

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

<b>Utilization In the Organized Markets of Electric Storage Resources as Transmission Assets Compensated Through Transmission Rates for Grid Support Services Compensated in Other Ways, and for Multiple Services</b>	<b>Docket No. AD16-25-000</b>
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**TECHNICAL CONFERENCE COMMENTS OF THE  
THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR  
CORPORATION**

The California Independent System Operator Corporation (“CAISO”) respectfully submits these comments on the November 9, 2016 technical conference on the utilization of electric storage resources as transmission assets, and for multiple-use applications.<sup>1</sup>

**Storage Qua Transmission**

The CAISO expects electric storage to become an increasingly significant presence on the system that will provide major benefits both to customers and to the grid. The Commission’s previous guidance that energy storage resources used as transmission assets should limit their activities to the provision of transmission services has been particularly helpful to the CAISO in past transmission planning processes. While the CAISO is enthusiastic about the role

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<sup>1</sup> Terms not otherwise defined herein have the meanings set forth in the CAISO tariff, and references to specific sections, articles, and appendices are references to sections, articles, and appendices in the current CAISO tariff and revised or proposed in this filing, unless otherwise indicated. The CAISO processes interconnection requests pursuant to its Generator Interconnection and Deliverability Allocation Procedures (“GIDAP”), Appendix DD to the CAISO tariff.

energy storage projects may play in renewables integration (and the potential roles for the CAISO in facilitating these efforts) these services are clearly not transmission services. The CAISO believes the role for storage is best achieved through existing procurement and market mechanisms. While the option of using a narrowly focused energy storage device as exclusively a transmission asset would seem to broaden the possible applications of energy storage, the CAISO sees very limited use of that framework.

Under the Commission's holding in *Western Grid*,<sup>2</sup> the CAISO's transmission planning process has studied a number of potential energy storage projects as reliability solutions, ranging from transmission asset models to local resources participating in markets.<sup>3</sup> More specifically, over the past several years the CAISO has studied 17 battery storage proposals and one pumped hydro storage proposal as potential transmission assets. None have resulted in storage projects moving forward. In contrast, LSE procurement has resulted in a number of energy storage projects moving forward and providing local capacity. These capacity needs can be driven by a variety of causes, including generation retirements, load growth, and other issues affecting existing resource availability. In this context, the CAISO's experience reflects that electric storage has fit within

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<sup>2</sup> *Western Grid Development LLC*, 130 FERC ¶ 61,056, at P 47, *reh'g denied*, 133 FERC ¶ 61,029 (2010) (*Western Grid*).

<sup>3</sup> The CAISO also published a stand-alone paper presenting its methodology for considering non-transmission alternatives in 2013. <http://www.caiso.com/Documents/Paper-Non-ConventionalAlternatives-2013-2014TransmissionPlanningProcess.pdf>. Detailed information on the CAISO's most recent consideration of non-transmission alternatives and preferred resources can be found in the CAISO's 2015-2016 Transmission Plan, beginning on page 27. <http://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf>.

the framework of market resources providing local capacity more effectively than as transmission assets.

Where independent system operators and regional transmission operators (“ISO/RTOs”) have developed models for electric storage resources to participate in energy and ancillary services markets, these resources have successfully provided system benefits. In the CAISO balancing authority area, procurement of resources to participate in these markets occurs principally through bi-lateral procurement by load-serving entities. Electric storage resources participate in these procurements and then provide system or local capacity to address needs that could otherwise be met through transmission investment. To date, storage has had significant success in these procurements.<sup>4</sup> The CAISO’s preference therefore is to inform and coordinate those procurements with the responsible local regulatory authority and its jurisdictional load-serving entities rather than develop duplicative or conflicting procurement processes. Although the CAISO does not approve non-transmission alternatives in its transmission planning process, the process does provide opportunities for non-transmission resources such as storage to be evaluated and, if the transmission planning process identifies them as the preferred alternative, the CAISO works to support regulatory approvals for those projects.

The CAISO also is concerned that a mechanism to compensate electric storage resources for their services through transmission rates could distort

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<sup>4</sup> The California Public Utilities Commission (“CPUC”) website tracks utility procurement of storage: <http://www.cpuc.ca.gov/General.aspx?id=3462>.

efficient market outcomes. In particular the CAISO prefers that operation of these resources—once procured by load-serving entities—occur through the CAISO’s energy and ancillary services market processes rather than through extra-market control mechanisms by the CAISO or the participating transmission owner. This approach ensures that the operations of all resources, whether meeting system needs or within a transmission constrained area, are coordinated through the market to meet grid reliability needs.

The CAISO acknowledges that there may be instances where a dedicated solution is necessary to support local transmission needs with limited or no alternatives, in which case the CAISO will consider the storage (as transmission) option in its planning process. In these instances, it is likely that the CAISO may need to constrain or define narrowly the operation of the electric storage resource; for example, by requiring it to abstain from market participation and remain fully charged (virtually idle) so that it is available to meet a local contingency need. This scenario also addresses the suggestion made by some stakeholders that the storage device might provide transmission services as a transmission asset at some times and then participate in the CAISO market when not needed for the transmission services. If the transmission need involves a potential contingency, there may be no flexibility for the resource to participate in the market. This is consistent with the Commission’s earlier findings in *Western Grid*. While these challenges may not be insurmountable, they are significant and should be undertaken only where circumstances or performance requirements make electric storage the clearly preferred solution to a

transmission issue. In such cases a reliability-must-run contract or similar arrangement could serve to support an electric storage resource, although these arrangements generally serve to maintain existing resources.

The Commission's agenda for the November 9 technical conference included the following statement: "Electric storage advocates often make the argument that an electric storage resource's ability to defer or avoid the costs of a traditional transmission asset makes it used and useful for transmission service," implying that the cost of the storage resource should be recovered fully through transmission rates. The CAISO does not agree with this argument. The same argument could be made for energy efficiency measures that reduce demand, for distributed generation located close to load, for behind-the-meter rooftop solar installations, and, essentially, for any alternative mode of meeting customers' needs for energy that reduces the need for transmission assets. As such, the argument is inconsistent with a customer-centric view of energy service. In a customer-centric view an energy user's needs for energy would be taken as the ultimate driver of systems and technologies for the supply of energy, and all modes of supply—including but not limited to kWh delivered from the transmission system—would compete for customers. This customer-centric view appears to be where the industry is heading as a result of technology evolution, increasing desires of energy users to choose and control their sources and uses of energy, and the consequent growth of distribution-side resources. Thus, the argument quoted above also would preclude industry evolution through market

competition, or at least would limit competition to forms of competitive procurement by the system operator or owner to procure new grid "assets."

The CAISO fully recognizes the demonstrated and potential benefits of electric storage as well as the challenges of achieving commercial viability for a resource type whose true value has not yet been sufficiently monetized. The CAISO believes, however, that classifying resources that reduce energy users' dependence on the transmission grid as transmission assets to enhance their commercial viability would distort the emerging technology marketplace by driving developers toward system operators and owners as their customers rather than toward end users where the needs for energy services actually originate. The CAISO would argue for an approach that leverages customer choice and market innovation to monetize the novel benefits of storage; for example, its ability to smooth load profiles, manage variability of renewables, and provide resilience to grid disturbances. In other words, the CAISO favors an approach that limits central planning and regulated cost recovery to the actual assets that comprise the grid *per se*.

The CAISO also notes that the storage-as-transmission-asset concept has been raised in the industry as a means to support storage as a renewable integration asset and overcome the obstacles of potentially significant capital outlays and free ridership. While the CAISO is open to discussions on these issues, and will be seeking to work with the industry to find creative and effective solutions, simply categorizing these assets as transmission assets is not an appropriate solution.

## **Multiple-use Applications**

Although the concept of multiple-use applications is relatively nascent, the CAISO and its stakeholders have dedicated significant thought and effort toward it.<sup>5</sup> The concept applies primarily to distribution-connected and behind-the-customer-meter resources, which may provide services to both the distribution and transmission systems. Enabling these “distributed energy resources” (“DER”)—including storage resources—to stack incremental value and revenue streams by delivering multiple services to the wholesale market, distribution grid, and end users will have significant benefits to the grids and their ratepayers. Achieving this vision will increase the value of DERs and enhance their economic viability and cost-effectiveness, potentially obviating the need for expensive transmission.<sup>6</sup>

The primary challenge in enabling multiple-use applications is the current regulatory construct, namely, the constitutional bifurcation between interstate and intrastate jurisdictions. This bifurcation creates a barrier between the wholesale and interstate grids/markets and the retail and distribution grids/markets in the form of the lack of a regulatory framework for a resource to participate in both realms. While this has not been a significant issue with past technological constructs (e.g., big commercial generators far from load centers and

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<sup>5</sup> The bulk of the CAISO’s publications on multiple-use applications are available in the CAISO’s Energy Storage and Distributed Energy Resources stakeholder initiatives, [http://www.aiso.com/informed/Pages/StakeholderProcesses/EnergyStorage\\_AggregatedDistributedEnergyResources.aspx](http://www.aiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_AggregatedDistributedEnergyResources.aspx), and in the CPUC’s energy storage proceeding, R.15-03-011, <http://www.cpuc.ca.gov/General.aspx?id=3462>.

<sup>6</sup> See U.S. Department of Energy workshop report on the Analytical Challenges of Valuing Energy Storage, <http://www.energy.gov/eere/analysis/downloads/analytic-challenges-valuing-energy-storage-workshop-report>.

interconnected to high-voltage transmission), it is becoming more significant as more distribution-connected and customer-based resources become available and want to avail themselves of multiple participation opportunities and revenue streams (e.g., demand response, distributed solar, customer-sited storage, and electric vehicle charging stations to name a very few).

As daunting as the long-standing jurisdictional divide may seem, the CAISO believes that the Commission can promote significant progress by encouraging coordination between transmission grid operation and distribution grid operation. Enhanced transmission-distribution operational coordination is needed with regard to both the DERs that participate in the wholesale markets and the DERs that do not.<sup>7</sup> In the case of DERs that participate in the wholesale markets, the ISO/RTO is typically unaware of the impacts its DER dispatches have on the distribution system, nor of distribution system conditions that may constrain the ability of the dispatched DER to respond. With higher levels of DERs these information gaps create uncertainty about the response the ISO/RTO can expect from the DERs. Similarly, the distribution utility is generally not informed of wholesale market schedules and dispatches from the ISO/RTO to the DER on its system, which prevents the distribution utility from anticipating DER behavior that could adversely affect distribution operations. The Commission's encouragement of ISOs/RTOs to work with the distribution utilities served by their systems to develop new transmission-distribution coordination

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<sup>7</sup> Where the latter's services to end-use customers and to the distribution system will ultimately have impacts on the bulk electric system at the transmission-distribution interfaces.



frameworks could go a long way toward mitigating these challenges and thereby facilitate multiple-use applications of DERs.

Another benefit of enhanced coordination between ISOs/RTOs and distribution utilities could be resolution of dispatch priority questions for DERs engaged in multiple-use applications. The basic problem is to determine what a DER or a DER aggregation should do when there is a conflict between ISO/RTO dispatch instructions and the needs of the distribution system, particularly when the DER or aggregation is contracted to provide services to the distribution system during the same or adjacent operating intervals in which it is participating in the wholesale market. The CAISO believes that the answer to this question will probably entail developing provisions and procedures to address a variety of scenarios, needs, and system conditions through collaborative efforts between the ISOs/RTOs and the distribution utilities. The Commission's guidance in this area would help initiate processes to establish a firm operational foundation for multiple-use applications of electric storage and other DER.

The Commission also can encourage transmission and distribution coordination by continuing to be flexible where jurisdictional rules could create conflicts. For example, the CAISO applauds the Commission's decision in the CAISO's Distributed Energy Resource Provider tariff filing on the issue of applicable interconnection rules.<sup>8</sup> There, some parties argued that it is appropriate for distribution-connected resources selling into CAISO wholesale markets to interconnect according the transmission owner's wholesale

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<sup>8</sup> *California Independent System Operator Corp.*, 155 ¶¶ 61,229 at P 47 *et seq.* (2016).

distribution access tariff (“WDAT”) interconnection procedures. The CAISO and others argued that WDATs may not apply to all distribution-connected resources, such as storage devices installed behind the end-use customer meter and providing dispatchable demand response. Requiring the use of WDATs in all instances would (a) impose unnecessary burdens for behind-the-meter resources, (b) impose costs that would make participation uneconomic for many resources, and (c) create jurisdictional uncertainty. The Commission agreed with these latter arguments. As a result, distributed energy resources that have interconnected under state interconnection rules are beginning to explore participation in the CAISO’s wholesale markets.

Respectfully submitted,

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## **CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each party listed on the official service list for this proceeding, 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 on this 14<sup>th</sup> of December, 2016.

/s/ Anna Pascuzzo  
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