

# Quarterly Joint Stakeholder Briefing Materials - October 30, 2023



Southwest Power Pool, Little Rock, AR

October 30, 2023 01:00 PM Central Time (US and Canada) Central Standard Time

<b>Agenda Topic</b>	<b>Presenter</b>	<b>Page</b>
Call to Order	Ms. Susan Certoma	
1. Federal Energy Regulatory Commission (FERC)	Mr. Patrick Clarey	
2. <a href="#">Transmission Planning</a>	Mr. David Kelley	2
3. <a href="#">Integrated Marketplace</a>	Mr. Antoine Lucas	35
4. <a href="#">RTO Operations</a>	Mr. Bruce Rew	48
5. <a href="#">Western Expansion</a>	Mr. Bruce Rew & Mr. Antoine Lucas	68

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# TRANSMISSION PLANNING UPDATE

QUARTERLY JOINT STAKEHOLDER BRIEFING

DAVID KELLEY

OCTOBER 30, 2023

*Working together to responsibly and economically  
keep the lights on today and in the future.*



SouthwestPowerPool



SPPorg



southwest-power-pool



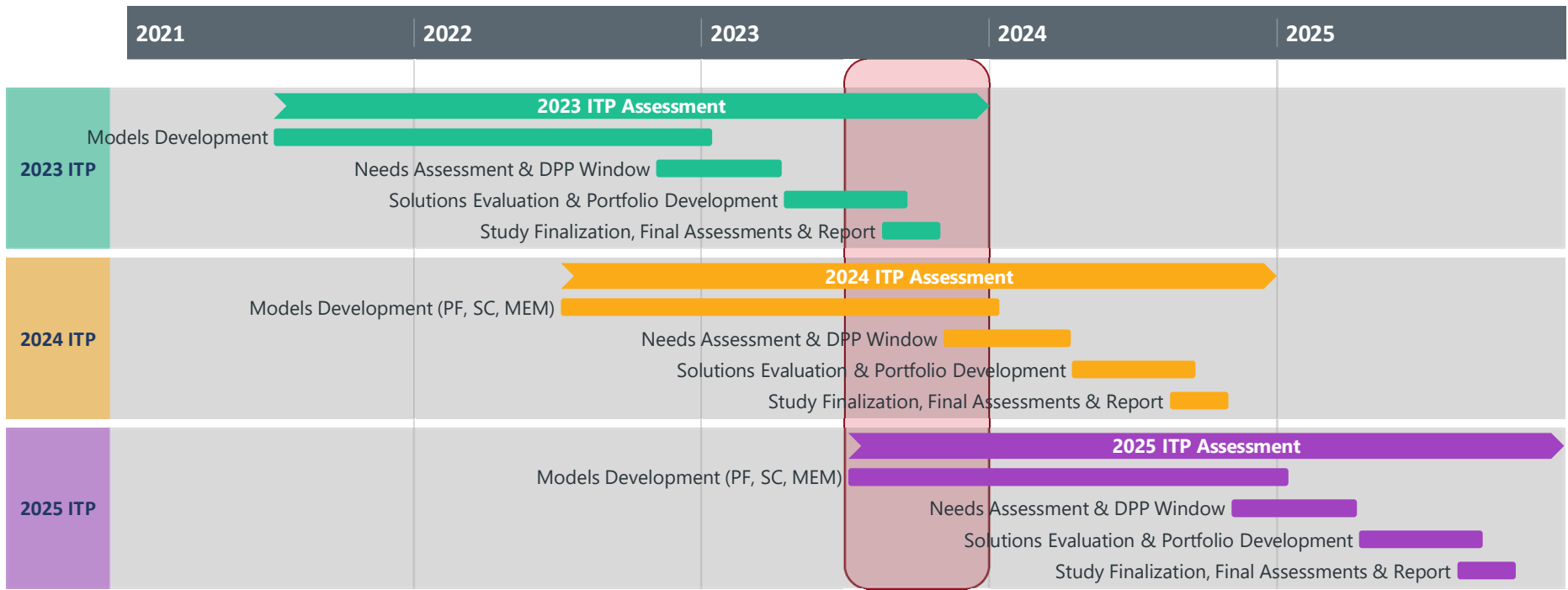
# ITP QUARTERLY UPDATE

*Working together to responsibly and economically  
keep the lights on today and in the future.*



# ITP Study Overlaps

The 2023 ITP, 2024 ITP and 2025 ITP all had schedule overlap in Q3. The 2025 ITP was kicked off in July and is underway.

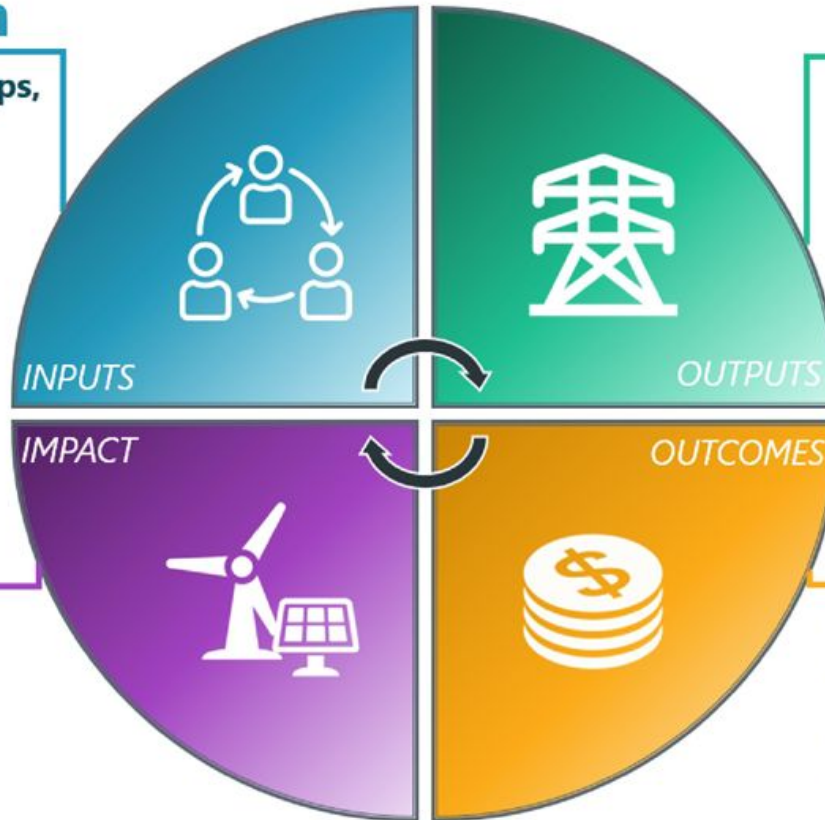


# ***2023 ITP ASSESSMENT***

# 2023 INTEGRATED TRANSMISSION PLAN

## Collaboration

- 8 organizational groups, 100+ meetings
- Evaluated > 1080 solutions
- 27-month study



## Results

- 150 miles of new transmission
  - 51 miles 345 kV
- 93 miles of rebuilt transmission
- 44 transmission projects

## Value

- More reliable grid
- Generation interconnection
- Relief of operational congestion

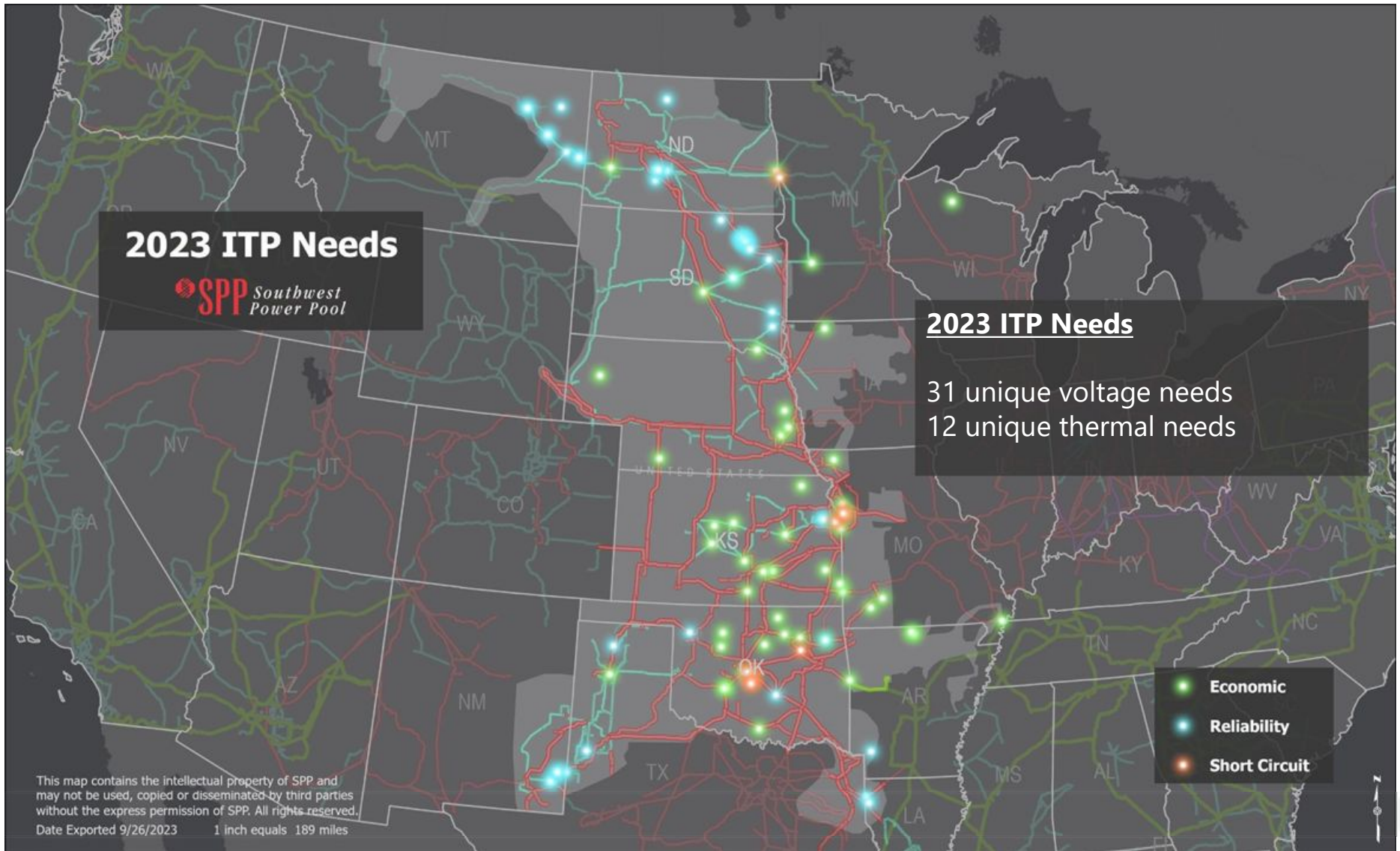
## Benefits

- \$735.5M E&C cost
- \$2.61B-2.98B lower 40-year APC
- \$1.14B 40-year PV cost
- 2.29-2.61 40-year B/C ratio range

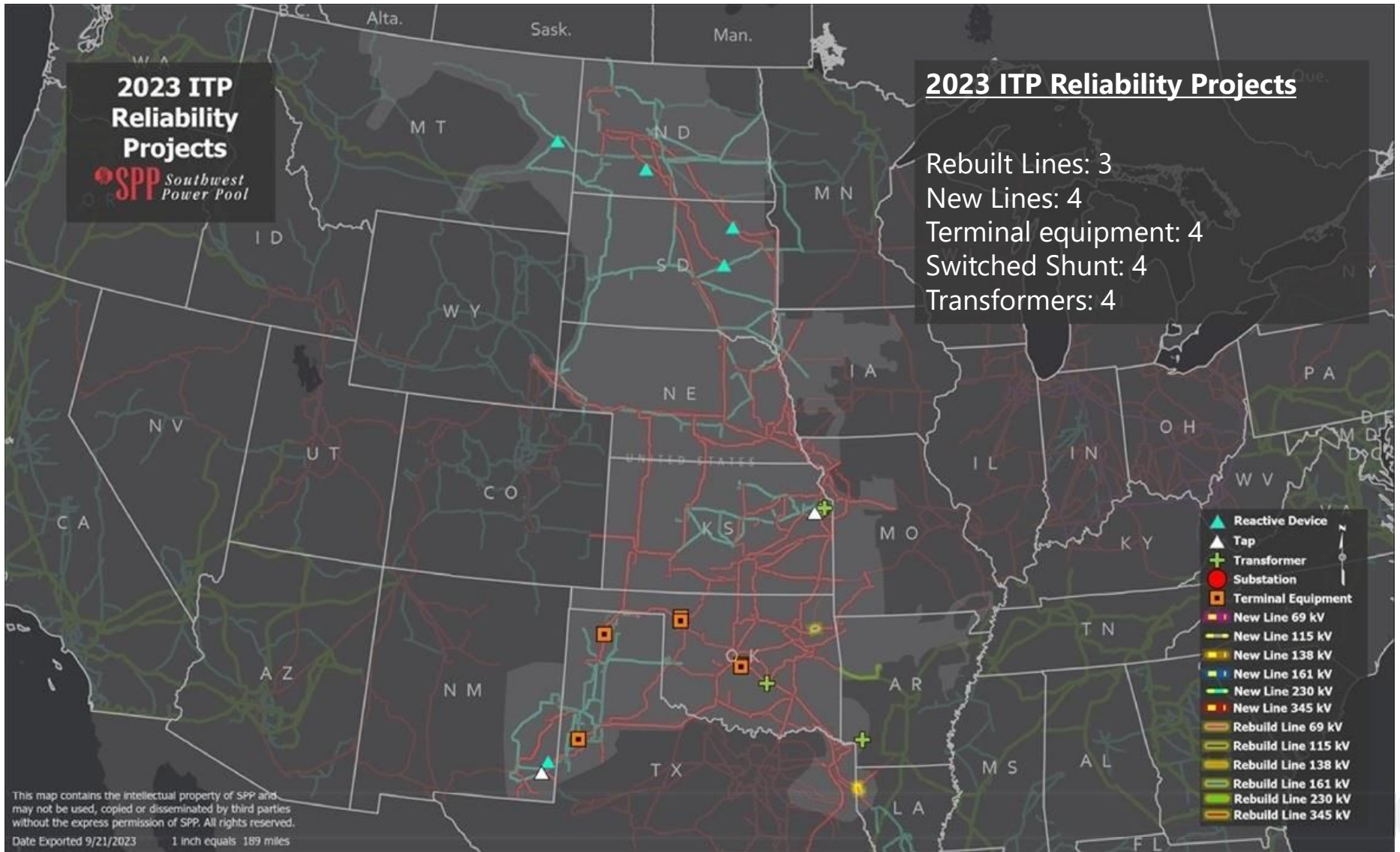
Continuing trends of a changing resource mix and energy growth

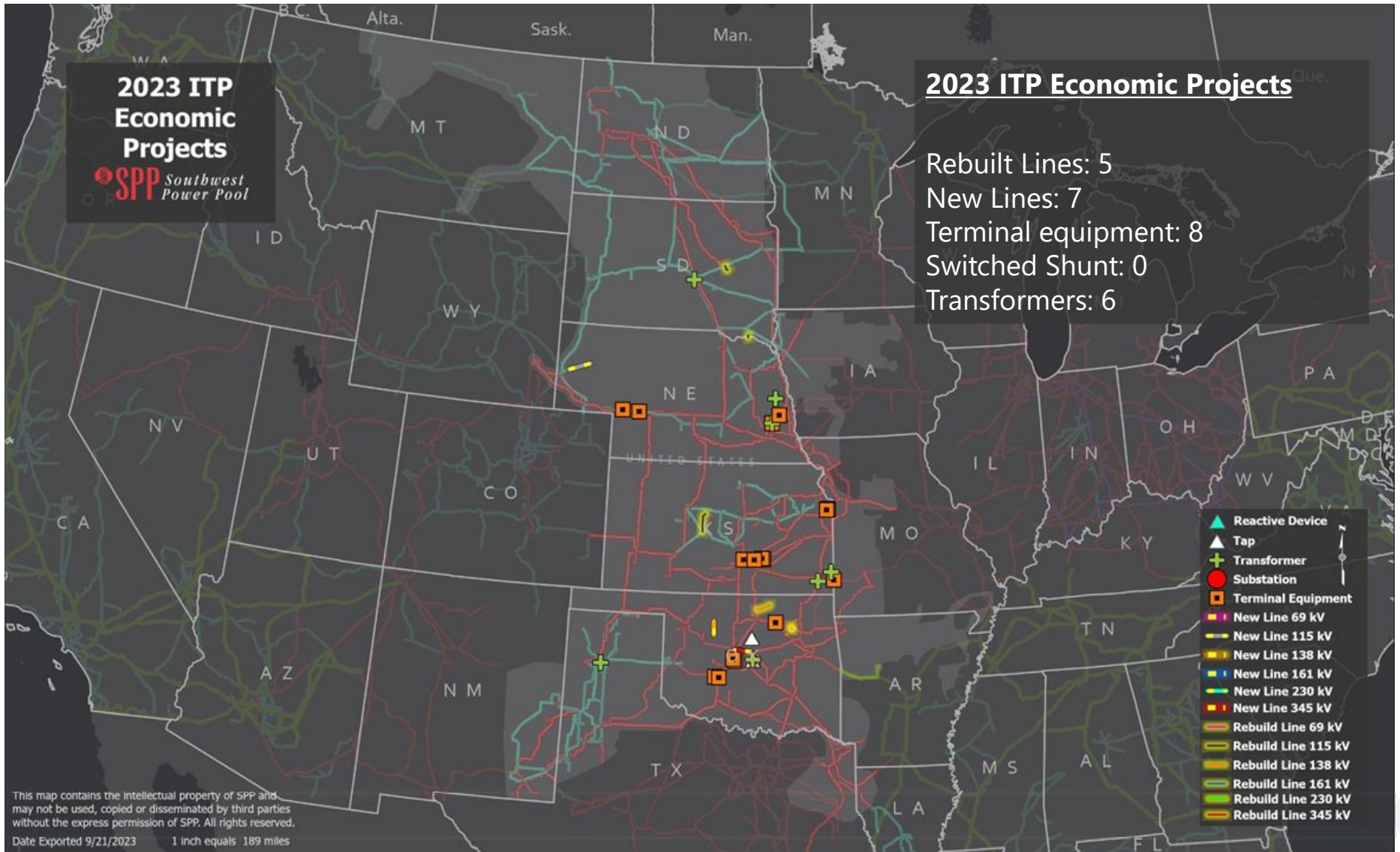
# FUTURES ASSUMPTIONS

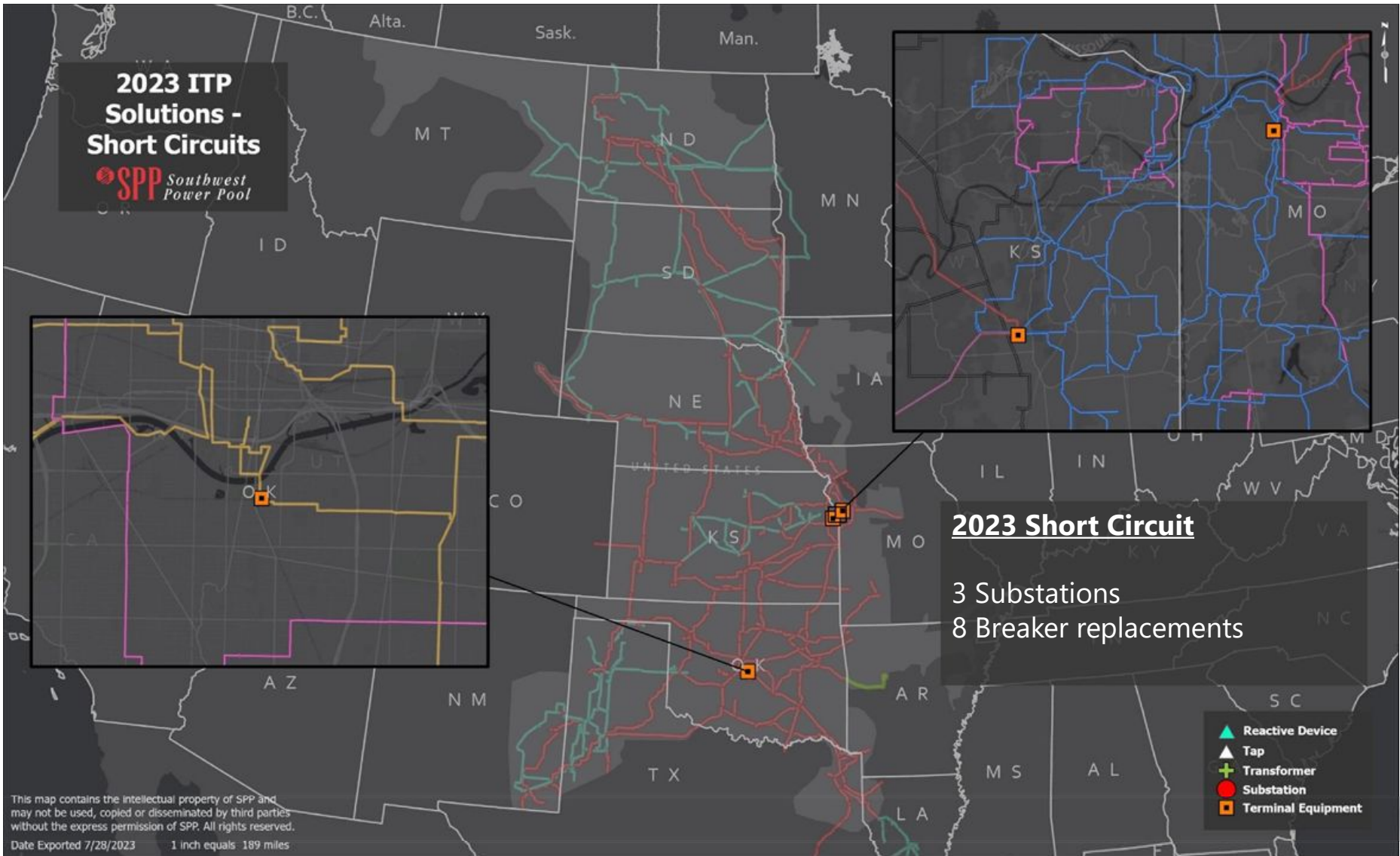
	Year 2	Reference Case		Emerging Technologies	
		Year 5	Year 10	Year 5	Year 10
Energy Growth	Current projections	Current projections		Increase due to EVs	
Coal Retirements	Current industry forecast	Age 56+ Subject to generator owner review		Age 52+ Subject to GO review and ESGW approval	
Gas Retirements	Current industry forecast	Age 50+ Subject to GO review		Age 48+ Subject to GO review and ESGW approval	
Energy Storage (GW)	None	0.9	2.2	2.1	5.3
Utility Solar (GW)	0.6	4.4	11	5.9	15
Wind (GW)	32	37	41	38	46







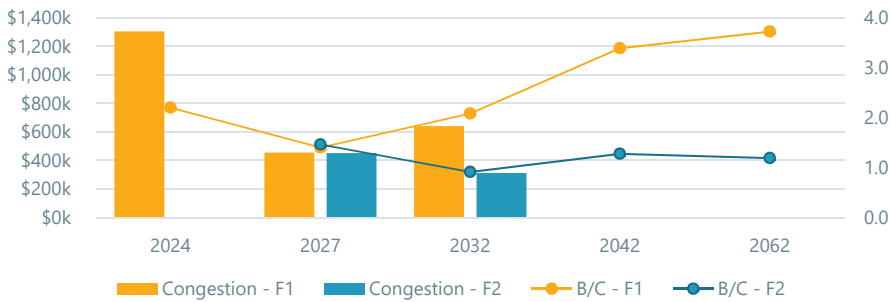




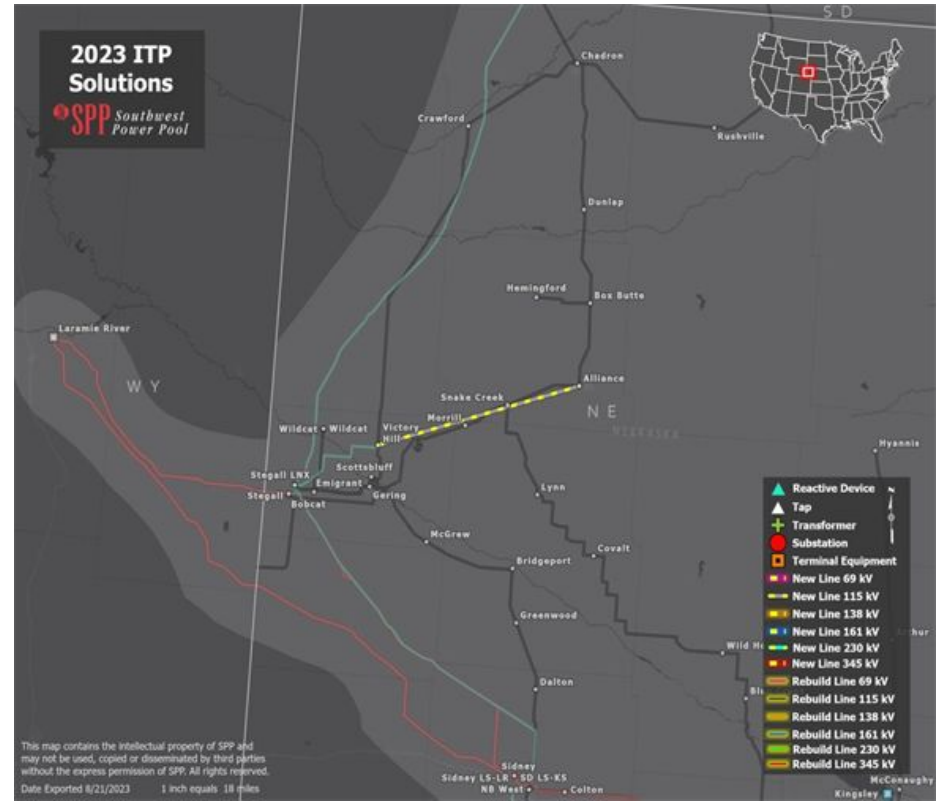
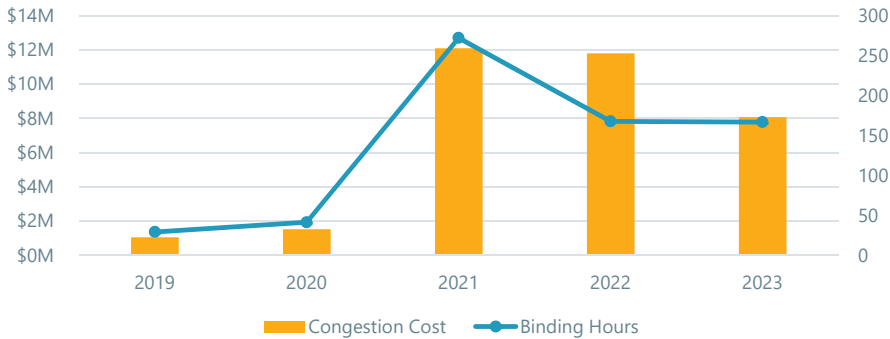
# ALLIANCE - VICTORY HILL 115 KV

Concerns expressed by some parties related to ability to construct project given that it would interconnect with non-SPP facilities as well as whether costs aligned with benefits. Ultimately ESWG and TWG recommended no NTC be issued in the 2023 ITP.

Planning Congestion Scores (\$/MWh) and Benefit/Costs



Real-Time Market Congestion Exposure (\$)



# GRACEMONT - ANADARKO NEW 138 KV HIGH-CAPACITY DOUBLE-CIRCUIT LINE

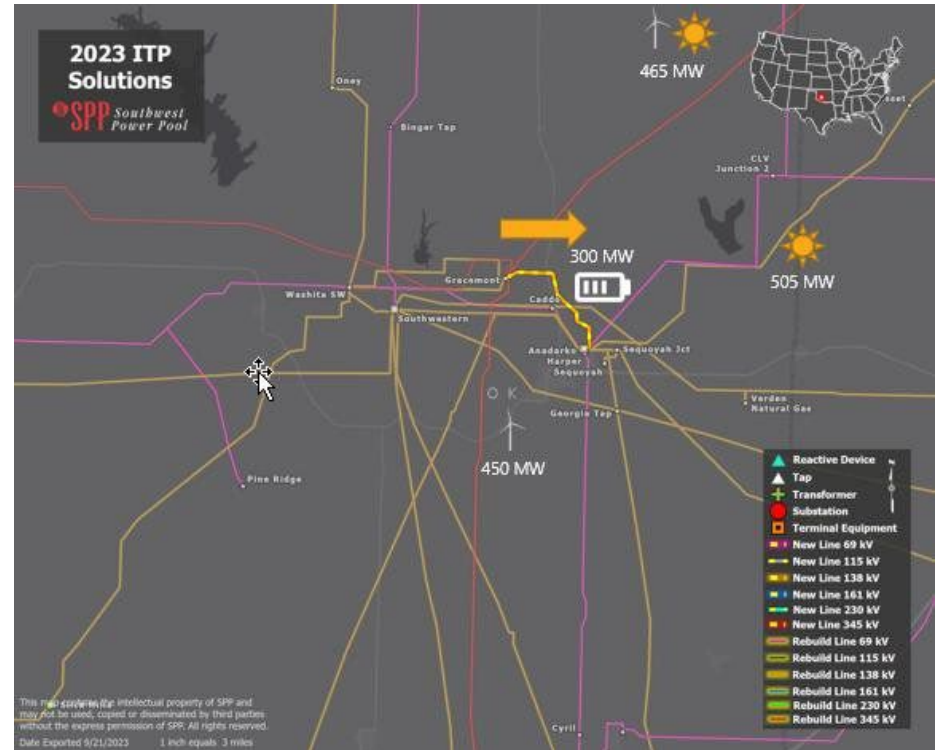
This project was ultimately approved to be recommended for NTC; however there was an abstention by one of the incumbent Transmission Owners due to a voiced need for EHV transmission, deviation from 20YA results, and perceived inconsistent treatment relative to the Alliance - Victory Hill 115 kV project.

Re-evaluation of 2020 ITP double-circuit rebuild project due to challenges with Bureau of Indian Affairs in constructing the approved project

\$87M in real-time congestion costs observed in 24 months prior to the ITP study

20YA projected the need for EHV solution in two futures, however there are updated generation repowers for nearby units that were assumed retired in 20YA

High-capacity double-circuit 138 kV transmission effectively resolves the current and projected congestion while avoiding the existing ROW issues



# STAKEHOLDER CONSENSUS

- **TWG and ESWG approved three recommendations associated with the 2023 ITP:**
  - Recommendation 1: Technical work
  - Recommendation 2: Recommended plan and NTC issuance
  - Recommendation 3: 2023 ITP Report

Group	Date	Recommendation	Action	In Favor	Abstained	Opposed
TWG	9/27/23	Motion 1	Unanimous approval	22	2	0
ESWG	9/27/23	Motion 1	Unanimous approval	13	3	0
TWG	9/27/23	Motion 2	Unanimous approval	21	3	0
ESWG	9/27/23	Motion 2	Unanimous approval	13	3	0
TWG	9/27/23	Motion 3	95% approval	19	4	1
ESWG	9/27/23	Motion 3	Unanimous approval	12	4	0

- **MOPC approved recommendations associated with the 2023 ITP:**

Date	Recommendation	Action	In Favor	Abstained	Opposed
10/17/23	Approve the 2023 ITP final portfolio and confirm the 2023 ITP assessment was completed in accordance with SPP OATT Attachment O. Endorse the 2023 ITP recommended plan. This includes recommended issuance, modification, and withdrawal of NTCs for projects within the four-year financial commitment window. Endorse the 2023 ITP Assessment Report as documentation of completion of the ITP planning process specified in SPP OATT Attachment O Section III.	98% approval	58	4	2

# IN-SERVICE DATE DELAY

## OVERVIEW

Stakeholders and Staff raised concerns about SPP issued projects that were delayed past their need date and/or first reported in-service date in early 2023



SPP staff over the past eight months has worked with PCWG, stakeholders and MMU on improvements to address the issue with three preferred outcomes identified:

Increased Transparency / Situational Awareness

Increased Accuracy

Project Certainty



An In-Service Date Delay Report was created to be reviewed by PCWG on a quarterly basis and provide updates to MOPC and other groups as needed

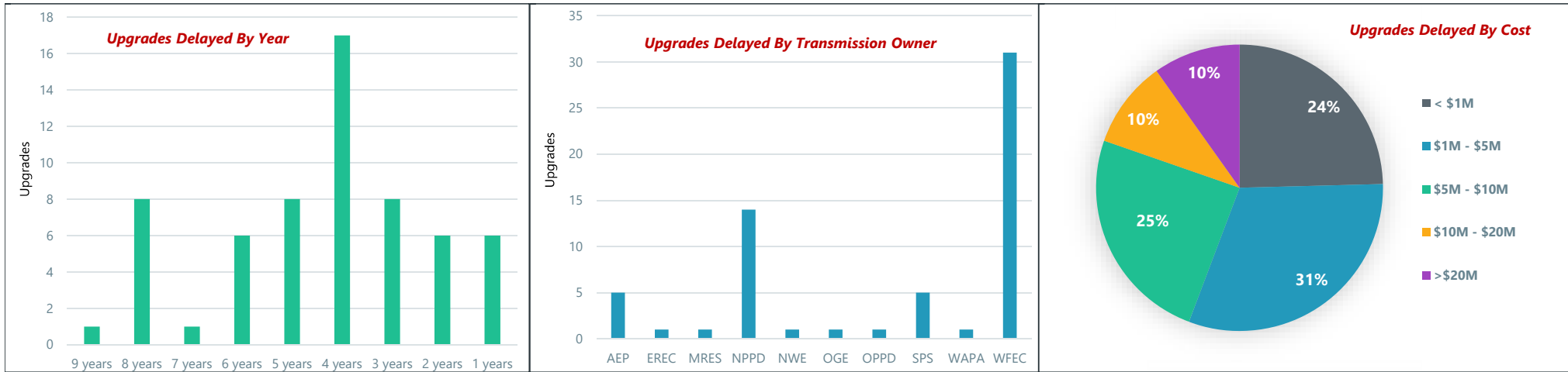


Development of the RR574 and phased approach



# IN-SERVICE DATE DELAY REPORT

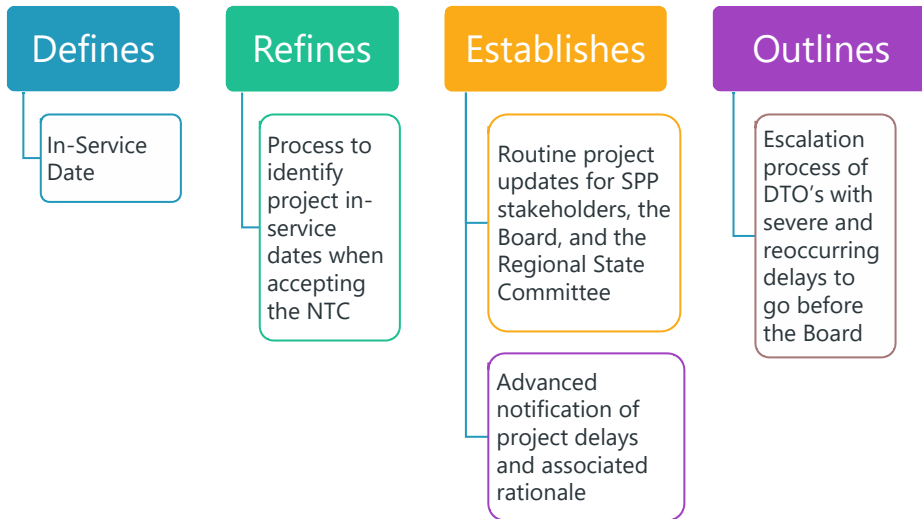
- PCWG continues to see a decrease in total upgrades in a delay status since issue was identified
- Delayed upgrades are down from 81 to 61 (~25%) since May



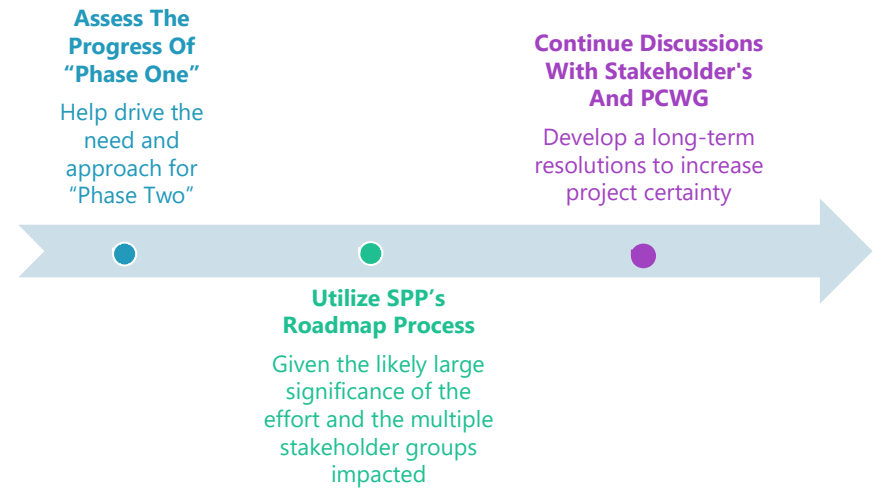
SPP staff reviews the In-service Date Delay Report with PCWG on a quarterly basis and provides updates to MOPC and other groups as needed

# CURRENT PROGRESS

## SPP Staff Phase 1: RR574 BP7060 In-Service Date Delay Report Submission



## SPP Staff Phase 2



### Next Steps:

- Seek RR574 approval from working groups
- Continue further analysis on the ISD Delay issue and the need for further improvements in phase two
- Review of external RR582 submitted by Enel to further investigate solutions for the ISD delay issue

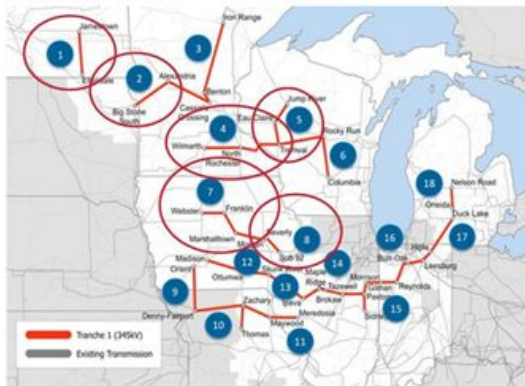
# MISO-SPP JOINT TARGETED INTERCONNECTION QUEUE STUDY

# UPDATED ADJUSTED PRODUCTION COST (APC) BENEFITS

	2021 10-yr PV APC Benefits	2023 20-yr PV APC Benefits
<b>MISO</b>	\$55.7 M 30%	\$76.5 44%
<b>SPP</b>	\$132.9 M 70%	\$99.3 M 56%
<b>Total</b>	\$188.6 M 100%	\$175.8 100%

Proposing to use 20-year PV benefits in calculations rather than 10-year PV benefits

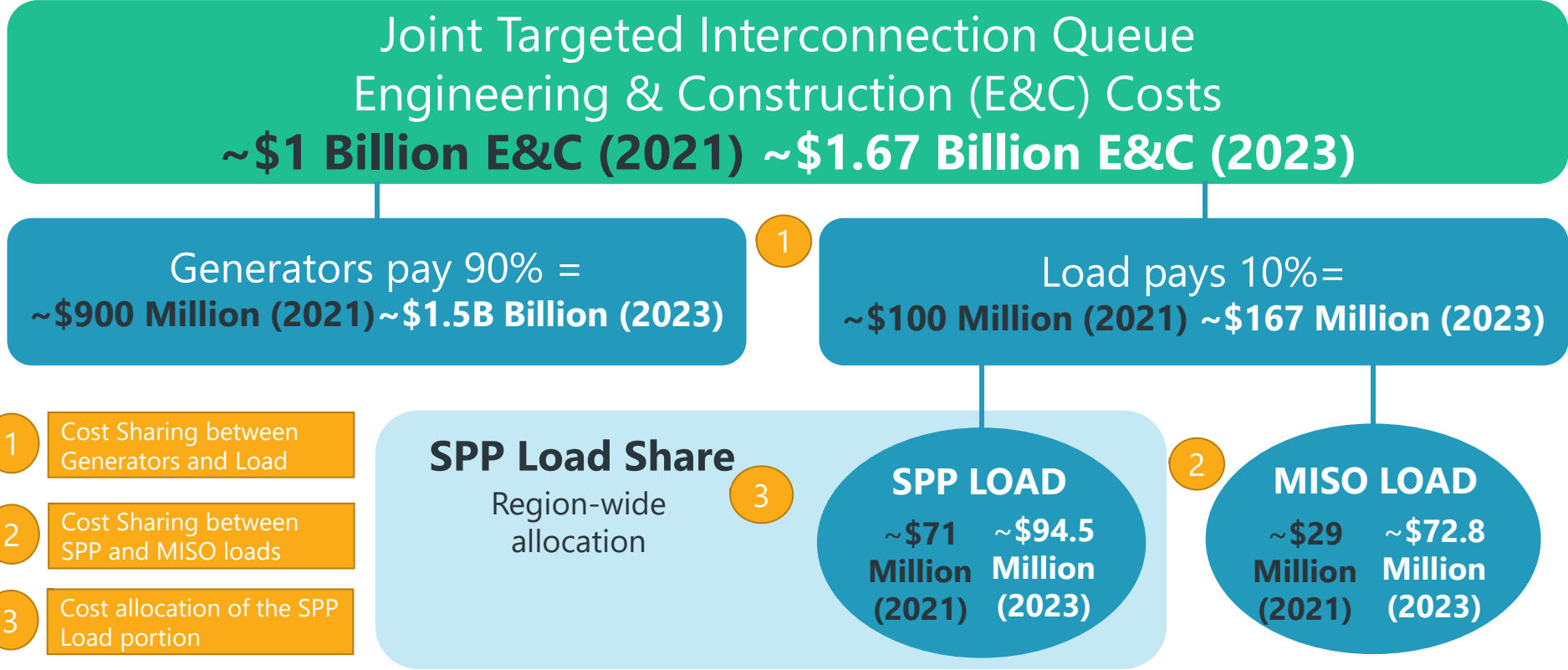
- Better aligns with proposed 20-year rate framework and other planning analyses (ITP, interregional, etc.)



APC benefits changed due to the inclusion of the entire MISO LRTP Tranche 1 portfolio used in the base case and change case models

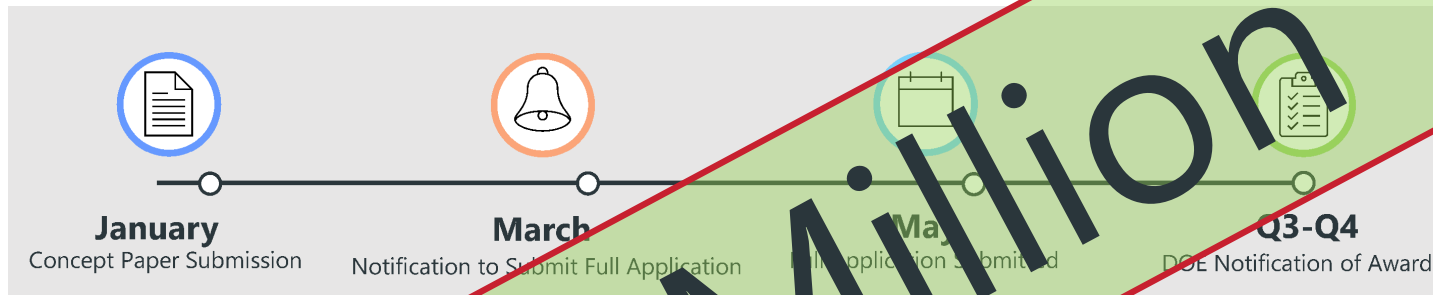
- Results in MISO receiving a greater share of the APC benefits and allocated costs
  - 44%/56% split rather than previous 30%/70% split

# UPDATED JTIQ PORTFOLIO PROPOSED COST SHARING ESTIMATES



❖ 2021 10-year projected benefit in adjusted production cost (APC). 2023 20-year projected benefit in APC.  
 ❖ \$1.67 billion based on cost updates provided by TOs in May 2023 and reflects the Lyon Co-Lakefield replacement project. The estimated total is subject to further review.

# DOE FUNDING - GRID RESILIENCE AND INNOVATIVE PARTNERSHIP PROGRAM



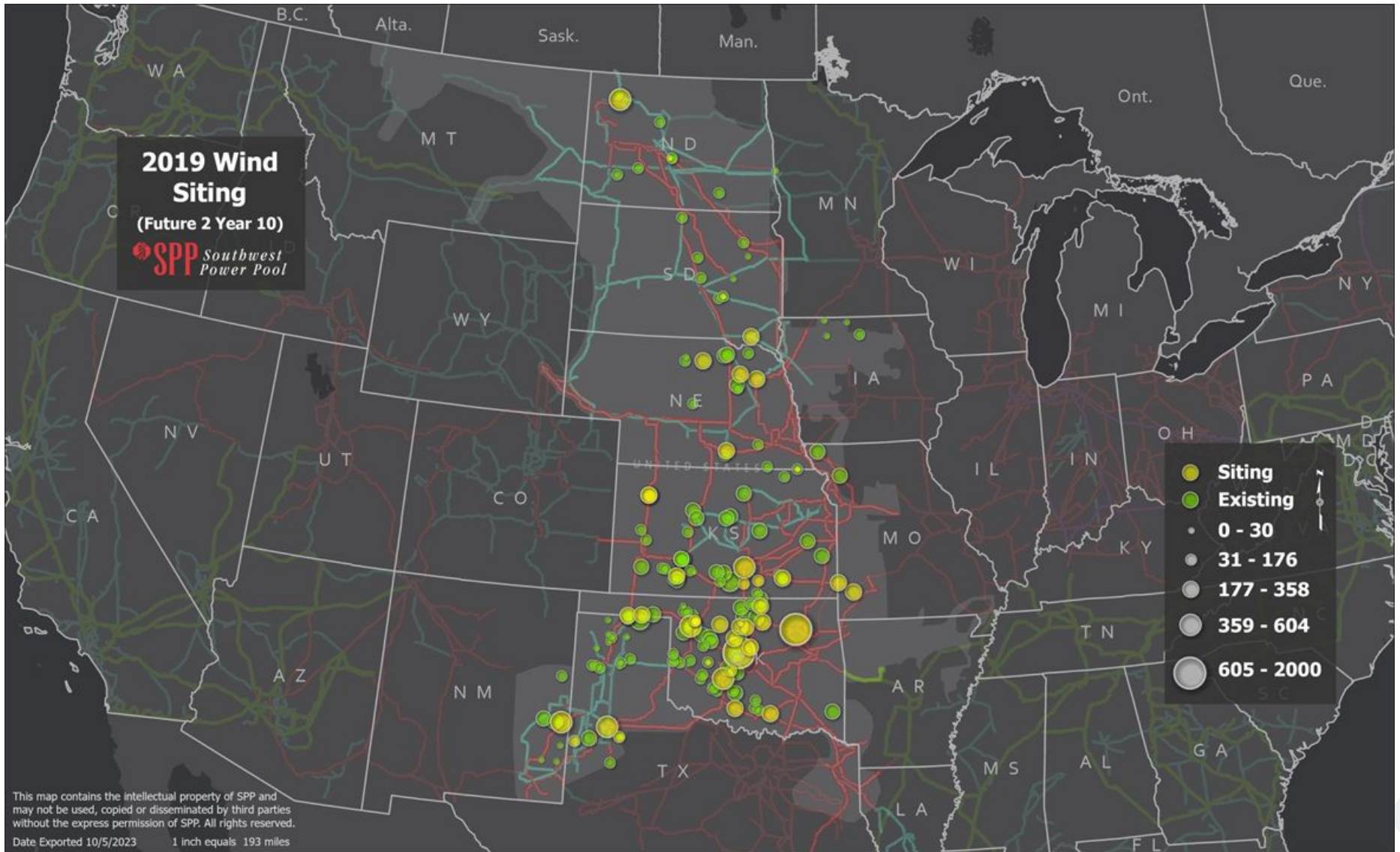
- The JTIQ Projects and Study Process were submitted to DOE for consideration in the [Grid Resilience and Innovation Partnerships](#) (GRIP) Program funding opportunity
  - Potential for project match of up to 50% of JTIQ portfolio
- Notification to submit full application was received early March
- Full application submitted on May 19
  - Project partners include MN Dept. of Commerce, SPP, MISO, Great Plains Institute, Evergy, ITC Midwest, MidAmerican Energy, OPPD, Otter Tail Power, and Xcel Energy
  - 39 Letters of Support from Governors; Community Benefits Plan Partners; State Congressional offices; State Commissions, Boards, and Agencies; Regional Entities; and National and State Interest Groups

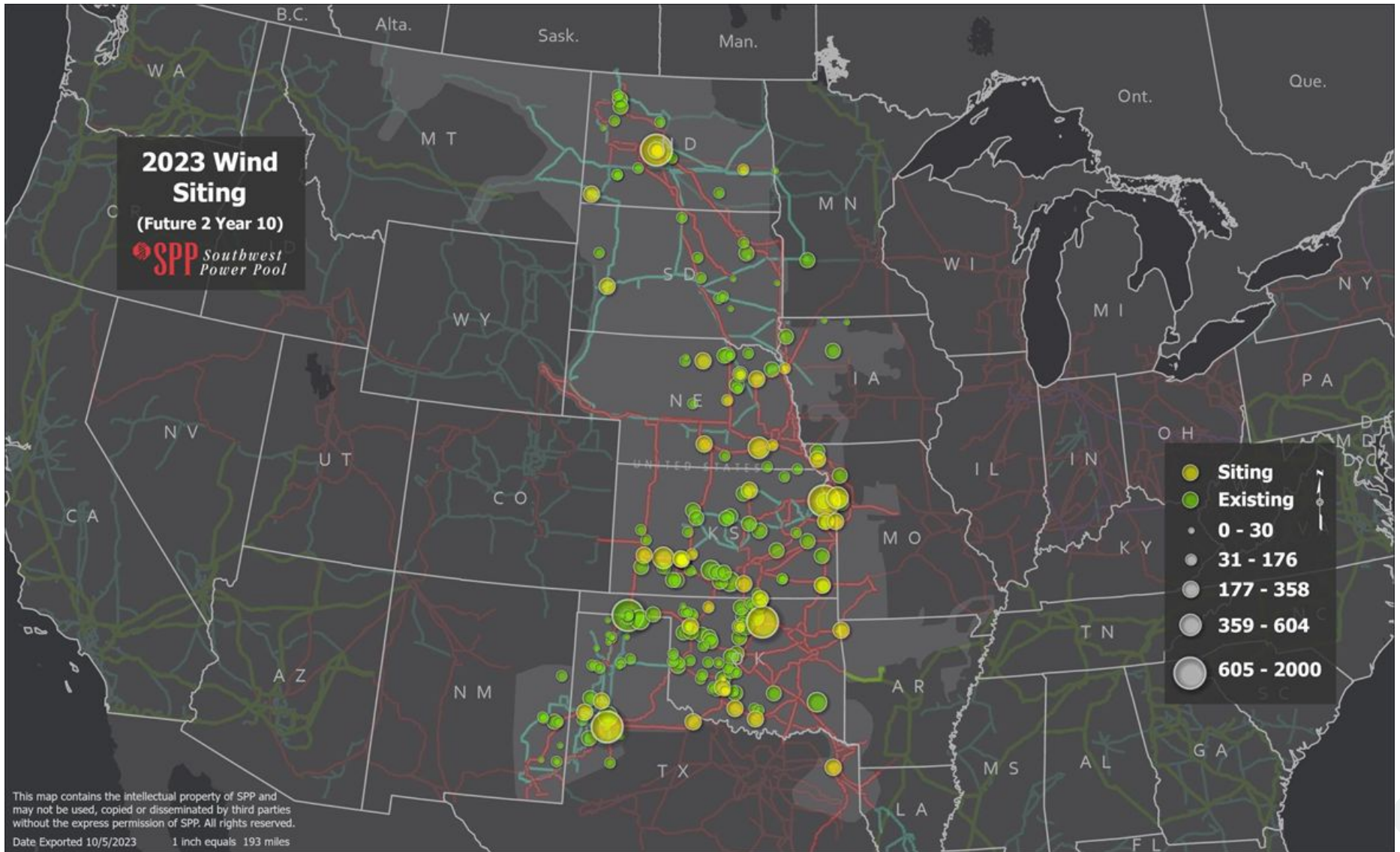
**\$464 Million**

# APPENDIX

# 2023 ITP







# RELIABILITY - NOTIFICATIONS TO CONSTRUCT (CONT.)

NTCs required to be issued within 45 days of Board approval

Project Description	Need Date	Lead Time (months)	NTC/ NTC-C <sup>1</sup>
Broadland 345 kV 75 MVAR reactor	4/1/2024	24	NTC
Extend Craig-West Gardner 345 kV, Clearview-Eudora 115 kV Tap, new 345/115 kV substation	4/1/2025	42	NTC-C
Cunningham-Quahada 115 kV tap line-Buckeye Tap 115 kV new line	6/1/2024	48	NTC-C
Devaul 115 kV 15 MVAR reactor	4/1/2024	24	NTC
Flournoy-Oak Pan-Harr-Longwood 138 kV rebuild	6/1/2028	24	NTC-C
Fort Peck-Dawson County 230kV 40 MVAR line reactor	6/1/2024	24	NTC
Groton 345 kV 68 MVAR reactor	4/1/2024	24	NTC
Kerr-Maid 161 kV circuit 1 and 2 rebuild	4/1/2024	24	NTC-C
Lovington 40 MVAR Reactor	1/1/2030	24	No
Moore Co 115 kV terminal equipment	6/1/2027	18	NTC
Newman Grace Tap and Woodward Nitrogen 69 kV terminal equipment	6/1/2024	18	NTC
Replace Turk 138/115 kV circuit 1 transformer	6/1/2024	24	NTC
Seminole 345/138 kV new transformer	6/1/2024	24	NTC
Pennsylvania-Southgate-Westmoore 138 kV extend line	6/1/2027	24	NTC
Sundown Interchange 115 kV terminal equipment	6/1/2030	18	No

<sup>1</sup> NTCs subject to upgrade determination as defined in Attachment Y section 1

\* Persistent Operational Projects

# ECONOMIC - NOTIFICATIONS TO CONSTRUCT

NTCs required to be issued within 45 business days of Board approval

Project Description	Need Date	Lead Time (months)	NTC/ NTC-C <sup>1</sup>
70th & Bluff-Sub 1214 161 kV raise line and transformer replacement	1/1/2027	24	NTC
87th Street 345/115 kV new circuit 2 transformer	4/1/2025	24	NTC
Alliance-Victory Hill 115 kV new line	1/1/2025	42	No
Anadarko-Gracemont 138 kV circuit 2 and 3 new line*	11/14/2023	42	NTC-C
Anadarko-Southwestern 138 kV terminal equipment	1/1/2025	18	NTC
Arcadia-Seminole 345 kV and Draper Lake-Seminole 345 kV tap line at Horseshoe Lake	1/1/2025	42	No
Matthewson-Redbud 345 kV	1/1/2025	48	NTC-C
Benton-Wichita 345 kV terminal equipment*	11/14/2023	18	NTC
Blackberry-Neosho 345 kV terminal equipment	1/1/2025	18	NTC
Butler-Midian 138 kV terminal equipment	1/1/2025	18	NTC
Chisholm Creek-Lone Oak 138 kV new line	1/1/2032	42	No
Cimarron and Czech Hall 138 kV terminal equipment	1/1/2025	18	NTC
Cleo Corner-Okeene 138 kV new line	1/1/2032	42	No

<sup>1</sup> NTCs subject to upgrade determination as defined in Attachment Y section 1

\* Persistent Operational Projects

## ECONOMIC - NOTIFICATIONS TO CONSTRUCT

NTCs required to be issued within 45 business days of Board approval

Project Description	Need Date	Lead Time (months)	NTC/ NTC-C <sup>1</sup>
Cleveland 138 kV Terminal Equipment*	11/14/2023	18	No <sup>2</sup>
Craig-Lenexa South 161 kV circuit 2 terminal equipment	1/1/2025	18	NTC
Ellsworth Tap-Great Bend 115 kV structures	1/1/2028	18	NTC
Fitzgerald Creek-Kenzie 138 kV line tap at Valley	1/1/2025	24	NTC
Fort Thompson 345/230 kV transformer*	11/14/2023	24	NTC
Franklin 161/69 kV circuit 2 transformer	1/1/2025	24	NTC
Fremont/Sub 976 115/69 kV transformer	1/1/2025	24	NTC
Gavins Point-Yankton 115 kV rebuild line	1/1/2025	30	NTC
Gerald Gentleman Station-Ogallala 230 kV terminal equipment*	11/14/2023	18	NTC
Huron B Tap-Huron-Huron West Park 115 kV rebuild	1/1/2025	30	NTC
Osage-Shidler-Webb City Tap 138 kV rebuild*	11/14/2023	36	NTC
Pine & Peoria Tap-46th Street Tap - Tulsa North 138 kV rebuild	1/1/2025	30	NTC
Potter County 345/230 kV circuit 1 and 2 transformer replacement*	11/14/2023	24	NTC-C

<sup>1</sup> NTCs subject to upgrade determination as defined in Attachment Y section 1

<sup>2</sup> Upgrades to non-SPP tariff facilities will be coordinated with AECl

\* Persistent Operation Projects

# SHORT CIRCUIT - NOTIFICATIONS TO CONSTRUCT

NTCs required to be issued within 45 business days of Board approval

Project Description	Need Date	Lead Time (months)	NTC/ NTC-C*
Blue Valley 161 kV breaker	6/1/2024	18	NTC
Craig 161 kV five breakers	6/1/2024	18	NTC
Lightning Creek 138 kV two breakers	6/1/2024	18	NTC

\* NTCs subject to upgrade determination as defined in Attachment Y section 1

# FUTURE 1 RATE IMPACTS RESULTS (BY ZONE)– BASE MODEL (ESTIMATED)

Zone	One-Year ATRR Costs 2032 (\$thousands)	One-Year Benefit 2032 (\$thousands)	Rate Impact-Cost	Rate Impact Benefit	Net Impact (2023\$)
AEPW	\$10,420.55	\$35,973.78	\$0.21	\$0.73	(\$0.52)
EMDE	\$755.98	(\$1,097.82)	\$0.13	(\$0.18)	\$0.31
GMO	\$1,235.34	\$2,127.03	\$0.11	\$0.19	(\$0.08)
GRDA	\$2,974.35	\$25,952.80	\$0.31	\$2.70	(\$2.39)
KACY	\$292.22	\$921.27	\$0.11	\$0.36	(\$0.24)
KCPL	\$2,475.80	\$16.74	\$0.14	\$0.00	\$0.14
LES	\$1,305.85	\$785.71	\$0.37	\$0.22	\$0.15
MIDW	\$237.75	(\$3,763.73)	\$0.10	(\$1.64)	\$1.75
NPPD	\$8,614.05	\$2,489.35	\$0.46	\$0.13	\$0.33
OKGE	\$8,563.28	\$19,889.67	\$0.24	\$0.56	(\$0.32)
OPPD	\$1,640.87	\$9,929.77	\$0.09	\$0.56	(\$0.47)
SPRM	\$422.60	\$606.65	\$0.13	\$0.19	(\$0.06)
SPS	\$6,184.20	\$18,403.60	\$0.21	\$0.63	(\$0.42)
SUNC	\$770.66	(\$8,820.24)	\$0.12	(\$1.35)	\$1.47
SWPA	\$247.30	(\$759.77)	\$0.07	(\$0.23)	\$0.30
UMZ	\$5,724.30	\$67,650.83	\$0.12	\$1.45	(\$1.32)
WERE	\$4,274.33	(\$4,239.84)	\$0.14	(\$0.14)	\$0.29
WFEC	\$2,786.54	\$6,663.08	\$0.21	\$0.50	(\$0.29)
<b>TOTAL</b>	<b>\$58,925.97</b>	<b>\$172,728.88</b>	<b>\$0.19</b>	<b>\$0.56</b>	<b>(\$0.37)</b>

- 1) Zonal costs are based on the allocated Annual Transmission Revenue Requirements.
- 2) All Values are adjusted for inflation to 2023 dollars.
- 3) Monthly impact on residential customer using 1,000 kWh.

Average regional decrease of \$0.37 on residential utility bill

# FUTURE 1 RATE IMPACTS RESULTS (BY STATE)– BASE MODEL (ESTIMATED)

State	One-Year ATRR Costs 2032 (\$thousands)	One-Year Benefit 2032 (\$thousands)	Rate Impact-Cost	Rate Impact Benefit	Net Impact (2023\$)
Arkansas	\$3,252.68	\$9,434.70	\$0.21	\$0.60	(\$0.39)
Colorado	\$19.63	\$153.66	\$0.16	\$1.28	(\$1.12)
Iowa	\$1,027.86	\$10,122.37	\$0.14	\$1.38	(\$1.24)
Kansas	\$7,078.79	(\$13,788.53)	\$0.14	(\$0.27)	\$0.41
Louisiana	\$1,396.00	\$4,819.25	\$0.21	\$0.73	(\$0.52)
Minnesota	\$196.53	\$2,269.07	\$0.12	\$1.43	(\$1.31)
Missouri	\$3,711.33	\$1,163.89	\$0.12	\$0.04	\$0.08
Montana	\$297.93	\$3,521.01	\$0.12	\$1.45	(\$1.32)
Oklahoma	\$16,873.62	\$61,734.31	\$0.24	\$0.86	(\$0.63)
Nebraska	\$11,442.98	\$14,003.65	\$0.28	\$0.35	(\$0.06)
New Mexico	\$2,442.87	\$6,948.22	\$0.21	\$0.60	(\$0.39)
North Dakota	\$2,522.50	\$29,811.40	\$0.12	\$1.45	(\$1.32)
South Dakota	\$1,784.04	\$20,996.62	\$0.12	\$1.44	(\$1.32)
Texas	\$6,879.20	\$21,539.25	\$0.21	\$0.66	(\$0.45)
Wyoming	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>TOTAL</b>	<b>\$58,925.97</b>	<b>\$172,728.88</b>	<b>\$0.19</b>	<b>\$0.56</b>	<b>(\$0.37)</b>

Average regional decrease of \$0.37 on residential utility bill

State level results are based on load allocations by zone, by state. For example, 21.1% of American Electric Power (AEP) load is in Arkansas, so 21.1% of AEP benefits are attributed to Arkansas.



# FUTURE 2 RATE IMPACTS RESULTS (BY ZONE)– BASE MODEL (ESTIMATED)

Zone	One-Year ATRR Costs 2032 (\$thousands)	One-Year Benefit 2032 (\$thousands)	Rate Impact-Cost	Rate Impact Benefit	Net Impact (2023\$)
AEPW	\$10,420.55	\$40,352.52	\$0.21	\$0.81	(\$0.60)
EMDE	\$755.98	(\$643.46)	\$0.13	(\$0.11)	\$0.24
GMO	\$1,235.34	\$4,633.95	\$0.11	\$0.42	(\$0.31)
GRDA	\$2,974.35	\$27,693.25	\$0.31	\$2.88	(\$2.57)
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MIDW	\$237.75	(\$3,469.19)	\$0.10	(\$1.51)	\$1.62
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SPS	\$6,184.20	\$5,418.83	\$0.21	\$0.19	\$0.03
SUNC	\$770.66	(\$5,668.18)	\$0.12	(\$0.87)	\$0.98
SWPA	\$247.30	(\$613.34)	\$0.07	(\$0.19)	\$0.26
UMZ	\$5,724.30	\$36,746.11	\$0.12	\$0.79	(\$0.66)
WERE	\$4,274.33	(\$5,763.57)	\$0.14	(\$0.19)	\$0.34
WFEC	\$2,786.54	\$6,954.27	\$0.21	\$0.52	(\$0.31)
<b>TOTAL</b>	<b>\$58,925.97</b>	<b>\$160,236.96</b>	<b>\$0.19</b>	<b>\$0.52</b>	<b>(\$0.33)</b>

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Colorado	\$19.63	\$80.17	\$0.16	\$0.67	(\$0.51)
Iowa	\$1,027.86	\$5,413.16	\$0.14	\$0.74	(\$0.60)
Kansas	\$7,078.79	(\$8,576.29)	\$0.14	(\$0.17)	\$0.31
Louisiana	\$1,396.00	\$5,405.85	\$0.21	\$0.81	(\$0.60)
Minnesota	\$196.53	\$1,245.29	\$0.12	\$0.79	(\$0.66)
Missouri	\$3,711.33	\$5,838.76	\$0.12	\$0.19	(\$0.07)
Montana	\$297.93	\$1,912.52	\$0.12	\$0.79	(\$0.66)
Oklahoma	\$16,873.62	\$73,928.60	\$0.24	\$1.03	(\$0.80)
Nebraska	\$11,442.98	\$19,012.33	\$0.28	\$0.47	(\$0.19)
New Mexico	\$2,442.87	\$3,031.06	\$0.21	\$0.26	(\$0.05)
North Dakota	\$2,522.50	\$16,192.75	\$0.12	\$0.79	(\$0.66)
South Dakota	\$1,784.04	\$11,401.13	\$0.12	\$0.78	(\$0.66)
Texas	\$6,879.20	\$13,860.10	\$0.21	\$0.42	(\$0.21)
Wyoming	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>TOTAL</b>	<b>\$58,925.97</b>	<b>\$160,236.96</b>	<b>\$0.19</b>	<b>\$0.52</b>	<b>(\$0.33)</b>

Average regional decrease of \$0.33 on residential utility bill

State level results are based on load allocations by zone, by state. For example, 21.1% of American Electric Power (AEP) load is in Arkansas, so 21.1% of AEP benefits are attributed to Arkansas.



# INTEGRATED MARKETPLACE UPDATE

ANTOINE LUCAS

VICE PRESIDENT, MARKETS

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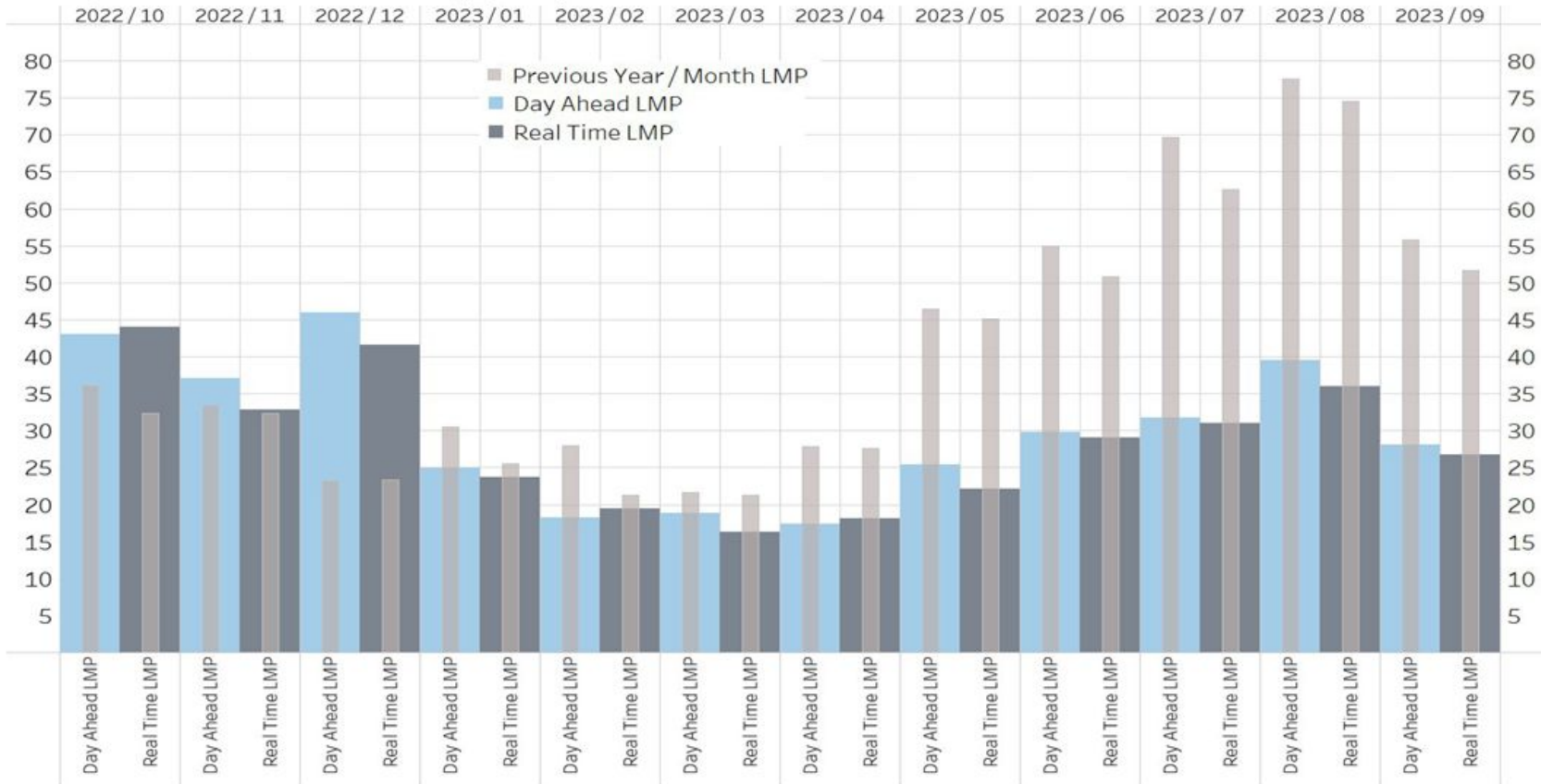


## MARKETPLACE HIGHLIGHTS

- Day-ahead prices increased from an average of \$24.17/MWh in Q2 2023 to \$33.13/MWh in Q3 2023, an increase of 37%.
- Real-time prices increased from an average of \$23.11/MWh in Q2 to \$31.26/MWh in Q3, an increase of 35%.
- Total revenue neutrality uplift (RNU) for Q3 decreased 36% from Q2
  - Mostly attributed to a reduction of the Real Time Congestion component
  - Implemented changes to improve modeling alignment
- New Operational peaks set during the quarter
  - New Historical Max Load record: 56,184 MW on 8/21/23 at 4:27:36 PM
  - New Historical Renewable record (Wind + Solar + Hydro + Waste): 25,024 MW on 9/4/23 at 8:54 PM
- SPP issued a Conservative Operations Advisory for its entire SPP Balancing Authority (BA) footprint in the Eastern Interconnection on 6 days in August

# MARKETPLACE PRICING

Average Settlement Location LMP (2 years)



# MARKETPLACE PRICING

Day Ahead - Average Settlement Location Price

		DA MEC	DA MLC	DA MCC	DA LMP
2023	January	26.72	-0.39	-1.46	24.87
	February	20.49	-0.38	-1.93	18.18
	March	21.03	-0.37	-1.84	18.82
	April	20.71	-0.33	-3.01	17.36
	May	27.19	-0.43	-1.36	25.41
	June	32.20	-0.50	-1.96	29.75
	July	33.64	-0.51	-1.39	31.74
	August	43.03	-0.71	-2.78	39.54
	September	32.57	-0.51	-3.94	28.12

RTBM - Average Settlement Location Price

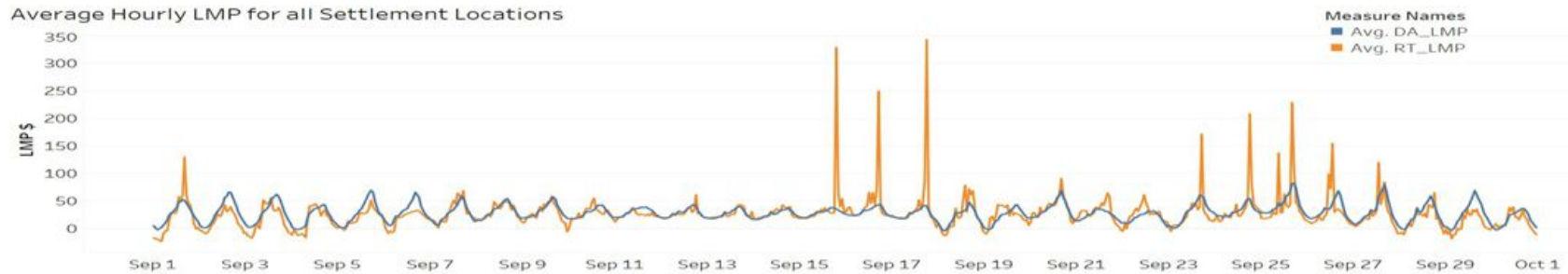
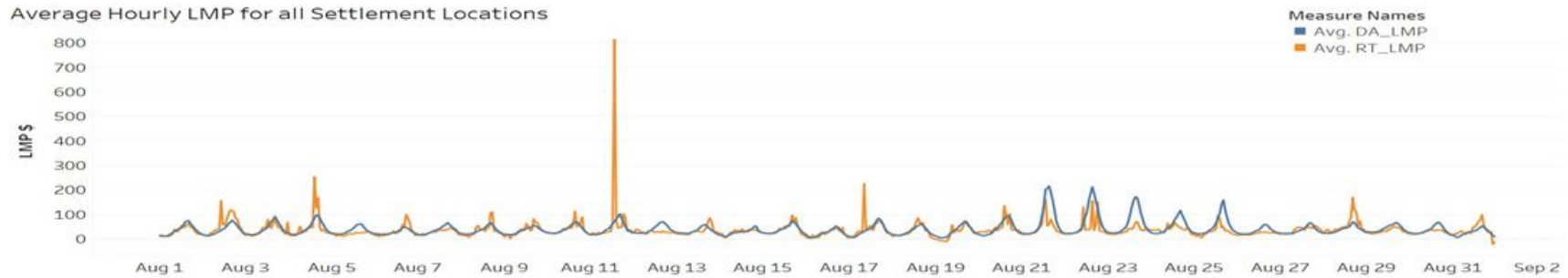
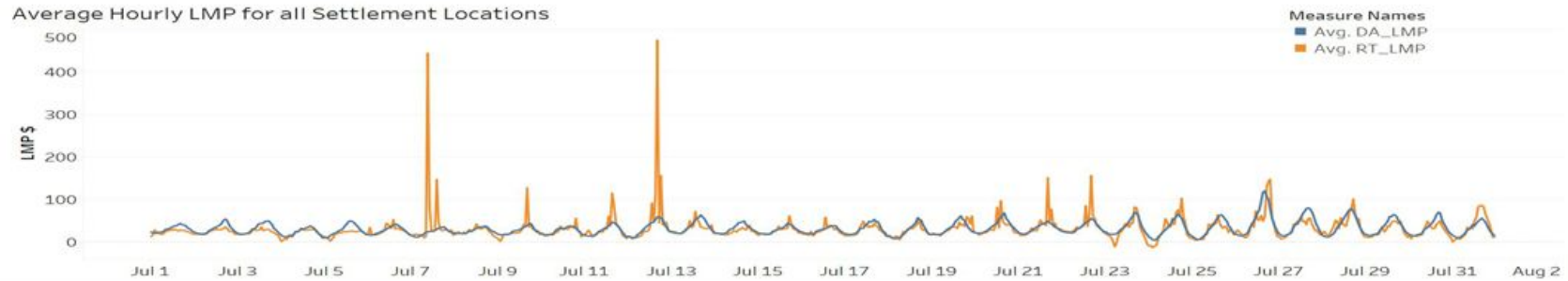
		RT MEC	RT MLC	RT MCC	RT LMP
2023	January	25.78	-0.39	-1.72	23.67
	February	22.40	-0.40	-2.51	19.49
	March	19.11	-0.34	-2.50	16.27
	April	23.34	-0.38	-4.81	18.16
	May	24.48	-0.44	-1.89	22.15
	June	31.26	-0.46	-1.77	29.04
	July	33.02	-0.48	-1.53	31.01
	August	40.26	-0.72	-3.57	35.98
	September	31.50	-0.53	-4.19	26.78

# REVENUE NEUTRALITY UPLIFT



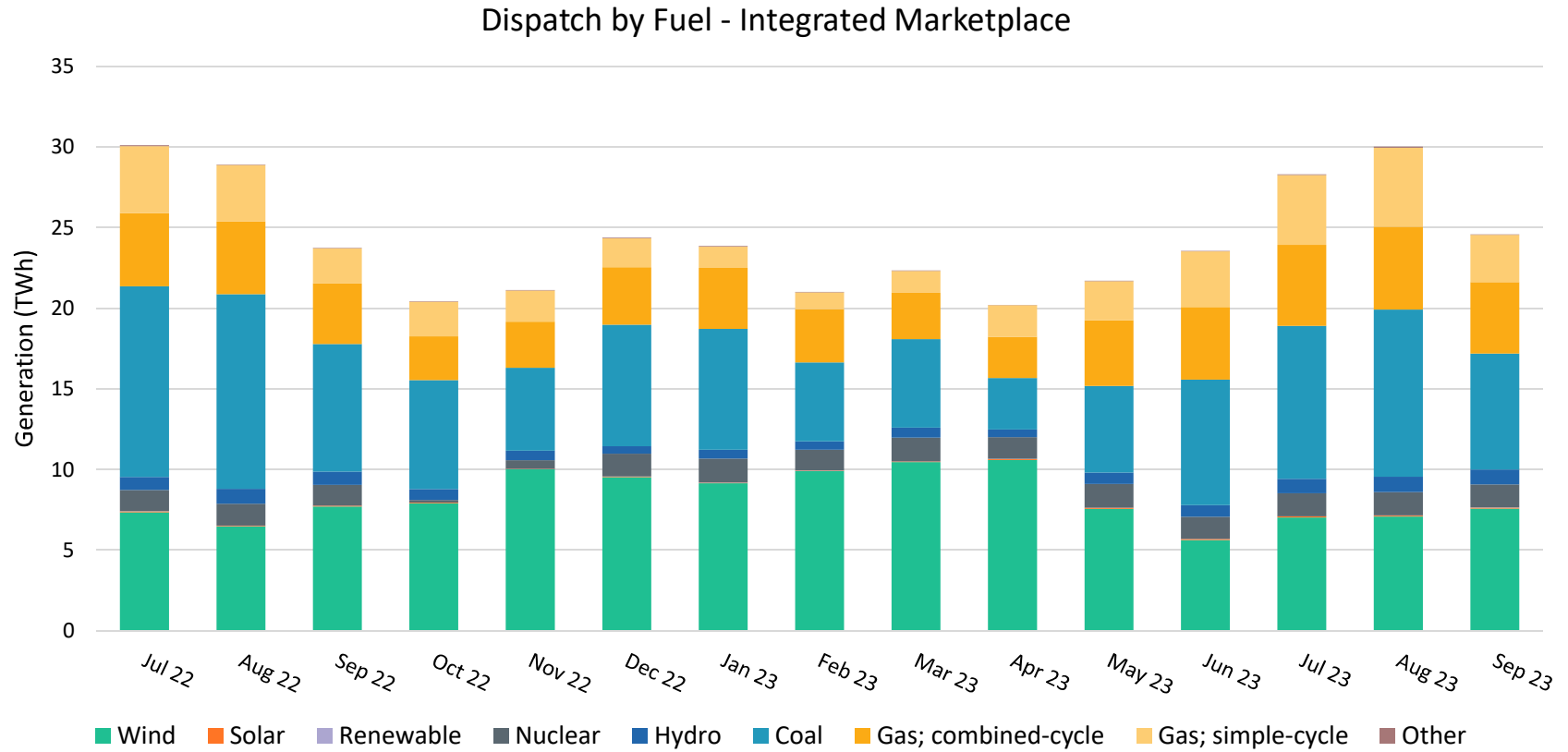
Source: MMU MWG Update for September

# DA/RT CONVERGENCE (JULY, AUGUST & SEPTEMBER)





# DISPATCH BY FUEL TYPE

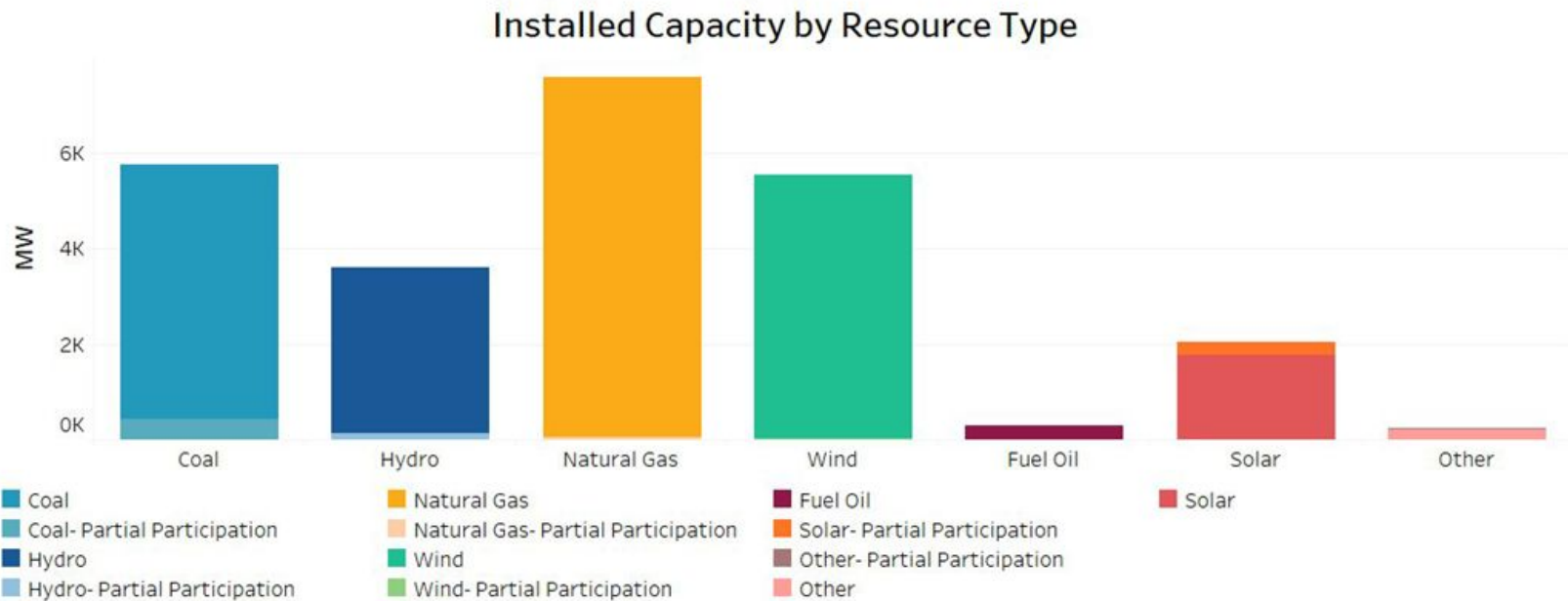


## MARKETPLACE OVER LAST 12 MONTHS

- 331 Market Participants
- SPP BA has successfully maintained NERC control performance standards (BAAL & CPS)
- High System availability
  - Day-Ahead Market results have posted 99.45 % on time in past 12 months and 100 % during Q3 2023
  - Real-Time Balancing Market has successfully solved 99.87 % of all intervals in the past 12 months and 99.94% during Q3 2023

# WESTERN ENERGY IMBALANCE SERVICE

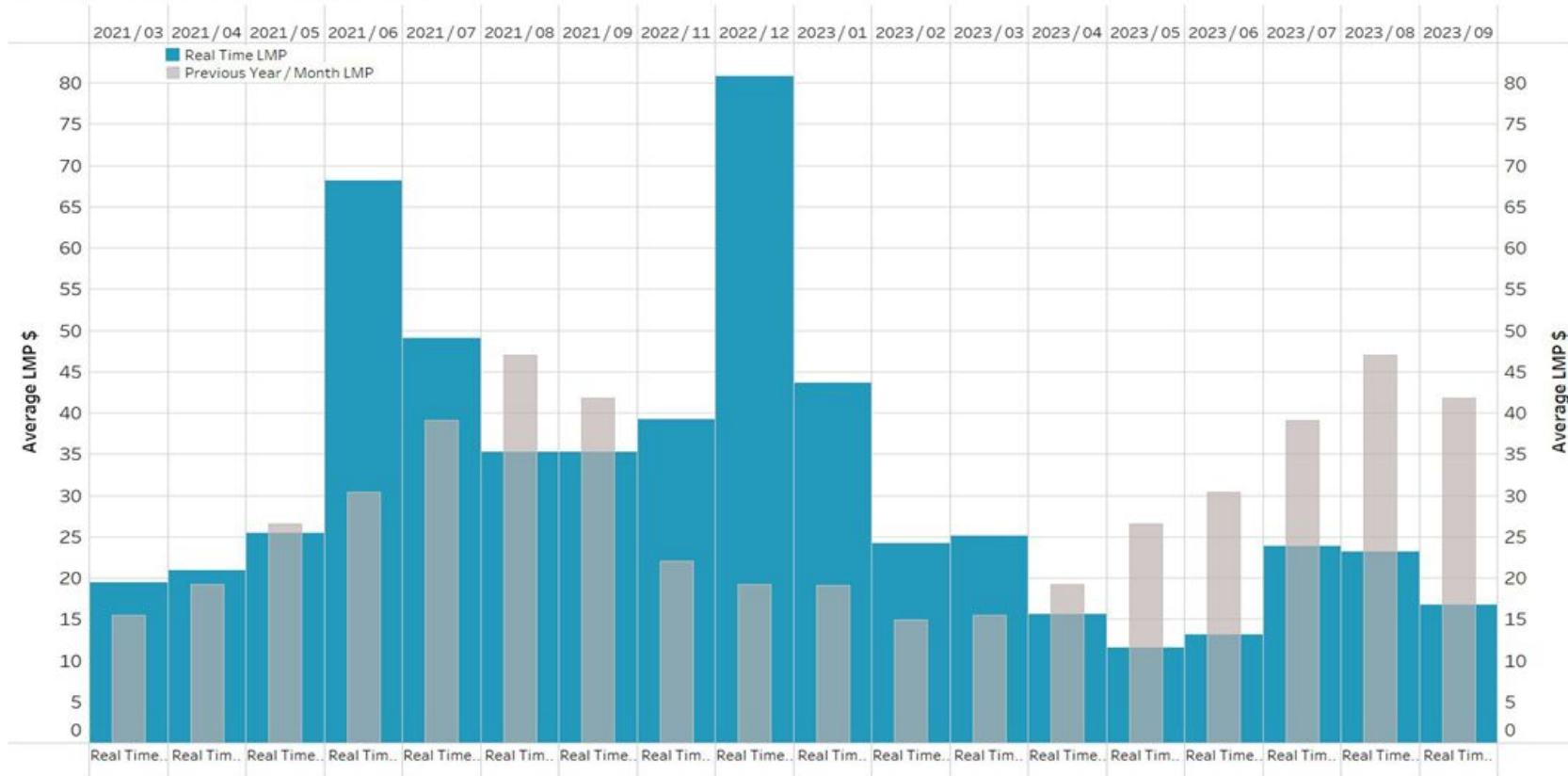
# WEIS MARKET INSTALLED CAPACITY



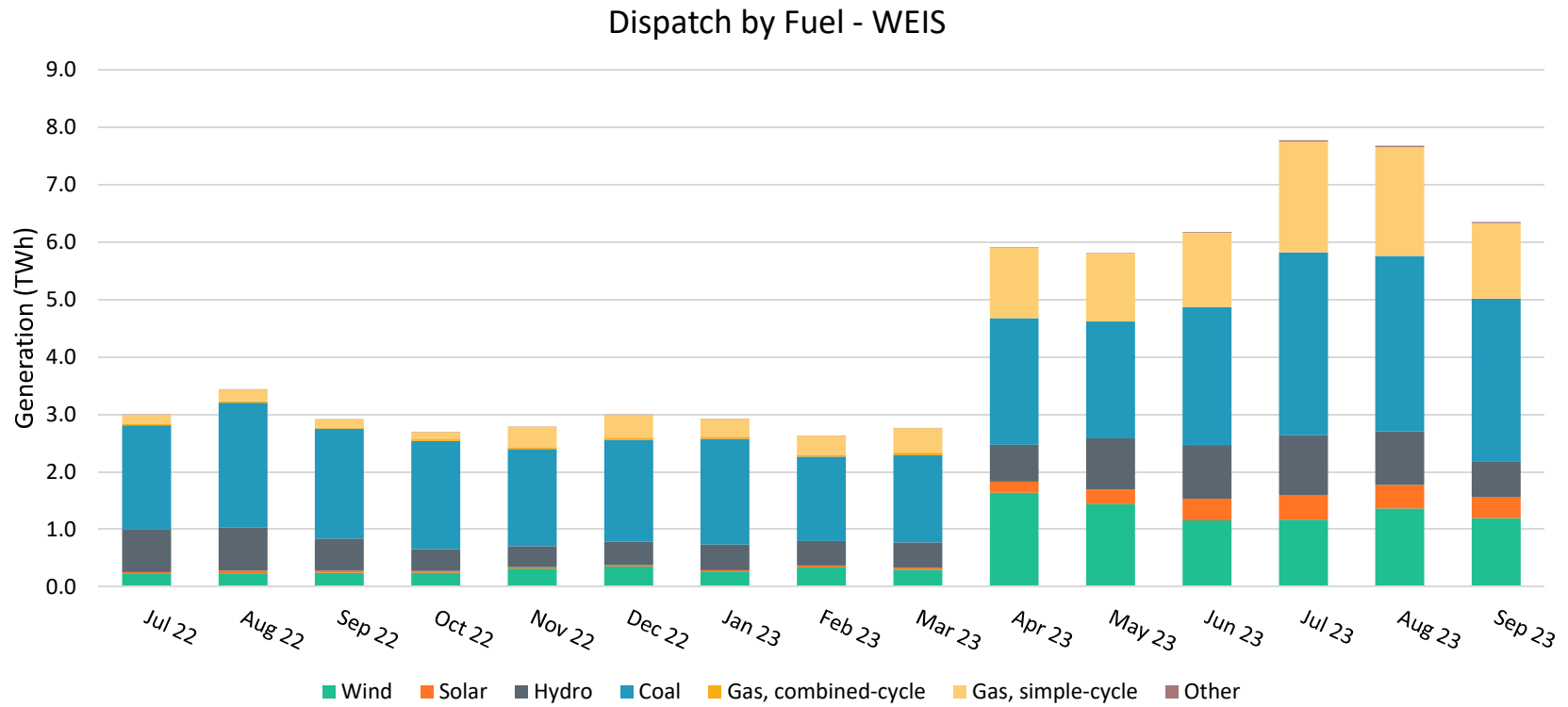
Resource Type	Full Participation	Partial Participation
Coal	5,328	422
Fuel Oil	292	
Hydro	3,454	142
Natural Gas	7,504	64
Other	225	16
Solar	1,773	254
Wind	5,509	30
<b>Total</b>	<b>24,086</b>	<b>927</b>

# WEIS PRICING

Average Settlement Location LMP (2 years)



# DISPATCH BY FUEL TYPE





**THANK YOU!**

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# OPERATIONS UPDATE 3Q 2023

BRUCE REW, PE

SENIOR VICE PRESIDENT, OPERATIONS

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# OPERATIONS METRICS THIRD QUARTER 2023

- **Load**
  - Load SPP BAA Summary
  - Weekly Averages
  - Net Load SPP BAA
- **Generation**
  - Generation outages
  - Wind Generation
  - Installed Capacity SPP BAA
- **Transmission**
  - Transmission outages
  - Congestion



# BALANCING AUTHORITY AREA: LOAD

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# MARKETPLACE OPERATIONAL HIGHLIGHTS

- SPP issued a Conservative Operations Advisory for its entire SPP Balancing Authority (BA) footprint in the Eastern Interconnection on the 3,4,11,21,22 and 25<sup>th</sup> of August.
- Historical Max Load
  - Current record: 56,184 MW at 8/21/23 4:27:36 PM
  - Previous record: 53,243 MW at 7/19/22 4:59 PM
- Historical Renewable (Wind + Solar + Hydro + Waste)
  - Current record: 25,024 MW at 9/4/23 8:54 PM
  - Previous record: 24,894 MW at 3/16/23 8:53:48 PM

Forecast Error	2023		2022
	Q3	Q2	Q3
Load	1.89%	1.72%	1.46%
Wind	3.64%	3.88%	3.13%
Solar	4.71%	5.19%	5.36%

Available Wind		
IM	33,525	MWs
WEIS	5,738	MWs

# LOAD SPP BAA

- **Winter 2022/2023 Load peak**

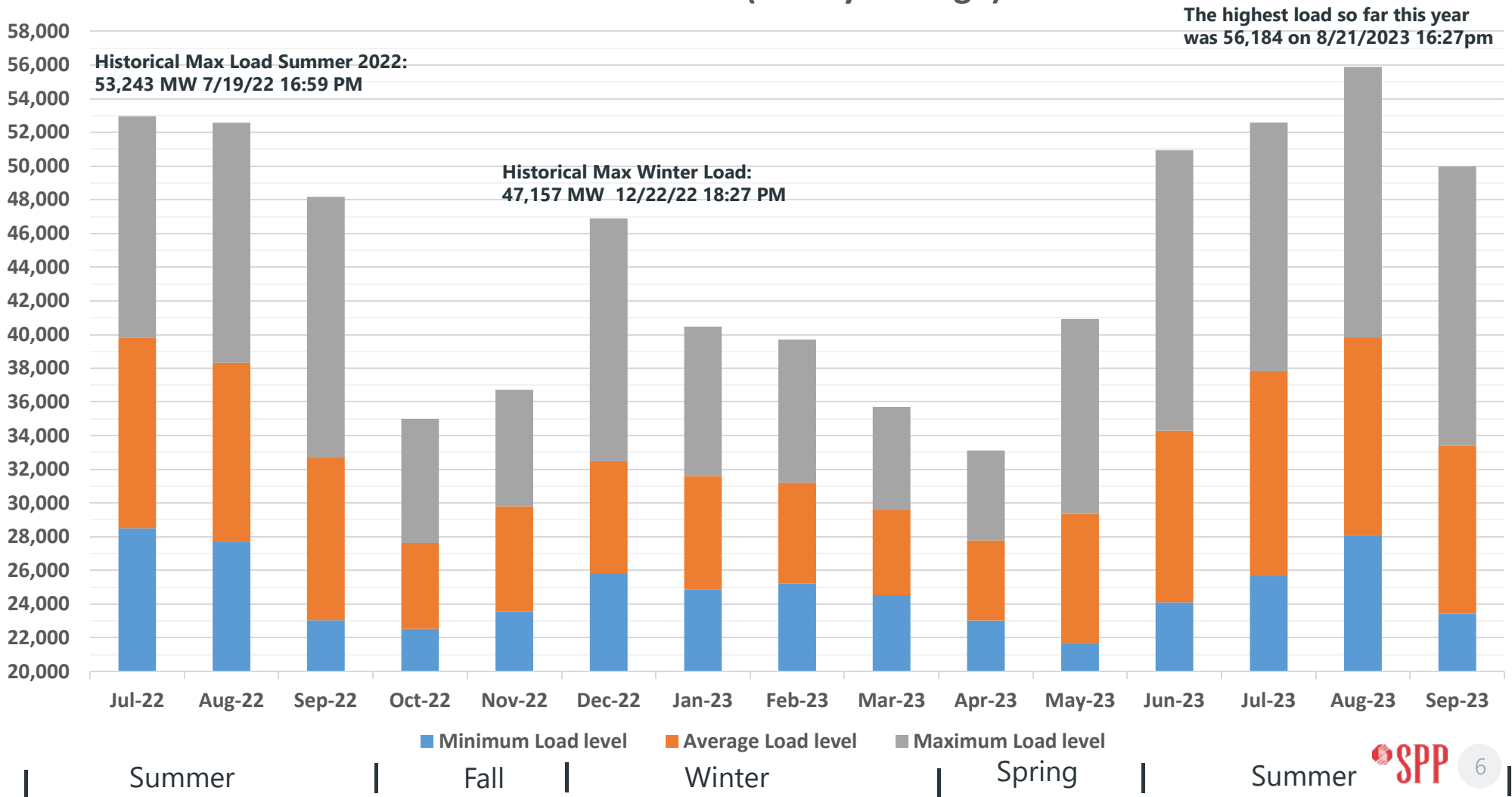
- Historical Max Winter Load (All-time BA Winter Load Nov - April): 47,157 MW 12/22/22 6:27 PM
- Historical Max RC Winter Load (All-time Winter RC Load Nov - April): 47,257 MW 12/22/22 6:27 PM

- **Summer 2023 Load peak**

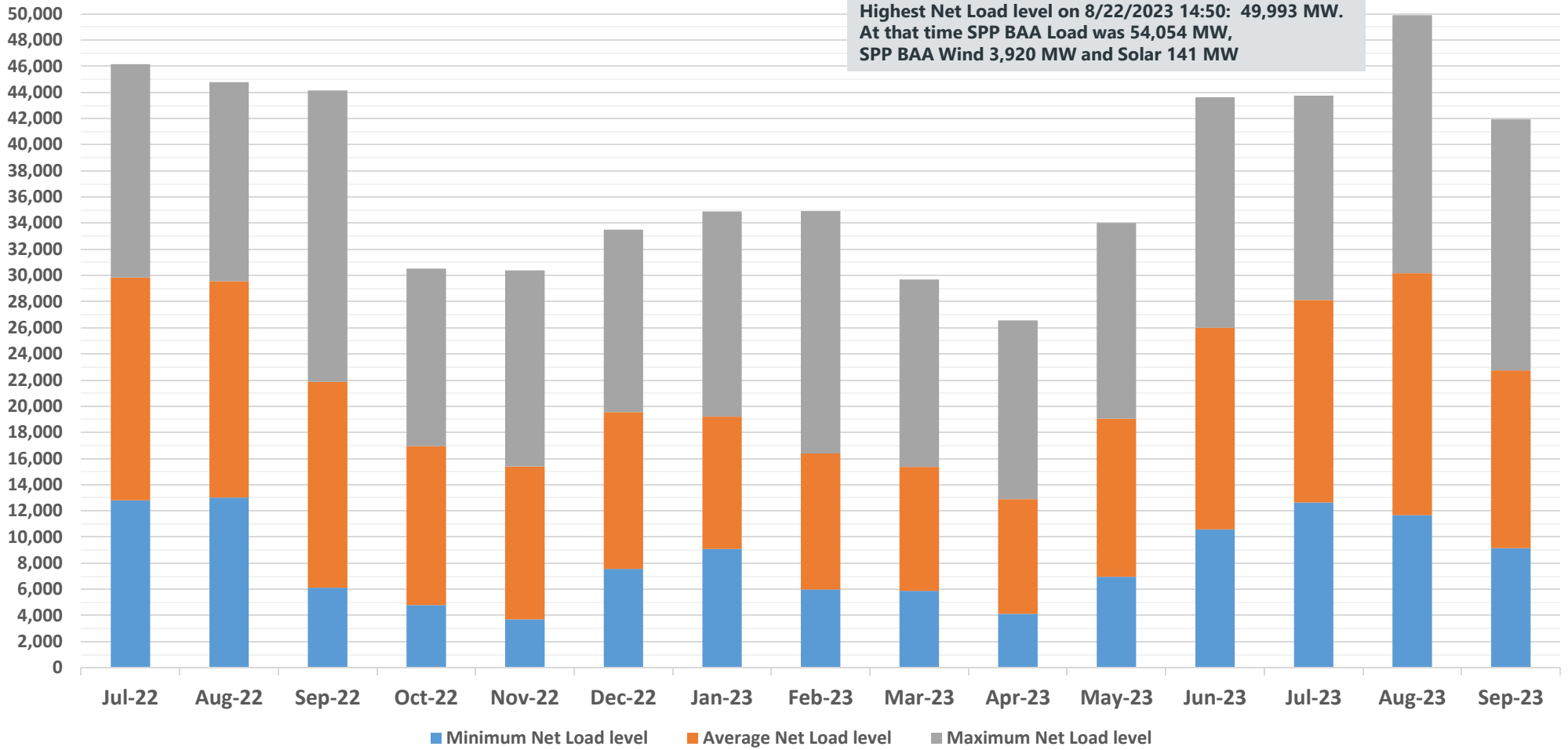
- Historical Max Load (All-time BA/Market Load) and Historical Max Summer Load (All-time BA Summer Load May - October): 56,184 MW 8/21/2023 16:27 pm
- Historical Max RC Load (All-time RC load) and Historical Max RC Summer Load (All-time Summer RC Load May - October): 56,215 MW 8/21/2023 16:27 pm

Winter Year	Winter 1 min data	Summer Year	Summer 1 min data
2016/2017	40,323	2016	50,622
2017/2018	43,584	2017	50,574
2018/2019	41,084	2018	49,685
2019/2020	39,258	2019	50,662
2020/2021	43,661	2020	48,835
2021/2022	41,328	2021	51,037
2022/2023	47,157	2022	53,243
2023/2024		2023	56,184

## SPP BAA Load (hourly average)



## SPP BAA Net Load (Load - Wind - Solar)



| Summer | Fall | Winter | Spring | Summer



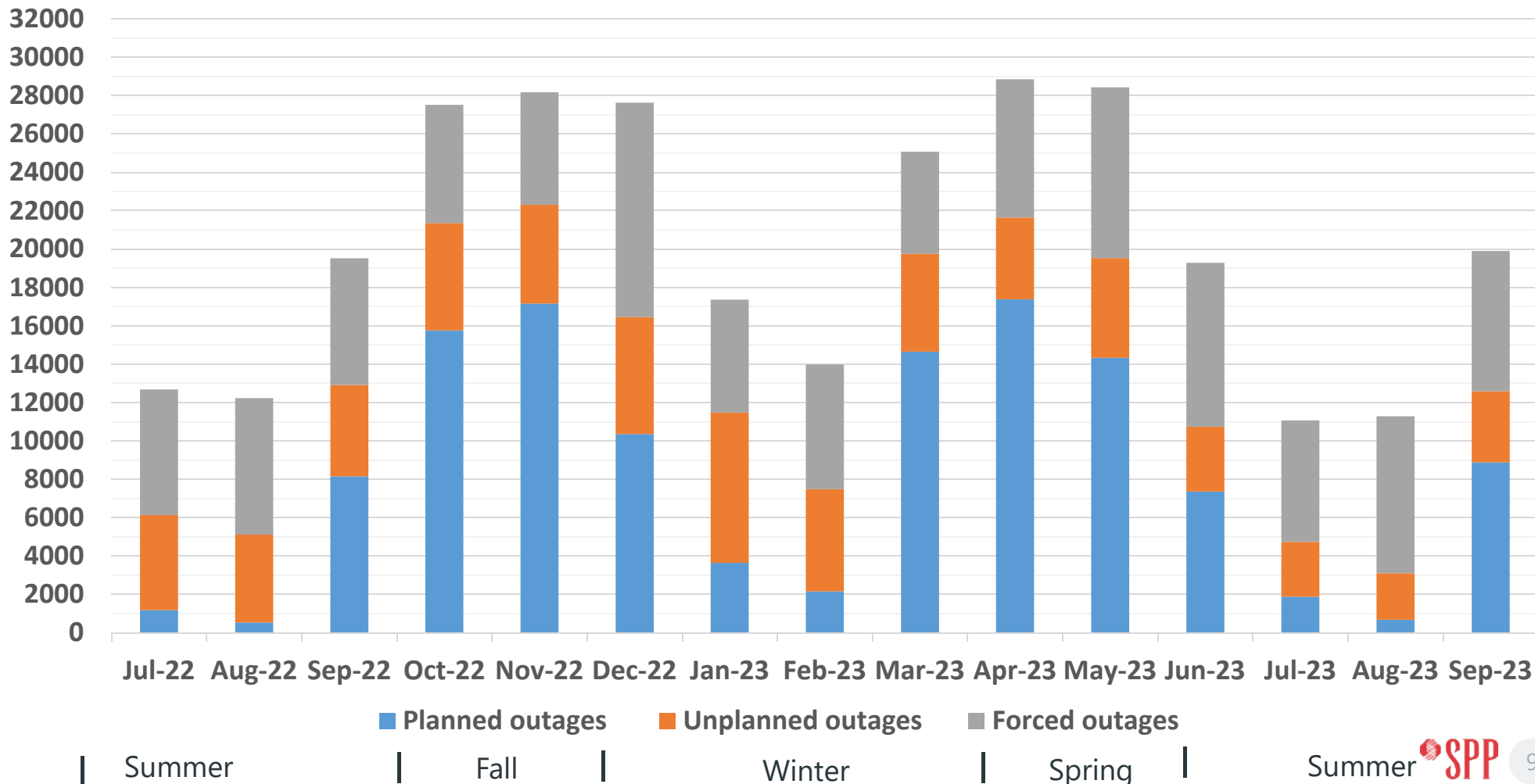


# BALANCING AUTHORITY AREA: GENERATION

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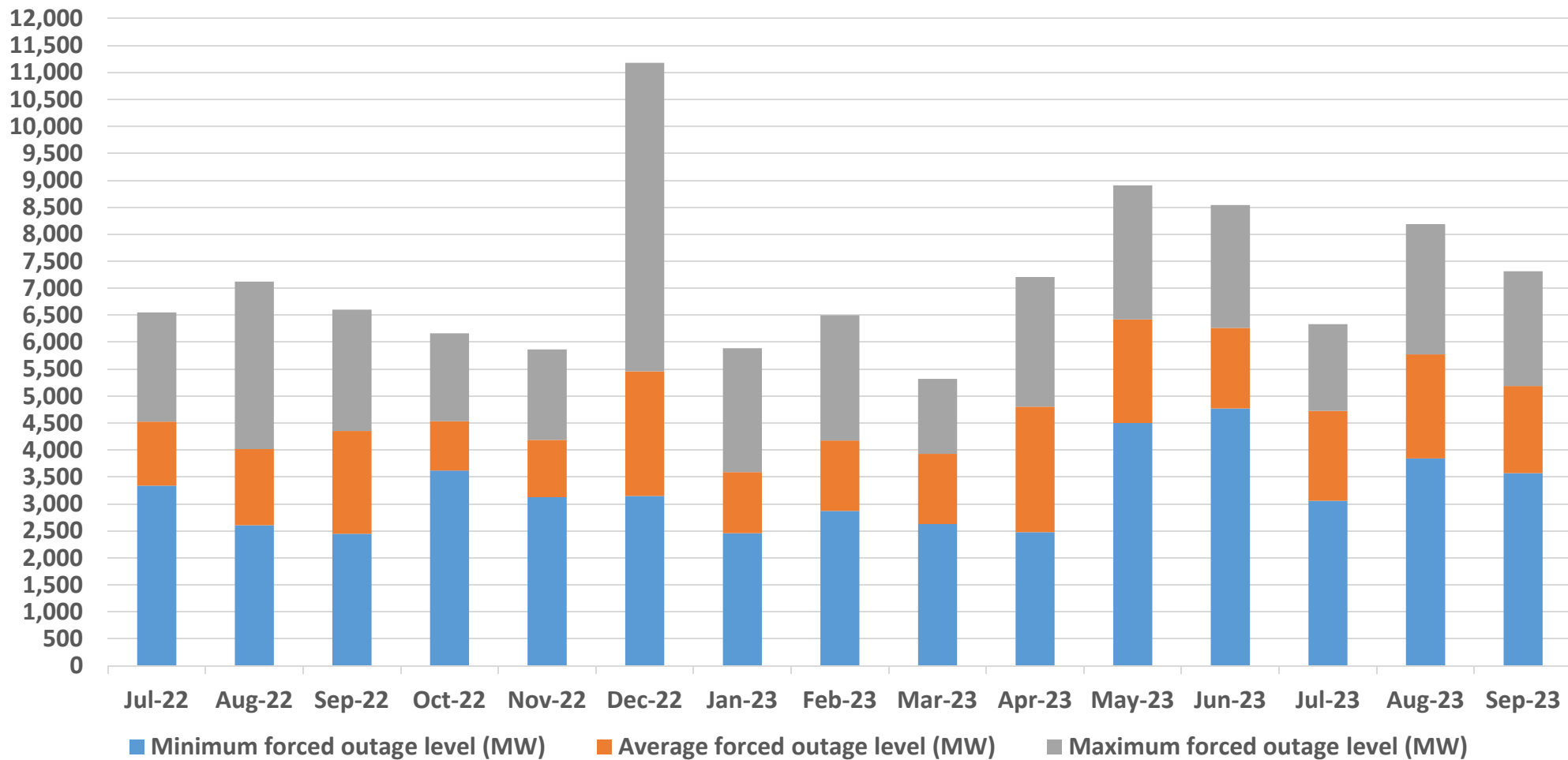


### SPP BAA: Generation outages (MW registered capacity)





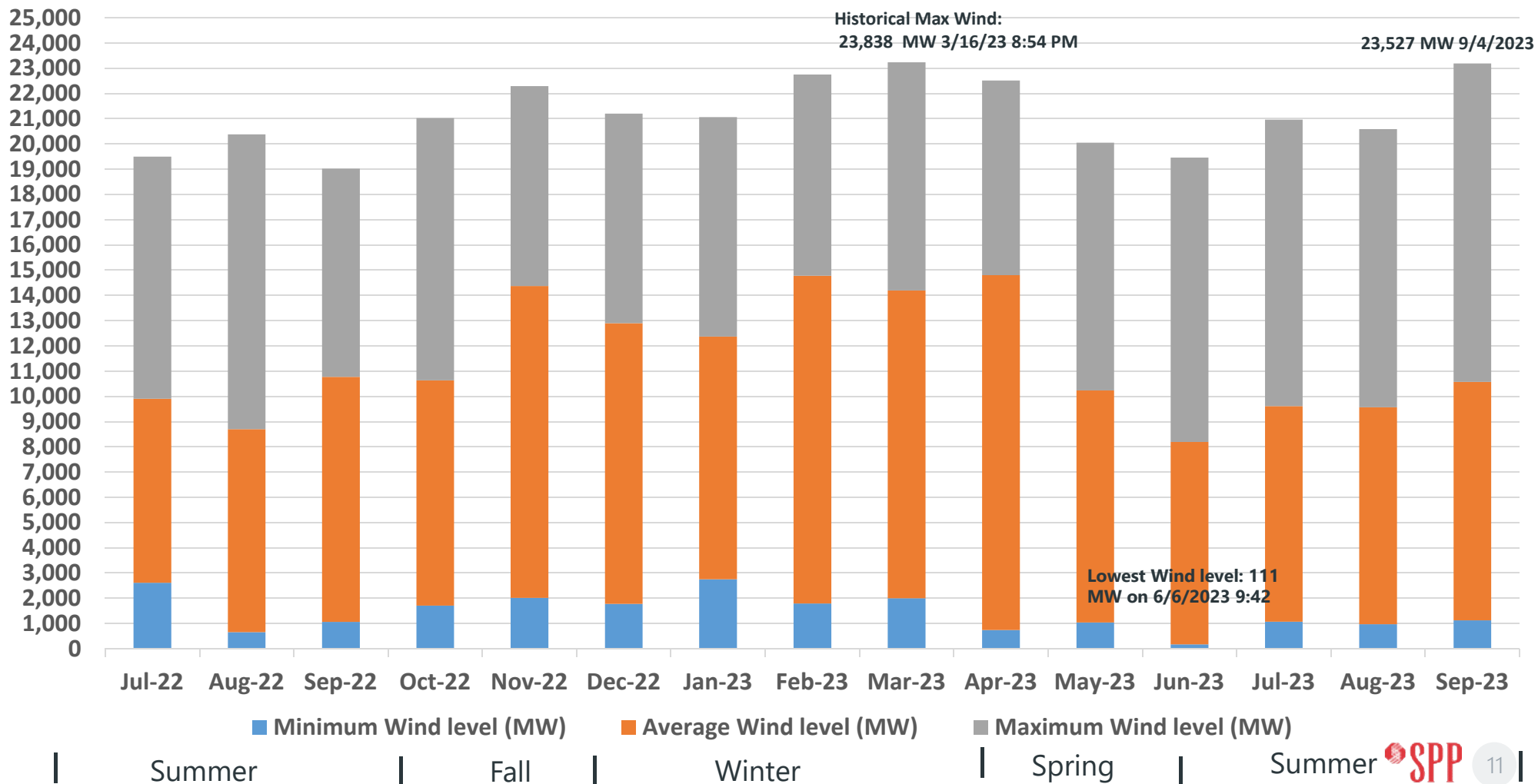
### SPP BAA: Forced outages levels SPP resource fleet (registered capacity)



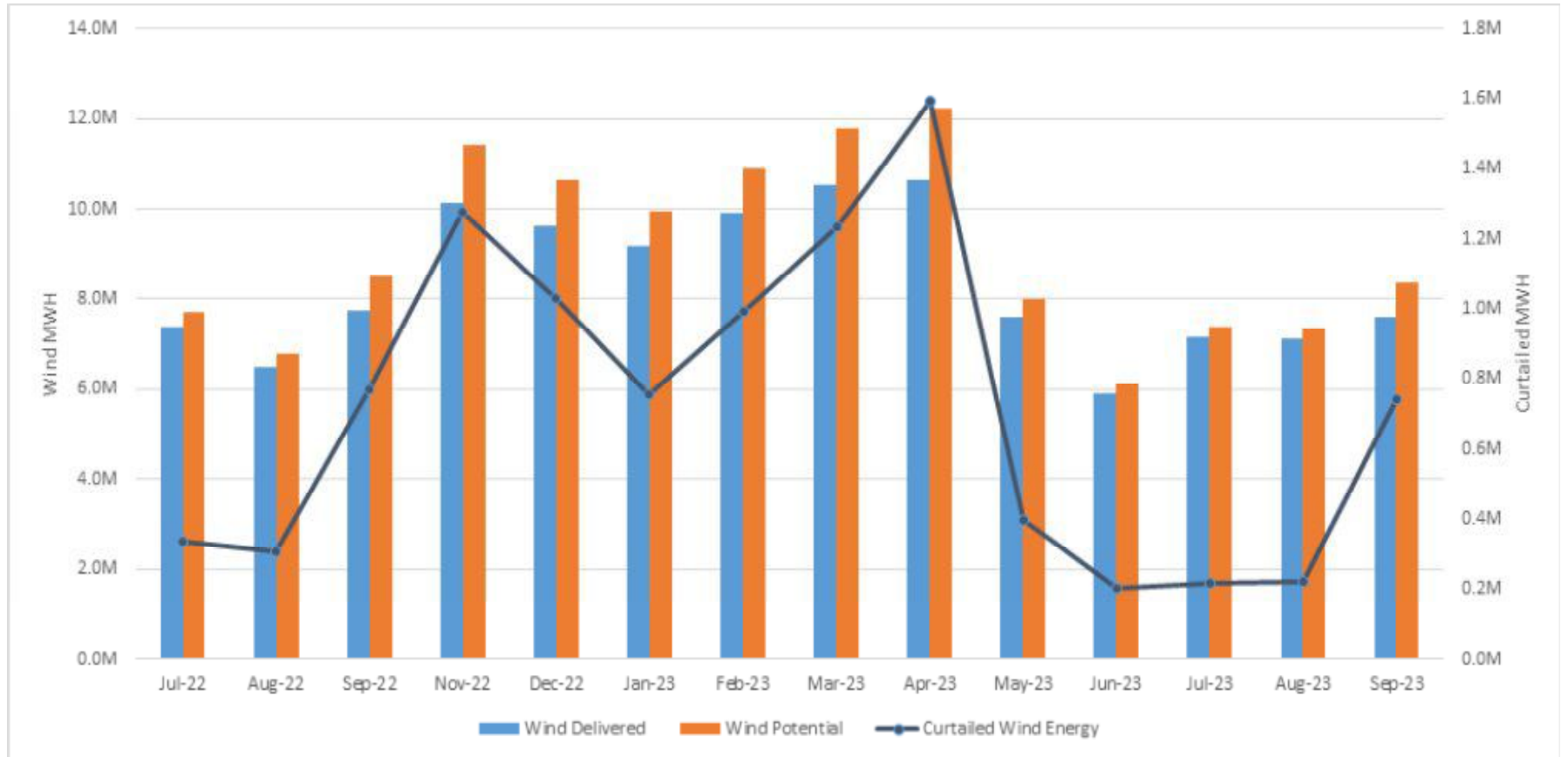
| Summer
| Fall
| Winter
| Spring
| Summer


10

### SPP BAA Wind generation hourly average



# WIND POTENTIAL VS DELIVERED



## WIND OUTPUT: JULY– OCTOBER 2023

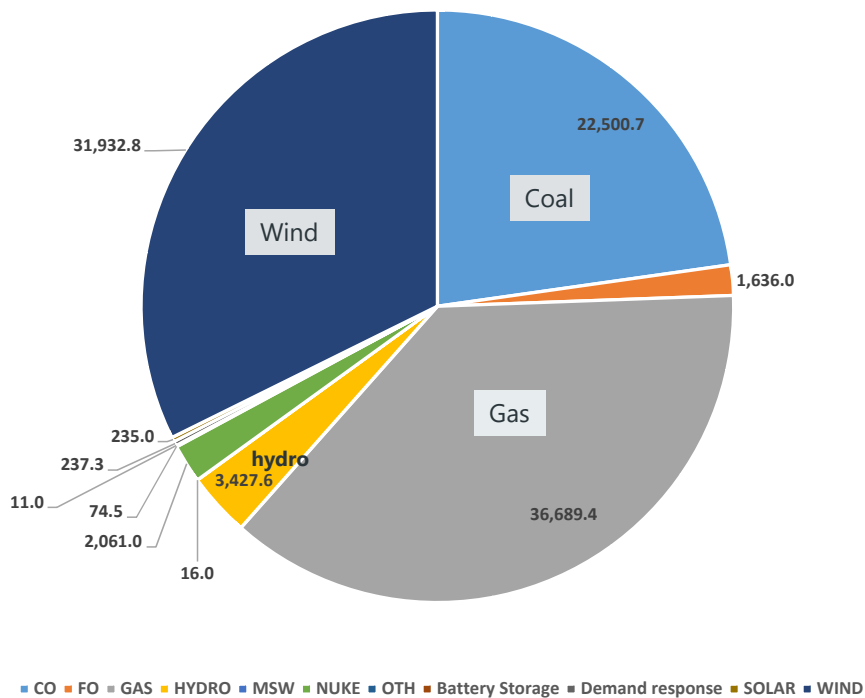
	@ Max Wind Output	@ Min Wind Output
MW Wind	23,555.03 MW	833.77 MW
Time	9/4/23 at 20:54:00	8/28/23 at 10:06:24
SPP Load	44,062.97 MW	36,039.27 MW
<i>Gen Mix Percent</i>		
Wind	51.69%	2.36%
Coal	20.51%	42.16%
Nat. Gas	20.20%	45.26%
Nuclear	4.35%	5.57%
Hydro	3.20%	4.25%
Other	0.05%	0.41%

## WIND PENETRATION: JULY– OCTOBER 2023

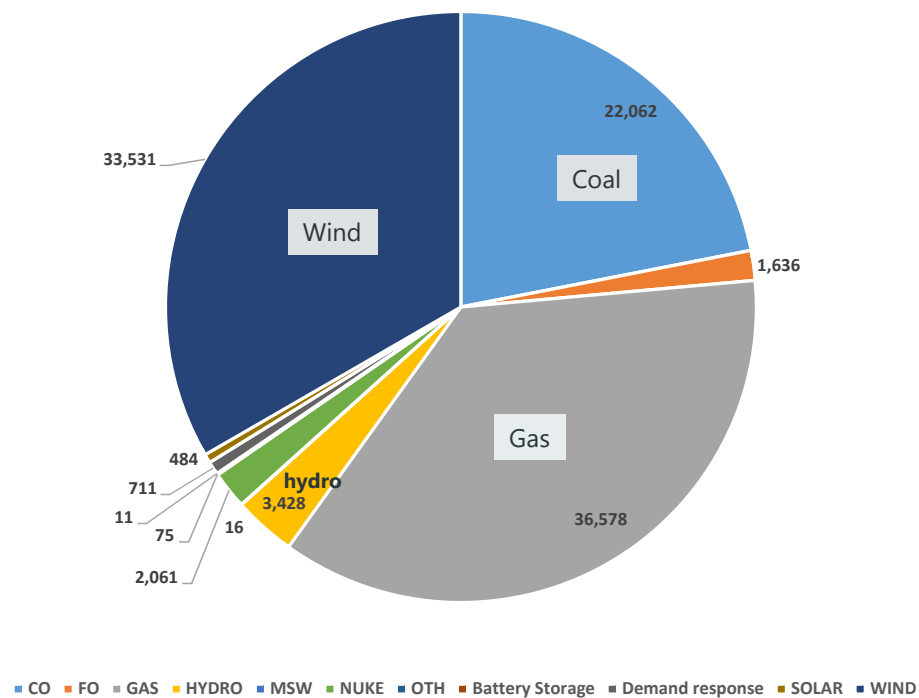
	Max Penetration	Min Penetration
Wind Penetration	64.8 % of load	2.31 % of load
Time	9/28/23 at 03:03:24	8/28/23 at 10:06:32
SPP Load	26,258.5 MW	36,044.25 MW
Wind Output	17,015.73 MW	836.68 MW
<i>Gen Mix Percent</i>		
Wind	57.12%	2.81%
Coal	17.28%	40.47%
Nat. Gas	16.02%	46.87%
Nuclear	6.72%	5.30%
Hydro	2.75%	4.03%
Other	0.09%	0.52%

Changes to fuel mix in last 12 Months	
Coal	-439 MW
GAS	-112 MW
Solar	+249 MW
Wind	+1,599 MW
Demand Response	+474MW

SPP BBA fleet: Registered Capacity 10/1/2022



SPP BBA fleet: Registered Capacity 10/1/2023

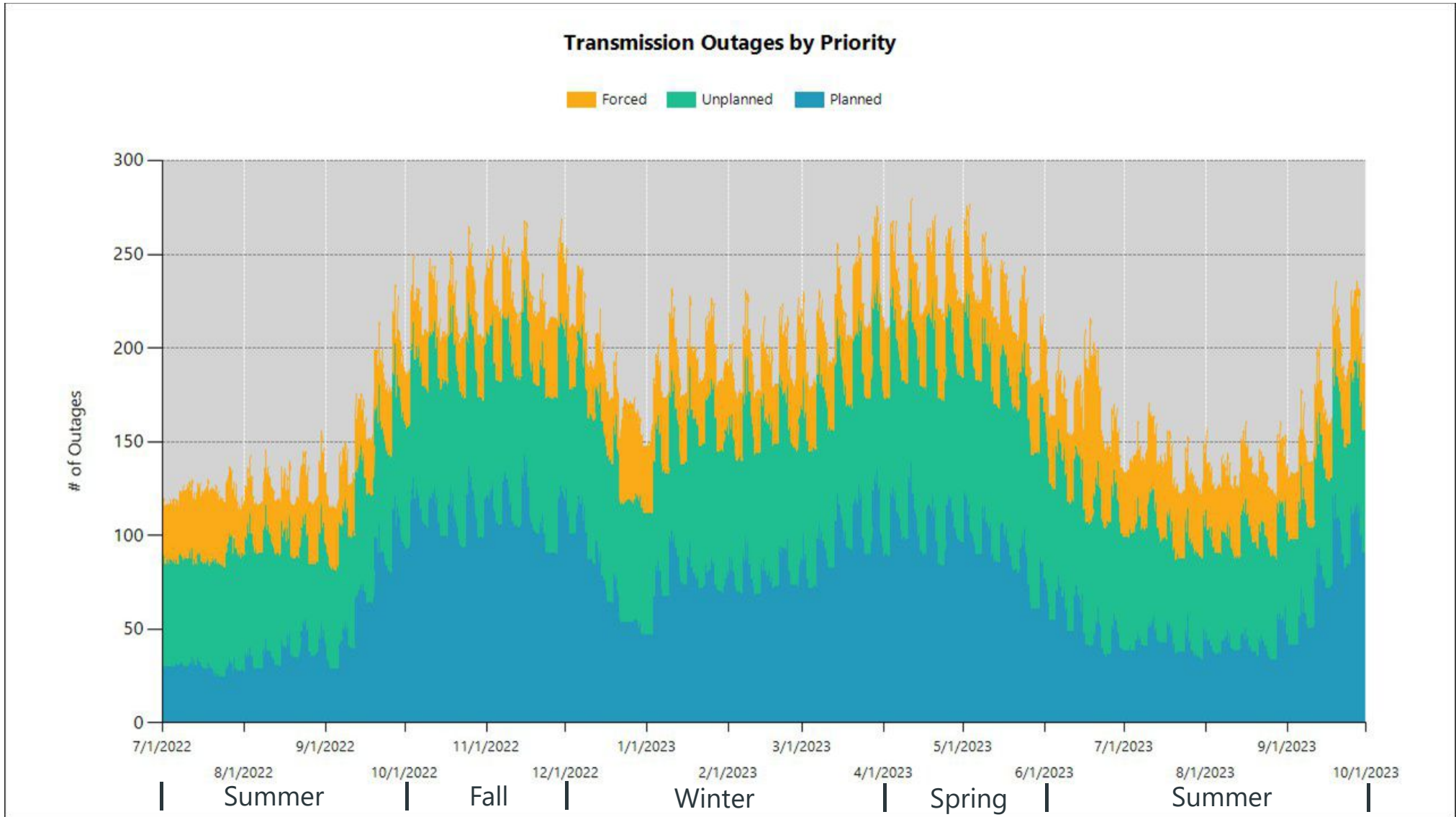




# BALANCING AUTHORITY AREA: TRANSMISSION

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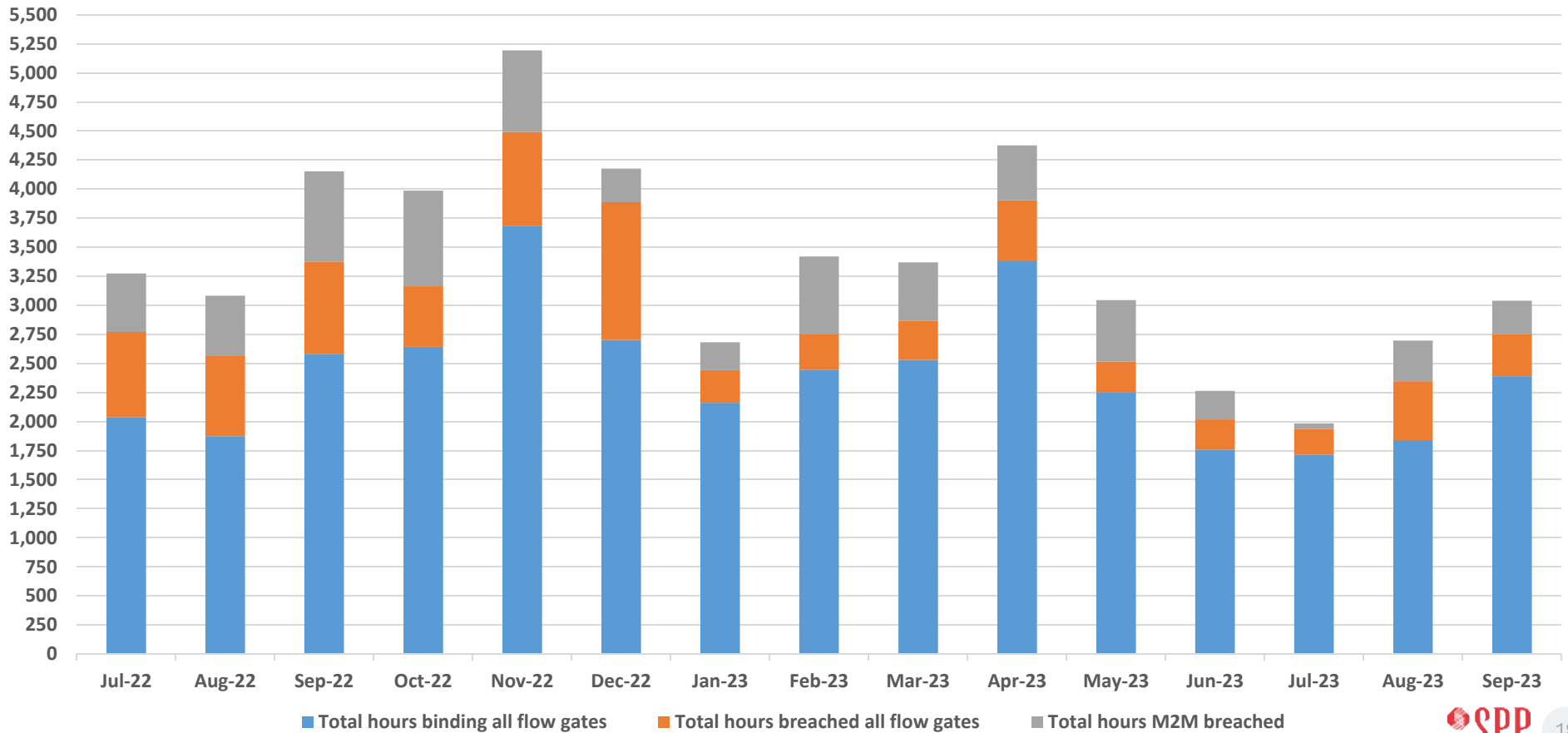




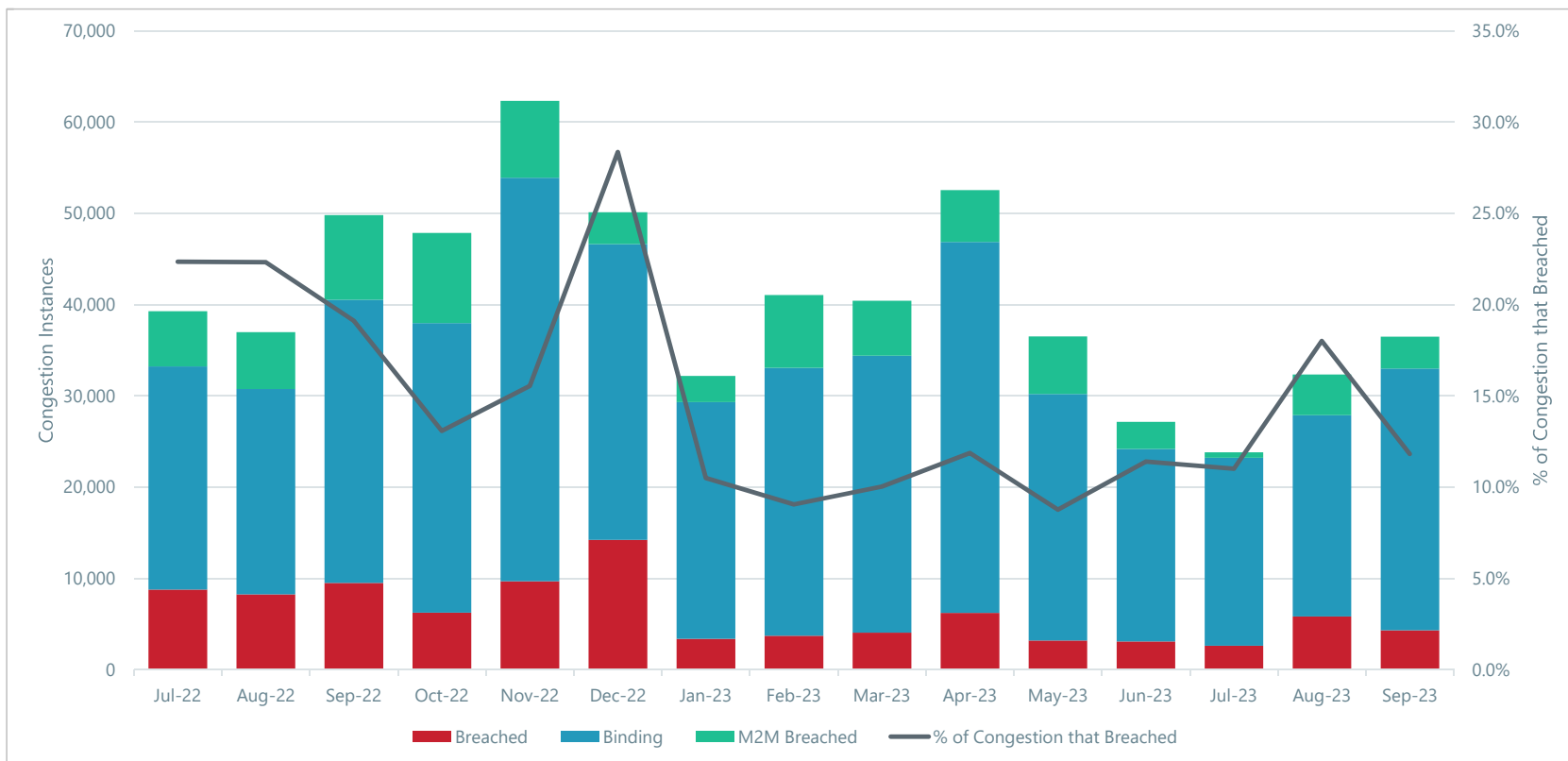


# RTBM CONGESTION - LAST 15 MONTHS

Total Congestion hours SPP BAA: Real time Balancing Market



# RTBM CONGESTION - LAST 15 MONTHS



A "congestion instance" here is defined by constraint-interval occurrences. So an RTBM interval with 3 constraints congested at that time would count as 3 "instances"



# QUESTIONS

BRUCE REW

BREW@SPP.ORG

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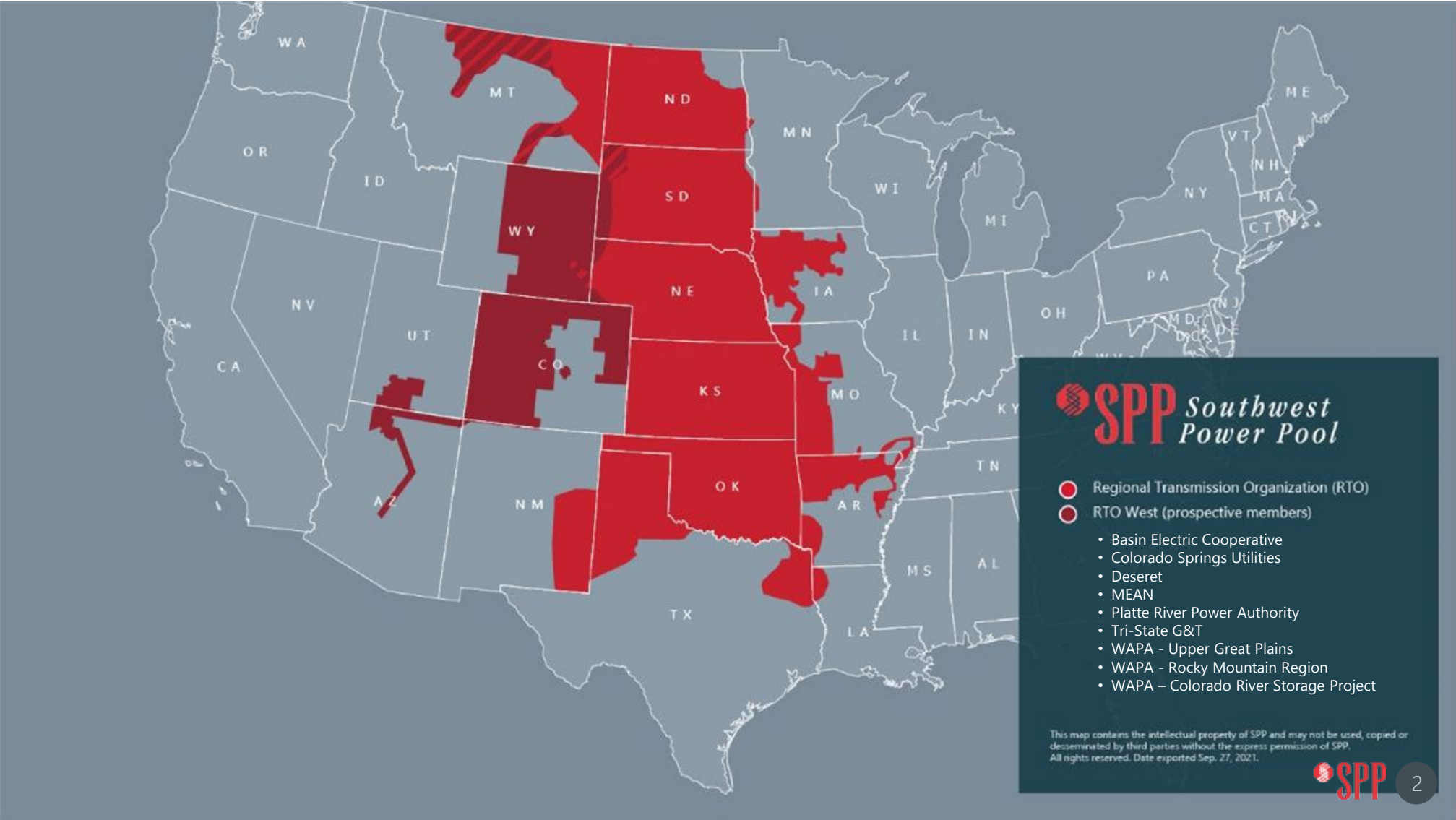


# RTO WESTERN EXPANSION

BRUCE REW  
SR. VP OPERATIONS

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## COMMITMENTS AGREEMENTS: ALL RECEIVED

- Pursue RTO Go-Live on April 1, 2026
  - Committed Members: Colorado Springs Utilities, Deseret G&T Cooperative, Platt River Power Authority, MEAN, Tri-State G&T, Basin Electric Cooperative, WAPA: CRSP, RMR, UGP
- Obligates Parties to reimburse SPP for development expenses if Membership Agreement not executed in March of 2026
- Changes to SPP documents consistent with Terms & Conditions
- Existing Members/Market Participants will be impacted

## REVISION REQUESTS

- Anticipate approximately 15 Revisions Requests
- Impacted Areas of the Tariff
  - Main Body Definitions;
  - Section 39.3;
  - Rate Schedules 7, 8, 9 and 11;
  - Attachments H, L, O, V, AA, AE, AI, AN, and AU
- RRs endorsed by the Prospective Participants proceed to Stakeholder Working Groups
  - Initial set of RR's to the January 2024 MOPC & RSC/BOD
  - Remaining RR's will proceed to April 2024 MOPC & RSC/BOD

# HIGH-LEVEL TIMELINE

Activity	2023		2024				2025				2026	
	Q3 23	Q4 23	Q1 24	Q2 24	Q3 24	Q4 24	Q1 25	Q2 25	Q3 25	Q4 25	Q1 26	Q2 26
Commitment agreements*	7/1, 10/10											
Tariff and member on-boarding	8/1-3/31											
Requirements and design		10/2-7/1										
MOPC approval				4/1								
Development				4/1-12/31								
Internal Testing (SAT, SIT/FIT)						10/1-7/1						
Member Testing							4/1-12/31					
Parallel Operations										1/26-4/1		
Go-live											4/1	

- Tariff development, West entities' approval, stakeholder WGs' approval, MOPC, RSC, BOD approval and filing







# MARKETS+

ANTOINE LUCAS  
VP, MARKETS

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## PHASE 1 STATUS

- Phase 1 Scope: Draft Tariff and Protocol Language
  - Porting over SPP's market tariff language as "boilerplate" for Markets+ when no significant differences between east & west identified
  - Crafting custom language for areas of novel market design
    - Green-House Gas (GHG)
    - Congestion Rents Allocation
    - Mitigation pricing for storage hydro
  - On schedule, but working to mitigate issues that could cause delay

## PHASE 2 STATUS

- Phase 2 Scope: Implementation of Markets+ systems for go live
  - Evaluating Markets+ participant funding options
    - Balancing regulatory, financial, and scheduling risks
  - Will vet funding proposal with SPP Finance Committee
  - Targeting February 2024 for resolution

## NEXT STEPS

- December 7, 2023: Markets+ Policy Executive Committee approves Tariff
- December 14, 2023: Interim Markets+ Independent Panel (IMIP) reviews and approves tariff
- February 6, 2024: SPP Board approves Markets+ tariff
  - SPP will file Markets+ tariff following SPP Board approval

# MARKETS+ TIMELINE

