

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Advance
Demand Flexibility Through Electric Rates.

Rulemaking 22-07-005
(Filed July 14, 2022)

**OPENING COMMENTS ON ORDER INSTITUTING RULEMAKING OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

Roger E. Collanton
General Counsel
Anthony Ivancovich
Deputy General Counsel
William H. Weaver
Senior Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: 916-608-1225
Fax: 916-608-7222
Email: bweaver@caiso.com

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I. Introduction

Pursuant to the California Public Utilities Commission’s (Commission) July 22, 2022 *Order Instituting Rulemaking to Advance Demand Flexibility Through Electric Rates* (OIR), the California Independent System Operator Corporation (CAISO) submits comments on the proposed preliminary scope and schedule.

II. Discussion

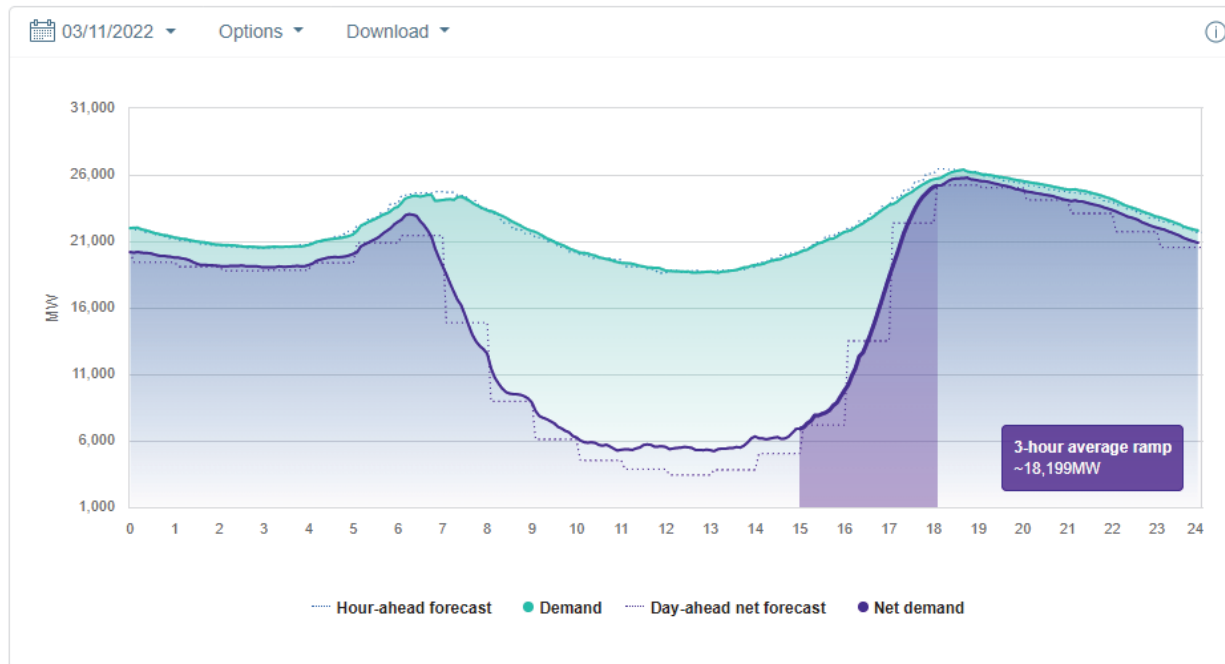
The CAISO supports the direction of the Commission’s new OIR and commends Energy Division’s Demand Flexibility Whitepaper. The strategies proposed therein will leverage wholesale market prices to inform dynamic retail rates. The CAISO sees clear reliability benefits from better aligning retail rates with grid conditions. As California transitions to a cleaner economy, increased renewable integration will require flexible, fast-ramping, and responsive resources across all hours of the year.

As noted in the Demand Flexibility Whitepaper, the maximum three-hour ramp in 2019 was 15,600 MW.¹ On March 11, 2022, the three-hour ramp was more than 18,000 MW, driven

¹ CPUC Staff White Paper, p. 14.

by a rapid decrease in both grid-connected and behind-the-meter (BTM) solar generation as shown in Figure 1 below.

Figure 1: 18,199 MW Average Three-Hour Ramp on March 11, 2022²



Wholesale market prices generally take the form of locational marginal prices (LMPs), which represent the marginal cost of producing energy at a specific time and location. LMPs send signals to attract supply to serve demand reliably or curtail load where and when needed on the high voltage grid. More dynamic retail rates informed by wholesale market prices could provide better financial incentives for retail customers who are capable of providing, and willing to provide, load flexibility to the grid. The CAISO continues to support greater demand flexibility and new “grid-informed” rate options that can generate beneficial flexible demand across all days and hours of the year.³

² <http://www.caiso.com/TodaysOutlook/Pages/default.aspx>.

³ Comments of the California Independent System Operator on the Proposed Decision Adopting Policy Guidelines to Assess Time Periods for Future Time-of-Use Rates and Energy Resource Contract Payments, CPUC Rulemaking 15-12-012, November 21, 2016.

Better rates will only come from better data. The Commission's scope should include data requirements to measure the underlying drivers of load response and facilitate evaluation of the effectiveness of dynamic retail rates. The Commission also should coordinate data requirements with the California Energy Commission (CEC) for long-term forecasting and with the CAISO and distribution utilities for operations. Lastly, the Commission should identify the new distribution-level functions and processes needed to support this effort and coordinate with the High Distributed Energy Resource OIR accordingly.⁴

A. The Commission Should Include Data Requirements to Measure the Underlying Drivers of Load Response to Evaluate Dynamic Retail Rates.

The CAISO relies on vast amounts of data to forecast demand accurately and serve load reliably. Data availability and analyses are essential for situational awareness. The CAISO uses its short-term load forecasts in market processes to schedule and dispatch wholesale market resources. This short-term forecast nets out behind-the-meter (BTM) generation and load-modifying behaviors, which has significantly altered the CAISO's load shape over the last few years. To estimate the net load with a high level of forecasting accuracy to maintain reliability, the CAISO has relied on commercially available solar inverter data. The CAISO uses the solar inverter data to train its forecasting models to recognize changed behavior in the underlying load so the wholesale market is positioned appropriately to maintain reliability. For example, when the forecast shows cloud coverage, the CAISO can pre-empt the reduction in solar generation by increasing wholesale market generation. Understanding the underlying load drivers allows the CAISO to increase situational awareness and accurately respond. In addition to the CAISO, the

⁴ *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*, R.21-06-017.

CEC, distribution utilities, load serving entities, and stakeholders all need data to ensure the integrity of their load forecasts.

Thus far, BTM solar has been the most impactful distributed energy resource (DER) for CAISO operations. In the future, DERs will be more heterogeneous, bi-directional, and driven by varying use patterns and customer needs. Even under a rates-driven paradigm as envisioned by the Demand Flexibility Whitepaper, access to underlying resource performance data will be critical to measuring both the success and limitations of retail rates and *why*. In the example above, without solar inverter and other data, reduced BTM solar generation due to cloud coverage may be indistinguishable from consumer response to dynamic rates that incentivize electric vehicle charging in the middle of the day.

Although rates can unify and drive load response to align with grid needs, it is equally important to understand when consumers cannot or will not reduce demand in the presence of high rates. For example, the CAISO has observed response fatigue to Flex Alerts during multi-day heat waves. As transportation electrification increases, a consumer's desire or need to travel may outweigh the higher charging rates during grid peak times. Stakeholders and regulators must be able to evaluate how and why end users do not always respond to dynamic rates (the circumstances, the magnitude, the cause, etc.). Without sufficient data gathering, stakeholders and regulators will be unable to understand the impact of dynamic rates.

The Commission's scope should include data requirements to ensure rates developed pursuant to this proceeding have the desired outcome. At minimum, the Commission should require documentation of DERs by type, MW capacity, zip code, and expected energy pattern (charge and/or discharge). For increased accuracy and to better understand retail customer behavior in response to rates, data needs will likely expand to include aggregated telemetered

response by technology type for both short-term (*i.e.*, within a few minutes or hours) and long-term modeling and forecasting. Telemetry enhances the accuracy of load forecasting to account for BTM resource penetration, thereby increasing system reliability.

B. The Commission Should Coordinate with the California Energy Commission on Data Needs and Uses.

The Commission should coordinate with the CEC on data needs and uses. For example, the CEC models several load modifiers for its long-term forecast in the Integrated Energy Policy Report (IEPR).⁵ The IEPR forecast, which the Commission and the CAISO use in critical procurement and planning processes, currently captures a wide range of load modifiers such as BTM solar, BTM storage, electric vehicles, energy efficiency, and fuel substitution. Each load modifier is modeled separately to account for unique and independent drivers. For certain DERs such as electric vehicles, the CEC's modeling also includes response to time-of-use (TOU) rates.⁶ If the Commission adopts some level of dynamic retail rates, it will be critical for the CEC to have sufficient data to model and develop accurate forecasts of how load modifiers respond to such rates and interact with each other.

Similarly, the Commission should coordinate data needs and uses with the CEC's recently opened informational proceeding on *Distributed Energy Resources in California's Energy Future*.⁷

⁵ See, e.g., CEC, *2021 Integrated Energy Policy Report, Volume IV - California Energy Demand Forecast*, available at: <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2021-integrated-energy-policy-report>

⁶ CEC, *2021 Integrated Energy Policy Report, Volume IV - California Energy Demand Forecast*, p. 69.

⁷ CEC, *Order Instituting Informational Proceeding on Distributed Energy Resources in California's Energy Future*, Docket: 22-OII-01.

C. The Commission Should Identify New Distribution-Level Functions and Processes Needed to Support This Proceeding and Coordinate with the High DER OIR.

As this proceeding develops, the Commission should identify new functions and processes at the distribution level to support implementation of the strategies in the Demand Flexibility Whitepaper. For example, regarding the data requirements described above, the Commission should identify a process for requesting and aggregating data for entities such as the CEC and CAISO for forecasting and planning purposes.⁸ Similarly, the Commission should identify a robust communication framework in the operational timeframes⁹ between the CAISO and distribution operators to coordinate at the transmission-distribution interface.¹⁰ For example, if a multi-day heat wave erodes the effectiveness of dynamic retail rates or significant distribution outages inhibit BTM resources to generate, there may be a need to increase wholesale supply. These functions may be appropriate for a distribution system operator (DSO), which will be discussed under the High DER OIR proceeding.¹¹ Consequently, the Commission should include in the scope of this proceeding express coordination with the High DER OIR regarding potential DSO functions.

⁸ With any appropriate confidentiality protections.

⁹ *I.e.*, day-ahead, day-of, or real-time.

¹⁰ CAISO High DER Reply Comments, pp. 1-2. [Microsoft Word - 2021-10-07_ReplyComments_OIR_High-
DER_DRAFT \(10-7 12PM\) \(caiso.com\)](#)

¹¹ *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*, R.21-06-017 (June 24, 2021).

III. Conclusion

The CAISO appreciates the opportunity to provide comments on the OIR and Energy Division's Demand Flexibility Whitepaper. The Commission's scope should include data requirements to measure the underlying drivers of load response to evaluate the effectiveness of dynamic retail rates. The Commission also should coordinate data requirements with the CEC for long-term forecasting and with the CAISO and distribution utilities for operations. Lastly, the Commission should identify the new distribution-level functions and processes needed to support this proceeding, and coordinate with the High Distributed Energy Resource OIR accordingly.

Respectfully submitted

By: /s/ William H. Weaver

Roger E. Collanton

General Counsel

Anthony Ivancovich

Deputy General Counsel

William H. Weaver

Senior Counsel

California Independent System

Operator Corporation

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