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California Energy Commission
Docket Office, MS-4
Re: Docket No. 11-IEP-1N
1516 Ninth Street
Sacramento, CA 95814-5512
docket@energy.state.ca.us

Re: California Energy Commission Docket No. 11-IEP-1N: Comments Related to Staff Workshop on Energy Storage for Renewable Integration

To Whom It May Concern:

On April 28th, 2011, the California Energy Commission (“Energy Commission”) held a Staff Workshop on Energy Storage for Renewable Integration (the “Workshop”) in connection with the 2011 Integrated Energy Policy Report (“2011 IEPR”). Southern California Edison Company (“SCE”) believes that certain applications for energy storage are important to consider, including applications designed to address challenges associated with increasing penetrations of renewable energy. SCE commends the Commission for creating a forum to discuss potential uses of energy storage and to discuss challenges that accompany the integration of renewable energy resources. SCE appreciates this opportunity to provide the following comments.

Energy storage is a broad and diverse category that can refer to numerous applications, technologies, or systems. Therefore, certain key principles should be considered when developing energy storage policy. Failure to consider these principles may result in policies that lead to a suboptimal solution to California’s electricity challenges and impose unnecessary costs on California ratepayers.

SCE’s comments include a discussion of the following key principles:

- a. Storage is a means not an end.
- b. Energy storage policy should be application-specific.
- c. Energy storage approaches should be cost-effective and technology-neutral.
- d. Research, development, and demonstration (“RD&D”) is an important prerequisite for energy storage deployment in applications.

SCE elaborates on each of these principles below. Furthermore, SCE recommends that the Energy Commission Staff develop a roadmap for the exploration of energy storage applications that explains how the many regulatory processes addressing storage are related, outlines when and

where major regulatory decisions regarding energy storage applications are being addressed, and provides a timeline for when the results of key demonstrations can be expected.

I. The Energy Commission Should Consider Certain Key Principles When Developing Energy Storage Policy.

Storage is a means not an end.

The role of storage in the shaping the future electricity grid should be thought of within the context of solving defined problems for which no other alternative solution is better. Therefore, any analysis of the need for storage should begin with identifying the specific problems that storage can solve. These problems can be thought of as potential energy storage applications. By defining these key applications, possible roles for energy storage solutions become clearer and thorough analyses can be conducted.

Energy storage policy should be application-specific.

SCE defines an application as a discrete energy storage asset sited at a defined location on the grid with a defined operating plan. Any energy storage application will involve one or more primary uses for a specific energy storage system. The specific details of an application are needed to clarify the operational plans for a storage system, determine the benefits that accrue to a deployed energy storage system, and identify any specific policy issues associated with that application.

Regarding rules and policy for energy storage systems, these too should be application-specific. Broad storage policy fails to address the specific issues associated with individual applications and fails to account for the complexity of energy storage applications. Energy storage policy should address unclear rules, problematic gaps in rules, or rules that, if revised, could promote more effective use of certain energy storage applications. For example, policy changes are likely to be needed to characterize resource adequacy (“RA”) value for energy storage applications focused on energy supply shifting and peak-load reductions. Currently, RA values for some energy storage applications are not fully defined and valued, though it is likely that the CPUC will soon address this issue. Whenever an energy storage application is compatible with existing policies and regulations, new storage-specific policies need not, and should not be developed.

Energy storage applications should be cost effective and technology neutral.

Storage solutions need to be allowed to compete with other technology solutions to address grid challenges in the most cost effective manner. This competition enables a true evaluation of an energy storage application’s cost effectiveness. Furthermore, prioritization of energy storage solutions or of specific storage technologies constitutes “picking winners.” Such policies are unfair and do not ensure that the most cost-effective solutions are pursued. An application-based approach is inherently technology neutral because it enables an objective evaluation of all possible solutions.

RD&D is an important prerequisite for energy storage deployment in some applications.

Grid scale deployments of new devices must be handled with adequate preparation, planning, and a high level of certainty with respect to grid reliability. Utility RD&D is an important step in assessing the readiness, benefits, and potential implications and problems of new technology deployments. Since grid-scale deployments of devices or systems may involve significant costs and

reliability concerns as well as the installation of complex technologies that will remain on the system for years to come, a comprehensive understanding of deployment issues and capabilities is needed. SCE is actively conducting testing and demonstrations of energy storage systems on its grid. Full results from these important projects are expected in 2015.

II. SCE Recommends That the Energy Commission Staff Develop a Roadmap To Coordinate Various Energy Storage Research and Development Efforts.

Numerous entities are currently making important efforts to clarify roles and opportunities for energy storage solutions. These activities are designed to address grid challenges where storage solutions may play a role, or to ensure energy storage solutions can compete with other possible solutions. These efforts include both regulatory processes and technology demonstrations.

In addition, these efforts are mostly application-based and rely on broad stakeholder participation. The efforts span a range of regulatory jurisdictions within the electric system – from customers to the distribution system to the transmission system to generators – and so highlight the need for agency coordination in addressing energy storage applications. Given the multitude and breadth of these processes, an important role for the Energy Commission would be to document and evaluate these key efforts as part of a California energy storage roadmap.

The purpose of such a roadmap would be to enable interested and relevant parties, regulators, and other policy makers to make informed and comprehensive decisions regarding energy storage. This roadmap would catalog existing activities and provide timelines and general guidelines and recommendations for future energy storage activities or actions. The purpose of a roadmap would be to explain how the many regulatory processes are related, outline when and where major regulatory decisions regarding energy storage applications are being addressed, and clarify when the results of key demonstrations can be expected. As a whole, the document will help interested parties understand how energy storage is being pursued in California.

A roadmap for California's energy storage efforts should accomplish the following goals:

- Provide timelines for major relevant activities such as demonstration projects and regulatory efforts.¹
- Clarify problems facing the grid and acknowledge major studies that are further quantifying and defining problems.
- Identify needs and plan for additional RD&D and regulatory efforts.

¹ Please refer to Appendix A for a list and description of the processes and demonstrations with which SCE is involved.

May 16, 2011

As always, SCE appreciates having the opportunity to submit comments on the Workshop and to work with the Energy Commission to resolve outstanding issues. Feel free to contact me regarding any questions or concerns.

Sincerely,

/s/ Manuel Alvarez

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Appendix A

As discussed in the letter, many activities are underway that will clarify roles and opportunities for energy storage solutions. These activities are designed to address grid challenges where storage solutions may play a role or to ensure energy storage solutions can compete with other possible solutions. These efforts include both regulatory processes and technology demonstrations. Those efforts in which SCE is a participant are as follows:

Regulatory Efforts

- The California Public Utilities Commission (“CPUC”)
 - The Energy Storage OIR – a broad review of energy storage applications, cost-effectiveness, and barriers, directed by Assembly Bill (“AB”) 2514.
 - Permanent Load Shifting Programs – these programs, designed to address peak energy needs and associated challenges are up for consideration by the CPUC and will likely allow for some energy storage solutions in these applications.
- The California Independent System Operator (“CAISO”)
 - Regulation Energy Management – an effort designed to improve competition in select Ancillary Services markets by allowing participation from limited energy resources, e.g. energy storage systems such as flywheels.
 - Renewables Integration Study – major study that better defines the specific energy, ramping, and regulation needs for the system under certain 33% RPS scenarios. This improved understanding of the scope and size of grid challenges highlights the categories of solutions needed, e.g. down-ramping services.
 - Renewables Integration Product Design – evaluates the CAISO’s suite of market products and provides a forum for tweaking products or introducing new products and services to the market to ensure reliability and policy compliance with the most cost-effective generation mix.
- The Federal Energy Regulatory Commission (“FERC”).
 - The *Western Grid* and *Nevada Hydro* decisions – recognize that different storage applications demand different policy solutions and established a “case-by-case” approach to addressing storage issues
 - The *Energy Storage Request for Comments* – illustrates the complexity of storage, the diversity of storage applications and the policy issues that arise in certain circumstances.
 - The Notice of Proposed Rulemaking (“NOPR”) on Variable Energy Resources – promotes rules to address the issues associated with increased intermittency and variability of certain renewables, highlighting roles and potential price signals for certain energy storage applications.
 - The NOPR on Frequency Regulation Compliance in Organized Wholesale Markets – proposes technology neutral policies that would improve price signals and thus market solutions for frequency regulation, a likely application for energy storage.

- The California Air Resources Board (“CARB”)
 - AB 32 Implementation – the implementation of AB 32 will provide price signals and other incentives to implement solutions that reduce greenhouse gas emissions. Through price signals associated with greenhouse gas emissions, certain energy storage applications may become more competitive.

Research Projects

Several major energy storage technology RD&D projects are underway. These projects are involved in testing a wide spectrum of storage applications and will provide a significant basis for understanding the potential opportunity for storage development in the future. Many projects are taking place within California, and many more are taking place in other locations throughout the United States. Collectively, these projects will provide crucial data and operational experience with an array of energy storage applications and technologies. SCE alone is managing \$136 million in RD&D projects that mostly or partly focus on energy storage applications.² The Energy Commission has helped to fund these projects with \$2 million in PIER funding. Further RD&D projects on energy storage applications should be considered. SCE’s major energy storage demonstration projects include:

- Tehachapi Wind Energy Storage Project – a \$57 million project to test and demonstrate multiple applications for a lithium ion energy storage system in “transmission” and “generation” functions, including providing voltage support, congestion management, wind energy firming or smoothing, basic energy provision, and ancillary services provision.
- Irvine Smart Grid Demonstration – a \$79 million project which demonstrates a plethora of smart grid concepts and technologies, parts of which are distribution and customer-level energy storage applications. The specific storage applications include: outage mitigation, VAR support and other applications addressed by transportable storage systems; voltage fluctuation mitigation, renewables integration, and transformer load relief addressed through community energy storage systems; and renewables integration and residential rate-management addressed through residential home energy storage systems.

² Tehachapi Wind Energy Storage Project budget is \$57 million. Irvine Smart Grid Demonstration budget is \$79 million.