BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of the California Energy Commission for Approval of Electric Program Investment Charge Proposed 2012 through 2014 Triennial Investment Plan	A.12-11-001 (Filed November 11, 2012)

RESPONSE OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON APPLICATION OF THE CALIFORNIA ENERGY COMMISSION FOR APPROVAL OF ELECTRIC PROGRAM INVESTMENT CHARGE PROPOSED 2012 THROUGH 2014 TRIENNIAL INVESTMENT 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

December 7, 2012

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In accordance with Rule 2.6 of the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA")[1] hereby submits this response to the, *Application of the California Energy Commission for Approval of Electric Program Investment Charge Proposed 2012 through 2014 Triennial Investment Plan*, filed November 11, 2012 ("Application").

I. INTRODUCTION.

CESA supports the California Energy Commission's ("CECs") Commission Report issued October 2012, proposed in accordance with D12-05-037 and appended as Attachment 1 to

[1] The California Energy Storage Alliance consists of A123 Systems, Beacon Power, Bright Energy Storage Technologies, CALMAC, Chevron Energy Solutions, Deeya Energy, DN Tanks, East Penn Manufacturing Co., Energy Cache, EnerVault, Fluidic Energy, GE Energy Storage, Green Charge Networks, Greensmith Energy Management Systems, Growing Energy Labs, HDR Engineering, Ice Energy, Innovation Core SEI, Kelvin Storage Technologies, LG Chem, LightSail Energy, Panasonic, Primus Power, Prudent Energy, RedFlow Technologies, RES Americas, Saft America, Samsung SDI, Seeo, Sharp Labs of America, Silent Power, SolarCity, Stem, Sumitomo Corporation of America, SunEdison, SunVerge, TAS Energy, UniEnergy Technologies, and Xtreme Power. 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

the Application setting forth how it will administer 80 percent of the approved EPIC research funds, or $127.8 million per year, beginning on January 1, 2013.

II. CESA SUPPORTS THE GENERAL SCOPE AND PURPOSE OF THE APPLICATION.

CESA applauds the CEC for recognizing that "There will be less reliance on central station capacity and greater reliance on economically feasible distributed generation and energy storage options." (p. 21). The California grid, from generation to transmission to distribution is all sized to meet infrequent load spikes. Optimizing both demand and system upgrades will result in higher asset utilization and therefore lower cost to ratepayers; the grid priorities of: (1) reliability and safety, (2) ratepayer cost, and (3) environmental impacts. California policy directives have greatly improved the prospects of a low carbon system; however that system cannot come at the expense of reliability. Energy storage projects and research focused on grid reliability are critical to achieving all three priorities. CESA recommends that all applied research and demonstration projects consider the call from CAISO for flexibility. Flexibility requires high resolution control as well as firm resource measurability. Resources that cannot be effectively measured or quantified within high confidence intervals and in a dynamic setting lose much of their option value to the system. This means they must be supplemented by measurable resources, therefore adding to system cost. CESA also caution against the undue use of "cost effective" as a qualifier for projects since the term is undefined. Further system costs of certain technologies are dropping on a monthly therefore altering the calculation of "cost effectiveness" rapidly.

III. CESA SUPPORTS THE APPLICATION'S EMPHASIS ON THE IMPORTANCE OF ENERGY STORAGE IN SPECIFIC AREAS AND ENCOURAGES THE COMMISSION TO CONSIDER ENERGY STORAGE MORE BROADLY WITHIN EACH STATED OBJECTIVE.

A. Strategic Objectives.

CESA specifically supports the Application's specific attention to energy storage in the following strategic objectives and proposed initiatives for applied research and development, namely identified in the Executive Summary of the Report:

> "Develop new technologies and applications that enable cost-beneficial customer-side-of- the-meter energy choices: Funding initiatives under this objective include developing cost- effective metering and communication devices to allow demand response, distributed generation, plug-in electric vehicles, and energy storage to participate in California Independent System Operator markets; developing technologies and strategies to allow demand response customers to participate in ancillary services markets; demonstrating and evaluating distributed energy storage at the community scale; and developing technologies, strategies, and applications for customer-side energy storage."
>
> "Integrate grid-level energy storage technologies and determine the best applications that provide locational benefits: Funding initiatives under this objective focus on optimizing grid-level energy storage by location, size, and type; and developing energy storage technologies that can improve integration of intermittent renewables and help meet peak electricity demand."
>
> "Advance technologies and strategies that optimize the benefits of plug-in electric vehicles to the electricity system: Funding initiatives under this objective focus on charging technologies and approaches to integrate plug-in electric vehicles into the power grid; developing grid communication interfaces to support vehicle-to-grid services; advancing strategies for second-use electric vehicle battery storage; and developing recycling technologies and processes for recycling plug-in electric vehicle batteries."

CESA agrees that these strategic objectives called out for energy storage are critically important to California's electric power sector. However, energy storage can be applied and used in many other areas of the electric power system too. It should be noted that energy storage is a key strategic asset for many of the other proposed objectives and initiatives.

B. Applied Research and Development

CESA agrees with all of the following applied research and development objectives and recommends that the energy storage, as a strategic asset that can further that objective, be explicitly mentioned:

> "Develop next-generation end-use energy efficiency technologies and strategies for the building sector: Funding initiatives under this objective focus on lighting systems; heating, ventilation, air-conditioning, and refrigeration systems; building envelope systems; understanding building occupant behavior; cost-effective building retrofit strategies; reducing energy use from plug loads; improving indoor air quality in energy-efficient buildings; and technologies and approaches to achieve zero-net-energy buildings."

Energy storage, as a flexible onsite load following and power quality and reliability device is essential to any net zero building strategy. For example, many sources of onsite distributed generation are either intermittent (solar, wind) or prefer to run as a baseload resource (fuel cells, CHP, biomass). The ability to store and deliver this onsite generation in concert with smart building strategies for superior reliability and energy efficiency and minimal grid impact can only be achieved with energy storage. As such, energy storage should be explicitly mentioned in this strategic objective.

> "Develop innovative technologies, tools, and strategies to make distributed generation systems more affordable: Funding initiatives under this objective include developing combined heat and power technologies and deployment strategies; accelerating the commercialization of sustainable bioenergy systems; and developing advanced distributed photovoltaic systems."

An innovative strategy for making distributed generation resources more affordable is the integration of such resources with energy storage. For example, in the case of CHP, sometimes there is ample need for onsite waste heat, but insufficient need for onsite energy production. Excess electrical generation from the onsite CHP could be stored in an onsite energy storage system for later use on peak, making the CHP unit more cost effective. The ability to store biogas or onsite PV generation for use at a later time (including in the event of power outages)

when the production is more valuable is another strategic use of energy storage. Finally, applied research funding to integrate such technologies so that the energy storage system and the onsite generation system share components is another way to make such technologies more flexible, and cost effective by lowering the overall capital cost of both components. For these reasons, energy storage should be explicitly mentioned in this strategic objective.

> "Develop emerging utility-scale renewable energy generation technologies and strategies to improve power plant performance, reduce costs, and expand the resource base: Funding initiatives under this objective focus on improving the performance of concentrating solar power; increasing performance and reliability of utility-scale renewable power plants; improving the cost-effectiveness of geothermal energy production; investigating barriers to offshore wind and wave energy technologies in California."

Similarly, energy storage integrated with utility-scale renewable energy generation technologies and strategies have the potential to transform renewable energy into renewable energy plus renewable capacity/and or ancillary services. This will improve the cost effectiveness of such resources by increasing the performance and value of the renewable product overall – as such, energy storage should be explicitly mentioned in this strategic objective.

> "Reduce environmental and public health impacts of electricity generation and make the electricity system less vulnerable to climate impacts: Funding initiatives under this objective consist of air quality research to address environmental and public health effects of conventional and renewable electricity production; research on sensitive species and habitats to assist renewable energy planning and deployment; reducing energy stresses on aquatic resources and improve water-energy management; and tools and technologies to plan for and minimize the effects of climate change on the electric system."

Energy storage, when deployed throughout California's electric power system, has the potential to improve utilization of existing assets thus reducing the environmental and public health impacts of electricity generation and making the electricity system less vulnerable to climate impacts. Further, because energy storage can also be used in lieu of a number of existing

status quo fossil fuel alternatives (e.g. natural gas peakers) and because energy storage can be distributed and easily sited close to load, it will directly reduce the GHG impacts of such fossil resources. Because of energy storage's ability to reduce the negative environmental and public health impacts of the electric power sector, it should be explicitly named in this strategic objective.

> "Develop technologies, tools, and strategies to enable the smart grid of 2020: Funding initiatives under this objective include developing technologies to allow for two-way power flow through the transmission and distribution system; expanding distribution automation capabilities; developing operational practices and automation to make use of smart grid equipment; improving forecasting of renewable resource availability; and developing smart grid communication systems that interface with customer networks and distributed resources."

As stated by the U.S. Department of Energy:

> "Energy storage is a key component of a smart grid. "The ability to accommodate a wide variety of generation and storage options is essential to realizing the full promise of the Smart Grid. Generation will increasingly include renewables and distributed generation alongside energy storage and other non-traditional sources." [2]

It is the resource that enables islanding and greater energy reliability and security. Bi-directional power flow, distribution automation capabilities and greater overall grid operational capabilities are possible with energy storage deployed throughout the electric power system. Finally, energy storage is a key distributed resource with which smart grid communication systems would interface. Given its strategic importance in the smart grid, it should be explicitly mentioned in California's smart grid 2020 goals.

> "Develop operational tools, models, and simulations to improve grid resource planning: Funding initiatives under this objective include research on the characteristics of the generation fleet in 2020; cataloging distributed resources to improve operator dispatch and visibility; developing and running real-time

[2] *Smart Grid Principal Characteristics*, Developed by the U.S. Department of Energy Office of Delivery and Energy Reliability by the National Energy Technology Laboratory, June 2009, at page 12.

> scenarios to support grid operations; and developing interoperability test tools and procedures."

A key application for energy storage is in the distribution system, and for grid-resource planning overall. The goals envisioned in this strategic objective would be greatly enhanced if energy storage were to be explicitly factored in as a key tool to meeting this objective. For example, 'cataloging distributed resources to improve operator dispatch and visibility and developing and running real time scenarios' would result in greater system reliability and utilization if dispatchable energy storage throughout the distribution system were considered as part of the toolkit.

C. Technology Demonstration and Deployment

Energy storage is similarly a strategic asset in the area of Technology Demonstration and deployment. As such, it should be explicitly mentioned for each of the following goals:

> "Demonstrate and evaluate the technical and economic performance of emerging energy efficiency and demand-side management technologies and strategies: Initiatives under this objective include identifying and demonstrating promising energy efficiency and demand response technologies suitable for commercialization and utility rebate programs and demonstrating integrated demand-side management programs to achieve targets identified in the California Energy Efficiency Strategic Plan."

Energy storage is a key strategic energy efficiency and demand side management technology. For example, thermal storage can be used to offset on peak air conditioning load, improving air conditioning efficiency significantly by reducing the need to run the compressor during the hottest part of the day. More generally, the ability to store energy or electricity and utilize it when most needed or when electricity is most expensive is a liberating demand side strategy that puts greater choice and control in the hand of ratepayers. Energy storage should thus be considered a key strategic demand side management tool when considering any new commercialization and utility rebate program for this purpose.

> "Demonstrate and evaluate emerging clean energy generation technologies and deployment strategies: Initiatives under this objective focus on demonstration and appraisal of operations and performance of pre-commercial biomass conversion technologies, generation systems, and development strategies and demonstration and deployment of pre-commercial combined heat and power applications."

There are many forms of commercially available energy storage solutions today. However, energy storage is a key clean technology investment area and there are many new emerging energy storage technologies that could benefit from EPIC funding for demonstration and evaluation. Energy storage should be explicitly mentioned in this strategic objective.

> "Demonstrate the reliable integration of energy efficient demand-side resources, distributed clean energy generation, and smart grid components to enable energy-smart community development: Initiatives under this objective consist of demonstrations of zero- net-energy buildings and communities, renewable energy microgrids, advanced vehicle-to- grid energy storage technologies, and second-use vehicle battery applications."

Microgrids are a form of smart grids – and a key goal associated with such grids is greater reliability and the ability to island from the main grid in the event of an outage. Such capability is only possible with energy storage. CESA applauds this strategic goal for recognizing the importance of advanced vehicle-to grid energy storage technologies and second use vehicle battery applications. However, it should be noted that stationary energy storage used for microgrid balancing, reliability and most importantly, to help integrate existing onsite generation resources is paramount to reliable and cost effective microgrid operations from both a cost and environmental standpoint. Additional demonstrations of such projects featuring stationary energy storage as well as mobile energy storage would be a valuable use of EPIC technology and development funding.

D. Market Facilitation

CESA applauds the focus of the market facilitation goals specified in the Application. In particular, the focus on collaboration with local jurisdictions and stakeholders to facilitate

regulatory assistance and streamlining permitting; and strengthening the clean energy workforce by creating tools and resources that connect the clean energy industry to the labor market. It should be noted that as a new asset class being deployed in the electric power sector, applications of energy storage will need substantial help in these areas. In many cases, there is no precedent for use of energy storage assets for grid application and the EPIC program can provide much needed assistance to facilitate the training, education and regulatory modifications necessary to realize the benefits of energy storage projects. Many existing trades in the renewable energy labor market can ideally be cross trained to also install energy storage systems either standalone or alongside renewable energy resources.

Similarly, CESA applauds the application's specific mention of energy storage under the strategic goal to guide EPIC investments. The forums mentioned in this strategic objective are absolutely essential to building the ecosystem for grid storage within California.

> "Guide EPIC investments through effective market assessment, program evaluation, and stakeholder outreach: Initiatives under this objective include creating a Web portal to share EPIC project results and connect innovators, investors, educators, job seekers, and policy makers seeking to promote adoption of clean energy technologies; conducting forums to connect technology innovators with potential investors, job seekers, and policy makers; assessing progress in the clean energy industry and developing roadmaps for future investments; conducting a survey on end-use energy consumption and saturation characterization in IOU service territories; conducting a market analysis of strategies to help clean energy storage, demand response, electric vehicles, and renewable energy; and conducting project and program evaluations." (pp. 5-6).

Finally, CESA also specifically supports requirements for the state's electrical transmission and distribution ("T&D") system to maintain safe, reliable, efficient, and secure electrical service to meet future growth and demand in achieving, "Deployment and integration of cost-effective advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning. (p.14).

IV. CONCLUSION.

CESA thanks the Commission for its consideration of this response.

Respectfully submitted,

Donald C. Liddell
DOUGLASS & LIDDELL

Counsel for the
CALIFORNIA ENERGY STORAGE ALLIANCE

December 7, 2012