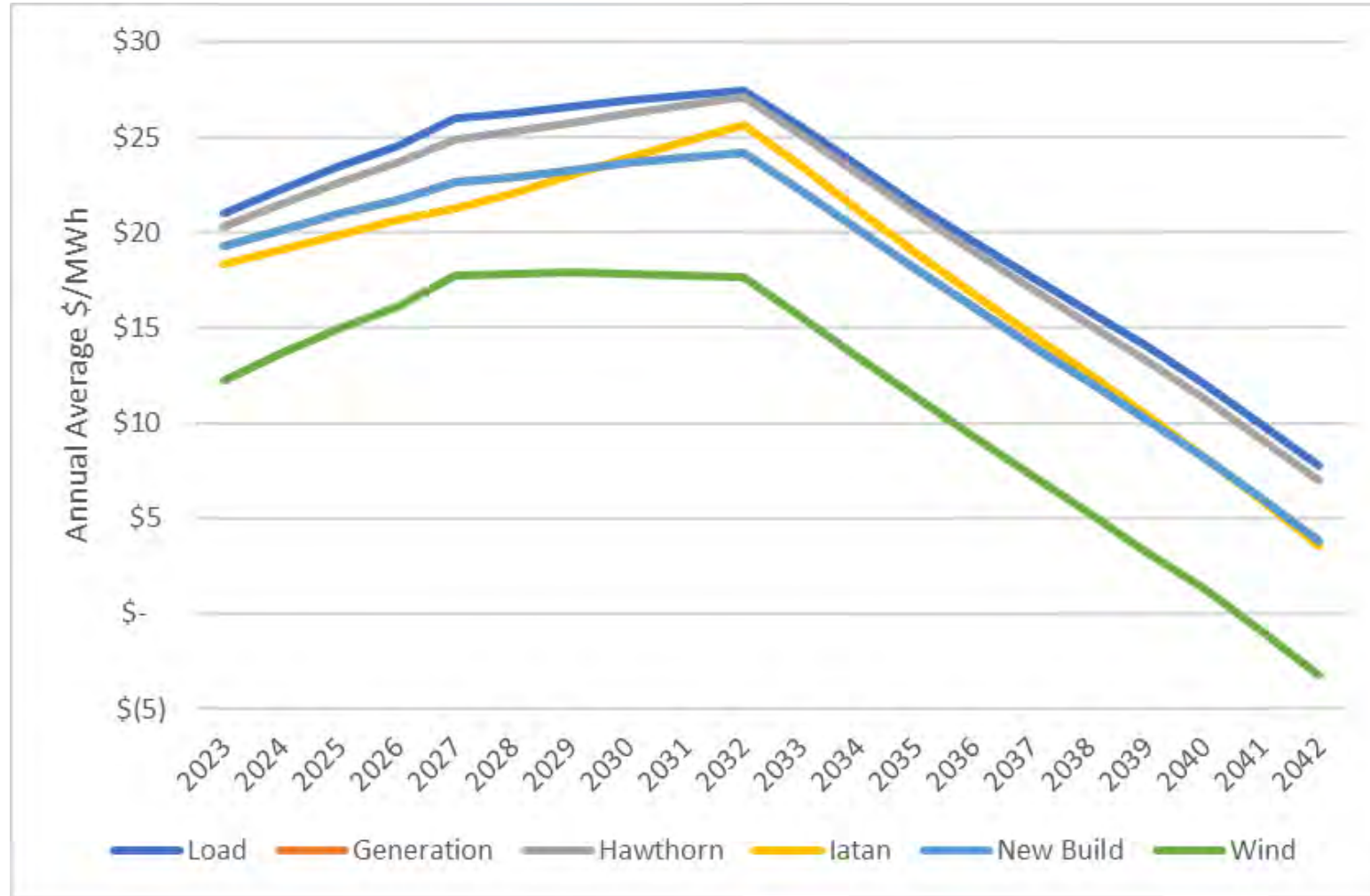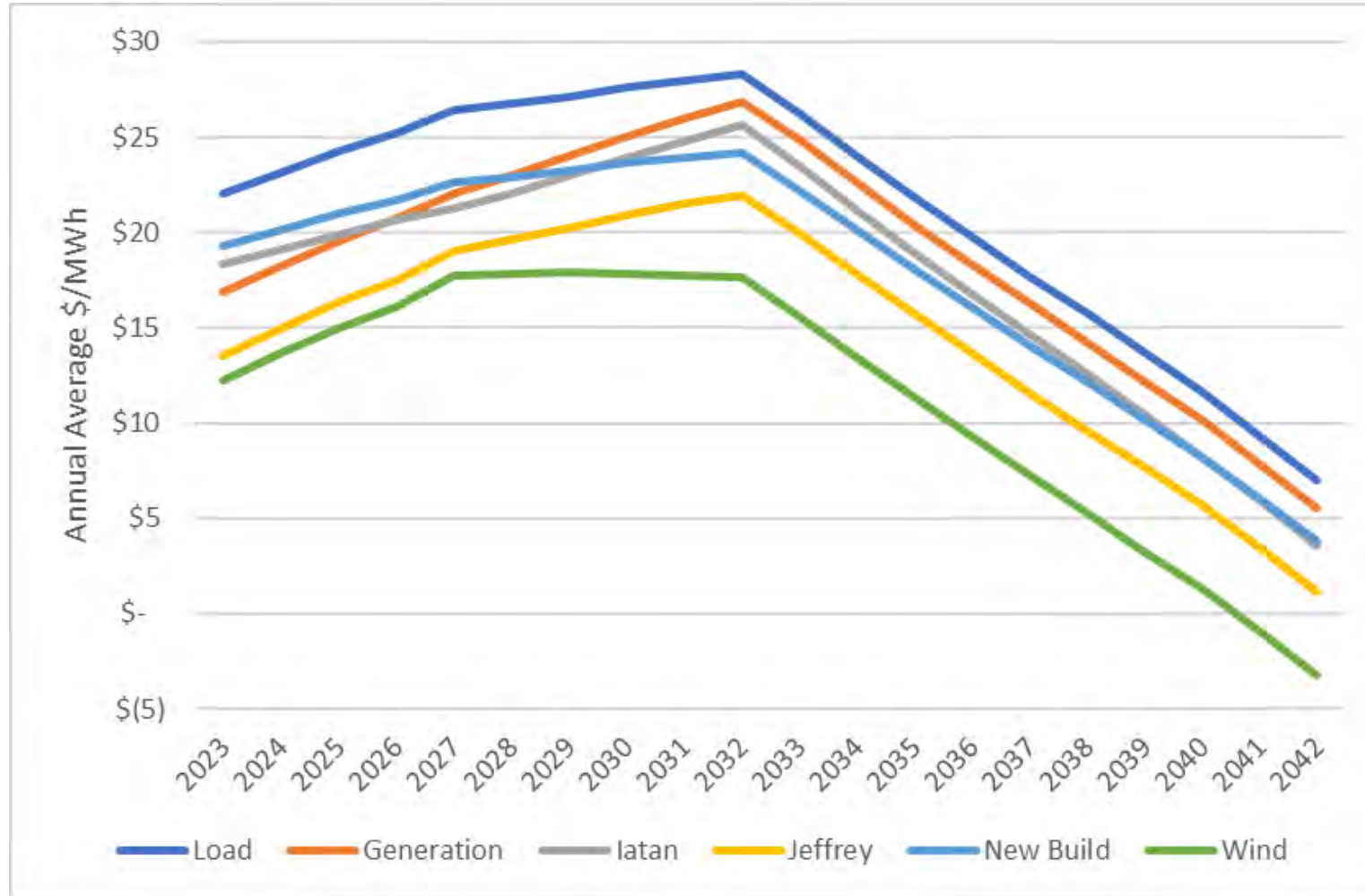
Percent of Hours Where Day Ahead Load LMP is Negative

2023 Annual Update Stakeholder Meeting
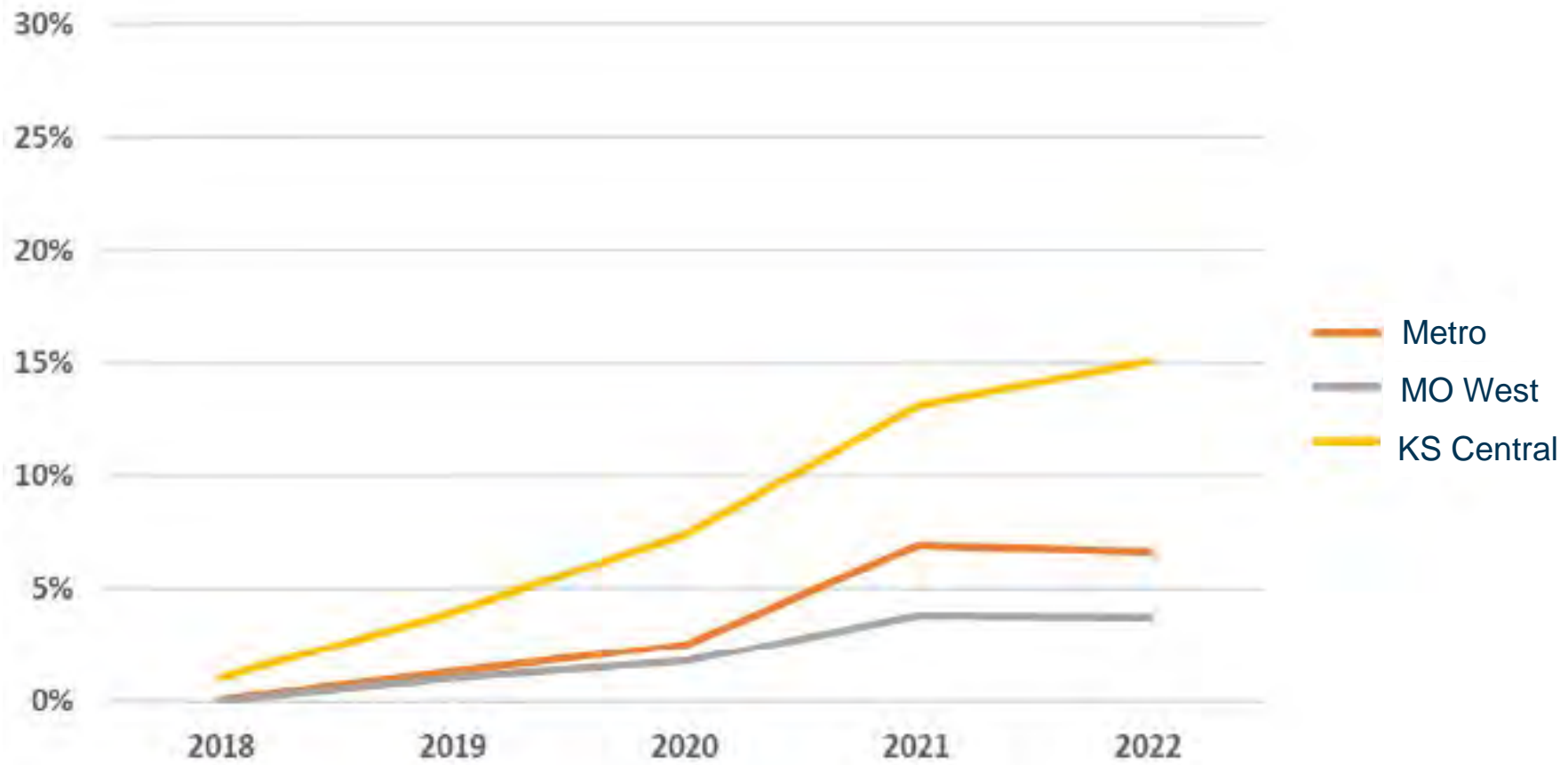
Percent of Hours Negative | Metro Load

2023 Annual Update Stakeholder Meeting
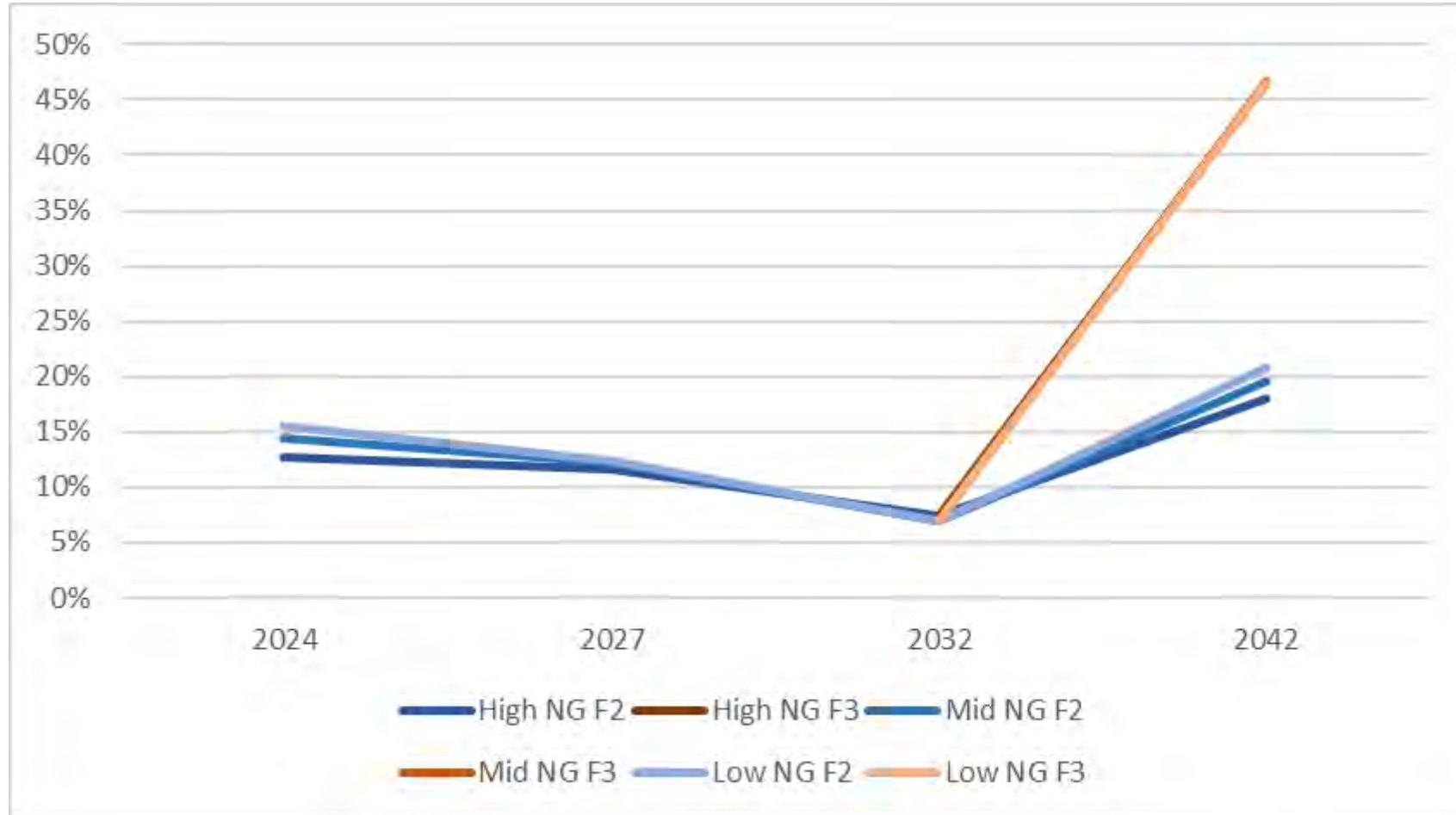
Percent of Hours Negative | MO West Load

2023 Annual Update Stakeholder Meeting
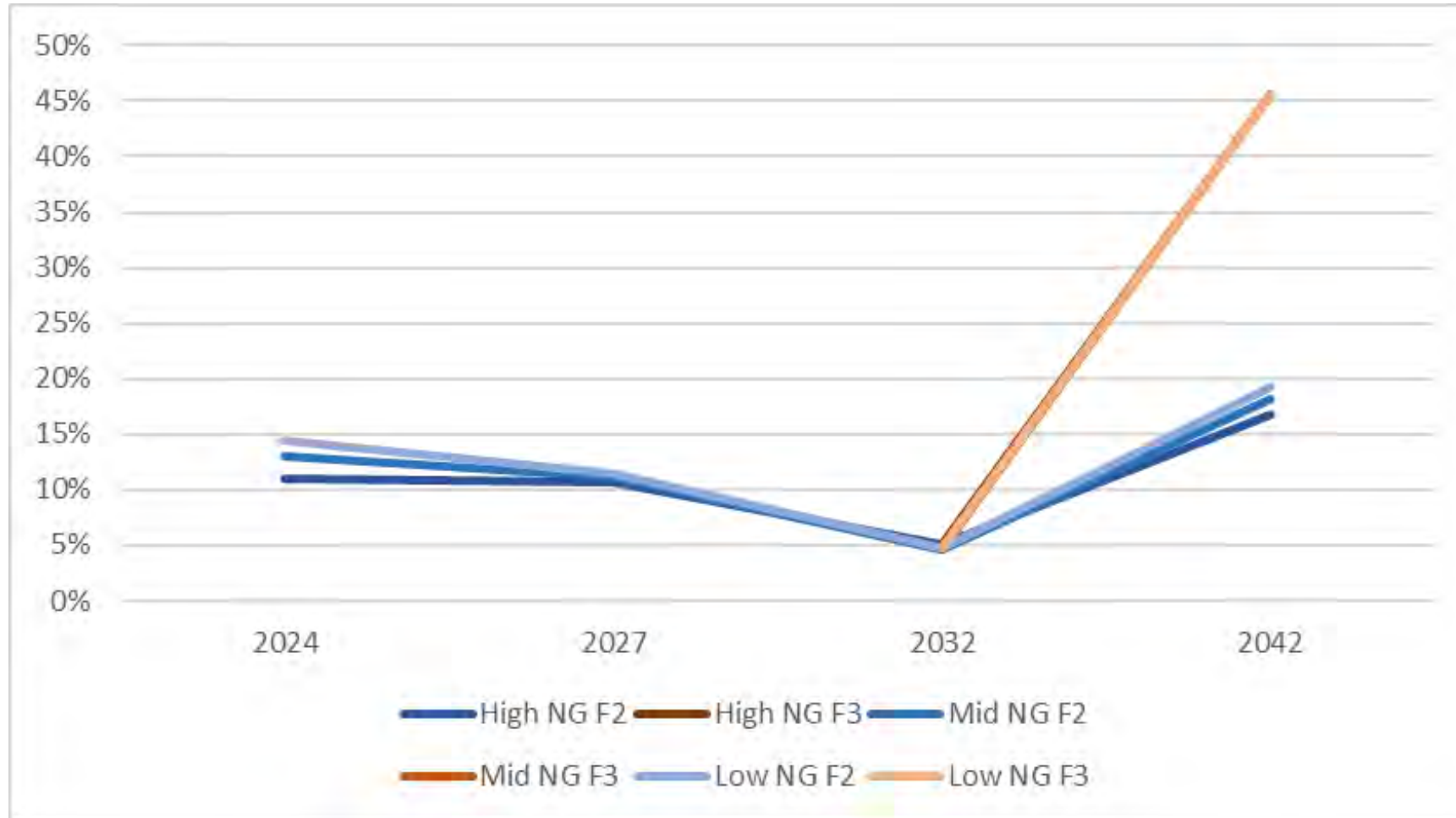
Maximum MW Available | Metro

Resource	2026	2027	2028	2034	2039
Wind	150	150	150	150	150
Solar		150	150	150	150
Battery	150	150	150	150	150
Solar Hybrid				267	
Combined Cycle			260	260	260
Combustion Turbine			476	476	476

Note: Each year shown represents the MW available by resource type in that year and following years until the next year shown in the table, which represents updated constraints

Maximum MW Available | MO West

Resource	2024	2025	2026	2027	2028	2034	2039
Wind			150	150	150	150	150
Solar			150	150	150	150	150
Battery			150	150	150	150	150
Solar Hybrid						267	
Combined Cycle					260	260	260
Combustion Turbine					476	476	476
Dogwood CC	143						

Note: Each year shown represents the MW available by resource type in that year and following years until the next year shown in the table, which represents updated constraints

2023 Annual Update Stakeholder Meeting

Supply-Side Technology Changes
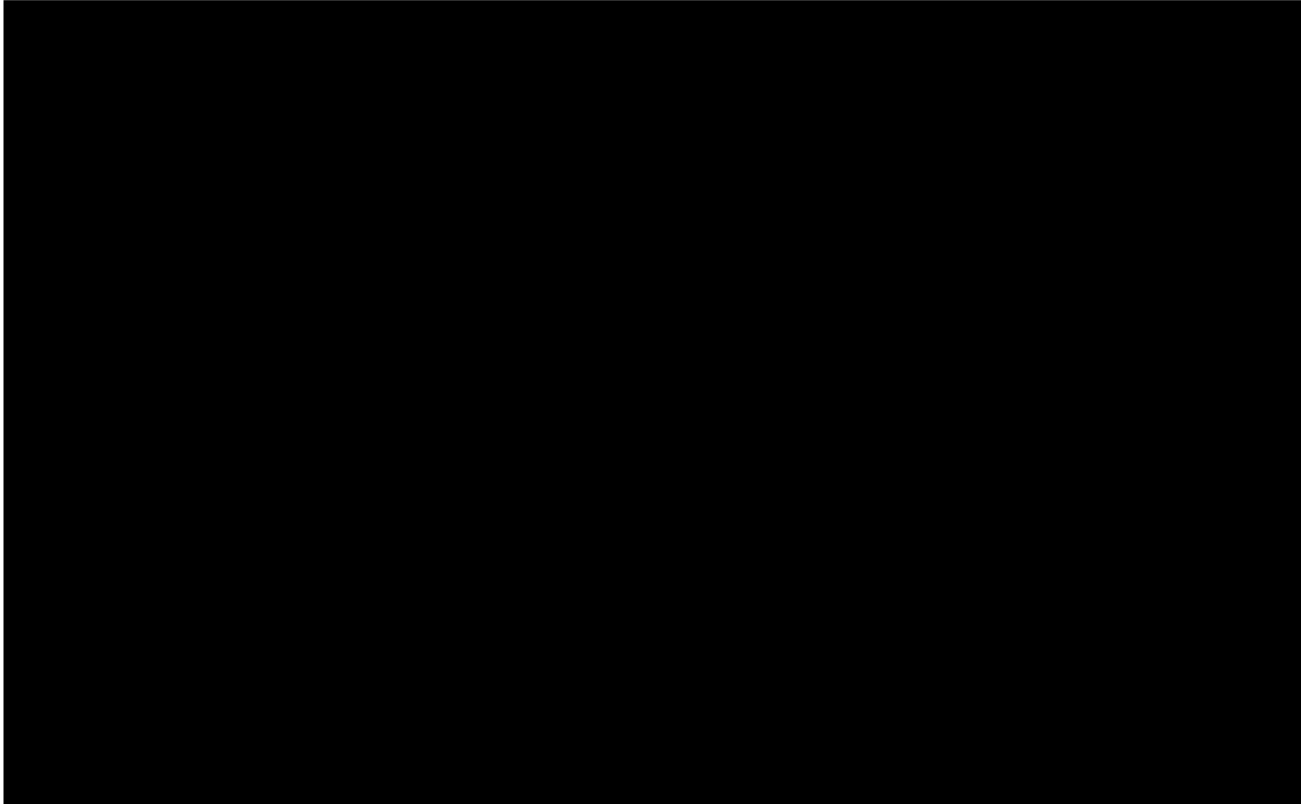
- Due to increased capacity requirements from SPP and potential load growth Evergy will consider building natural gas-fired resources sooner

- Evergy is currently conducting a study to determine optimal locations. Due to interconnection queue times and siting needs, the earliest operation year for a new natural gas resource is 2028

- New natural gas resources (CT or CC) are assumed to become carbon-free in years beyond 2035 in High CO_2 scenarios

RFP results demonstrated increased costs and delayed availability of solar projects, which were incorporated into capacity expansion modeling

Integrated Resource Analysis

evergy

Overall Modeling Approach – Objectives

- Leverage capacity expansion modeling to select optimal build plans in all modeled scenarios – avoid "hard-coding" build decisions unless needed to show specific comparison
  - *Note: This creates more variability between Alternative Resource Plans than we have seen historically because the model "reoptimizes" resource additions whenever any part of the capacity balance (load, demand-side management, plant retirements) is changed – makes it harder to compare "apples-to-apples"*

- Balance interests in co-owned facilities by assessing retirement decisions at the Evergy- and Individual Utility-level

- Perform capacity expansion planning at the individual utility level to ensure capacity build decisions are aligned with individual utility need

- Given increased volatility in SPP energy and capacity markets, mitigate long-term exposure to these markets by building to serve customers' energy and capacity needs at the lowest cost with a small amount of market support

- Focus on providing supplemental analysis of near-term (next 3 years) resource decisions beyond "base" IRP modeling – other resource decisions will be evaluated in future IRPs in more detail and can, in particular, be discussed through the upcoming Triennial IRP process

Overall Modeling Approach

Evergy Level

1 — **2022 Preferred Plan Retirements** *(RAP DSM; additions based on capacity expansion)*

2 — **Test Individual Retirements Changes** *(RAP DSM; additions based on capacity expansion)*

3 — **Identify Lowest-Cost Retirement Plan**

Individual Utility Level

3a — **Re-Test Individual Retirements Changes** *(Confirmed consistent results with Evergy-level)*

4 — **EKC-Only: Test JEC 8% Addition** *(Due to interaction with retirement dates, unable to use capacity expansion)*

5 — **Test DSM Portfolios** *(KS – None, Low, Full; MO – None, RAP-, RAP, RAP+, MAP)*

6 — **Capacity Expansion Modeling** *(Selected retirement and DSM Plan, base market scenario)*

7 — **EKC-Only: Execution-driven adjustment to NGCC Timing**

Pref. Plan

Capacity Expansion Scenarios *(Selected retirements, under 3 Market Scenarios)*

7a — **One-Off Tests of Near-Term Adds** *(e.g., Dogwood – demonstrate NPVRR difference of removing only that resource)*

Prior IRP Retirement Dates

Evergy-level retirement dates from 2021 & 2022 Preferred Plans:

2021 Triennial IRP	2022 IRP Annual Update
Lawrence 4 in 2023	Lawrence 4 in 2024
Lawrence 5 in 2023	Lawrence 5 in 2024
Lake Road 4/6 in 2024	(Coal)
Jeffrey 3 in 2030	Jeffrey 3 in 2030
La Cygne 1 in 2032	Lake Road 4/6 in 2030
La Cygne 2 in 2039	La Cygne 1 in 2032
Jeffrey 1 in 2039	La Cygne 2 in 2039
Jeffrey 2 in 2039	Jeffrey 1 in 2039
Iatan 1 in 2039	Jeffrey 2 in 2039
	Iatan 1 in 2039

Evergy-Level Retirement Analysis

Rank	Plan	NPVRR ($M)	Difference	Description
1	BIBD	62,747		Extend Lawrence 4 & 5 to 2028, Jeffrey 2 Retires 2030; High/High
2	BIBA	62,917	170	Extend Lawrence 4 & 5 to 2028, Jeffrey 2 Retires 2030
3	BCAA	62,942	196	Jeffrey 2 Retires 2030
4	BGAA	63,236	490	Jeffrey 1 & 2 Retire 2030
5	BBBA	63,580	833	Extend Lawrence 4 & 5 to 2028
6	BDAA	63,595	848	Iatan 1 Retires 2030
7	BAAA	63,605	859	2021/22 Preferred Plan
		██████████		
9	BACA	63,819	1,073	Hawthorn 5 to NG 2027
10	BEAA	63,946	1,199	Hawthorn 5 Retires 2027
11	BADA	64,455	1,709	Jeffrey 3 to NG 2030
12	BAEA	64,601	1,855	Jeffrey 3 to NG 2030, Jeffrey 2 to NG 2039
13	BHAA	65,208	2,462	Extend Lawrence 4 & 5 to 2028, Extend all others past 2042
14	BIBE	66,941	4,195	Extend Lawrence 4 & 5 to 2028, Jeffrey 2 Retires 2030; Low/Low

Evergy-level analysis indicates that extending Lawrence Energy Center's retirement / transition to gas-only operations and accelerating the retirement of Jeffrey 2 reduces NPVRR by $688 - $859M, depending on resource additions, compared to the 2021/2022 Preferred Plan retirements

Metro NPVRR Results

Retirement Re-testing ❯

| Rank	Plan	NPVRR ($M)	Difference	Description
1	BAAA	20,408		RAP MO, No DSM KS; 2021/2022 Preferred Plan
███	███	███	███	███
3	BMAA	20,422	14	RAP MO, No DSM KS; No Retirements
4	BDAA	20,424	16	RAP MO, No DSM KS; Iatan 1 Retires 2030
5	BACA	20,506	98	RAP MO, No DSM KS; Hawthorn 5 to NG 2027
6	BDCA	20,574	166	RAP MO, No DSM KS; Iatan 1 Retires 2030, Hawthorn 5 to NG 2027
7	BEAA	20,578	170	RAP MO, No DSM KS; Hawthorn 5 Retires 2027

Demand-side Management ❯

Rank	Plan	NPVRR ($M)	Difference	Description
1	GAAA	20,402		RAP- MO, Low DSM KS
2	FAAA	20,408	6	RAP+ MO, No DSM KS
3	BAAA	20,408	6	RAP MO, No DSM KS
4	IAAA	20,413	11	RAP MO, Full DSM KS
5	LAAA	20,414	11	RAP- MO, Full DSM KS
6	EAAA	20,416	14	RAP+ MO, Low DSM KS
7	AAAA	20,417	14	RAP MO, Low DSM KS
8	HAAA	20,421	18	RAP- MO, No DSM KS
9	KAAA	20,421	19	RAP+ MO, Full DSM KS
10	MAAA	20,467	65	No DSM
11	CAAA	20,677	275	MAP MO, Low DSM KS
12	DAAA	20,669	266	MAP MO, No DSM KS
13	JAAA	20,690	288	MAP MO, Full DSM KS

Modeling at the Metro level confirmed that the lowest-cost option was the 2021/2022 Preferred Plan (Metro is not impacted by changes to LEC and JEC) and that there is little variability in costs created by selecting RAP/RAP+/RAP- for Missouri Metro and None/Low/Full for Kansas Metro. For consistency with other jurisdictions, RAP+ and Low KS were selected

Metro Capacity Expansion Sensitivities

"High" Scenario Supply-Side Additions (BAAD)
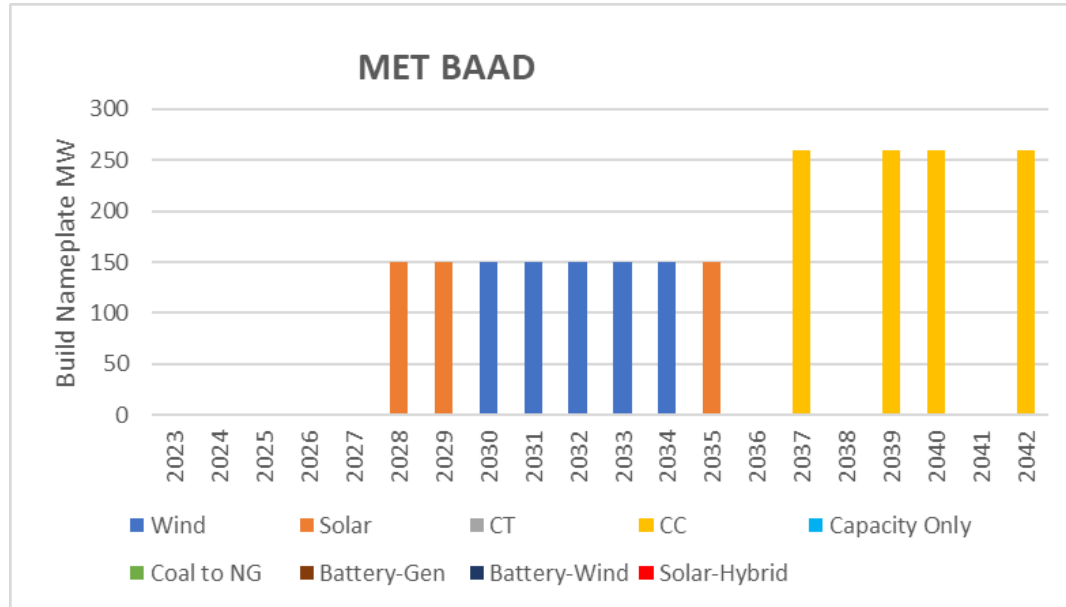
"Low" Scenario Supply-Side Additions (BAAE)
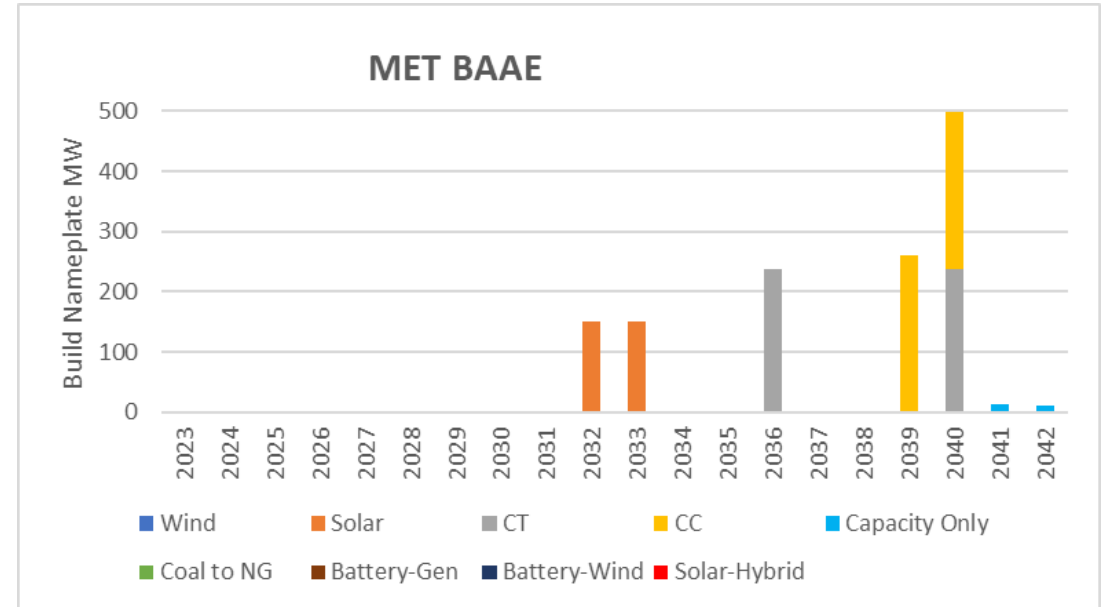
"High" capacity expansion sensitivity (high gas price, high carbon restriction) resulted in significantly more resource additions for Evergy Metro

Metro Preferred Plan – Capacity Expansion Results
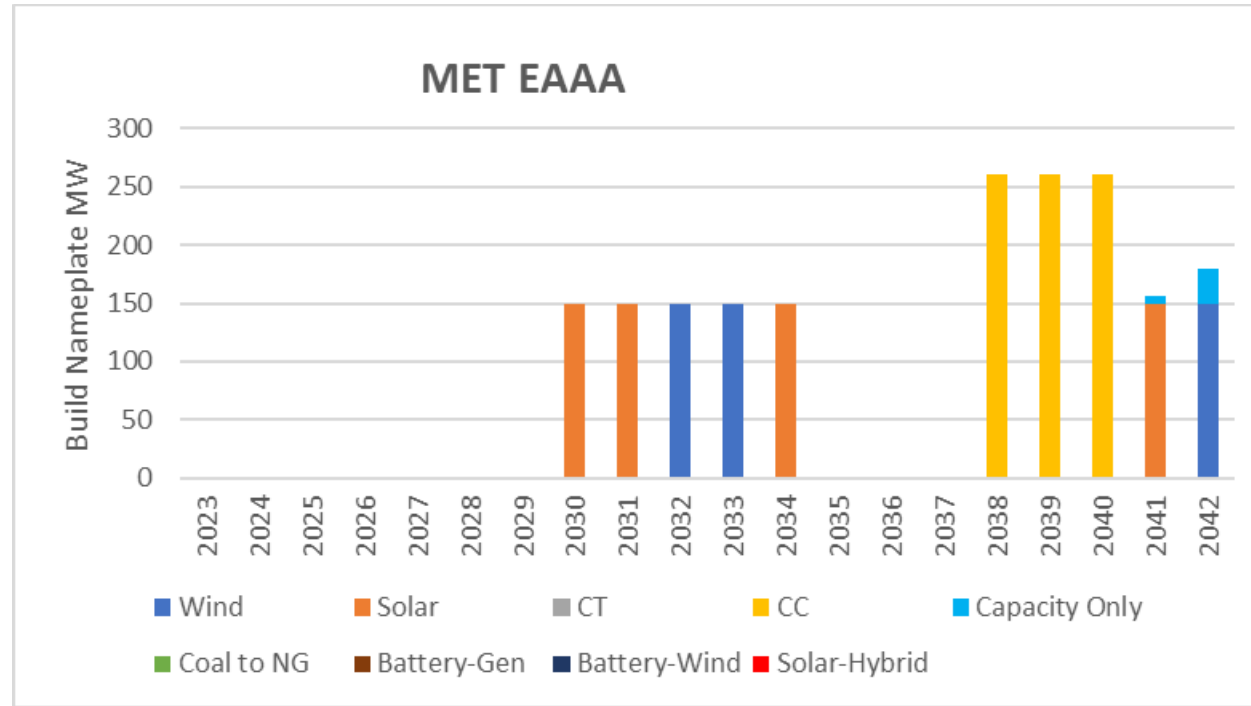
Capacity expansion performed in the base case based on selected retirements and DSM portfolios resulted in mix of additions over the timeframe, with all occurring in the second decade as plants are retired

2023 Annual Update Stakeholder Meeting

Metro Alternative Resource Plans

Rank	Plan	NPVRR ($M)	Difference	Description
1	GAAA	20,402		RAP- MO, Low DSM KS
2	FAAA	20,408	6	RAP+ MO, No DSM KS
3	BAAA	20,408	6	RAP MO, No DSM KS
4	IAAA	20,413	11	RAP MO, Full DSM KS
6	LAAA	20,414	11	RAP- MO, Full DSM KS
7	EAAA	20,416	14	RAP+ MO, Low DSM KS
8	AAAA	20,417	14	RAP MO, Low DSM KS
9	HAAA	20,421	18	RAP- MO, No DSM KS
10	BAAD	20,421	18	RAP MO, No DSM KS; High/High
11	KAAA	20,421	19	RAP+ MO, Full DSM KS
12	BMAA	20,422	20	RAP MO, No DSM KS; No Retirements
13	BDAA	20,424	21	RAP MO, No DSM KS; Iatan 1 Retires 2030
14	MAAA	20,467	65	No DSM
15	BACA	20,506	103	RAP MO, No DSM KS; Hawthorn 5 to NG 2027
16	BDCA	20,574	171	RAP MO, No DSM KS; Iatan 1 Retires 2030, Hawthorn 5 to NG 2027
17	BEAA	20,578	176	RAP MO, No DSM KS; Hawthorn 5 Retires 2027
18	EAAO	20,610	207	RAP+ MO, Low DSM KS; No New Renewables or Storage
19	DAAA	20,669	266	MAP MO, No DSM KS
20	CAAA	20,677	275	MAP MO, Low DSM KS
21	JAAA	20,690	288	MAP MO, Full DSM KS
22	BAAE	21,030	627	RAP MO, No DSM KS; Low/Low

Preferred Plan (Rank 7, EAAA)

The Preferred Plan is near the lowest-cost plan, but is not lowest-cost due to selecting consistent DSM portfolios with other jurisdictions, which created a slightly higher-cost plan

Missouri West NPVRR Results

Retirement Re-testing ➤

Rank	Plan	NPVRR ($M)	Difference	Description
1	AGAA	10,858		RAP; Jeffrey 1 & 2 Retire 2030
2	ACAA	10,858	0	RAP; Jeffrey 2 Retires 2030
3	AAAA	10,954	96	RAP; 2021/2022 Preferred Plan
4	ADAA	11,004	146	RAP; Iatan 1 Retires 2030

Demand-side Management ➤

Rank	Plan	NPVRR ($M)	Difference	Description
1	ECAA	10,838		RAP+; Jeffrey 2 Retires 2030
2	ACAA	10,858	20	RAP; Jeffrey 2 Retires 2030
3	GCAA	10,878	39	RAP-; Jeffrey 2 Retires 2030
4	MCAA	10,975	137	No DSM; Jeffrey 2 Retires 2030
5	CCAA	11,018	180	MAP; Jeffrey 2 Retires 2030

Missouri West-level testing confirmed the benefits of changes to the JEC 2 retirement date and identified RAP+ as the lowest-cost DSM portfolio

Missouri West Capacity Expansion Sensitivities

"High" Scenario Supply-Side Additions
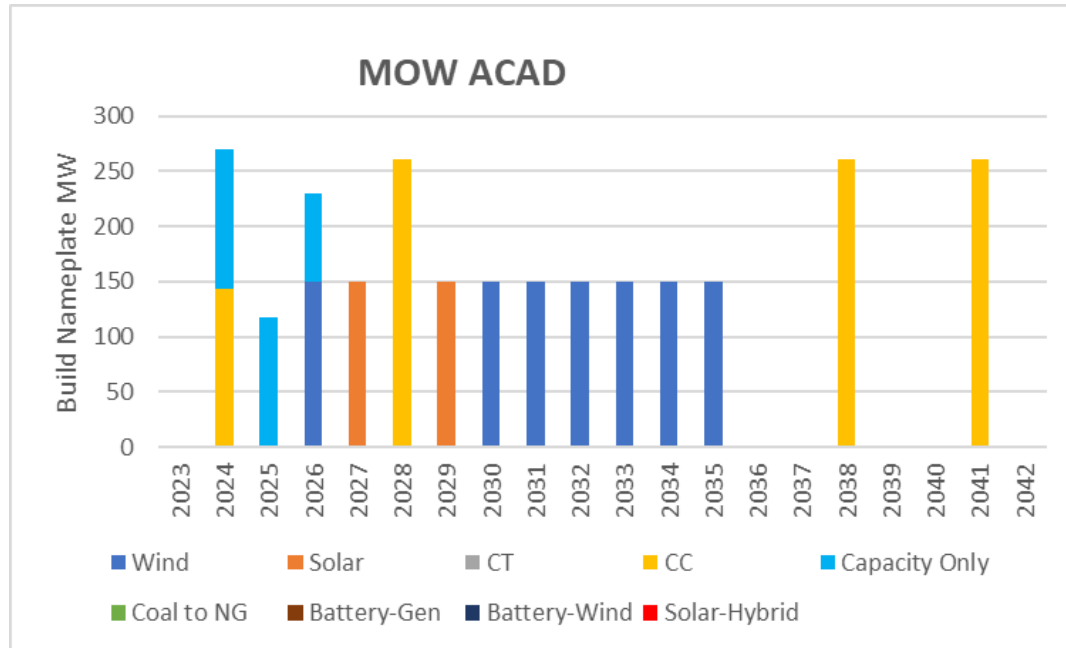
"Low" Scenario Supply-Side Additions
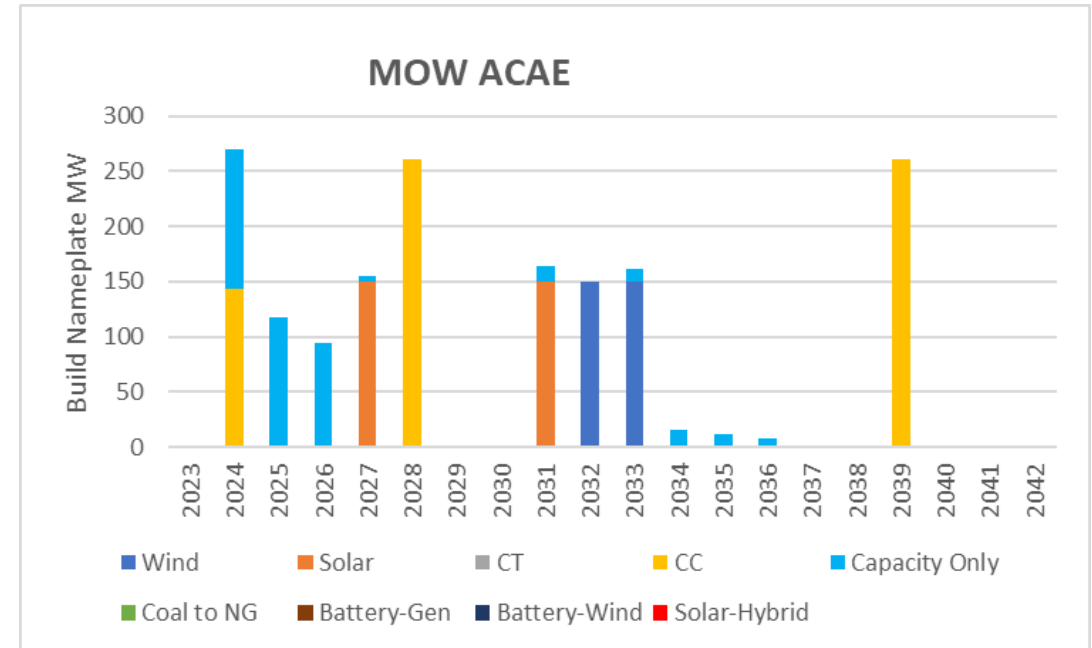
Dogwood, 2027 solar, and an additional 2028 combined cycle addition were selected in both capacity expansion sensitivities, but renewable additions in the medium-term vary significantly
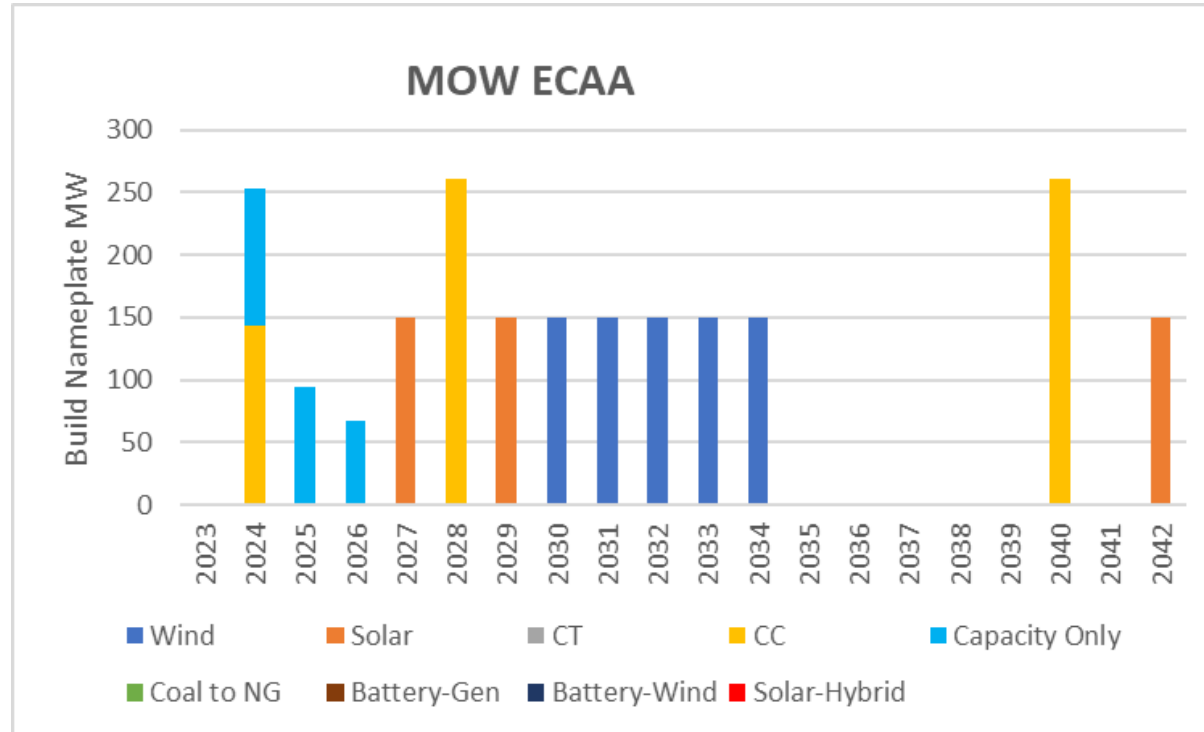
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Missouri West Preferred Plan – Capacity Expansion Results

Capacity expansion performed in the base case based on selected retirements and DSM portfolio resulted in mix of additions over the timeframe, with Dogwood, solar, and an additional Combined Cycle being added through 2028

2023 Annual Update Stakeholder Meeting

Near-Term Resource Addition Sensitivity

Table 37: Plan Comparison with and without Dogwood Addition
Evergy Missouri West Twenty-Year Net Present Value Revenue Requirement

Rank	Plan	NPVRR	Difference	Description
1	ACAA	10,858		RAP; Jeffrey 2 Retires 2030
2	ACAC	10,867	8	RAP; No Dogwood, Jeffrey 2 Retires 2030

Sensitivity analysis resulted in an $8 million lower net present value revenue requirement for the plan including a 2024 addition of Dogwood compared to plans without the resource addition

Missouri West Alternative Resource Plans

Rank	Plan	NPVRR($M)	Difference	Description
1	ECAA	10,838		RAP+; Jeffrey 2 Retires 2030
2	ACAD	10,851	12	RAP; Jeffrey 2 Retires 2030; High/High
3	AGAA	10,858	20	RAP; Jeffrey 1 & 2 Retire 2030
4	ACAA	10,858	20	RAP; Jeffrey 2 Retires 2030
5	ACAC	10,867	28	RAP; No Dogwood, Jeffrey 2 Retires 2030
6	GCAA	10,878	39	RAP-; Jeffrey 2 Retires 2030
7	EAAA	10,943	105	RAP+
8	AAAA	10,954	115	RAP
9	GAAA	10,958	120	RAP-
10	AAAC	10,966	128	RAP; No Dogwood
11	MCAA	10,975	137	No DSM; Jeffrey 2 Retires 2030
12	ADAA	11,004	166	RAP; Iatan 1 Retires 2030
13	CCAA	11,018	180	MAP; Jeffrey 2 Retires 2030
14	AAAB	11,100	262	RAP; No Wind
15	CAAA	11,113	275	MAP
16	MAAA	11,184	346	No DSM
17	ACAE	11,383	545	RAP; Jeffrey 2 Retires 2030; Low/Low
18	ECAO	11,487	649	RAP+; Jeffrey 2 Retires 2030; No New Renewable/Storage Builds

Preferred Plan (Rank 1, ECAA)

The selected Preferred Plan is the lowest cost plan out of all modeled plans for Missouri West

Preferred Plan Summary

Evergy Missouri West Preferred Plan ECAA

Year	Wind (MW)	Solar (MW)	Battery (MW)	Thermal (MW)	Capacity Only (Annual MW)	DSM (Annual MW)	Retirements (MW)
2023	0	0	0	0	0	73	0
2024	0	0	0	143	110	81	0
2025	0	0	0	0	94	128	0
2026	0	0	0	0	67	164	0
2027	0	150	0	0	0	183	0
2028	0	0	0	260	0	201	0
2029	0	150	0	0	0	216	0
2030	150	0	0	0	0	230	0
2031	150	0	0	0	0	243	117
2032	150	0	0	0	0	253	0
2033	150	0	0	0	0	260	0
2034	150	0	0	0	0	270	0
2035	0	0	0	0	0	283	0
2036	0	0	0	0	0	297	0
2037	0	0	0	0	0	307	0
2038	0	0	0	0	0	322	0
2039	0	0	0	0	0	333	0
2040	0	0	0	260	0	344	187
2041	0	0	0	0	0	353	0
2042	0	150	0	0	0	362	0

Evergy Metro Preferred Plan EAAA

Year	Wind (MW)	Solar (MW)	Battery (MW)	Thermal (MW)	Capacity Only (Annual MW)	DSM (Annual MW)	Retirements (MW)
2023	0	0	0	0	0	51	0
2024	0	0	0	0	0	86	0
2025	0	0	0	0	0	142	0
2026	0	0	0	0	0	178	0
2027	0	0	0	0	0	206	0
2028	0	0	0	0	0	187	0
2029	0	0	0	0	0	199	0
2030	0	150	0	0	0	211	0
2031	0	150	0	0	0	222	0
2032	150	0	0	0	0	232	0
2033	150	0	0	0	0	236	380
2034	0	150	0	0	0	244	0
2035	0	0	0	0	0	256	0
2036	0	0	0	0	0	267	0
2037	0	0	0	0	0	279	0
2038	0	0	0	260	0	290	0
2039	0	0	0	260	0	299	0
2040	0	0	0	260	0	308	832
2041	0	150	0	0	6	316	0
2042	150	0	0	0	30	324	0

Resource Acquisition Strategy

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Implementation Plan

› Acquisition of share of Dogwood Energy Center pending completion of negotiations and necessary regulatory approvals

› Near-term solar execution based on Request for Proposal responses

› Ongoing planning and preparation for future thermal additions

› MEEIA Cycle 4 Planning

› Ongoing environmental projects at existing sites

Dogwood CCGT

Metric	Dogwood
Total CapEx	$60.78M
Capacity	143 MW
$/kW	$425
Historical Net Capacity Factor	35%
60-Day Notice of a Case Filed	3-20-2023
Operating CCN Case	H2 2023

- Firm-Dispatchable power in Evergy Service Territory – Response to Missouri-West Capacity RFP

- Selected as part of the 2023 IRP Update for EMW

- 643 MW combined cycle combustion turbine (CCGT) served from Southern Star and Panhandle pipelines

- Ownership
  - Proposed: Evergy Missouri West – 22.2%
  - Unified Gov of Wyandotte County (BPU) - 17.0%
  - MJMEUC – 16.4% + 11.7% currently being sold
  - City of Independence – 12.3%
  - Kansas Power Pool – 10.3%
  - Kansas Municipal Energy Agency – 10.1%

- Favorable long-term economics

- Flexibility at site to expand up to 300 MW of CTs

Dogwood is an attractive firm, dispatchable acquisition target with no construction or permitting risk that is within EMW's service territory and near its largest load center

2023 All-Source RFP thoughtfully evaluated in light of IRA

2023 RFP Process To Market Check IRA Impacts

	2022	2023
Phase I		Peer RFP benchmarking analysis; integration of risk-appropriate PPA scoring criteria
Phase II		Write RFP, establish timeline and associated scoring criteria
Phase III		Solicitation of bids and short listing
Phase IV		Contract negotiations

Renewables Evaluation Process

1 **Participation Criteria** – requirements, application review

2 **Direct Cost Screening** – levelized cost of energy, reliable levelized cost of capacity

3 **Indirect Cost Screening** – long-term ownership and operation, project and bidder risk, community impacts

4 **Shortlist Portfolio Evaluations**

> ***RFP Responses received in February of 2023 to inform asset options in the 2023 annual IRP Update***

2023 All-Source RFP – Issued January 18th, 2023

Criteria	Decision
Nameplate Capacity	1,241 MW
Technology Considered	All Proven Technologies
Minimum Offer Size	50 MW
Minimum Contract Length	15 Years
Base Offer	BTA

Criteria	Decision
Offer Fee	$5,000/site
Solicitation Length	6 weeks
PPA Liquidated Damages	$10 million
PPA Financial Security	Minimum of PPA LDs
Optional Offer	PPA

- Robust scoring and evaluation methodology established to appropriately risk rank different structures and asset types

- Responses were due February 28, 2023 with short-list selection by April 4, 2023

- RFP timing intended to incorporate the benefits of the Inflation Reduction Act for renewables and batteries while allowing for conventional generation offers

RFP Issued in January; utilized the peer benchmarking and federal guidance for IRA benefits to properly structure RFP and scoring criteria

RFP Short List Next Steps – 2024-2026 Assets

- Contractual discussions will be prioritized by project target Commercial Operation Date
- High level regulatory timeline based roughly on Persimmon Creek process below

2Q-3Q 2023	3Q 2023	1Q – 2Q 2024	2Q – 4Q 2024	YE 2024-YE 2026

2Q-3Q 2023
- Shortlist candidates notified of selection
- Counsel engaged
- Detailed Q&A on proposal and initial 2024 term sheet negotiation

3Q 2023
- Board of Director Approval
- Target for definitive commercial agreements
- File CCN, Predetermination
- Target for term sheet negotiations complete for 2025 CODs

1Q – 2Q 2024
- Final CCN or Predetermination Regulatory Outcome
- Provide Notification to Proceed to Construction or Asset Purchase notification
- File abbreviated rate case if necessary
- Target final term sheets or plans for 2026 COD Assets

2Q – 4Q 2024
- On site heavy construction
- Compliance and In-Service Criteria documentation
- Contractual dispute and change order resolution
- File CCN, Predetermination for 2026 Assets

YE 2024-YE 2026
- Finalize regulatory proceedings for 2026 Assets
- Finalize construction and complete performance, in-service and validation testing
- Complete startup procedures
- In-service asset and announce Commercial Operation
- Market operations for the utility

All dates TBD based on contracting, regulatory and construction deadlines ahead of the 2024-2026 Commercial Operation Dates

Hydrogen Capable Conventional Generation

SPP Interconnection Queue
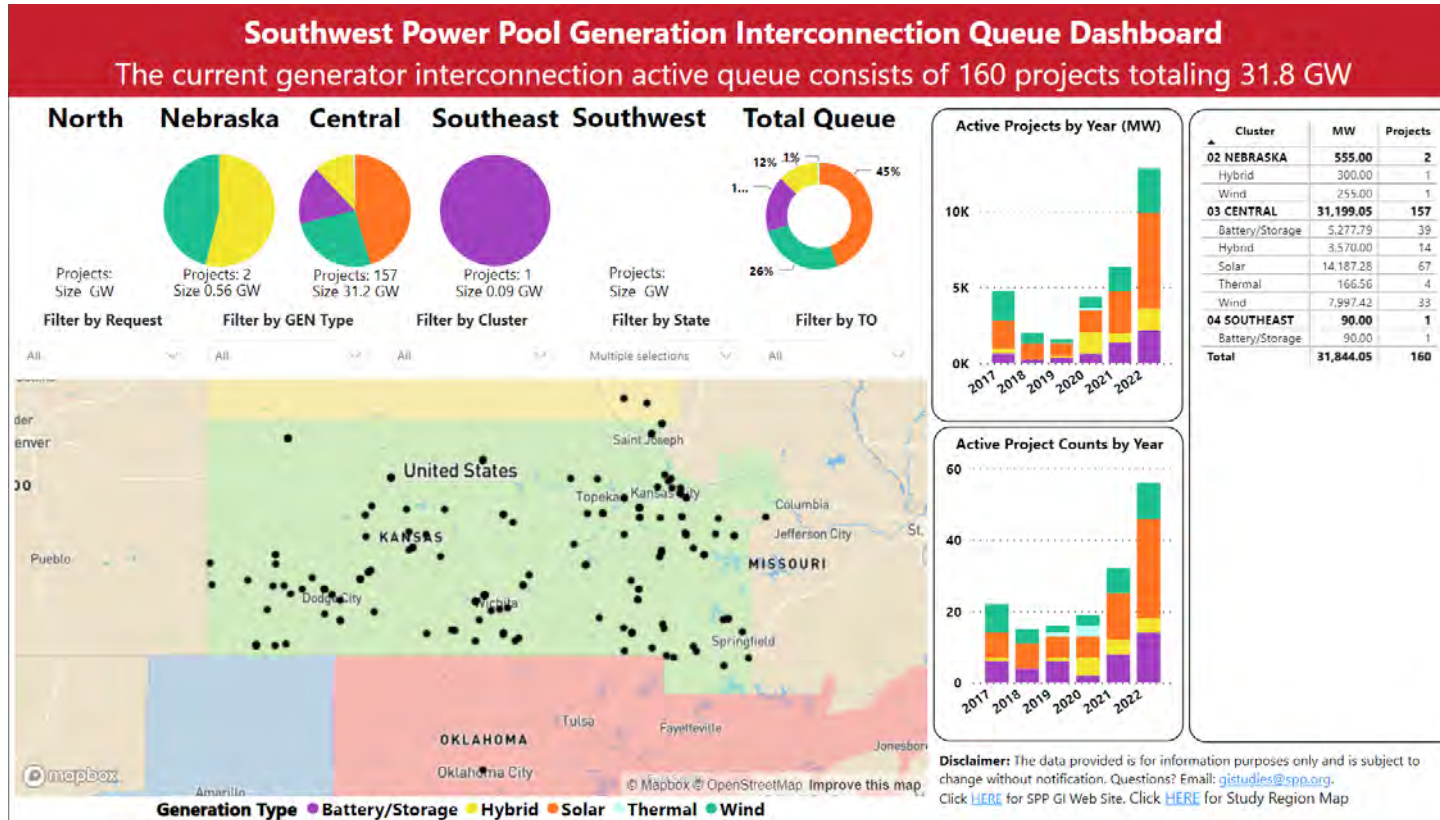
- IRP Identified two CCGT plants for EKC and Missouri West (~780 MW in 2028 and ~520 MW in 2029)

- SPP Interconnection Queue for Kansas and Missouri has less than 200 MW of Thermal Capacity as of June 2023

- Output from the siting and technology study will inform interconnection applications for the two Evergy sites

- Major contracts to be competitively bid

Early steps of the pursuit of hydrogen capable, firm-dispatchable CCGT will result in interconnection requests later in 2023

Hydrogen Capable Generation Siting & Technology Study

- SPP reserve margin changes and economic development activity indicate that firm, dispatchable capacity is needed before the end of the decade

- In light of that need, Evergy is partnering with Power Engineering

- Outputs from this study are intended to identify ideal siting locations and potential technologies by studying available electrical and gas delivery infrastructure, land, environmental permitting issues, and construction feasibility
  - Plan to study hydrogen capable simple cycle and flexible combined cycle combustion turbines, high-efficiency reciprocating engines, co-sited batteries with existing wind assets and advanced technologies like long-duration storage where appropriate

- Next steps will be land acquisition, air and water permitting, and SPP & natural gas interconnection requests

- Long term followers would be initial site design with EPC firm followed by predetermination or Certificate of Convenience and Necessity filings depending on the owner utilities' state

Plan to conduct siting and technology study in 2023 to target two to five promising sites for future firm, dispatchable, hydrogen capable generation build

Next Steps

- *Comments expected to be due August 14, 2023 (pending filing of Summary Report)*

- *Beginning planning for 2024 Triennial filing – including pre-filing stakeholder engagement*

- *Will provide details on stakeholder meetings in the coming months – likely to being late summer / early fall*

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