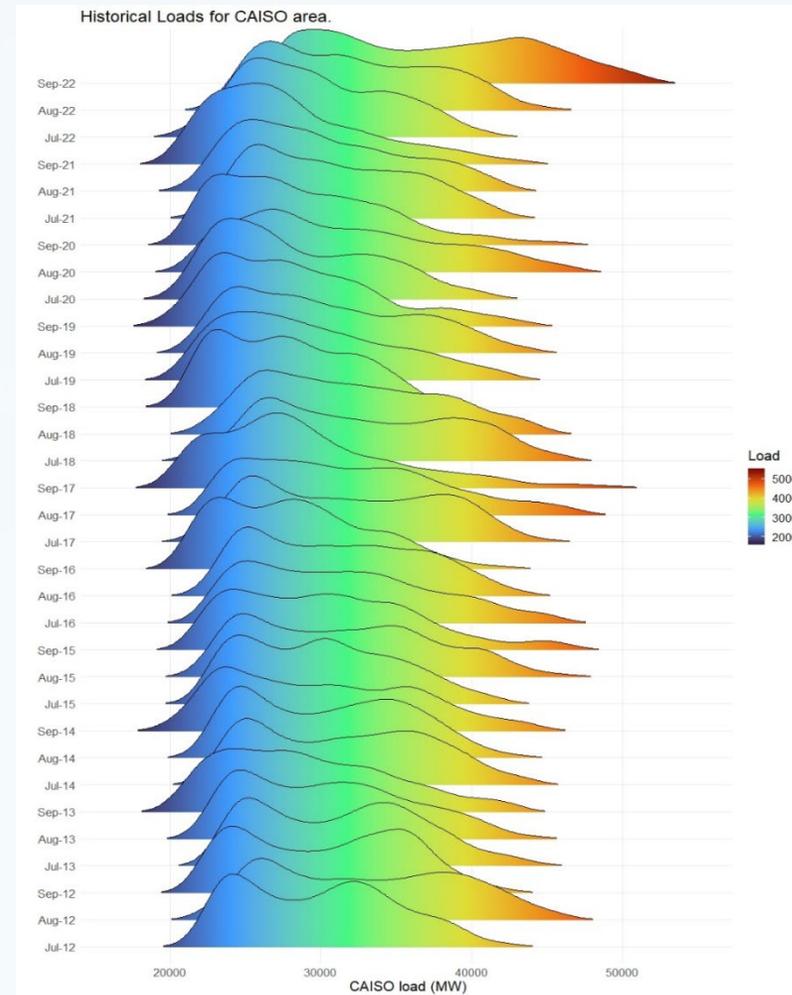

FEATURED PRESENTATION – RELIABILITY THROUGH COLLABORATION

Mark Rothleder

Senior Vice President & Chief Operating Officer,
California ISO

HEAT WAVE

The September heat wave was extraordinary in duration and intensity



HEAT RECORDS – SEPTEMBER 1-10

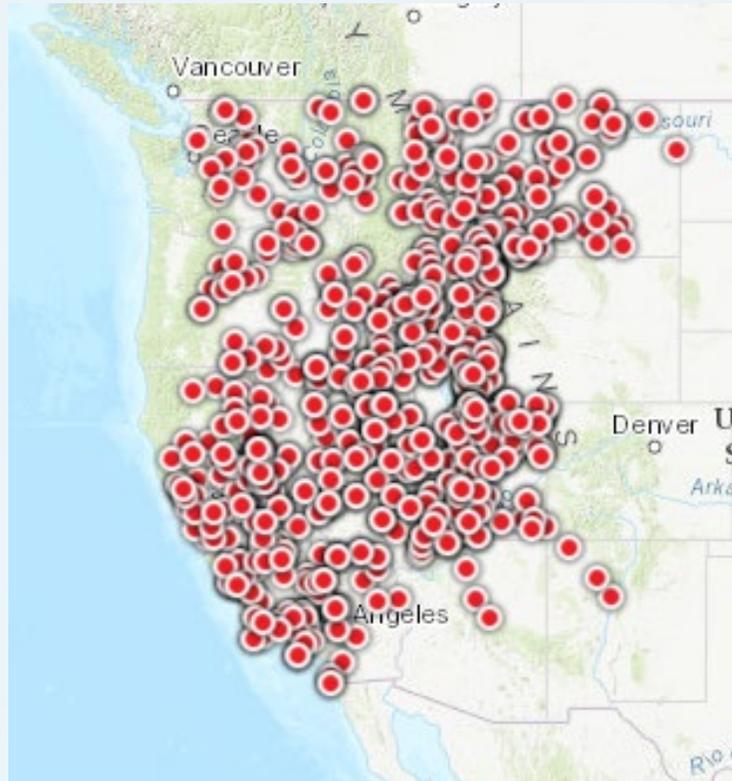
28 California cities broke or tied all-time records for maximum temperatures.

- Sacramento – 116
- San Jose – 109
- Livermore – 116

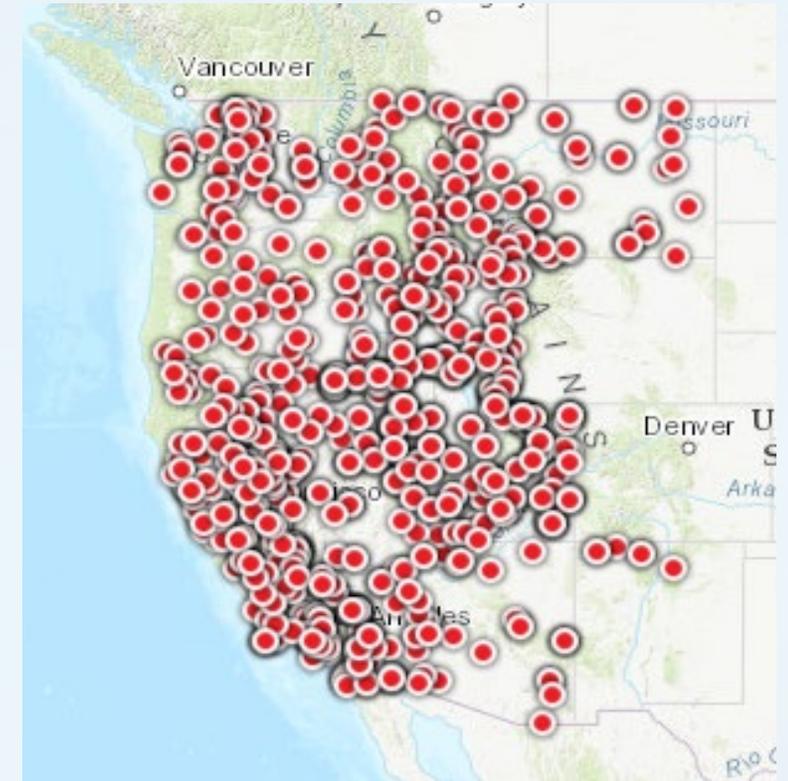
Across the West:

- 2,864 daily highest maximum temperature records tied or broken
- 2,074 daily high minimum records tied or broken

Highest **maximum** temperature records



Highest **minimum** temperature records

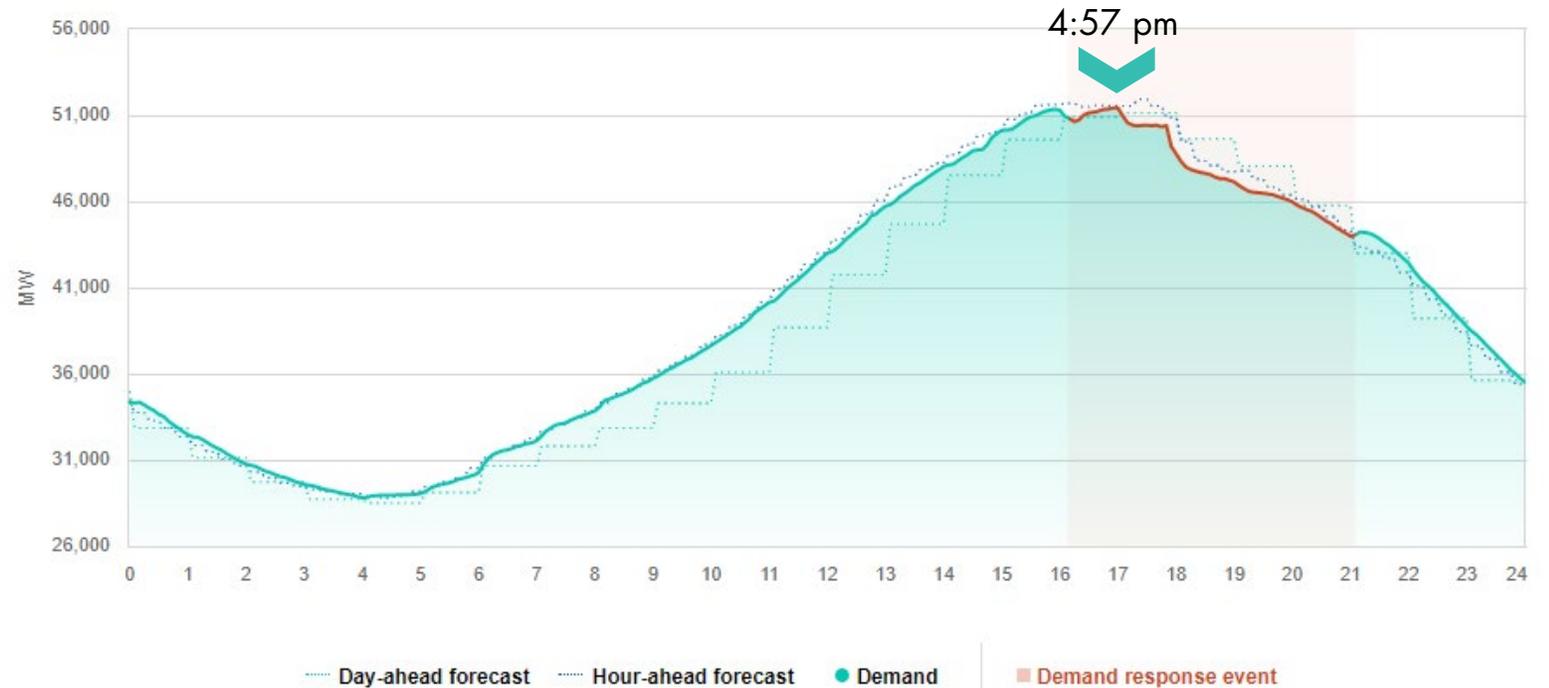


DEMAND RECORDS FOR SEPTEMBER 6, 2022

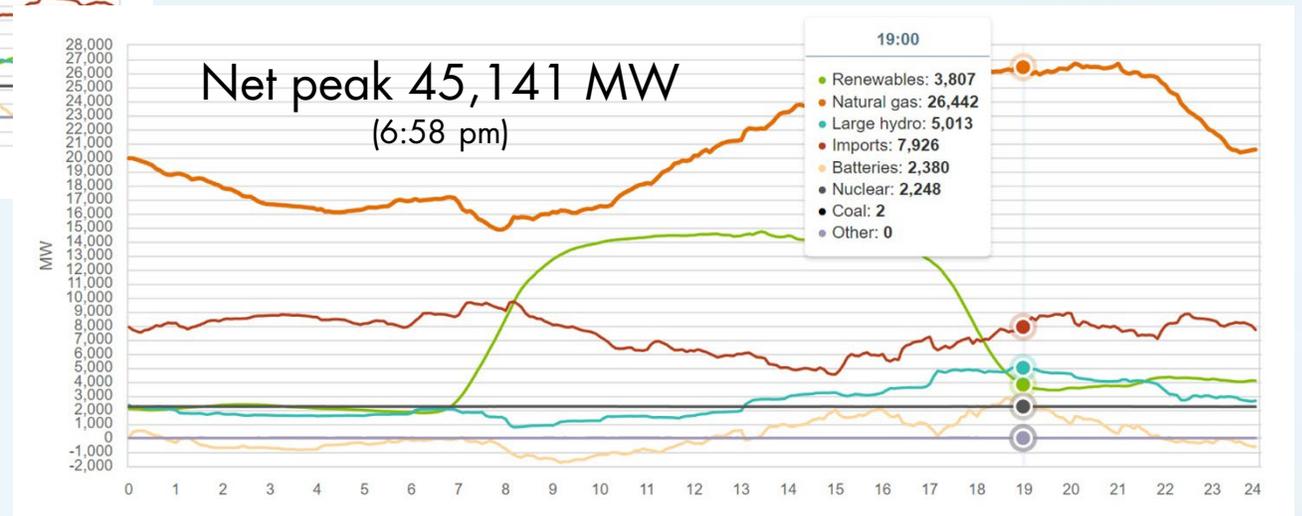
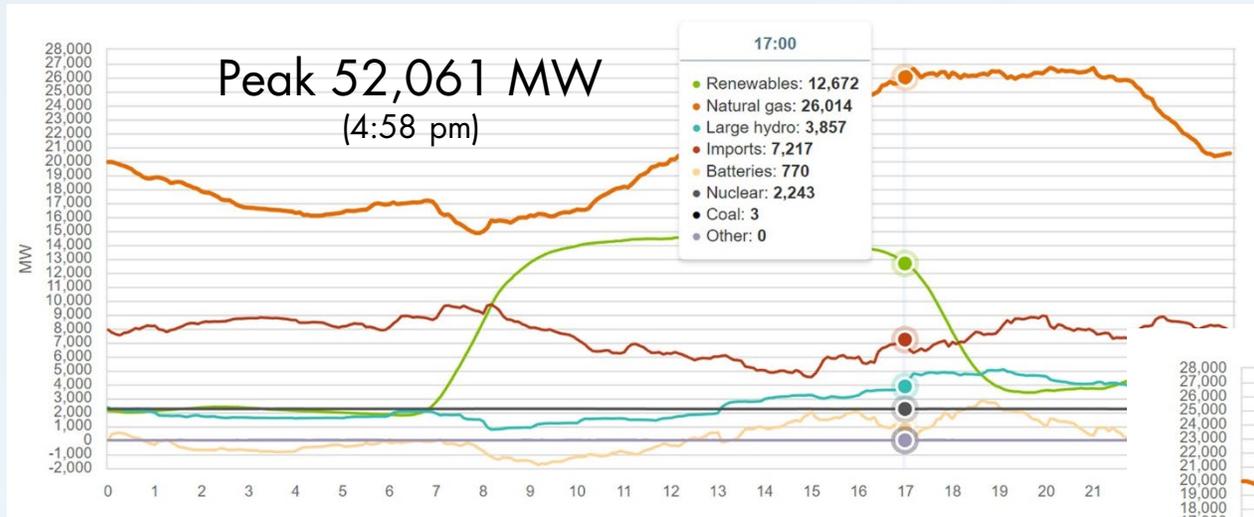
ISO all-time record
52,061 MW

Western Interconnection
record
167,500 MW

RC West record
130,920 MW



SEPT 6 PEAK AND NET PEAK RESOURCE STACK



SEPT 6 DEMAND RESPONSE & EMERGENCY RESOURCES

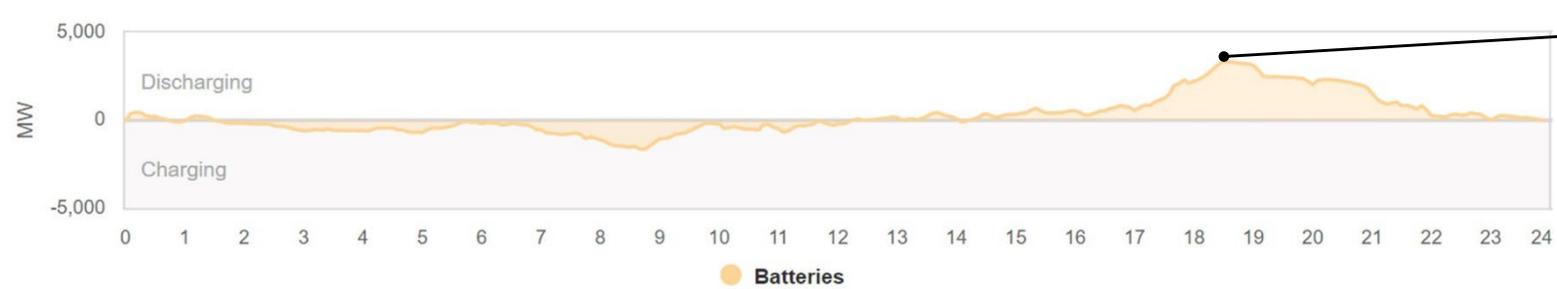
Demand trend

System demand, in megawatts, compared to the forecasted demand in 5-minute increments.

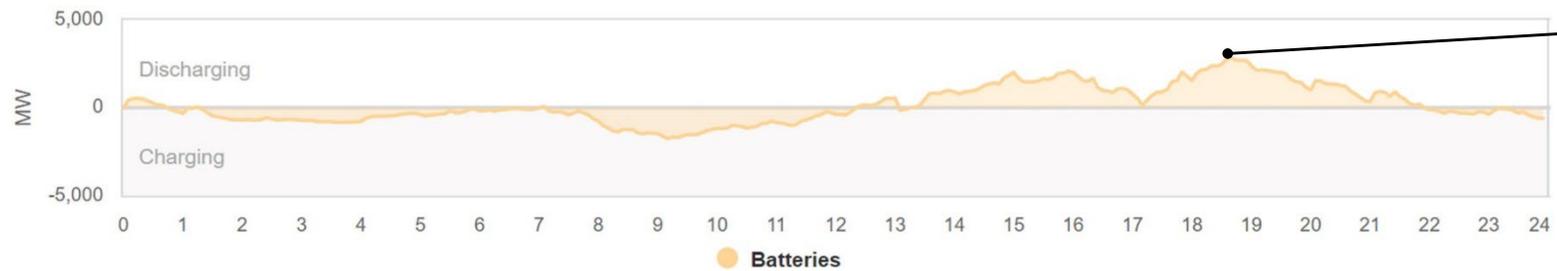


4-HOUR LITHIUM-ION BATTERY DISPATCH

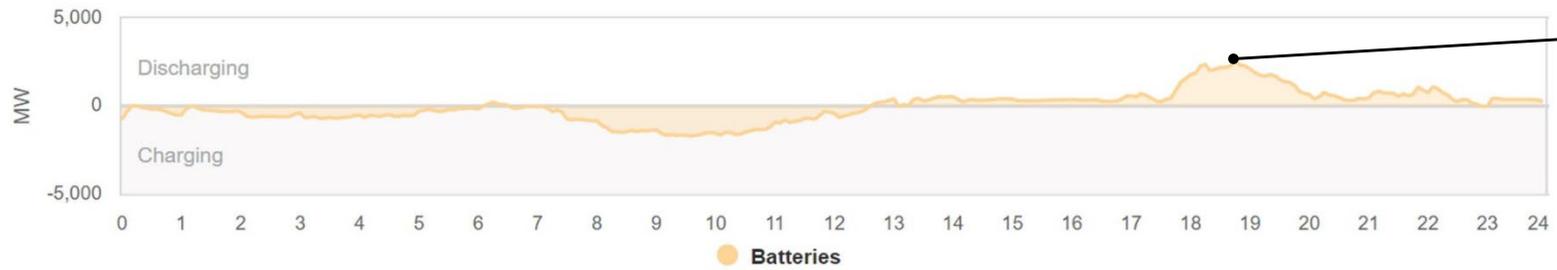
SEPT 5



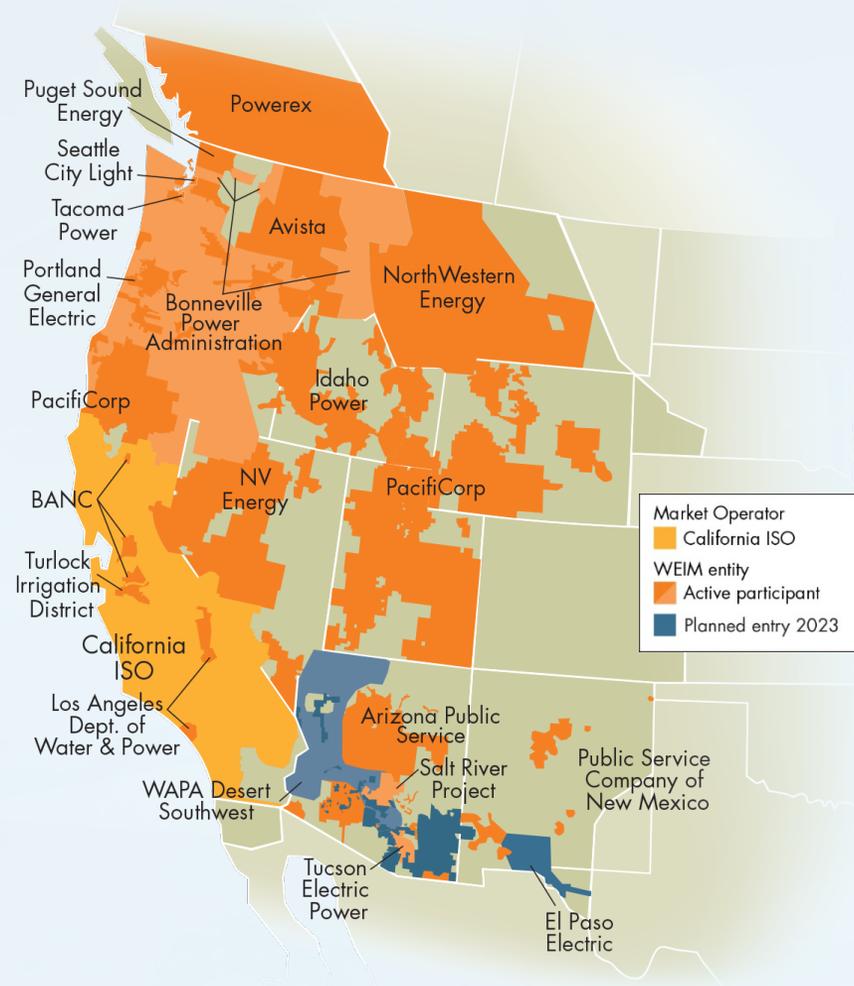
SEPT 6



SEPT 7



WESTERN ENERGY IMBALANCE MARKET (WEIM)



- Excellent performance during heat wave.
- Efficiently cycled energy between utility systems across the West and supported reliability during very stressed grid conditions.
- Demonstrated value of wide-area coordination across the Western US and highlighted potential additional reliability and cost-saving benefits of an Extended Day-Ahead Market (EDAM).

WHAT WENT WELL

- New clean energy capacity
- Improved communication and coordination
- Advance preparation and exercises
- Effective pre-emptive maintenance and outage coordination
- Excellent overall fleet performance
- Meaningful amount of DR
- West demonstrated ability to support each other
- Strong Western Energy Imbalance Market performance
- Geographic diversity of weather and good hydro



OPPORTUNITIES FOR IMPROVEMENT

- Strengthen resource adequacy and planning models
- Expedite construction of infrastructure
- Improve load flexibility capabilities
- Broaden system visibility and improve liquidity and reliability with EDAM
- Align storage market design with grid needs
- Establish strategic reserve resources for extreme events
- Strengthen communication and coordination



COLLABORATION ENABLES OPERATIONAL, ECONOMIC AND ENVIRONMENTAL BENEFITS



Real-time (WEIM)

- Optimized imbalance dispatch
- Reserve and flex sharing
- Emergency assistance
- Transmission utilization
- Curtailement avoidance
- Demand shaping
- GHG accounting



Day-ahead (EDAM)

- Optimized commitment
- Uncertainty management
- Sufficiency assessment
- Transmission provisioning
- Situational awareness/response
- Unlock supply & load diversity
- Enhanced GHG accounting



Year(s) ahead (other collaboration)

- Resource adequacy
- Resource planning
- Transmission planning
- Enable innovation