CESA
CALIFORNIA ENERGY STORAGE ALLIANCE

February 9, 2015

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Original copy to

Lead Commissioner: Andrew McAllister
California Energy Commission
Dockets Office, MS-4
Re: Docket 13-IEP-1A
1516 Ninth Street
Sacramento, California 95814-5512

Re: **Comments of the California Energy Storage Alliance on Request for Public Comments on 2015 Integrated Energy Policy Report Scoping Order (Docket No. 15-IEPR-01)**

Dear Commissioner McAllister:

CESA strongly recommends scheduling a workshop specifically focused on energy storage and the role it will play in each of the energy policy areas traditionally tracked and reported on in the IEPR. Because energy storage can both inject and withdraw energy in a variety of locations and applications on the transmission and distribution networks, it is strategically important in enabling all of the subject categories currently identified in the Scoping Order for inclusion in the 2015 IEPR Plan: energy efficiency, renewables, electricity demand, natural gas, transportation and climate change. In addition, the 2015 IEPR should be harmonized with the results and recommendations recently published in the joint agency Energy Storage Roadmap,[1] which includes a significant number of specific implementation activities assigned to the Energy Commission.[2] CESA also recommends several specific improvements to the Electricity Program Investment Charge ("EPIC") program.

With AB 2514 procurement targets,[3] Southern California Edison Company's ("SCEs") applications for approval of procurement of energy storage to meet local capacity requirement ("LCR"),[4] California's

[1] *Advancing and Maximizing the Value of Energy Storage, a California Roadmap. California Independent System Operator*. December 2014. http://www.caiso.com/Documents/Advancing-MaximizingValueofEnergyStorageTechnology_CaliforniaRoadmap.pdf.

[2] *Ibid*, pp. 4 (procurement), 8 (valuation and modeling), 13 (telemetry and metering), and 19 (safety and certification).

[3] D.13-10-040. *Decision Adopting Energy Storage Procurement Framework and Design Program*. California Public Utilities Commission. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M079/K533/79533378.PDF.

[4] A.14-11-012, *Application of Southern California Edison Company for Approval of the Results of Its 2013 Local Capacity Requirements Request for Offers for the Western Los Angeles Basin*, filed November 21, 2014, and A.14-11-016, *Application of Southern California Edison Company for Approval of the Results of Its 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area*, filed November 26, 2014.

climate goals,[5] and the transition toward a more distributed, "smarter" grid,[6] energy storage will necessarily be playing a much more influential role in energy policy and planning. As such, the 2015 IEPR process would benefit greatly by highlighting in a workshop the many ways in which this game changing technology can better optimize existing grid assets and overcome expected challenges on the electric power grid.

The key role of energy storage in each proposed 2015 IEPR subject category discussed in the Scoping Order is briefly described below:

Energy Efficiency

Energy storage will play a very valuable role in energy efficiency – most specifically, in introducing the concept of shifting and adding load when it is most advantageous to the electric power system overall. During periods of over-generation or curtailment of renewable resources, energy storage systems can absorb excess energy and dispatch it during times of peak demand. Achieving the Governor's goal of 50% renewable generation without energy storage would result in a marginal over-generation rate of at least 42% for new solar installations.[7] Customer sited energy storage can store this excess energy and use it to reduce demand later in the day while simultaneously enhancing overall grid efficiency. Energy storage integrated with "smart" electronics and appliances can further optimize loads, especially during peak times, which can defer the timing and extent of upgrades to the distribution network. With anticipated scale, energy storage will reduce the need for new fossil-fueled peaking generation resources despite growing demands on the grid and will reduce the demand on existing, inefficient peaker plants. Customer-sited energy storage is able to remove much of the variability in load demand from specific building loads (both existing and new construction), and when paired with locally generated renewable energy sources, can cause buildings to have a truly net-zero draw from the grid.

Renewables

Energy storage has been hailed by the California Independent System Operator ("CAISO") and many energy industry stakeholders as a key solution for dealing with rapidly emerging flexible capacity and ramping needs of the grid resulting from high penetration of intermittent renewable energy resources. To reach California's Renewables Portfolio Standard targets and the Governor's goals of 50% renewables by 2030, which Strategen Consulting has estimated will save the ratepayers over $12B annually in avoided costs of fuel and electricity imports[8], significantly more renewable generation capacity will be needed. The impact of the anticipated variability and intermittency of these resources

[5] *E.g.,* AB 32, AB 785, AB 2514, SB 861, AB 1613, and Executive Order S-13-08.
[6] *See, More Than Smart: a Framework to make the distribution Grid More Open, Efficient and Resilient*, Greentech Leadership Group, Resnick Institute, August 2014.
[7] *Investigating a Higher Renewables Portfolio Standard in California*, Energy and Environmental Economics, Inc., January 2014, p.124.
[8] Strategen Consulting modeling, inputs*:* Building energy usage from California Energy Consumption Data Management System ($6.5B imported electricity savings); Electric power production and natural gas data from CEC Energy Almanac ($6B natural gas savings via reductions in natural gas electricity generation and use in buildings)

cannot be considered in isolation. Reliability-enabling resources such as energy storage are paramount to achieving this goal, and must be included in any informed energy policy discussion.

Electricity

Traditional grid planning methodologies simply will not work going forward, particularly for the addition of energy storage throughout the electric power system. The ability of energy storage to inject into and withdraw energy from the grid can defer or reduce the need for new distribution and transmission system upgrades if appropriately integrated into generation and load resource planning. The Commission should explore ways that traditional load forecasting should evolve, given the ability to schedule and dispatch energy storage capacity to modify load and to enhance the overall reliability and resilience of the grid – at very specific targeted locations. SCE's pending Applications for approval of procurement of its LCR by the California Public Utilities Commission ("Commission") includes over five times more energy storage than was required by the Commission.[9] Not only does this reflect SCE's confidence in energy storage's viability and cost-effectiveness, but it also confirms its expected value of energy storage to utilities in helping ensure grid reliability at the local and system level.

Natural Gas

For our existing electric power system, the role energy storage can play in optimizing existing fossil fuel assets should also be emphasized. Demand-side management through energy storage that serves to create a leveled load profile will increase existing generation fleet efficiency, reduce the need for additional gas-fired generation and reduce GHG emissions. With a fast and flexible resource such as energy storage, there will be less of a need to procure additional peaking resources going forward. CESA has determined that, on a per MW basis, energy storage can provide over 600 times the ramp rate, four times the flexible range, and over three times the operational hours than a typical combustion turbine peaking facility. In addition, energy storage uses significantly less water and produces far fewer GHG emissions by enabling a cleaner generation fleet and can work in synergy with AB 32 mechanisms.

Co-located with existing thermal generators, energy storage can also optimize utilization by taking over ancillary service responsibilities, helping meet ramp obligations, and reduce utilization of peaking resources, which are the least efficient generators in the fleet.

The CEC should also explore utilization of the State's existing natural gas infrastructure as a means of storage renewable energy in the form of hydrogen. This is being actively explored/demonstrated in Europe and Canada already as a viable form of bulk energy storage.

[9] D.13-02-015, *Decision Authorizing Long-Term Procurement for Local Capacity Requirements*, issued February 13, 2013, and D.14-03-004, *Decision Authorizing Long-Term Procurement For Local Capacity Requirements Due To Permanent Retirement Of The San Onofre Nuclear Generations Stations,* issued March 13, 2014, authorized a minimum of 50 MW of energy storage. SCE is seeking approval of 260.6 MW of energy storage.

Transportation

Energy storage is playing and will continue to play a very important and strategic role in the electrification of transportation. The Governor's goal of up to 50% petroleum reduction in California will require a large scale migration to Electric Vehicles. The result will be billions of dollars of annual benefit to the state, as petroleum spending that goes largely to sources outside California is instead spent on electrical infrastructure and renewable energy generation. Commercially available stationary energy storage solutions are being used to facilitate grid integration of new electric vehicle ("EV") load, and energy storage has been a fundamental driver in the adoption of EV charging infrastructure. For example, as the charging rate of new cars increases, stationary storage can be used to boost real time charging, minimize demand charge spikes to the grid, mitigate significantly higher energy bills to EV charging host customers, and help facilitate grid integration of new EV load. In addition, EVs represent significant amounts of mobile energy storage. Smart charging and ultimately, using the storage for grid services, is possible and needs to be demonstrated near term.[10]

Looking ahead, EVs will also provide growing supply of millions of used batteries that may be repurposed as stationary energy storage. By repurposing these batteries, especially in conjunction with large vehicle fleet operations, workplace charging, and enabling other distributed energy resource programs, California will further increase GHG reductions across transportation and grid operations.

Climate Change

For all of the reasons discussed briefly above, energy storage will play a critical role in mitigating climate change. The interconnected goals of 50% renewable energy, 50% petroleum reduction, and 50% reduction in building energy consumption will save Californians over $40B per year.[11] Energy storage is a critical enable to achieving those goals while maintaining, and even enhancing, grid reliability.[12] The Energy Commission could and should play a larger role in helping to fund system studies, models, and innovative new storage applications in all of the areas discussed above that help quantify the benefits and impacts of utilizing energy storage to optimize the grid at short duration, fast response time scale (frequency response, frequency and voltage regulation) as well as the benefits of utilizing energy storage to most efficiently take full advantage of California's abundant locally-produced renewable energy.

[10] A number of Energy Commission Program Opportunity Notices ("PONs") are dedicated to supporting the development and demonstration of the hardware and software platforms and standards that will allow EVs to meet grid needs while at the same time meeting consumer driving needs.

[11] Strategen Consulting modeling, inputs: EMFAC vehicle and mileage data from CARB ($28-45B fuel savings); Building energy usage from CEC Consumption Data Management System ($6.5B imported electricity savings); Electric power production and natural gas data from CEC Energy Almanac ($6B natural gas savings via reductions in natural gas generation and use in buildings).

[12] *Grid Energy Storage*, US Department of Energy, December 2013.

Electric Program Investment Charge Program (EPIC)

The Energy Commission should continue improving the EPIC program in the following specific ways:

(a) Intellectual property provisions in agreements entered into in relation to PON for energy storage development projects should be modified to provide better protection to the work product of start-ups and other technology development-oriented companies. This is to encourage innovation and collaboration with the CEC.

(b) A plan should be implemented for advancing energy storage projects, including pilot demonstrations, that have successfully completed EPIC or equivalent programs reaching technology readiness level ("TRL") >5 to full commercial readiness TRL 7-9[13]. This is to encourage technology innovation within California State.

(c) The technology adoption guidelines already under development by the CEC should be accelerated to incentivize consideration of new energy storage technologies that have successfully completed EPIC or equivalent programs for migration to AB 2514 compliance at the CPUC and other procurement processes targeting advancement of preferred resources.

CESA looks forward to continuing to work with the Energy Commission and stakeholders in this important proceeding and thanks the Energy Commission for its consideration of these comments.

Very truly yours,

Janice Lin, Executive Director
California Energy Storage Alliance

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[13] TRLs are measures used to assess the maturity of evolving technologies during their development and in some cases during early operations. Wikipedia: http://en.wikipedia.org/wiki/Technology_readiness_level