

SOUTHWEST POWER POOL

WESTERN INTERSTATE ENERGY BOARD
ANNUAL MEETING

MAY 21, 2021

TODAY'S PRESENTATION

WESTERN ENERGY SERVICES

THE SPP DIFFERENCE

SPP'S VALUE PROPOSITION IN THE WEST

WINTER WEATHER EVENT

QUESTIONS

WESTERN ENERGY SERVICES

NWPP RESOURCE ADEQUACY PROGRAM

RELIABILITY COORDINATOR

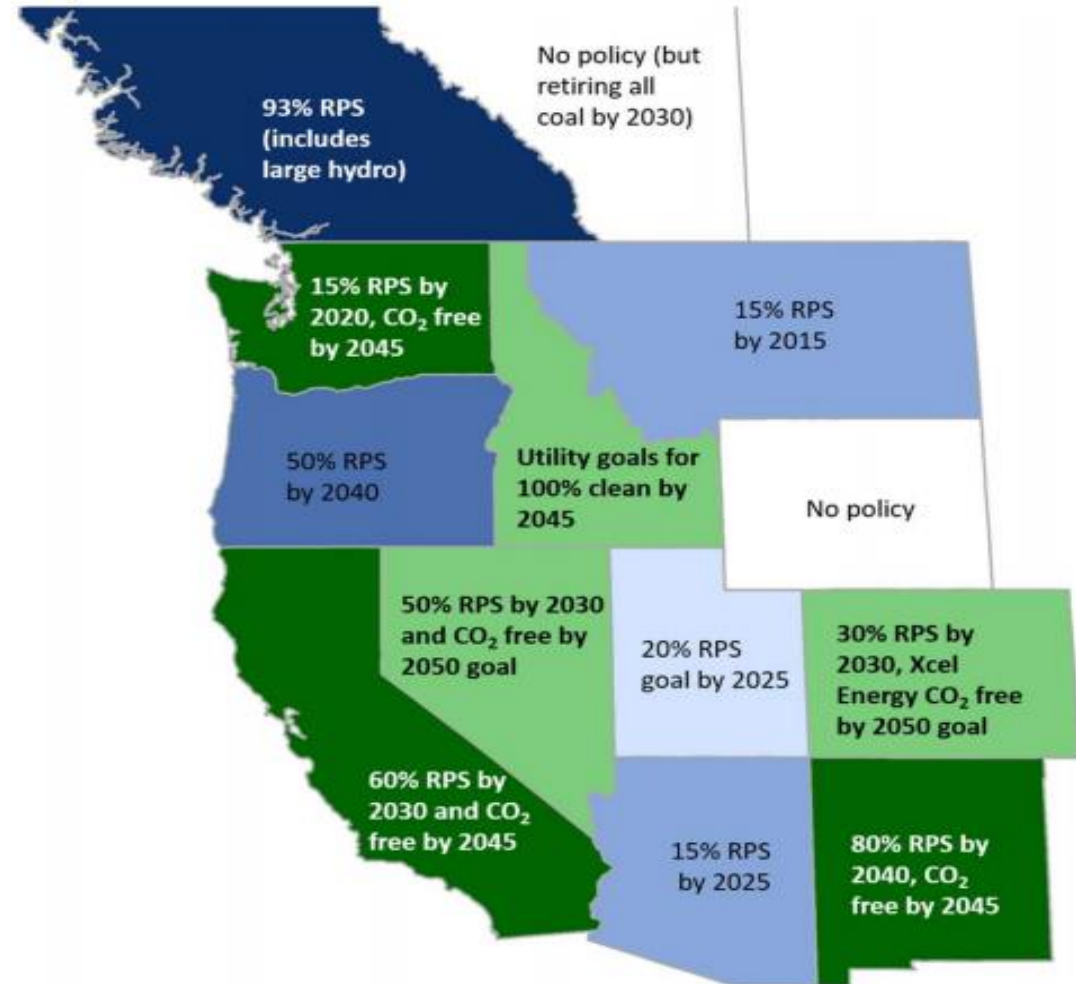
WESTERN ENERGY IMBALANCE SERVICE

SPP WEST

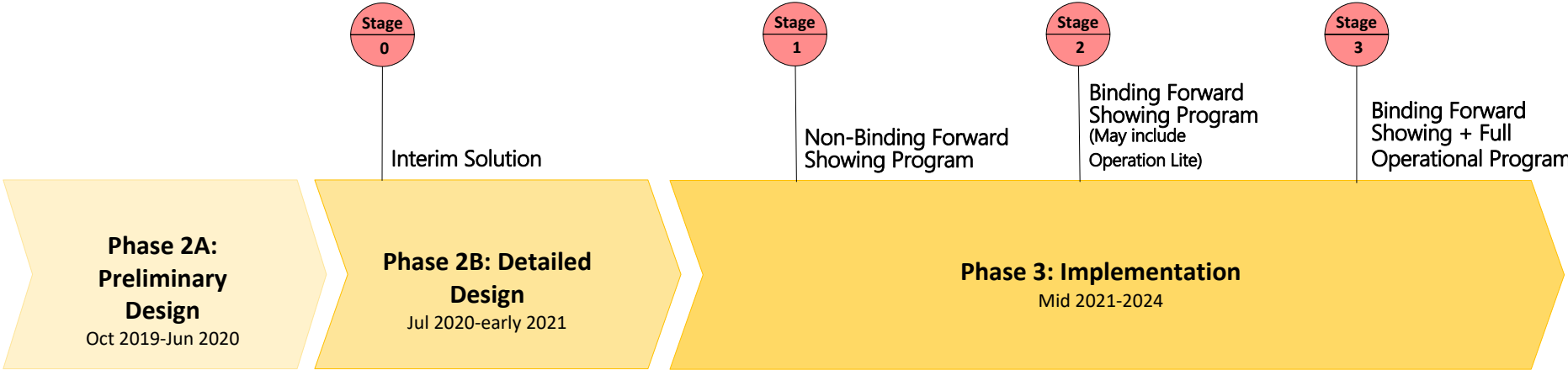
NWPP RESOURCE ADEQUACY

WHAT IS THE NEED?

- Several studies have indicated that the NW has a capacity shortfall
- Many states are mandating a shift to renewable resources
- Regional capacity metrics will enable entities to appropriately support a transition to variable energy resources (VERs) by assessing their contribution to regional reliability



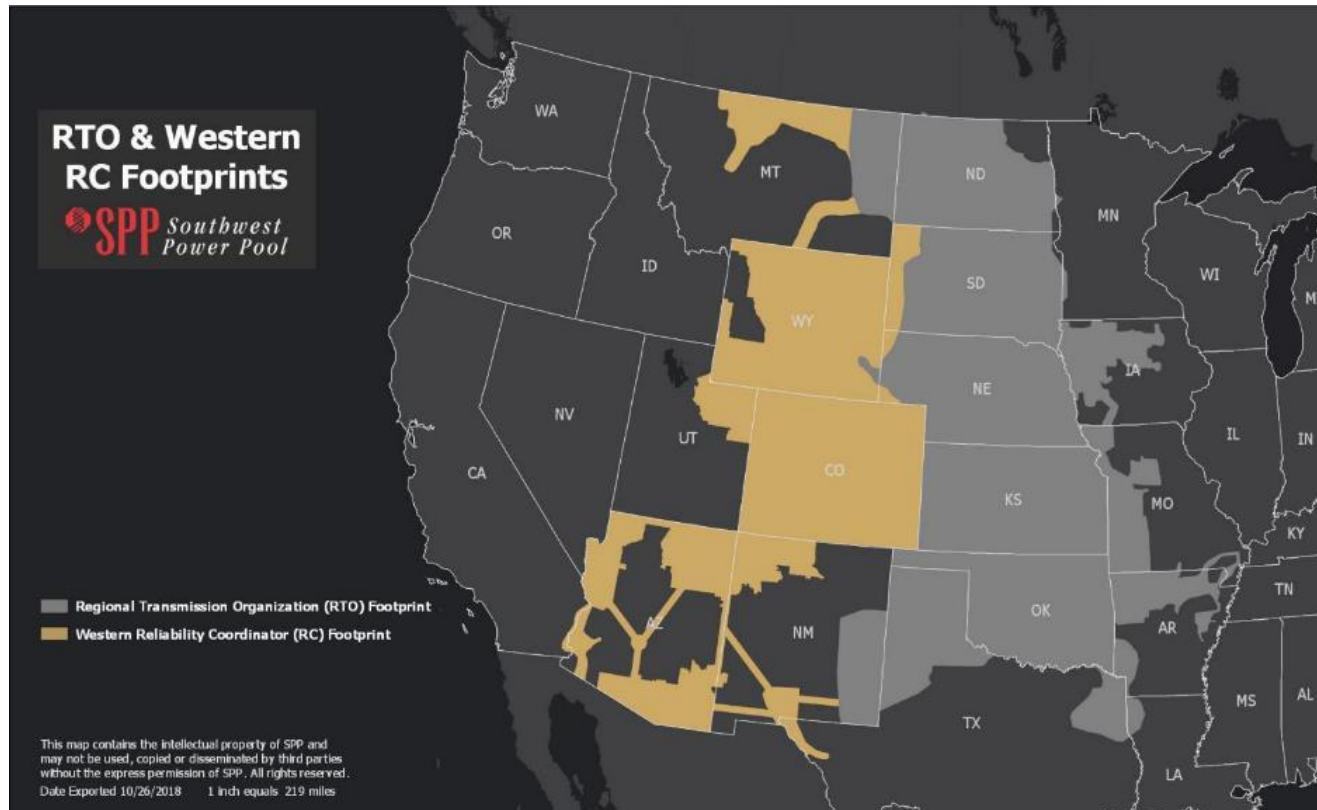
PROGRAM SCHEDULE



RELIABILITY COORDINATOR

WESTERN RELIABILITY COORDINATION SERVICES

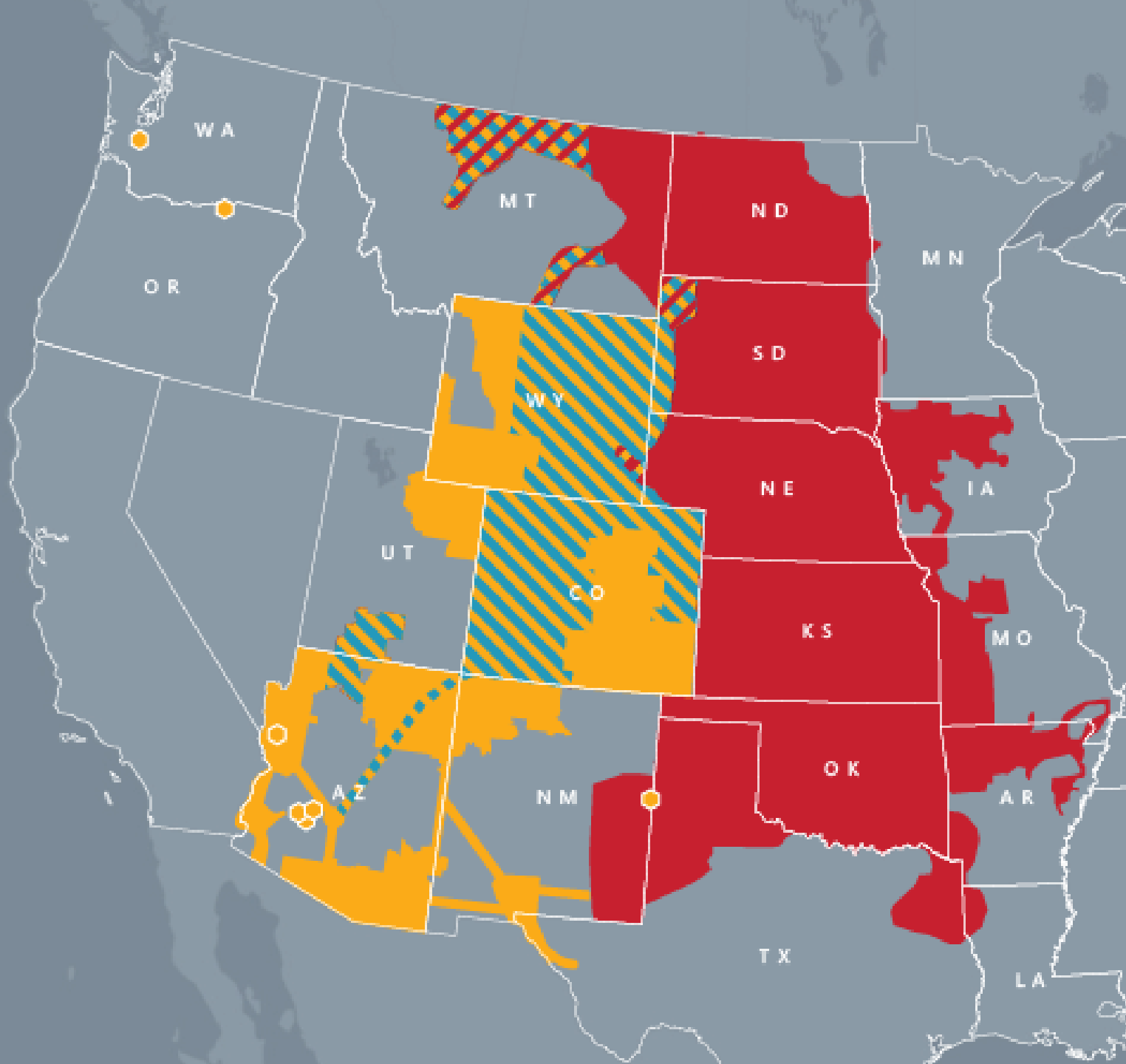
SPP-provided RC services launched December 2019



CUSTOMERS

- Arizona Electric Power Cooperative, Inc.
- Black Hills Energy's three electric utilities: Black Hills Power, Inc., Cheyenne Light, Fuel and Power Company, and Black Hills Colorado Electric, Inc.
- City of Farmington, NM
- Colorado Springs Utilities
- El Paso Electric Company
- Intermountain Rural Electric Association
- Platte River Power Authority
- Public Service Company of Colorado (Xcel Energy)
- Tri-State Generation and Transmission Association
- Tucson Electric Power
- Western Area Power Administration (WAPA) Desert Southwest Region, WAPA Rocky Mountain Region, and WAPA Upper Great Plains – West

WEIS AND SPP WEST



SPP *Southwest Power Pool*

- Regional Transmission Organization (RTO)
- Western Energy Imbalance Service (WEIS) and SPP RTO West
- Western Reliability Coordinator (RC)
- Generation-only Western RC participant

SPP West prospective members:

- Basin Electric Cooperative
- Tri-State G&T
- Deseret
- MEAN
- WAPA - Upper Great Plains
- WAPA - Rocky Mountain Region
- WAPA - Colorado River Storage Project

Launched February 1, 2021

KEY WEIS FEATURES: PRODUCTS, PRICING AND DISPATCH

DESIGN COMPONENT	DESCRIPTION
Market Product	Energy imbalance (five-minute)
Supply Adequacy	Supply adequacy checked day-ahead and before each operating hour
Pricing Mechanism	Locational Marginal Prices (LMP)
Dispatch	SPP sends resources real-time security constrained dispatch signals calculated by its market clearing engine (MCE)
Unit Commitment	Each entity is responsible for commitment of generation to meet its real-time obligation

KEY WEIS FEATURES: SETTLEMENTS

DESIGN COMPONENT	DESCRIPTION
Settlement Responsibilities	SPP provides centralized calculation, collection and distribution of market settlements.
Settlement Granularity	Five-minute
Settlement Timeline	Daily settlement statements


New Member Integration Process

1. Initial Discussion

- Occurs after First Triggering Event
- Establish Members Forum
- Establish State Commission Forum




2. Due Diligence and Membership Agreement Discussion

- 
- SPC, State Commission Forum, Members Forum provide input and receive regular updates on progress
 - SPP Staff Responsible for due diligence and negotiation
 - SPP Staff updates to working groups and committees
 - SPP Staff report on cost benefit analysis



3. SPP OATT and Governing Document Changes

- 
- SPP Staff updates to SPC, others as needed
 - All Member meeting to discuss OATT and Governing Document changes, RSC may attend and/or request a special RSC meeting
 - If documents amended, respective groups are convened for approval

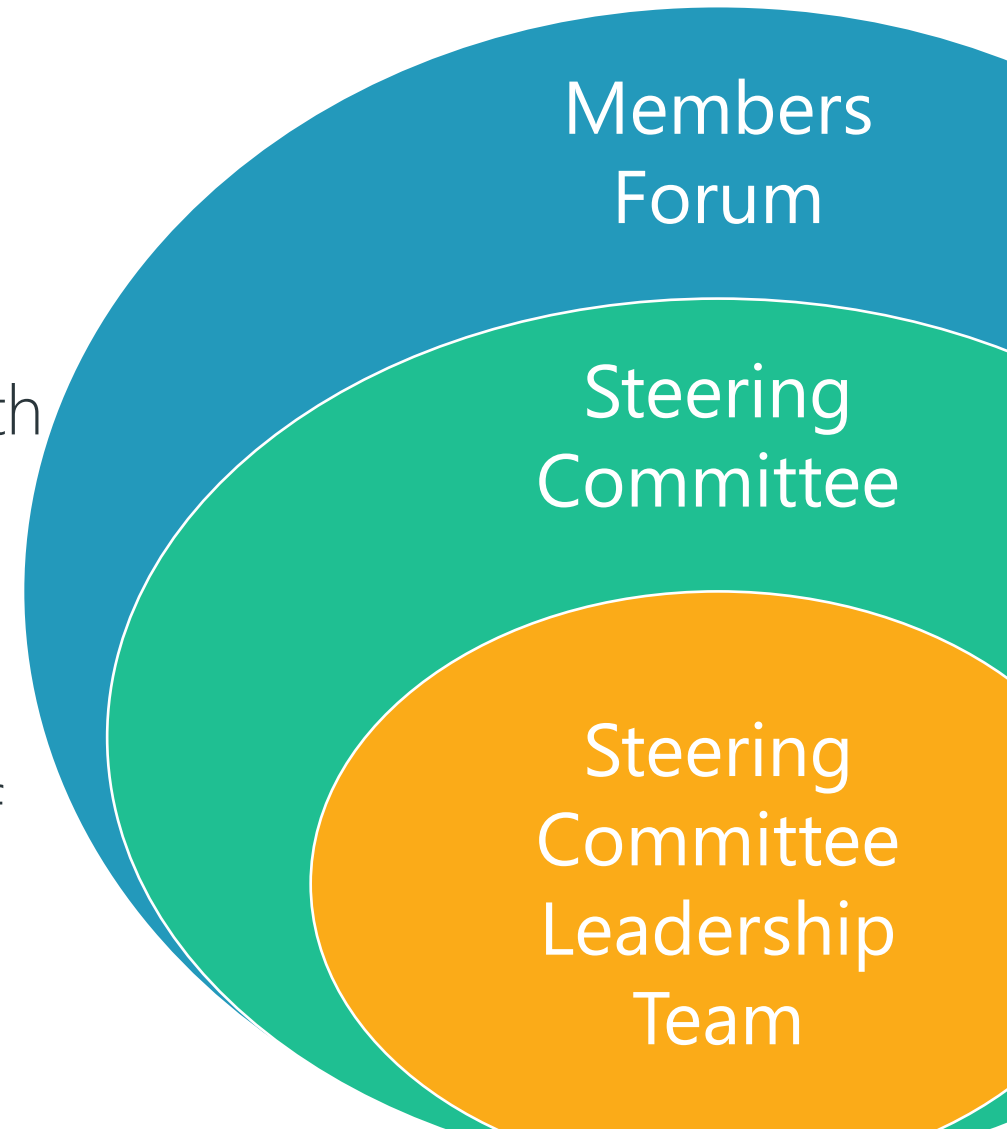


4. FERC Approvals

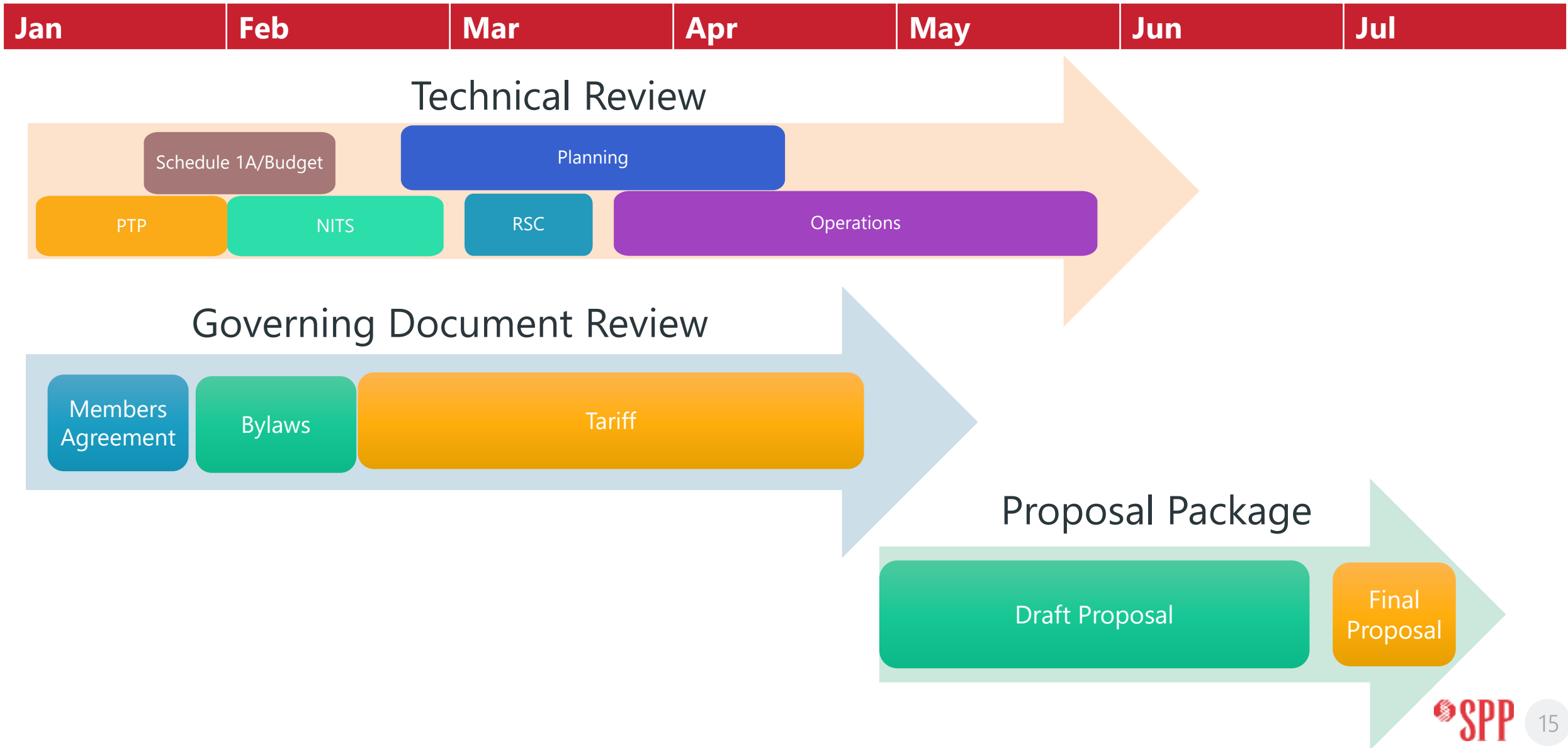
5. Integration

MEMBERS FORUM

- Members Forum is open to all SPP Members
 - Requires Confidentiality Agreement
- **Steering Committee of the Members Forum**
 - Twelve participants from Members Forum with diverse backgrounds
- **Steering Committee Leadership Team**
 - Two Representatives selected by the Steering Committee to participate alongside SPP Staff during negotiations



SCHEDULE



THE SPP DIFFERENCE



Build and maintain trusted relationships

Achieve collaboratively and engage passionately

Deliver superior service

Drive value beyond reliability

Embrace and promote diversity

**THE SPP
DIFFERENCE**

	ISONE	NYISO	CAISO	SPP	ERCOT	MISO	PJM
Peak Demand (in MW)	28,130	33,956	50,270	50,662	74,531	130,917	165,492
	(August 2006)	(July 2013)	(July 2006)	(Aug. 2019)	(August 2019)	(July 2011)	-2011
Capacity (in MW)	33,000	42,056	45,455	89,999	78,000	190,432	180,086
Miles of Transmission	9,000	11,173	25,715	66,892	46,500	71,800	84,236
Number of Generators	350	760	1,080	818	650	6,624	1,379
Number of Employees	609	595	629	638	728	940	735
(as of August 2019)							
Operating Expenses	193	N/A	213.7	176.6	207.7	377	356.8
(in millions)*							
States in footprint	6	1	2	14	1	15	14**

GOVERNANCE

FACILITATION



BOARD OF DIRECTORS

	Larry Altenbaumer, Chairman		T. Graham Edwards, Vice Chairman		Barbara Sugg, President and CEO		Bronwen Bastone
	Julian Brix		Susan Certoma		Mark Crisson		Joshua W. Martin, III
			Elizabeth Moore		Darcy Ortiz		

2021 REGIONAL STATE COMMITTEE



Kristi Fiegen, RSC President*
South Dakota
Public Utilities
Commission



Randel Christamann, RSC Vice President*
North Dakota
Public Service
Commission



Geri Huser, RSC Secretary/Treasurer
Iowa Utilities
Board



Andrew French
Kansas
Corporation
Commission



Dana Murphy*
Oklahoma
Corporation
Commission



Dennis Grennan
Nebraska Power
Review Board



Jefferson Byrd*
New Mexico
Public Regulation
Commission



Mike Francis*
Louisiana Public
Service
Commission



Scott Rupp
Missouri Public
Service
Commission



Ted J. Thomas
Arkansas Public
Service
Commission

* Elected commissioner

AUTHORITY OF THE RSC

4 Areas of Authority	Description	Used
Cost Allocation	Whether participant funding will be used for transmission enhancements & whether license plate or postage stamp rates will be used for the regional access charge	10
Financial Transmission Rights (FTRs)	FTR allocation, where a locational price methodology is used; and the transition mechanism to be used to assure that existing firm customers receive FTRs equivalent to the customers' existing firm rights	3
Planning for Remote Resources	Whether transmission upgrades for remote resources will be included in the regional transmission planning process and the role of transmission owners in proposing transmission upgrades in the regional planning process	3
Resource Adequacy	Determine the approach for resource adequacy across SPP	2

“As the RSC reaches decisions on the methodology that will be used to address any of these issues, SPP will file this methodology pursuant to Section 205 of the Federal Power Act. However, nothing in this section prohibits SPP from filing its own related proposal(s) pursuant to Section 205 of the Federal Power Act.”

– SPP Bylaws § 7.2

MARKET DESIGN

TRACK RECORD OF SUCCESS

SPP is a customer-driven organization.

SPP designs and operates its markets for the benefit of participants.

SPP settles approximately \$16.2 billion in market transactions annually.

Only market administrator to delegate real decision-making authority to market.

SPP has consistently implemented markets on time and on budget.

SPP has provided peace of mind, electric reliability, and cost-savings for more than 75 years.

Directed construction of ~\$10B in transmission upgrades predicted to return benefits at a rate of 3.5-to-1.

TRACK RECORD OF SUCCESS

More than a decade of successful market administration

Beats counterparts in terms of affordability and reliability

- First energy imbalance service market in 2007
 - Returned \$103M in net benefits in first year (a **3-to-1 return on implementation costs**)
- Built and launched Integrated Marketplace, becoming first and only such organization to implement a day-ahead market on-schedule and on-budget.
 - Integrated Marketplace provides average of **\$744.3 million in net benefits annually**.

SPP'S VALUE PROPOSITION FOR THE WEST

ECONOMIC BENEFITS

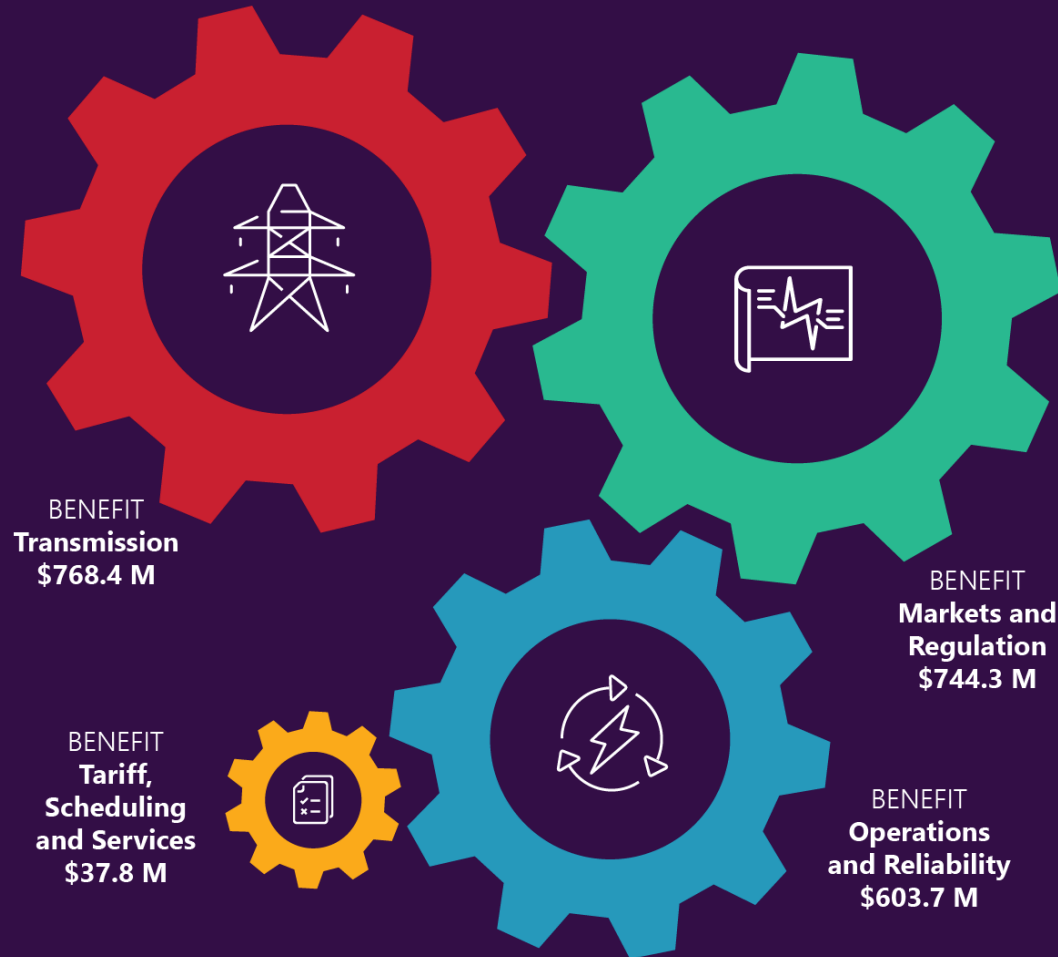
ENHANCE RELIABILITY

ACHIEVE CLEAN ENERGY GOALS

ECONOMIC BENEFITS

\$2.14 BILLION

ANNUAL SAVINGS AND BENEFITS



Operations and Reliability: \$603.7 million

SPP operates the grid from a regional perspective. This reduces costs and required energy reserves and increases efficiency.

Markets: \$744.3 million

SPP's Integrated Marketplace combines efficient and economic day-ahead, real-time and transmission markets.

Transmission: \$768.4 million

SPP's collaborative, stakeholder-driven transmission planning processes result in robust infrastructure and have rapidly and reliably integrated renewables.

Tariff, Scheduling and Services: \$37.8 million

SPP's industry-leading services and training meet the compliance, settlements, engineering, tariff and scheduling needs of our customers on a regional scale.

OTHER BENEFITS



Positive Environmental Impact

SPP's centralized markets and transmission expansion improved access to renewables and reduced CO₂ emissions by 21% since 2014.



Improved Public Policy

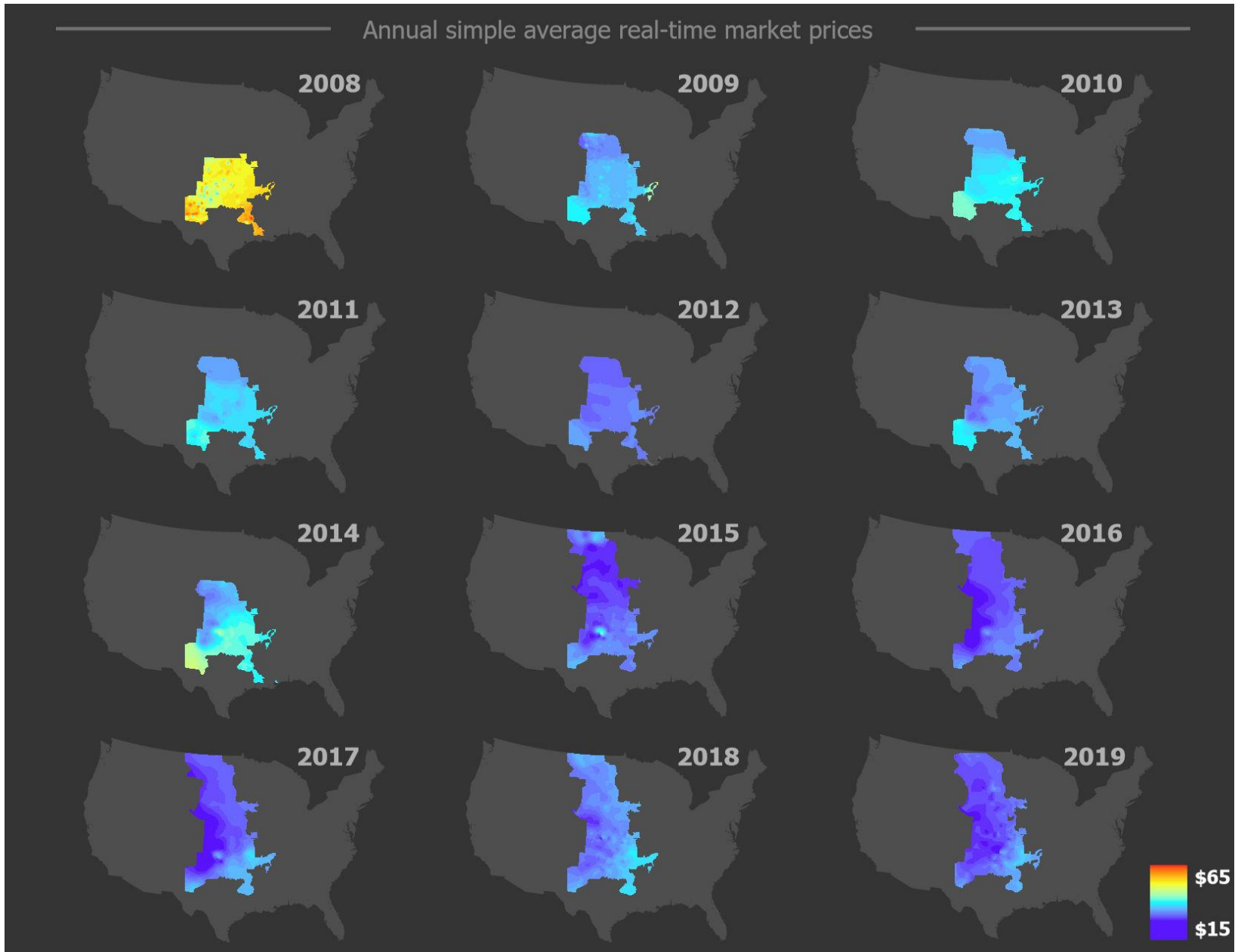
SPP helps members meet state renewable goals, provide alternatives to right-of-way acquisitions, use stakeholder processes to create mutually beneficial policies and more.



Economic Development

Transmission expansion facilitated by SPP results in billions of capital investment and thousands of skilled jobs for local economies. Our competitive wholesale rates are attracting new business to our region.

Annual simple average real-time market prices



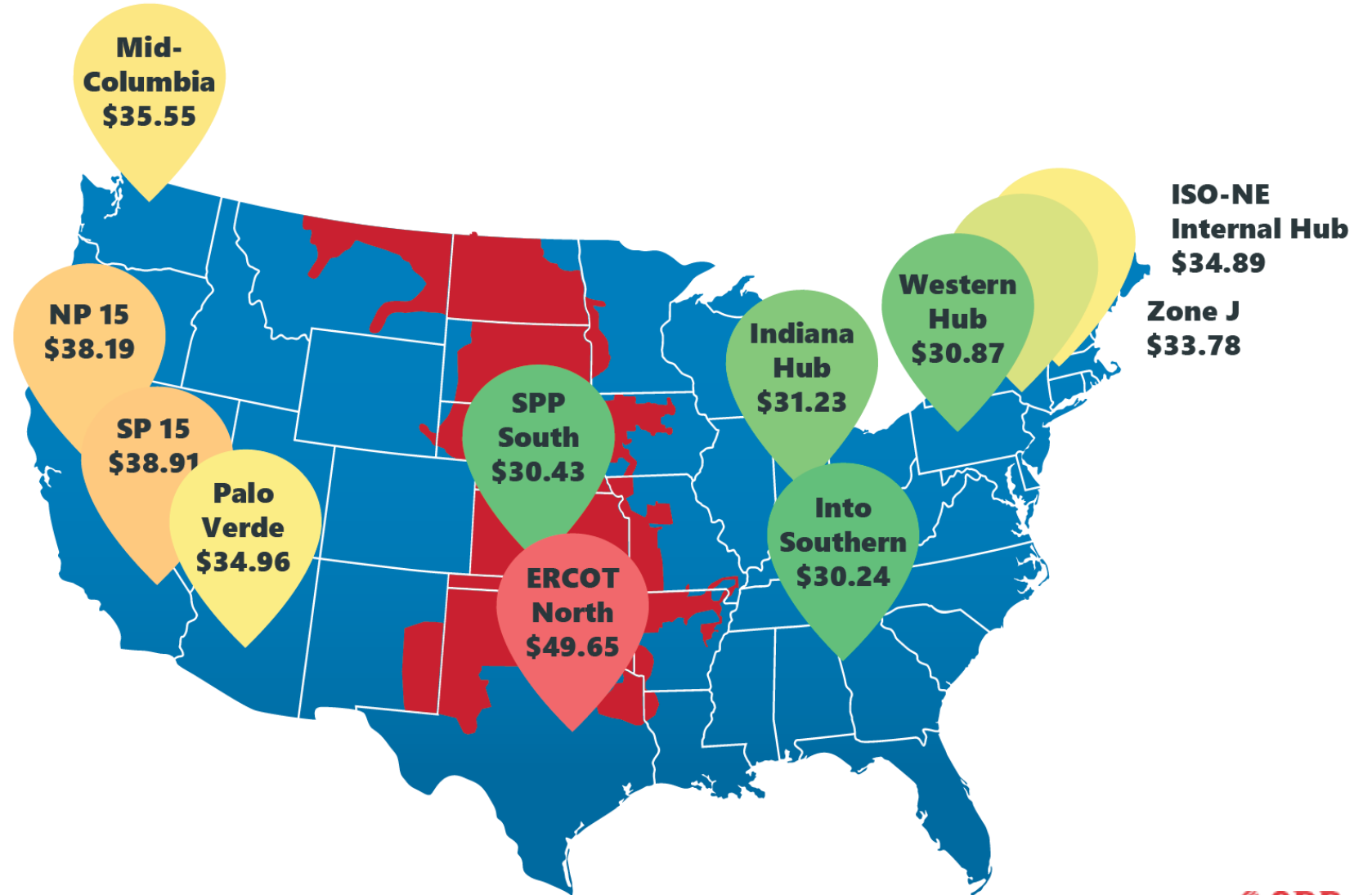
AVERAGE REAL-TIME MARKET PRICES: 2008-2019

SPP's markets have helped lower region-wide wholesale electricity prices

2019 ANNUAL AVERAGE SPOT PRICES

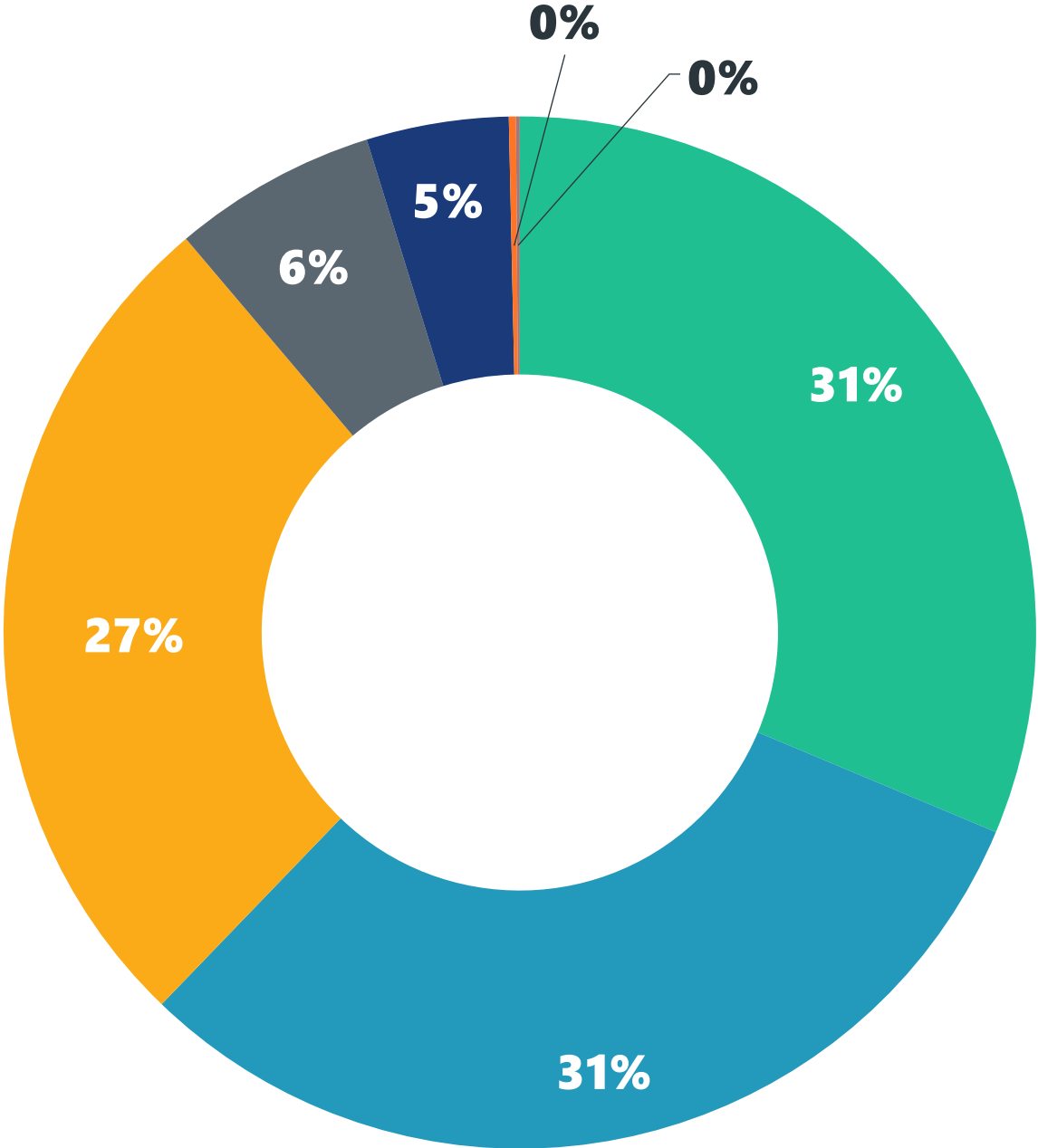
In 2019, SPP's average wholesale electricity prices remained the lowest of any organized market in the U.S.

Adapted from FERC's 2019 State of the Markets Report (March 19, 2020). Sources: Nodal prices from ABB Velocity Suite. ISO hub prices from SNL's Day-Ahead On-Peak Prices data. Mid-Columbia, Palo Verde, and Into Southern prices from SNL's S&P Global Market Intelligence Day-Ahead—Annual OnPeak Prices data.



ENHANCE RELIABILITY

2020 ENERGY PRODUCTION BY FUEL TYPE: 262.730 TWH TOTAL



- Wind (31.32%)
- Coal (30.88%)
- Natural Gas (26.61%)
- Nuclear (6.40%)
- Hydro (4.45%)
- Solar (0.22%)
- Other (0.12%)

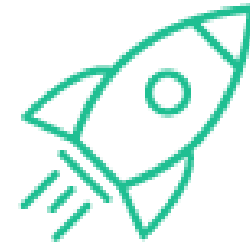
TRANSMISSION PLANNING



Directed construction of ~\$10B in transmission upgrades predicted to return benefits at a rate of 3.5-to-1.

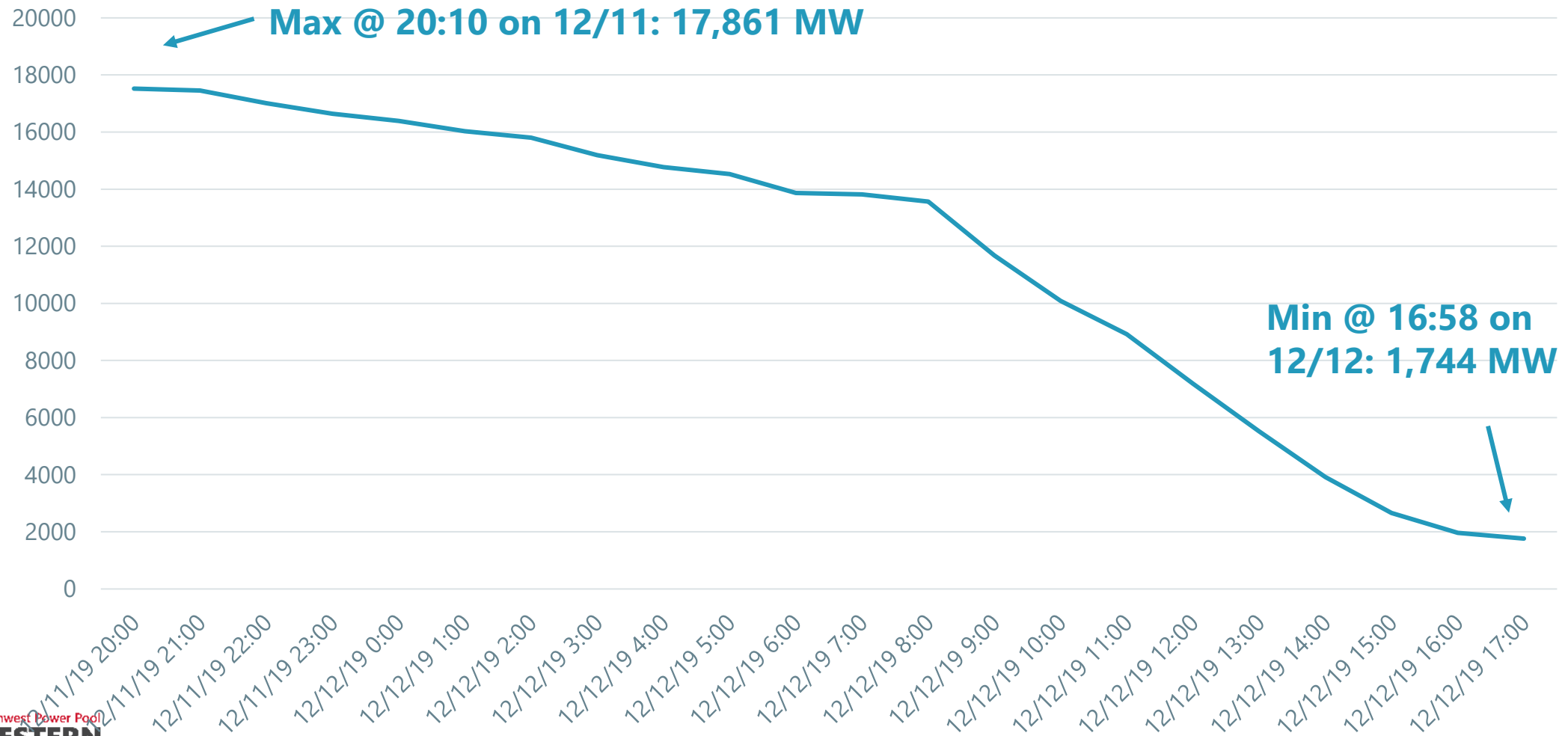


Regional planning results in stronger interconnections and increased reliability



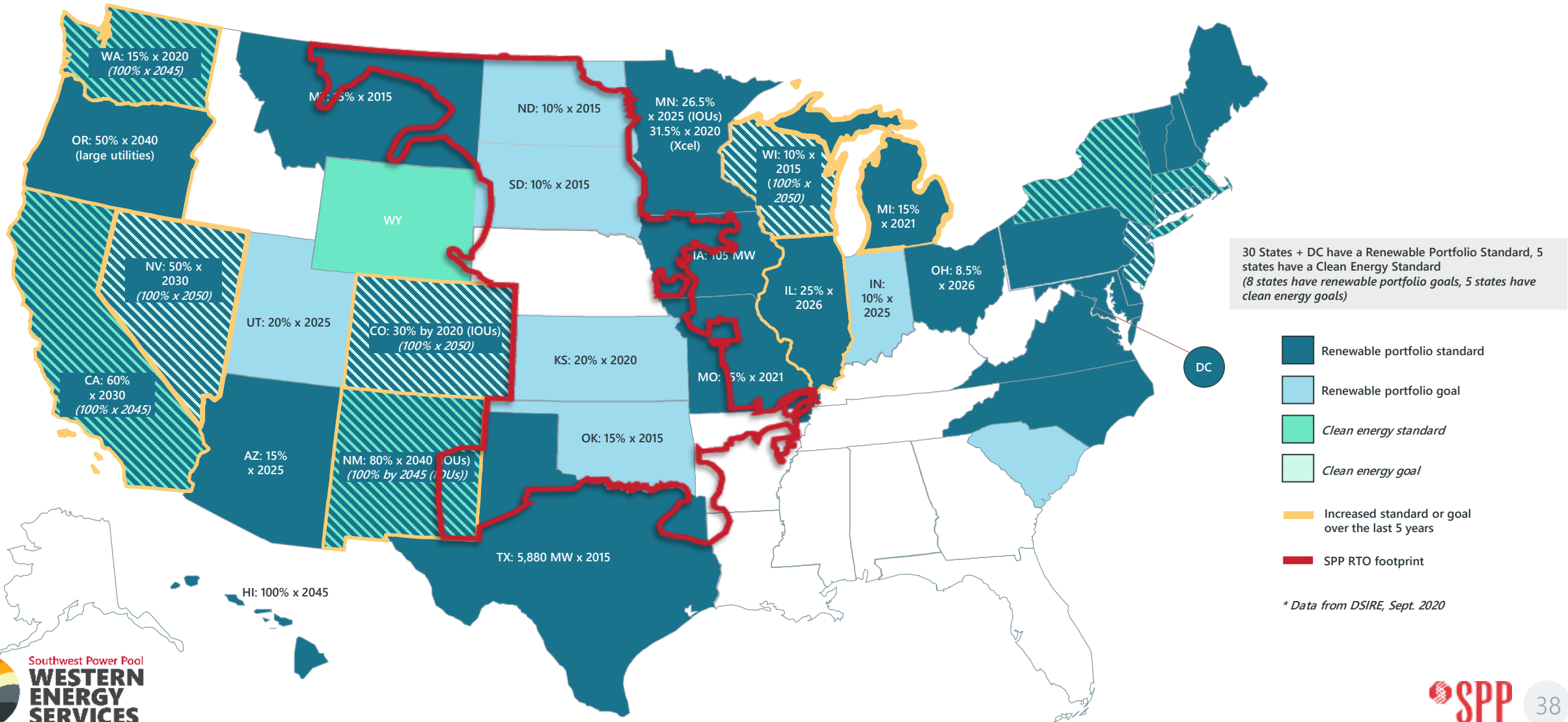
Grid modernization allows for more renewable integration, market access, and lower rates.

WHY FUEL DIVERSITY MATTERS: SPP'S RECORD WIND SWING (16 GW IN 21 HOURS)



ACHIEVE CLEAN ENERGY GOALS

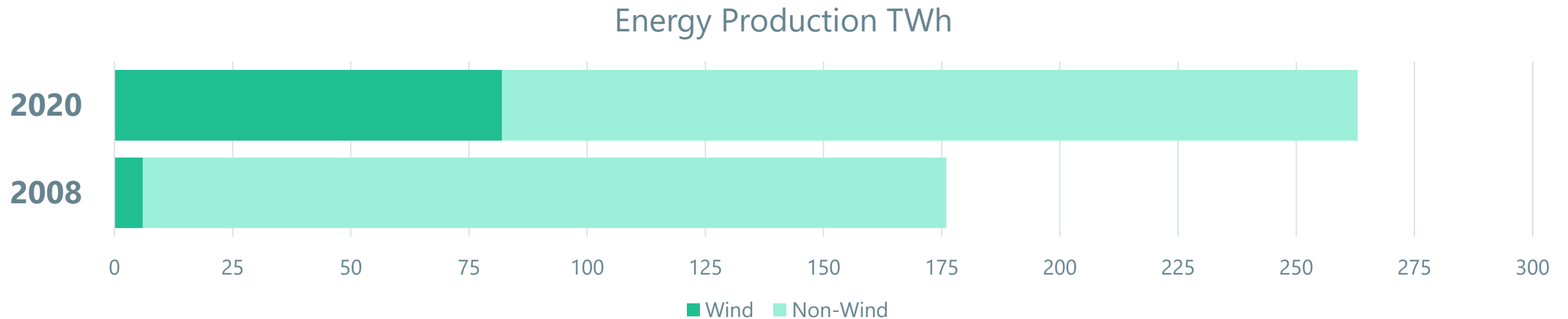
RENEWABLE & CLEAN ENERGY STANDARDS



* Data from DSIRE, Sept. 2020

INTEGRATION OF RENEWABLE GENERATION

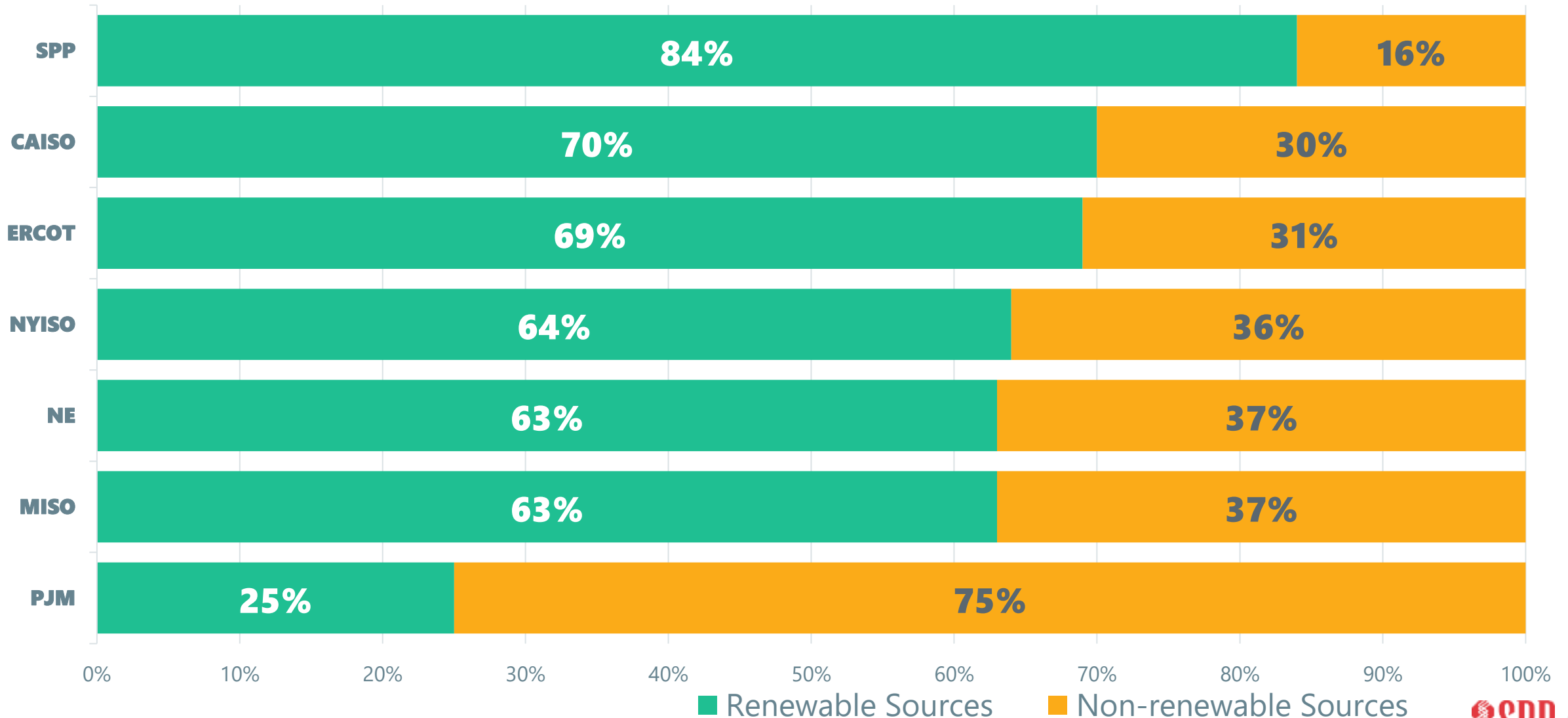
- In 2008, wind energy made up 3 percent of SPP's annual energy production (~6 TWh of 176 TWh). In 2020, SPP produced 263 TWh of energy, of which wind made up 31.3% or 82 TWh.



- On May 8, 2021, SPP served 87.5% of its load with renewables and more than 84% with wind alone.

% OF NEW ELECTRICITY GENERATION IN U.S. RTOS

New generation built in each RTO since 2012 including what will be built through 2022



Source: NRDC analysis of S&P Global Market Intelligence data

WINTER WEATHER EVENT

SPP REGION IN COLDEST PART OF U.S.

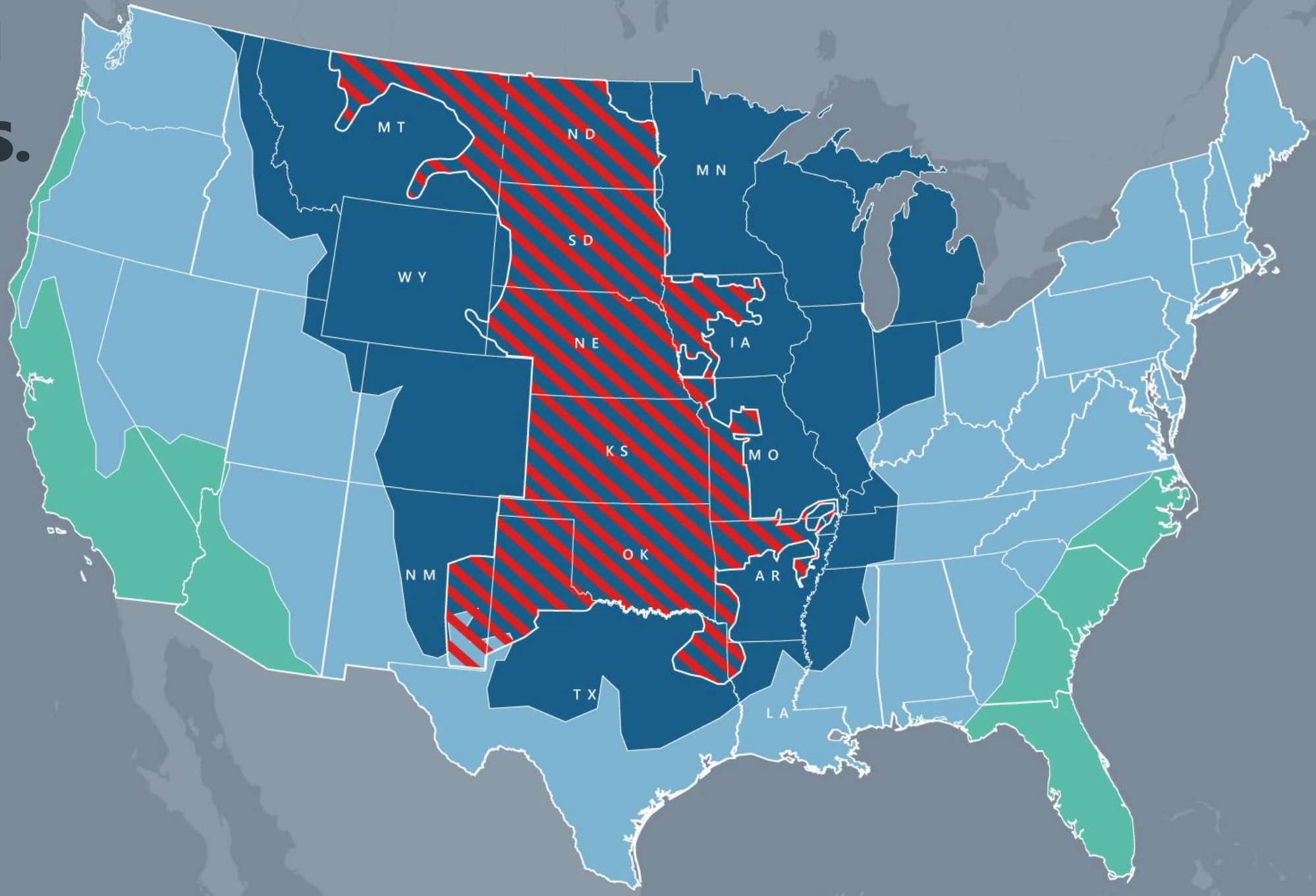


Southwest
Power Pool

temperatures forecast
for 2021
by National Weather
Service,

-
-
-
-

territory/
authority
temperatures below 0°F
and 32°F



THE BIG PICTURE



Early prep helped

2/4: Issued cold weather alert

2/8: Issued resource alert

2/11: Committed long-lead generation



Public appeals reduced demand

Demand dropped below forecast, helping minimize interruptions



We used every MW we could get

We ran every available generator and imported energy from neighbors



Service interruptions required

2/15
~1.5% of system demand for 57 min.

2/16
Up to ~6.5% of system demand for 3 hr. 23 min.



Collaboration reduced impact

Controlled, temporary interruptions prevented uncontrolled blackouts

PARALLEL PATHS



Operational review



Financial review



Regional State Committee review



Market Monitoring Unit review



Communications review

QUESTIONS

BRUCE REW

BREW@SPP.ORG

KARA B.FORNSTROM

KFORNSTROM@SPP.ORG