

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

California Independent System  
Operator Corporation

Docket No. ER21-2853-000

**INFORMATIONAL REPORT OF THE  
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

The California Independent System Operator Corporation (CAISO) files this informational report in compliance with the Commission's Order Accepting Tariff Revisions.<sup>1</sup>

**I. Background**

On November 30, 2021, the Commission issued its Order Accepting Tariff Revisions requiring the CAISO to file an informational report describing the performance of hybrid resources providing resource adequacy capacity on the CAISO system. The Commission directed the CAISO to: (1) evaluate the resource adequacy performance of hybrid resources; and (2) identify any plans to reform resource adequacy counting rules, incentives, or the Resource Adequacy Availability Incentive Mechanism (RAAIM) framework.

**II. Response to Reporting Directives**

**A. Hybrid resources generally made their resource adequacy capacity available to the market**

The CAISO's tariff defines hybrid resources to mean a Mixed-fuel Resource

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<sup>1</sup> *California Independent System Operator Corporation*, 177 FERC ¶ 61,153 (2021) (*Order Accepting Tariff Revisions*).

with a single Resource ID at a single Point of Interconnection.<sup>2</sup> Hybrid resources generally consist of an electric storage component and a variable energy component. During the past two years, a significant amount of electric storage has interconnected to the CAISO grid, often as a separate resource co-located with a solar or wind resource or as part of a hybrid resource.

As part of its tariff revisions to implement market rules to support hybrid resources, the CAISO proposed to exempt hybrid resources from RAAIM, which incentivizes resources to ensure they offer their resource adequacy capacity during specific availability assessment hours. RAAIM requires resource adequacy resources to make their resource adequacy capacity available 94.5 percent of the time during availability assessment hours, excluding unavailability due to certain outage types, before incurring a penalty. The Commission accepted the CAISO's tariff provisions exempting hybrid resources from RAAIM but required the CAISO to submit this informational report.

At the start of 2022, there were five hybrid resources interconnected to the CAISO grid, with only two of those resources offering a total of 14 MW of resource adequacy capacity. As more storage capacity interconnected to the system throughout the year, the total number of hybrid resources increased. During August 2022, hybrid resources offered 428 MW of resource adequacy capacity. Table 1 shows the percentage of resource adequacy capacity each hybrid resource bid into the market during all hours of the operating day each month from January 2022

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<sup>2</sup> See CAISO tariff, Appendix A, Master Definition Supplement. The CAISO tariff defines Mixed-fuel Resource to mean "A Generating Facility with components that use different fuel sources or technologies, participating as a Hybrid Resource or Co-located Resources."

through October 2022. The CAISO calculated these values on an hourly basis as a ratio of the amount of capacity bid into the real-time market by each resource, taking into consideration outages, compared to the amount of resource adequacy capacity the resource provided during the relevant month. The CAISO capped these values at 100 percent.<sup>3</sup> The CAISO then calculated a simple average over all hours for the relevant month. The values in Table 1 generally reflect that hybrid resources made their resource adequacy capacity available to the market.

*Table 1: Hybrid Resource Performance January – October 2022<sup>4</sup>*

Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Hybrid Resource 1										
Hybrid Resource 2			100%	100%	100%			100%	100%	100%
Hybrid Resource 3					100%	100%	100%	100%	100%	100%
Hybrid Resource 4										
Hybrid Resource 5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hybrid Resource 6						100%	100%	70%	100%	100%
Hybrid Resource 7							100%	76%	100%	100%
Hybrid Resource 8				93%	100%	90%	84%	94%	98%	100%
Hybrid Resource 9					100%	92%	87%	92%	98%	94%
Hybrid Resource 10						96%	86%	90%	95%	100%
Hybrid Resource 11					100%	89%	90%	100%	100%	100%
Hybrid Resource 12		100%	100%					100%	100%	100%
Hybrid Resource 13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

<sup>3</sup> Hybrid resources may in some cases have more capacity than was offered as resource adequacy capacity during a particular resource adequacy month.

<sup>4</sup> In Table 1, blank cells represent that the resource did not provide resource adequacy capacity in that month.

**B. The CAISO plans to consider revisions to tariff sections on resource adequacy counting rules, incentives, and the RAIM framework**

**1. A new statewide resource adequacy framework may impact various CAISO resource adequacy processes**

In 2019, the California Public Utilities Commission (CPUC) began to consider structural reforms to its resource adequacy program to better account for the increased demand and proliferation of energy-limited resources on the CAISO system.<sup>5</sup> In 2021, the CPUC adopted a “slice-of-day” resource adequacy framework, which will set 24 hourly resource adequacy requirements each month, based on the peak load day of the month.<sup>6/7</sup> This is a shift from the CPUC’s current resource adequacy framework, which sets single monthly requirements based on the system peak hour. Under this new framework, the CPUC will change capacity counting rules for solar, wind, and hybrid resources to account for resources’ production profiles across the day.

Any CPUC changes to capacity counting rules for solar, wind, and hybrid resources and resulting qualifying capacity (QC) values could impact various CAISO resource adequacy processes that rely on these QC values. These processes include system and local capacity assessments and setting must-offer and outage substitution obligations. Although parties recently discussed options for the CAISO to operationalize the CPUC’s “slice of day” framework in CPUC workshops, any

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<sup>5</sup> See *generally* CPUC Rulemaking 19-11-009.

<sup>6</sup> See CPUC Decision (D.) 21-07-014, Ordering Paragraph (OP) 1; CPUC D.22-06-050, OP 14.

<sup>7</sup> The CPUC ordered full implementation of the new resource adequacy framework in 2025, with 2024 serving as a test year. See, CPUC D.22-06-050, OP 15.

changes to CAISO rules and processes would require the CAISO to undertake a stakeholder initiative focused on resource adequacy.<sup>8</sup>

## **2. The CAISO will consider resource adequacy enhancements in a forthcoming stakeholder initiative**

The CAISO is currently working with stakeholders and local regulatory authorities to explore potential reforms to California’s resource adequacy program. As described above, the CPUC is developing details of a 24 hour “slice of day” resource adequacy framework that accounts for energy needs in addition to planning for peak load capacity needs.<sup>9</sup> The CAISO intends to launch a stakeholder initiative to consider the reforms necessary to meet the needs of the transforming grid all hours of the year, including the system’s capacity, energy and flexibility needs.

While the CAISO is still determining the full scope of its planned stakeholder initiative, the CAISO expects to continue assessing enhancements to capacity counting methodologies given the evolving needs of the grid. Capacity counting and accreditation can be accomplished through different techniques (all of which have advantages and disadvantages), including assessing resources based on their effective load carrying capability, employing exceedance-based resource counting methods, or applying an unforced capacity methodology to accredit resource adequacy capacity based on a resources’ contribution to reliability needs. The forthcoming initiative may consider modifications to how hybrid and co-located resources qualify to offer resource adequacy capacity, so as to incentivize these

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<sup>8</sup> See generally Workshop Report on Final Proposals from Reform Track Phase 2 Workstreams 1-3 Submitted by Pacific Gas and Electric Company (U 39 E) dated November 15, 2022: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M499/K158/499158861.PDF>.

<sup>9</sup> See generally CPUC Rulemaking 21-10-002.

resources to be available and inform effective procurement of a resource adequacy fleet. In addition, CAISO's forthcoming stakeholder initiative will consider potential capacity counting and accreditation reforms to align California's resource adequacy program with the Western Resource Adequacy Program.<sup>10</sup> Related to capacity counting, the CAISO also plans to discuss potential counting implications arising from the current federal investment tax credit program. Finally, the CAISO's planned stakeholder initiative will assess whether RAAIM remains effective and what changes, if any, the CAISO should make to this mechanism.

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<sup>10</sup> The WRAP is a regional, voluntary resource adequacy planning and compliance framework in the Western Interconnection. On August 31, 2022, Northwest Power Pool filed a proposed tariff to establish the WRAP in FERC Docket No. ER22-2762. The filing is pending disposition.

### III. Conclusion

The CAISO expects significant deployment of hybrid and co-located resources in its balancing authority area over the next several years. The CAISO will continue its efforts to integrate these resources into its markets.

Respectfully submitted,

**By: /s/ Marissa Nava**

Roger E. Collanton  
General Counsel  
Anthony Ivancovich  
Deputy General Counsel  
William H. Weaver  
Assistant General Counsel  
Marissa Nava  
Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel. (916) 608-7209  
[mnava@caiso.com](mailto:mnava@caiso.com)

Counsel for the California Independent  
System Operator Corporation

Dated: November 29, 2022

## CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 29th day of November, 2022.

/s/ Martha Sedgley  
Martha Sedgley