

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

Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators	Docket No. RM16-23-000
Electric Storage Participation in Regions with Organized Wholesale 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 these comments in response to the Federal Energy Regulatory Commission’s (“FERC’s”) request for comments in the Notice of Proposed Rulemaking (“NOPR”) issued on November 17, 2016. CESA appreciates FERC’s stated intent to remove barriers to wholesale market access, which underlie the proposed requirements to facilitate electric storage resource wholesale market participation.

CESA focuses primarily on energy storage markets and policies in California, and has played substantive roles in numerous energy storage-related procurements, legislation, and market reforms. CESA applauds FERC’s proactive efforts to examine existing market participation models and associated barriers to electric storage resource participation to provide various wholesale grid services. As the NOPR correctly notes, electric storage resources are technically capable of providing numerous wholesale grid services, but existing market participation models do not always sufficiently accommodate the physical and operational

characteristics of these resources.<sup>1</sup> Fortunately, in California, the California Independent System Operator (“CAISO”) has been forward-looking in terms of facilitating electric storage resource participation in its wholesale market with, for example, Non-Generator Resources (“NGR”), Pump Storage, and Proxy Demand Response (“PDR”) models.

Of course, the NOPR frequently cites the CAISO as a model for other Regional Transmission Organizations (“RTOs”) and Independent System Operators (“ISOs”). CESA greatly appreciates the CAISO’s efforts as a constructive partner regarding these initiatives. CESA advocates in its comments for further improvements to be made to the CAISO’s models to continue lowering barriers to electric storage resource wholesale market participation, and suggests a number of adjustments or additions to be considered in any Final Rule issued in this docket.

## **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.

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<sup>1</sup> NOPR at ¶21.

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

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

CESA's current membership consists of 8minutenergy Renewables, Advanced Microgrid Solutions, AES Energy Storage, AltaGas Services, Amber Kinetics, Bright Energy Storage Technologies, Brookfield, Consolidated Edison Development, Inc., Customized Energy Solutions, Demand Energy, Doosan GridTech, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, Electric Motor Werks, Inc., ElectriQ Power, ELSYS Inc., Energy Storage Systems Inc., Enphase Energy, GE Energy Storage, Geli, Green Charge Networks, Greensmith Energy, Gridscape Solutions, Gridtential Energy, Inc., Hitachi Chemical Co., IE Softworks, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Johnson Controls, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Magnum CAES, Mercedes-Benz Research & Development North America, National Grid, NICE America Research, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, NGK Insulators, Ltd., NRG Energy, Inc., OutBack Power Technologies, Parker Hannifin Corporation, Powertree Services Inc., Qnovo, Recurrent Energy, RES Americas Inc., Sharp Electronics Corporation, SolarCity, Southwest Generation, Sovereign Energy, Stem, Sunrun, Swell Energy, Wellhead Electric, and Younicos. 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.**

##### **A. FERC should authorize Multiple-Use Applications and allow regional entities to determine additional rules or controls, as appropriate.**

CESA supports many of the proposals in the NOPR regarding market participation models for distributed energy resource (“DER”) aggregations. CESA agrees that technological advancements have made it possible to enable these DER aggregations, and that any particular technology type should not be prohibited from being part of DER aggregations. The NOPR also reasonably directs RTOs and ISOs regarding locational requirements, distribution factors, bidding parameters, resource list modification processes, market participation agreements, and stakeholder coordination in support of DER aggregations. Each of these changes, many of which have already been or are in the process of being implemented by the CAISO, will ensure that wholesale markets have as much participation as possible by DERs in providing various wholesale grid services.

CESA believes the details of how and which multiple-use applications (“MUAs”) should be authorized is best left to regional decision-makers, such as RTOs or ISOs, or Local Regulatory Authorities (“LRAs”). Blanket FERC positions on the details of MUAs could prove to be overly broad and could inadvertently or inappropriately conflict with or restrict otherwise acceptable rules. FERC should thus express its policy goals but stay above the details, such as rules regarding whether retail demand response should or should not be allowed to be part of a DER aggregation in cases where double payment concerns may arise.

The details of MUA rules and eligibility are complex and could easily be misconstrued. For example, a California LRA may pursue demand response contracts for distribution functions

that could be completely separate from wholesale market needs and benefits.<sup>2</sup> In such a case, the demand response dispatch would not already be reflected in wholesale market prices nor would the resource be compensated for market participation. In this case, concerns about double payment for an incremental and unique demand response ‘service’ participating in both wholesale markets and the distribution function are likely to be inapplicable. Broad rules might miss the important details of such an arrangement, so rules for double payments should be left to regional decision-making bodies.<sup>3</sup>

CESA does not support inappropriate double compensation for a service. But, if two or more services (whether wholesale or retail) are demonstrated to provide distinct and incremental value to more than one entity (*i.e.*, customer, distribution utility, or the ISO), and where the action is not otherwise already reflected in energy prices through normal mechanisms (*e.g.* through load procurement of energy in a wholesale market) then each of the grid services provided should be separately compensated. CESA believes double payment concerns typically arise in instances where unique and incremental market-directed actions are *not* occurring and so the grid or system effects of an action is negligible or is already reflected in market prices, plans, etc. The CAISO’s rules that measure incremental performance from a baseline specifically address this concern in a fair and reasonable way. The CAISO thus squarely addresses the double payment concern for MUAs. The provision of services in other jurisdictions, such as distribution services or customer services, can be valuable and warrant compensation so long as the services are in fact provided and regardless of whether or not such actions simultaneously cause effects or provide benefits in other jurisdictions.

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<sup>2</sup> This issue is being currently considered at the California Public Utilities Commission in its Energy Storage Rulemaking (R.15-03-011).

<sup>3</sup> NOPR at ¶104.

CESA thus concludes that the double payment issue should not be addressed in any detail by FERC. LRAs may have different retail programs governed by different qualification criteria and operational requirements such that FERC could be sub-optimally situated to determine when participation in a retail program broadly constitutes double payment and therefore should be excluded from wholesale market participation. Insofar as FERC may categorically prohibit some MUA configurations, CESA is concerned that FERC could unnecessarily limit MUAs situated as behind-the-meter (“BTM”) electric storage resources and other DERs, and thereby create a barrier to wholesale market participation without accounting for the differences in retail programs in different jurisdictions.

In conclusion, instead of determining that DERs enrolled in retail programs should be excluded from wholesale market participation due to double payment concerns, FERC should defer to local stakeholders (*i.e.*, LRAs, and ISOs and RTOs) to review retail program rules and requirements to determine whether a double payment issue is indeed present.

**B. FERC should only require state-of-charge as a bidding parameter when appropriate.**

The NOPR directs RTOs and ISOs to include state-of-charge (“SOC”), upper and lower charge limit, and maximum charge and discharge rates as bidding parameters for electric storage market participation models.<sup>4</sup> These bid parameters are understandably specified to ensure that the RTO or ISO can direct feasible dispatches from an electric storage resource. However, CESA believes that establishment of such bid parameters should be optional at the discretion of market participants, who are then responsible for how the electric storage resource is dispatched if not providing SOC information. The reason for this optionality is that there may be certain

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<sup>4</sup> NOPR at ¶58.

resources, such as DER aggregations, where the inclusion of SOC and other bid parameters are unjustly and unreasonably difficult or infeasible to provide.

CESA understands that bidding parameters may be necessary for providing frequency regulation, which requires high-frequency dispatch (*e.g.*, every four seconds), and also understands that being able to submit these bidding parameters is important for some electric storage resources, which may suffer physical or economic consequences if certain operating parameters are exceeded or violated. In Phase 1 of its Energy Storage and Distributed Energy Resources (“ESDER”) Initiative, the CAISO therefore established an optional daily SOC bidding parameter to be submitted in the day-ahead market in order to avoid infeasible dispatches. Prior to this change, the CAISO’s NGR model assumed that the initial SOC value for the trading day as the ending SOC value for the previous trading day, while assuming a 50% SOC if there were no awards in the previous trading day. At the same time, the CAISO maintained the optionality of this bid parameter, appropriately putting the onus on market participants to manage their own SOC and optimize their resource’s operations. This optionality should also be afforded to real-time market bids, as actual SOC may not always align with forecasted SOC.

**C. The 100-kW minimum size requirement for market participation is appropriate for PDR and DER Aggregation models.**

The NOPR explains the benefits of increased competition from more electric storage resources participating in the market, and how such participation models are manageable by RTOs or ISOs, as is the case with the CAISO’s Distributed Energy Resource Provider (“DERP”) model.<sup>5</sup> Conversely, allowing resources that are *de minimus* in size to participate may create challenges for power flow modeling, require utility conferral and review, and generate additional costs for implementing software changes to optimize across more data points, which could

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<sup>5</sup> NOPR at ¶76.

combine to lead to longer or excessive market solution times. Accordingly, CESA supports the minimum size requirement for PDRs and DERPs at 100 kW as reasonable participation size floor. The 100 kW level implies there is some energy delivery capability yet avoids the need to develop resource IDs and data for too many small resources.

**D. FERC should clarify that efficiency losses and directly integrated loads associated with electric storage resources represents wholesale consumption for resale.**

The NOPR correctly requires that the sale of energy from wholesale markets to electric storage resources to be used for resale be charged at the wholesale locational marginal price (“LMP”).<sup>6</sup> This rule is fair and reasonable. The CAISO, for example, currently requires all electric storage resources participating in its wholesale markets to operate under such a rule. This proposal is appropriate but further clarity is needed. Thus, while CESA appreciates FERC’s determination that the sale of energy from wholesale markets to electric storage resources to be used for resale should be charged at the wholesale LMP, FERC should further stipulate that efficiency losses and directly integrated loads that cannot be differentiated from charging loads should be counted as energy charged for resale.

For electric storage resources, fair and reasonable accounting and rate treatment of wholesale charging energy is important to their economics and relative competitiveness in wholesale market participation. FERC should thus clarify that efficiency losses and directly integrated loads associated with electric storage resources represents wholesale consumption for resale. This clarification is important to overcoming a potential barrier to wholesale market participation by electric storage resources.

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<sup>6</sup> NOPR at ¶81.



CESA proposes that loads that are unavoidable to the ‘production’ or ‘conversion’ of energy drawn from the grid or are integral to the optimal production or conversion of energy drawn from the grid represent efficiency losses. These are inherent and directly integrated loads that factor into the direct production or conversion of energy to be stored in the electric storage device with the intent of reselling it later to provide various grid services. If these loads are turned off, the electric storage device could no longer operate, or be otherwise disadvantaged. CESA therefore believes that efficiency losses *and* directly integrated loads should unambiguously be subject to wholesale rates.

**E. FERC should allow metering and accounting rules to be determined at the regional local regulatory authority level.**

The NOPR seeks comment on whether metering and accounting practices need to be established to determine end-use for energy used to charge electric storage devices. Beyond a declaratory rule for wholesale charging energy, efficiency losses, and necessary directly-integrated loads to receive wholesale treatment, as discussed above, CESA recommends that development and implementation of metering and accounting rules should be determined at the LRA level. In some cases, these rules may seek to differentiate retail from wholesale loads, making the matter jurisdictional to states. In other cases, the appropriate metering and accounting configuration may simply benefit from a solution tailored to meet specific needs. For instance, metering accuracy, a requirement for revenue grade metering versus estimation methodologies, could be determined at the local level and may further link to the suite of products intended for sale. By allowing for local or LRA determination, FERC can avoid making any potentially unreasonable inappropriate or ex-jurisdictional policy requirements on what is a regional, local, or LRA matter.

**F. FERC should affirm that shorter-duration electric storage should be able to meet minimum run-time requirements without de-rating capacity.**

CESA strongly supports FERC's proposal to ensure that electric storage resources are eligible to provide all capacity, energy, and ancillary services that they are operationally capable of providing. The NOPR captures the breadth of services that electric storage resources can provide, including non-market-based services such as black start and reactive power.<sup>7</sup> CESA agrees that qualification criteria should not limit participation of any type of electric storage resource. For example, by stating that the participation of electric storage resource should not inappropriately be conditioned on requirements that were designed for synchronous generators,<sup>8</sup> FERC should help to remove the barrier to electric storage providing spinning reserves as asynchronous, inverter-based resources.

Regarding market participation eligibility, however, CESA recommends that FERC revise its proposal that electric storage resources be allowed to de-rate their capacity to meet minimum run-time requirements to provide capacity or other services.<sup>9</sup> Specifically, in recognition of the range of electric storage technology types, FERC should affirm that shorter-duration electric storage resources should be eligible for market participation and product eligibility, where reasonable, without de-rating if the assigned value of capacity for those resources. In the CAISO's balancing authority area, NGR resources that also provide Regulation Energy Management ("REM"), for example, can bid their full capacity in the day-ahead market for 15-minute intervals. As such, it is not always the case that shorter-duration electric storage resources must necessarily de-rate their capacity to meet minimum run times to participate in

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<sup>7</sup> NOPR at ¶19-20.

<sup>8</sup> NOPR at ¶50.

<sup>9</sup> NOPR at ¶45.

capacity markets. These determinations should therefore be made by the individual RTO or ISO based on market needs.

**G. FERC should ensure that electric storage resources recover their full costs comparable to traditional wholesale resources.**

FERC seeks comment on whether market models should include commitment costs and also whether make-whole payments should be used in cases where resources are unable to recover their costs. CESA believes these policies are sound aspects of market participation and ensure good-faith participation by resources that are committed for market activities. Most other resource participation models include a Commitment Cost and Bid-Cost Recovery functionality. Accordingly, FERC should direct that all electric storage participation models such as the NGR or PDR models include the ability to represent commitment costs and also to receive Bid-Cost recovery or other applicable uplift or make-whole payments where appropriate.

Currently, the CAISO's NGR model does not include the ability to represent commitment costs, which may lead to unrecoverable costs. For instance, if a NaS-based electric storage device is committed to provide market services, that resource may incur costs for managing its thermal loads as part of 'readying' the device to participate in the market. The unit may then be decommitted without ever having sold energy at bids where it could recover its costs. Through the use of Commitment Costs, such a resource operator could be made whole. CESA thus recommends that FERC affirm the need for appropriate Bid Cost Recovery and Commitment Cost models for all electric storage market participation models.

**H. FERC should direct RTOS and ISOs to develop tools to better direct dispatch preferences or needs.**

Electric storage resources have unique capabilities and characteristics such that participation models for electric storage may need additional tools. These tools can ensure

electric storage resources can compete economically and rationally in competitive markets. These tools should include the ability to submit multiple bid-stacks to real-time markets that optimally dispatches an electric storage resource based on its SOC as well as its daily or other interval throughput limitations. CESA therefore recommends that FERC direct the establishment of two such tools to be included or packaged with electric storage participation models – such as the NGR or PDR models in California.

First, CESA notes that electric storage resources may seek or need to use a mechanism to update dispatch preferences based on SOC. An appropriate tool to achieve this need is to allow for submittal and subsequent use of different set of economic bids, *a.k.a.* energy ‘bid-stacks’, for electric storage resources participating in real-time markets. CESA has proposed this approach in the CAISO’s ESDER Initiative Phase 2. The idea is that, depending on the SOC of a resource, the unit may wish to have different economic signals for dispatch. Thus, if an electric storage resource has a very low SOC, it may wish to bid so that it will likely be scheduled for charging, and vice versa. By allowing submittal of multiple bid-stacks, an electric storage resource can be reasonably sure it will be dispatched appropriately given its SOC. Electric storage resources need this capability because the SOC is occasionally difficult to determine at the time when bids are submitted. In CAISO’s case, real-time bids are submitted 75 minutes prior to an operating hour. By submitting multiple bid-stacks that should be used only at a certain SOC, the market will choose to dispatch from the appropriate bid-stack depending on the SOC, and the bid stack is configured to economically signal how the resource wishes to dispatch across the hour. This approach would help ensure electric storage resources are not disadvantaged in real-time by being dispatched to a degree that subsequent schedules are difficult to honor. For example, if a resource wants to deliver on its Day-Ahead schedule to provide 10 MWh of energy in Hour-

Ending 17, it may not wish to be fully discharged in Hour-Ending 16. Yet the resource would need to submit bids for Hour-Ending 16 at 13:45 – *i.e.*, 75 minutes prior to the beginning of the bid hour. By submitting multiple bid-stacks based on high, medium, or low SOC, the optimization can dispatch in a manner that accords with the energy limitations of the resource while also ensuring a resource can feasibly meet day-ahead market schedules.

A second tool that is appropriate for electric storage is the ability to limit daily cycling, a.k.a. a ‘megawatt-hour through-put limitation’. Consider that electric storage resources may have near infinite ramp rates. As such, a resource participating in the real-time market could be cycled between p-max and p-min *every five minutes*. This type of usage may be appropriate but could also cause excessive wear-and-tear, and could force electric energy resources out of the market without having participated during optimal time periods. To avoid this excessive cycling concern which may void warranties and expose electric storage resources to more ‘mileage’ than other similarly situated resources, the electric storage resources should be able to limit the amount of cycling by means of some kind of practical mechanism. CESA recommends that electric storage participation models include a through-put limitation. For instance, if a resource only wants to cycle three times in a day, a through-put limitation could represent this restriction and mathematically ensure the market solution or market optimization uses the resource only where applicable and within acceptable limits.

## V. CONCLUSION

CESA supports many of the proposals in the NOPR as effective guidance for RTOs and ISOs, although as discussed above, there are certain areas where greater clarity is needed. Clarifying details are best addressed at the RTO and ISO level, given that each has its own unique market structures, policies, and grid needs. With the benefit of this kind of clear direction

from FERC, CESA looks forward to continuing collaboration with the CAISO and other stakeholders to develop the detailed implementation frameworks needed to eliminate many of the existing market participation barriers to electric storage resources and DER aggregations.

Respectfully submitted,



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February 13, 2017

## 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 *RM16-23-000 and 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 February 13, 2017, at Calabasas, California.

  
Michelle Dangott

### SERVICE LISTS RM16-23-000 AND AD16-20-000

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