BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Pursuant to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements.	R.13-09-011 (Filed September 19, 2013)

COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON ADMINISTRATIVE LAW JUDGE'S RULING REGARDING DEMAND RESPONSE POTENTIAL STUDY AND DRAFT STUDY PLAN

Donald C. Liddell
DOUGLASS & LIDDELL
2928 2nd Avenue
San Diego, California 92103
Telephone: (619) 993-9096
Facsimile: (619) 296-4662
Email: liddell@energyattorney.com

Counsel for the
CALIFORNIA ENERGY STORAGE ALLIANCE

June 3, 2015

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Pursuant to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements.	R.13-09-011 (Filed September 19, 2013)

COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON ADMINISTRATIVE LAW JUDGE'S RULING REGARDING DEMAND RESPONSE POTENTIAL STUDY AND DRAFT STUDY PLAN

The California Energy Storage Alliance ("CESA")[1] hereby submits these comments pursuant to the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission") in response to *Administrative Law Judge's Ruling Regarding Demand Response Potential Study and Draft Study Plan*, issued May 11, 2015.

I. <u>INTRODUCTION.</u>

The California Energy Storage Alliance ("CESA") applauds the Commission and Lawrence Berkeley National Laboratory ("LBNL") for proposing a framework to evaluate the technical, economic, and market potential for Demand Response ("DR") in 2025, and for

[1] 1 Energy Systems Inc., Abengoa, Advanced Microgrid Solutions, AES Energy Storage, Aquion Energy, ARES North America, Brookfield, Chargepoint, Clean Energy Systems, CODA Energy, Consolidated Edison Development, Inc., Cumulus Energy Storage, Customized Energy Solutions, Demand Energy, Duke Energy, Dynapower Company, LLC, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, ELSYS Inc., Energy Storage Systems, Inc., Enersys, EnerVault Corporation, Enphase ENERGY, EV Grid, Flextronics, GE Energy Storage, Green Charge Networks, Greensmith Energy, Gridtential Energy, Inc., Hitachi Chemical Co., Ice Energy, IMERGY Power Systems, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Invenergy LLC, K&L Gates, LG Chem Power, Inc., LightSail Energy, Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Manatt, Phelps & Phillips, LLP, Mitsubishi Corporation (Americas), Mobile Solar, NEC Energy Solutions, Inc., NextEra Energy Resources, NRG Solar LLC, OutBack Power Technologies, Panasonic, Parker Hannifin Corporation, Powertree Services Inc., Primus Power Corporation, Princeton Power Systems, Recurrent Energy, Renewable Energy Systems Americas Inc., Rosendin Electric, S&C Electric Company, Saft America Inc., Sharp Electronics Corporation, Skylar Capital Management, SolarCity, Sony Corporation of America, Sovereign Energy, STEM, SunEdison, SunPower, Toshiba International Corporation, Trimark Associates, Inc., Tri-Technic, Wellhead Electric.

soliciting stakeholder feedback on the Research Plan for the *2015 California Demand Response Potential Study* ("Study Plan"). CESA looks forward to providing technical assistance on modeling energy storage throughout this process that will ultimately shape Phase 4 of this proceeding, and enable the Commission to create a roadmap for future program design and adoption targets. If executed correctly, as expected, CESA's view is that the results of this effort will have important implications and may highlight new roles for DR resources in meeting California's energy goals. As described in the Study Plan, distributed energy storage provides a highly responsive resource that can be dispatched on demand and will play a key role in achieving the Commission's goals in this proceeding.

II. RESPONSES TO QUESTIONS REGARDING THE DRAFT RESEARCH PLAN.

1. Economic Potential: The Team is still developing the methodology for determining economic potential.

a. For the economic analysis, what avoided costs values would stakeholders like to be excluded and/or what additional avoided cost values would stakeholders like to be included?

CESA's Response: Dispatchable supply resources and load modifying DR facilitated by energy storage offers great benefit to grid needs in at least the following important ways:

1. Energy storage can offer reliable flexibility needed by the California Independent System Operator ("CAISO") by being dispatchable on command, offering reliable load reduction, energy, and ancillary services.
2. Energy storage can efficiently utilize renewable energy by instantly increasing load at times characterized by high excess renewable generation, and reducing load during ramping time periods, and adding to the regulation capability of the grid.
3. Energy storage can offset the need for inefficient ramping of traditional generation, and ultimately relieve the system of the need for new peaking capacity.
4. Energy storage can offset the need for costly distribution upgrades by enabling a more efficient use of resources on the distribution system.

CESA urges LBNL to incorporating all of these avoided costs in the scope of the Study Plan. This should include quantifying the number of peaker plant unit starts that can be avoided with effective DR dispatch, estimating transmission and distribution deferrals, as well as quantifying the value of reduced curtailment under 2025 assumptions.

b. For the modified Total Resource Cost test perspective, what non-energy benefits would stakeholders like to be considered?

CESA's Response: See response to Question 1(a), above.

2. Market Potential: The Study Team is still developing the methodology for determining market potential.

a. What proposals and ideas do stakeholders have for quantitatively analyzing customer response to pricing products, behavioral products, and/or controlled and automated products?

CESA's Response: CESA reserves the right to respond to this question at a later time.

3. Scenario Analysis: The Study Team is still developing the variables to consider here.

a. What scenarios or topics do stakeholders think best characterize the uncertainties of demand response potential in the future?

CESA's Response: Ongoing efforts to redesign the rules governing wholesale market participation may result in large amounts of highly dispatchable resources such as energy storage moving to participate in higher value products, directly competing and enhancing existing generation assets. Regulatory change and future market design is by far the biggest source of uncertainty.

b. Do you have recommendations, comments, or concerns on key concepts that should be included in the high or low demand responses scenarios?

CESA's Response: CESA reserves the right to respond to this question at a later time.

4. **Technical Potential:**

   a. **Do you have recommendations for end uses or industries that deserve more attention?**

CESA's Response: One of the key goals addressed in this modeling exercise is to establish the certainty of DR resources in 2025 based on the evaluation of different load profiles. The Study Plan states that after selecting key use cases illustrated: "we will consider the role of electric on-site behind-the-meter energy storage in the residential, commercial, and industrial sectors that could increase site-wide capabilities for responsive demand." (p.24). CESA's view is that it would be incorrect to assume that energy storage should only be "considered" under the umbrella of an existing use case such as heating, cooling, etc. Energy storage has become a critical component of the grid with its own dispatch capabilities and should be modeled as such. The increased number of participation options being considered at the CAISO and the Commission imply that there may be substantial value for distribution level resources such as energy storage, electric vehicles, and smart thermostats to provide system benefits in other buckets than those envisioned in DR proceedings. The Study Plan should consider energy storage as a use case for each of the loads identified: residential, commercial, and industrial.

   b. **Do you have recommendations, comments, or concerns regarding the proposed estimation approach and/or suggestions for alternative approaches?**

CESA's Response: CESA reserves the right to respond to this question at a later time.

   c. **Do you have recommendations for additional factors to consider in forecasting the loads?**

CESA's Response: CESA reserves the right to respond to this question at a later time.

   d. **What system needs do stakeholders believe cannot be met with demand response resources?**

CESA's Response: CESA reserves the right to respond to this question at a later time.

e. **What demand response products from the proposed table with examples would stakeholders like to remove? What should be added?**

CESA recommends modifying the example of end uses in scope to add energy storage to each type of load:

Residential	**Commercial**	**Industrial**
• Heating • Cooling • Water Heating • Refrigeration • Pool Pumping • Ventilation • Electric Vehicles • Backup Generation • Energy Storage	• Heating • Cooling • Lighting • Ventilation • Electric Vehicles • Backup Generation • Energy Storage	• Agricultural Pumping • Data Centers • Freshwater Distribution Pumping • Wastewater Pumping • Municipal Lighting • Refrigerated Warehouses • Chemical Manufacturing • Beverage Manufacturing • Food Manufacturing • Petroleum Refining • Backup Generation • Energy Storage

f. **What new end-use control technology should the Study Team consider for the technical potential?**

CESA's Response: As discussed above, CESA recommends revising the Study Plan to include energy storage as an end use case and building load profiles and sensitivities accordingly.

5. **Behind the Meter Resources: Behind the meter customer resources (storage, back-up generation) are taken into account in Section 2 of the draft research plan.**

   a. **Do stakeholders have additional ideas on how these resources should be analyzed in the study?**

CESA's Response: Energy storage should be modeled as a stand-alone end use under Task 2. To further the goal set forth in the Study Plan, LBNL states that the analysis "will include evaluating the capabilities of end-use loads to shift, shed, or take electricity use." LBNL proposes to develop scenarios "that help to span the possible changes in future customer end-use load shapes, and will thus influence future DR potential." (p. 9). CESA generally agrees with these goals however, given the dispatchable nature of energy storage resources, it is reasonable to assume that they can be separately dispatched from load and they should therefore be modeled as a use case.

Whether it is stand-alone or aggregated, behind-the-meter energy storage value proposition relies on a careful evaluation of customer and system needs and rewards. For example, under the right market assumptions a fully automated energy storage system could forfeit customer revenue streams for market participation values such as ancillary services.

The CAISO's Metering & Telemetry ("M&T") and Energy Storage and Aggregated Distributed Energy Resources ("ESDER") Initiatives are efforts to formulate participation rules for these scenarios and encourage direct market participation from behind the meter. These initiatives are expected to be approved in 2015-2016 and may have significant impacts on the value proposition of highly dispatchable resources such as energy storage. If designed correctly, the Non-Generating Resource ("NGR") product could capture an increasing number of energy storage resources that would otherwise be modeled as DR as part of the Study Plan. CESA thus disagrees in part with the following statement: "Although energy storage is not an end use per se, it can be operated in ways that modify load profiles with behavior similar to that of other DR approaches we consider." (p. 23).

The Commission's Energy Storage Rulemaking[2] and the CAISO's Energy Storage Roadmap[3] helped identify several use cases where energy storage may be considered an integral end use supporting the transmission and distribution systems. Whether the energy storage system is owned by a customer, a third party developer, or operated by a utility, it could be providing a multitude of services to the grid independently of the load that it is associated with. Furthermore, the operational requirement of collocating an energy storage system with a load is only truly indispensable in cases where energy storage directly offsets heating or cooling or replaces existing hardware such as certain thermal energy storage solutions replace HVAC.

The Olsen, *et al.*, "sheddability" theory referred to at page 29 of the Study Plan doesn't fully capture the complex assumptions related to on-site energy storage since, for one, "controllability" and "acceptability" may perfectly overlap if the right market structure are in place. The limitations of modeling energy storage as a "shadow load modifier" highlighted here above also apply to the tasks related to "shed" and "take" filters (Task 6.1 and Task 6.2) where energy storage can easily be modeled as a standalone resource but not necessarily as part of another end use case. For these reasons, CESA recommends revising the Study Plan to include energy storage as an end use case and building load profiles and sensitivities accordingly.

b. How should the study account for customer curtailment options that depend on behind-the-meter resources such as storage and back up generation?

CESA's Response: CESA recommends revising the Study Plan to include energy storage as an end use case and building load profiles and sensitivities accordingly.

---

[2] *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*, filed March 26, 2015.

[3] *Advancing and Maximizing the value of Energy Storage Technology, a California Roadmap*, December 2014.

c. **To what extent would it affect the Technical Potential and Market Potential estimations?**

CESA's Response: The approach proposed by LBNL for behind-the-meter energy storage may undervalue the asset class and skew the final results of available DR. CESA recently commissioned a production cost modeling effort with PLEXOS using the CAISO's input assumptions for its 2014 LTPP scenario of 40% RPS by 2024. CESA modeled two sensitivities on this scenario – one without energy storage and one with a small amount (412.5 MW) of 2-hour discharge energy storage. Assuming a very conservative round-trip efficiency of 60%, the addition of 412.5 MW of 2-hour discharge energy storage to the grid provided a net savings of 203,677 tons of CO2, along with a reduction of 2,927 Unit Starts across the system (a 6.4% reduction in total annual fossil fuel unit starts).

If the 412.5 MW of energy storage resources were modeled under the veil of existing load management programs, supporting commercial, industrial, and residential loads, it is likely that the system benefits would be far lower. The undervaluing that may occur is due to the above "sheddability" issue but also the incorrect assumption that an immovable silo exists between DR participation and participation in other behind-the-meter programs.

d. **While the Commission has not prohibited back-up generation usage with existing demand response programs, it is seeking more information about back-up generation usage to determine the size of the issue. How should the study take into account the possibility that back-up generation usage with demand response programs could be addressed by the Commission at later time?**

CESA's Response: CESA reserves the right to respond to this question at a later time.

III. <u>CONCLUSION.</u>

CESA thanks the Commission for the opportunity to provide these comments in response to the ALJ's Ruling.

Respectfully submitted,

Donald C. Liddell
DOUGLASS & LIDDELL
Email: liddell@energyattorney.com

Counsel for the
CALIFORNIA ENERGY STORAGE ALLIANCE

Date: June 3, 2015