

Redwood Coast Energy Authority: 2022 Summer Assessment

RCEA takes seriously its responsibility to help support the California Independent System Operator (CAISO) in ensuring statewide grid reliability. Locally RCEA contributes to reliability through the power resources it procures on behalf of its customers.

CAISO Grid Conditions Summary

CAISO is forecasting that the grid's summer peak demand is expected to reach 45,866 MW, with the possibility of reaching 51,469 MW should a 1-in-10 year heat wave occur. Due to the multi-year drought in California, hydro generation is expected to be significantly below average. The reduction in available hydro generation coupled with potential extreme temperatures creates a high degree of vulnerability for CAISO grid reliability during the summer months.

The CAISO has revised their load forecast methodology this year to use the most recent 20 years of historical data (previously 26 years) to give more weight to recent weather experiences related to climate change.

CAISO Peak Demand Forecast 2021 vs. 2022

	1-in-2¹	1-in-5	1-in-10
CAISO 2022 Forecast (MW)	45,866	47,850	51,469
CAISO 2021 Forecast (MW)	45,837	47,747	50,968
Difference (MW)	29	103	501
Difference (%)	0.1%	0.2%	1.0%

Available power plant capacity on the CAISO system to meet the forecasted peak demand is projected at 52,654 MW in July, 50,885 MW in August, and 47,892 MW in September².

KEY TAKEAWAY: *A significant state-wide heat wave that brings demand above a 1-in-5 year weather forecast would create extremely tight conditions on the CAISO grid and potentially threaten grid reliability, particularly in the latter half of the summer*

Additional risks that were not captured by the CAISO's analysis but could increase the threat to grid reliability include:

- More extreme weather events beyond those projected from the past 20 years of historical data;
- Wildfire events that could limit key transmission paths or other potential transmission outages;
 - For example, in July 2021 California lost roughly 4 GW of import capacity from the Pacific Northwest due a fire in southern Oregon

¹ A 1-in-2 peak demand forecast is the forecast of peak demand that is statistically expected to be reached once every two years. Similarly, a 1-in-5 and 1-in-10 peak demand forecasts are statistically expected to be reached once every five years and once every ten years, respectively

² The decline of available capacity from July to September is the result of two factors: (1) the decline of available hydro generation over the summer and (2) the declining effective load carrying capability (also known as Net Qualifying Capacity [NQC]) of solar resources as solar generation during times of expected peak grid need decreases with the decline in daylight hours.

- A combination of extreme heat and smoke from wildfires that could reduce solar generation;
- Project development delays for power plants expected to come online this summer
 - For example, the recent federal Department of Commerce investigation of solar panel imports for potentially circumventing tariffs

CAISO Grid Conditions – Deeper Dive

New Power Plants

CAISO is projecting a net addition of 7,556 MW of new capacity to be online for this summer compared to last summer (June 1, 2021 to June 1, 2022). New resource capacity includes 3,206 MW of which is dispatchable capacity of which the vast majority (3,124 MW) comes from energy storage systems. Energy storage systems do not generate additional energy, but they enable excess solar generation from the middle of the day to be available to meet peak demand in the early evening, thereby shifting the energy availability.

Hydro Generation

For the third consecutive year, California's hydro energy supply will be significantly lower than normal. Snowpack was significant early in the season but decreased to 38% of average by April 1. While the entire Sierra Nevada had significant snow during the latter half of April that added nearly three inches to the statewide snowpack, levels have nonetheless steadily declined to 21% by May 9. Major reservoir storage levels in California were at 70% of average by April 11, which is slightly below the 74% of average in 2021.

Stack Analysis of Available CAISO Resources

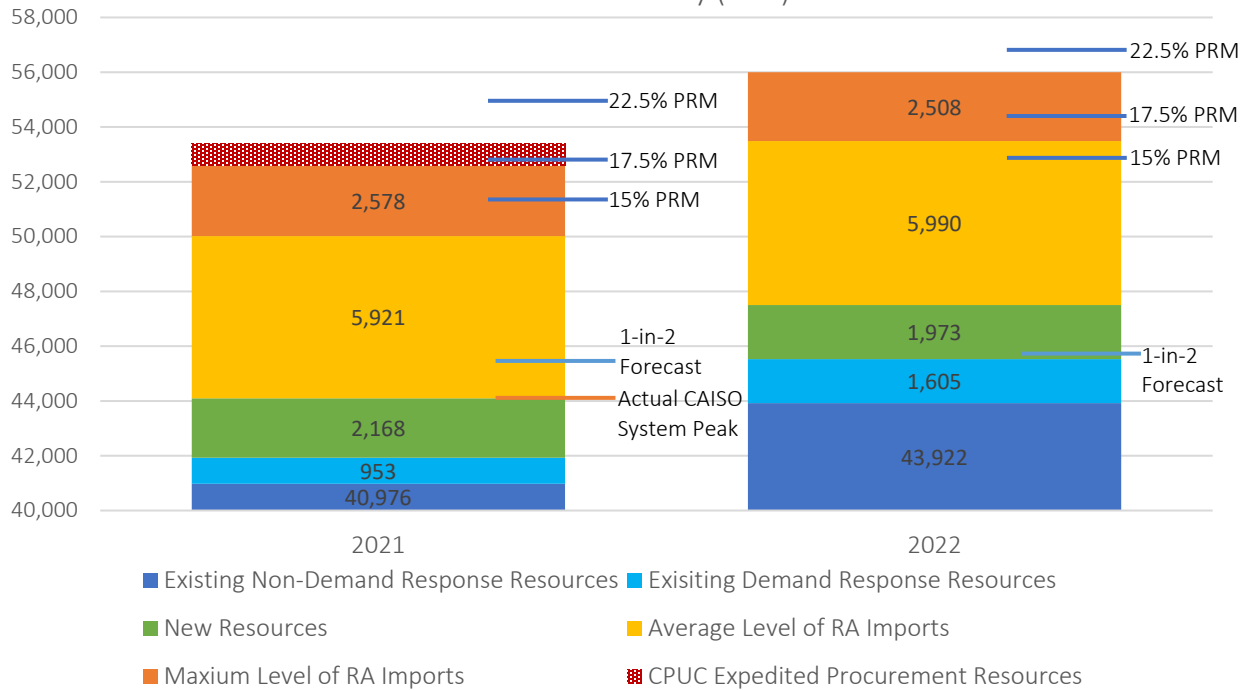
As part of CAISO's 2022 Summer Loads and Resources Assessment, the CAISO performed a stack analysis to provide an additional perspective on the amount of capacity the ISO is expecting to be available for summer 2022, and the level of reliability that is anticipated under various load levels and import conditions. The figure on the following page shows the result of this analysis for the month of September 2022 at 8 pm (the greatest supply risk month and hour) and compares the results from 2021, with various planning reserve margins (PRM) above each year's respective 1-in-2 load forecasts.

The CAISO stack analysis shows an improvement in supply conditions in 2022, compared to 2021. This is a result of approximately 4,000 MW of additional capacity as measured by Net Qualifying Capacity metrics. This capacity increase is partially offset by a higher load forecast of 1,005 MW for 2022 based on the CEC 1-in-2 forecast, represented by the higher PRM in the figure above. The figure also demonstrates the importance of imports above average RA import levels for meeting 1-in-2 and higher peak demand conditions during late summer.

Overall, capacity conditions for this summer are better in 2022 than 2021 due to new resources, despite expectations of increased load and poor hydro conditions. The addition of dispatchable generation (energy storage) should help alleviate the decrease in flexible capacity from the reduction in hydro availability. However, the CAISO grid remains quite vulnerable to high loads and import supply availability this summer.

Further details on CAISO's 2022 Summer Loads and Resources Assessment can be found at the following link: <http://www.aiso.com/Documents/2022-Summer-Loads-and-Resources-Assessment.pdf>

September 2021 & 2022 Maximum RA Imports (8,500 MW) at 8 pm on Forecasted Peak Day (MW)



Redwood Coast Energy Authority Summer 2022 Readiness

A short summary of RCEA’s work in ensuring local and statewide grid reliability is described below.

Energy Hedging

RCEA has actively hedged its expected summer loads through its long-term power purchase agreements and short-term power deals. In Q3 of 2022, RCEA on average is 100% hedged through these contracts for on-peak hours and 95% hedged in off-peak hours.

Resource Adequacy

RCEA has procured 100% of its System, Local, and Flexible Resource Adequacy compliance obligations in Q3 of 2022.

New Resources

RCEA has fully contracted for new capacity to meet its incremental RA compliance obligations pursuant to D.19-11-016. This new capacity, which equals 8 NQC MW inclusive of both 2021 and 2022 obligations, is fully deliverable and available to help support system needs this summer. RCEA’s 5.5 MW demand response contract with Leapfrog Power began delivering RA in June 2021 and the Tierra Buena Battery Energy Storage project began operating in June 2022, for which RCEA is receiving 2.5 MW, or half the project’s capacity.

In late 2022 RCEA brought online the Redwood Coast Airport Microgrid (RCAM) which is a hybrid microgrid consisting of solar + storage assets which has the benefit of being renewable and available during peak hours, while also able to serve as a key local community resiliency project in the case of power outages within the Humboldt grid. RCAM has no planned outages and is expected to be available

all summer to provide dispatchable energy and ancillary services. RCAM is not yet able to provide resource adequacy, but RCEA staff are pursuing a deliverability allocation so that the facility can contribute further to grid reliability in future years.

Existing Resources

RCEA has two power purchase agreements (PPAs) with generators local to Northern California. The Humboldt Sawmill Company biomass facility is contractually incentivized via its PPA with RCEA to provide as much power as possible during Q3. It has no planned outages for Q3 and is expected to be available all summer to provide baseload power. RCEA's second PPA is with Cove Hydro, a small seasonal run-of-rive hydro facility in Shasta County. It is offline until the winter rains begin, as was expected and planned for by RCEA staff.

Public Safety Power Shutoffs

RCEA staff has developed protocols regarding communication with its scheduling coordinator, The Energy Authority, as well as with PG&E in anticipation of PSPS events that may impact Humboldt County. In the case of a PSPS event and other transmission outages, PG&E may island the Humboldt County Local Capacity Area using its Humboldt Bay Generating Station, reducing the risk of significant blackout events for Humboldt residents compared to previous years.