

Energy Imbalance Information Session

John Paulsen

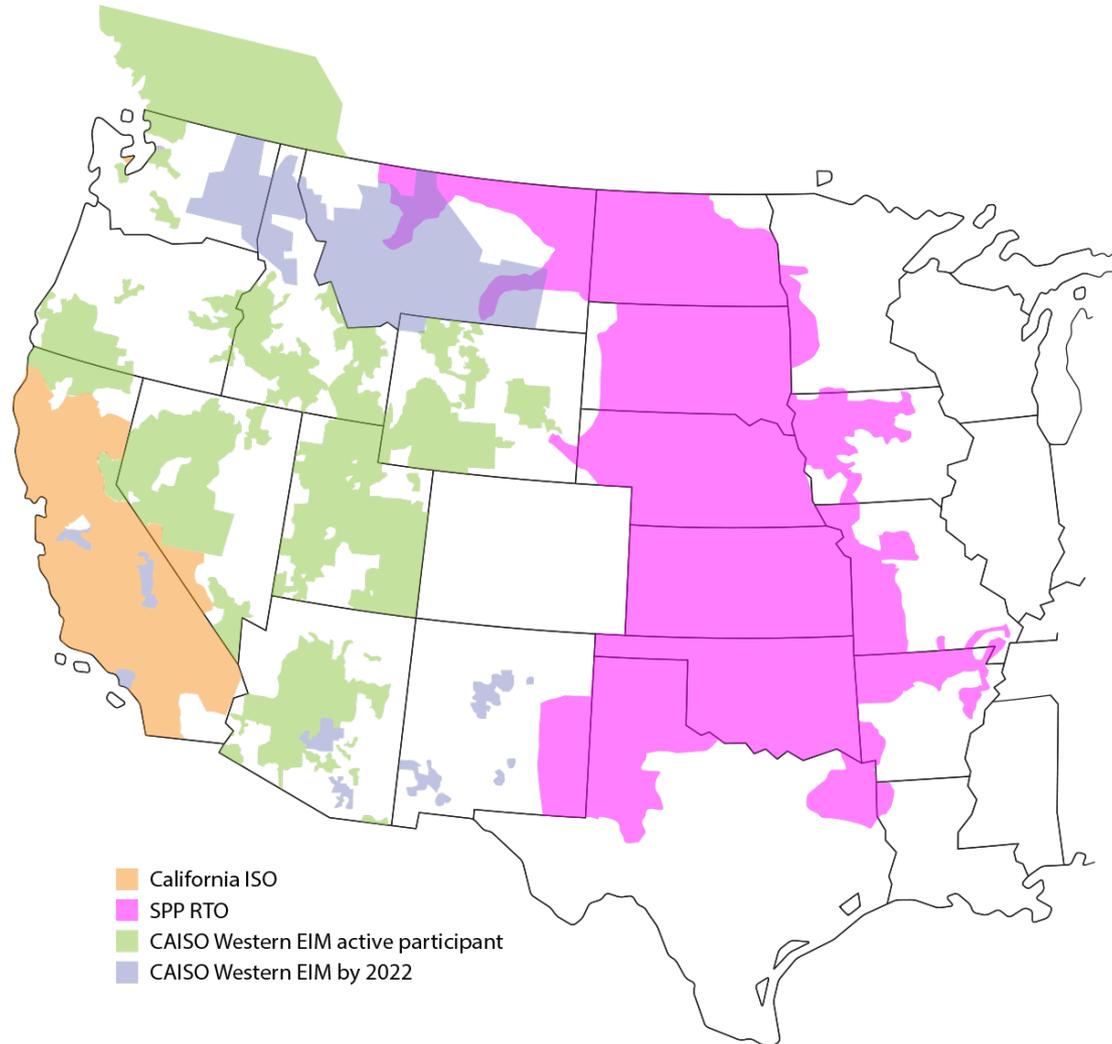
Energy Management and Marketing Manager

March 25, 2020

Agenda

- Background information
- Current Activities
- Next Steps
- Questions

Markets Are Here

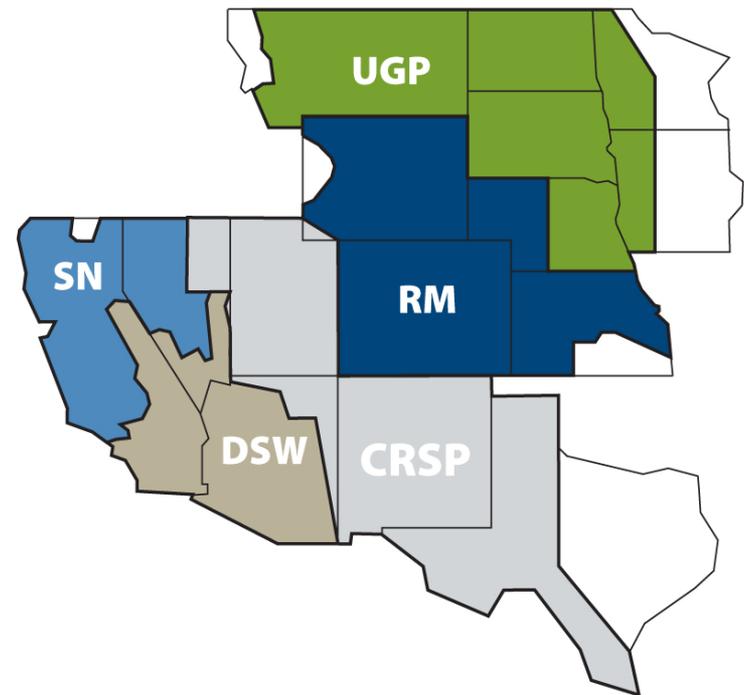


Bi-Lateral vs Organized Markets

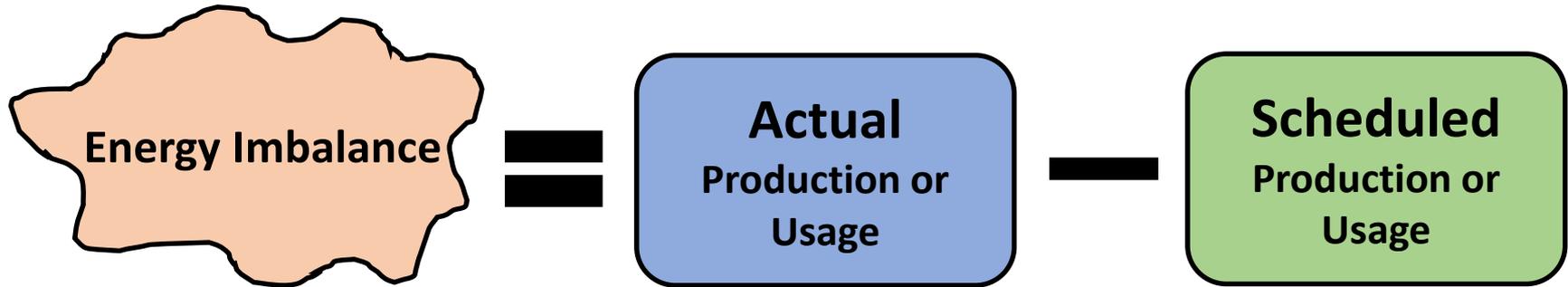
- Independent buyers and sellers of energy products get together and transact with each other. Price and terms are agreed to by the two parties.
- An organized market is the mechanism through which energy products are bought and sold. Either a full market (energy, capacity, and ancillary services) or an energy imbalance market.

WAPA's Position on Markets

- No 'one size fits all' solution
- Stay strategic, proactive and aligned with our mission
- Goal: Create the best possible outcome for our customers and our organization



Energy Imbalance & Energy Imbalance Markets



Today: WAPA handles imbalance for its balancing authorities

- We use either hydro or bilateral agreements to handle EI
- EI calculated and priced hourly
- Region settles and bills each customer

Future: Market Operator handles imbalance

- Market Operator optimizes market resources to supply EI
- EI calculated and Locational Marginal priced sub-hourly
- Market Operator does some or all settlement and billing

Energy Imbalance Options

- California Independent System Operator (CAISO) Energy Imbalance Market (EIM)
- Southwest Power Pool (SPP) Western Energy Imbalance Service (WEIS)

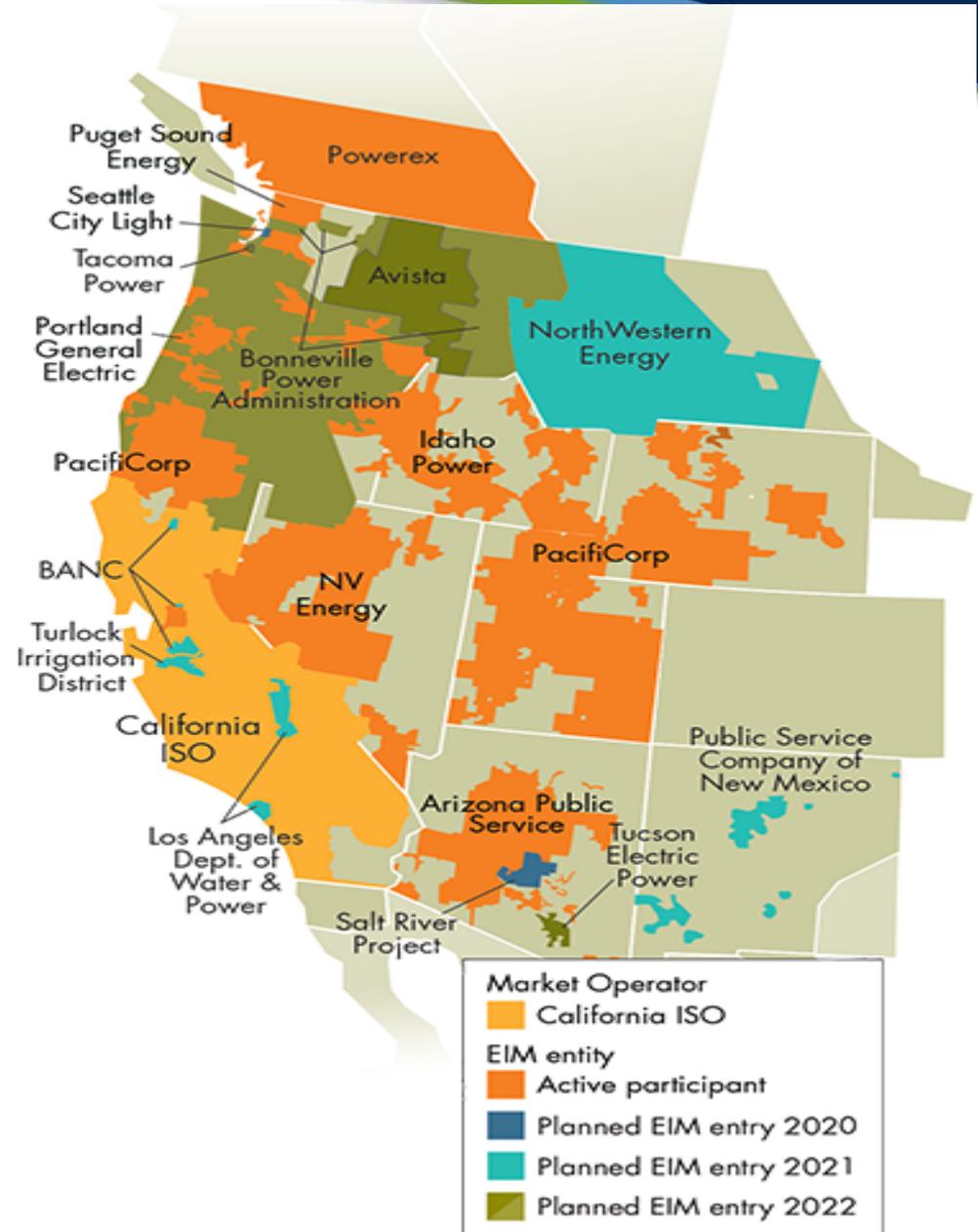
Why is WAPA interested in EIM/EIS?

Ensure reliable delivery of our hydropower while adjusting to a changing energy mix

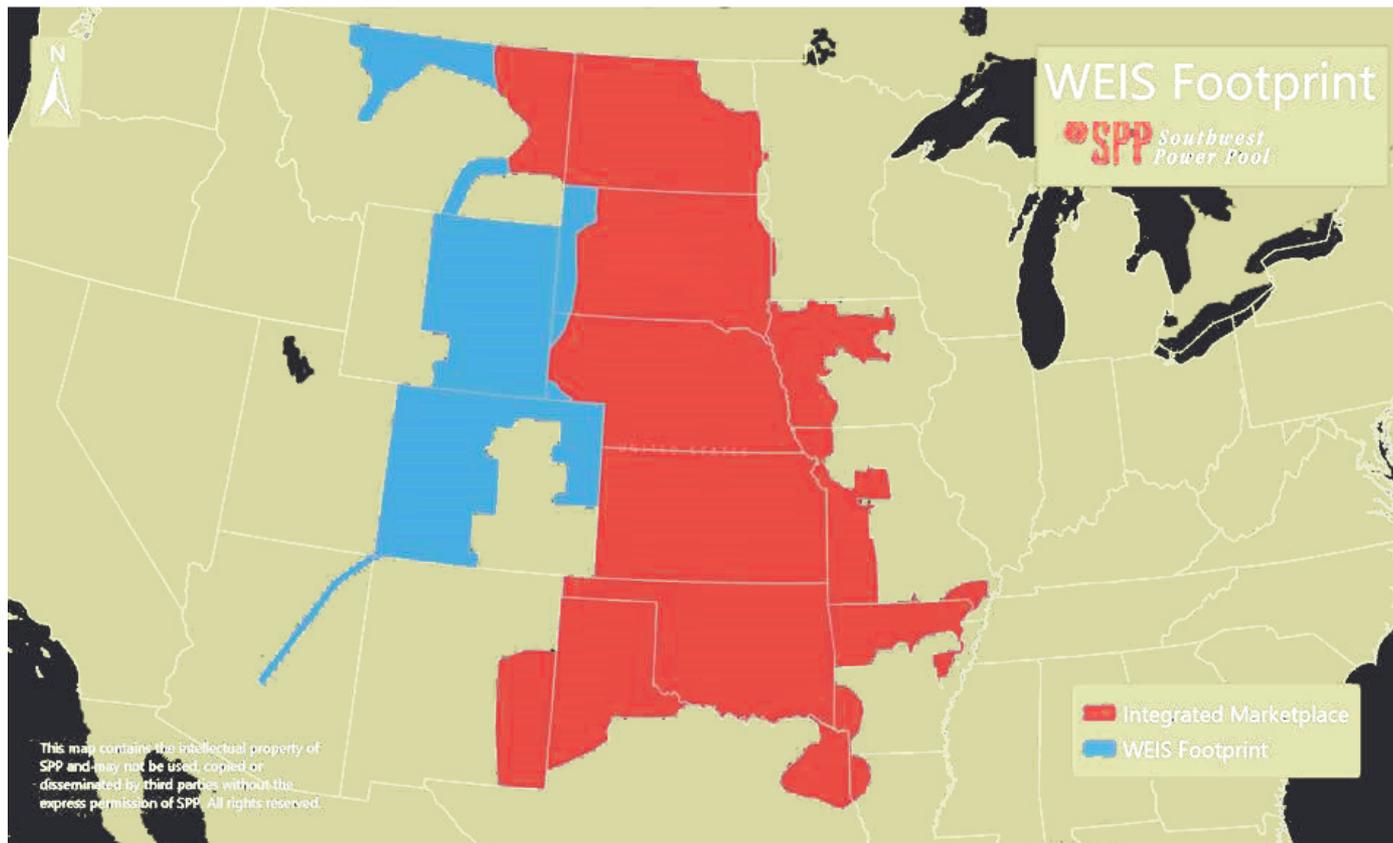
- Respond to customer feedback requesting WAPA to lead organized market discussions
- Address WAPA balancing authority limitations
- Facilitate integration of variable resources
- Enable participants who want to optimize their resources

CAISO EIM

- In operation since 2014
- WAPA's Sierra Nevada Region to join in 2021



SPP WEIS



WEIS

- Go live scheduled for February 2021
- WAPA's Rocky Mountain and a portion of Upper Great Plains Regions along with the Colorado River Storage Project facilities to join at that time
 - Also joining
 - Tri-State Generation and Transmission Association
 - Basin Electric Power Cooperative
 - Wyoming Municipal Power Agency
 - Municipal Energy Agency of Nebraska

DSW Activities

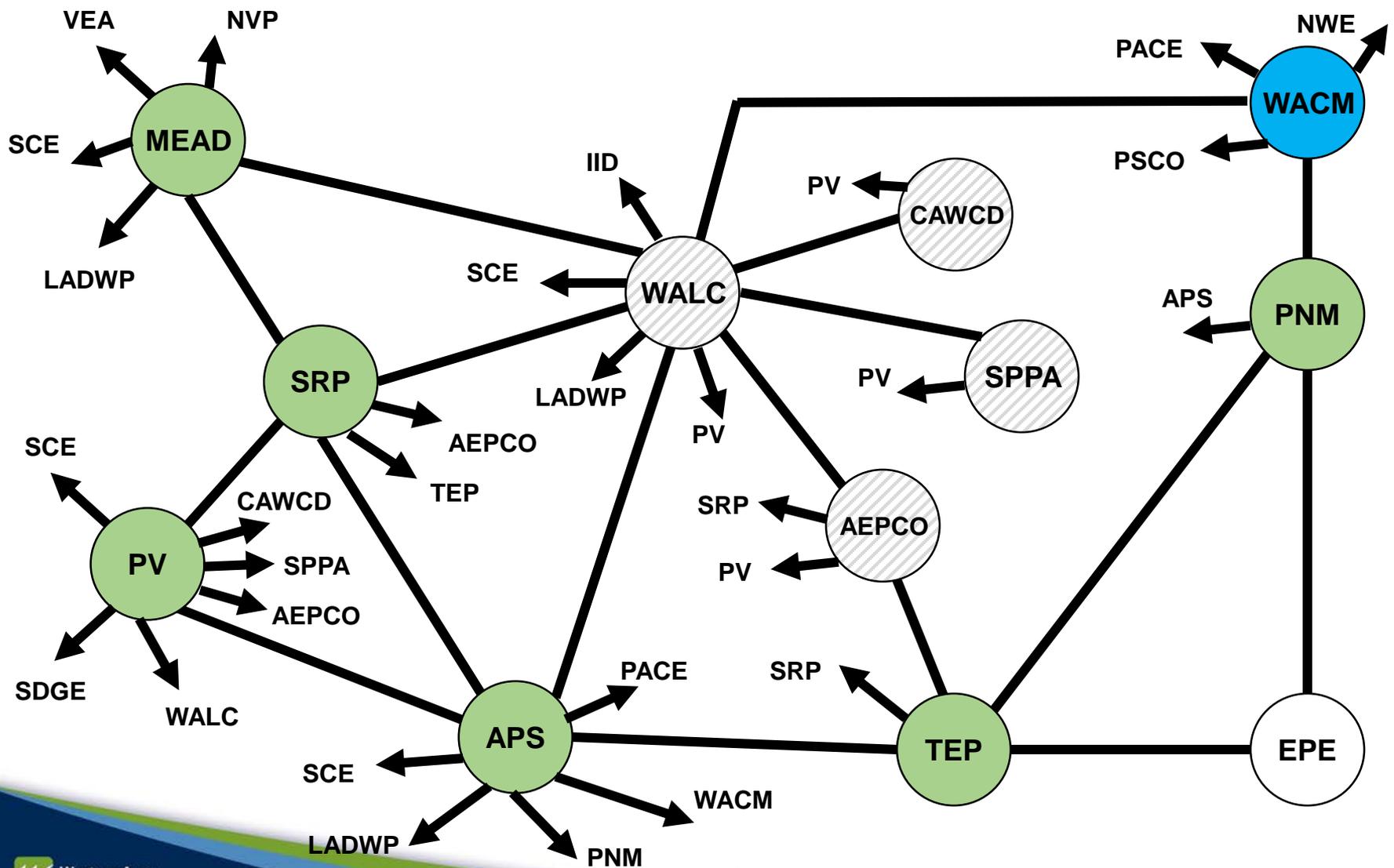
- Review transmission capability of connections to WEIS footprint
- Benefits Study being conducted by E3 to compare relative market results between CAISO EIM and WEIS
- Gap Analysis being conducted by Utilicast to provide understanding of cost and requirements to participate in either market

Benefit Study Participants

2019 Peak Demand
from Each Entity's
Perspective

1	AEPCO	Arizona Electric Power Cooperative	649 MW
2	CAWCD	Central Arizona Water Conservation District	446 MW
3	SPPA	Southwest Public Power Agency	866 MW
4	WAPA DSW	Western Area Power Administration Desert Southwest Region	1,688 MW

SW Region + WACM Zonal Representation



Gap Analysis

- Current state operations vs WEIS or CAISO EIM operations
 - Systems
 - Resources
 - Training

Next Steps

- Data gathering for benefits study and gap analysis
- Results expected this summer
- Continued customer engagement
- Utilize WAPA's Decision Framework
- Your thoughts and suggestions are welcome
- DSW web page

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Questions?