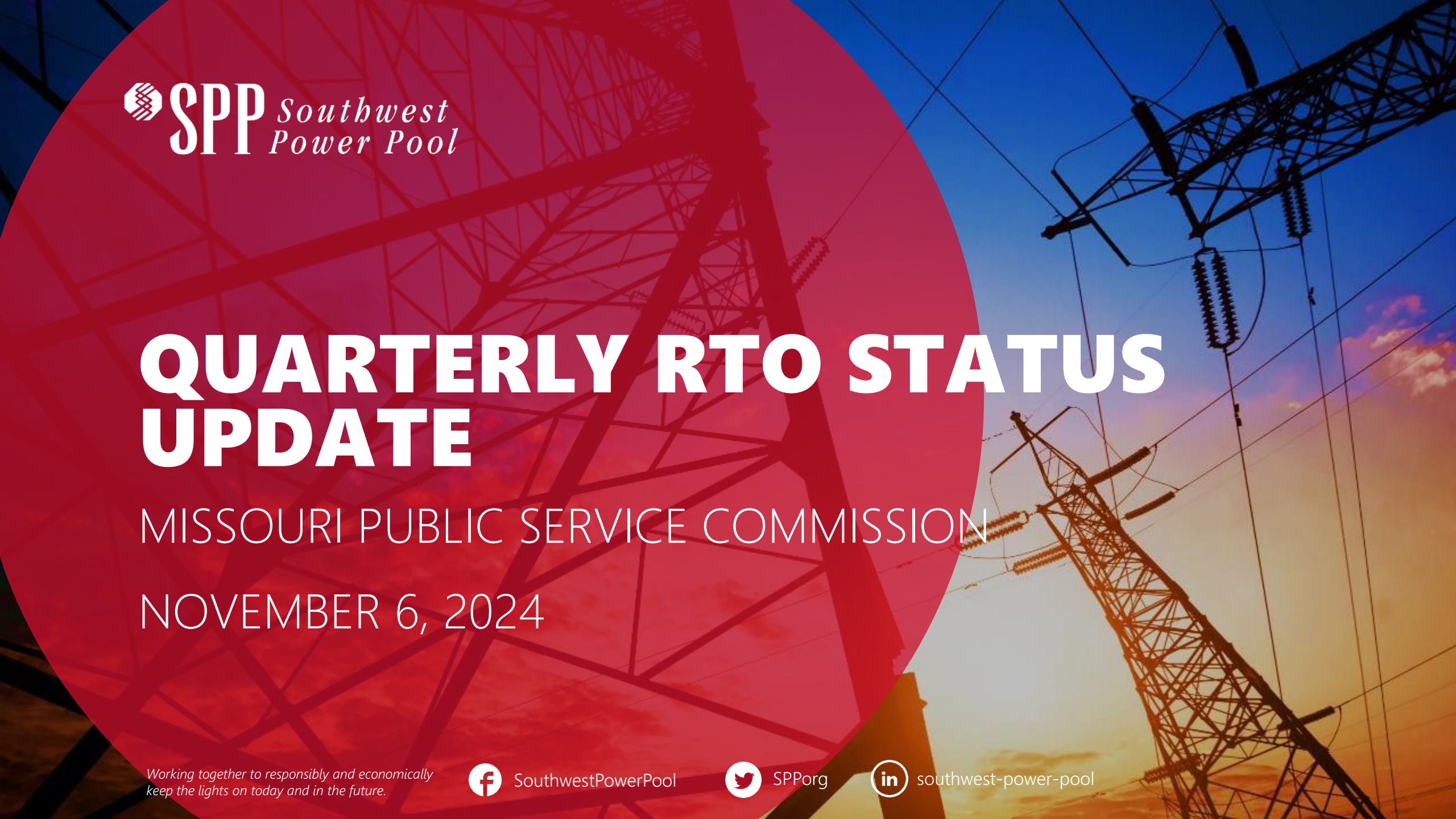


SPP Southwest Power Pool

QUARTERLY RTO STATUS UPDATE

MISSOURI PUBLIC SERVICE COMMISSION

NOVEMBER 6, 2024

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

SouthwestPowerPool SPPorg southwest-power-pool

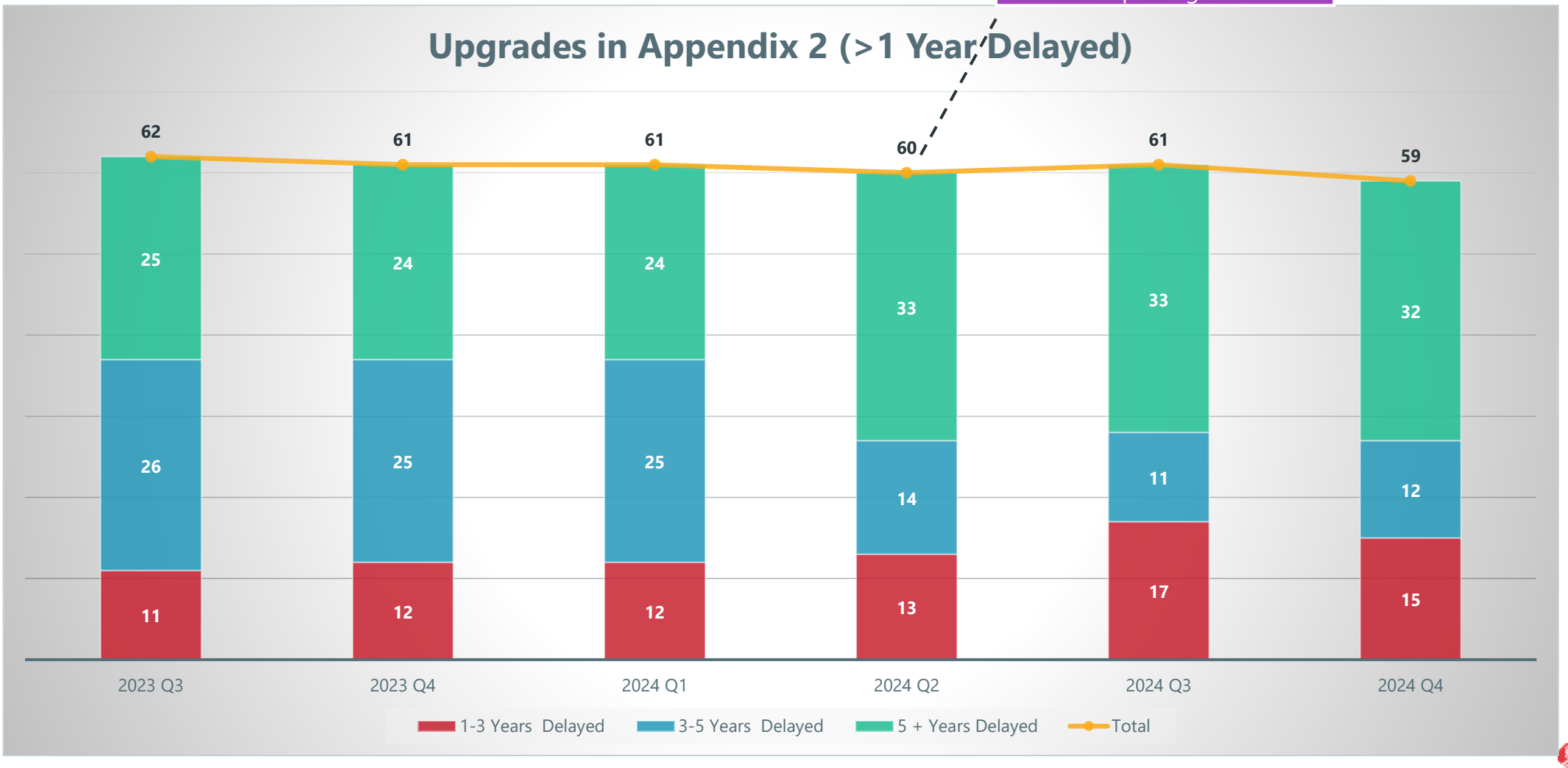
TOPICS

- In-Service Date Delay Update
- Generator Interconnection Queue
- 2024 Integrated Transmission Plan
- Competitive Bid Process

IN-SERVICE DATE DELAY UPDATE

ISD DELAY PROGRESSION

Jump in 5+ year delayed projects coincides with first quarter of reporting after approval of ISD Delay Reporting RR

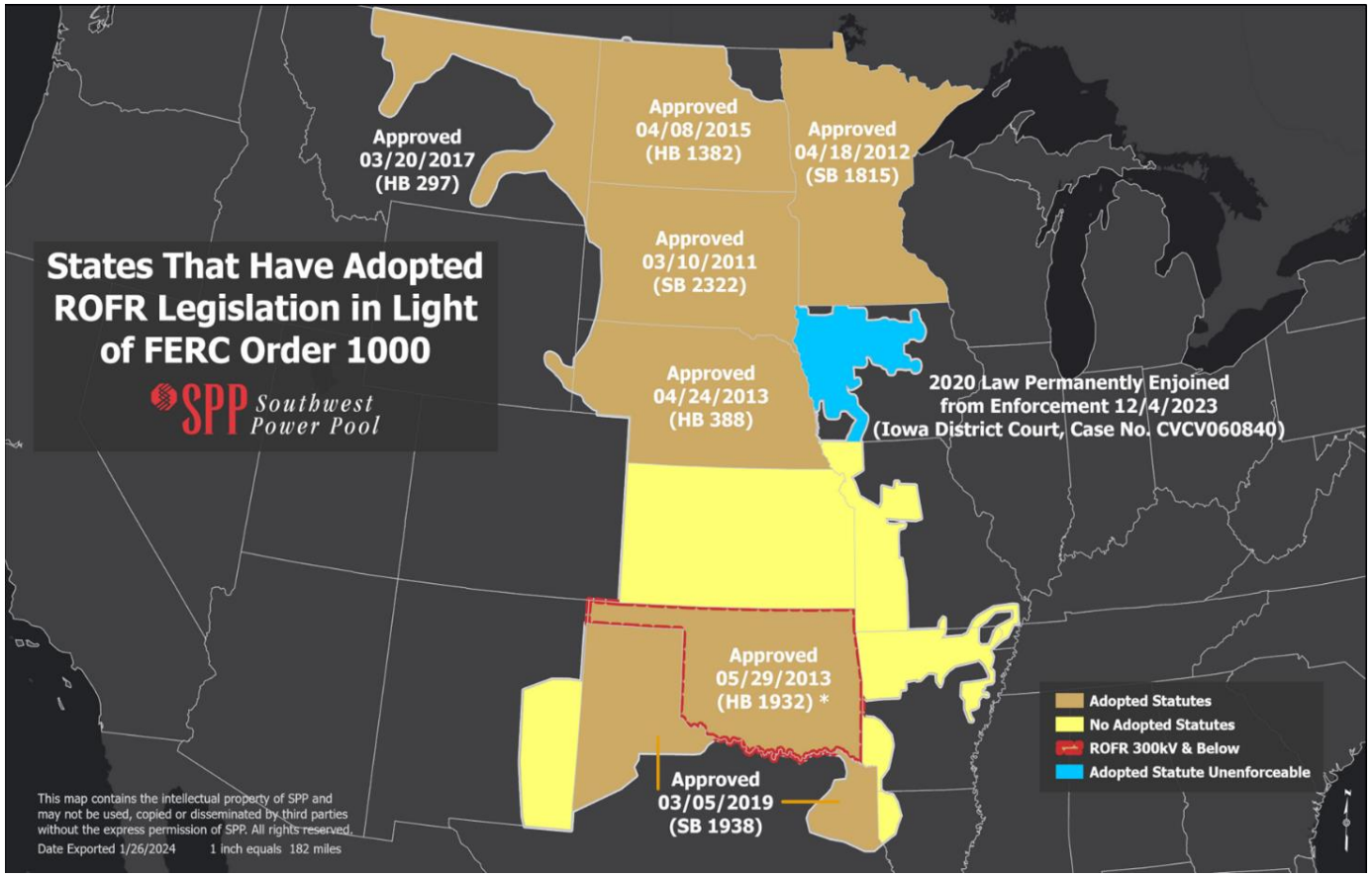


ISD DELAY IMPROVEMENTS

- Clarification of Need Date vs. In-Service Date
  - Previously only the Need Date was used for tracking which was at times unachievable and diluted the meaning of "delayed"
  - The clarification of In-Service Date adds realistic accountability
- More attention than ever is being paid to current NTC ISDs
  - New review/approval process developed in '23 and implemented in '24 has ramped up scrutiny at NTC issuance
  - NTC delays are discussed at all PCWG meetings
- Since approval of the ISD Delay Reporting RR
  - 31 upgrades are in-service or complete since tracking
  - 1 upgrade approved for withdrawal

ONGOING CHALLENGES

- Legal and Regulatory Challenges and Complexities
  - Property Laws
  - Right of First Refusal (ROFR) Laws
- 59 Projects currently delayed >1 year
  - 81% are brownfield
  - 98% are in ROFR states
  - 100% are either brownfield or ROFR
    - All currently delayed projects by ISD face one or both challenges
- Diverse Stakeholder Opinions
  - Reporting and Transparency vs. Enforcement and Project Prioritization



2024 ITP PORTFOLIO ISD DELAY RISK

- Total Portfolio ($7.6B)
  - Low Risk ($4.7B)
  - Medium Risk ($2.7B)
  - High Risk ($0.2B)

Assumed DTOs with minimal delayed upgrades ≥3 years

Assumed DTOs with many delayed upgrades ≥3 years

Low/Medium/High Risk is based on the 2024 ITP projects assumed DTO and their current number of delayed upgrades

ITP PORTFOLIO ISD DELAY HISTORY

- 93% of upgrades delayed >1 year were issued in or before 2021
  - 2024 ITP upgrades wouldn't be expected to be reported as delayed until 2027
- Only 13% of total ITP upgrades by cost are delayed >1 year
  - $4.79B in upgrades issued from ITP since 2012[1]
    - $626M ITP upgrades are delayed >1 year
      - $451M of that is the R-Project from the 2012 ITP10
    - Without the R-Project only 4% of all ITP projects by cost are delayed >1 year

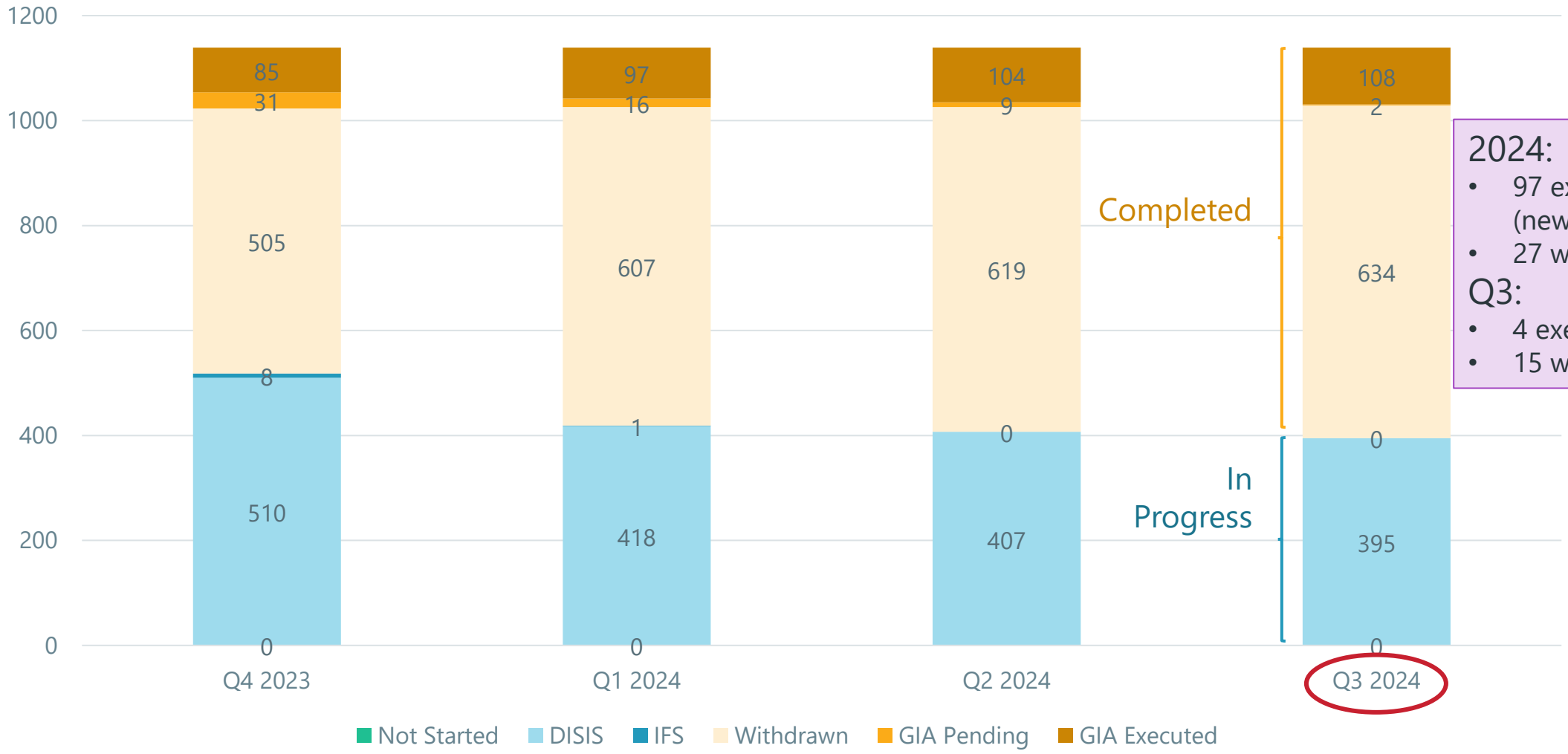
1 – From 2024 SPP Transmission Expansion Plan Report

GENERATOR INTERCONNECTION UPDATE

HOW ARE WE DOING?
BACKLOG MITIGATION

Progress towards eliminating the backlog

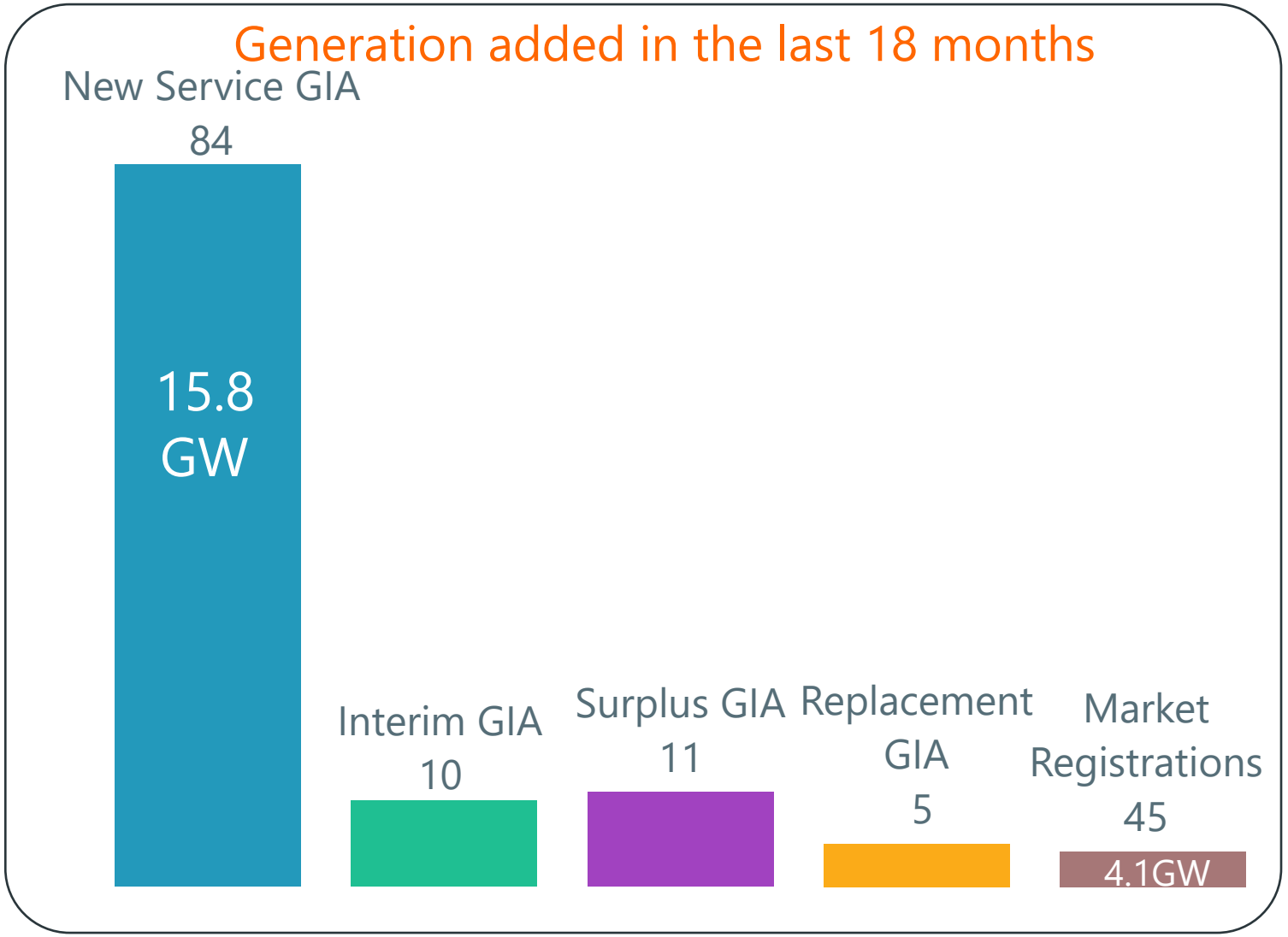
Active queue began with 1139 Requests = 221 GW
As 9/25/2024: 395 active requests = 82 GW



2024:
- 97 executed GIA (new or revised)
- 27 withdraws

Q3:
- 4 executed GIA
- 15 withdraws

HOW ARE WE DOING?
GENERATION ADDED TO THE SYSTEM



As we work through the backlog, new generators are being added to SPP's resource pool

Since January 2017: **41.6 GW added** to the system **243 New GIAs executed**

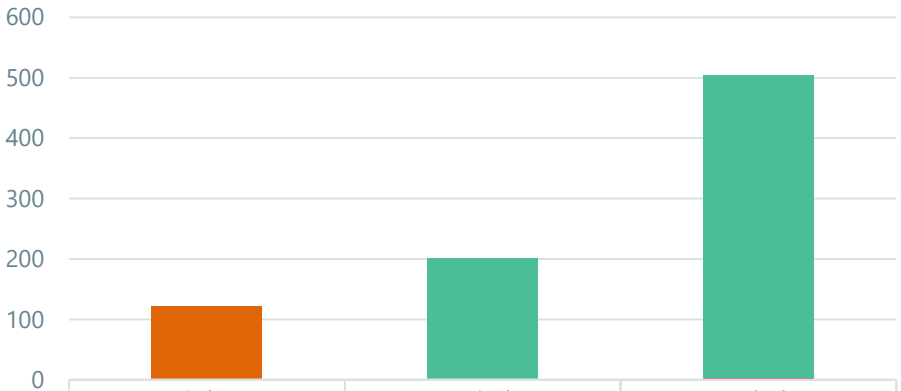
In 2024, the 97 executed GIA have resulted in 17.1 GW

2024 COMMERCIAL OPERATION UPDATE

As of 9/2/2024 we have had 4 projects with a total of 820 MW declare Commercial Operation

There are 10 projects with 2024 COD's that have not yet declared their projects are in Commercial Operation

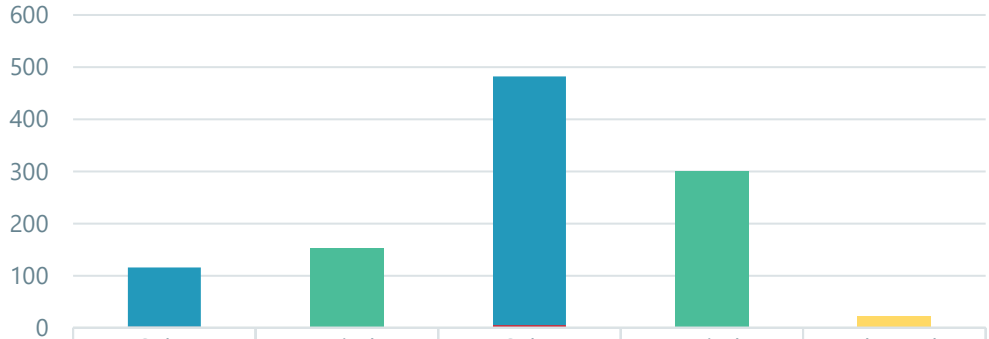
2024 COD by Cluster and Generation Type



	Solar DISIS-2015-001	Wind DISIS-2016-001	Wind DISIS-2016-002
Sum of Capacity (MW)	120	200	500
GIAs Executed	1	1	3

GIAs Executed Sum of Capacity (MW)

Projects with 2024 COD that have not reached Commercial Operation



	Solar DISIS-2016-002	Wind DISIS-2016-002	Solar DISIS-2017-001	Wind DISIS-2017-002	Thermal Surplus
Sum of Capacity (MW)	114	151	477	300	22
GIAs Executed	2	1	5	1	1

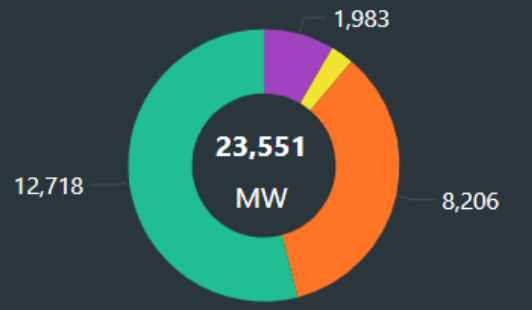
GIAs Executed Sum of Capacity (MW)

Commercial Operation Date Forecast

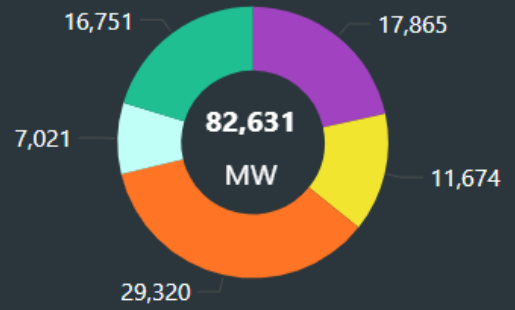
135 projects with executed GIAs expected to come on-line within the next 6 years

409 projects in active study status. Based on historical 60% withdrawal rate, SPP estimates 164 additional projects to come on-line in next 6 years

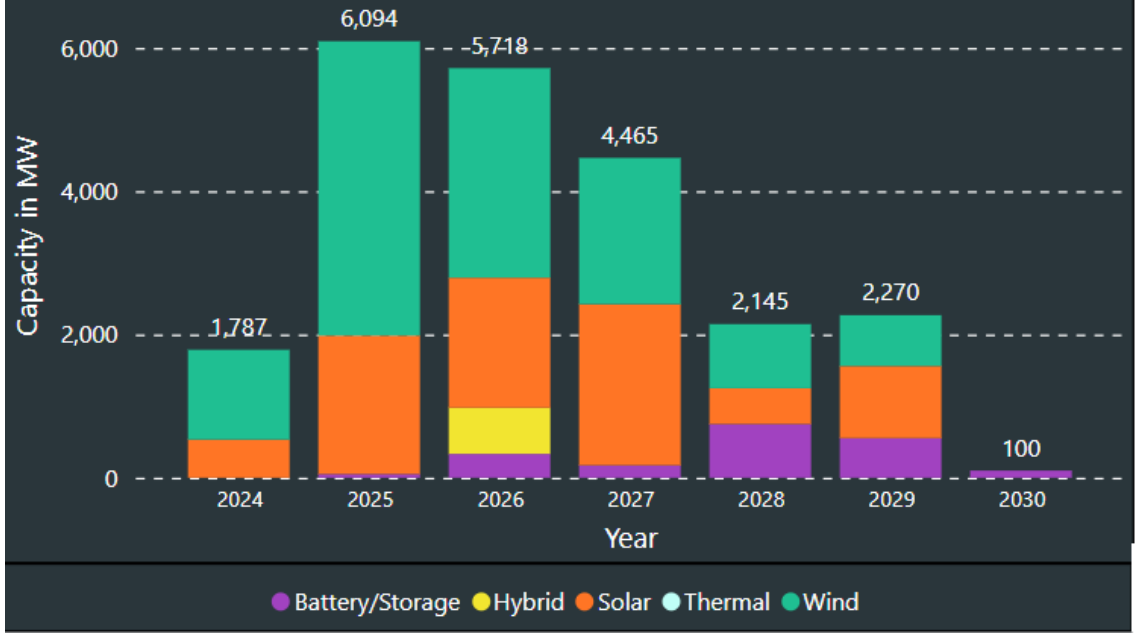
Executed GIA Generation (MW)



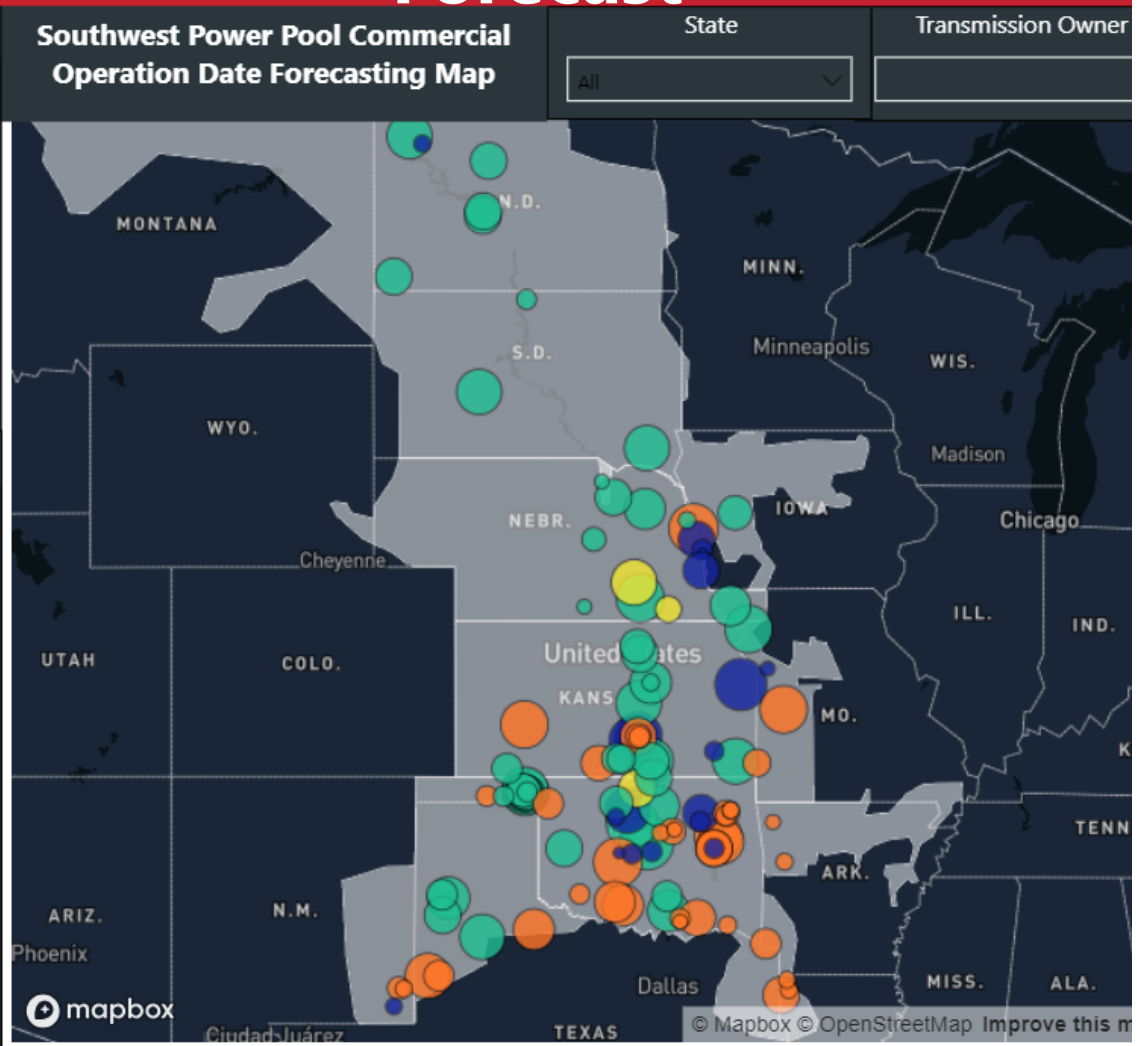
Active Study Generation (MW)



Executed GIA by Commercial Operation Year



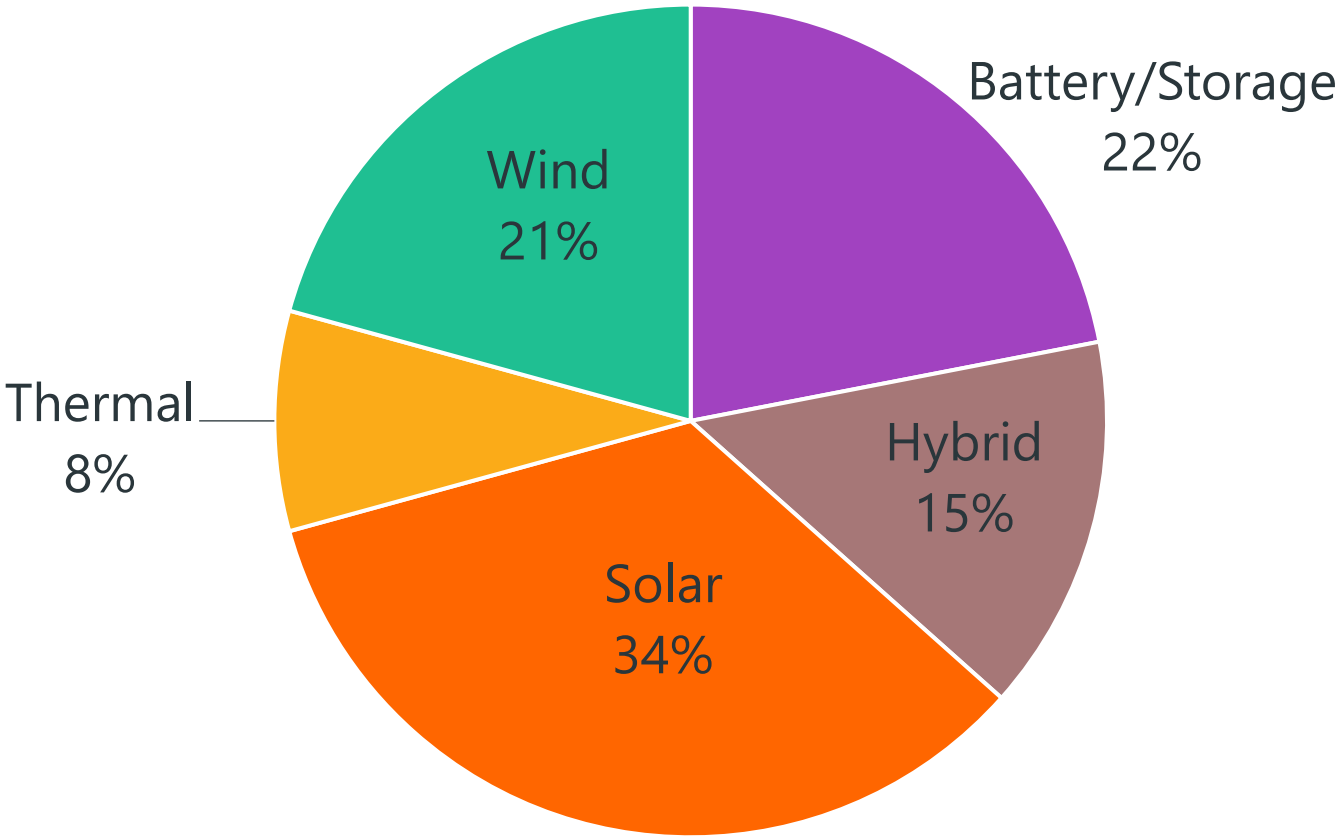
Southwest Power Pool Commercial Operation Date Forecasting Map

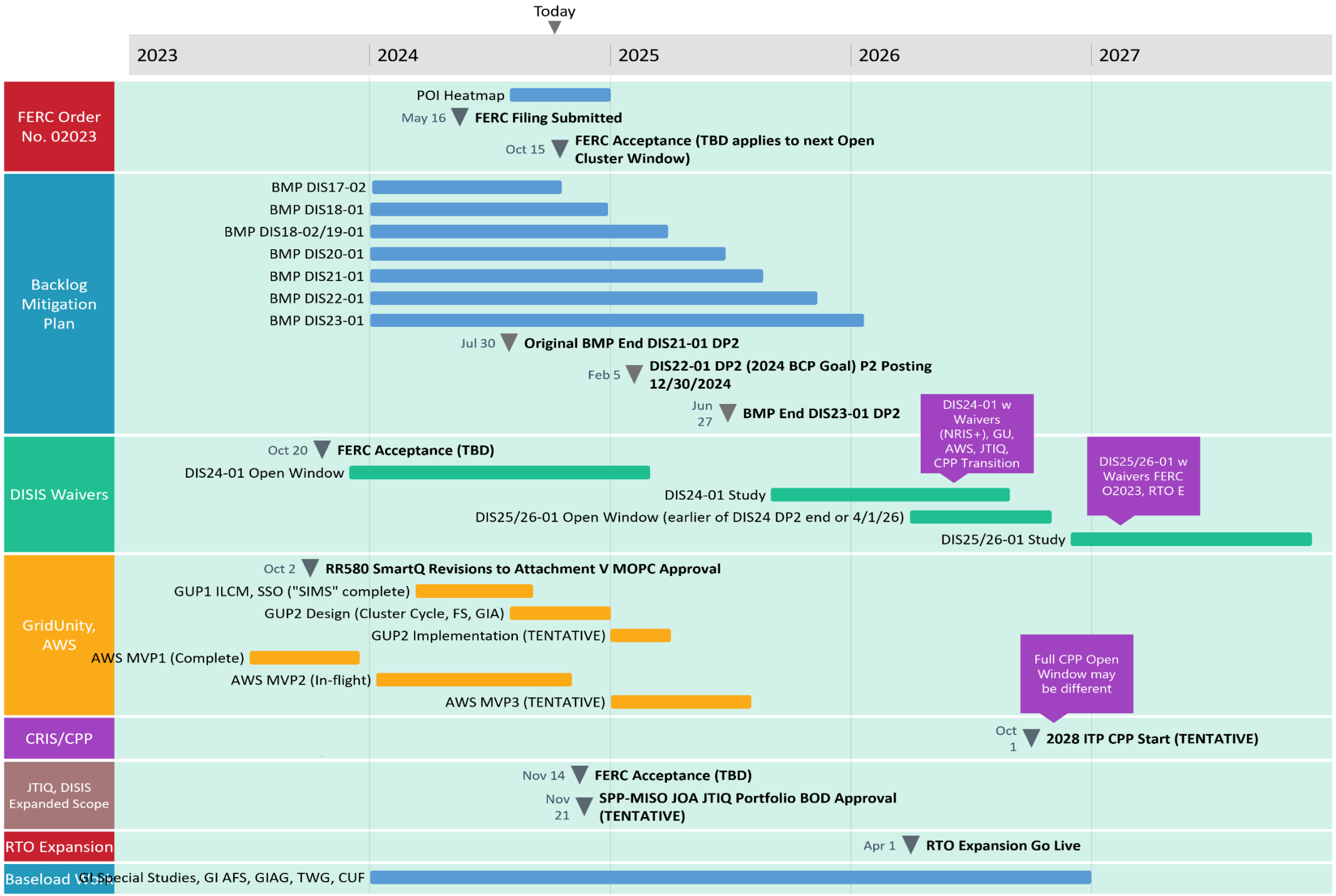


Disclaimer: The data provided is for information purposes only. Questions? Submit to Request Management System
Click HERE for SPP GI Web Site. Click HERE for GI Queue data.

REQUESTS PENDING IN THE CURRENT GI QUEUE

GEN TYPE	Requests	GW Capacity
Battery / Storage	109	18 GW
Hybrid	50	12 GW
Solar	138	28 GW
Thermal	28	7 GW
Wind	70	17 GW
TOTAL	**395**	**82 GW**




Today
2023
2024
2025
2026
2027
FERC Order No. 02023
POI Heatmap
May 16
FERC Filing Submitted
Oct 15
FERC Acceptance (TBD applies to next Open Cluster Window)
Backlog Mitigation Plan
BMP DIS17-02
BMP DIS18-01
BMP DIS18-02/19-01
BMP DIS20-01
BMP DIS21-01
BMP DIS22-01
BMP DIS23-01
Jul 30
Original BMP End DIS21-01 DP2
Feb 5
DIS22-01 DP2 (2024 BCP Goal) P2 Posting 12/30/2024
Jun 27
BMP End DIS23-01 DP2
DISIS Waivers
Oct 20
FERC Acceptance (TBD)
DIS24-01 Open Window
DIS24-01 Study
DIS25/26-01 Open Window (earlier of DIS24 DP2 end or 4/1/26)
DIS25/26-01 Study
DIS24-01 w Waivers (NRIS+), GU, AWS, JTIQ, CPP Transition
DIS25/26-01 w Waivers FERC O2023, RTO E
GridUnity, AWS
Oct 2
RR580 SmartQ Revisions to Attachment V MOPC Approval
GUP1 ILCM, SSO ("SIMS" complete)
GUP2 Design (Cluster Cycle, FS, GIA)
GUP2 Implementation (TENTATIVE)
AWS MVP1 (Complete)
AWS MVP2 (In-flight)
AWS MVP3 (TENTATIVE)
Full CPP Open Window may be different
CRIS/CPP
Oct 1
2028 ITP CPP Start (TENTATIVE)
JTIQ, DISIS Expanded Scope
Nov 14
FERC Acceptance (TBD)
Nov 21
SPP-MISO JOA JTIQ Portfolio BOD Approval (TENTATIVE)
RTO Expansion
Apr 1
RTO Expansion Go Live
Baseload WS
GI Special Studies, GI AFS, GIAG, TWG, CUF

GI QUEUE INFORMATION FOR MISSOURI

TOTAL QUEUE

- Total capacity in the SPP GI Queue exceeds 82,000 MW with 36% of that from solar projects.
- Projects in “Restudy 2” have received a GIA

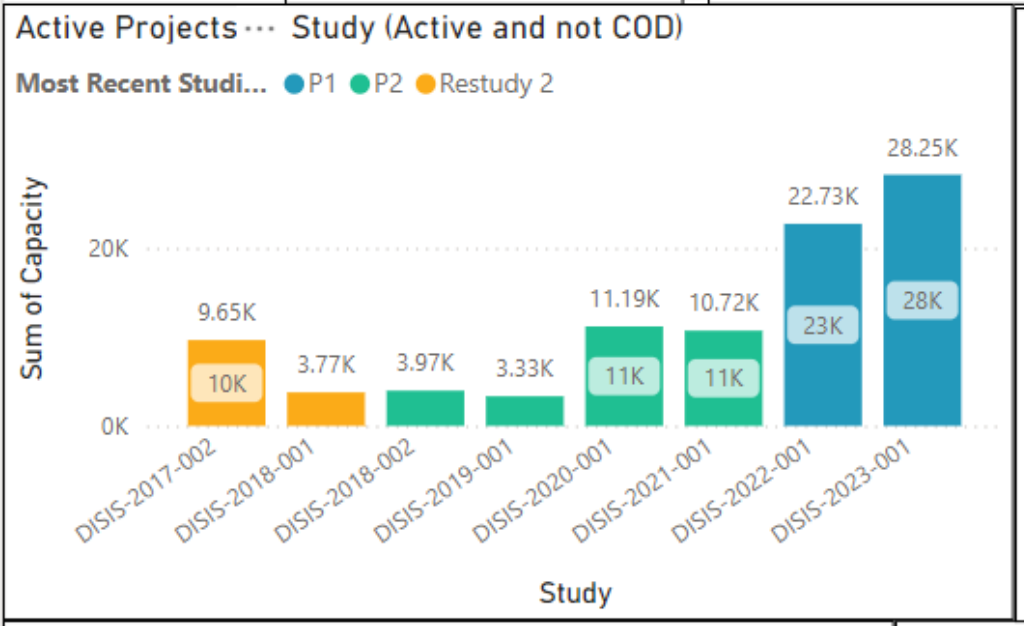
Active Capacity
82,418.42
Sum of Capacity (MW)
405
Count of GI_Number

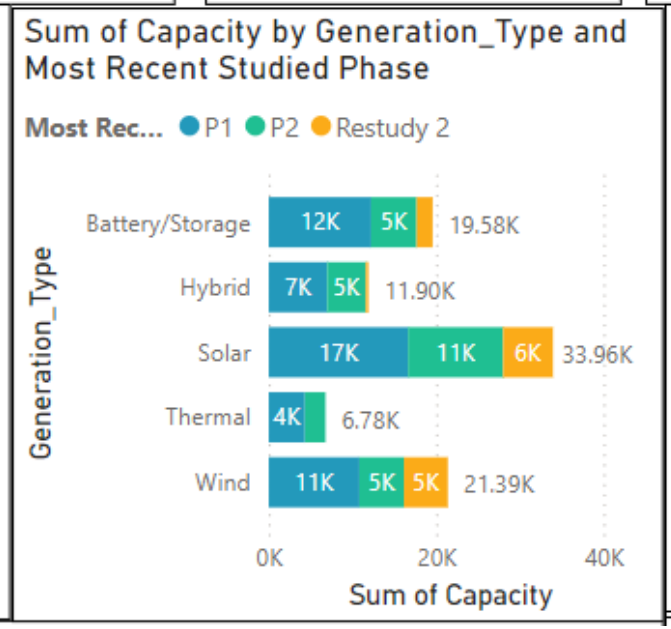
Active Project Customers
160
Customers
30
TOs

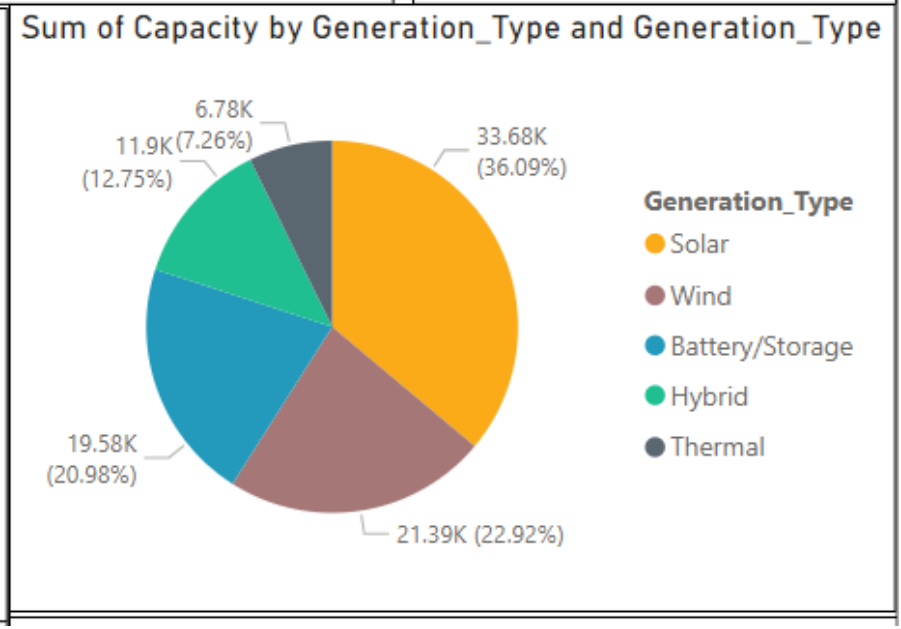
Active Upgrades
$11,367,277,721
Sum of Allocated Cost
1600
Count of Upgrade Name

High % Projects
54,826.05
Sum of MW
260
Count of Gen Number

High % Active Upgrades
$3,629,217,429
Sum of Allocated Cost
956
Count of Upgrade Name







MISSOURI ONLY

Total capacity in Oklahoma Queue exceeds 6000 MW with 38% of that from solar projects.

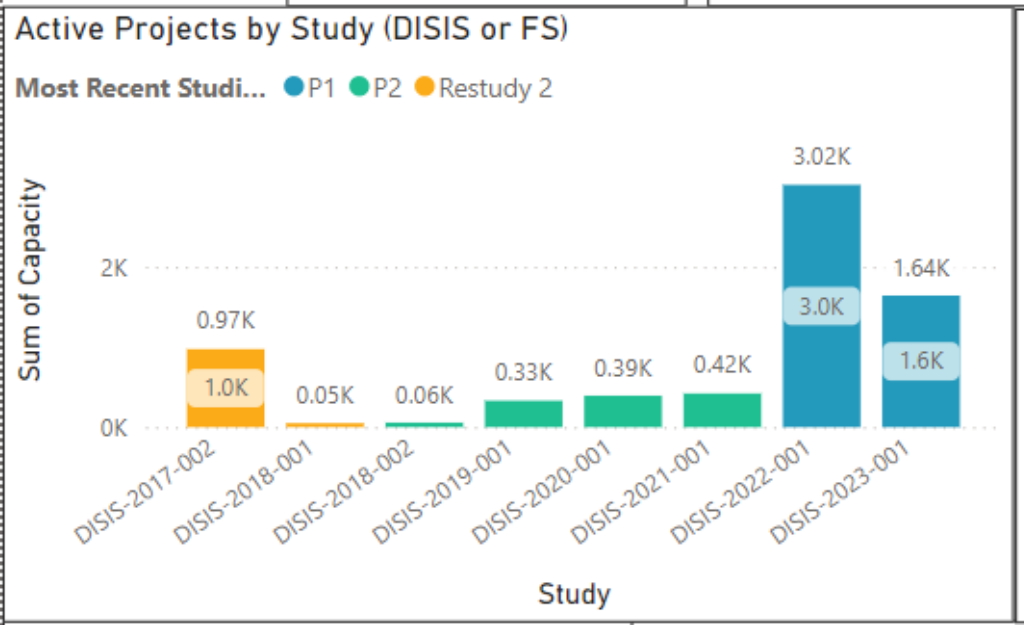
Active Capacity
6,034.99
Sum of Capacity (MW)
37
Count of GI_Number

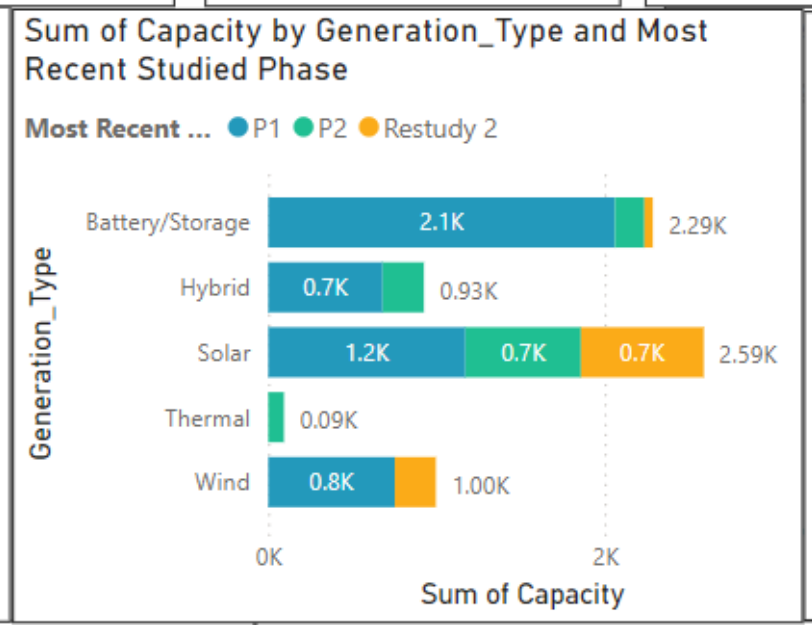
Active Project Customers
21
Customers
7
TOs

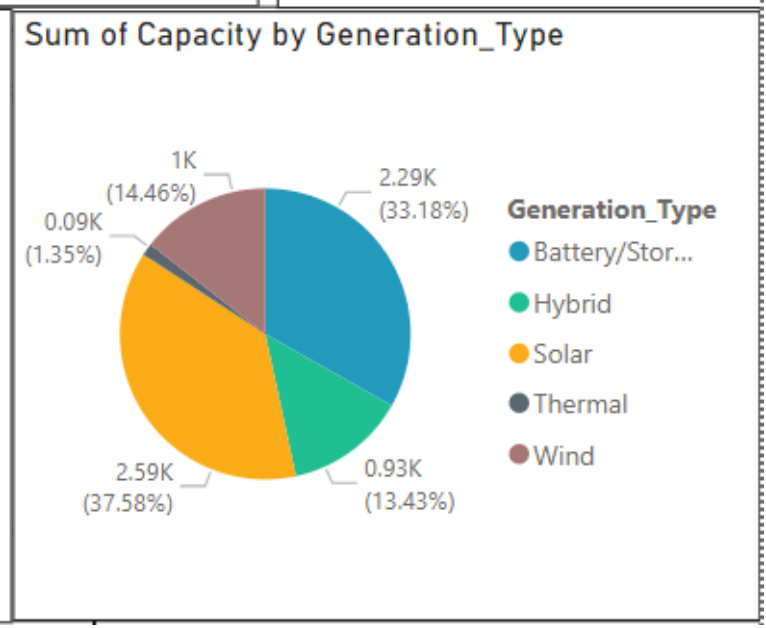
Active Upgrades
$994,130,807
Sum of Allocated Cost
181
Count of Upgrade Name

High % Projects
2,445.99
Sum of MW
19
Count of Gen Number

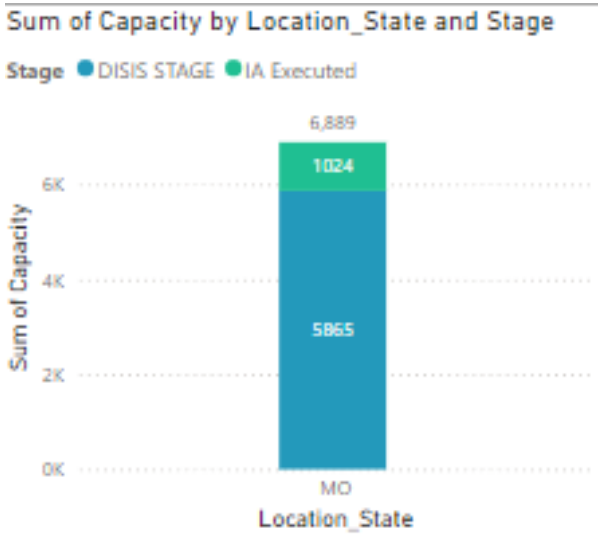
High % Active Upgrades
$177,353,200
Sum of Allocated Cost
106
Count of Upgrade Name

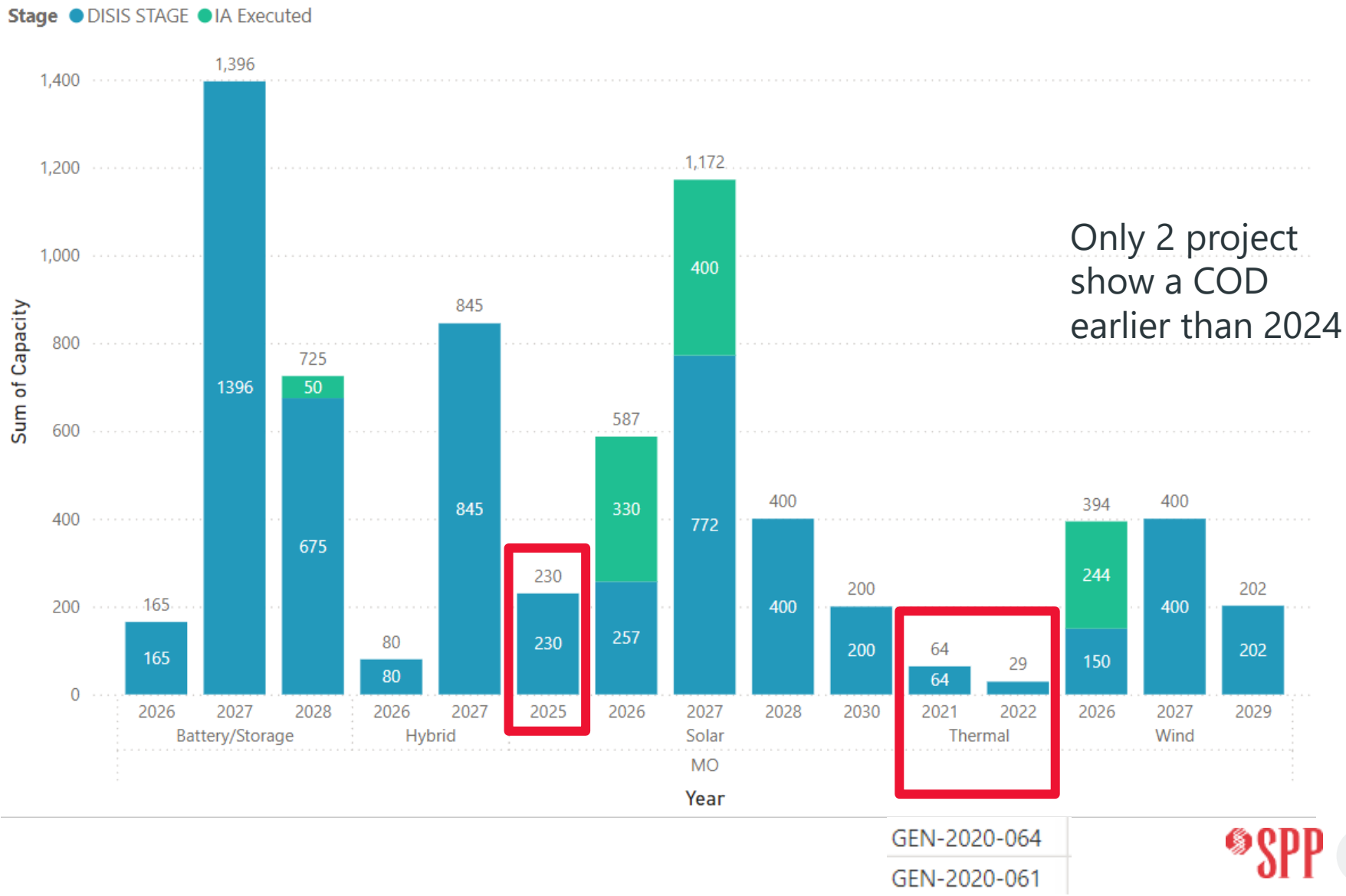






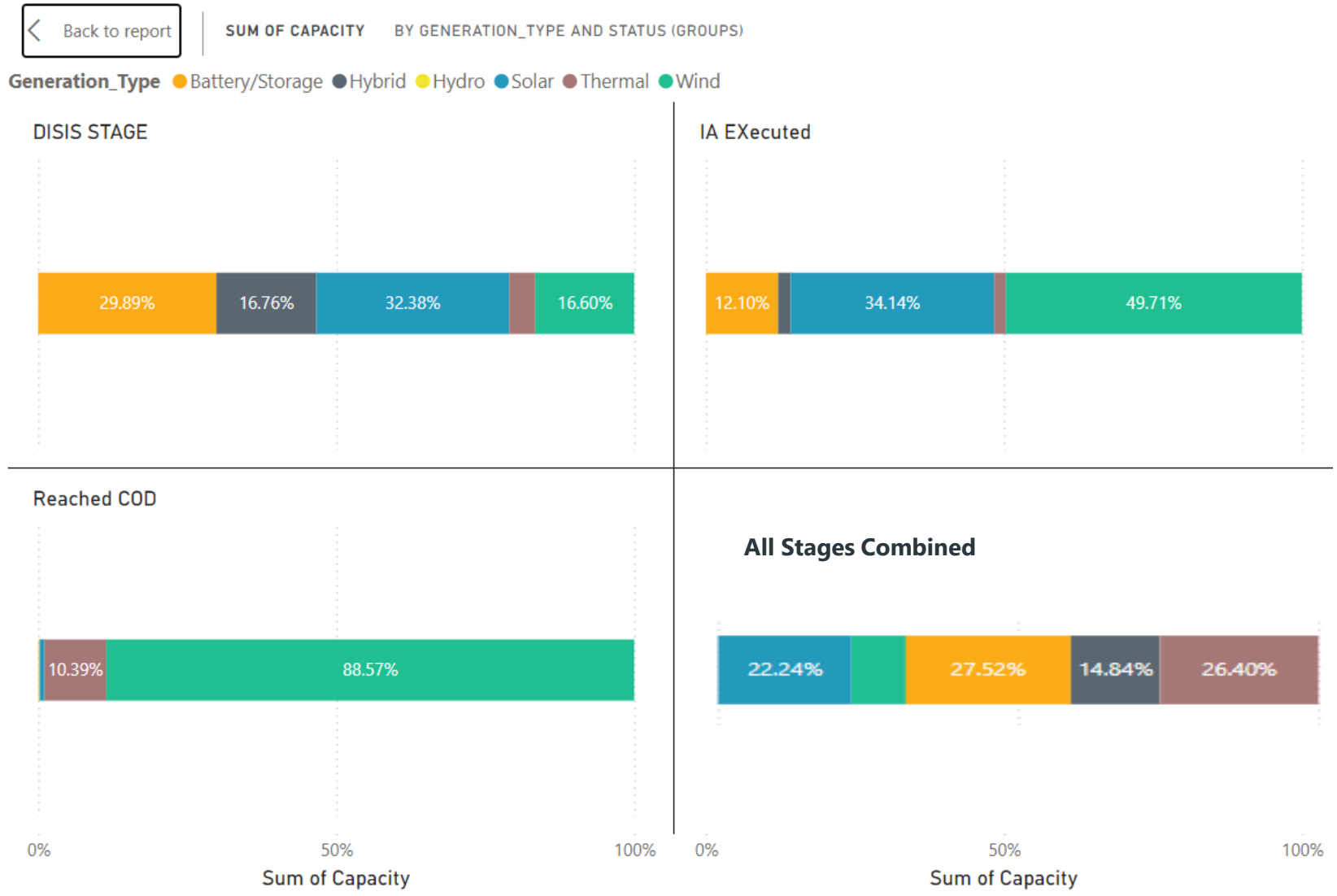
MO DETAIL BY GEN TYPE AND COD YEAR



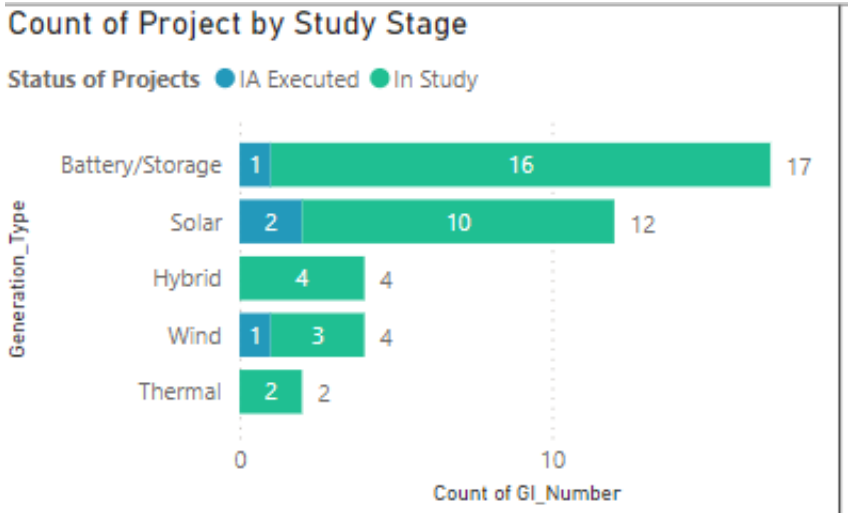


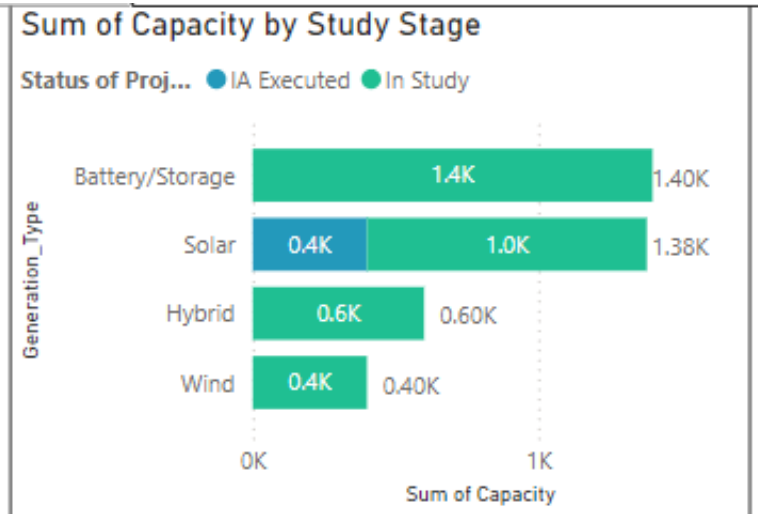
Only 2 project show a COD earlier than 2024

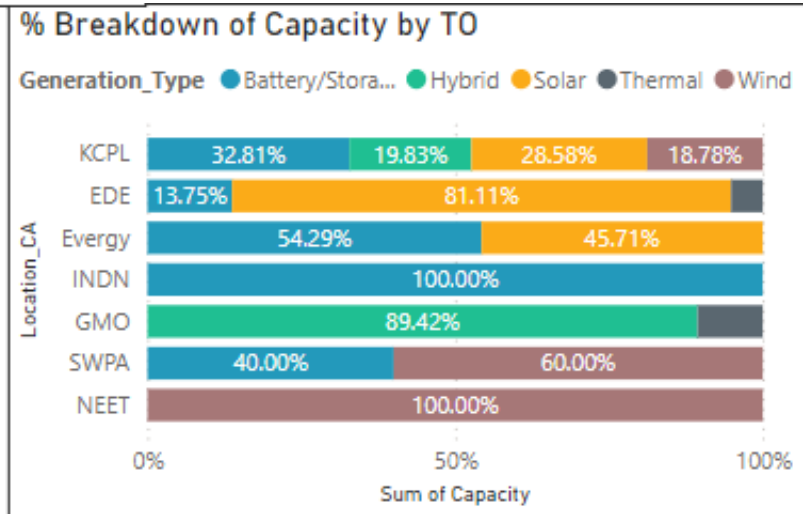
MISSOURI % BREAKDOWN BY STUDY STAGE



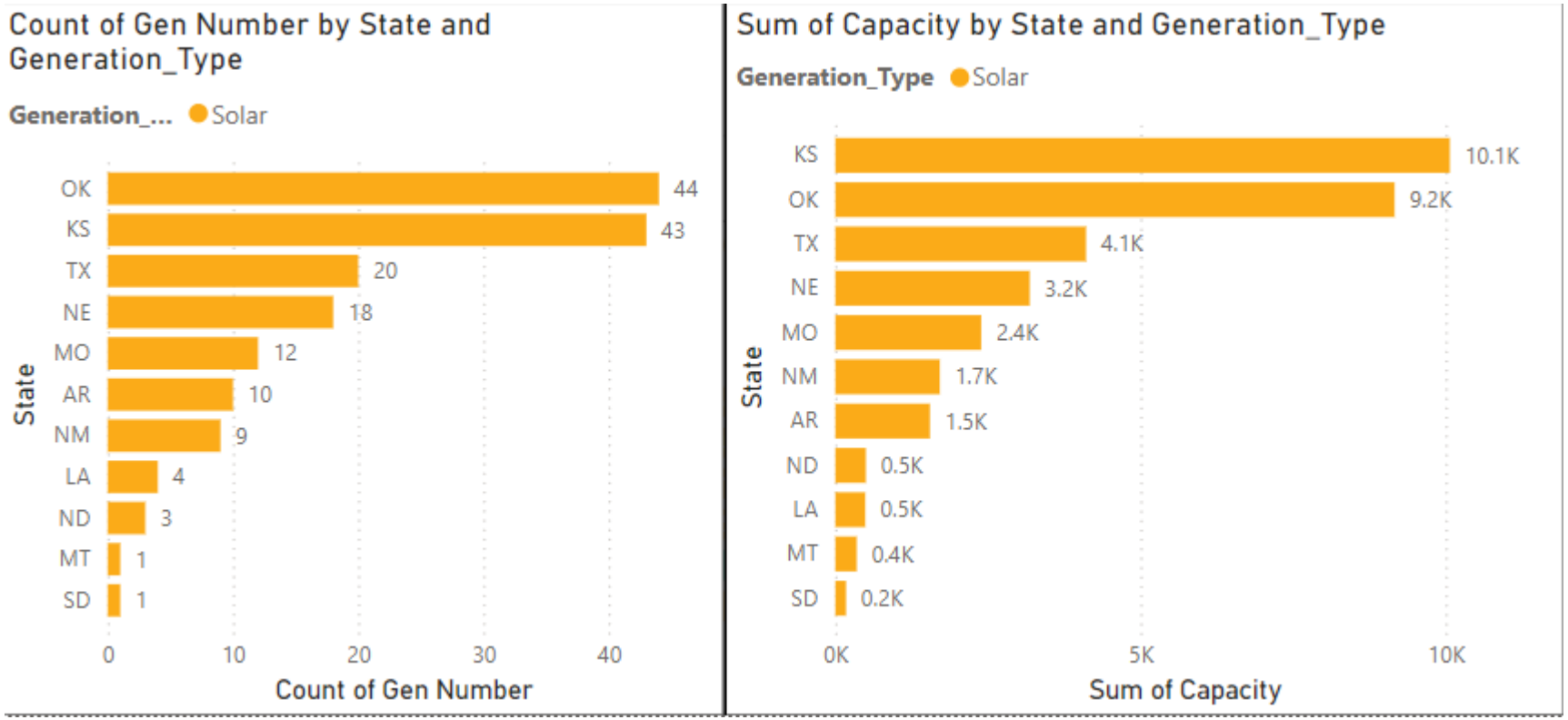
MISSOURI DETAIL BY PROJECT AND TRANSMISSION OWNER







SOLAR COMPARISON BY STATE



INTEGRATED TRANSMISSION PLAN (ITP) UPDATE

Our Generational Challenge

A Reliable Future for Electricity

Excess generating capacity in SPP is shrinking to dangerously low levels.

As coal and gas generators are being retired, SPP increasingly depends on renewable energy, which is cleaner and lower cost but challenging due to its variability.

Emerging technologies can be helpful but need more investment and development to address today's challenges.

All generation types struggle to perform during extreme weather when demand is highest and human health and safety are at greatest risk.

We need significant amounts of new transmission and generation, which is costly and takes years to complete.

Our world is increasingly becoming electrified, and demand is rapidly rising across the U.S.

Demand in SPP could be 25% higher by 2030.

New sources of demand — data centers, crypto mining, oil and gas production, electric cars — consume tremendous energy.

Extreme weather events are more frequent and cause greater consumption during times of urgent need.

Winter and summer peak demands are growing at alarmingly high rates.

Our risks will increase exponentially if we don't take steps to address our generational challenge.

To meet the supply and demand challenge, more transmission and generation must be built.

ASPIRE 2026

Value Proposition

- Drive value beyond reliability
- Build and maintain trusted relationships

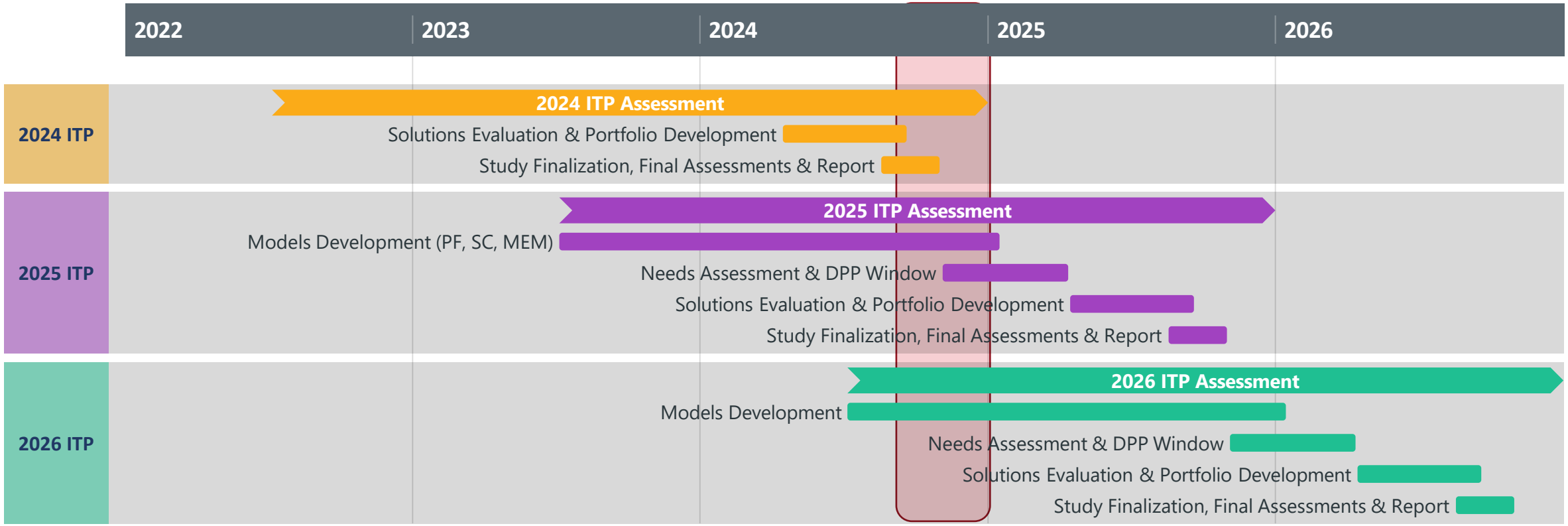
Strategic Opportunities

- Innovative Transmission Planning
- Optimized Seams

STRENGTHEN THE CORE CHANGE THE GAME

ITP STUDY OVERLAPS – ACTIVE STUDIES

The 2024 ITP, 2025 ITP and 2026 ITP (Including CPP Transition Study) are in progress and had schedule overlap in Q3. The 2024 ITP has completed final assessments while the 2025 ITP and 2026 ITP continue with planning and modeling tasks into Q4.



2024 INTEGRATED TRANSMISSION PLAN

COLLABORATION

INPUTS

- 11 Organizational Groups, 138+ meetings
- Evaluated >2,100 solutions
- 27-month study

RESULTS

OUTPUTS

- 2,333 miles of new transmission
  - 1,495 miles 345 kV
  - 293 miles 765 kV
- 495 miles of rebuilt transmission
- 89 new transmission projects

VALUE

IMPACT

- More reliable and resilient grid
- Cost levelization across SPP footprint
- Relief of operational congestion
- Facilitation of generation interconnection, resource adequacy and delivery point load additions

BENEFITS

OUTCOMES

Final Portfolio Benefits

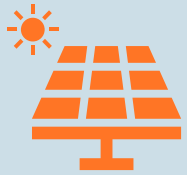
- $7.68B E&C costs
- $10.77B 40-year PV cost
- $88.7B - $95.7B Lower 40-year APC
- 8.23 - 8.88 40-year B/C ratio range

WHAT'S NEW AND WHAT HAS CHANGED IN THE 2024 ITP?

While SPP's typical renewable growth trends continue, the **main drivers** of projects in the 2024 ITP are **rapid load growth** and **extreme winter weather analysis**

2023 ITP
- F1 Y5: 37 GW
- F1 Y10: 41 GW
- F2 Y5: 38 GW
- F2 Y10: 46 GW

2024 ITP
- F1 Y5: 48.2 GW
- F1 Y10: 54.9 GW
- F2 Y5: 52.3 GW
- F2 Y10: 59.1 GW



2023 ITP
- F1 Y5: 4.4 GW
- F1 Y10: 11 GW
- F2 Y5: 5.9 GW
- F2 Y10: 15 GW

2024 ITP
- F1 Y5: 9.4 GW
- F1 Y10: 19.1 GW
- F2 Y5: 19.1 GW
- F2 Y10: 24.1 GW

Load Growth Across the footprint

Rapid Load Growth in specific zones (Upper Missouri Zone, Southwestern Public Service)

Elliott Model

Uri-Based Model

89 NEW TRANSMISSION PROJECTS

148
MILES OF REBUILT EHV TRANSMISSION

1,788
MILES OF NEW EHV TRANSMISSION

If the rebuilt and new lines were strung together, they would span **from the bottom of SPP's footprint to the top...and back!**

1,062
SYSTEM ISSUES MITIGATED

MILES OF REBUILT HIGH VOLTAGE TRANSMISSION
347

545
MILES OF NEW HIGH VOLTAGE TRANSMISSION

COST AND BENEFIT

E&C Costs by Grouping

Reliability:	$3,147,438,114
Short Circuit:	$ 1,873,928
Winter Weather:	$ 2,229,622,633
Operational:	$ 297,636,782
+ Economic:	$2,005,274,280

$7,681,845,737

Portfolio optimizes reliability, resiliency and economics to bring substantial benefits to the region

2024 IT B/C is 8.2-8.8 compared to the previous ITP historical max of 5.8

	40-Year Present Value (PV) in 2024$		
Project Type	**Total ATRR Cost**	**APC Benefit (F1)**	**APC Benefit (F2)**
Reliability & Short Circuit	$4.34	$71.28	$77.38
Winter Weather	$3.13	$0.43	$0.71
Operational	$0.42	$1.05	$1.38
Economic	$2.87	$4.21	$4.66
Full Portfolio	$10.77	$88.68	$95.66

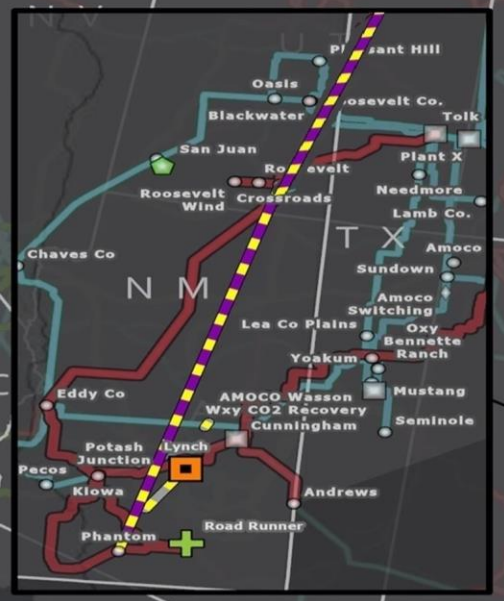
Note: Economic projects that addressed Reliability or Operational need types were included in the other need type's calculation

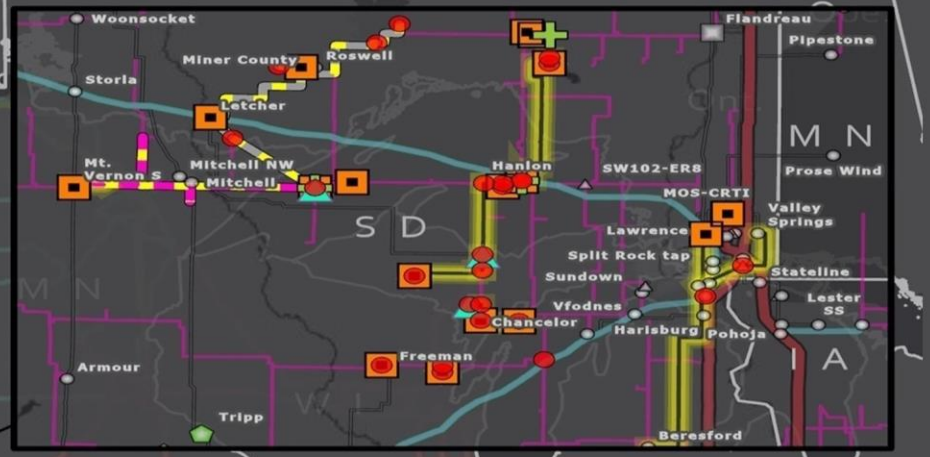
Value Proposition

Strategic Opportunities

2024 ITP Solutions

SPP Southwest Power Pool





Date Exported 9/9/2024 1 inch equals 189 miles

2024 ITP Winter Weather Projects

SPP Southwest Power Pool

Sidney to Holcomb & Tobias to Elm Creek 345 kV New Lines

Increase in Transfer Capability From North to South (Year 10)

Project Description	Transfer Increase (MW)	% Voltage Violations Mitigated in the transfer area
Sidney to Holcomb	650 MW	78%
Sidney to Holcomb + Tobias to Elm Creek	1500 MW	98%

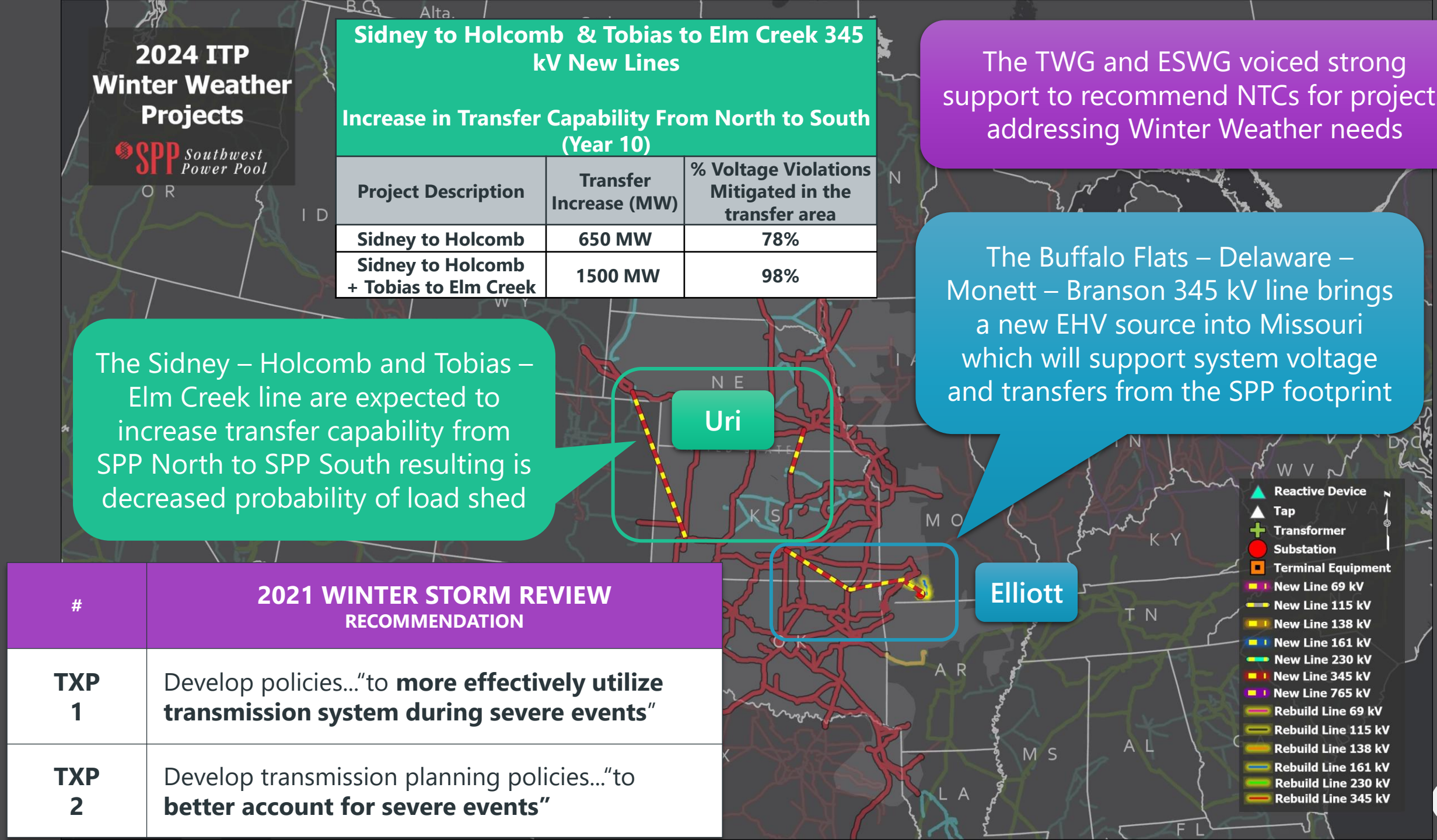
The TWG and ESWG voiced strong support to recommend NTCs for projects addressing Winter Weather needs

The Sidney – Holcomb and Tobias – Elm Creek line are expected to increase transfer capability from SPP North to SPP South resulting is decreased probability of load shed

The Buffalo Flats – Delaware – Monett – Branson 345 kV line brings a new EHV source into Missouri which will support system voltage and transfers from the SPP footprint

Uri

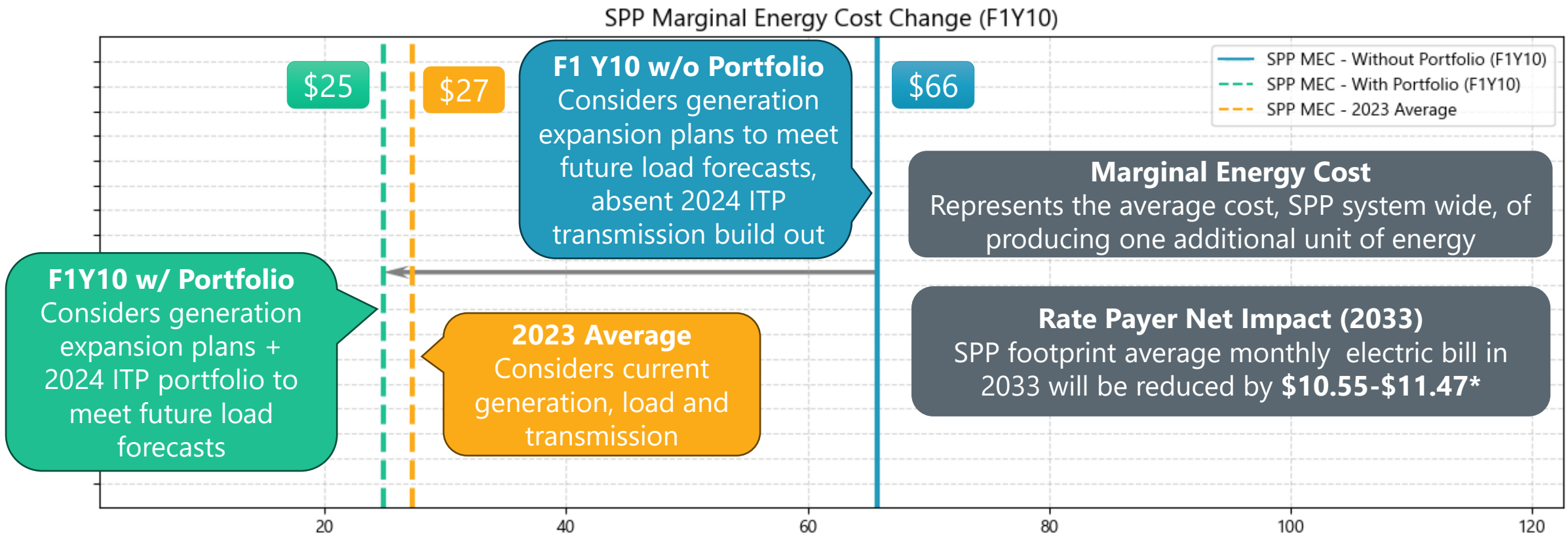
Elliott



#	2021 WINTER STORM REVIEW RECOMMENDATION
TXP 1	Develop policies…"to **more effectively utilize transmission system during severe events**"
TXP 2	Develop transmission planning policies…"to **better account for severe events"**

AFFORDABILITY OF THE 2024 ITP PORTFOLIO

The 2024 ITP portfolio maintains customer affordability while addressing reliability, economic, and resiliency needs



F1 Y10 w/o Portfolio
Considers generation expansion plans to meet future load forecasts, absent 2024 ITP transmission build out

Marginal Energy Cost
Represents the average cost, SPP system wide, of producing one additional unit of energy

F1Y10 w/ Portfolio
Considers generation expansion plans + 2024 ITP portfolio to meet future load forecasts

2023 Average
Considers current generation, load and transmission

Rate Payer Net Impact (2033)
SPP footprint average monthly electric bill in 2033 will be reduced by **$10.55-$11.47***

Portfolio expected to pay for itself within three years

Each state has a B/C ratio >1.0

8.2-8.8 B/C ratio is the highest in SPP history

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

Leading our industry to a brighter future while delivering the best energy value.

Mission & Vision

WINTER WEATHER PROJECT STAGING

Staff and stakeholders agree that the portfolio is needed and expected to provide significant benefits to SPP and its customers

TWG and ESWG recommend staging the winter weather projects as **soon as possible similar to** persistent operational solutions

- Recommend MOPC approve a waiver of the **ITP staging** process

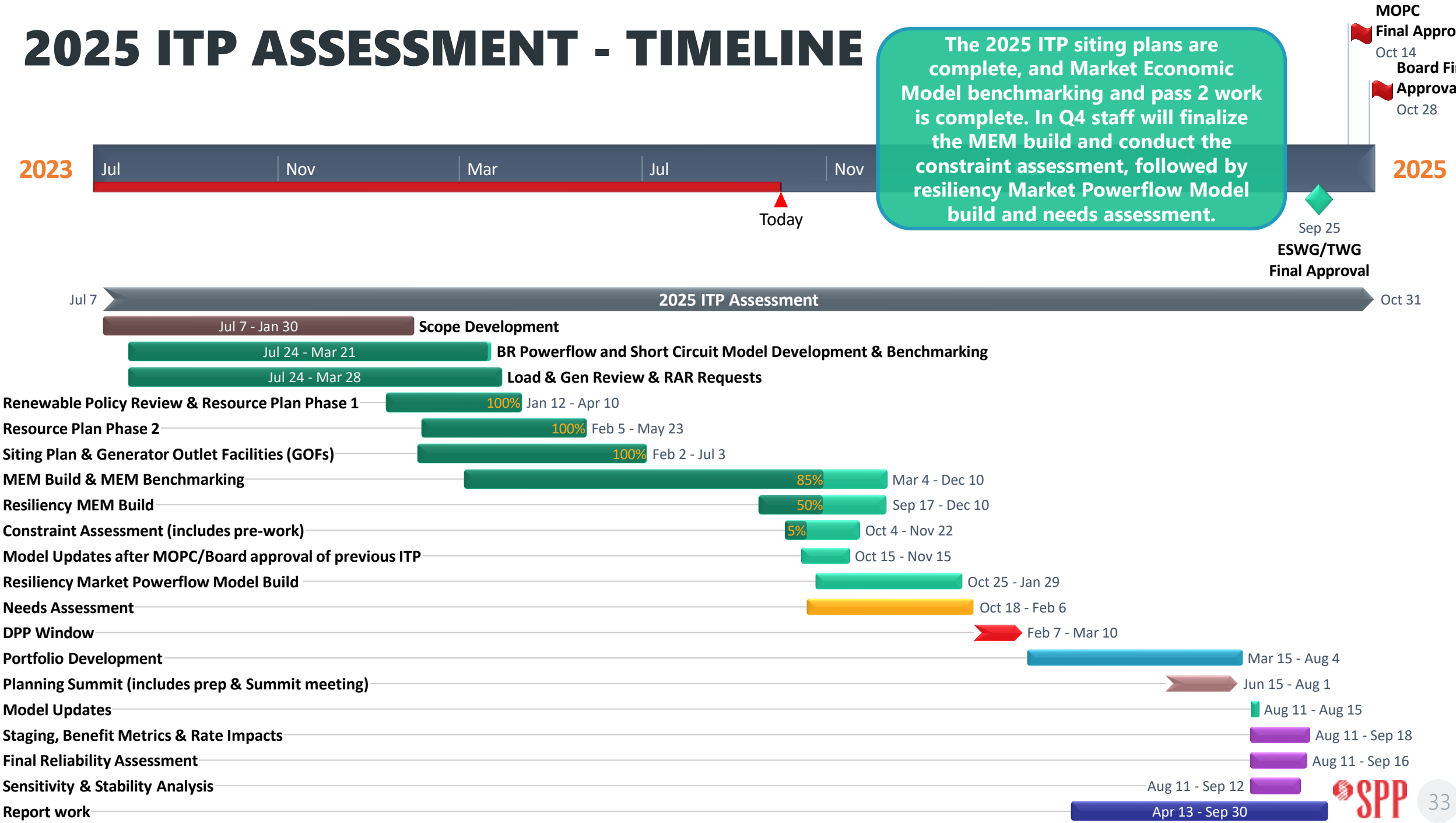
SPP staff recommends analysis and staging methodology consistent with the existing tariff and ITP Manual

- Includes the recent creation of a year 2 Elliott model to calculate need date

Project	SPP Need Date	TWG/ESWG Need Date
Elm Creek – Tobias 345 kV new line	12/1/2028	Date of NTC Issuance
Holcomb - Sidney 345 kV new line	Date of NTC Issuance	Date of NTC Issuance
Buffalo Flats – Delaware 345 kV new line	12/1/2028	Date of NTC Issuance
Delaware – Monett 345 kV new line	12/1/2025	Date of NTC Issuance
Monett – N. Branson 345 kV new line	12/1/2025	Date of NTC Issuance

2025 ITP ASSESSMENT - TIMELINE

The 2025 ITP siting plans are complete, and Market Economic Model benchmarking and pass 2 work is complete. In Q4 staff will finalize the MEM build and conduct the constraint assessment, followed by resiliency Market Powerflow Model build and needs assessment.



MISSOURI 2024 ITP PROJECTS

Zone	Project	Type	Need Date*	Project In-Service Date
Evergy/American Electric Power	- **NEW**: Buffalo Flats – Delaware 345 kV 154.6 miles	Winter Weather	12/1/2028	11/12/2029
American Electric Power/Empire District Electric	- **NEW**: Delaware – Monett 345 kV 114.5 miles	Winter Weather	12/1/2025	11/12/2029
Empire District Electric	- **NEW**: Monett – North Branson 345 kV 47.2 miles	Winter Weather	12/1/2025	11/12/2028
Empire District Electric	- **REBUILD**: Monett – Aurora 161 kV 11.5 miles	Winter Weather/Persistent Operational	Date of NTC Issuance	5/12/2027
Empire District Electric	- **REBUILD**: Aurora – North Reed Springs 161 kV 23.7 miles	Winter Weather	12/1/2025	11/12/2027
Empire District Electric	- **REBUILD**: North Reed Springs – South Reed Springs 161 kV 1.5 miles	Winter Weather	12/1/2025	5/12/2027
Empire District Electric	- **REBUILD**: South Reed Springs – Branson Northwest 161 kV 8.3 miles	Winter Weather	12/1/2025	5/12/2027
Empire District Electric	- **REBUILD**: Branson Northwest – Branson North 161 kV 0.85 miles	Winter Weather	12/1/2025	5/12/2027
Empire District Electric	- **REBUILD**: Branson North – Ozark Dam 161 kV 7 miles	Winter Weather	12/1/2025	5/12/2027
Empire District Electric	- **VOLTAGE CONVERSION**: Ozark Dam – Forsyth North 3.8 miles	Winter Weather	12/1/2025	5/12/2027
Empire District Electric	- **VOLTAGE CONVERSION**: Forsyth North – Ozark South 24.4 miles	Winter Weather	12/1/2025	5/12/2027

*Need Date is based upon staff's recommended staging methodology

MISSOURI 2024 ITP PROJECTS

Zone	Project	Type	Need Date	Project In-Service Date
AECI	Lamar 161/69 KV Circuit Transformer	Economic	1/1/2036	1/1/2036
Evergy-Greater Missouri Operations	Martin City (east) Martin City (west) 161 kV Terminal Equipment	Economic	1/1/2025	5/12/2026
AECI/ Evergy	Blackberry – Neosho 345 KV Rebuild	Economic	1/1/2036	1/1/2036
Evergy Metro	Nashua 345/161 KV CKT 2 Transformer	Economic/Persistent Operational	Date of NTC of Issuance	11/12/2026

SOUTHWEST POWER POOL COMPETITIVE UPGRADE DETERMINATION

SPP GOVERNING DOCUMENTS

Attachment O

- Governs the transmission planning process which is reviewed and approved by stakeholder groups with final Board approval.

Attachment Y

- Processes for award of a project whether it is competitive or assigned to the incumbent Transmission Owner (TO).

Business Practice 7660

- Outlines the procedures utilized to determine which Attachment Y Tariff process is used to select a TO for upgrades approved by the SPP Board of Directors.

WHAT IS A COMPETITIVE UPGRADE?

TRANSMISSION FACILITIES:

ITP Upgrades, Network Upgrades required pursuant Attachment AQ, high priority upgrades, Generator Retirement Upgrades, or Interregional Projects;

With a nominal operating voltage of greater than 100 kV;

Not a Rebuild of an existing facility;

Do not alter a Transmission Owner's use and control of its existing right of way under relevant laws or regulations;

Located where the selection of a Transmission Owner pursuant to Section III of this Attachment Y does not violate relevant law where the transmission facility is to be built;

Do not require both a Rebuild of existing facilities and new transmission facilities;

Not a Local Transmission Facility

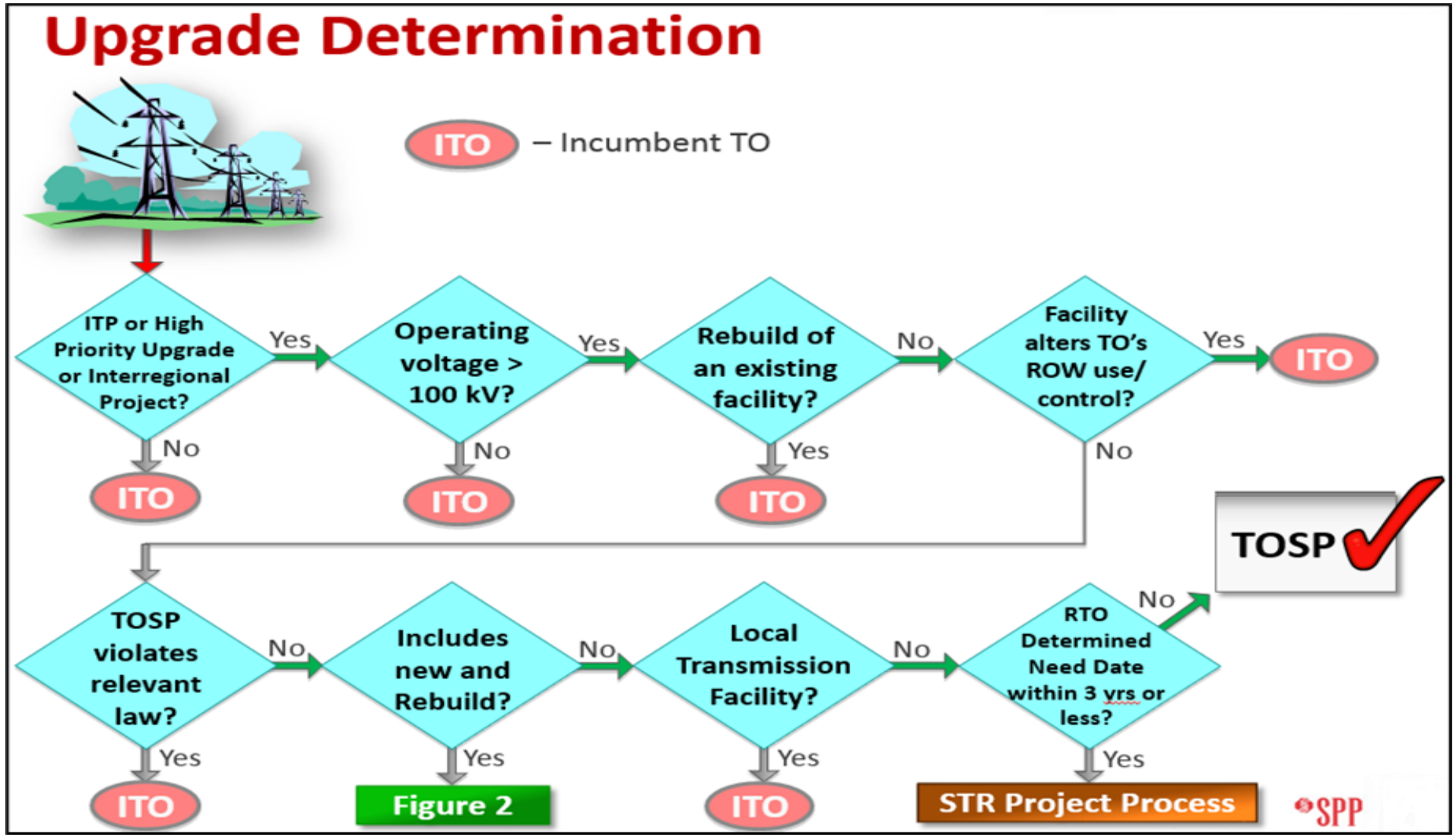
Not short-term reliability projects

2024 ITP – PROJECT DETERMINATION

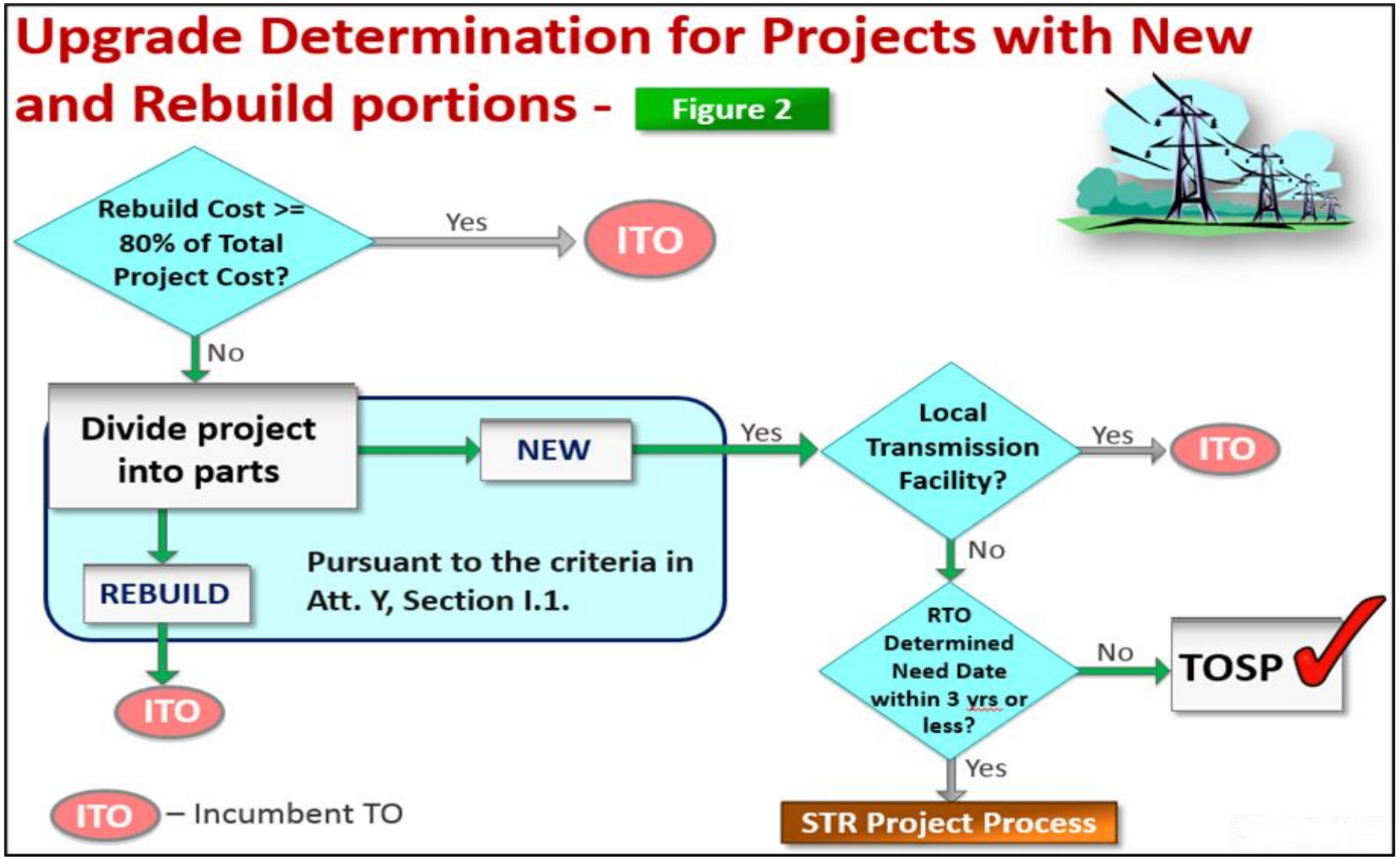
- After a legal analysis of the approved projects
  - 2 projects have been deemed to be competitive with RFPs to be issued within 30 days of the October 29, 2024 Board approval
    - Lynch - Medanos 115 kV (New Mexico)
    - Beckham County - Potter 345 kV (Oklahoma to Texas)
  - 2 potentially competitive projects will be reviewed by the Board in December to determine appropriate staging dates
  - Additional projects will follow the Short-term Reliability Process to determine how NTCs will be awarded

APPENDIX

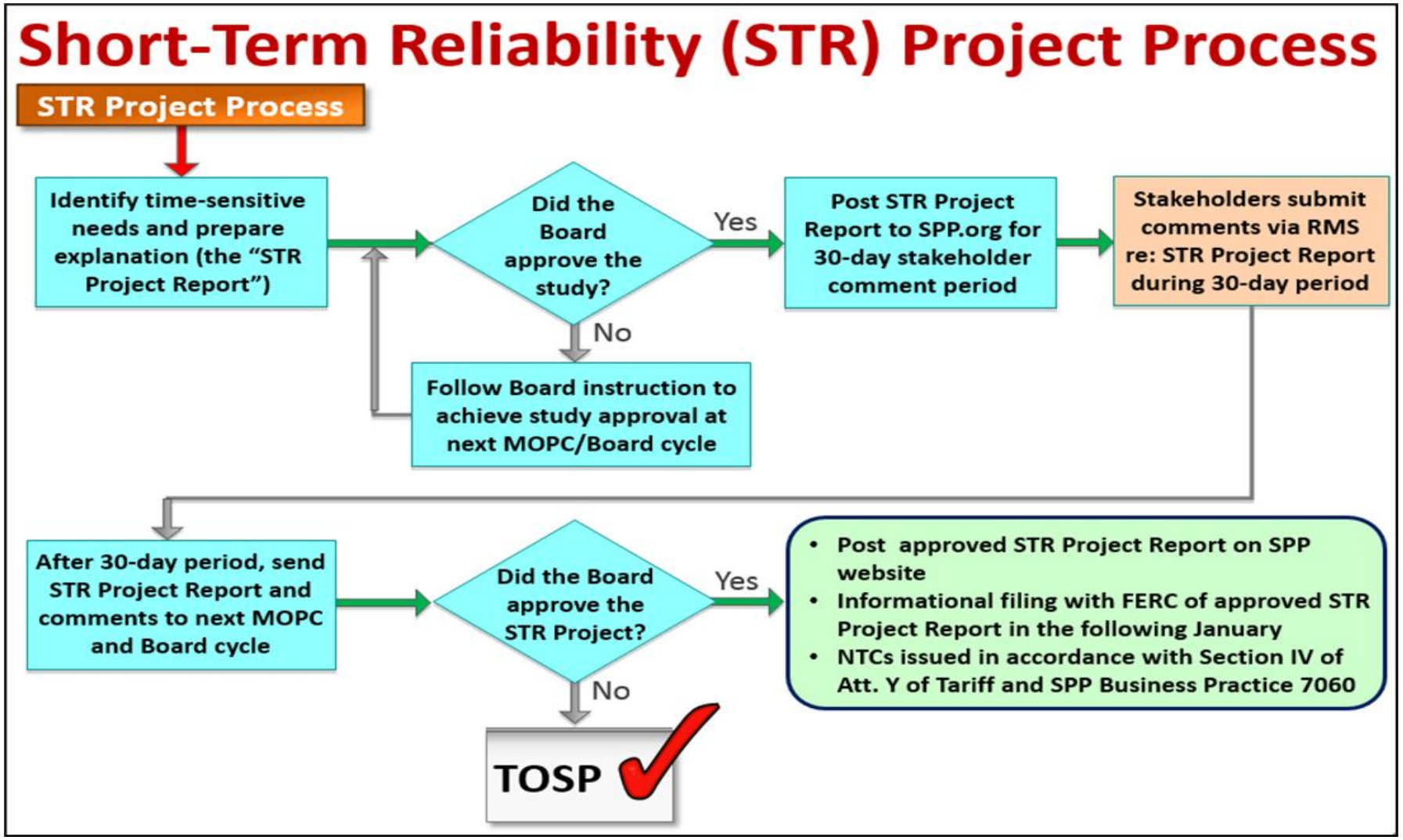
COMPETITIVE UPGRADE DETERMINATION



PROJECTS WITH NEW AND REBUILD PORTIONS



SHORT-TERM RELIABILITY PROCESS



2024 ITP ASSESSMENT
Q3 POSTINGS AND APPROVALS

Milestone & Posting Description	Posting Date	Stakeholder Review Dates
2024 ITP Draft Project List	7/15/2024	7/15/2024 – 7/29/2024
2024 ITP Final Project List and Consolidated Portfolio IDV Files	8/2/2024	8/2/2024 – 8/15/2024
Consolidated Portfolio & Staging Results	8/21/2024	*Approved 8/28/2024*
2024 ITP Report – Preliminary Draft for Review	8/21/2024	8/21/2024 – 8/28/2024
2024 ITP Final Project List	9/3/2024	9/3/2024 – 9/17/2024
2024 ITP Report and NTC Recommendations	9/18/2024	9/18/2024 – 9/25/2024
2024 ITP Report and NTC Recommendations – Updated	9/26/2024	9/26/2024 – 10/3/2024

2026 ITP ASSESSMENT AND CPP TRANSITION STUDY
Q3 POSTINGS AND APPROVALS

Milestone & Posting Description	Posting Date	Stakeholder Review Dates
Base Reliability Model Pass 1 – Powerflow	7/26/2024	7/26/2024 – 8/2/2024
Base Reliability Model Pass 1 – Short Circuit	7/26/2024	7/26/2024 – 8/2/2024
Base Reliability Model Pass 2 – Powerflow	9/13/2024	9/13/2024 – 10/4/2024
Scoping – Futures Information	9/18/2024	9/18/2024 – 9/25/2024
Load and Generation Review Pass 1	9/20/2024	9/20/2024 – 9/27/2024
RAR and Waiver Request	9/27/2024	9/27/2024 – 10/11/2024

ACTIVE ITP ASSESSMENTS – UPCOMING DATES
Q4 POSTINGS

2024 ITP Assessment

- **October**
  - 4 – 2024 ITP Report and NTC Recommendations (MOPC)
  - 18 – 2024 ITP Report and NTC Recommendations (BOD)
- **November**
  - N/A
- **December**
  - N/A

2025 ITP Assessment

- **October**
  - 1 – Resiliency Market Economic Model
  - 3 – Market Economic Model (MEM) – Pass 2 Updated
  - 24 – Constraint Assessment – Pass 1
  - 31 – Proposed Final ITP BR PF Models
- **November**
  - 7 – Constraint Assessment Pass 1 with Feedback
  - 27 – MEM Final
- **December**
  - 11 – Resiliency Market Powerflow Model – Pass 1

2026 ITP Assessment

- **October**
  - 22 – Scope Document (TWG)
  - 24 – Scope Document (ESWG)
- **November**
  - 1 – Base Reliability Powerflow Model – Pass 3
- **December**
  - 3 – Final Scope Document (TWG)
  - 5 – Final Scope Document (ESWG)
  - 20 – Base Reliability Powerflow Model – Pass 4
  - 20 – Base Reliability Short Circuit Model – Pass 2