

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Stakeholder Perception Program Revisions

Jennifer Flandermeyer, CCC Chair and MRC Representative
Scott Tomashefsky, CCC Vice Chair
Member Representatives Committee
February 4, 2021

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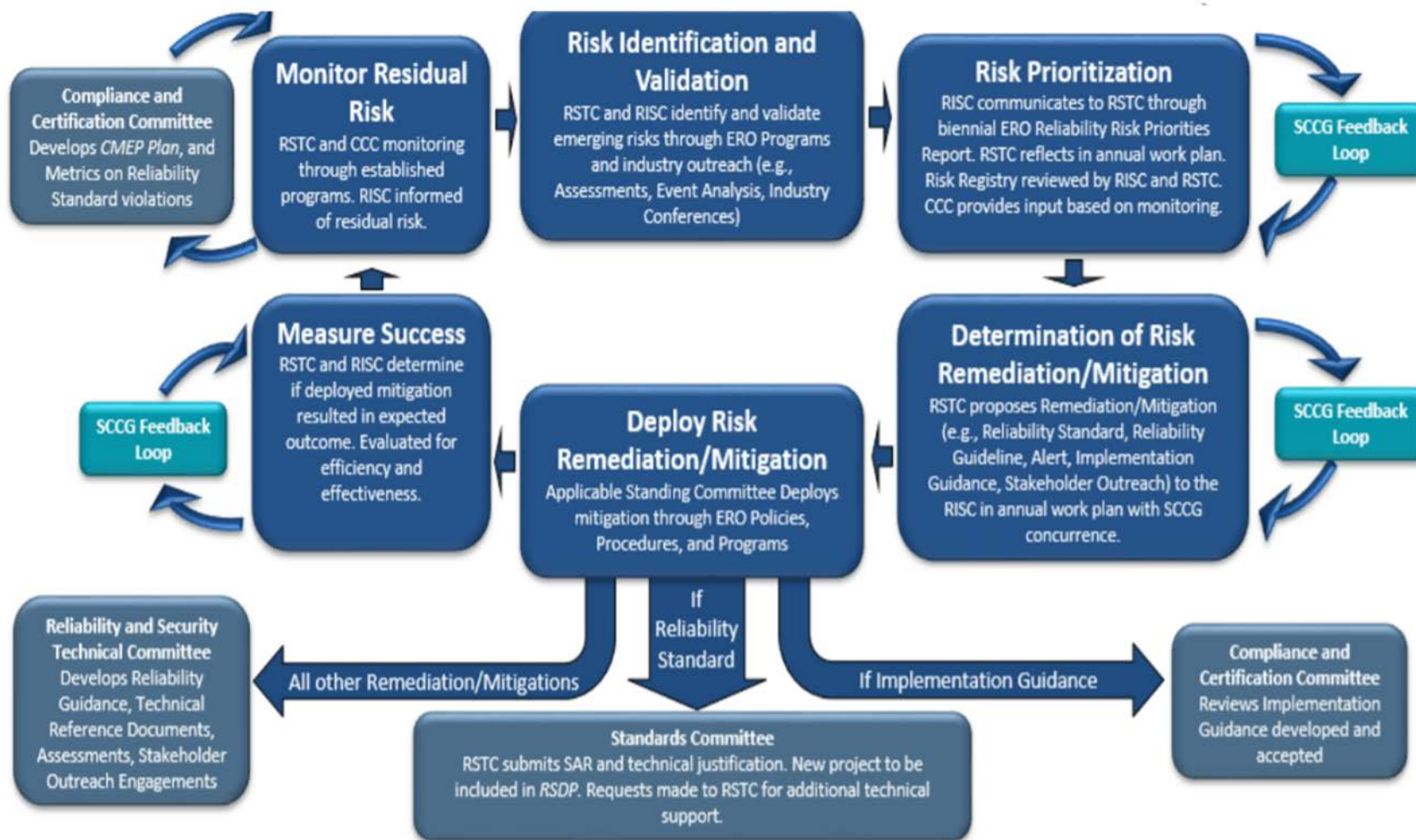


- As part of the CCC Charter, the CCC provides comments and recommendations to the NERC Board and BOTCC, the EWRC and NERC staff with respect to stakeholders' perceptions of the policies, programs, practices and effectiveness of the CMEP, Registration program and Certification program
- The CCC Program Procedures (CCCPP) describe how the Committee executes those chartered responsibilities
- The Program document for Monitoring Stakeholder Perceptions (CCCPP-008) describes the program and associated processes utilized by the CCC to carry out this responsibility

- The CCC had used a survey, including the ERO Enterprise Effectiveness Survey (“ERO Survey”), as the process to measure stakeholder perceptions on NERC programs for compliance monitoring and enforcement, registration and certification activities
- Early 2020 – ERO Survey discontinued with decision to gather stakeholder perceptions in different ways
- CCCPP-008 reviewed and revised to include additional monitoring processes
- In August 2020, CCCPP-008 was approved by NERC BOT

- Revisions made to ensure:
 - Gather feedback in a more real-time, fluid way;
 - Attain a more focused or “surgical” feedback; and
 - Implement flexibility in tools used to gather stakeholder perceptions.

- Stakeholder Surveys on Specific Areas or Initiatives
- Focus Groups
- Regional Entities
- Industry Organizations
- Through direct stakeholder feedback
- CCC Reps / Alignment Working Group
- NERC Board and Management Requests





Recent FERC Activities

Andy Dodge
Director, Office of Electric Reliability
Federal Energy Regulatory Commission
February 4, 2021

The views expressed in this presentation are my own and do not represent those of the Commission or any individual Commissioner

Recent Reliability Orders

SER Retirements, Docket Nos. RM19-16-000 and RM19-17-000.

- On 9/17/20, the Commission issued an Order approving the retirement of 18 of the 76 Reliability Standard requirements requested for retirement by NERC.
- The Commission remanded proposed Reliability Standard FAC-008-4 for further consideration by NERC.
- The Order does not address the retirement of the MOD A Reliability Standards which is tied to the NASEB effort.

Supply Chain Notice of Inquiry (NOI), Docket No. RM20-19-000.

- On 9/17/20, the Commission issued an NOI on the potential risks to the Bulk Electric System posed by the use of equipment and services produced or provided by certain entities identified as risks to national security.
- The Commission seeks comments on strategies to mitigate any potential risks posed by such telecommunications equipment and services.
- Comments were due 11/23/20 and reply comments were due 12/22/20.

Recent Reliability Orders

WECC Regional Reliability Standard BAL-002-WECC-3 (Contingency Reserve), Docket No. RM19-20-000.

On 10/15/20, the Commission issued a NOPR proposing to approve the proposed Regional Reliability Standard and directed NERC and WECC to submit an informational filing 27 months following its implementation.

Business Plans and Budgets, Docket No. RR20-6-000.

On 11/2/20, the Commission issued an order approving the 2021 budgets of NERC, Regional Entities, and WIRAB.

Delegation Agreements, Docket No. RR20-5-000.

- On 12/2/20, the Commission issued an order conditionally approving the revised *pro forma* Delegation Agreement and the revised Delegation Agreements between NERC and each of the six Regional Entities.
- The order directed NERC and the Regional Entities to modify the revised Delegation Agreements within 120 days of order. The order noted that if a Regional Entity modifies its selection of a hearing process, NERC and the Regional Entities will amend the Delegation Agreements and file such amendments with the Commission.

Virtualization, Cloud Services for Power Grid Operations

- On 12/17/20, the Commission issued an order directing NERC to make an informational filing that considers the feasibility of modifying the CIP Reliability Standards to facilitate the voluntary use of virtualization and cloud computing for purposes beyond data storage (i.e., to perform BES reliability operating services), as well as the status and schedule for any plans to modify the standards by NERC in response to comments filed in response to the 2/20/20 NOI. Docket No. RM20-8.
- The order stated that the Commission supports NERC's effort to reassess the CIP Reliability Standards to facilitate the adoption of virtualization and cloud computing and relieving registered entities of compliance uncertainties. However, consistent with the precept that the Reliability Standards are technology-neutral, virtualization and cloud computing should continue to be voluntary to allow registered entities to consider the deployment of these new technologies, their system needs, and applicable security requirements.
- The Order directed NERC to make the filing by 1/1/22.

ERO Five-Year Performance Assessment

- On 1/19/21, the Commission issued an order approving NERC's proposed modifications to its Rules of Procedure related to: (1) the E-ISAC (section 1003); (2) Sanction Guidelines (Appendix 4B); and (3) Registration and Certification (section 500 and Appendices 2, 5A, 5B, and 5C), Docket No. RR19-7-001.
- The order denies NERC's proposal to replace its Appendix 4A audit process with an alternative program and directs NERC to submit completed reports on its audits of all six Regional Entities by June 30, 2023.
- The order accepts NERC's description of its Reliability Guidelines process and its explanation on E-ISAC operations and its All Points Bulletins (APBs) issuances.
- The order directs NERC to submit a further compliance filing within 120 days of this order that: (1) further clarifies information sharing between NERC and the E-ISAC, including the gap analysis process that is currently under development; and (2) revises its Rules of Procedure to explicitly require that NERC must share all APBs with the Commission no later than at the time of issuance.

Revisions to Regulations on ERO Performance Assessments

- On 1/19/21, the Commission issued a NOPR proposing to revise its regulations on the ERO's Performance Assessments, Docket No. RM21-12.
- The NOPR proposes to modify the Commission's regulations on the ERO requirement to submit a performance assessment from the current five-year cycle to a submission every three years.
- The NOPR also proposes to add a requirement for the ERO to include in its performance assessment a detailed discussion of any areas of the ERO's responsibilities and activities, or a Regional Entity's delegated functions, beyond those required by the Commission's regulations, that the Commission has identified at least 90 days prior to the expected performance assessment submission date.
- Finally, the NOPR proposes formalizing the method for the ERO and REs to receive and respond to recommendations by the users, owners, and operators of the Bulk-Power System, and other interested parties for improvement of the ERO's operations, activities, oversight and procedures.
- Comments are due 30 days after filing is posted in the Federal Register.

Stay Home, Stay Safe!

- Thank you!
- Questions?



NERC MRC Meeting - Summer 2020 Heat Event

Mark Rothleder
SVP & Chief Operating Officer

February 4, 2021

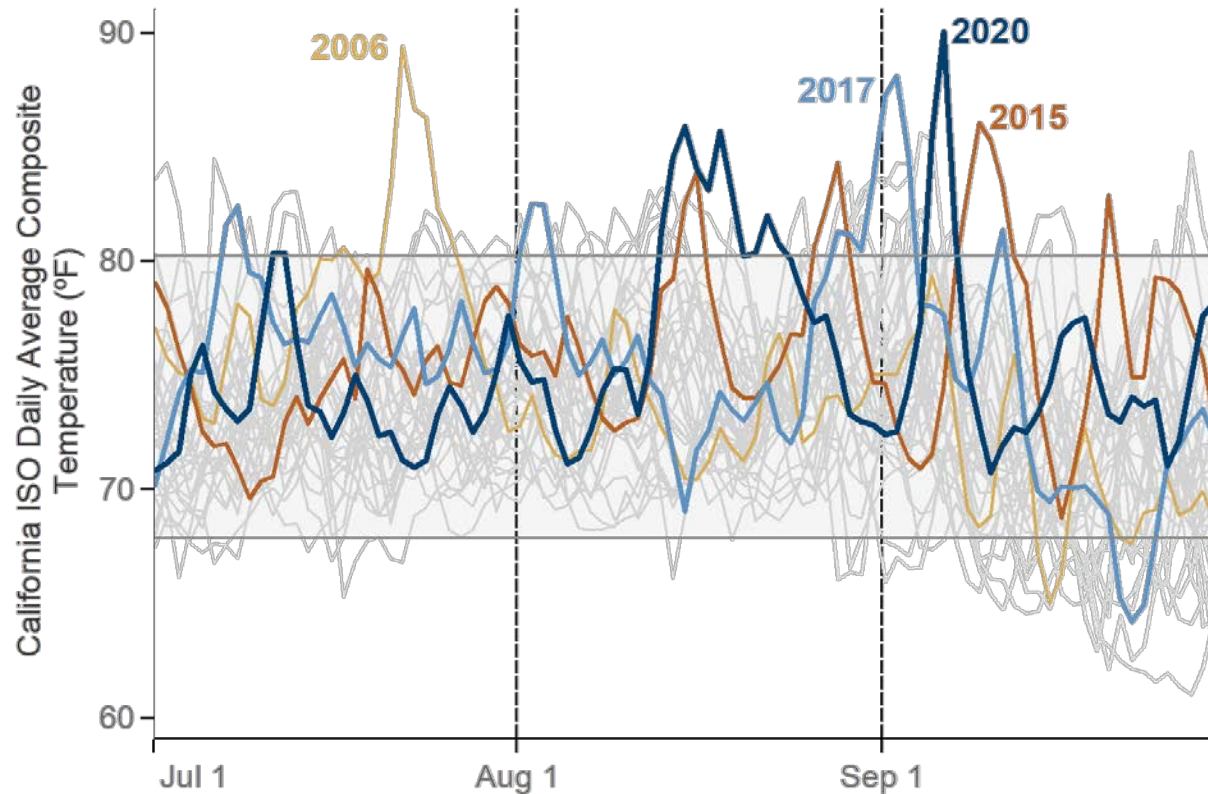
Joint agency final analysis confirms preliminary findings

- The climate change-induced extreme heat wave across the western United States resulted in demand for electricity exceeding existing Resource Adequacy and planning targets
- Planning targets in the transition to a reliable, clean and affordable resource mix have not resulted in sufficient resources to meet demand in the early evening hours of extremely hot days
- Several practices in the energy markets exacerbated the supply challenges under highly stressed conditions

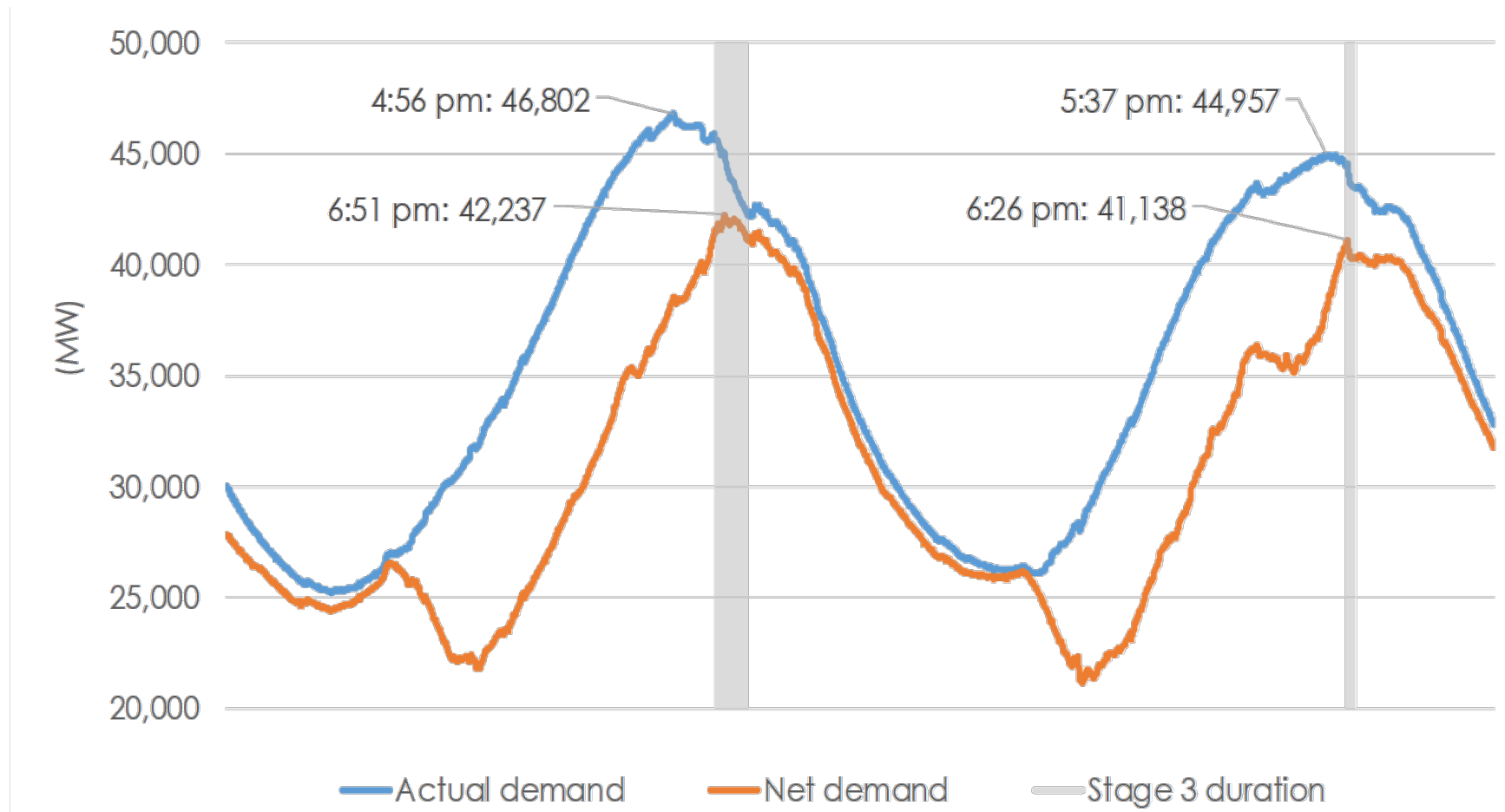
Updated temperature analysis

- The extreme heat wave experienced in August was a 1-in-30 year weather event in California; September heat wave event was roughly a 1-in-70 event

July, August, and September Temperatures 1985 - 2020



Tightness in resource supply during peak and net peak hours due to the transition to clean resources was amplified by the weather conditions

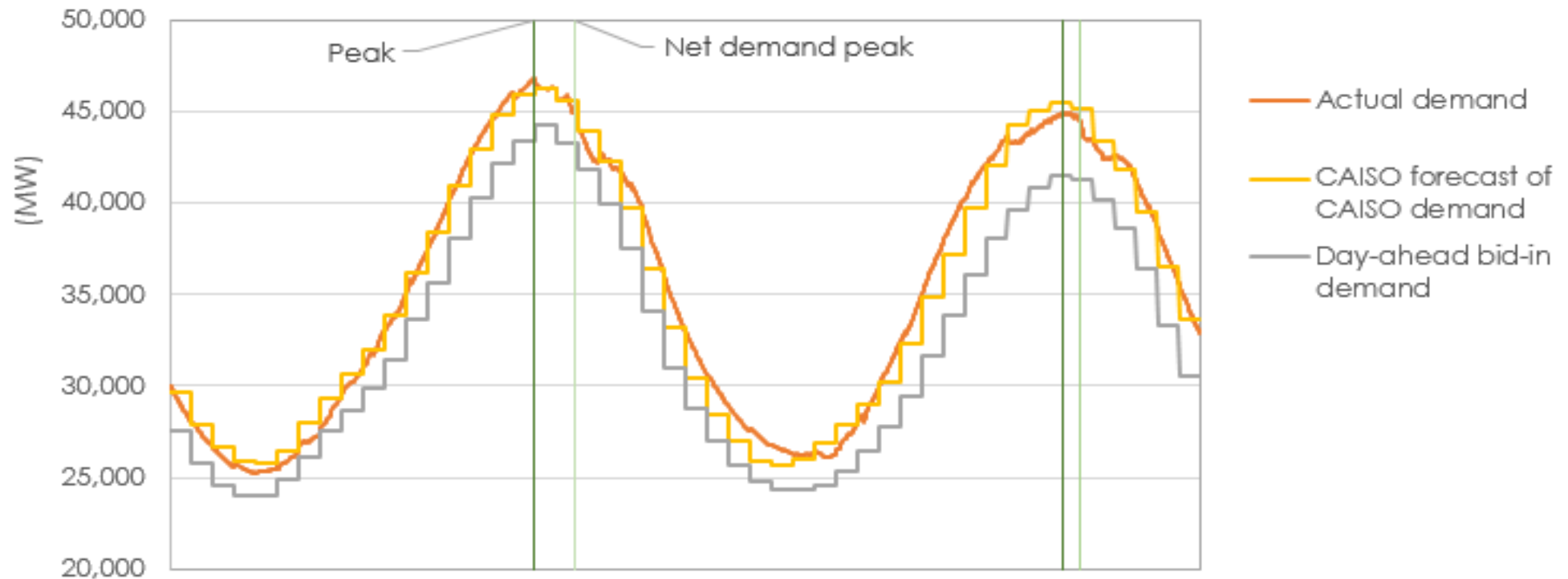


Summer 2021 priority actions

1. CPUC Emergency Reliability rulemaking (R.20-11-003)
2. CAISO conducting analysis to supporting an increase to the CPUC's RA program procurement targets
3. CAISO expedited stakeholder process on market rules and practices
4. CPUC tracking and approving projects currently under development to help ensure project completion by their target online dates
5. CEC conducting probabilistic studies that evaluate the loss of load expectation on the California system
6. CAISO, CEC, and CPUC improvements to future coordination, including communication protocols and development of a contingency plan
7. CEC and CAISO to coordinate with non-CPUC-jurisdictional entities to encourage additional necessary procurement
8. CAISO, CPUC, and CEC planning to enhance the efficacy of Flex Alerts

BACKUP SLIDES

Energy market activity and processes did not perform as expected during stressed conditions



Day-ahead bid-in demand below actual:

	<u>8/14</u>	<u>8/15</u>
At peak:	3,386	1,792
Time of net demand peak:	3,434	3,219

Updates from Preliminary Root Cause Analysis

- Discussion of the Labor Day weekend heat wave
- Additional analysis of resource performance by resource type, including demand response based on customer meter settlement data
- Scheduling/bidding of load into the day-ahead market by type of load serving entity
- References to analysis provided in the Department of Market Monitoring report on the rotating outages
- Revised and updated recommendations

Summary of CPUC-jurisdictional demand response performance

	Metered load drop	RDRR dispatched or PDR real-time awards	% metered load drop	Credited (w/o losses or PRM gross up) or shown RA	% metered load drop	Credited w/o PRM	% metered load drop	Credited (w/ losses and PRM gross up)	% metered load drop
During 8/14 Stage 3									
IOU RDRR (credited)	762	935	81%	904	84%	978	78%	1,115	68%
PDR (credited)	69	101	68%	288	24%	311	22%	368	19%
PDR (RA)	79	191	41%	243	33%	n/a	n/a	n/a	n/a
During 8/15 Stage 3									
IOU RDRR (credited)	722	846	85%	904	80%	978	74%	1,115	65%
PDR (credited)	2	8	30%	288	1%	311	1%	368	1%
PDR (RA)	32	127	25%	243	13%	n/a	n/a	n/a	n/a

Comparison of Under- and Over-Scheduling of Load on August 14 & 15

	<u>IOU</u>	<u>CCA</u>	<u>ESP</u>	<u>Non-CPUC</u>	<u>Other</u>	<u>Total</u>
<u>8/14 (MW)</u>						
Peak	(1,288)	(153)	(206)	(131)	(385)	(2,164)
Net demand peak	(664)	(146)	8	(134)	(336)	(1,272)
<u>8/15 (MW)</u>						
Peak	(1,147)	(297)	(90)	(223)	(266)	(2,023)
Net demand peak	(671)	(282)	(118)	(242)	(234)	(1,547)
<u>8/14 (%)</u>						
Peak	(5%)	(4%)	(4%)	(3%)	(8%)	(5%)
Net demand peak	(3%)	(4%)	0%	(3%)	(7%)	(3%)
<u>8/15 (%)</u>						
Peak	(4%)	(8%)	(2%)	(6%)	(6%)	(5%)
Net demand peak	(3%)	(8%)	(2%)	(6%)	(5%)	(4%)



Western Interconnection August Heat Wave Event

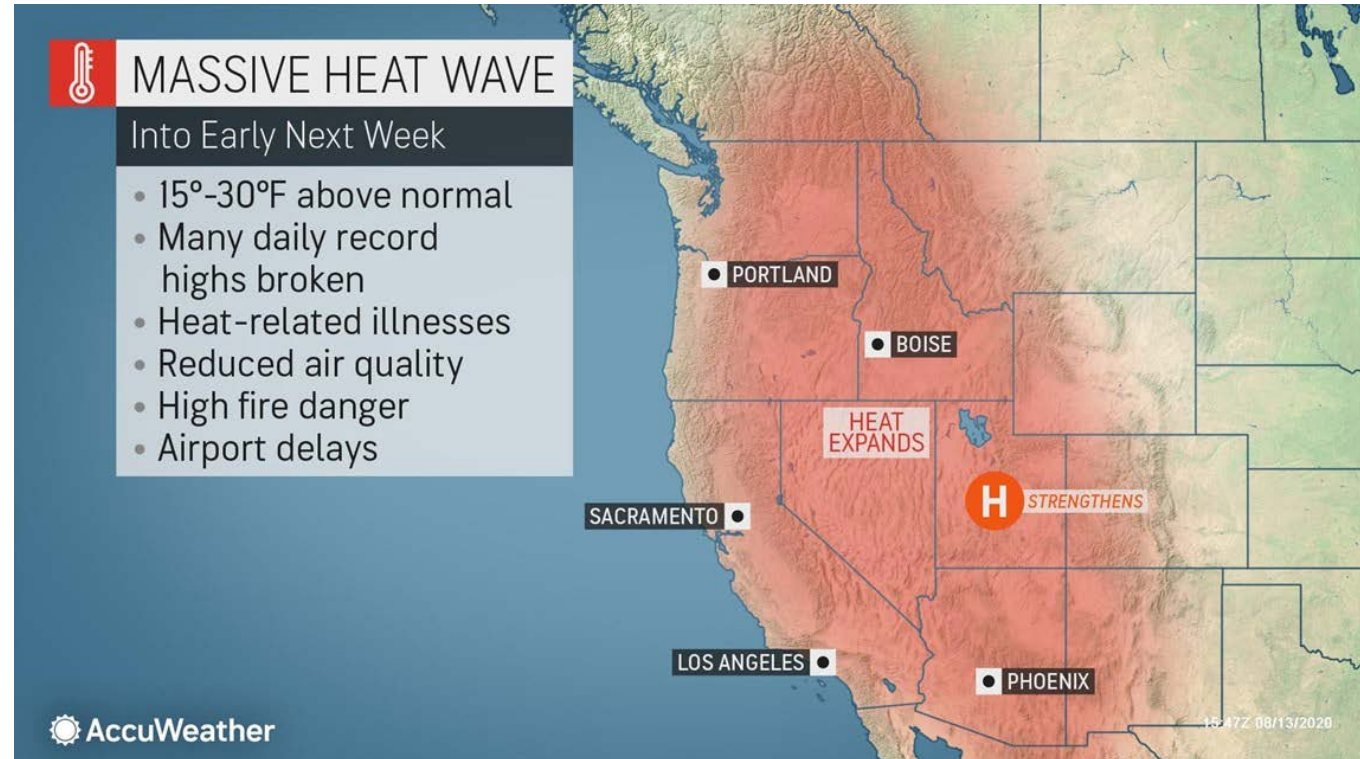
February 4, 2021

Branden Sudduth

VP, Reliability Planning &
Performance Analysis

Background

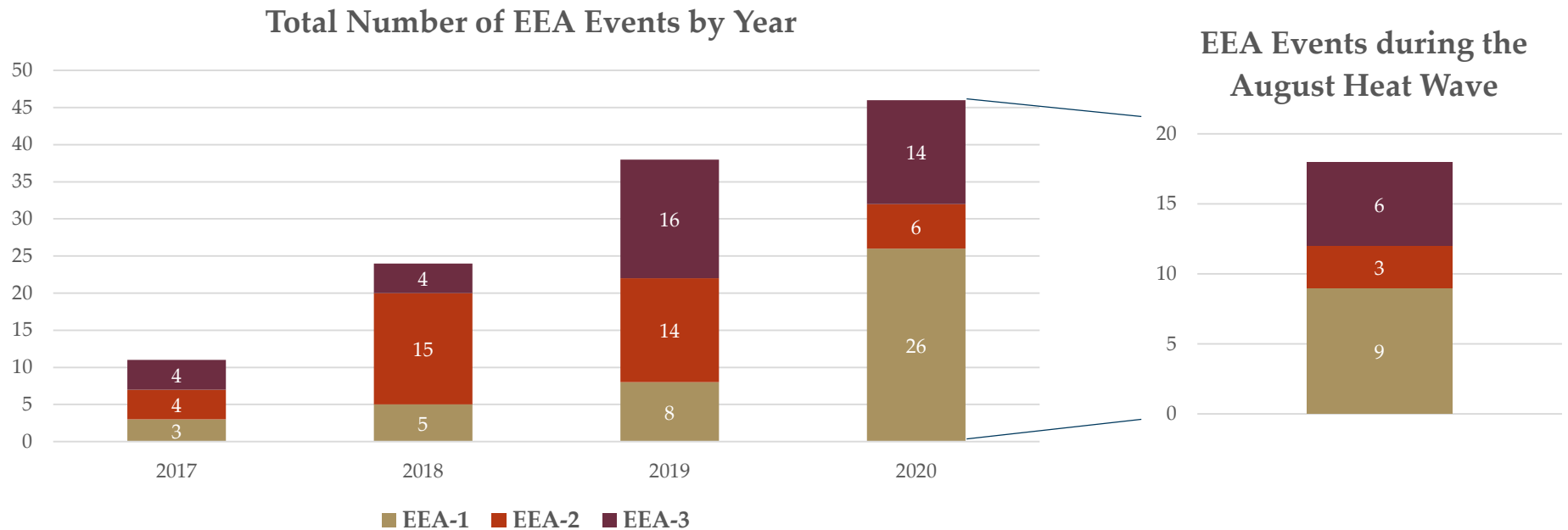
- Extremely hot conditions across the West
- Firm load was shed on Aug 14 (1,087 MW) and Aug 15 (692 MW)
- WECC Summer Peak Load occurred on Aug 18 at 162,017 MW



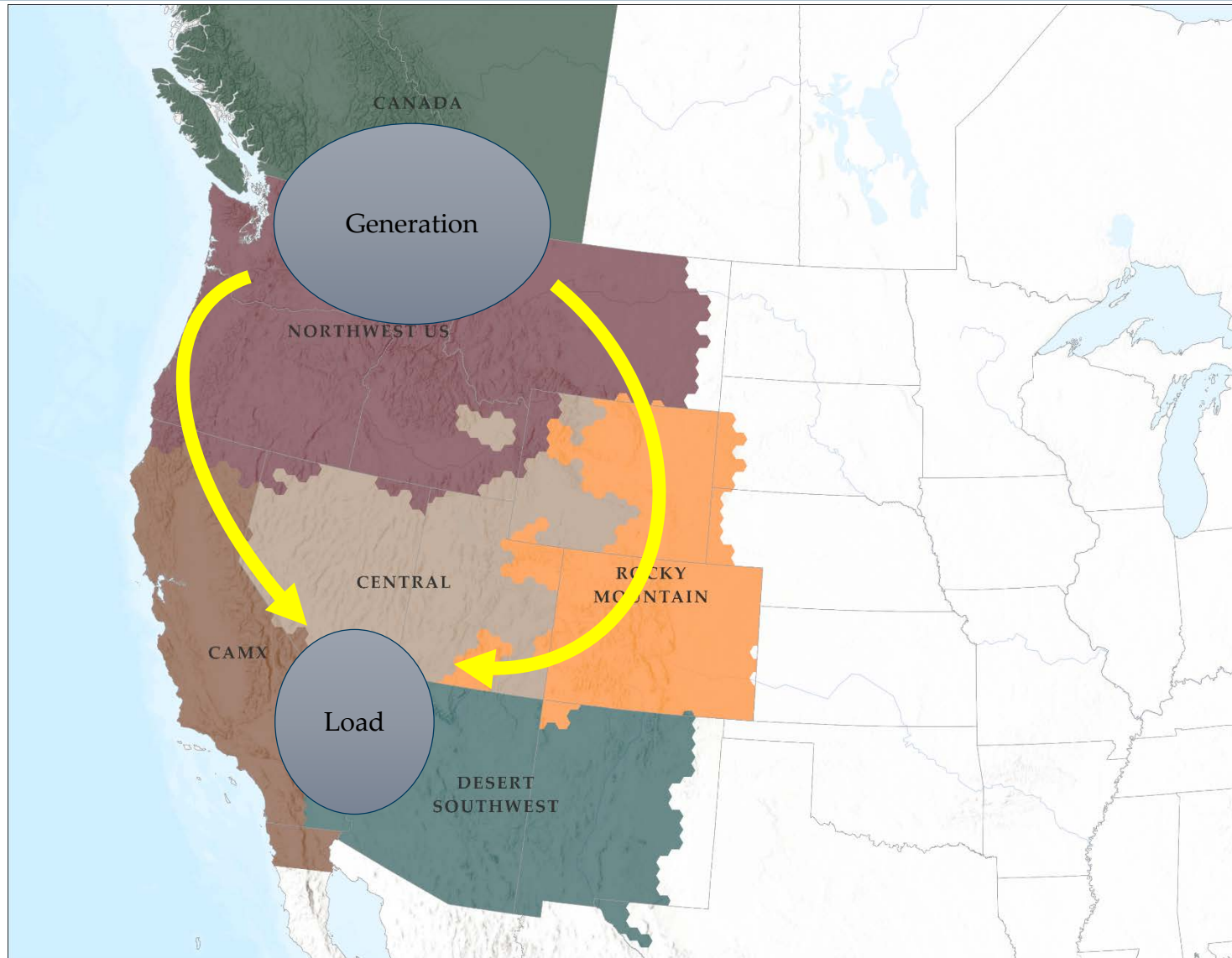
Source: <https://www.abc10.com/article/weather/accuweather/heat-wave-weather-forecast-western-us/507-f22bddea-cbed-4122-9828-0d60ae22a887>

High Demand

- Eleven Balancing Authorities placed in an Energy Emergency Alert (EEA) state
 - Six BAs placed in an EEA-3 state



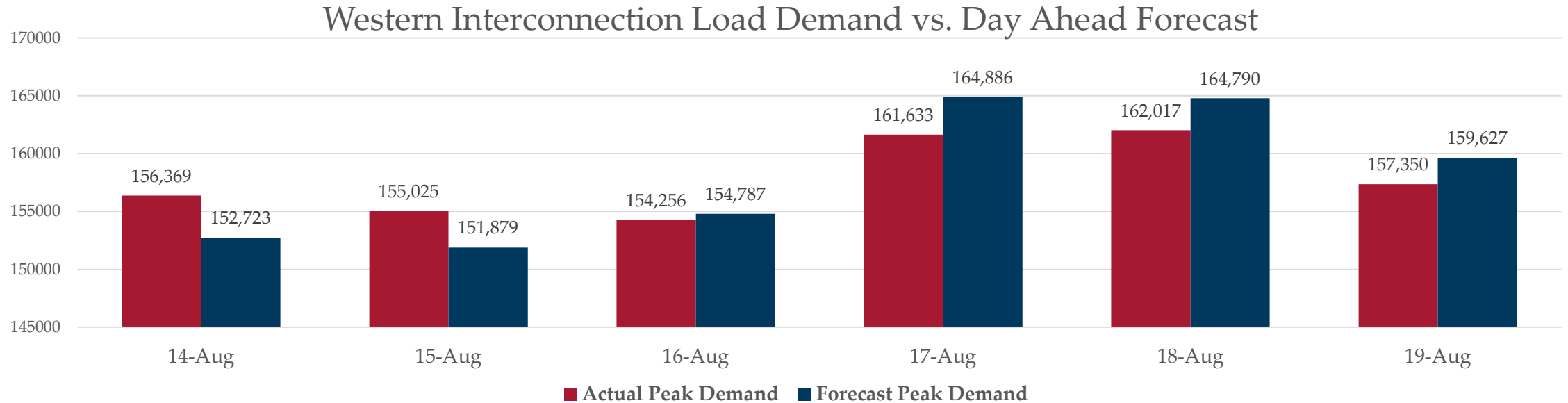
Use of Transmission



Day-Ahead Forecasting

1. Inaccuracies for day-ahead forecasting

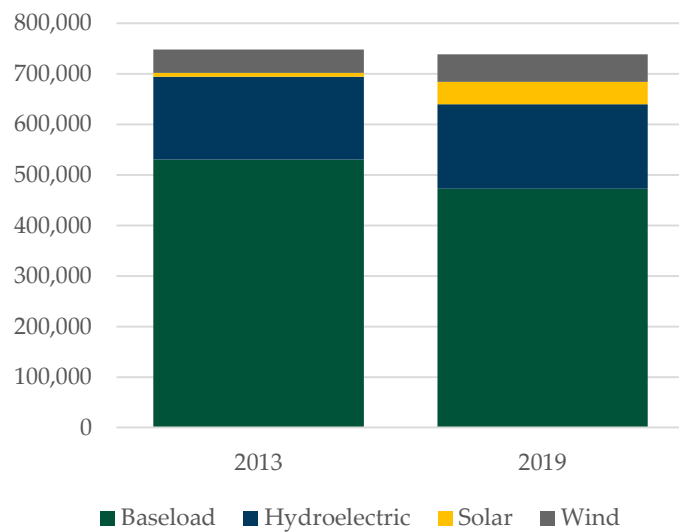
1. Load forecasting for August 14 and 15 was significantly lower than actual peak demand
2. Deficit of wind and solar generation related to the day-ahead forecast



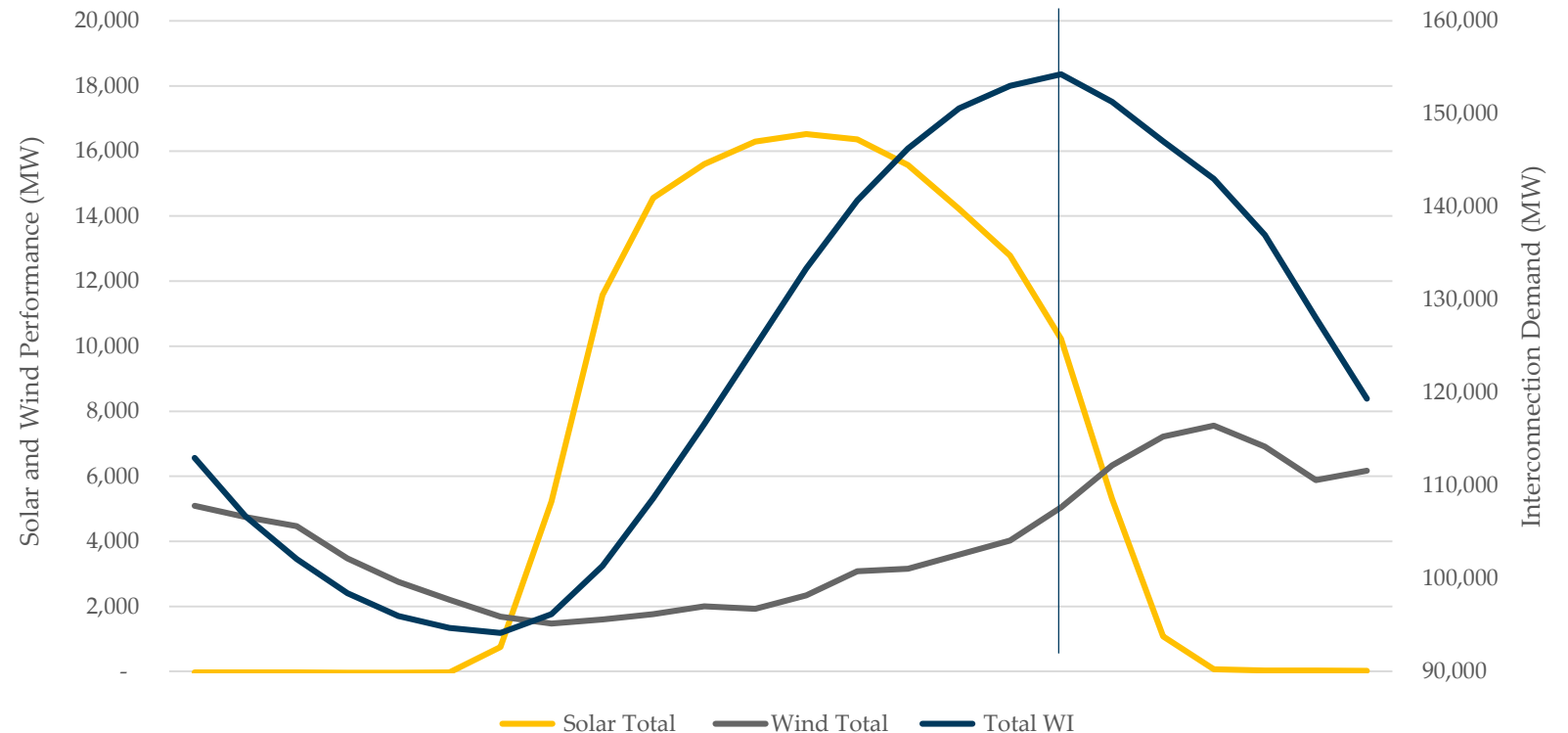
Resource Adequacy

1. Variable generation affected ability to help with peak demand

2013 to 2019 Net Generation by Fuel Type Comparison

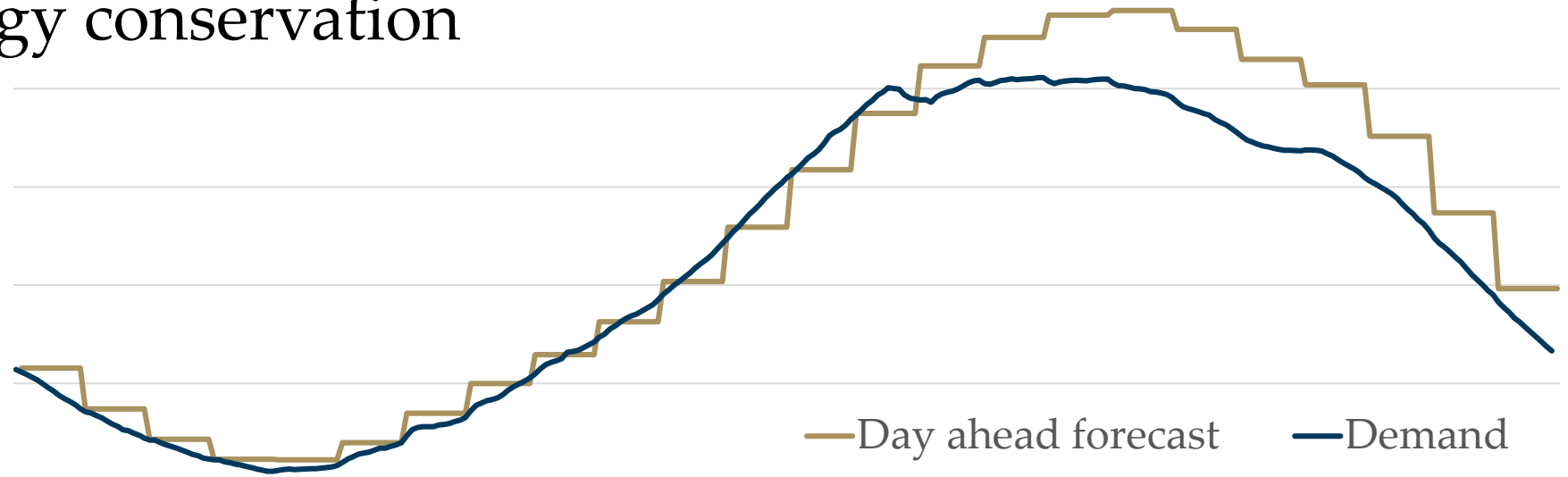


Variable generation with Interconnection Demand



Positive Observations

1. Proactive coordination among RC managers
2. Heat wave supports the findings from the WECC MAVRIC tool
3. Use of real-time synchrophasor data to monitor and take action on phase angles
4. Impacts of energy conservation





WECC

Electric Reliability and Security for the West

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Battery Storage

Impacts of Electrochemical Utility-Scale Battery Energy Storage Systems on the Bulk Power System

Howard Gugel, Vice President of Engineering and Standards
Member Representatives Committee

February 4, 2021

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Generator Fleet

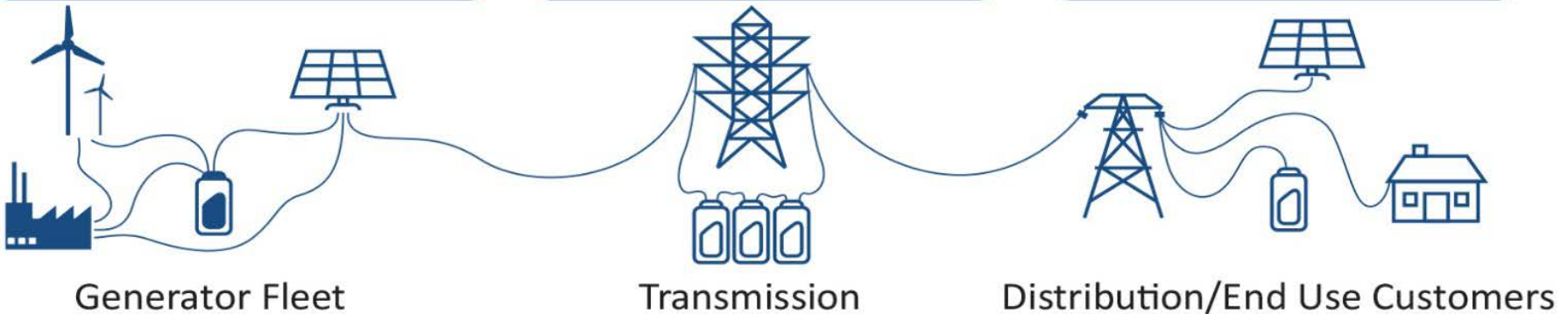
- Operating Reserves
- IBR Energy Capacity Firming
- Peaking Capacity
- Black Start Capability

Transmission

- Frequency Regulation
- Voltage Support
- Energy Arbitrage¹
- Upgrade Deferrals

Distribution/End Use Customers

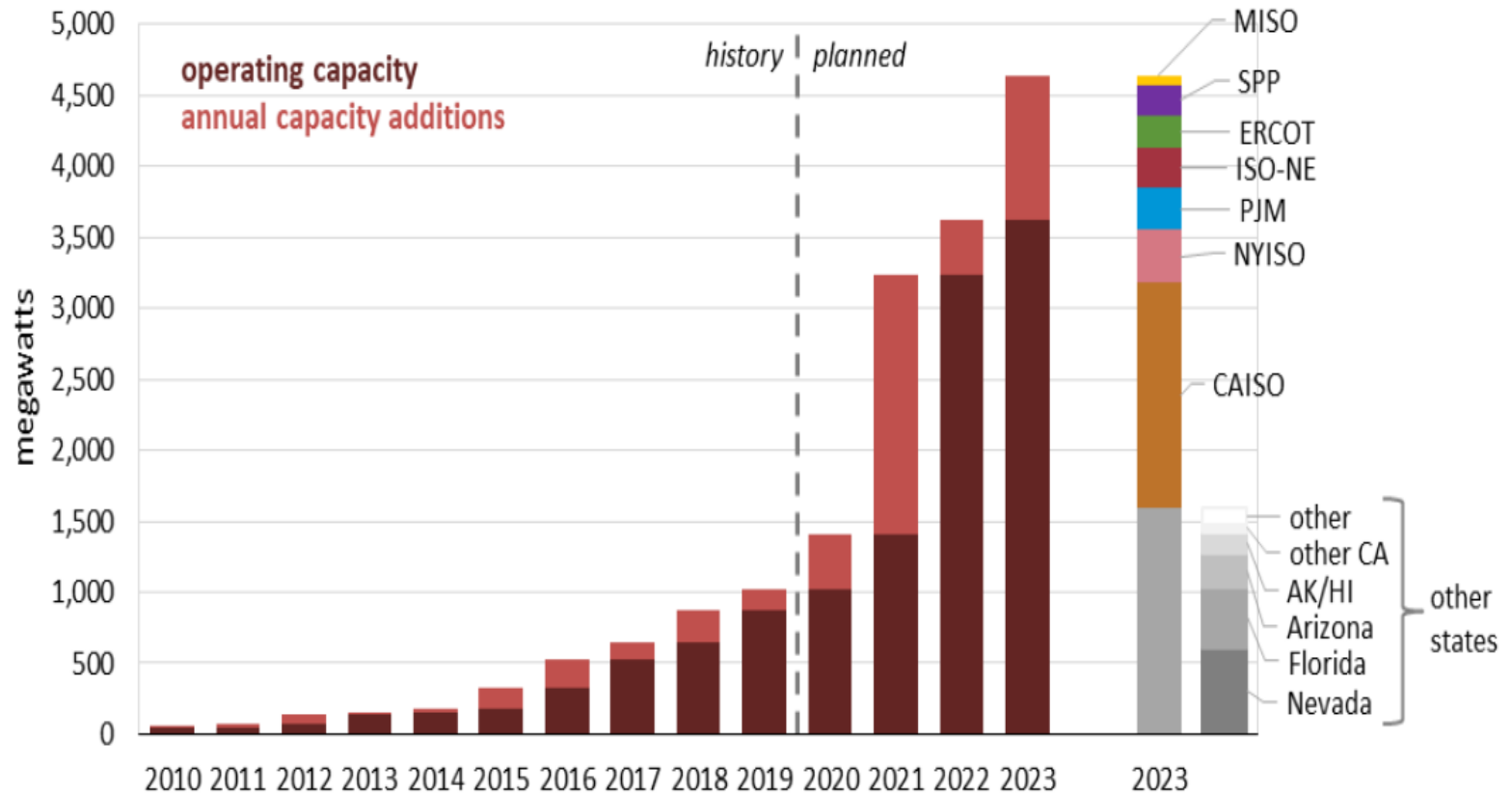
- Voltage Support²
- Upgrade Deferrals



¹ This term is related to the load leveling term commonly found in nonmarket solutions. They both effectively look to have similar battery performance: shifting energy to different times.

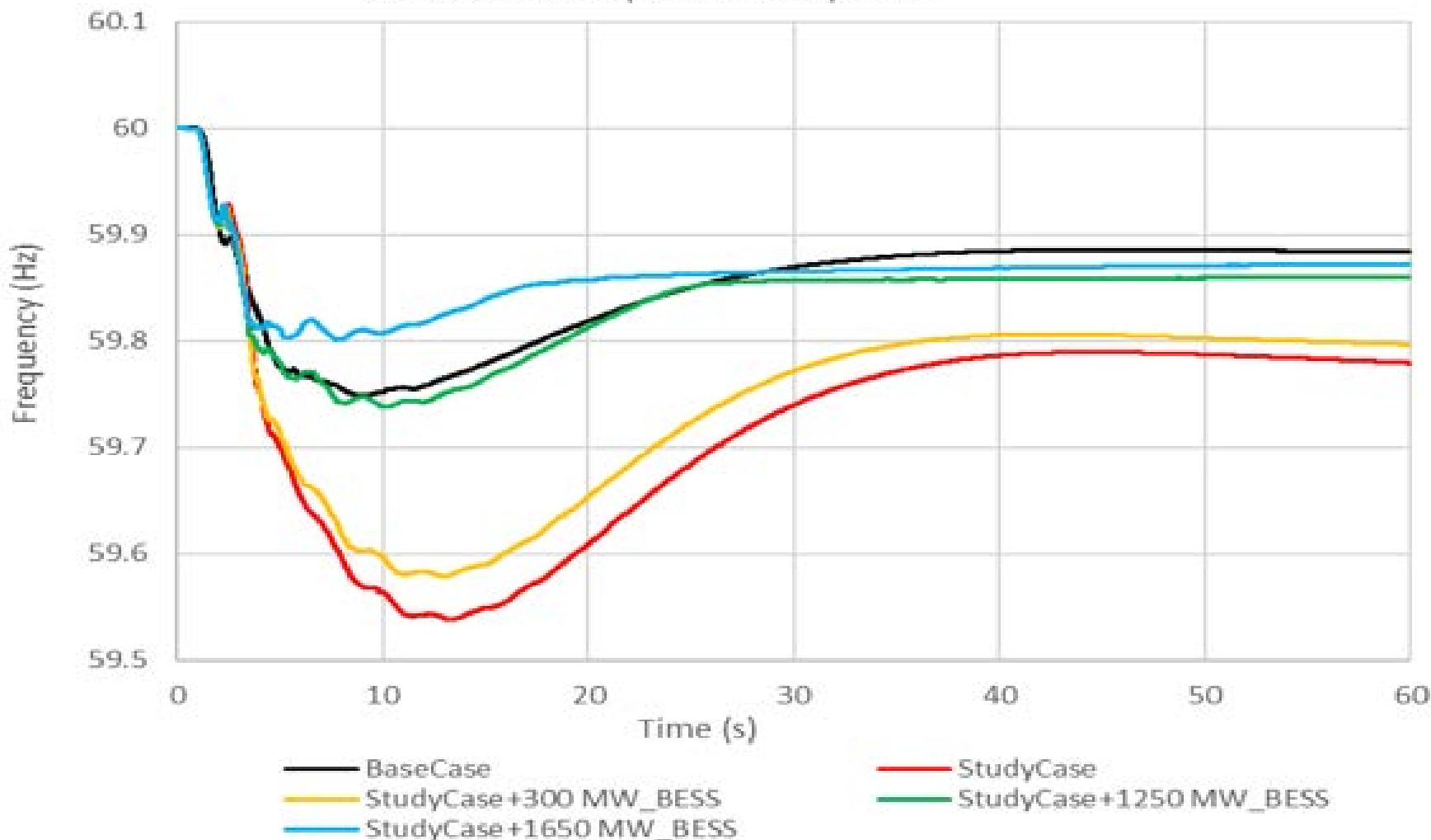
² While not commonly used for distribution systems, BESSs can perform their voltage support on the distribution system. It is expected most BESSs that provide voltage support will be placed on the transmission system.

Figure 12. Large-scale battery storage cumulative power capacity (2010–2023)



Source: U.S. Energy Information Administration, Form EIA-860M, *Preliminary Monthly Electric Generator Inventory*

Grid Median Frequencies Comparison



- Lithium-ion batteries account for >50% installed Battery Energy Storage Systems (BESS) capacity
- Flow batteries are an emerging technology, 2% installed capacity
- Many factors are promoting growth
- BESS can provide Essential Reliability Services

- BESSs can provide effective fast frequency response
- Existing NERC Standards adequately reflect battery storage
- Data for battery storage non-uniform and lack consistency
- Utility-scale battery storage lagging with integration of renewable energy

- System Planners
 - Be prepared for significant increases in BESSs
 - Understand characteristics to maintain reliability
 - Consider impact of size, location, and operating characteristics
- Intermittent resources (wind and solar)
 - Studies to determine system stability impacts
 - Meet reserve margin requirements
 - Provide essential reliability services

- NERC
 - Form Task Force/Working Group of RSTC
 - Standards and gap analysis if sizable increase in BESS
- Data Collection
 - Enhance data collection methods
 - IEEE updates/GADS updates



Questions and Answers