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Western Energy Markets

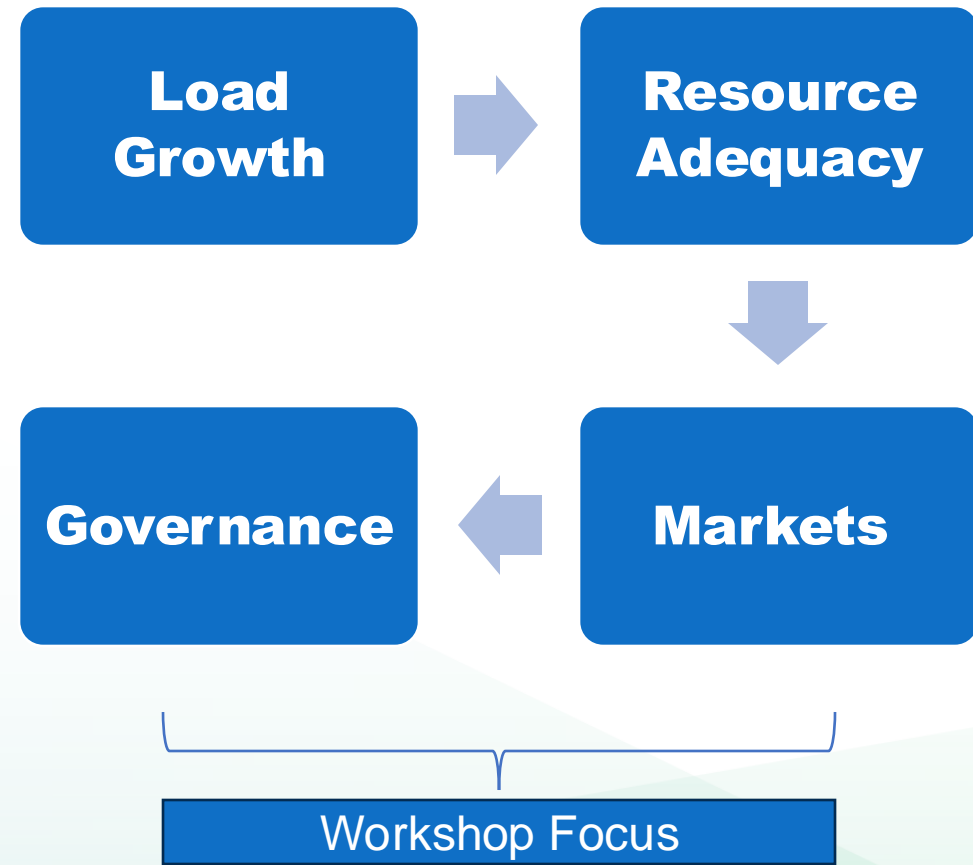
Jake McDermott, Western Interconnection Coordination Lead

January 24, 2025



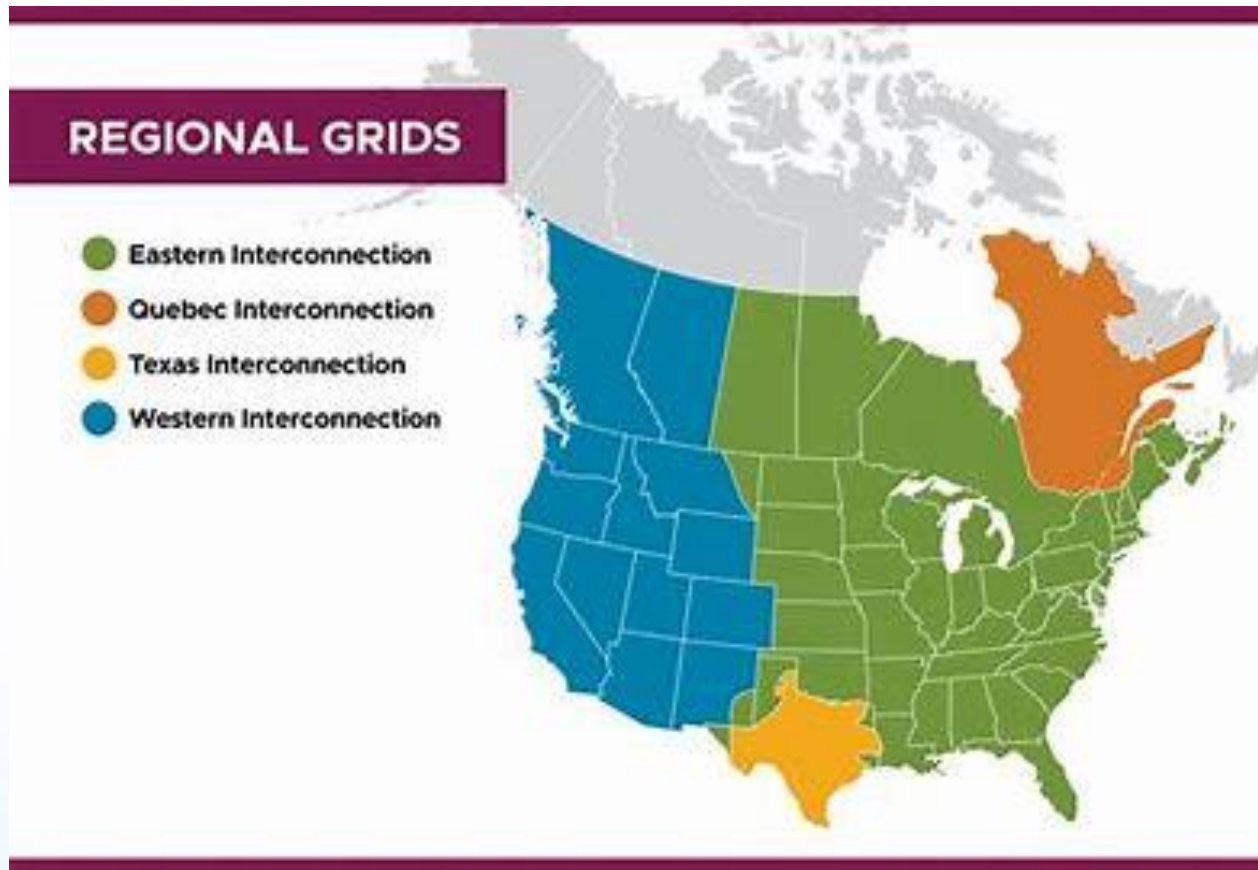
Key Topics

- Western Trends: Load Growth
- Resource Adequacy in CA and the West
- Western Energy Imbalance Market
- Day Ahead Markets: EDAM and Markets+
- Market Governance and Pathways Initiative





Background: Western Trends



- NERC: ensures reliability of the bulk power system.
- WECC: creates, monitors, and enforces reliability standards.
- NERC December 2024 Long-Term Reliability Assessment:
 - Demand increases and generator retirements create new risks in future years.
 - Extreme weather events pose reliability challenges.
- Additional clean energy deployment throughout the West.



Resource Adequacy: California

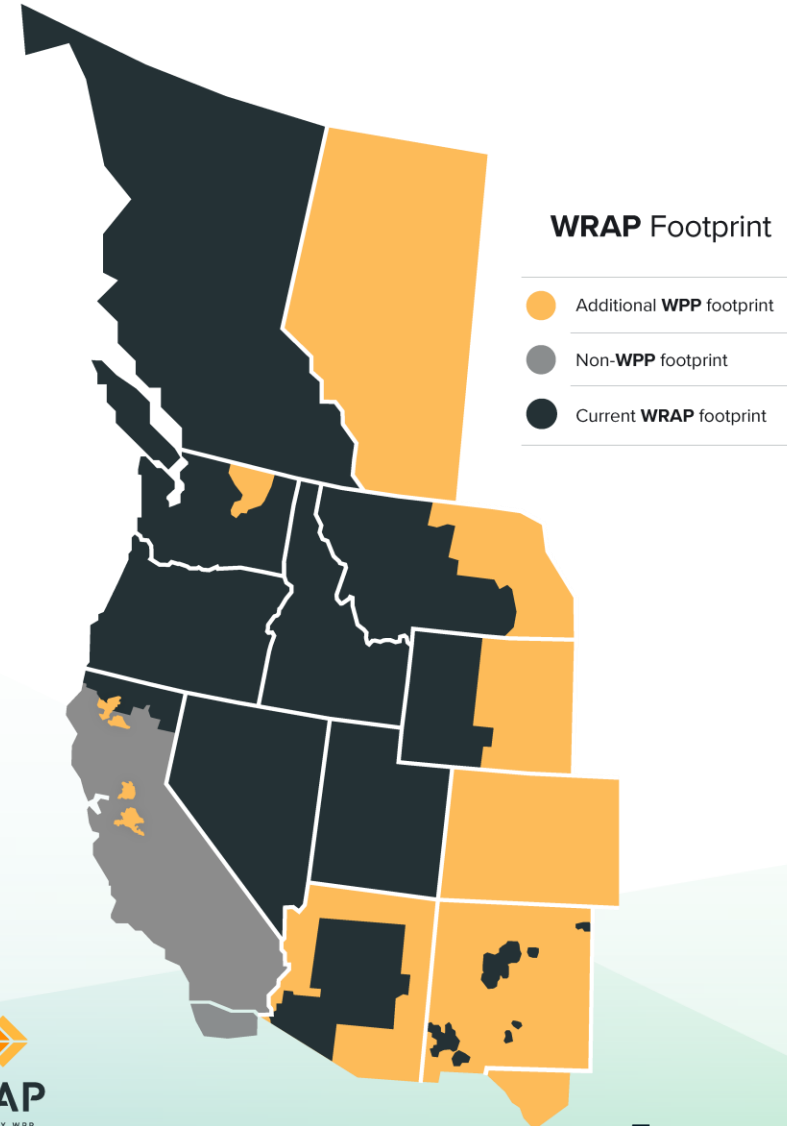


- In 2004, CPUC adopted the initial Resource Adequacy (RA) framework in response to the California energy crisis.
- CEC evaluates publicly owned utilities (POUs) progress on meeting RA needs.
- RA ensures that there is a sufficient supply of capacity to meet demand. It incentivizes the construction of new resources to maintain reliability.
- Suppliers and Load Serving Entities (LSEs) are required to maintain enough contracted capacity to meet system, local, and flexible RA requirements.
- RA requires procurement of capacity to meet forecasts in addition to a planning reserve margin (PRM).
- Extreme weather events can stress the system and create reliability challenges.



Resource Adequacy: WRAP

- Western Resource Adequacy Program (WRAP)
 - Voluntary resource adequacy program
 - Includes Pacific Northwest, parts of the Desert Southwest, and areas within the Intermountain West.
 - Aims to reduce the risk of resource shortages for its participants.
 - Penalties for noncompliance with RA targets are not currently in effect.



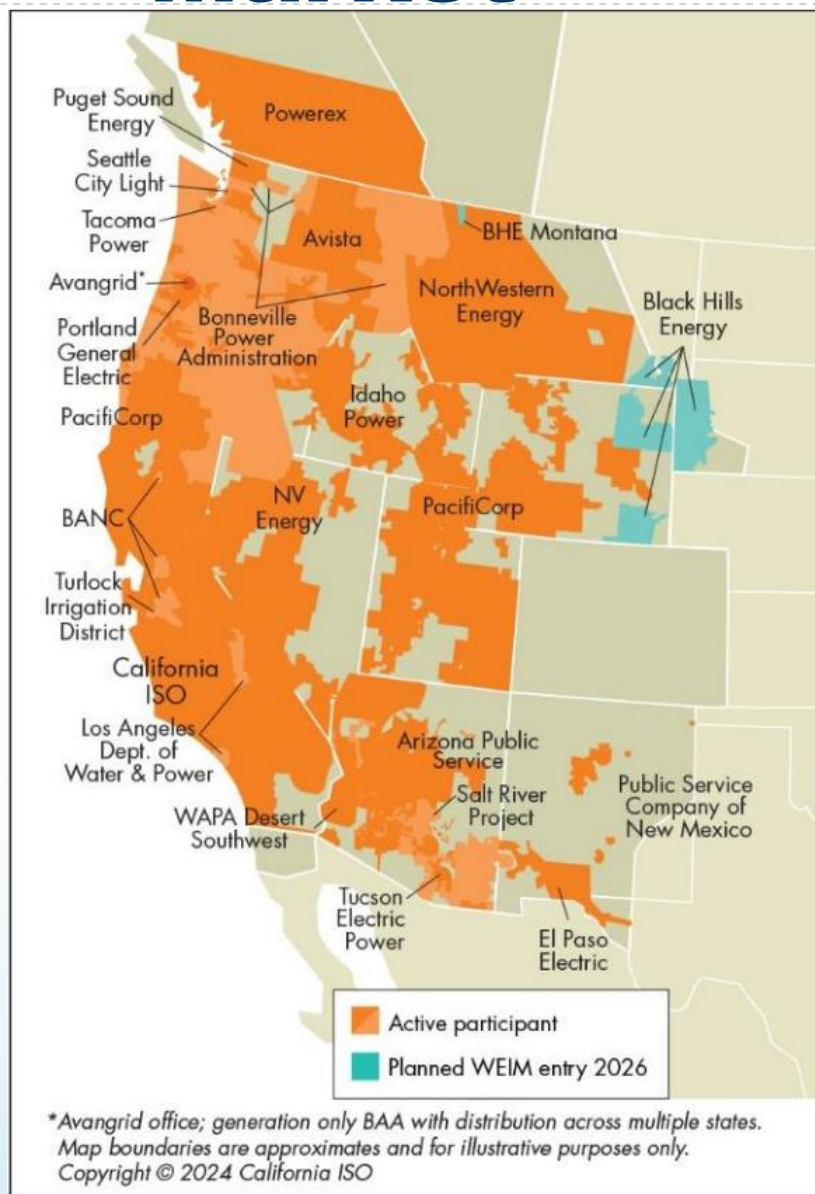


The West Continues to Build

Balancing Authority	2024 Incremental Capacity (GW)	2025 Incremental Capacity (GW)	Total (GW)
California Independent System Operator (CAISO)	10.82	4.95	15.77
Alberta Electric System Operator (AESO)	4.56	0.63	5.19
Pacificorp East (PACE)	2.62	1.70	4.32
Arizona Public Service Company (AZPS)	1.82	1.78	3.60
Nevada Power Company (NEVP)	2.29	0.31	2.60



Markets: Western Energy Imbalance Market

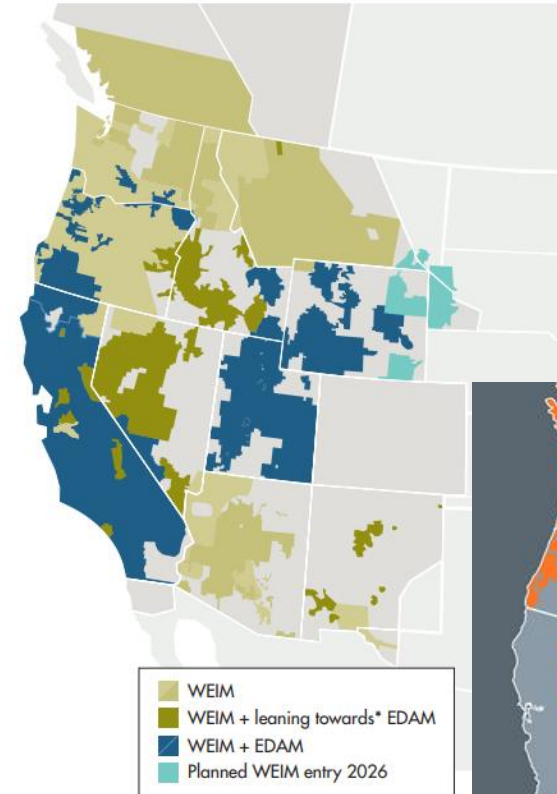


- 2014: CAISO begins operating WEIM with Pacificorp.
- WEIM analyzes grid needs and finds lowest cost supply to meet intra-hour supply and demand imbalances.
- 2015-2024: Multiple participants join WEIM. Currently, WEIM participants represent 11 states and about 80% of load in the Western Interconnection.
- >\$6B in gross benefits since Nov 2014.



Day Ahead Markets Emerging

- CAISO currently operates a Day Ahead Market (DAM) within its balancing area.
- EDAM to voluntary allow for DAM participation from WEIM entities.
- FERC-approved and go-live in 2026.
- Several WEIM entities have signaled interest in EDAM participation.
- Additional reliability and economic benefits from increased integration and coordinated resource commitment between areas.
- SPP stakeholders developing Markets+ DAM. FERC conditionally approved Markets+.



*These entities have publicly indicated a leaning towards EDAM as their preferred day-ahead market.





Market Governance Matters

- Market growth does not occur in a vacuum.
- As markets emerge, increasing degrees of independent governance are needed.
- Pathways Initiative is a step towards unlocking a larger market footprint and value accruing to participants.
- Day Ahead Market can provide additional value on top of a real-time market.



Thank You!

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