BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION ON THE ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENTS REGARDING FUTURE GRID STUDY REPORT

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I. Introduction

The California Independent System Operator Corporation (CAISO) submits comments on the October 17, 2024 *Administrative Law Judge's Ruling Seeking Comment on Future Grid Study Report* (FGS Report) by the California Public Utilities Commission (Commission).

II. Summary of CAISO Comments

The CAISO recognizes the structure of coordination between transmission system operators (TSOs)[1] and distribution system operators (DSOs) will evolve as distributed energy resources (DERs) grow and as the TSOs and DSOs continue to work with one another and gain experience managing DERs and their impacts on grid operations. The CAISO expects to work closely with DSOs to refine the roles, responsibilities, and information-sharing needed between TSOs and DSOs under a "high DER future." As an initial step, coordinating with DSOs to enhance DER visibility can help deepen the CAISO's understanding of the impacts of out of market resources and programs.[2]

The CAISO oversees the operation of the bulk electric system for the CAISO balancing authority area. The CAISO is responsible for ensuring sufficient electric supply is available to

[1] TSOs include the CAISO and utility transmission operators.

[2] "DER visibility" for the purpose of these comments means access to characteristic and operational time horizon information such as, for example; location, technology type, data on the capacity, capabilities, schedules, and performance of DERs at a sufficient level of aggregation to identify and understand DERs' impacts on CAISO load.

meet demand. Out-of-market resources and retail programs—including DERs—impact the demand the CAISO must meet and balance.[3] There are currently approximately 17 gigawatts (GW) of behind-the-meter (BTM) solar installed capacity in California.[4] The CAISO has integrated BTM solar in CAISO operations in its short-term load forecast. Site-specific data such as capacity, location, and production from BTM solar resources is critical to ensure the CAISO's short-term load forecast is accurate. The CAISO uses its short-term load forecast to clear its wholesale market, which commits and dispatches resources to meet CAISO load. Accurate load forecasting allows the CAISO to effectively predict shifts in load, and then dispatch the lowest-cost resources to meet CAISO load, supporting reliability and market efficiency.

Although the CAISO has successfully integrated BTM solar into its short-term demand forecast to date, other DER resource categories such as BTM batteries, electric vehicles, and residential device level controls are growing at a rapid pace in California. Just like BTM solar, these DER categories impact CAISO load, and the CAISO has observed shifts in actual CAISO load patterns attributable to these new DER categories. This is a growing concern because the CAISO currently has limited visibility into the capacity, capabilities, schedules, and performance of these DER categories.

The CAISO recognizes that compared to BTM solar, impacts of these DER categories may be more challenging to predict. But gaining DER visibility in coordination with the distribution companies can help the CAISO understand the drivers of observed load shifts and inform how shifts in CAISO load should be managed as the DER fleet grows.

The CAISO supports the deployment of DERs, including aggregations of resources that participate in CAISO wholesale energy market and as out-of-market resources that offset CAISO load. The CAISO looks forward to working with parties to continue to support electric reliability across both the transmission and distribution (T&D) systems as DERs grow on the distribution system.

The CAISO's comments to the FGS Report focus on enhancing DER visibility in coordination with DSOs. DER visibility is important to help the CAISO understand how each type of DER can impact CAISO load. In addition to the CAISO, it is critical that the

[3] In these comments, the CAISO refers to the load the CAISO must meet as "CAISO load."
[4] https://www.californiadgstats.ca.gov/.

Commission, TSOs, and DSOs understand these impacts. TSOs and DSOs must work together to manage changes to load under a high DER future, including enhancing the CAISO's short term demand forecast. Doing so will benefit ratepayers and help reliability. The CAISO thus supports enhancing platforms such as Distributed Generation Statistics (DG Stats) for sharing DER data, including aggregated capacity, capabilities, schedules, and performance to support T&D coordination.

The CAISO also recommends that as DSOs build out DSO platform and systems, DSOs should work closely with TSOs. Doing so will ensure enhancements to distribution system operations are interoperable with transmission system operations, and that DSOs and TSOs understand the impacts on one another. Finally, the CAISO supports the Commission's convening a series of workshops to discuss TSO and DSO roles, DER visibility, and data sharing requirements.

The CAISO provides responses to a subset of Ruling questions below:

III. Responses to Questions for Parties

Question 1. The FGS Report includes a wide range of stakeholder input and recommendations from three public workshops. Please review the report (Attachment 1) to ensure it accurately reflects stakeholder input from the workshops. If there are discrepancies, please identify the sections, provide specific details and suggested corrections, and identify any inaccuracies, inconsistencies, or omissions from the workshop discussion in the sections of the FGS Report. Comments should be limited to workshop discussions and proposed recommendations.

The FGS Report accurately characterizes the CAISO's presentation in Workshop 1. Specifically, it accurately captures the importance of DER visibility for the CAISO to understand the impacts of DERs on CAISO load and evaluate potential enhancements to the CAISO's short-term demand forecast.

The FGS Report also accurately reflects the CAISO's input into Workshop 3. During Workshop 3, the CAISO suggested that an expansion of the DG Stats platform to include information on DERs other than BTM solar resources. Currently, the CAISO uses capacity data for BTM solar resources from DG Stats at the zip code level. This data informs the short-term load forecast. The CAISO then augments the DG Stats data with telemetry data on BTM solar resources.

The CAISO supports DG Stats, or a similar platform, making capacity and performance data available for both BTM solar and other DERs at an aggregated level, consistent with the

CAISO's presentation in Workshop 1 and the CAISO's presentation in the Commission's Data Working Group under R.22-11-013.[5] Parties should determine the appropriate level of aggregation that balances usefulness, customer privacy, workload, and other considerations. In Workshop 2, the CAISO offered as a starting point that this data could be aggregated by zip code or sub-Load Aggregation Point (sub-LAP), and by technology type such as BTM storage, BTM solar.

Lastly, page 45 of the FGS Report states, "CAISO participants… hope to expand this platform in the near-term to include other DERs." The CAISO clarifies that the Commission, not the CAISO, manages the DG Stats platform.

Question 2. The FGS Report outlines ten key operational needs, categorized as broad themes, that are essential for realizing a High DER future. These needs were identified based on insights and discussion from Workshop 1 - Identifying Operational Needs. ***(Refer to Attachment 1, pages 24-29, "Outcome: Operational Needs for a High DER Future" section.)*** **Based on the stakeholder survey during workshop facilitation, the FGS Report findings show that the following three operational needs are considered high priority with sufficient urgency to justify implementation within 1-2 years:**

i. **DER Visibility to the Distribution System Operator,**
ii. **DER dispatchability/control, and**
iii. **Open access to the distribution system**

Question 2a. Do you agree that the above operational needs are the highest priority and need to be implemented within 1-2 years? If so, why?

The CAISO supports the three operational needs identified as high priority needs. However, as DSOs build out their distribution system operations, DSOs should work closely with TSOs to ensure enhancements to distribution system operations are interoperable with and consider the impacts to transmission system operations. Parties should consider coordination and communication with TSOs and upstream impacts to the transmission system in parallel with advancing DER visibility and operations for DSOs, not after the fact.

Question 3. Diverging approaches to enabling a High DER Future—Following Workshop 1, the workshop series highlighted a diverging approach to long-term visions for a High DER Future between the IOUs' top-down "grid orchestration" approach where DSOs are central in coordinating DERs and the bottom-up, open-access vision recommended by other stakeholders. ***(Refer to Attachment 1, page 36, "Key Takeaways from Workshop 2".)***

[5] *See* CAISO slides for the September 30, 2024 CPUC R.22-11-013 Data Working Group - Grid Infrastructure: https://static1.squarespace.com/static/525dcddce4b03a9509e033ab/t/670efbb976ff7b63cafbeaa2/1729035199267/CPUC_DWG_Notes+and+Slides_9-30-24.pdf

Question 3a. Which approach do you support, the top-down "grid orchestration" approach or the bottom-up, open-access vision for a High DER future? Please explain your reasoning for supporting the chosen approach and what steps should be taken in this proceeding to implement this vision. How do these steps align with the DSO's roles and responsibilities?

During Workshop 1, parties outlined different views of how the grid could operate in a future with high penetration of DERs. The investor-owned utilities—Pacific Gas & Electric, San Diego Gas & Electric, and Southern California Edison (Joint IOUs)—outlined a future where a DSO actively "orchestrates" the bidirectional flows from fleets of DERs to manage loads and distribution system constraints.[6] In Workshop 2, the Joint IOUs explained they have started to implement this vision by "planning, developing, and deploying" technologies such as distributed energy management systems (DERMS).[7] According to them, DERMS are expected to instruct "participating DERs to produce or consume a specific amount of power and energy at specified time."[8]

The Climate Center promoted a market-based approach where the distribution system impacts from bidirectional flows of DERs are optimized by a market that clears distribution-level supply and demand, subject to distribution system constraints.[9] Similar to the DERMS in the Joint IOUs' presentation, this distribution system market would create DER schedules.

The CAISO expects that DERs scheduled by utilities' DERMS will impact CAISO load. In either of these scenarios, utilities should work closely with the CAISO as they develop their respective DERMS to evaluate and develop any needed information sharing between the TSOs and DSOs. The CAISO also interfaces with several different DSOs and utilities and as such, recommends uniformity in communications and information sharing.

Question 5. The FGS Report compiled stakeholder recommendations as five topic summaries based on input and discussion during Workshop 3 - Developing Recommendations to Address Gaps. The FGS Report also includes Gridworks' recommendations for the next steps. ***(Refer to the "Stakeholder Recommendations ..." and "Gridworks Recommended Next Steps ..." sections in Workshop 3, pages 39 –51 of Attachment 1.)***

[6] Joint IOUs' Workshop 2 presentation, page 19.
[7] Joint IOUs' Workshop 2 presentation, page 19.
[8] Joint IOUs' Workshop 2 presentation, page 22.
[9] Workshop 1 presentation, page 148.

Question 5b. Which recommendations from stakeholders and/or Gridworks do you support for each topic and why?

The FGS Report suggests that the Commission "convene the CAISO, the IOUs, other LSEs and other interested stakeholders for a workshop series to discuss DER visibility to the CAISO."[10] The CAISO supports the Commission's convening a series of workshops. Before establishing a workshop schedule, TSOs and DSOs should collaborate on the desired scope, schedule, and goals of future workshops to propose collectively a workshop framework to the Commission.

The CAISO envisions that future workshops will focus on communications and information sharing between TSOs and DSOs. This includes options for sharing DER data at an aggregated level, including capacity, capabilities, schedules, and actual performance. Such data is critical to ensure the CAISO is able to manage the impacts of DERs on CAISO load and forecasting processes. Workshops also should focus on roles and responsibilities between DSOs and DSOs regarding DER visibility, and how T&D coordination should evolve as the DER fleet grows.

The Utility Consumers' Action Network (UCAN) recommends that the CAISO's day-ahead market clear on a sub-hourly basis.[11] The UCAN states this would align load scheduling in the day-ahead market with the real-time market. This recommendation constitutes a significant change to the CAISO's market design and should not be considered in this proceeding.[12] The Commission should not take up UCAN's recommendation and should direct party comments on changes to CAISO market design to CAISO's stakeholder process.

Question 5c. Regarding topic 3b in the FGS Report, DER Visibility to the CAISO, how do we ensure interoperability and visibility between the DSO and the CAISO for DER visibility to the CAISO?

As explained in these comments, the CAISO supports including these questions within the scope of future workshops and continued T&D coordination efforts.

[10] Future Grid Study, page 46.
[11] Future Grid Study, page 51.
[12] Additionally, the issue itself would be under the jurisdiction of the Federal Energy Regulatory Commission.

IV. Conclusion

The CAISO appreciates the opportunity to provide comments on the FGS Report and looks forward to continued collaboration with parties on these important issues.

Respectfully submitted

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