

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D.13-10-040, D.14-10-045) and related Action Plan of the California Energy Storage Roadmap.

Rulemaking 15-03-011  
(Filed March 26, 2015)

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE  
ON ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENTS  
ON JOINT REPORT AND STAFF PROPOSAL**

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In accordance with Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), the California Energy Storage Alliance (“CESA”)<sup>1</sup> hereby submits these comments on the *Administrative Law Judge’s Ruling Seeking Comments on Joint Report and Staff Proposal*, issued by Administrative Law Judge Michelle Cook on January 10, 2017 (“Ruling”).

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<sup>1</sup> 8minutenergy Renewables, Adara Power, Advanced Microgrid Solutions, AES Energy Storage, AltaGas Services, Amber Kinetics, Aquion Energy, Bright Energy Storage Technologies, Brookfield, California Environmental Associates, Consolidated Edison Development, Inc., Cumulus Energy Storage, 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, Gordon & Rees, Green Charge Networks, Greensmith Energy, Gridscape Solutions, Gridtential Energy, Inc., Hitachi Chemical Co., Ice Energy, IE Softworks, 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, Mercedes-Benz Research & Development North America, National Grid, Nature & PeopleFirst, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, 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, Southwest Generation, Sovereign Energy, Stem, Sunrun, Swell Energy, Trina Energy Storage, Tri-Technic, UniEnergy Technologies, Wellhead Electric, Younicos. The views expressed in these Comments are those of CESA, and do not necessarily reflect the views of all of the individual CESA member companies. (<http://storagealliance.org>).

## I. INTRODUCTION.

CESA appreciates the opportunity to comment on the Ruling, and on the considerable amount of thoughtful work that has gone into the *Joint Report and Staff Proposal* attached to the Ruling (“Report”).<sup>2</sup> Throughout the course of this proceeding, CESA has advocated for a clear Commission guidance on the subject of station power rules so that grid-connected energy storage devices, or resources, participating in wholesale markets would not be disadvantaged by tariff rates that can lead to discriminatory and unduly burdensome operations and costs when compared with conventional resources.

Energy storage is a relatively new regulatory energy resource class that requires a forward-looking perspective in developing rules and regulations applicable to station power and multiple use applications (“MUAs”).<sup>3</sup> Historical approaches may be inadequate to the task, failing to direct energy storage project deployments and uses consistent with basic principles that should govern a clear beneficial role for energy storage resources in supporting key grid, customer, and environmental policies. Commission guidance developed in this proceeding will be critical to clarifying and expanding the role of energy storage in integrating higher penetrations of renewable resources, diversifying California’s energy resource portfolio, and improving reliability, while at the same time reducing greenhouse gas (“GHG”) emissions, lowering costs to the benefit of ratepayers, and expanding flexible options for grid managers and operators.

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<sup>2</sup> *Joint Report and Staff Proposal, May 2, 2016 Joint Workshop Station Power for Electric Storage Device Rulemaking (R.)15-03-011*, published January 5, 2017.

<sup>3</sup> See, e.g., Federal Energy Regulatory Commission Policy Statement, *Utilization of Electric Storage Resources*, No. PL17-2-000, issued January 19, 2017; 158 FERC ¶61,051.

## **II. BACKGROUND**

The Report substantially informs the record in this proceeding for consideration of points relevant to Commission determination of appropriate station power rules governing energy storage resources. Station Power rules define which loads associated with the operation of wholesale market participants, such as traditional fossil fueled generators or energy storage resources, are subject to either retail or wholesale tariff rates, as well as how retail tariff rates may be added to, or “netted” against, energy resource output. Loads associated with the direct operation of wholesale market participants are termed “auxiliary loads,” and are afforded wholesale rate treatments as befits wholesale market participation.

The Report lists general findings and recommended rules for station power, including:

- 1) Energy storage is similarly situated to conventional generation in cases where station power rules are applicable.
- 2) Station power rules for resources other than energy storage are out of scope.
- 3) Energy drawn from the grid to charge energy storage resources, and efficiency losses, for later resale should be subject to a wholesale rate.
- 4) Energy storage station power rules should apply to in-front of the meter (“IFOM”) and behind-the-meter (“BTM”) energy storage where BTM resources are sub-metered and participating subject to “must-offer” obligations.
- 5) Energy consumed and not resold is station power and should be considered retail energy.
- 6) Wholesale energy treatment, for these purposes, should apply to charging energy, resistive losses, pump (flow batteries), power conversion systems, and transformers; whereas retail station power rates should apply to the battery management system, thermal regulation, vacuum for flywheels, IT and communications, lighting, ventilation, and safety.
- 7) Netting, or treating retail loads as wholesale, should be permitted where the mileage or absolute value of the energy transacted for wholesale purposes exceeds that of retail station power loads.

On May 2, 2016, the Commission and the California Independent System Operator (“CAISO”) convened a joint workshop devoted entirely to the subject of station power. At the workshop and in comments filed in this proceeding, as well as in the CAISO’s initiative titled *Energy Storage and Distributed Energy Resources 2* (“ESDER 2”),<sup>4</sup> CESA has advocated for two main station-power tariff rate outcomes:

First, CESA proffers the following breakdown of energy storage loads as either wholesale auxiliary loads or retail station power loads.

**Table 1: CESA recommended categories for Efficiency Losses, Auxiliary Loads, and Retail Station Power Loads**

<b>Efficiency Losses</b>	<b>Non-Discretionary Auxiliary Loads</b>	<b>Discretionary Station Loads</b>
<ul style="list-style-type: none"> <li>• Resistive losses</li> <li>• Self-discharge (standby)</li> <li>• Pumps (flow batteries)</li> <li>• Power conversion system</li> <li>• Transformer</li> </ul>	<ul style="list-style-type: none"> <li>• Battery management system controller</li> <li>• Thermal regulation</li> <li>• Vacuum (flywheels)</li> </ul>	<ul style="list-style-type: none"> <li>• IT &amp; communications</li> <li>• Lighting</li> <li>• Ventilation</li> <li>• Safety</li> </ul>

Second, CESA has identified specific netting rules for any station loads to place energy storage on even footing with traditional fossil fueled generation resources that are currently able to leverage netting mechanisms.

**III. THE COMMISSION SHOULD EXPEDITIOUSLY MANDATE ACCOUNTING FOR STATION POWER LOADS TO ACCOMMODATE NETTING FOR ENERGY STORAGE PARTICIPATION IN WHOLESALE MARKETS IN CHARGING, DISCHARGING, ANCILLARY SERVICES, AND FLEXIBILITY ROLES.**

CESA strongly supports the Report’s finding that netting of retail energy costs should be authorized for energy storage resources participating in sales of wholesale energy services. While netting in intervals where energy storage devices are discharging is a conventional form of

<sup>4</sup>[http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage\\_DistributedEnergyResourcePhase2.aspx](http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResourcePhase2.aspx)

netting, the Report properly finds that netting should also be allowed for periods of “negative generation.” This accounting treatment for retail loads combined with periods of negative generation is crucial for energy storage to optimally provide flexibility to the system, including fast response services such as regulation. The record in this proceeding to date, specifically including the examples provided by LS Power,<sup>5</sup> clearly shows how overly restrictive station power or netting rules for energy storage would disadvantage the entire resource category when compared to traditional fossil-fueled generators.

A Commission decision issued in this proceeding should immediately direct Commission-jurisdictional Investor-Owned Utilities (“IOUs”) to revise extant contract terms and conditions to allow for wholesale accounting of specifically define energy storage loads, including netting of retail loads, by treating such loads as wholesale under certain market participation scenarios or conditions. As IOU solicitations are currently underway pursuant to energy storage procurement Applications approved by the Commission and elsewhere,<sup>6</sup> the Commission should ensure IOU compliance with station power rules expeditiously in order to avoid any potential for flawed or inappropriately-structured contracts.

#### **IV. PERMITTED NETTING METHODOLOGY AND TRIGGERS MAY NEED ADJUSTMENT.**

CESA supports a reasonably precise set of rules for determining when retail station power loads can be accounted for as wholesale costs through netting. Such rules are particularly important given the economic motivation for operators of energy storage resources to provide more than one energy service under MUAs. Rules should fully authorize netting at appropriate times, while restricting or prohibiting netting at other times when such restrictions may be

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<sup>5</sup> See, LS Power’s ESDER 2 Revised Straw Proposal Comments, pp. 14-15, submitted August 11, 2016.

<sup>6</sup> See, *Decision Adopting Energy Storage Procurement Framework and Design Program*, D.13-10-040, issued October 17, 2013, pp. 9-10.

unnecessary, such as when a customer-sited energy storage resource is providing retail services for the onsite host customer and is therefore not operating “in the wholesale market.”

Specifically, the Commission should establish a rule whereby retail station power loads receive wholesale netting treatment during intervals during which the sum of the absolute value of charging or discharging energy is greater than station power loads. The Commission should clarify that such netting is allowed across the CAISO’s “standard” 15-minute or larger settlement period rather than in a “to-be-determined” mode or a different interval.

In addition to the Report’s proposals, CESA recommends one additional rule also be authorized by the Commission for tracking and triggering when station power loads can be accounted for through the approved netting methodology. Some energy storage resources may provide ancillary services which may involve no “movement,” or energy charging or discharging, yet where the resource is clearly participating in the wholesale market. Similarly, a wholesale generator spinning and committed for providing spinning reserve will net its station power loads against its wholesale market participation capability, even if no energy for spinning reserve is being discharged to the grid. Functionally, such an approach should reduce the total effective output of the resource to the grid.

CESA thus recommends that the Commission establish rules to enable wholesale accounting for station power loads during any period in which a grid-connected energy storage device is providing any authorized service to the CAISO, including energy, flexible ramping, regulation, spinning reserve, and non-spinning reserve.<sup>7</sup> To capture these proposed changes, CESA recommends the following revisions to the Reports:

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<sup>7</sup> With such a rule, the CAISO would of course also need to establish its own rules for tracking commitment costs for energy storage resources, akin to its current Non-Generator Resource or Proxy-Demand Resource participation tariffs.



*“7a. Insofar as an In-front of the Meter or Behind-the-Meter energy storage resource withdraws energy (charges) or injects energy (discharges) subject to a dispatch at a greater capacity absolute value of energy than its station power consumption, that consumption should be able to be netted against the response to the dispatch within a fifteen minute or larger settlement period, just as it is for conventional generators.”*

*7b. Station Power loads should also be accounted for at wholesale rates during settlement periods of 15-minutes or larger when an energy storage resource is providing or committed to provide any CAISO product, including energy, flexible ramping product, regulation, spinning reserve, or non-spinning reserve.”<sup>8</sup>*

Finally, CESA respectfully finds concerns about cost-shifting as a result of “netting” during periods of negative generation irrelevant and representative only of changes from assumed rules. Stepping back, it is important to note how, in periods of netting for negative generation, energy storage resources still pay fully for the wholesale costs of these loads. As new resources on the system, they will fundamentally add load in utility service territories, absorbing costs. CESA notes, for example, that Southern California Edison’s (“SCE’s”) accounting for cost-shifting implies that rates were established with an expectation for energy storage systems to operate under SCE’s proposed station power rules, which would establish discriminatory treatment to energy storage. Only from this vantage point would a switch to the Report’s proposed netting rule yield a cost-shift. If looked at from a baseline where netting during periods of negative generation is allowed, the application of and switch to rules such as SCE’s would create a windfall benefit to other retail users.

**V. BEHIND THE METER RESOURCES REQUIRE CLEAR STATION POWER RULES AND WHOLESALE RATE TREATMENT, BUT MAY NOT ALWAYS REQUIRE TWO METERS.**

CESA supports the intent of the Report’s proposed two-meter requirement for BTM energy storage metering configurations. Energy storage devices should only operate under

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<sup>8</sup> Report, p. 30.

auxiliary load and station power netting rules when providing wholesale services, not when providing other services. This distinction is important for MUAs, including for BTM energy storage providing both market and onsite host customer services at various times. CESA therefore supports the need for *some form of* measurement by which to account for accurately accounting what and when and how much BTM loads are part of wholesale-directed actions.

Sub-metering need not always require two-meters. Instead, rules should allow for multiple metering configurations so long as they categorize and document how energy is used and for what functions, *e.g.* for wholesale generation versus for customer use on site. So called “metering-in-isolation” metering configurations should be allowed and illustrate this need. Such metering configurations should be authorized to replace Net Generator Output Metering (“NGOM”) so that NGOM is not required as the default metering for wholesale service configurations. CESA notes that the implementation of NGOM is appropriate for traditional resources but is problematic for energy storage resources since NGOM charges for all energy drawn from the grid but gives zero netting or credit when energy is released, and so results in energy storage devices being charged for energy at retail rates for a use which is actually wholesale and then being given zero credit when that energy is released back to the grid under CAISO control. The economics of this result in a double charge to the energy storage system operator while giving the energy to the Utility without compensation, economically disadvantaging many energy storage applications inappropriately. Metering for such “sub-metering type” configuration resources may ensure that net energy metering (“NEM”) credits are not inappropriately counted as wholesale services.<sup>9</sup>

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<sup>9</sup> Metering configurations can be project specific and complex at times. See Appendix A, attached, for an example of a metering configuration where “measurement in isolation” occurs. Settlement issues with this configuration would need to be addressed in the CAISO’s settlements process. ESDER 2 could appropriately address these needs.

**VI. DEFINITIONS OF AUXILIARY LOADS AND STATION POWER LOADS SHOULD BE UPDATED IN SEVERAL IMPORTANT WAYS.**

As discussed in the Report, clearly establishing auxiliary load treatment for specified energy storage loads is essential to the success of this emerging technology as a class. Energy storage will doubtless play a key role in helping operate the grid under current and foreseeable future conditions as California pursues ambitious levels of renewable generation resources. Auxiliary load rules can have material effects on what may or may not need distinct metering, and greatly help or harm the feasibility of energy storage projects in providing grid services in open, competitive, and non-discriminatory markets.

The physical configuration of energy storage resources should also inform rules for auxiliary loads. Some energy resources are not designed to distinguish loads as conceived by the Report. Such resources could thus be prohibited from market participation and interconnection. This would be discriminatory and is avoidable by correctly clarifying definitions. These changes may also lessen the criticality of netting rules and metering, as many costs would be automatically considered as wholesale rates.

For these reasons, the following definitional changes should be made to auxiliary loads for energy storage resources. First, definitions should be changed to expand the list of auxiliary loads to include loads for the battery management system, thermal regulation and vacuum loads.

Second, definitions should be updated to include loads directly integrated on the direct current side of energy storage devices and essential for optimal use of energy storage systems. The Tesla Powerpack, for instance, serves as an example of an energy storage technology that can provide a variety of wholesale services yet which, for engineering and efficiency purposes, serves many loads from the DC side of the inverter, making such loads indistinguishable from wholesale charging or cycling-related efficiency losses. As proposed in the Report, rules could preclude some energy storage with loads directly integrated on the direct current side of the

energy storage devices due to ambiguity about how to distinguish these loads from accepted auxiliary loads. This approach would create a regulatory barrier to some energy storage resources which would impede deployments of energy storage as a class.

Third, if the Commission does not support the above definitions, alternative solutions would be needed to determine auxiliary loads vs station power loads for systems in which such loads are intermingled on the DC side of the energy storage system. Such alternative approaches could involve percentage based rules for separating efficiency losses from other loads, such as the battery management system. CESA generally finds this alternative approach less desirable and accurate, since many of the use percentages of these loads may depend on temperatures, operations, and other factors, making a static-rule based approach less accurate.

CESA therefore recommends the following revisions to the definition of wholesale auxiliary loads, provided in Recommendation Number 6 of the Report:

“a. Wholesale: charging energy, resistive losses, pumps (flow batteries and pump hydro resources), power conversion system, transformer, battery management system, thermal regulation, vacuum (for flywheels), IT, and any energy use that is directly-integrated and essential for the use of the storage system especially if the load occurs on the Direct Current side of the energy storage system where applicable.”

“b. Retail (station power): battery management system, thermal regulation, vacuum (for flywheels), IT and communications,—lighting, ventilation, and safety.”<sup>10</sup>

## **VII. SEVERAL CLARIFICATIONS ON THE REPORT PROPOSALS ARE ALSO NECESSARY.**

The intent and precision of the Report could be further clarified in two instances. CESA provides specific redlines for providing this clarify and confirmation in the Report. In Recommendation Number 5, the current language could be erroneously construed to exclude

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<sup>10</sup> Report, pp. 29-30.

efficiency losses or other loads clearly intended to be categorized as wholesale loads. CESA thus recommends the following revisions to Recommendation Number 5:

“5. All energy that is ~~consumed (and not resold)~~ *used for purposes other than for supporting a resale of energy back into wholesale markets* is station power and inherently retail.”<sup>11</sup>

Additionally, Recommendation Number 7 could be clarified to affirm that the netting provisions apply to both IFOM and BTM resources.

“7. Insofar as *an In-front of the Meter or Behind-the-Meter* energy storage resource withdraws energy (charges) or injects energy (discharges) subject to a dispatch at a greater capacity than its consumption, that consumption should be able to be netted against the response to the dispatch, just as it is for conventional generators.”<sup>12</sup>

#### **VIII. CONCLUSION.**

CESA appreciates the opportunity to submit these comments and looks forward to working with Commission and stakeholders to implement the recommendations provided in the Report.

Respectfully submitted,



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<sup>11</sup> Report, p. 29.

<sup>12</sup> Report, p. 30.

# APPENDIX A

## METERING IN ISOLATION SINGLE-LINE DRAWING

