

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

Electric Storage Participation in Regions with  
Organized Electric Markets

Docket No. AD16-20-000

**MOTION TO INTERVENE AND COMMENTS OF THE  
CALIFORNIA ENERGY STORAGE ALLIANCE**

The California Energy Storage Alliance (“CESA”) appreciates the opportunity to submit comments in response to the Federal Energy Regulatory Commission’s (“FERC”) Request for Comments (“Request”).<sup>1</sup> CESA is primarily concerned with California electricity markets and therefore focuses its recommendations to issues that directly impact organized electricity markets of the California Independent System Operator (“CAISO”).<sup>2</sup> CESA applauds FERC’s proactive efforts to examine the use of electric storage resources to address wholesale electricity needs and its interest in examining barriers to the participation of electric storage resources in capacity, energy, and ancillary service markets in Regional Transmission Organizations (“RTOs”) and Independent System Operators (“ISOs”). In its Request, FERC asks important questions about the eligibility, performance and technical requirements, bid parameters, and rate treatment of stand-alone and aggregated electric storage resources to identify the current means to and barriers for wholesale market participation.

Electric storage resources are a unique asset class that does not fall under traditional “generation” or “load” categories. It may be appropriate to evaluate the existing market participation eligibility, requirements, bid parameters, and treatment for traditional generation resources or load-modifying resources to identify areas where tariffs should be revised to support the capabilities of electric storage resources to act as both generation and load. In particular, it

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<sup>1</sup> Request for Comments Regarding Electric Storage Participation in Regions with Organized Wholesale Electric Markets, Docket No. AD16-20-000, April 11, 2016, and Order Extending Deadline to Respond to Request for Comments, April 27, 2016.

<sup>2</sup> CESA generally concurs with the substance of the comments filed by the Energy Storage Association (“ESA”) on this date.

may be appropriate in most circumstances to define unique sets of participation eligibility, requirements, bid parameters, and treatment for electric storage.

Electric storage resources should have reasonable and nondiscriminatory access to wholesale energy markets. To this end, CESA's comments highlight areas for further investigation and direction on changes that will better provide reasonable access for electric storage resources. While the CAISO has taken many important steps, further collaboration is needed to overcome the remaining barriers to full electric storage market participation.

## **I. BACKGROUND.**

Founded in 2009, CESA is a non-profit membership-based advocacy group committed to advancing the role of energy storage in the electric power sector through policy, education, outreach, and research. CESA's mission is to make energy storage a mainstream energy resource which accelerates the adoption of renewable energy and promotes a more efficient, reliable, affordable, and secure electric power system. As a technology-neutral group that supports all business models for deployment of energy storage resources, CESA membership includes technology manufacturers, project developers, systems integrators, consulting firms, and other clean-tech industry leaders.

## **II. COMMUNICATIONS AND CORRESPONDENCE.**

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## **III. MOTION TO INTERVENE IN THIS PROCEEDING.**

CESA is a non-profit membership-based advocacy group, membership which consists of 1 Energy Systems Inc., Adara Power, Advanced Microgrid Solutions, AES Energy Storage, Amber Kinetics, Aquion Energy, Bright Energy Storage Technologies, Brookfield, California Environmental Associates, Consolidated Edison Development, Inc., Cumulus Energy Storage,

Customized Energy Solutions, Demand Energy, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, Electric Motor Werks Inc., ElectrIQ Power, ELSYS Inc., Enphase Energy, GE Energy Storage, Geli, Gordon & Rees, Green Charge Networks, Greensmith Energy, Gridscape Solutions, Gridtential Energy, Inc., Hitachi Chemical Co., Ice Energy, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Invenergy LLC, Johnson Controls, K&L Gates, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, NEC Energy Solutions, Inc., NextEra Energy Resources, NGK Insulators, Ltd., NRG Energy LLC, OutBack Power Technologies, Parker Hannifin Corporation, Powertree Services Inc., Qnovo, Recurrent Energy, RES Americas Inc., Saft America Inc., Samsung SDI, Sharp Electronics Corporation, Skylar Capital Management, SolarCity, Sovereign Energy, Stem, SunPower Corporation, Sunrun, Swell Energy, Trina Energy Storage, Tri-Technic, UniEnergy Technologies, Wellhead Electric, and Yunicos. CESA's intervention in this proceeding is in the public interest, and CESA's interests will not be adequately reflected by any other party. CESA therefore respectfully requests that this motion to intervene be granted.

#### **IV. COMMENTS.**

CESA has worked closely with the CAISO on a number of stakeholder initiatives to increase the participation of electric storage resources in wholesale markets. In particular, CESA commends the CAISO in its work on the Energy Storage Roadmap, the Energy Storage and Distributed Energy Resources (“ESDER”) Phase 1 Initiative, the Energy Storage Interconnection Initiative, and the Metering and Telemetry Initiative. CESA appreciates the progress made to date on storage and recognizes the CAISO’s important role in this progress.

Despite this progress, however, CESA believes that multiple market participation barriers for electric storage resources still exist in the CAISO’s market. In these comments, CESA focuses on identifying these barriers and proposing potential solutions to mitigate or remove them.

##### **A. CESA recommends key principles in assessing the accessibility of energy storage to wholesale markets.**

Electric storage resources are a growing part of the resource mix and should have nondiscriminatory access to wholesale energy markets. CESA believes several key principles

should govern this review and any efforts to remove barriers and create fair pathways to participation by electric storage resources.

- **Fair and reasonable compensation for services provided:** Electric storage resources should be fairly compensated for all of the benefits that they bring to the electric transmission system, including those that are not monetized through existing ISO and RTO markets. These benefits should be assessed in a balanced and comprehensive fashion, .
- **ISOs and RTOs should meet the intent of the FERC’s rules:** CESA encourages the FERC to direct follow-up actions for instances where market structures may not reflect the intent of FERC’s rules. As markets transform, rules may require adjustment, incorporating lessons learned where appropriate, even if those adjustments may limit regional flexibility. Similar to FERC’s follow-up Orders on Third Party Ancillary Services, the FERC must direct further change to ensure markets operate as intended.

**B. The ISOs and RTOs should be directed to develop market participation model specific to behind-the-meter electric storage resources.**

Currently, customer-sited electric storage resources participate in market participation models which may limit participation and value from these resources, leaving these resources under-valued and/or to be restricted from providing and being compensated for services provided.

The Proxy Demand Response (“PDR”) model’s Metered Generator Output (“MGO”) participation rules, for example, limit performance to resource movements beyond a baseline. This baseline is conservatively derived from a methodology that implies bidding only at the Net Benefits Test level. A more flexible baseline methodology that uses a less conservative approach to determining or measuring actions by the electric storage resources for customer services should be developed instead. This model should provide for varying ramp rates, regulation provision, and other resource restrictions, including detailed resource or aggregation capabilities. Because the PDR is the only model whereby BTM electric storage resources can ‘exit’ the market – *i.e.*, not be metered and exposed to market prices, BTM electric storage resources remain restricted to primarily using the PDR or Reliability Demand Response Resource (“RDRR”) models.

Fundamentally, market participants should be able to exit an organized market – *i.e.*, to participate in such markets in some hours and not in others, instead of having to choose up-front which model to follow. In the CAISO, Resource Adequacy (“RA”) rules direct the participation of resources in the CAISO market. The exposure of a resource without a Must-Offer Obligation (“MOO”) to participate in the CAISO market seems punitive and unwarranted. These electric storage resources should be able to choose to schedule and bid in those markets at some times but not others. For BTM electric storage resources, their out-of-market actions are reflected in their retail load profile so that all actions and costs are adequately addressed. For BTM electric storage resources participating in the NGR model, however, no such “exit” capability exists, exposing these resources to Uninstructed Imbalance Energy (“UIE”) and potentially other costs.

Rather than attempting to fit BTM electric storage resources into existing market participation models for traditional load-modifying resources or generation resources, FERC should direct ISOs and RTOs to develop a market model specific to BTM electric storage resources. In this specific model, BTM electric storage resources should be allowed to respond to market signals to provide any wholesale market service (*e.g.*, frequency regulation, demand response, spinning reserve) without restrictions, with its market participation governed by minimum performance requirements. In such a market model, more appropriate measurement and verification methodologies can be developed and multiple-use applications can be enabled that utilize a greater share of a BTM electric storage resource’s capacity and energy.

**1. The PDR model should allow for load consumption and/or regulation services.**

The PDR model should compensate PDR resources for consuming load in response to a unique CAISO dispatch. These resources thus could provide this valuable service in managing potential overgeneration situation, which may increase in frequency and magnitude as California advances toward its 50% Renewables Portfolio Standard (“RPS”) target by 2030. The potential oversupply of energy during the middle of the day, when solar generation is at its peak, is one reason why the PDR construct should be modified so that electric storage resources can consume this excess supply and thereby reduce the need to curtail renewable generation, thus avoiding wasted investment in renewable generation. Key jurisdictional issues and metering/settlement issues must be worked out in regards to the rate treatment of energy drawn from the CAISO grid to be resold or to be provided as a grid service – *e.g.*, regulation down.

CESA is actively involved in the CAISO's ESDER Phase 2 Initiative, which is investigating and developing a PDR product to allow for load consumption. As with load reduction, the CAISO is considering metering and settling load consumption under a baseline construct, which under-values electric storage resources, even as sub-metering is allowed with the MGO methodology. While CESA is collaborating with the CAISO to enhance the PDR model, CESA recommends consideration of a new model that applies new frameworks and methodologies to measure and compensate electric storage resources for the services it provides, which differ in capabilities from traditional load-modifying resources.

**2. Interconnection requirements for sub-resources may be excessive and should be reduced where appropriate.**

On the CAISO system, customer-sited and distribution-connected electric storage resources interconnect under the CPUC-jurisdictional Electric Tariff Rule 21. However, aggregated BTM electric storage resources that wish to export energy into the electric transmission grid and participate in the wholesale market must interconnect under the Wholesale Distribution Access Tariff ("WDAT"), in addition to the Electric Tariff Rule 21 study processes and interconnect under the Electric Tariff Rule 21.

The WDAT interconnection process can represent a significant burden for sub-resources within an electric storage resource aggregation that represents a small amount of load for several reasons. First, the WDAT interconnection process is time-intensive. Second, it can involve a study that assumes the "worst-case" charging behaviors (*e.g.*, charging energy and therefore adding load during peak-load times, or discharging energy to the grid at minimum-load times), creating higher deliverability or upgrade costs. Third, it is expensive for small resources. Finally, study processes or requirements should be accommodate how components of aggregations may interconnect at different times and how each site may not always plan to be part of an aggregation from the outset.

CESA therefore recommends consideration of a WDAT "lite" or a WDAT fast-track process to address this disproportional interconnection burden. Given that most BTM electric storage resources first interconnect under Electric Tariff Rule 21 to serve customer site needs (*e.g.*, demand charge management) and have already been studied for distribution system effects, it may be unnecessary to conduct a full WDAT interconnection study process. The WDAT lite or WDAT fast track option could import the study results from the Electric Tariff Rule 21

interconnection study process and agreement to streamline review and avoid duplicative efforts. Alternatively, within a cap, exemptions to the WDAT interconnection process could be made for aggregated electric storage resources under some stated megawatt capacity. Of course, the appropriate studies would need to be conducted to set such a threshold.

**3. Overhead costs of registering sub-resources within an aggregation can be burdensome and costly.**

Registration of individual customer sites with Load-Serving Entities (“LSEs”), the CPUC, and the CAISO can impose significant costs that discourage participation in the PDR and other wholesale market models. Instead, a separate administrative process under a BTM electric storage resource-specific model, or a streamlined version under existing constructs could reduce these administrative costs by allowing these forms and processes to be standardized across all sub-resources and be submitted in a single application.

**C. Current CAISO market compensation structures do not sufficiently value electric storage resources.**

There are several wholesale markets in which electric storage resources are not adequately valued and or allowed to provide specific ancillary or transmission-level services. In the following discussion, CESA provides an overview of the performance requirements and compensation structures (or lack thereof) that prevents electric storage resources from providing fast-responding, cost-effective electric transmission grid services.

**1. Regulation pay-for-performance in the CAISO’s market does not sufficiently compensate fast-response electric storage resources and does not reflect how those fast and accurate resources can lower procurement requirements when they are selected.**

Electric storage resources can provide fast-responding and more accurate frequency regulation in response to automatic generation control signals than traditional generation. This fast and accurate response can improve the reliability of the electric transmission grid and reduce the amount of regulation dispatch required.

FERC Order Number 755 required RTOs and ISOs to pay regulation service providers just and reasonable rate treatment based on regulation capacity and performance, *i.e.*, payments for mileage and accuracy in providing regulation. The CAISO implemented a pay-for-performance model in 2013 that included a market-based mileage payment and accuracy

adjustments. However, the CAISO has reduced its regulation performance requirements to continue to allow highly inaccurate resources to provide regulation, rather than implementing the market changes necessary to incent high-performing regulation assets such as electric storage resources that would result in procuring less regulation service overall, as was intended by FERC Order Number 755.

FERC Order Number 755 however, should lead the CAISO to assess how tighter accuracy rules could have saved costs by directing a lower amount of incremental regulation procurement. CESA believes that the CAISO can correct its pay-for-performance regulation design by applying its accuracy adjustment to *both* the capacity and mileage factors of its pay-for-performance formula, rather than just to the mileage factor. Minimum accuracy requirements could also be increased, and regulation demand curves could link to fleet accuracy levels. The CAISO should be directed to perform a review of performance, and compensation data is needed to consider whether adjustments are needed to mileage multipliers, long-term regulation contracts, etc.. Such information will help determine whether the implementation of pay-for-performance per FERC Order Number 755 has had the desired effects to the degree seen in other ISOs and RTOs.

**2. FERC should direct the CAISO to create a primary frequency response market.**

Electric storage resources have the capability to provide primary frequency response (“PFR”) to comply with NERC BAL-003-1 requirements. To meet those requirements by the December 2016 deadline, the CAISO is proposing a near-term solution that procures frequency response solutions through a competitive solicitation process from other Balancing Authority Areas (“BAAs”) but expects the PFR provision of CAISO BAA resources to be largely uncompensated and directed through interconnection and participation agreements. The CAISO plans to consider “in-market” solutions in the next phase of the Frequency Response Initiative to ensure that the most efficient and best-performing resources are selected to meet frequency response obligations.

FERC should direct that this service be provided through in-market optimizations and capacity reservations. This approach will yield an optimized dispatch and will not require PFR capabilities or provision from resources that provide it at higher costs. By directing PFR



procurement through an “in-market” solution, the opportunity cost of reserving the capability to provide this service will be reflected in market clearing prices.

**3. Electric storage resources are not sufficiently valued and compensated in transmission projects as non-wires alternatives.**

Electric storage resources continue to be hampered by “silo-like” treatment that fails to consider all of the benefits it can provide. For example, electric storage resources can act as non-wire alternatives that cost-effectively meet transmission needs (*e.g.*, congestion relief). Some electric storage resource benefits are compensable through CAISO/RTO markets (*e.g.*, energy price arbitrage, ancillary services provision, and, in some cases, capacity and ramping benefits) but other benefits (*e.g.*, reduced curtailment of renewable energy) are not monetized through existing markets. Electric storage resources as non-wires alternatives also have added benefits that provide value to ratepayers and help California meet its carbon reduction and clean-energy goals:

- Reduced siting environmental impacts
- Lower emissions from fossil-fuel resources
- Relatively quick design and construction for some technologies
- Flexibility to be developed incrementally
- Ability to be developed using existing infrastructure (*e.g.*, co-locating with existing electrical infrastructure)
- Reliability advantages by siting in diverse geographic locations

The CAISO itself studied a generic 500 MW pumped storage facility in the 2015-2016 Transmission Planning Process (“TPP”). The study concluded that the project could not cover its revenue requirement through existing markets and stated that “the net revenue from the market would not reasonably be the only revenue stream – consideration should also be given to how the storage resource would be compensated for the benefits it brings to the system.”<sup>3</sup> However, the study did not take the next logical step to propose how such benefits could be fairly compensated. The one case where a developer attempted to characterize an energy storage project as “advanced transmission” and requested compensation through the CAISO Transmission Access Charge (“TAC”) – admittedly with a flawed application that raised many

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<sup>3</sup> CAISO 2015-2016 Transmission Plan, p. 60. <http://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf>

issues under the then-market structure – was not supported by the CAISO and was never approved.

CESA believes that the Commission should provide additional guidance to the CAISO and other RTOs that electric storage solutions should be analyzed in a comprehensive manner that: (1) considers all of the benefits such solutions can provide; and (2) allows for cost recovery in transmission rates commensurate with the full range of benefits not recoverable in organized markets. With appropriate controls and authorities for Multiple Use Applications, compensation for grid-wide benefits in the TAC would also better enable electric storage resources to fairly compete and provide services for “all-resource” procurement opportunities with traditional generation for the benefits they provide that are similar to such resources.

**D. There are very few long-term contracts for electric storage resources.**

A significant barrier to robust wholesale market participation by electric storage resources is the lack of long-term energy storage contracts, which can provide revenue certainty for financial institutions and thereby increase electric storage resource participation in providing various transmission grid services. The robust response by energy storage developers to SCE’s 2013 Local Capacity Requirements (“LCR”) Request for Offers (“RFO”) stems in large part from the long-term RA and grid services contracts signed and executed. For the CAISO, long-term contracts for electric storage resources would create certainty in planning and modeling efforts and greater assurance of a deep pool of resources to provide capacity, energy, regulation, and other grid services. Reliance on spot markets can lead to deficiencies in certain ancillary services, such as regulation down in the CAISO’s market. The onus on developing these long-term contracts should be on the CPUC and the LSEs.

**E. There should be fuel or resource diversification requirements for wholesale market resources.**

FERC’s gas-electric coordination work highlighted how problems on gas distribution systems can present serious challenges to the electric transmission and distribution grid. In some cases, these challenges may be significant enough to represent an “N-1” contingency, or other high-level constraint on the electric transmission and distribution grid.

For example, the gas leak and subsequent use moratorium at the Aliso Canyon gas storage facility in the Los Angeles Basin has created the risk of up to 14 days of blackouts in

summer 2016 and uncertainty for future operations. Because Aliso Canyon is the only gas storage facility available to provide gas supplies for the area's natural gas-fired power plants that support hourly and sub-hourly summer electricity demand changes, Southern California Edison Company ("SCE") and the Los Angeles Department of Water and Power ("LADWP") customers are at risk of outages, with uncertainty as to the timing of the return to normal conditions. Use of any of the limited amount of gas available from the Aliso Canyon gas storage facility in summer 2016 would only worsen the conditions for winter 2016 and beyond. This situation has raised important questions about natural gas as a reliable resource in the long-term and caused numerous stakeholders to push for the state to consider reducing overall reliance on natural gas and increasing the use of other types of energy resources, such as renewable energy and energy storage.

At the CAISO level, this situation has also indicated a need for resource or fuel diversification requirements for wholesale market resources and services. As it stands today, there are no fuel-diversification requirements in California's RA program or the CAISO's energy and ancillary services markets. In the event of a gas supply shortage, gas-fired generators may be unable to provide RA as contracted, leading to situations like Aliso Canyon gas storage facility situation. Similarly, in the ancillary services market, an overreliance on gas-fired generators may lead to a shallow pool of resources that can provide frequency regulation, ramping, or energy services when gas supplies cannot be delivered to generators. Greater wholesale market participation of electric storage resources would help states diversify the pool of resources to provide energy and grid reliability services. However, without resource diversification requirements, electric storage resources would be under-valued in the wholesale market.

CESA believes that ISOs and RTOs need workable fleets to manage their systems. To this end, FERC should revisit how ISOs and RTOs assess fuel risks and should consider requiring diversification levels. Diversification requirements should be implemented capacity modeling and planning exercises to ensure that the generation fleet does not face inappropriate fuel-supply risks. Such actions could have helped identify the high reliance on the Aliso Canyon gas storage facility earlier and mitigated the urgency of the current situation.

V. **CONCLUSION**

The barriers and solutions presented in these comments and in this proceeding should inform FERC to order the ISOs and RTOs to make tariff changes needed to allow electric storage resources to both better participate in wholesale markets and be fairly valued and compensated for the range of services they can provide. CESA looks forward to continuing to work with FERC to ensure that appropriate rules and incentives are in place to enable robust electric storage participation in wholesale markets.

Respectfully submitted,



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Counsel for the  
**CALIFORNIA ENERGY STORAGE ALLIANCE**

June 6, 2016

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served a copy of *Motion to Intervene and Comments of the California Energy Storage Alliance* on all parties of record in proceedings *AD16-20-000* by serving an electronic copy on their email addresses of record and by mailing a properly addressed copy by first-class mail with postage prepaid to each party for whom an email address is not available.

Executed on June 6, 2016, at Woodland Hills, California.

  
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