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California ISO

Extended Day-Ahead Market: Evolution of CAISO Regional Markets

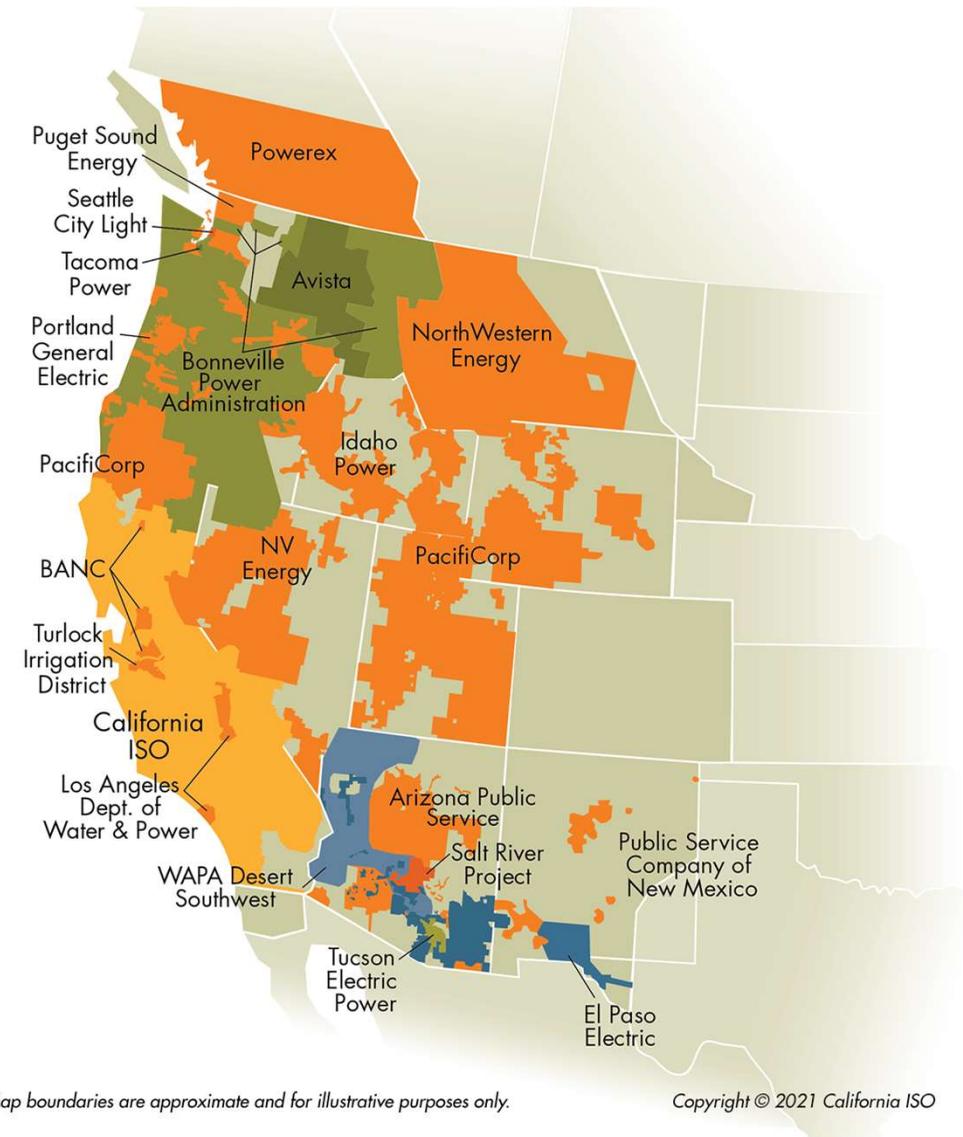
California Energy Commission
Western Electricity System Integration Workshop

Anna McKenna, VP, Market Policy and Performance
December 2, 2022

Western Market Landscape: The Western Energy Imbalance Market (WEIM)

- Builds on the ISO real-time market features
 - Automated dispatch facilitates renewable integration, resolves imbalances & avoids congestion
- Situational awareness enhances reliability
- No critical mass required. No exit fees.
- Preserves Balancing Authority Area autonomy, including compliance, balancing, and reserve obligations
- Launched in 2014 with PacifiCorp
- Now have 19 participating balancing areas totaling over 75% of the load in WECC.
- Economic benefits totaling over \$3 billion* since inception.

*Estimated WEIM benefit through October 2022

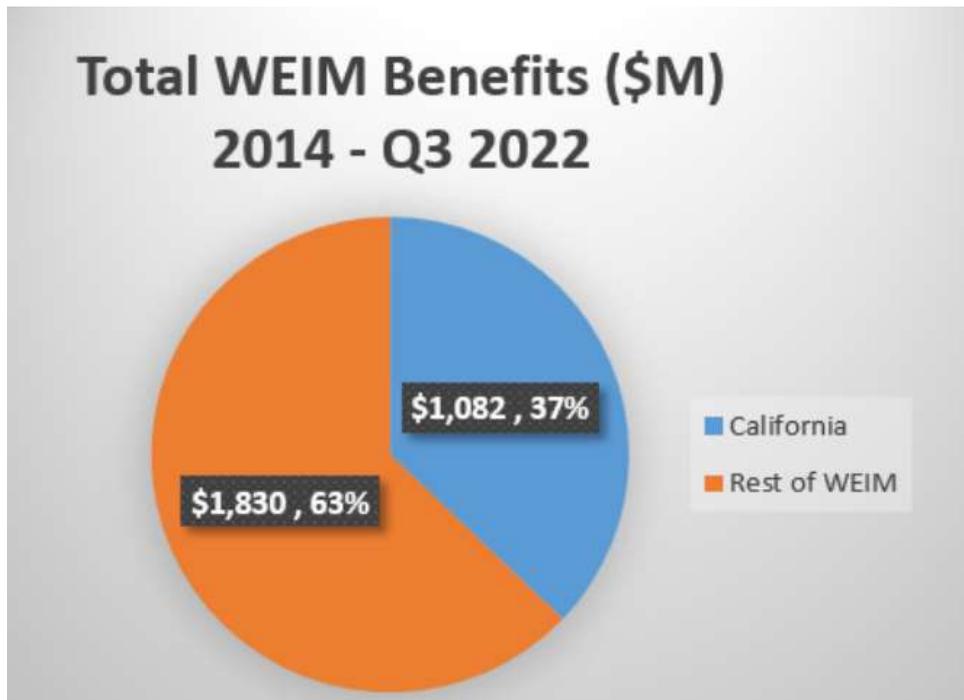


Extending the ISO real-time market to WEIM participants relies upon a defined tariff framework

- The framework is embedded in the ISO tariff and extends to WEIM participant OATTs
- Accounts for differences between the ISO real-time market and its extension to WEIM participants
- Ensures consistency of real-time market rules for the benefit of all market participants
- Allows flexibility for WEIM participants under their OATT
- Supports autonomous and independent governance of WEIM market rules

WEIM Economic Benefits

Actual WEIM benefits have generally exceeded expected studied benefits.



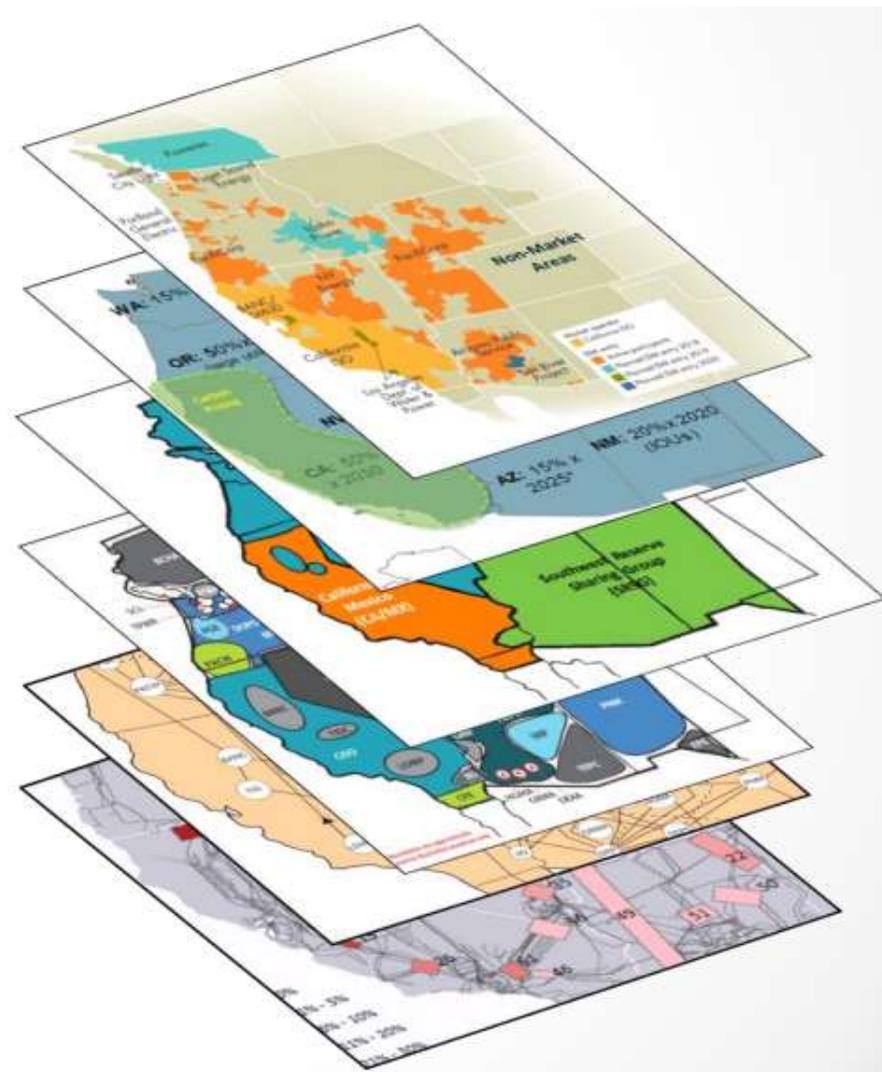
CAISO Benefits = \$601 Million
(~21% of Total Benefits)



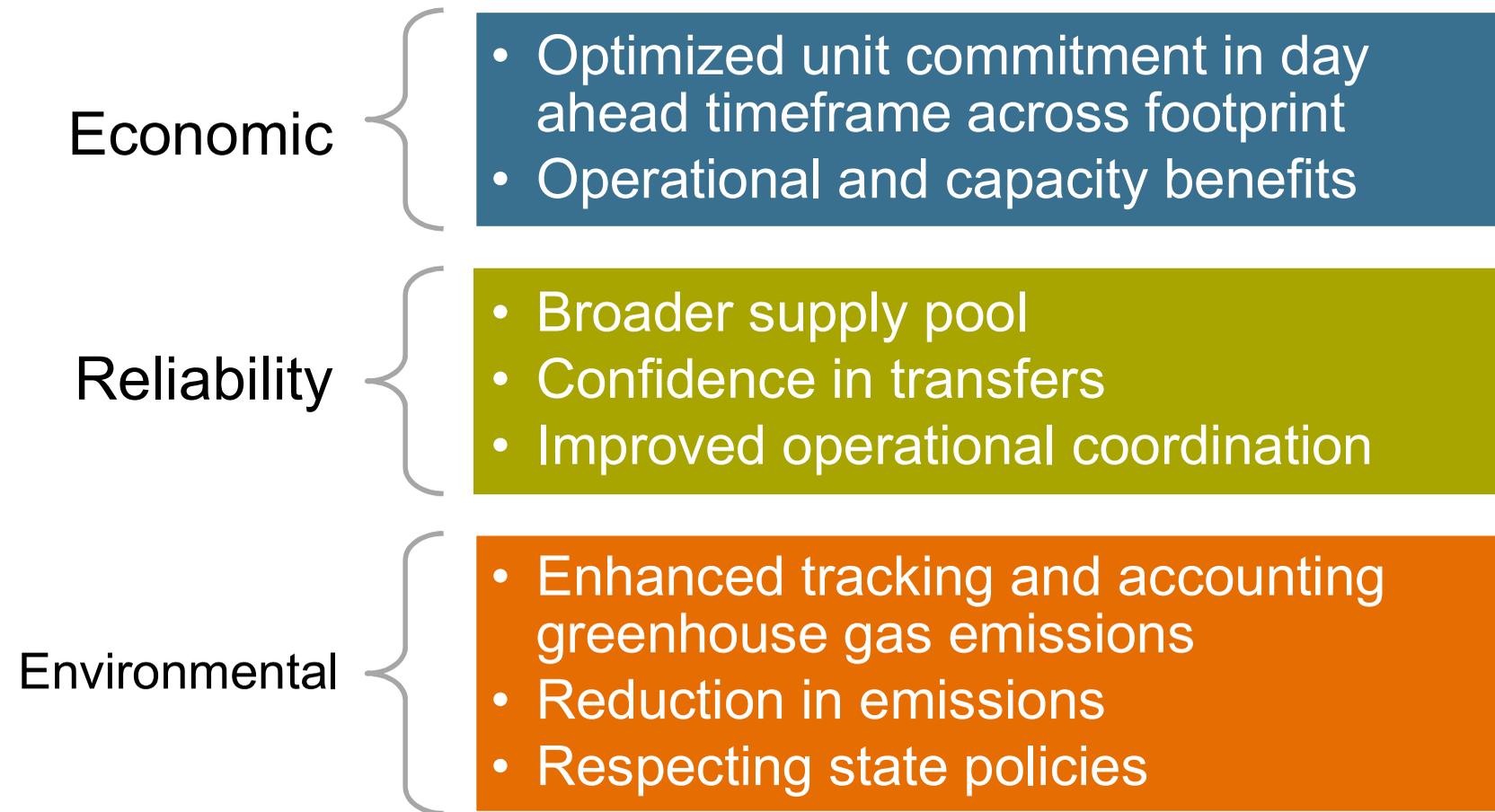
CAISO Benefits = \$201 Million
(~20% of Total Benefits)

What is the Extended Day-Ahead Market (EDAM)?

- An extension of the CAISO day-ahead market across the West allowing for optimized commitment of generation in the day ahead timeframe.
- Builds upon the WEIM, providing incremental economic, reliability, and environmental benefits.
- An incremental step toward an RTO in the West.
- Balancing areas participating in EDAM retain their resource planning, transmission planning and reliability operation functions.



Harnessing the benefits of a day-ahead market in the West



EDAM Design Overview

Day-Ahead Resource Sufficiency

Each balancing area demonstrates sufficient supply to meet day ahead obligations, which is offered into the day-ahead market.

Transmission Availability to EDAM

Design seeks to maximize transmission available to support transfers between balancing areas, while respecting and harmonizing OATT transmission rights.

Day-Ahead Market Structure

The day ahead market optimizes resource commitment and transfers between balancing areas. Retaining key day-ahead market functions.

Confidence in Market Transfers

Design elements instill confidence in energy transfers between balancing areas in stressed conditions, supporting reliability across the footprint.

Greenhouse Gas (GHG) Accounting

Design supports current and evolving regulatory GHG emission pricing programs across the West.

Settlements

All transactions emerging from the day ahead market are settled.

Enhancements to Underlying Day-Ahead Market Design

- Introduces an imbalance reserve product procured in the day-ahead market to manage uncertainty between day ahead and real time.
 - Procuring imbalance reserves to meet net load uncertainty, as opposed to out-of-market actions, produces substantial benefits.
- EDAM allows for reduced procurement of imbalance reserves to meet uncertainty over the large footprint due to the geographic diversity benefit.
 - Procured more efficiently across a larger EDAM footprint.
 - Manages costs while needs for uncertainty increase.
- Studied EDAM benefits have estimated a \$128 million/year benefit for California.

EDAM Economic Benefits – Incremental to WEIM

- Operational savings – driven by more efficient resource commitment and reduced operating costs, efficient transmission management, lower operating reserve requirements.
 - Includes imbalance reserve savings.
- Studies have produced a range of benefits, with the most recent *Energy Strategies* study indicating the following benefits:

Area	Operational Savings (\$M/year)	Capacity Savings (\$M/year)	Total Savings (\$M/year)
California	\$214	\$95	\$309
Other Western States	\$329	\$557	\$886
Total	\$543	\$652	\$1,195

CAISO Benefits estimated to be 50-80% of total quantified California benefits

Source: <http://www.caiso.com/Documents/Presentation-CAISO-Extended-Day-Ahead-Market-Benefits-Study.pdf>

EDAM Reliability Benefits to the ISO Area

- Increased market visibility and awareness into conditions across the EDAM footprint.
- Increased confidence in imports and transfers to the ISO.
- Coordinated response to changes between day-ahead and real-time conditions.
- Reduced risk of declared energy emergencies.

EDAM Environmental Benefits

- Similar to the WEIM, the EDAM will continue to contribute toward the reduction of greenhouse gas (GHG) emissions.
 - Commitment and dispatch of more cost effective generation, which tend to be renewable resources.
- Reduction in curtailments of excess renewable supply.
 - Excess renewable supply in the ISO can be used to serve load across the EDAM footprint, thus providing value and reducing GHG emissions.
 - Similarly, excess renewable supply in rest of EDAM footprint can be committed and dispatched to serve ISO load.

EDAM Upcoming Milestones

Date	Milestone
Q4 2022	
October 31, 2022	Publication of draft final proposal
November 22, 2022	Stakeholder comments
December 7, 2022	Publication of final proposal
December 14, 2022	Joint ISO Board of Governors and WEIM Governing Body meeting (briefing)
February 2023	Joint ISO Board of Governors and WEIM Governing Body meeting (decision) Additional decision point on the Day Ahead Market Enhancements (DAME) initiative.
Q1 2023	Draft tariff publication and stakeholder process
Q2 2023	FERC filing
Q4 2023	Implementation activities
2024	EDAM go-live coordinated with interested entities