Energy Storage Evolution in California

Thermal-Mechanical-Chemical Energy Storage Workshop

August 11, 2021 8:50am – 9:20pm
Agenda

• About California Community Choice Aggregators and Clean Power Alliance

• California Energy Storage Leadership

• Long-Duration Storage in California

• CPA’s Storage Procurement and Upcoming Long-Duration Storage Activities
What is a Community Choice Aggregator?

- A Community Choice Aggregator (CCA) is a local government program to procure power on behalf of residents and businesses while still receiving transmission and distribution service from the existing utility producer.
CCAs in California

- CCAs are now serving ~20% of California’s total load
- CCAs have contracted for more than 6,000 MW of new clean generation capacity through long-term power purchase agreements
About Clean Power Alliance

- Clean Power Alliance (CPA) is a CCA formed through a Joint Powers Authority made up of 32 public agencies across Southern California.

- CPA is CA’s 5th largest Load Serving Entity and 3rd largest buyer of storage:
  - 715 MW lithium-ion storage (3 and 4-hour) contracted to date
  - 150 MW lithium-ion storage online (4-hour) by September 2021
  - Residential & commercial behind the meter storage programs

![Total MW by Resource Type](image)
California Energy Storage Leadership

- CAISO had 200 MW storage end-2020; 500 MW now; expecting 2,000 MW by 8/1/2021
- California SB100 – 60% renewable by 2030 and 100% clean energy by 2045
  - 10-14 GW storage need by 2030
  - 25-56 GW by 2045
  - 1-2 GW long-duration storage represent 12-hour needs
  - Recent procurement complying with 3,300 MW reliability order by 2023
Long-Duration Storage Roles

• Discharging supports reliability in peak net load hours (hours ending 18-21)
• Charging reduces renewable curtailment
• Discharging prevents carbon emission from natural gas ramping and evening generation
• Discharging supports climate change resiliency (longer reliability events related to extreme heat/wildfires)
California Long Duration Storage Updates

1. New regulation reduced storage reliability contributions
   (May 2021)
   - California Public Utilities Commission (CPUC) limited the amount of standalone
     4-hour storage and 8-hour storage that can be counted for Resource Adequacy

2. Integrated Resource Plan resulted in Diablo Canyon procurement order
   (June 2021)
   - 1,000 MW long-duration storage by 2026 (out of 11,500 MW total)
   - Long-duration storage categorized as “long-lead time” (LLT) resource; eligible
     for compliance extension to 2028
CPA’s 2020 Integrated Resource Plan

- CPA’s 2020 Integrated Resource Plan (IRP) recommended two resource portfolios that maintain reliability and achieve environmental goals
  - CPUC’s CAISO-wide environmental goal: 46 million metric tons (MMT) CO₂
  - CPA’s preferred, aggressive emission goal: 38 million metric tons (MMT) CO₂
- Expansion plans created using an iterative AURORA modeling process
- CPA will require ~1000 MW 4-hour storage by 2030 to integrate renewables and support reliability during the net load peak hours
CPA Storage Procurement

- CPA procures long term contracts to ensure affordable, reliable, clean power that supports load-resource balance, and to meet compliance obligations
- Four long-term Request for Offers (RFOs) to date (2018, 2019, 2020):
  - RPS Generation
  - RPS + Storage
  - Standalone Storage
  - Long Duration Storage (2020 only)

**CPA’s 2020 Clean Energy RFO**

13 long-duration storage offers

- Lithium-ion
- Compressed air
- Zinc Hybrid
CA CCA Joint Long-Duration Storage Procurement

- CPA partnered with 10 other CA CCAs in creating a joint RFI for long-duration storage proposals
  - $\geq 8$ hours discharge
  - Front of meter
  - Qualifies for Resource Adequacy

- “Other” types included:
  - Hydrogen (electrolytic)
  - Molten Salt Thermal Storage
  - Gravity Energy Storage
  - Liquid Salt Combined Cycle
  - Renewable Natural Gas
CPA Planned Procurement

- CPA is issuing 2021 Mid-Term Reliability RFO for Diablo Canyon Compliance
- 118 MW long-lead time resources by 2026
  - 59 MW of long-duration storage (8-hour or longer)
  - 59 MW of new firm zero-emitting resources (e.g., baseload renewables)
Resources and Links

• CPA Procurement and Contracting Page:
  https://cleanpoweralliance.org/get-involved/job-contracting-opportunities/

• CPA Procurement Contact (to register for RFO announcements):
  Procurement@cleanpoweralliance.org

• Joint CCAs Long Duration Storage RFI:

• CPA’s Integrated Resource Plan (2020):

• CPUC’s Diablo Canyon Procurement Decision (2021):
  https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K603/389603637.PDF