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October 21, 2013

California Public Utilities Commission
Policy and Planning Division
Attention: Stephen St. Marie, Marzia Zafar
505 Van Ness Ave
San Francisco, CA 94102

SUBJECT: SCE Preferred Resource Pilot, AES Proposal, Local Capacity Arrays

Dear Mr St. Marie and Ms Zafar:

AES is pleased to submit the below proposal for the SCE Preferred Resources “Living” Pilot program in advance of the CPUC Policy and Planning Division’s symposium.

Introduction

A number of advanced storage technologies have matured to the point where they can effectively provide local capacity and reliability. Several of these technologies are suited to dense urban and suburban neighborhoods where thermal generation or other alternative forms of generation cannot be located due to space, emissions, water, fuel, or other constraints. As a dispatchable and fully controllable resource, storage can be located exactly where it is needed, serve as a generation alternative for peaking activities, and supply power without any local emissions.

Preferred Resource Pilot Proposal

As part of the Preferred Resource Pilot, AES proposes to work with Southern California Edison to deploy Local Capacity Arrays (LCA) powered by advanced sealed-cell batteries. These LCAs would each be capable of providing up to 10 MW of continuous power for an extended duration of two to four hours. In addition, the LCAs would be configured to enable higher power levels for shorter periods of time, enabling the system to locally manage rapid changes in net load. The LCAs would also serve as a source for reactive power within the local area.

AES proposes an initial 10 MW LCA to be installed within either the Johanna or Santiago substation. This LCA would also be capable of withdrawing power at a rate of up to 10 MW, proving a 20 MW flexible operating range. If the initial LCA performs as expected, AES proposes to work with Southern California Edison to expand the Preferred Resource Pilot deployment to include up to four additional 10 MW LCAs at SCE’s Johanna or Santiago substation sites, adjacent to the AES Alamitos or AES Huntington Beach sites, or in other areas where local reliability needs are identified. The additional LCAs could be deployed. Such a deployment would manage several years of expected net load growth in the target areas.

Local Capacity Arrays (LCA)

Each LCA would be a fully capable, stand-alone power resource with all necessary components to provide or withdraw energy from the power grid. The LCA will be composed of a DC subsystem, an AC subsystem, electrical connection subsystem, controls modules, and balance of plant. AES would specify

**SCE Preferred Resource Pilot
AES Proposal: Local Capacity Arrays**

the system components and work with SCE to adapt any portions for local site conditions. AES would manage all installation and construction required.

The DC subsystem will include a series of efficient sealed-cell advanced batteries. To expose SCE to a broader spectrum of technology operating experience, AES could propose to include batteries within a single LCA from multiple equipment suppliers who have passed AES' or SCE's pre-qualification requirements.

The AC subsystem will be comprised of a power conversion system including bidirectional inverters with full reactive and real power capabilities. These will communicate with an LCA control system which will allow the entire LCA to be dispatched manually, autonomously according to pre-programmed algorithms, or by Automated Generation Control by CAISO or other central operator.

Market Strategies

An initial Preferred Resource Pilot procurement across a broad set of preferred resources might be overly complex because the wide variety of potential solutions. Another procurement method that could allow for faster deployment or a more iterative process is for SCE to seek qualified partners with whom to pursue initial deployments, and then to perform follow-on deployments either through an expansion of those partnerships or through more general procurement mechanisms for preferred resources to meet Local Capacity Requirements.

To balance the interests of customers and utilities in meeting grid needs with innovative solutions such as the Preferred Resource Pilot, AES suggests the Commission prioritize a recommendation made by the Policy and Planning Division in 2010 to “develop a methodology to allow utilities to earn an incentive rate of return on power purchase agreements signed with [energy storage] developers.”¹ Such an incentive could accelerate the deployment of innovative solutions by attracting private capital to fund deployments while mitigating the perceived risk to customers of newly commercialized technologies.

Measurement and Metrics

In the Preferred Resource Pilot, SCE and AES would measure the performance Local Capacity Arrays and their relative effectiveness in meeting the Local Capacity Requirements and mitigating system stability events. These measurements would be used to inform future SCE procurement activities for local capacity and reliability. These measurements would consider the following:

1. The overall effectiveness of LCAs in delivering local capacity;
2. The comparative effectiveness of LCAs and other preferred resources;
3. The benefit and effectiveness of different power-to-energy configurations;
4. The benefit and effectiveness of fast-response capabilities;
5. The impact LCA deployment on out-of-merit energy dispatch;
6. The benefit and effectiveness of LCA reactive power management;
7. The collection of a typical duty cycle of a LCA being used to meet LCR needs;
8. Establishing optimal dispatch configurations of real and reactive power capabilities as well as various energy and ancillary services combinations for the LCA; and
9. Developing protocols for the integration of LCA resources into Energy Management and Distribution Management Systems as well as CAISO controls.

¹ *Electrical Energy Storage: An Assessment of Potential Barriers and Opportunities*, California Public Utilities Commission, Policy and Planning Division Staff White Paper, July 2010.

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AES Proposal: Local Capacity Arrays**

Proposer Capabilities

AES operates nearly 4,000 MW of thermal power generation in the Western Los Angeles basin and has been serving power needs in the Southern California Edison (SCE) area since 1998. In addition, AES has worked with utilities and power system operators to install more than 170 MW of advanced battery-based energy storage systems, the largest fleet of such resources in the world. AES has 1,000 MW of energy storage resources in development, typically proposing commercial deployments of 100-400 MW under long-term PPAs.

Most recently, SCE and AES worked closely to retrofit retired units at the AES Huntington Beach generating facility for use as a synchronous condenser to support local reliability after the outage of the San Onofre Nuclear Generating Station. This innovative approach developed cooperatively by the two companies is a great example of how effective new solutions can be brought to market to the benefit of the SCE customers.

SCE and AES have also worked together previously on an energy storage system which was piloted for the CAISO in 2008-2010. This ground breaking project was one of the largest of its kind at the time and helped to inform the state as to the benefits of fast response storage for grid support. The combination of SCE's extensive local power system knowledge and commitment to pursuing new Preferred Resources with AES' experience in deploying utility scale energy storage is a strong team for generating valuable insights that can inform future procurements to meet local reliability needs.

We look forward to participating in the November 6th symposium facilitated by the CPUC's Policy and Planning Division. If you have further questions about this proposal please contact me at 703-682-6690 or praveen.kathpal@aes.com.

Sincerely,

Praveen Kathpal
Vice President, AES Energy Storage