

Exhibit to Agenda Item #1

Board Strategic Development Committee and Special SMUD Board of Directors Meeting

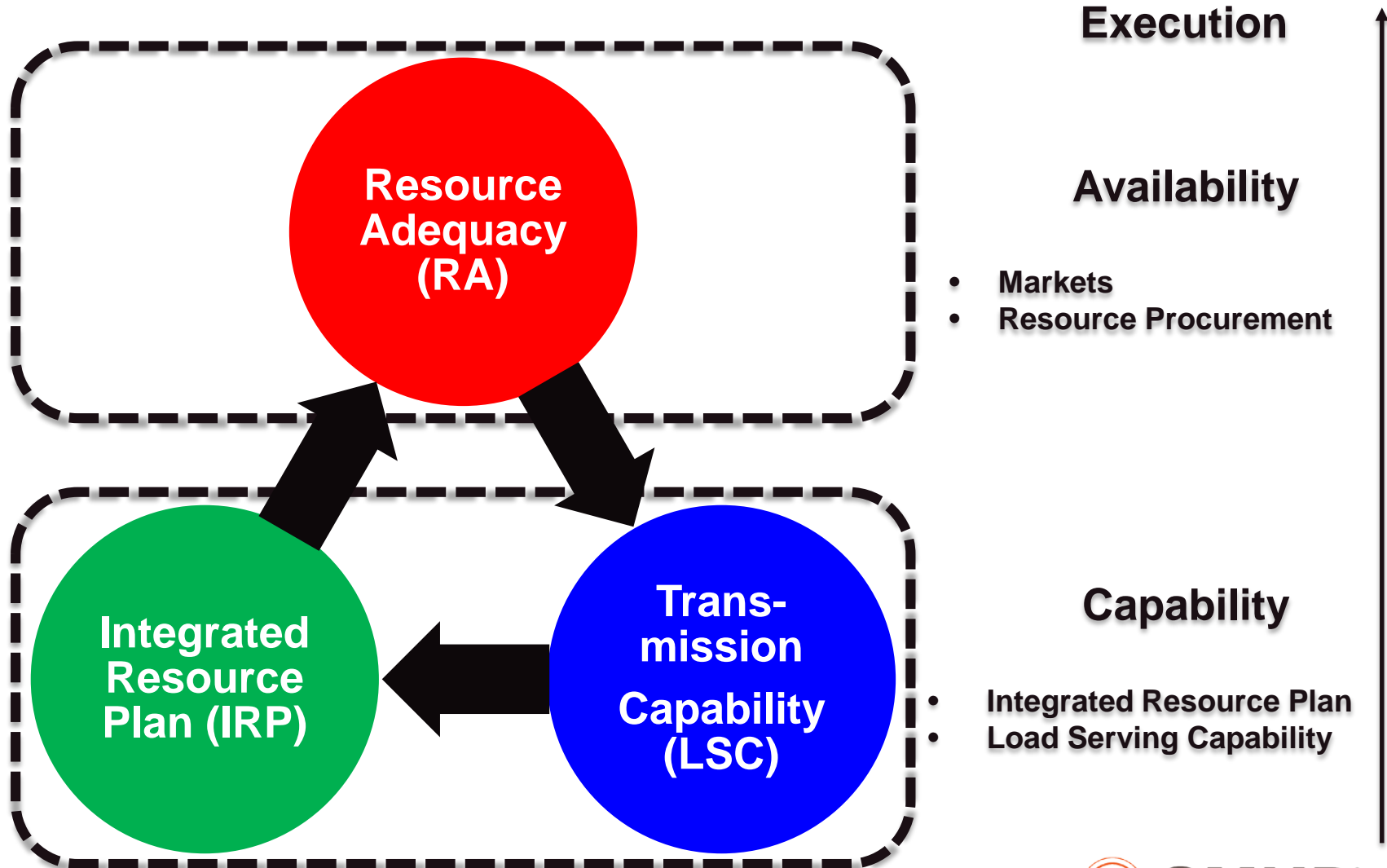
Tuesday, January 7, 2020, scheduled to begin at 5:30 p.m.

Customer Service Center, Rubicon Room

Powering forward. Together.



Reliability Objectives



SMUD RA Procurement Criteria per California Public Utility Commission (CPUC) Guideline

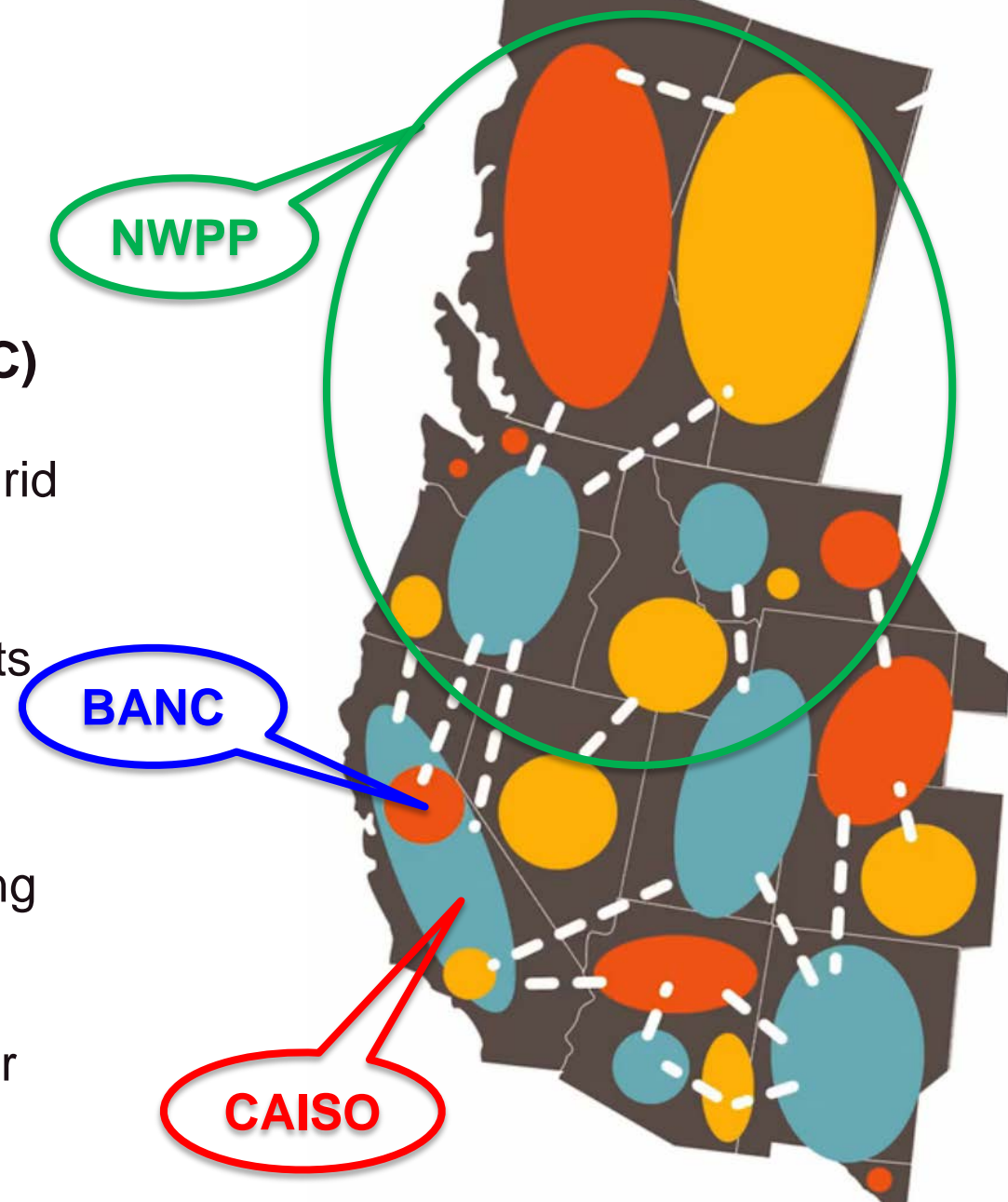
- **Capacity Requirement = 115% of Load Forecast**
- Procure **90%** of Next Year Capacity Requirement by October 31st of the Current year.
- For the 5 **summer months** (May, June, July, August, & September), procure **100%** of RA Capacity Requirement by the end of second month prior to the beginning of the target month (e.g., finish RA procurement by April 30th for June)
- For **non-summer months** (October through April), procure **100%** of RA Capacity Requirement by the end of the previous month (e.g., finish RA procurement by March 31st for April).
- SMUD adopted 3-year capacity hedging program (EROC)



California
Public Utilities
Commission

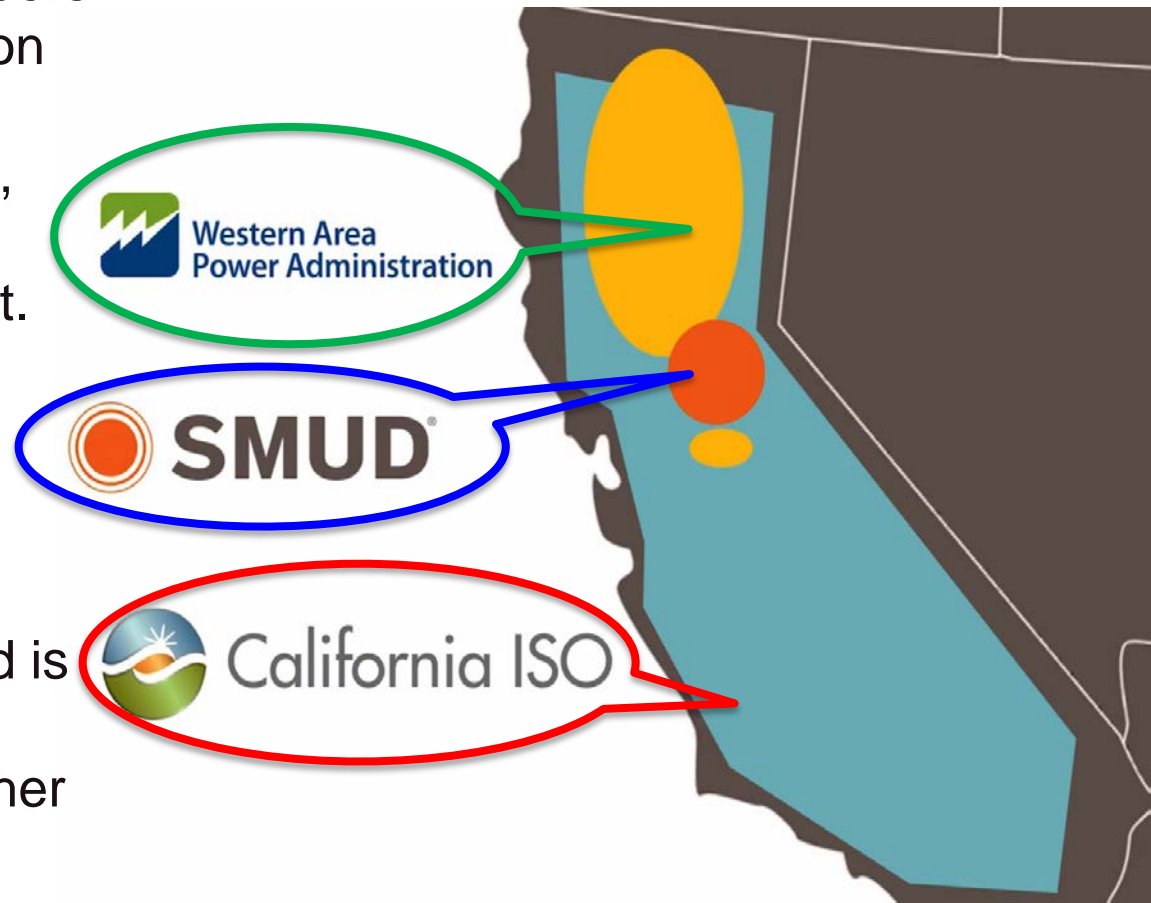
What is BANC?

- **Balancing Authority of Northern California (BANC)** is one of the 38 Balancing Authorities in the Western grid of the North America and is responsible to balance demand and supply within its footprint.
- **BANC Members** serve customer demand by utilizing internal generation, energy imports from CAISO and NWPP, and the hydro power from USBR's Central Valley Project (CVP).



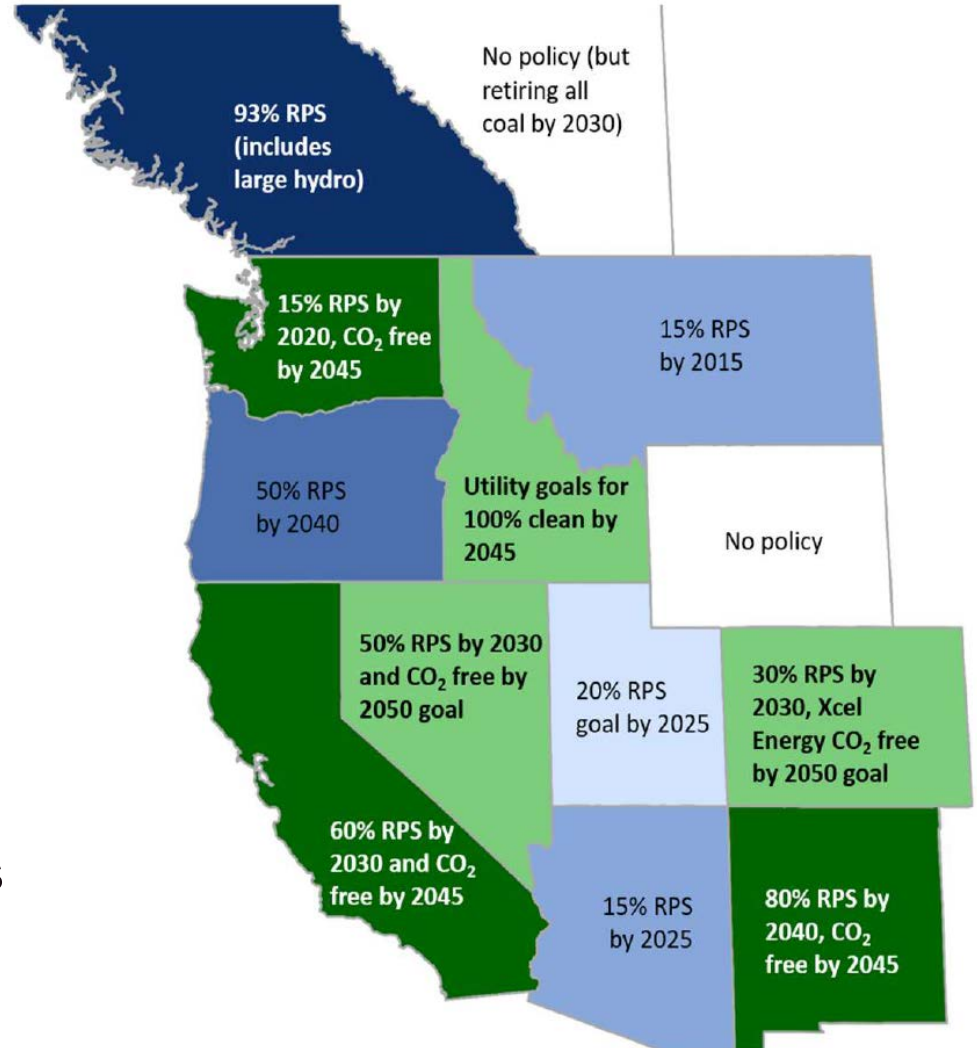
BANC, SMUD, & WAPA

- **BANC** consists of 5 members
 - SMUD, Modesto Irrigation District (MID), City of Roseville, City of Redding, City of Shasta Lake, and Trinity Public Utility District.
- **SMUD** is the contracted Operator for BANC.
- **WAPA** is a sub-Balancing Authority within BANC and is responsible to balance demand and supply for other BANC members and the 2,000 MW CVP hydro generation.



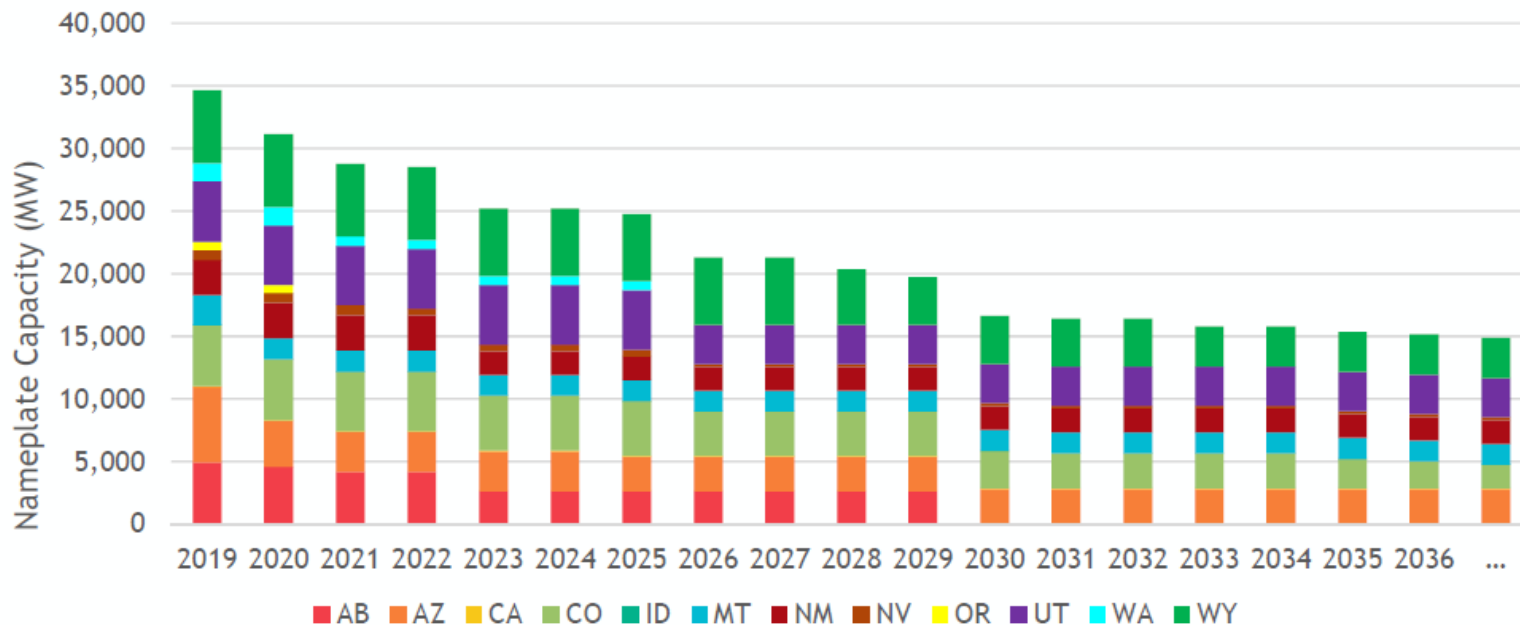
Current Renewable Portfolio Standards

- RPS policies are driving the retirement of thermal resources (coal-fired and gas-fired), causing “duck curve” issue and potential capacity shortage.
- Utilities start to rely on the “Market” to maintain Resource Adequacy. However, market depth is not measured or monitored.
- Other grid reliability challenges include over-generation, regulation, frequency support, etc.



Coal Generation Retirement in the West

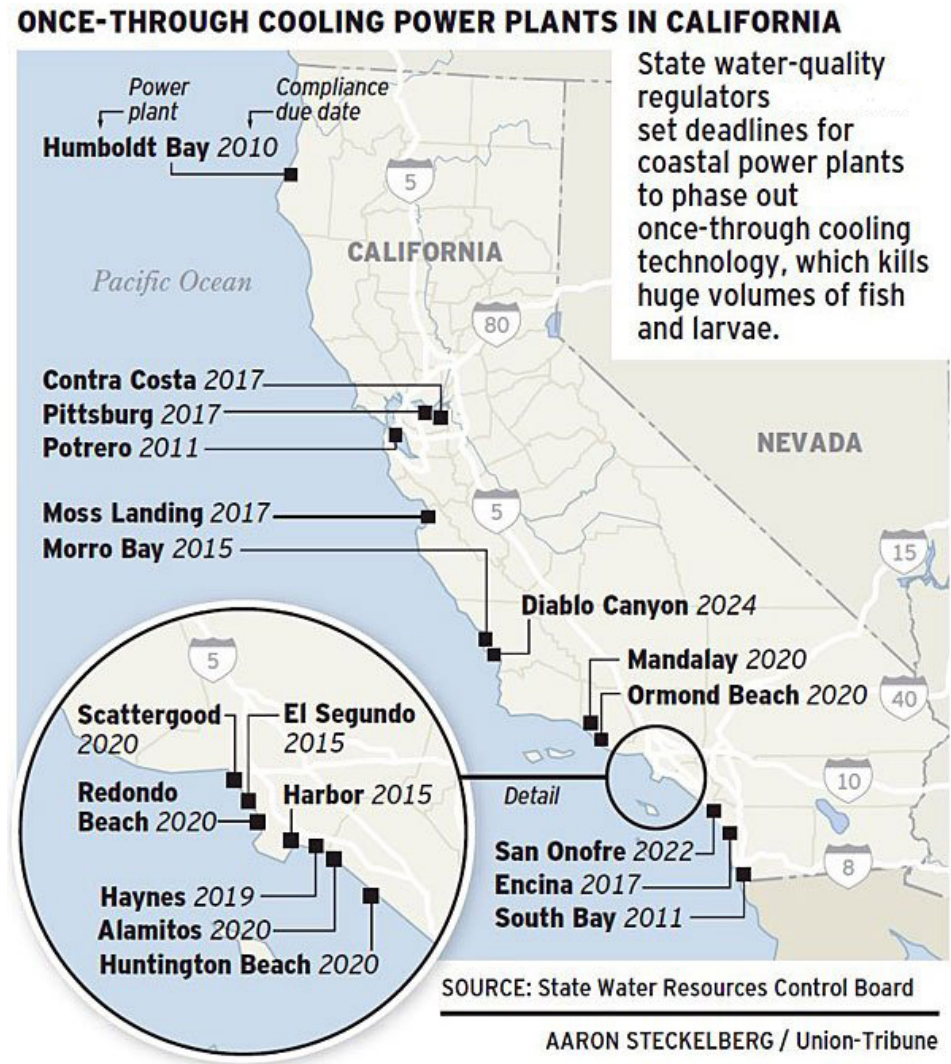
WECC Coal Units in Operation, Decreasing over Next 20 Years



Overall, coal operating in the WECC in falls from about ~34GW in 2019, to ~15GW in 2036

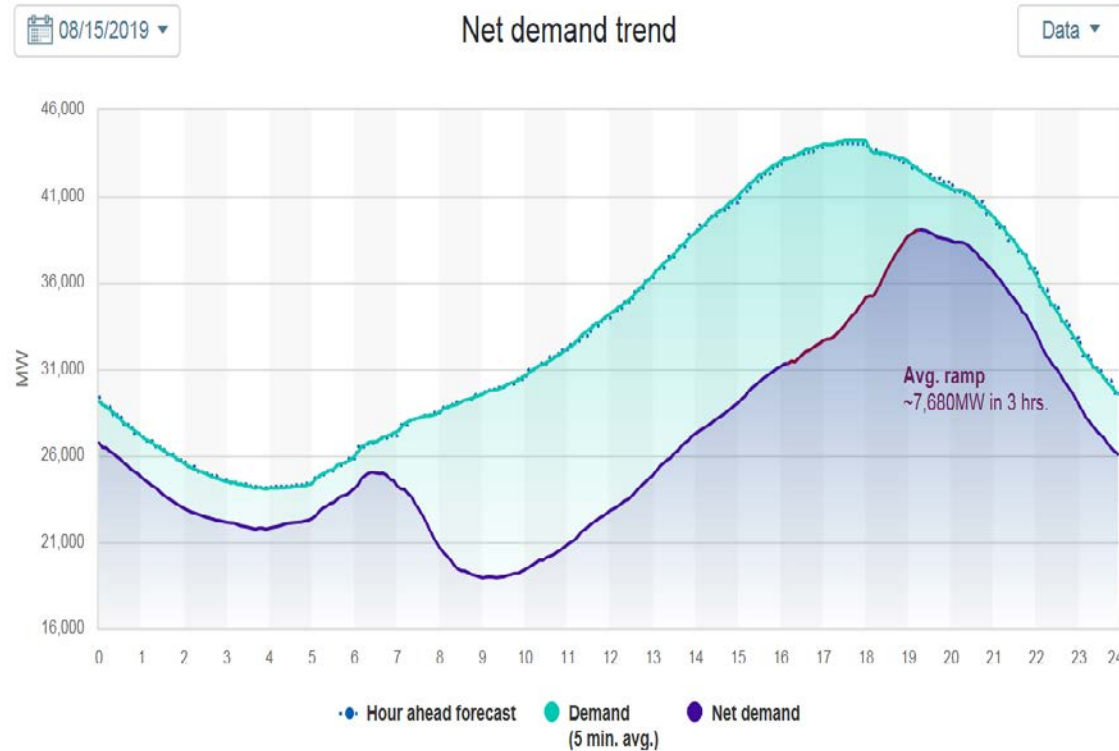
Once-Through-Cooling Generation

- In 2010, a total of **17,300 MW** Once-Through-Cooling (OTC) generation (Gas and Nuclear) within CAISO footprint was ordered to be retired or repowered.
- By 2018, approximately **9,200 MW** OTC generation within CAISO has been retired.
- Another **5,300 MW** OTC generation within CAISO is expected to retire by 2020.
- **Diablo Canyon Nuclear Power Plant (2,240 MW)** will retire in 2024~2025.



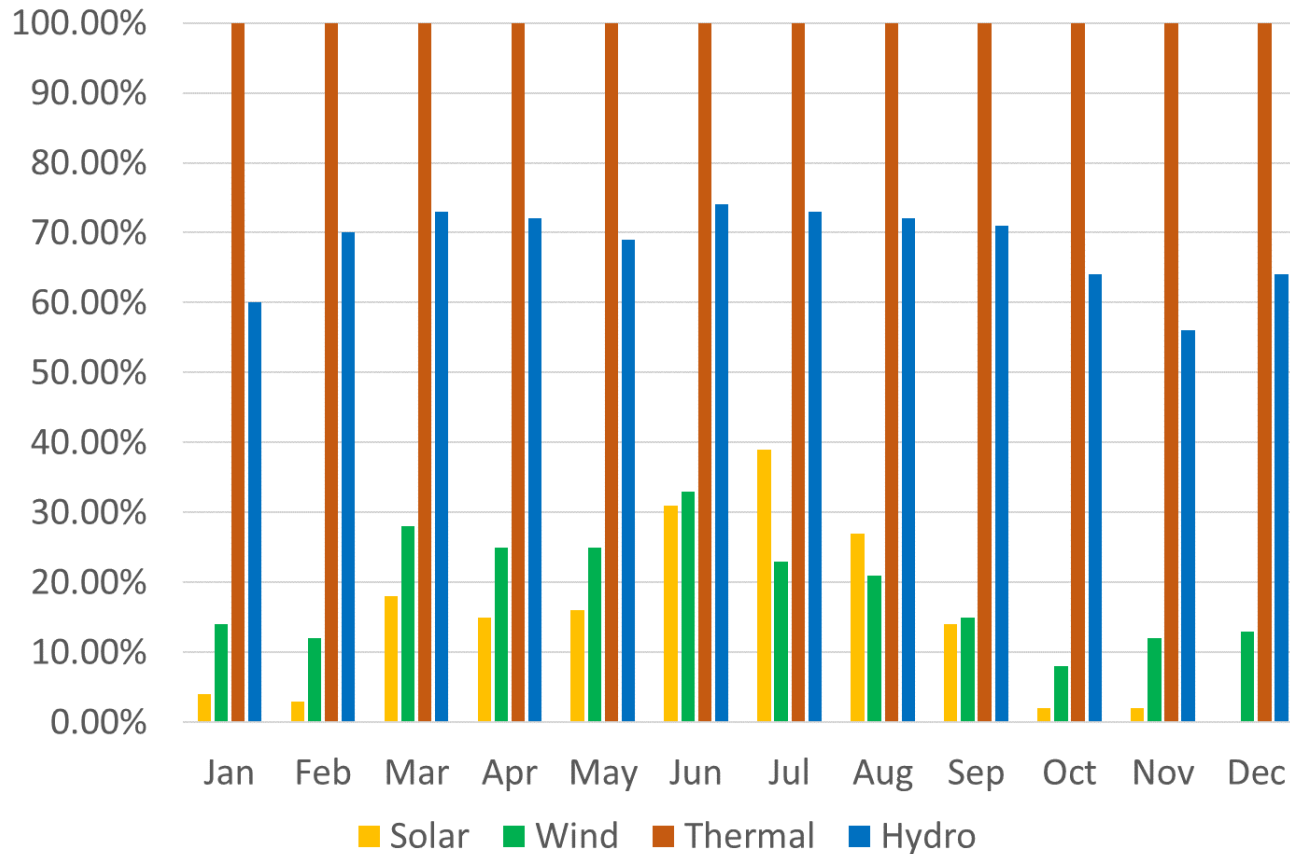
Net Demand vs. System Demand

- The current CPUC RA requirement is only set as 115% of the monthly system peak load.
- The system peak demand typically occurs around 17:00 when solar production is still at 30~40% of its capacity – this is ~5000 MW for California.
- This 5000 MW solar generation will fade away in two hours and the system needs other resources to serve the increasing net demand.

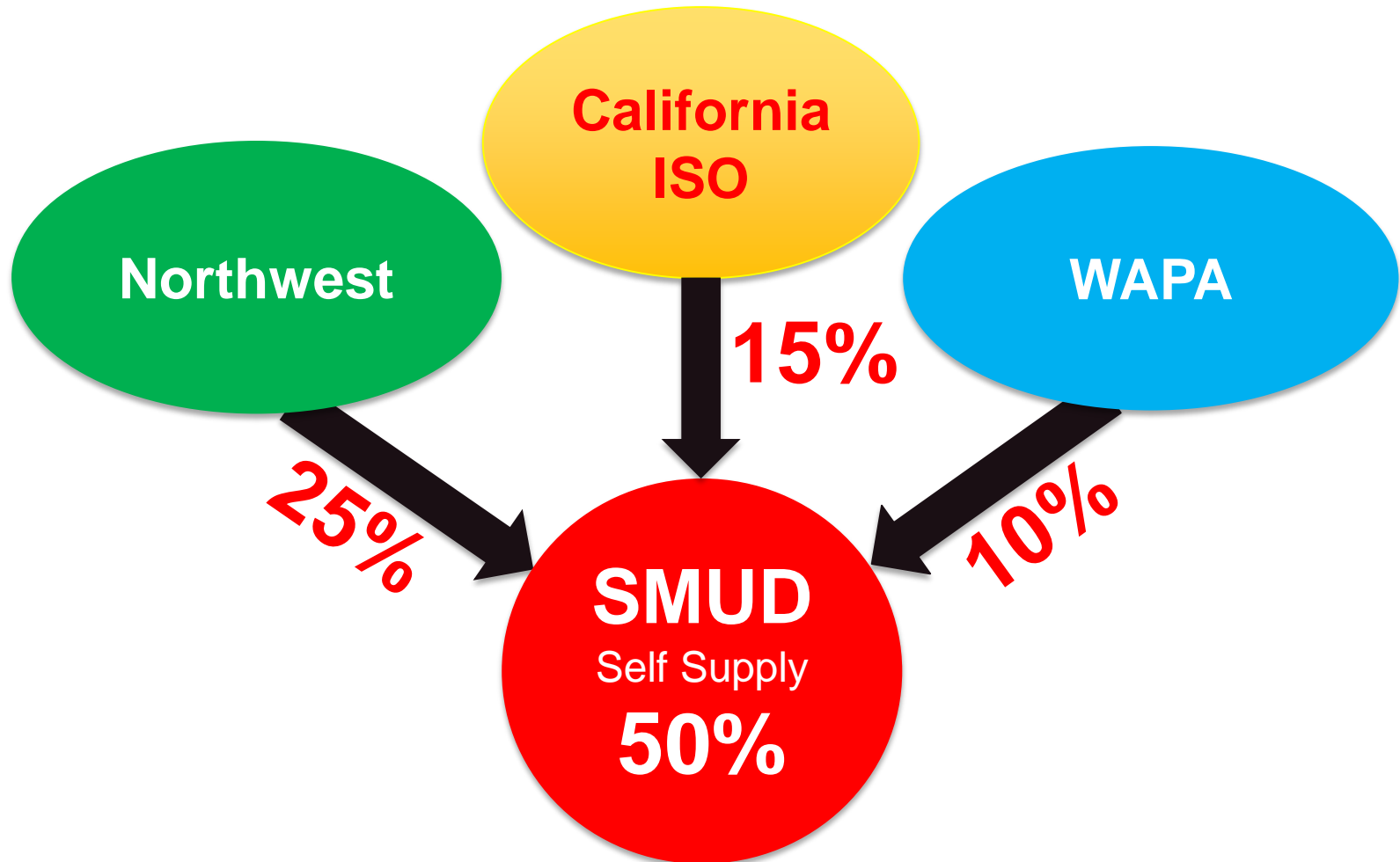


Effective Load Carrying Capacity by Fuel Types Adopted by CAISO for 2020

2020 ELCC by Fuel Type Adopted by CAISO

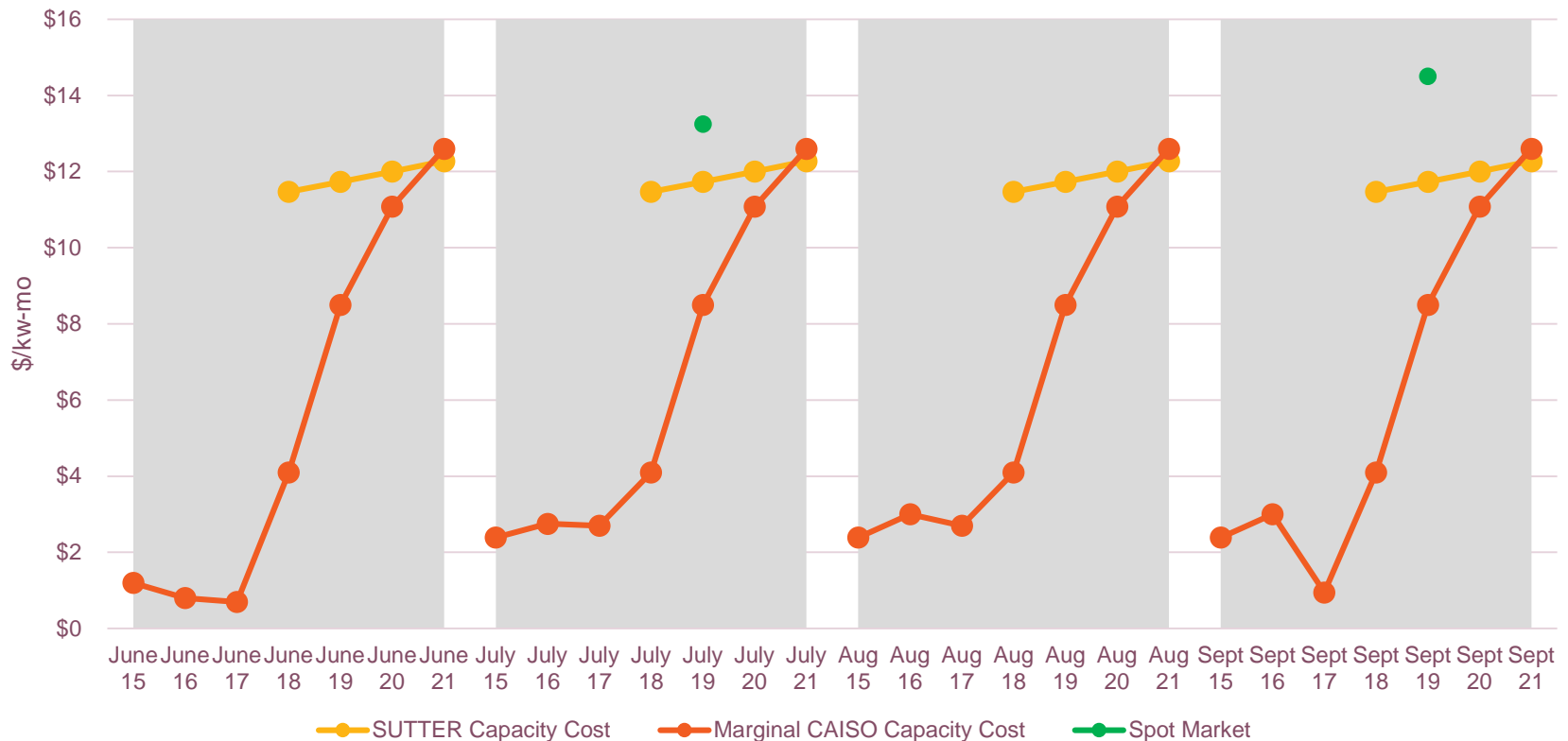


Market Dependence and Availability - Imports from CAISO & Northwest during Peak Loads



Availability Results in Increased Capacity Prices

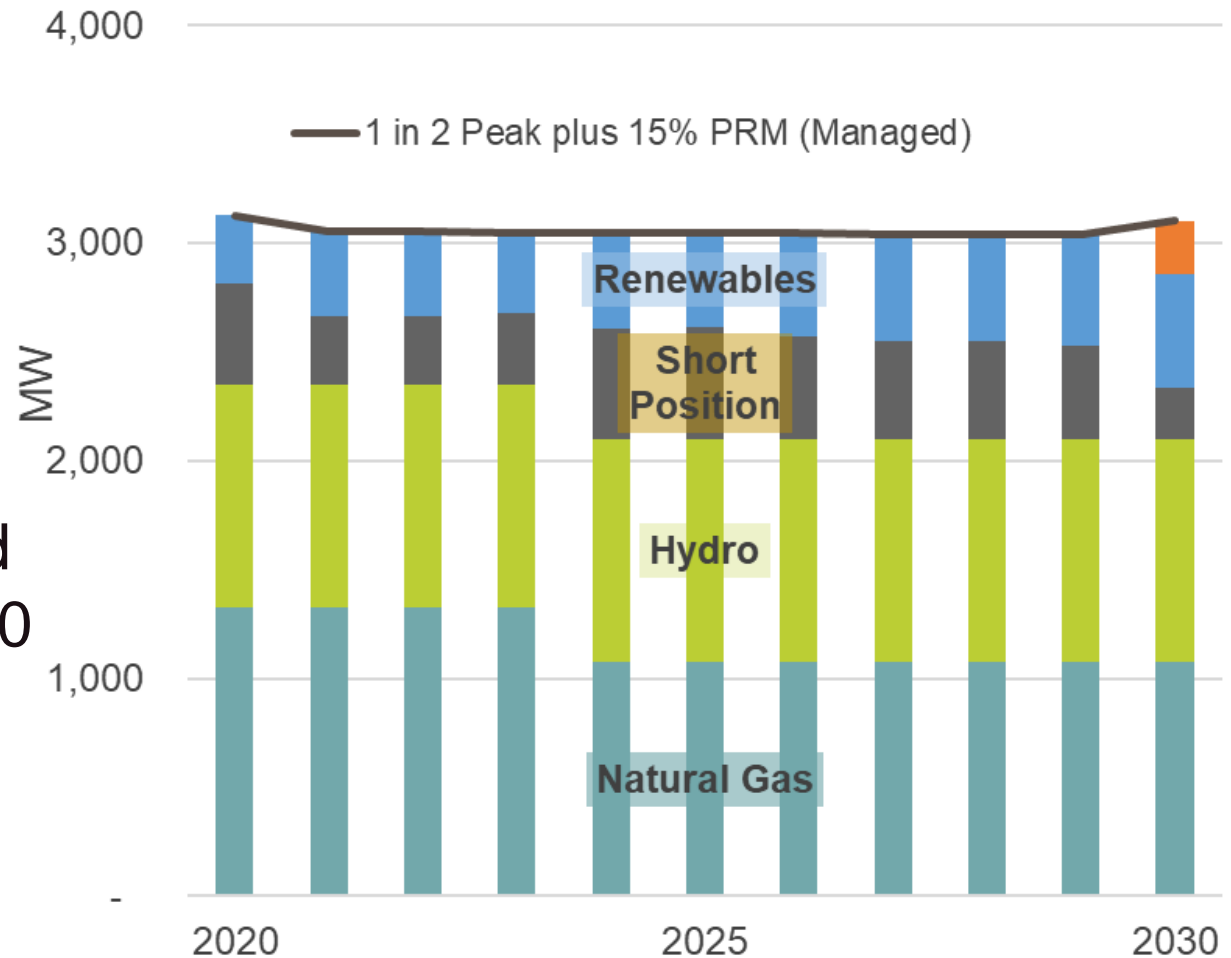
Resource Sufficiency Product Costs



- Today's issue is that we are facing a potential Capacity Shortfall due to insufficient installed generation capacity.
- CAISO resource price has almost tripled in three years and may go even higher in the future.

Resource Outlook

- SMUD relies on markets to fill our short position
- Capacity need is between 300 and 500 MW.



Preparing for the Future

- Joined Energy Imbalance Market (EIM) in April 2019
- Facilitating other BANC members (WAPA, MID, Roseville, and Redding) joining EIM in April 2021
- Exploring the CAISO's Extended Day-Ahead Market (EDAM) Initiative (2021)
- Participating in NWPP Resource Adequacy Program
- Actively pursuing long term renewables contracts

Next Steps

- Proactive by developing transition plan based on the recent outlooks for the next 5~10 years
- Capability:
 - Execution of the IRP
 - ❑ Load Serving Capability
 - ❑ Internal resources available for the long term
- Availability – loss of market depth
 - Maintain reliability
 - Hedging strategy beyond yearly due to the transition state of the Market
 - Evaluation of storage/other resources and other market options
 - Procure or build resources based on market prices