

**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Pursuant
to Assembly Bill 2514 to Consider the
Adoption of Procurement Targets for
Viable and Cost-Effective Energy Storage
Systems

R.10-12-007
(Filed December 16, 2010)

**COMMENTS OF
PACIFIC GAS AND ELECTRIC COMPANY (U 39 E)
ON PRESENTATIONS MADE AT THE JUNE 28, 2011
WORKSHOP IN THE ENERGY STORAGE OIR**

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Pursuant to Administrative Law Judge (“ALJ”) Amy C. Yip-Kikugawa’s ruling of July 21, 2011 (“Ruling”) in the above-captioned proceeding (“Energy Storage OIR”), Pacific Gas and Electric Company (“PG&E”) submits its comments on the presentations made by parties at the June 28, 2011, workshop in this proceeding, as well as answers to the questions provided in the Ruling.

GENERAL COMMENTS

1. PG&E supports an environment where storage can compete on an equal footing.

PG&E supports the California Public Utilities Commission’s (“Commission”) proposed two phased approach for the OIR, with the first phase focusing on the overall policies and guidelines for energy storage systems (“ESS”) and the second phase focusing on the costs and benefits of ESS. As part of the first phase, PG&E supports the Commission’s efforts to identify barriers and impediments to usage or development of energy storage in the electric system. However, in addition to addressing barriers and impediments, PG&E believes that the OIR should also consider and balance the cost, reliability, and environmental impacts of ESS to California. Rather than focusing on imposing procurement targets or mandates which PG&E

believes could increase customer costs, the Commission’s efforts should instead focus on creating an environment that allows energy storage technologies to compete on equal footing with other technology alternatives.

- 2. Rather than imposing a procurement mandate or target, the Commission should assist in efforts currently underway to estimate integration needs and develop efficient energy and ancillary services markets.**

PG&E believes it is appropriate for the Commission, along with other interested stakeholders, to work with other entities such as the California Independent System Operator (“CAISO”) in determining future system needs and identifying products in energy and ancillary services markets that can address the feasibility and effectiveness of integrating cost-effective energy storage solutions into the state’s energy mix. As is discussed more fully below, the CAISO is currently undertaking various initiatives that could impact energy storage policy. Over the next year, as these initiatives progress, PG&E believes that the need and market for energy storage products will become clearer. In the meantime, it is prudent to continue pilot programs and feasibility studies that can enable ESS to compete with other alternatives to integrate renewable additions. Efforts should continue to pilot promising emerging technologies to test participation in energy and ancillary services markets and allow feasibility studies for large scale projects with long lead times. These efforts create implementation options for promising storage projects in the future by driving down costs, gaining commercial operating experience, and accelerating future lead-times, if a need for additional resources is determined.

ANSWERS TO RULING’S QUESTIONS

- 1. Parties are asked to comment on whether they agree or disagree with the presentations made at the Commission’s June 28, 2011 workshop on energy storage systems barriers and impediments.**

During the June 28th workshop, eight (8) parties provided presentations. PG&E’s comments address presentations made by the Public Interest Energy Research (“PIER”) 2020

Energy Storage Vision Project (Attachment A to the Ruling) and the California Energy Storage Alliance (“CESA”) (Attachment D to the Ruling).

The 2020 Energy Storage Vision Project could provide useful information in this proceeding about storage technologies, policy and regulatory drivers, and cost and benefit assessments. At the time of the presentation, a paper being developed by 2020 Energy Storage Vision Project was not yet complete and only preliminary findings were communicated. To support the presentation, which has been included in record, PG&E recommends that a draft of this paper be entered into the record of this proceeding so that parties can have the opportunity to review and provide comments on it.

PG&E disagrees with several aspects of the CESA presentation. CESA’s statement that “more storage is needed in the system”¹ is premature. PG&E recognizes that the electric supply system needs to be more flexible than it is today to integrate the planned intermittent renewable additions to meet the 33% percent Renewable Portfolio Standard and that storage is one class of resource alternatives that can provide additional flexibility to the system. However, there is not sufficient information to evaluate the cost-effectiveness of the emerging technologies compared to the other alternatives.²

CESA also requests procurement targets and storage friendly tariff structures, for which it provides no support. PG&E disagrees with both requests, as they can lead to sub-optimal resource procurement decisions and potentially higher rates for customers. PG&E does support removing policies and barriers, to the extent that they exist, that specifically hinder storage from competing against other similarly situated technologies on a level playing field. PG&E supports

¹ CESA Presentation at page 4.

² Because of this challenge, the Commission should continue its support for energy storage pilot projects and feasibility studies. This issue is discussed in further detail at page 9 of these comments.

having a competitive approach that considers all storage and non-storage alternatives based on cost, reliability, and environmental impacts.

2. Which barrier(s), either identified by the presenters or the CPUC, do you believe present the greatest impediment to more widespread usage of energy storage and development of ESS in California?

Parties at the workshop identified potential barriers or challenges to the development of energy storage, and certain parties additionally indicated that there was a need to implement targets to ensure the widespread use of energy storage. However, procurement targets or mandates, as explained below, do not resolve any of these barriers or challenges.

(a) While it is difficult to value the costs and benefits of energy storage, procurement targets will not alleviate this challenge.

As indicated by the PIER 2020 Energy Storage Vision Project, CESA, and Southern California Edison Company (“SCE”), energy storage has the potential to provide a variety of services to the system (i.e. energy and ancillary services).

However, ESS devices can potentially provide other benefits across many parts of the electric supply chain, such as local load firming and distribution asset deferral, although many of these benefits cannot be provided simultaneously. The benefits that can be provided are limited by the operational characteristics of a particular storage device, its physical location on the electric grid, and day-to-day charge/discharge decisions that govern its operations. It is not known yet how frequently each of the benefits can be provided or the amount of a particular benefit that can be offered.

Many organizations, not all of which are represented in the OIR, have suggested potential models and benefit values for energy storage, although the industry still lacks a proper methodology and models to value the potential benefits in a fair and accurate manner that reflects the true operational benefits to the electric system. This presents a barrier or challenge

that cannot be overcome by the simplistic establishment of procurement targets. PG&E recommends that phase 2 of the OIR include the evaluation of methodologies and models to accurately value operational benefits of storage.

(b) Lack of information about future system needs and ancillary services markets makes it difficult to value energy storage.

While the CAISO, the utilities, and other ESS stakeholders have all put forth significant efforts to address the complexity of integrating intermittent renewable resources into the grid, additional work still remains to determine future system needs and the associated operating characteristics of future resources to meet those requirements. These efforts will continue to evolve and be refined in the coming months. However, given the current circumstances and the lack of definitive information about future electric system needs, there is significant uncertainty about the need for new flexible resources.

Additionally, the types of products and markets that will be available in the future are evolving. The CAISO's presentation (Attachment B to the Ruling) highlights some of the already approved changes to CAISO's market rules. For example, the CAISO has created a new product called Regulation Energy Management ("REM"), approved by the CAISO Board in February 2010, which allows limited energy resources ("LER"), such as energy storage, to provide regulation service with full resource capacity for 15 minutes. In addition to REM, the CAISO has also lowered the requirements for spin and non-spin from two hours to thirty minutes.³ Both of these market changes highlight the importance of market product rules in determining the ability for energy storage to participate.

The CAISO has also proposed major changes in phase 2 of its Renewable Integration Market and Product Review that are still evolving. These proposed changes have the potential to

³ <http://www.cpuc.ca.gov/NR/rdonlyres/09262274-EC45-4746-B7C1-18FFB4D7B1E5/0/CAISO.pdf>, pg 5-6

change the products and markets for energy and ancillary services in California. While these potential new products may expand opportunities for participation by energy storage devices, the precise set of products available in the future is uncertain.

(c) Resource Adequacy (“RA”) counting rules for energy storage devices are not clear.

As mentioned by Beacon Power, CESA, and SCE, the current rules for counting storage capacity for RA purposes need clarification. Each Load Serving Entity (“LSE”) is required to procure sufficient capacity to meet its peak load capacity plus the required planning reserve margin (“PRM”). The Commission has adopted rules to determine how much each supply and demand-side resource contributes towards a LSE’s requirements. For RA counting purposes, the current counting rules state that the resource must be available for at least 4 hours per day for 3 consecutive days, and for a minimum number of hours ranging from 40 to 60 hours per month.⁴ However, it is unclear how energy storage resources with less than 4 hours of energy should be counted for RA purposes. The Commission should clarify RA rules for energy storage. By clarifying counting rules, storage can more easily monetize RA capacity benefits and which can help facilitate the long-term procurement of ESS, a concern identified by both CESA and Beacon Power.

(d) Transmission deferral benefit is an on-going issue being examined by the Federal Energy Regulatory Commission (“FERC”).

Transmission deferral is commonly referred to as the potential of a resource to delay investment in new transmission assets or upgrades to existing assets, if its location allows the resource to relieve overload conditions on a transmission line. CESA stated the inability to capture this benefit as a barrier for energy storage. This issue is currently part of FERC’s Notice

⁴ “Workshop Report On Resource Adequacy Issues” which was submitted in ALJ Ruling R.01-10-024, Page 24. http://docs.cpuc.ca.gov/word_pdf/REPORT/37456.pdf

of Inquiry on “Third Party Provision of Ancillary Service, Accounting and Financial Reporting for New Electric Storage Devices.”⁵ Specifically, because of the potential for certain storage technologies to provide multiple services, and the possibility that storage could simultaneously recover costs under both cost-based and market-based rates, FERC has asked for comments on whether current accounting and reporting requirements for activities and costs relating to the operation of new electric energy storage resources provide sufficient transparency.⁶ Given that FERC is already investigating the potential simultaneous use of cost-based and market-based rates for energy storage, PG&E does not believe that the Commission needs to address this issue in this proceeding.

(e) Lack of integration costs masks the value that energy storage technologies can provide.

The PIER 2020 Energy Storage Vision Project, CESA, and SCE identified renewable integration as a key benefit that can be provided by energy storage. One aspect of renewable integration is energy imbalances. Imbalances between forecasted and actual generation by resources must be settled at the real-time energy price. To the extent that a generator over-forecasted, the generator must pay the difference between the actual generation and forecasted generation at the real-time price. Currently, the CAISO’s Participating Intermittent Renewables Program (“PIRP”) masks the imbalance energy costs for each intermittent renewable generator by allowing the intermittent renewable generator to net all energy imbalances over a month at the average real-time price.⁷

⁵ FERC Docket RM11-24-000

⁶ FERC NOI, PP 25.

⁷ This assumes the intermittent resource is scheduled in the day-ahead market. However, even for situations in which the resource is scheduled in the real-time market, PIRP uninstructed deviation settlement rules tend to provide a benefit to the resource.

Another aspect of renewable integration is the costs of additional ancillary services, which includes the cost of additional capacity needed to cover the imbalances. The costs of ancillary services are charged to LSEs based on their share of overall demand. These policies result in a lack of transparency regarding the true costs of integration and do not attribute those costs to the responsible generator. The CAISO has proposed improvements to PIRP to improve the transparency of intermittent renewable generation's imbalance costs.

PG&E believes that a cost allocation for these integration costs for intermittent renewable generation should follow the principle of cost causation and that this will result in greater transparency of the true integration costs. Greater transparency will enable flexible resources, such as energy storage, to monetize the renewable integration value they provide to the system. The Commission can help achieve this goal of greater transparency of the costs of intermittent renewable generation through an interagency collaboration with the CAISO to ensure that future policies result in greater transparency for integration charges.

- 3. Are there other barriers that were not identified during the workshop? Please explain how these other barriers impede the usage or development of energy storage and whether they need to be resolved at the Commission or other forums. To what extent can the Commission assist in removing these barriers?**
 - (a) Lack of commercial operating experience for emerging technologies and long lead times for pumped hydro and Compressed Air Energy Storage ("CAES") are barriers for energy storage technologies.**

PG&E believes that novel emerging technologies and mature larger capacity technologies each face distinct barriers.

Many of the emerging energy storage technologies, such as batteries, lack long-term commercial operating experience. Utilities around the country, including PG&E, are still evaluating the value proposition and useful life-time for these assets through demonstration projects. PG&E supports continuing pilot and demonstration projects to help utilities accurately

value the costs and benefits of storage and gain operational experience with these technologies. Furthermore, these efforts will enable the emerging technologies to reach maturity and the experience will allow technologies to progress down the cost curve.

The more mature and larger capacity technologies, such as pumped hydro and CAES, face impediments in long lead times to develop and construct. Rather than setting procurement targets, PG&E recommends that the Commission continue to support pilot projects and fund feasibility studies for long lead time storage technologies to enable implementation options if and when future resource needs and cost-effectiveness are determined.

4. In your opinion, are there certain barriers that need to be resolved first, and therefore have higher priority?

PG&E believes that the Commission's priority should not be to set a mandate or target for energy storage. Rather, as discussed above, the Commission should remove barriers to create a competitive environment that allows all energy storage technologies to compete on an equal footing with other technology alternatives on the basis of cost, reliability, and environmental impacts.

Another priority for the Commission should be to work with stakeholders to develop rigorous methodology and models for quantifying the benefits and costs of different storage technologies.

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The need for renewable integration and the structure of the future CAISO markets have not yet been quantified or defined, but PG&E believes it is reasonable to support pilot opportunities for emerging technologies and feasibility studies for mature large capacity technologies. Both efforts will accelerate the use of energy storage for services that may be needed on the electric grid in the future.

Respectfully submitted,

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Dated: August 29, 2011

**CERTIFICATE OF SERVICE
BY ELECTRONIC MAIL OR U.S. MAIL**

I, the undersigned, state that I am a citizen of the United States and am employed in the City and County of San Francisco; that I am over the age of eighteen (18) years and not a party to the within cause; and that my business address is Pacific Gas and Electric Company, Law Department B30A, 77 Beale Street, San Francisco, CA 94105.

I am readily familiar with the business practice of Pacific Gas and Electric Company for collection and processing of correspondence for mailing with the United States Postal Service. In the ordinary course of business, correspondence is deposited with the United States Postal Service the same day it is submitted for mailing.

On the 29th day of August, 2011, I caused to be served a true copy of:

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- [XX] By Electronic Mail – serving the above via e-mail transmission to each of the parties listed on the official service list for R.10-12-007 with an e-mail address.
- [XX] By U.S. Mail – by placing the above for collection and mailing, in the course of ordinary business practice, with other correspondence of Pacific Gas and Electric Company, enclosed in a sealed envelope, with postage fully prepaid, addressed to those parties listed on the official service list for R.10-12-007 without an e-mail address.

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this 29th day of August, 2011 at San Francisco, California.

/s/ Stephanie Louie

STEPHANIE LOUIE