ICEF 2022

9th Annual Meeting

October 5, 2022

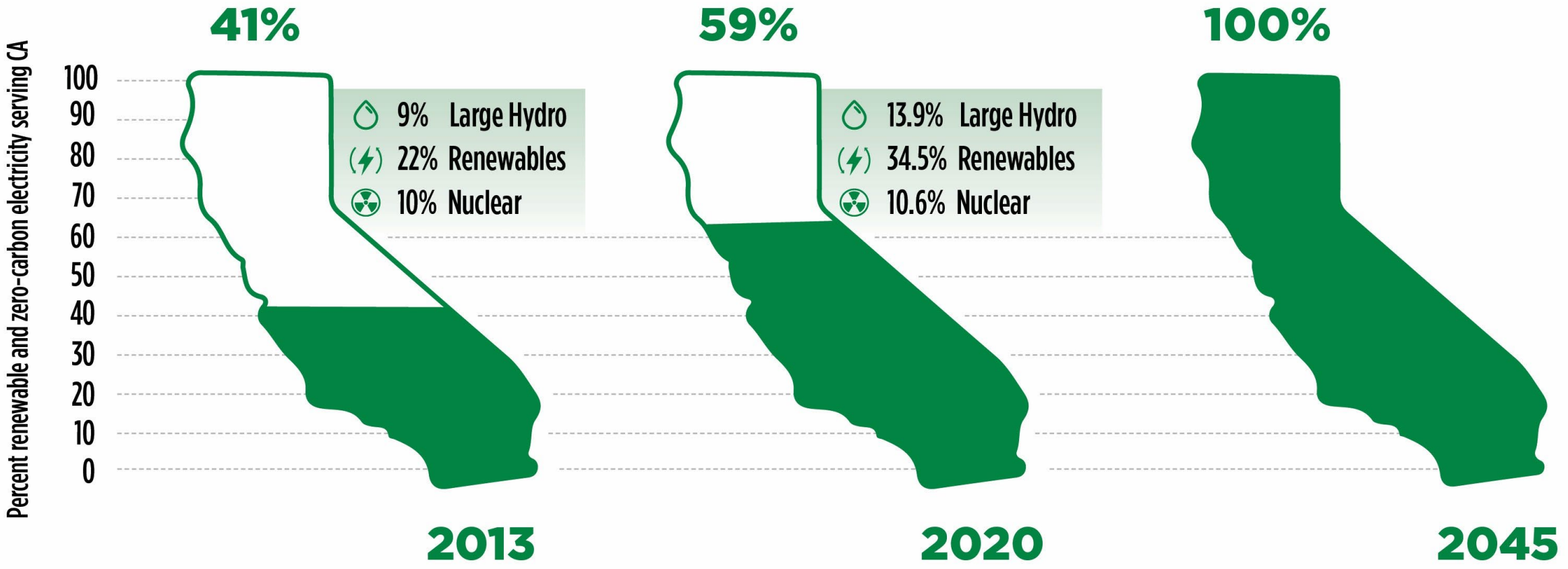
Siva Gunda, Vice Chair, California Energy Commission

California is Implementing Ambitious Climate Goals

- **Carbon Neutrality for our diverse population no later than 2045**

- **Electric Grid Planning**
  - 100% Clean Electricity by 2045
  - 90% Clean Electricity by 2040
  - 90% Clean Electricity by 2035

Progress to 100% Clean Electricity



California

Clean Electricity Resources

Projected to increase annual costs 6% above a 60% RPS baseline

* Includes in-state

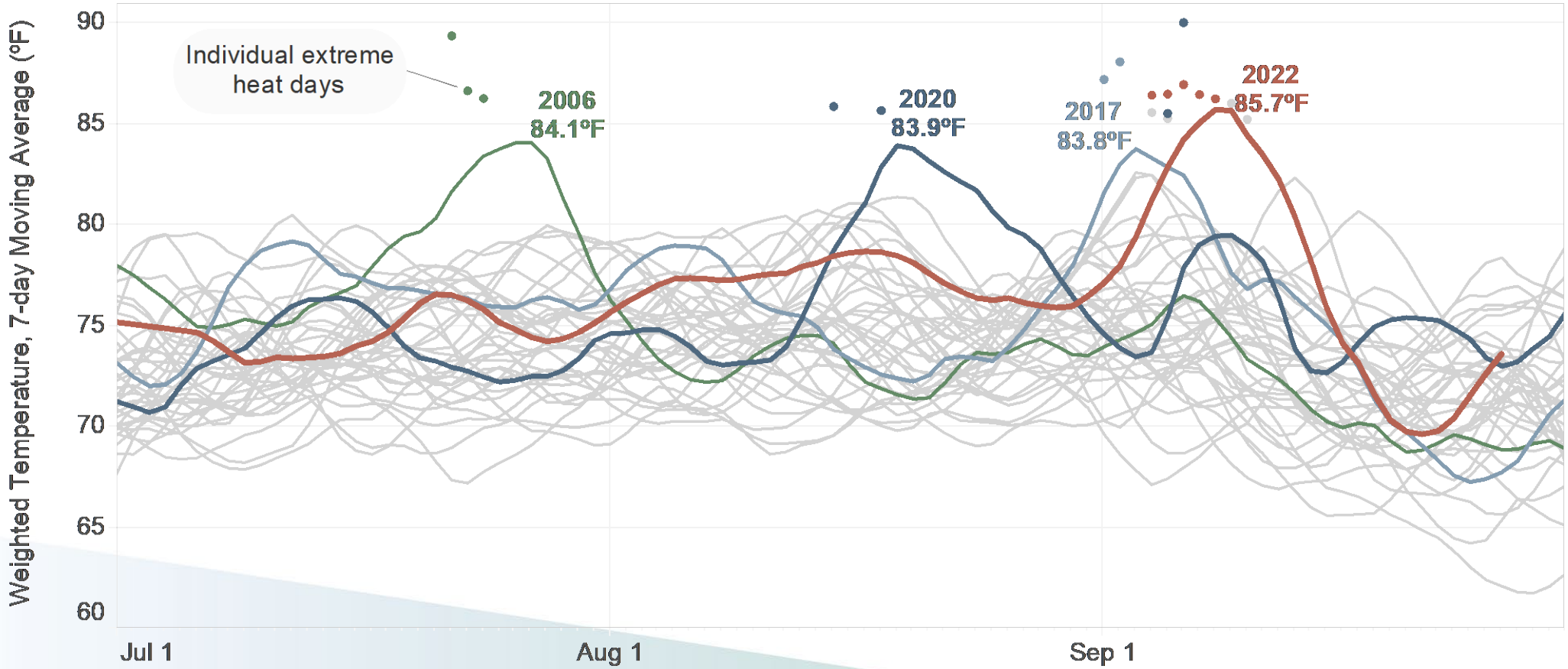
** Includes in-state and out of state capacity

† New hydro and nuclear resources were not candidate technologies for this round of modeling and could not be selected

	Existing Resources	Projected New Resources	
	2019*	2030**	2045**
Solar (Utility-Scale)	12.5 GW	16.9 GW	69.4 GW
Solar (Customer)	8.0 GW	12.5 GW	28.2 GW
Storage (Battery)	0.2 GW	9.5 GW	48.8 GW
Storage (Long Duration)	3.7 GW	0.9 GW	4.0 GW
Wind (Onshore)	6.0 GW	8.2 GW	12.6 GW
Wind (Offshore)	0 GW	0 GW	10.0 GW
Geothermal	2.7 GW	0 GW	0.1 GW
Biomass	1.3 GW	0 GW	0 GW
Hydrogen Fuel Cells	0 GW	0 GW	0 GW
Hydro (Large)	12.3 GW	N/A†	N/A†
Hydro (Small)	1.8 GW	N/A†	N/A†
Nuclear	2.4 GW	N/A†	N/A†

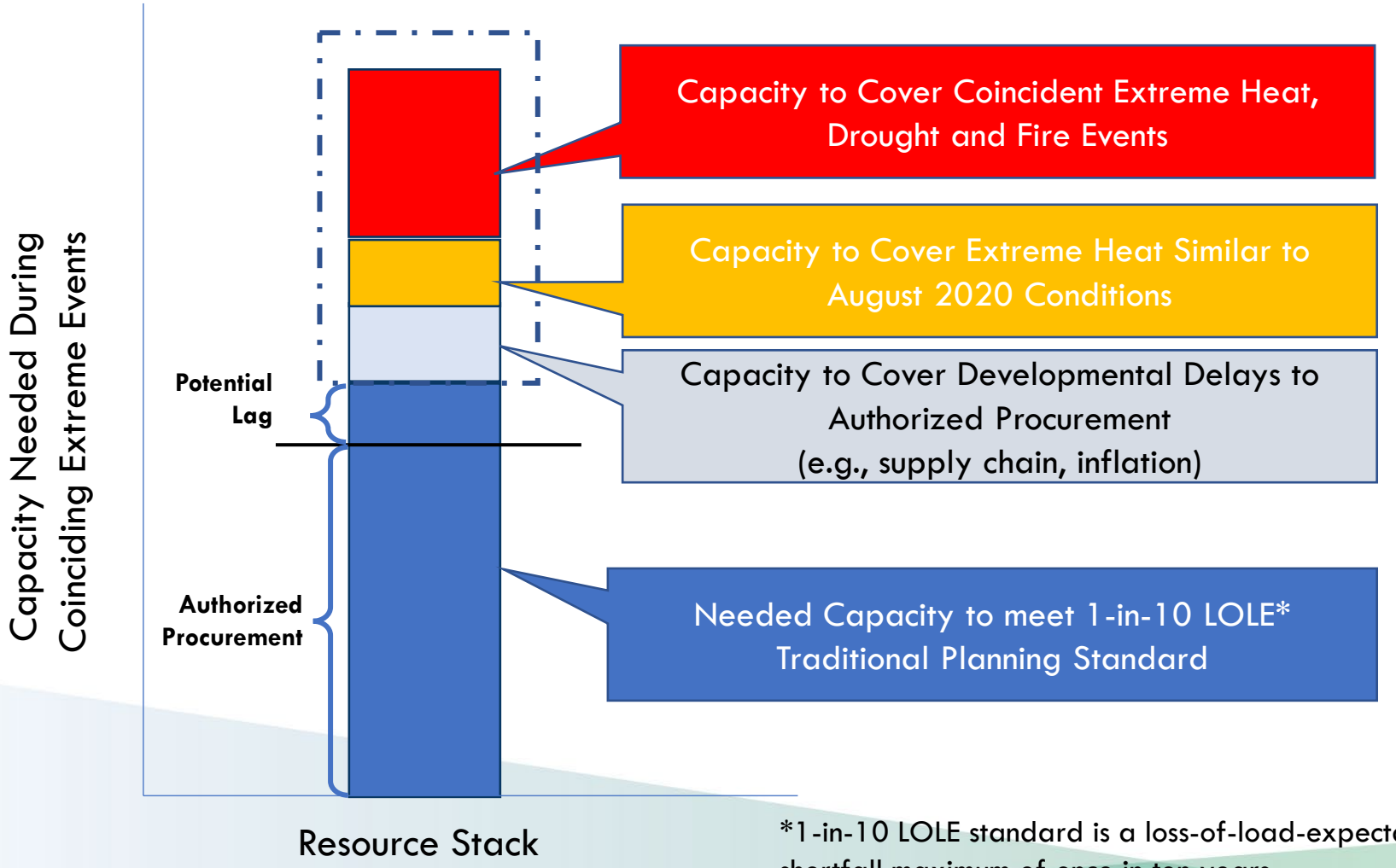
Achieving 100% Clean Electricity in California

A More Extreme Climate



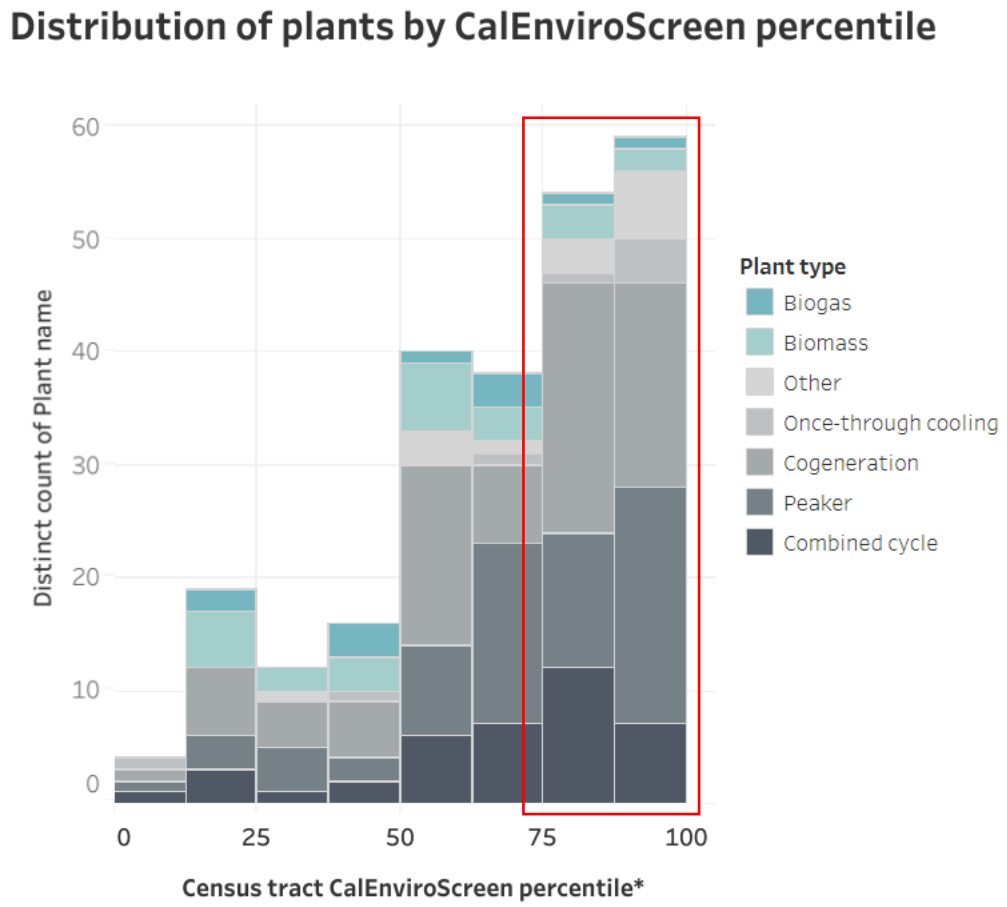
Composite Statewide Temperature, Summers 1985–2022

Climate Risks to Reliability



*1-in-10 LOLE standard is a loss-of-load-expectation (an outage) due to supply shortfall maximum of once in ten years.

Power Plants are Disproportionately Located in Disadvantaged Communities



Source: PSE Healthy Energy California Power Map

- Prioritization of Retirement of Fossil fleet in Disadvantaged and highly burdened communities
- Acceleration of electrification and improvement of air and water quality
- **Expand and accelerate demand side opportunities**

Flex Alert Performance over the Past Two Years

2020

395-2300MW (Higher Range with GO Communication in September)

2021

June

Date	Conservation
June 17th, 2021	85-735 MWs
June 18th, 2021	77-413 MWs

July

Date	Conservation
July 9th, 2021	None Observed
July 10th, 2021	18-190 MWs
July 12th, 2021	380-940 MWs
July 28th, 2021	0-100 MWs

GO Communication

August

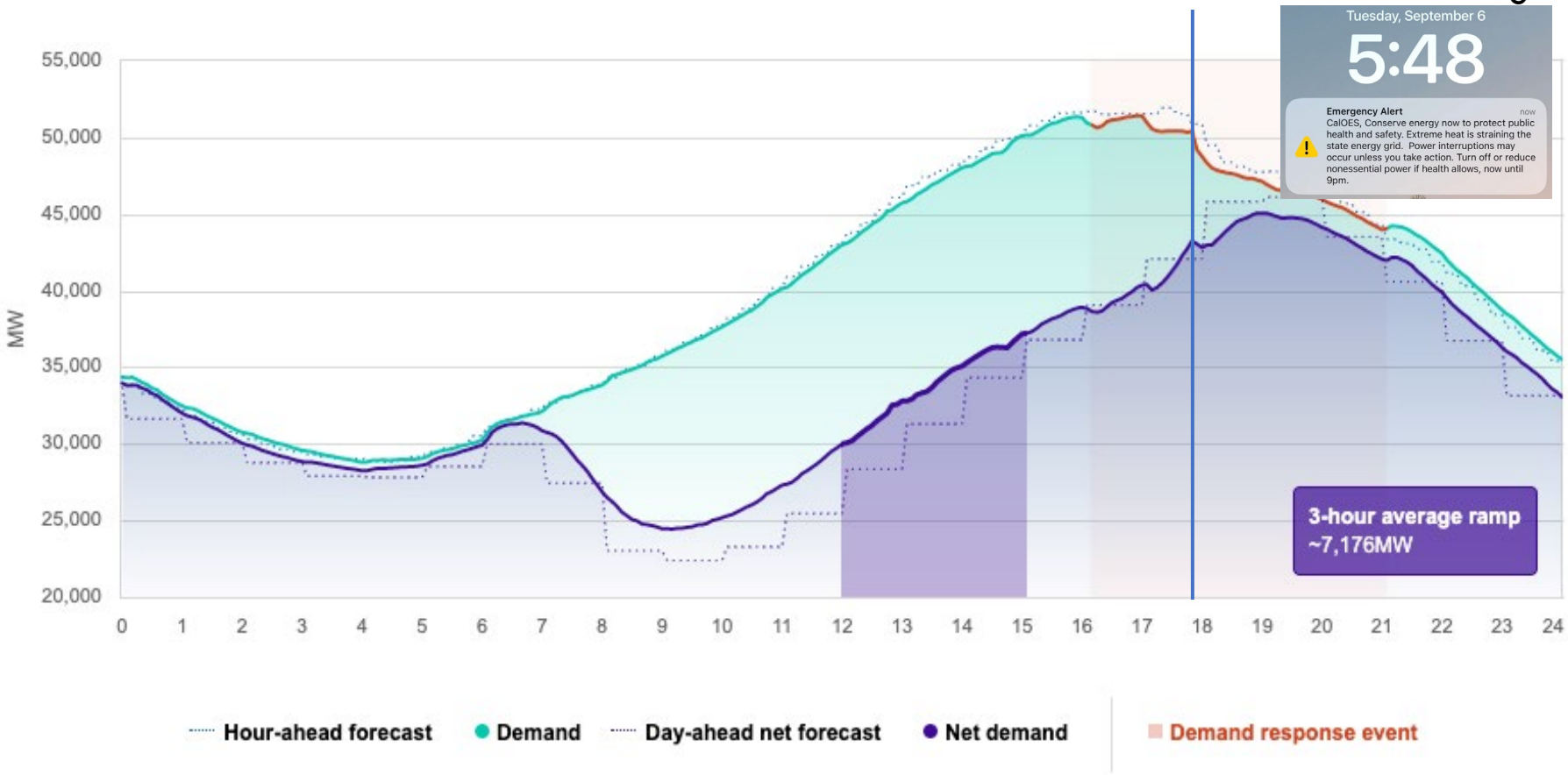
No-Flex Alerts

September

Date	Conservation
8-Sep-21	0-120MW
9-Sep-21	40-650MW

Demand Flexibility is Critical to Reliability

CalOES Wireless Emergency Alert



CAISO experienced a system peak of ~52,000 MW

On track for a peak of ~53,000 before demand side load reductions

Key Questions

- How to transition from voluntary appeals to dependable and sustainable long-term solutions?
- How to value the contribution of demand response to reliability and compensate it appropriately?
- How to transition demand response from behavior change to a lifestyle change? What is the role of automation?