

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

Electrification and the Grid of the Future

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Docket No. AD21-12-000

**Comments of the California Independent System Operator Corporation**

The California Independent System Operator Corporation (CAISO) submits these comments in connection with the Commission’s May 17, 2021 notice inviting post-technical conference comments on various issues involving electrification and the grid of the future.<sup>1</sup> The CAISO has developed and will continue to refine pathways for wholesale market participation by flexible demand resources. New sources of flexible demand can also provide value to the electric system by helping shift and shape the load curve to relieve stress on the electricity grid. The CAISO encourages the Commission to coordinate with states and local entities regarding the integration of new sources of flexible demand to ensure opportunities exist for these resources to receive value for the services they provide to the electricity system and that their integration occurs in a safe and reliable manner.

**I. Summary**

With efforts to electrify more sources of demand, including transportation, buildings and industrial processes, the CAISO supports the Commission’s consideration of how best to integrate these resources into the operation of the electric system. As part of the grid of the future, the CAISO encourages the Commission and state regulators to explore policies that leverage and value flexible demand resource’s contribution to grid reliability. Growth of flexible demand resources can reshape and

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<sup>1</sup> *Notice Inviting Post-Technical Conference Comments* dated March 17, 2021 in Docket AD21-12.

shift load curve by lowering peak demand, mitigating minimum net loads, and alleviating challenging ramping conditions, all of which improve reliability and lower costs to ratepayers. Likewise, the CAISO supports refining its market participation models as needed to integrate new sources of flexible demand that can effectively participate in wholesale markets. Costs and regulatory complexities can vary widely depending on the specific characteristics of demand resources, which, in most cases, will locate behind the customer meter. For that reason, the CAISO emphasizes the importance of exercising a range of options and opportunities to integrate flexible demand resources—inside and outside of the wholesale market.

The CAISO recommends that the Commission monitor state efforts to integrate new sources of flexible demand into the electricity system and support pilot programs and wholesale market rule changes that compliment these efforts. The CAISO also recommends the Commission work with state regulators to explore how retail rates and rate designs that are “grid-informed” can induce greater demand flexibility. By way of example, the California Public Utilities Commission (CPUC) is considering a comprehensive proposed roadmap for advanced distributed energy resources (DER) and demand flexibility management, which will leverage new system-wide retail rate reforms and load modifying demand response proposals.<sup>2</sup> The Commission should consider coordinating any action it may take with actions such as that contemplated by the CPUC.

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<sup>2</sup> Information on the May 25, 2021 workshop on advanced DER and Demand Flexibility Management can be found here: <https://www.cpuc.ca.gov/General.aspx?id=6442469050>.

## **II. New Sources of Flexible Demand can Bolster Reliable Operation of the Transmission System**

Most, if not all newly electrified resources have the potential to support reliable operation of the transmission system. This includes EVs, stationary storage, fuel cells, water and space heating and cooling, and hydrogen production. Depending on the resource characteristics and capabilities, the CAISO has developed and is refining several market participation platforms for these resources, including:

- Demand Response models, including a load shift product for behind the meter energy storage resources to consume energy during oversupply conditions and return that energy to the system during times of need;
- The Non-Generator Resource model (a storage model that accounts for positive and negative generating capability); and
- The Distributed Energy Resource Aggregation model (allowing for DER aggregation both in front of and behind the customer meter to provide transmission grid services).

These platforms provide flexible demand resources an opportunity to offer energy and ancillary services in the CAISO's wholesale markets. The CAISO continues to work with stakeholders, including state regulators, resource developers, aggregators, and utility distribution companies to identify and resolve barriers for access to the wholesale market participation by these resources. In the first instance, the CAISO believes any additional wholesale market rule changes necessary to facilitate participation by flexible demand resource should occur through these collaborative efforts and in the context of the CAISO's stakeholder initiative processes.

### **III. The CAISO supports all options to leverage the value new sources of flexible demand can provide to the electric system**

Presently, utility distribution tariffs and programs almost exclusively rely on enabling flexible demand through wholesale market participation as supply-side resources in the form of load curtailment as demand response resources. However, the CAISO is working closely with the CPUC and other local entities to enable flexible demand beyond supply-side demand response through other load modifying and load management strategies. These strategies include employing new “grid-informed” time variant and dynamic rate options that can help manage load shapes for the grid operator. The grid has evolved due to increased renewable penetration and the expansion of DER, such as rooftop solar, resulting in a greater need for flexible, fast-ramping, and responsive resources across all hours of the year to balance growing supply and demand variability. This stands in contrast to the traditional role for “demand response” which meant peak shaving a few times a year during very stressed grid conditions. Because state and local entities are actively exploring these additional load management pathways, the CAISO encourages the Commission to monitor and support these efforts.

In connection with transportation electrification, the CAISO is also working with state agencies and utilities to explore how best to integrate electric vehicle (EV) aggregations into the electricity system both as supply resources in the wholesale markets and as flexible demand resources that can modulate their charging activity in response to conditions on the transmission system. This effort includes an update to the 2014 VGI (Vehicle Grid Integration) Roadmap, support for the development of grid informed retail rate options which can improve grid reliability and reduce grid operation

costs by shaping and shifting load to align to grid conditions, EV load forecasting analysis, and utility EV pilots for wholesale market participation.

**IV. The Commission should actively facilitate the development of a unified vision on how transmission and distribution operators should integrate new sources of flexible demand**

Trends in building electrification, EV aggregations and virtual power plants present questions about how best to integrate these resources. The majority of these resources will interconnect on the distribution system, often behind the customer meter. The size of newly electrified resources may also make current requirements for providing wholesale market-based services too costly and complex, thereby inhibiting markets from fully obtaining services from these resources. The Commission in coordination with state regulators should help facilitate a clear and unified vision for how transmission and distribution operators integrate these resources.

The CAISO supports enabling demand-side resources to provide essential grid services, like conventional supply does today, but the CAISO also sees an emerging path and growing opportunity for demand-side resources to play a greater role in supporting grid reliability by taking beneficial load modifying actions through grid informed time-variant and dynamic retail rate options. Many resource adequacy and forward capacity rules in the wholesale electricity markets do not easily accommodate small, aggregated distributed energy resources, even though their developers consistently believe such revenue streams are an essential to project viability. Likewise, the need to develop compensation rules, mechanisms, and practices that reward “avoided costs,” such as avoided resource adequacy capacity, due to beneficial load modifying actions is another important issue that requires further development and

discussion. Opening a viable “load modifying” path provides developers the choice to elect a supply-side or load-modifying option for their projects, with each path providing just compensation for the services rendered or costs avoided, and each path having somewhat different benefits and burdens. In this way, flexible demand can contribute to the highly electrified, zero-carbon grid of the future either inside or outside wholesale electricity market participation, providing system benefits either way.

By developing a unified vision, the Commission and state regulators can help create a new system of coordination and information exchange among the distribution operator, the transmission operator, and third-party aggregators. Transmission and distribution operators must identify new mechanisms to coordinate the operation of the transmission-distribution interface. The CAISO has begun defining a grid architecture framework with the distribution utilities, but additional input and guidance from the Commission and state regulators will help generate a feasible approach.

## **V. Conclusion**

The CAISO supports both the integration of flexible demand into wholesale markets and leveraging load modifications through grid informed time variant and dynamic retail rates for newly electrified resources to mitigate stress on the system by beneficially shifting and shaping load to create a flatter and more manageable system load profile. Although participation in the wholesale market as a supply-side resource may not be appropriate for every resource, the CAISO can and does facilitate the market participation of smaller, aggregated distributed energy resources. Outside of the wholesale electricity markets, flexible demand and distributed energy resources can contribute significantly to the grid of the future through a variety of load modifying

actions via grid informed rate options. These resources should be appropriately valued for their ability to reduce and avoid costs.

Respectfully submitted,

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Dated: July 1, 2021

## 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 1<sup>st</sup> day of July, 2021.

*/s/ Jacqueline Meredith*  
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