



Hydrogen Electrolyzer Market Participation

May 15, 2024

Annual Policy Catalog Roadmap
Process 2024 Working Group

Background

- Hydrogen electrolyzers use electricity to split water into hydrogen and oxygen, and the hydrogen gas that is produced can be used to generate carbon free energy as a replacement to natural gas
- Department of Energy (DOE) awarded \$1.2 billion in funding from the Bipartisan Infrastructure Law to California's Alliance for Renewable Clean Hydrogen Energy System (ARCHES)



Using of Hydrogen as Energy Storage

- Renewable energy produced during the day can be used to make hydrogen
- Stored hydrogen can then be used in existing or new generation facilities to produce energy during periods when supply is needed (e.g., ramping periods)
- Lodi Energy Center / Hydrogen Development
 - On-site hydrogen production
 - Turbine co-firing capability
 - Storage capability
 - Clean energy production; small foot print



Use of Hydrogen as Storage

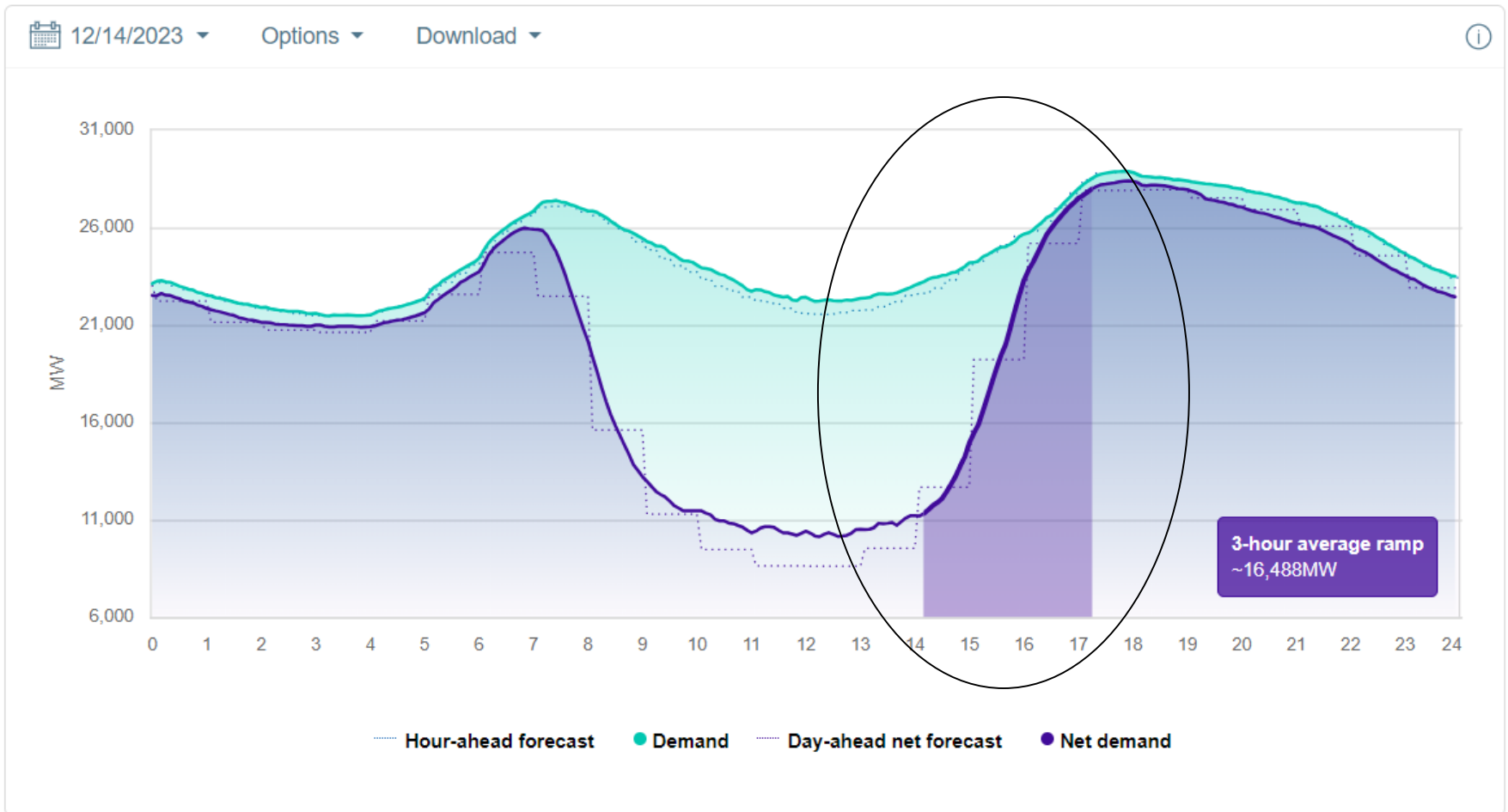


Dispatchable and Flexible Capacity

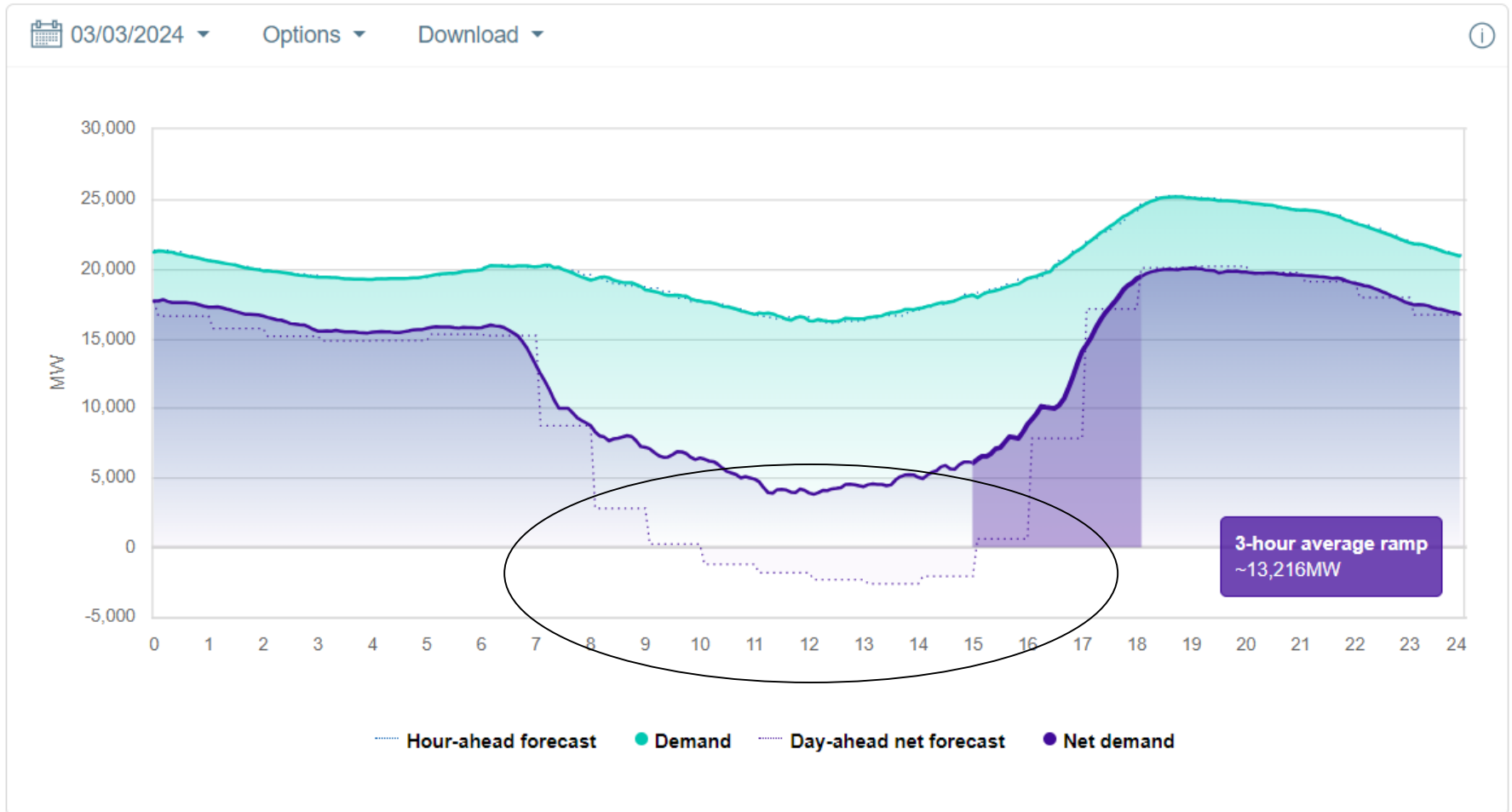
- Targeted electrolysers have flexible operating characteristics
 - Energy production
 - Spinning reserves
 - Non-spinning reserves
 - Regulations services
 - Storage capability
- When pair with existing or new dispatchable resources, this can act as the missing “dispatchable renewable resource” in the fleet to support reliability



Renewable and Storage Integration



Renewable and Storage Integration



Initiative Goal

- Current CAISO Tariff does not contain market rules for hydrogen electrolyzer technology operating characteristics
- Goal of Market Initiative
 - Develop market rules that will enable hydrogen electrolysers to participate in CAISO energy and capacity markets
 - Rules to account for unique operating characteristics, including energy production, capacity/reliability and storage services
 - Can be stand-alone or co-located with other generation technologies

Questions / Comments