

# Energy Imbalance Market Customer Meeting

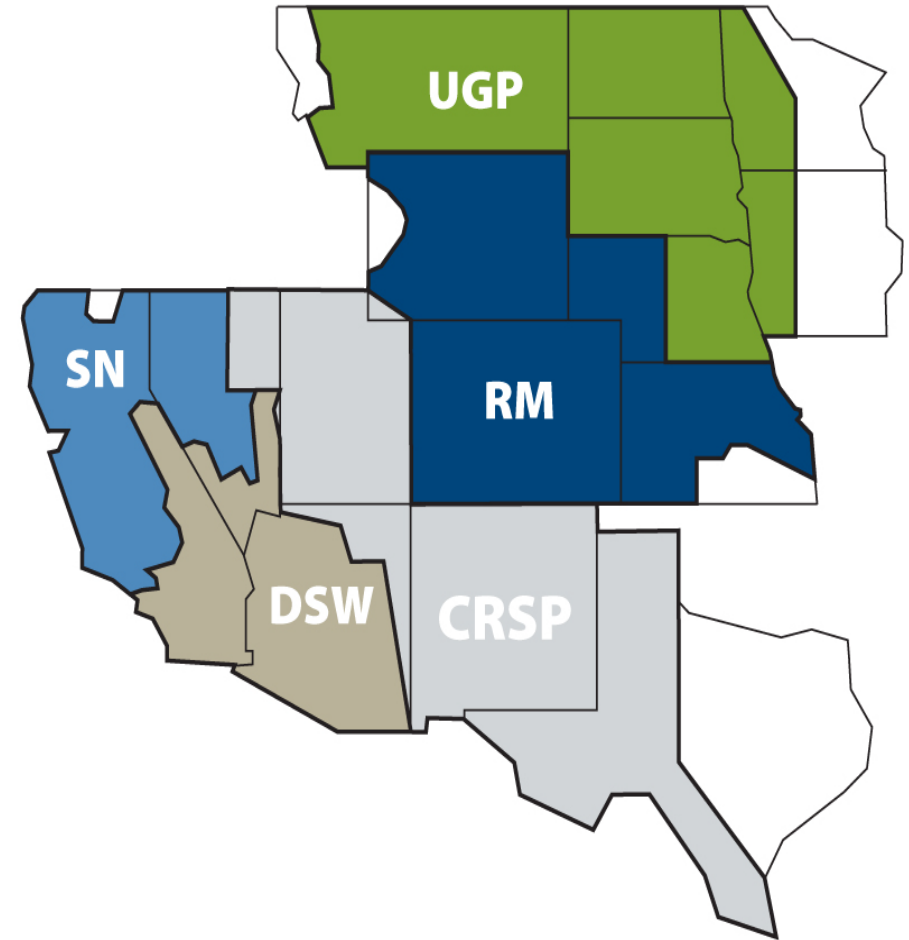
June 22, 2021

# Agenda

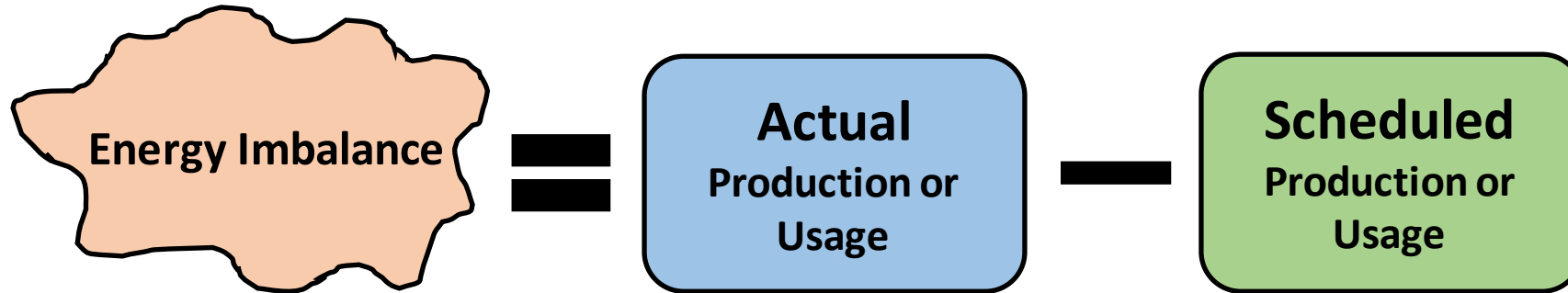
- Introduction and summary of energy imbalance situation
- Study results
- AEPCO Update
- CAWCD Update
- SPPA Update
- WAPA's Decision Factors
- Next Steps

# 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

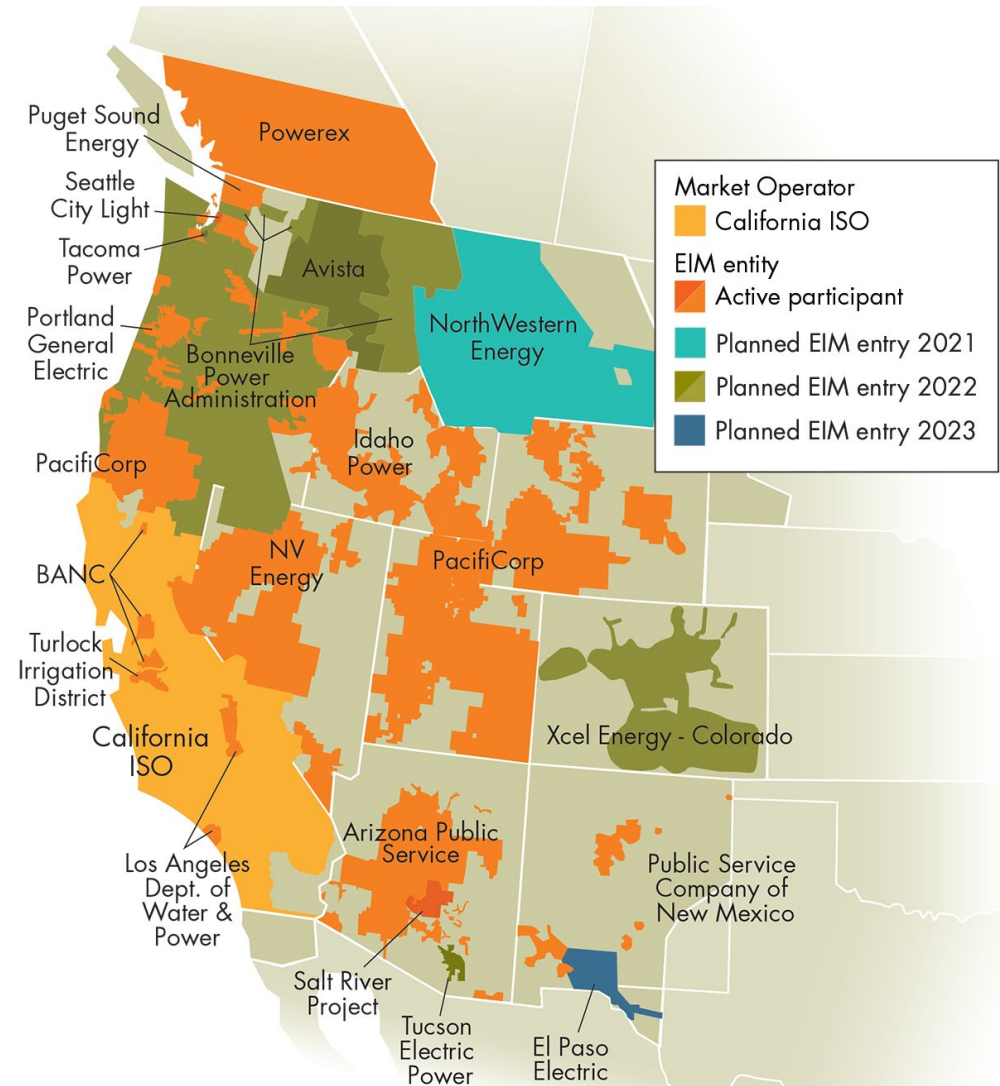
- We use either hydro or bilateral agreements to handle EI
- EI calculated and priced hourly
- Region settles and bills each customer

## Future: Market Operator handles imbalance

- Market Operator optimizes market resources to supply EI
- EI calculated and Locational Marginal priced sub-hourly
- Market Operator provides aggregate settlement and billing

# EIM

- In operation since 2014
- WAPA's Sierra Nevada Region joined this year

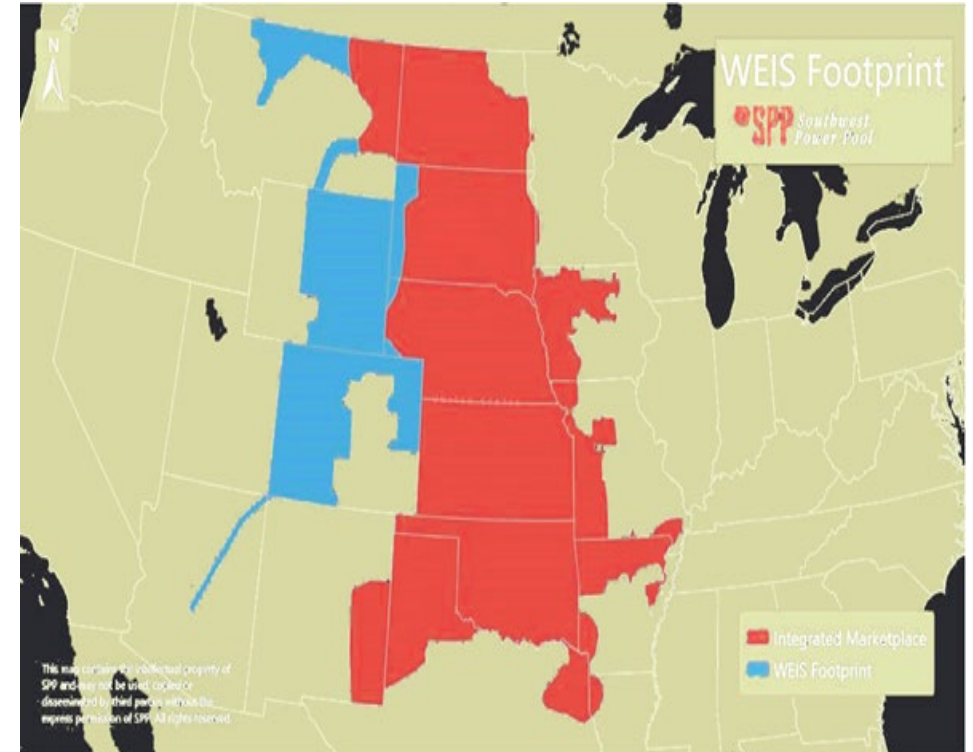


Map boundaries are approximate and for illustrative purposes only.

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# WEIS

- In operation since February 2021
- WAPA's Rocky Mountain and a portion of Upper Great Plains Regions along with the Colorado River Storage Project facilities currently participating
  - Also participating
    - Tri-State Generation and Transmission Association
    - Basin Electric Power Cooperative
    - Wyoming Municipal Power Agency
    - Municipal Energy Agency of Nebraska
    - Deseret Power Electric Cooperative
    - Colorado Springs Utilities (April 2022)



# ACSW Market Study Results

# Study Participants and Objective

- Arizona Electric Power Cooperative (AEPCO)
- Central Arizona Water Conservation District (CAWCD)
- Southwest Public Power Agency (SPPA)
- Western Area Power Administration's Desert Southwest Region (WAPA DSW)

Examine the prospects of participating in either the California Independent System Operator's Western Energy Imbalance Market (CAISO EIM) or the Southwest Power Pool's Western Energy Imbalance Service (SPP WEIS)



# Study Method

## Benefits Analysis

A market participation benefits analysis was conducted by Energy & Environmental Economics (E3). Similar to analyses that have been conducted by a number of other utilities in the Western U.S., looking at the representative future year 2024, the study identified estimates of the benefits of participating in either the EIM or the WEIS for each study participant.

## Cost Analysis

A market participation cost analysis was conducted by Utilicast. Similar to analyses that have been conducted by a number of other utilities in the Western U.S., this analysis identified estimated ranges for the initial and ongoing annual costs associated with choosing to participate in either EIM or WEIS.

## Summary

The overall net effects of benefits and costs were identified.

# Market Participation Annual Gross Benefits

<i>(In thousands)</i>	<b>AEPCO</b>	<b>CAWCD</b>	<b>SPPA</b>	<b>WAPA-DSW</b>	<b>Total</b>
<b>EIM</b>	<b>\$1,781</b>	<b>-\$8</b>	<b>\$502</b>	<b>\$468</b>	<b>\$2,743</b>
<b>WEIS</b>	<b>\$791</b>	<b>\$174</b>	<b>\$108</b>	<b>\$369</b>	<b>\$1,442</b>

- Based on analysis of a representative future year, 2024.
- “Gross” means that no costs have been accounted for in these numbers.
- Each benefit number represents the difference between two production cost simulations:
  - A Business-As-Usual scenario in which none of the study participants participate in a market, and
  - A market scenario in which all of the study participants participate in the same market (either EIM or WEIS)
- Benefits stem from:
  - Reduced generation costs in sub-hourly time increments, and/or
  - Increased energy sales in sub-hourly time increments
- AEPCO, SPPA and WAPA DSW would benefit from participation in either EIM or WEIS, and to a greater extent in EIM
- According to this study, CAWCD would benefit from participation in WEIS but not from participation in EIM

# Benefits Analysis

- The benefits analysis was conducted using data originally developed by WECC's Transmission Expansion Planning & Policy Committee (TEPPC). Numerous forecasts and assumptions about generation, transmission and loads were made. Collectively, this portrayal of the representative future year 2024 constituted the "Base Condition" for the benefits analysis.
- Sensitivity scenarios were run but did not produce differing study conclusions
  - WALC / WEIS transfer capability
  - Additional resources

# Market Implementation Costs

<i>(In thousands)</i>	<b>AEPCO</b>	<b>WAPA DSW</b>	<b>Total</b>
<b>EIM</b>	\$4,006	\$14,882	\$18,888
<b>WEIS</b>	\$5,376	\$12,857	\$18,233

- Cost analysis was conducted by Utilicast. Significant collaboration with WAPA and AEPCO occurred.
- WAPA implementation costs are higher in EIM than WEIS because CAISO has more requirements of Balancing Authorities (BAs) than SPP
- AEPCO implementation costs are higher in WEIS than EIM because AEPCO would take on some additional responsibilities in WEIS that WAPA would handle in EIM
- Utilicast concluded that the small difference (3%) between EIM and WEIS implementation costs is such that implementation cost should not be the basis for a market participation decision
- For context, in a public forum in April 2017, SRP reported estimated EIM implementation costs of \$21.2 Million

# Ongoing Annual Market Costs

(In thousands)	AEPCO	WAPA DSW	Total
<b>EIM</b>	\$335	\$2,117	\$2,452
<b>WEIS</b>	\$1,095	\$2,124	\$3,219

- Cost analysis was conducted by Utilicast. Significant collaboration with WAPA and AEPCO occurred.
- Despite needing to add an estimated 2.5 FTE more for EIM than WEIS, WAPA ongoing costs are higher in WEIS than EIM principally because SPP's annual market fee is \$862,000 higher than EIM
- AEPCO's annual ongoing costs are higher in WEIS than EIM because AEPCO would take on some additional responsibilities in WEIS that WAPA would handle in EIM
- Utilicast observed that over a five-year period, annual ongoing WEIS costs would exceed annual ongoing EIM costs by \$3.8 Million
- For context, in a public forum in April 2017, SRP reported estimated ongoing annual EIM costs of \$3.7 Million

# Net Benefit Calculations

For All Four Study Participants

(In thousands)	Annual Gross Benefit	Ongoing Annual Cost	Annual Net Benefit
<b>EIM</b>	\$2,743	\$2,452	\$291
<b>WEIS</b>	\$1,442	\$3,219	(\$1,777)

- The estimated total annual net benefit for AEPCO, CAWCD, SPPA and WAPA DSW stemming from prospective participation in EIM is \$291k
- The estimated total annual net benefit for AEPCO, CAWCD, SPPA and WAPA DSW stemming from participation in WEIS is (\$1,777)k

# Summary

- The analysis indicated that the study participants would experience greater levels of gross benefits in EIM rather than WEIS. This result occurred because the EIM features a much larger generation marketplace, and the study participants have much greater connectivity with other EIM participants than other WEIS participants.
- The value of prospective market participation resides primarily in sub-hourly time frames: lower generation costs to meet loads, and/or increased sales to other market participants.
- With respect to current system operations, the study participants observe the same phenomena that other utilities have reported prior to joining markets:
  - The availability and number of bi-lateral trading partners has declined, and
  - It has become increasingly difficult to meet BA and sub-BA level grid management obligations given the number of renewable resource additions that are occurring
- The ACSW Market Study indicates projected benefits associated with joining either EIM or WEIS are relatively small for the study participants. However, the cost of doing nothing may be more expensive and all of the study participants believe that market participation is necessary.

# AEPCO Update

Jon Martell

Executive Director of Energy Services



# CAWCD Update

Brian Young

Power Programs Manager

# SPPA Update

Dennis L. Delaney P.E.  
Partner, K. R. Saline & Associates

# WAPA's Decision Factors

# Status Quo Concerns

- Market participation is expanding
  - Western Area Lower Colorado Balancing Authority (WALC) is surrounded by market participants
  - Opportunities for transactions for timely hourly or sub-hourly power has evaporated
- Transactions outside of the market will be less efficient and more costly
- WALC customers are unable to take advantage of market transactions

# Trading Partners and Connectivity

- The Benefits data confirms the depth of participation in EIM relative to WEIS provides greater benefits in comparison
  - Depth of participation in EIM
  - Price volatility in WEIS
- WALC connection to EIM participants provides robust transfer capability
- WALC connection to WEIS is limited by a constrained path
  - Constraint does not preclude WEIS but will impact market evolution

# Market Evolution

- Full RTO potential in WEIS footprint
  - Constrained path concerns for WALC participation
- EDAM or other CAISO market expansion
  - If EDAM takes shape, it offers a potentially very deep market in day ahead
  - Governance and structural concerns remain
- EIM offers the best current answer to status quo concerns
  - Provides market solution
  - Provides flexible option to market evolution

# Rate Impacts

- WAPA will capitalize nearly all of the implementation costs, which minimizes the rate impact
- Capitalize over 15 years at 3% interest rate
- Repayment of the capitalized costs will begin the year after implementation is complete – estimated to be FY24
- FY22 and FY23 O&M execution is expected to be lower as staff charges time toward implementation
- Ongoing imbalance costs will begin in FY24
- Rate impacts only reflect costs - excludes benefits

# Rate Impacts

## EIM

	Annual Costs	Existing Rate		Rate Impact	% Change
<b>BCP</b>	\$ 893,995	Base Charge		n/a	1.28%
<b>CAP</b>	\$ 182,110	\$ 21.00	\$/kW-Year	0.29	1.38%
<b>Intertie</b>	\$ 622,485	\$ 19.32	\$/kW-Year	0.40	2.06%
<b>P-DP Generation</b>	\$ 513,219	\$ 13.67	mills/kWh	0.36	2.63%
<b>P-DP Transmission</b>	\$ 850,951	\$ 20.64	\$/kW-Year	0.34	1.63%
<b>WALC Regulation</b>	\$ 248,332	\$ 0.096	\$/kW-Mo	0.01	15.40%
<b>Total</b>	\$ 3,311,092				

## WEIS

	Annual Costs	Existing Rate		Rate Impact	% Change
<b>BCP</b>	\$ 838,099	Base Charge		n/a	1.20%
<b>CAP</b>	\$ 170,724	\$ 21.00	\$/kW-Year	0.27	1.29%
<b>Intertie</b>	\$ 583,565	\$ 19.32	\$/kW-Year	0.37	1.93%
<b>P-DP Generation</b>	\$ 481,131	\$ 13.67	mills/kWh	0.34	2.47%
<b>P-DP Transmission</b>	\$ 797,746	\$ 20.64	\$/kW-Year	0.32	1.53%
<b>WALC Regulation</b>	\$ 232,805	\$ 0.096	\$/kW-Mo	0.01	14.43%
<b>Total</b>	\$ 3,104,070				



# Customer Input and Next Steps

- Study results and analysis (quantitative and qualitative) indicates that EIM is the best option for DSW
- WAPA seeks comments from all our customers and stakeholders
  - Provide your questions, comments, or contact us for more dialogue
  - Please contact us no later than July 22, 2021
- Market decision anticipated in August
- Targeting implementation of a market decision in 2023

# Questions and Comments

**John Paulsen**

Energy Management and Marketing  
Manager

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# Drought Mitigation Options

- Drought will impact rates, available power, and purchase power costs
- WAPA and Reclamation are continuing to explore options to mitigate these impacts
- Customers have suggestions
  - We want to hear them
    - Send to [DSWPWRMRK@WAPA.GOV](mailto:DSWPWRMRK@WAPA.GOV)
    - Drought Mitigation Options or DMO in subject line
    - WAPA will post suggestions online
- Customer meeting August 24, 2021