

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



FILED

01-21-11

04:59 PM

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

Rulemaking 10-12-007
(Filed December 16, 2010)

**COMMENTS OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902-E) ON
ORDER INSTITUTING RULEMAKING**

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January 21, 2011

#251233

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**I.
INTRODUCTION**

On December 21, 2010, the California Public Utilities Commission (the “Commission” or “CPUC”) issued the above-entitled Order Instituting Rulemaking (OIR).^{1/} Pursuant to the OIR, CPUC Rule of Practice and Procedure 6.2, and the schedule set forth at page 5 of that OIR, San Diego Gas & Electric Company (SDG&E) hereby submits the following comments on scope, schedule and other procedural issues. In addition, SDG&E provides its initial comments concerning the Policy and Planning Division (PPD) white paper entitled “Electric Energy Storage: An Assessment of Potential” (the “White Paper”).^{2/}

**II.
SCOPE OF THE RULEMAKING**

The OIR states that it is initiated “in response to the enactment of legislation (Assembly Bill (AB) 2514 – Skinner, Stats. 2010 – ch. 469). This legislation directs this Commission to open a proceeding by March 1, 2012 to determine appropriate targets, if any, for each load-serving entity (LSE) as defined by Pub. Util. Code Section 380 (j) to procure viable and cost-

^{1/} OIR available at <http://publicserver.cpuc.ca.gov/PUBLISHED/proceedings/R1012007.htm> .

^{2/} The White Paper was released by staff on July 9, 2010.

effective energy storage systems and, by October 1, 2013, to adopt an energy storage system procurement target, if determined to be appropriate, to be achieved by each LSE by December 31, 2015, and a second target to be achieved by each LSE by December 31, 2020.”^{3/} Further, the OIR identifies that the specific purpose for this proceeding is to:

- (1) Review, analyze and establish, if appropriate, opportunities for the development and deployment of energy storage technologies throughout California’s electricity system;
- (2) Remove or lessen any barriers to such development and deployment;
- (3) Review and weigh the associated costs and benefits of such development and deployment; and,
- (4) Establish how those costs and benefits should be distributed.

As discussed further below, SDG&E does not believe adoption of a mandatory energy storage system procurement target is appropriate at this time. Specifically, as SDG&E explains in more detail below, the Commission should recognize that there are many different storage technologies and many different applications. Storage is not an end unto itself. Storage is one possible technology that can be employed to address issues facing the electric grid. These issues range from behind the meter customer applications, to the distribution and transmission system, to the wholesale generation market. Some applications may be very specific to a particular location, while some may be suitable for utilization in a wide range of locations and at different spatial scales. Additionally, the different functions storage may provide are not mutually exclusive, and may come under different regulatory structures, including FERC jurisdictional transmission and wholesale energy markets and state or local jurisdictional distribution or retail energy markets. Consequently, the regulatory concept of instituting or attempting to institute a single mandatory energy storage procurement target may not prove to be practical or productive. Therefore, SDG&E recommends that as the Commission proceeds with this OIR it does so to gain valuable insight into the function, technology, location and size, among other factors, of

^{3/} OIR at p. 1.

energy storage. Further, the Commission's most constructive path forward towards a constructive dialogue and consensus on adoption of cost-effective energy storage systems would be to work, when possible, to ensure that markets exist so that potential applications can be judged against accurate prices, and thus the use of energy storage solutions will emerge as mission-oriented, applied research activities are expanded in the future in direct response to the natural progression of industry benefits that meet or exceed the capital costs associated with energy storage and conversion equipment. By achieving measurable business benefits, including more innovative products and services, more effective enterprise application integration, better access to operational knowledge, lower cost of deployment, and higher system reliability, companies will logically make greater use of the technologies.

SDG&E would also note that the Commission should not put a stop to the deployment of storage application while this OIR is underway. Instead the Commission should address these applications on a case-by-case basis. Much can be learned about the cost and effectiveness of storage in addressing the needs of the electric system by pursuing targeted applications. SDG&E is aware of a number of proposed applications that vary from deployment as part of a micro grid or in application to address voltage issues on the distribution system. The commission should remain open to these based on these individual cost benefit showing or to the extent these can provide better insight.

1) No Mandatory Targets Should Be Set At This Time

Energy storage driven by a mandated "target" approach will most likely not achieve the most efficient application of storage technologies, and only by coincidence will it be the "efficient" or "correct" amount of storage. SDG&E believes that from an engineering, operations and cost-effectiveness model standpoint, California Investor-Owned Utilities' (IOUs)

should be allowed to make any technical or operational decisions about whether their specific energy storage projects best meet the utility's territory-specific and diverse needs, developed to fully address future infrastructure planning goals, both long and short term, based on the analysis and alignment to the overall mission of the system providing reliable power to consumers.

The use of targets in the 2013-15 time frames to mandate installation of energy storage systems is ill-advised. There is no meaningful way to prescribe values to these targets. A more rational approach is to create a process to insure comprehensive case-by-case project assessments. The need and benefits of storage are very location, technology and application detailed. Applying a mandatory, and arbitrary, target for storage installation assumes that the need for storage is uniform across all energy entities.

In addition, storage differs significantly from renewable energy, and thus drawing any meaningful comparisons with the existing RPS policies is not appropriate. The idea behind the RPS was to encourage clean renewable energy to replace energy generated by plants burning fossil fuels, because it was thought that the fossil plants were creating negative impacts on the economy which were not being priced (pollution, CO₂, dependence on foreign energy sources). Renewable energy is an end in itself, but in contrast storage does not replace any specific product, so a storage mandate will not appreciably correct any anomalies pertaining to market inefficiencies. Further, storage serves many different functions and through configuration parameters can actually give rise to many different products (for example, energy arbitrage between low cost and high price periods, or extremely short-term voltage support), thus a mandate for storage may not even deliver the storage that was envisioned. It is also likely that, whereas for renewables many of the benefits were not location dependent, the solutions which electricity storage may provide are specific to certain locations within the grid. These inherent

differences make taking a portfolio standard approach from the renewable market to the storage market unworkable.

2) Renewable Variability and Integration

One of the major functions envisioned for electricity storage is as a tool to accommodate the integration of renewable generation into the electricity grid. The impact of renewable resources on electric grid operations is currently being studied in considerable depth and results are only now beginning to emerge. Impacts of large central wind or solar installations, for example, are different than the impacts of small, widely dispersed installations. Recent news stories about the cancellation of certain projects and additional environmental and other protests to other projects remind us that we don't know what renewable generation and developing a sustainable energy supply for future generations looks like. The amounts, types and geographical dispersion of these intermittent energy resources, both central station and distributed, will determine whether and what types of storage could be useful in integrating these intermittent resources. Moreover, decisions impacting market based incentive measures and how costs of integration will be allocated, will also delineate the relevant market and whether, to what extent, and in what manner participants actually have an incentive to look at varying technologies to address and solve the energy intermittency problem. The timing of these intermittent renewable resource additions is also an important variable in determining when new resources, including storage, will be needed and cost efficient solutions to the intermittency challenge.

Given the numerous uncertainties about what renewables will be built, where and when they will be built, who will have incentives to address the increased variability, and whether storage will be a cost effective method of addressing these concerns setting targets for storage

adoption at this point will only coincidentally lead to the correct technology and quantity choices. More likely, targets for storage adoption will only serve to confuse and obscure markets and accurate prices and lead to inefficient adoption of storage.

3) Metrics to measure cost and benefits

The best way for the Commission to ensure that cost-effective energy storage is adopted is to ensure that all parties see the full-costs accounting of their decisions and face the proper incentives for implementing storage solutions as compared with other competing technologies. By allowing markets to exist where possible and ensuring that all parties face the actual costs the Commission will be contributing to the efficient adoption of storage.

Ensuring that parties see the actual costs and prices for storage will allow parties to determine the appropriate values for case specific energy storage applications. However, even then it will be difficult, and likely impossible, to determine what appropriate “target” levels of storage would be for a generic storage mandate. The Commission should work to ensure that utilities and other entities are careful to see that cost effectiveness measures are based on hard benefits (as opposed to soft, un-measurable benefits) as much as possible. Storage should be utilized where the specific storage technology is appropriate, effective, and a selection of least-cost best-fit for the uses and functions it is to serve and should not be installed simply to meet a mandated storage target. Ratepayers should not be burdened with the costs of uneconomic storage projects installed simply to meet a mandated target.

From an engineering, operations and cost effectiveness standpoint, electric energy storage is likely to be an important element in the mix of resources that the CAISO and electric utilities, LSE’s, generators, and other market participants will need for the integration of increased amounts of renewable energy resources. SDG&E urges the Commission to recognize that

simply adding storage should not be the objective, but that the purpose should be to help refine the role cost effective storage may play in providing reliable power at the lowest possible costs.

III. WHITE PAPER

1) Cost effectiveness

The White Paper touches briefly on the issues of cost and appropriate price signals associated with storage. Those issues will be one of the most important topics for discussion and resolution in considering the proper implementation of AB2514.

AB2514 provides that the storage the commission should be considering is limited to “viable and cost-effective energy storage systems.” It is likely that each different storage application would provide different benefits and costs (as recognized in the White Paper). In order to meet AB2514’s requirements, it will be necessary for the Commission to consider the cost-effectiveness of each energy storage application and recognize not a single cost-effective test or method will be applicable to all applications.

2) Appropriate Price Signals / Rate Design

SDG&E has explained above that the best way to encourage the cost efficient adoption of electric storage is to ensure that parties see accurate prices that correctly reflect the costs of the storage they would use. These cost signals should be at the wholesale and retail level. Many of the whole sale price changes need to be implemented by the California Independent system Operator (CAISO). The CAISO is already starting to look at possible changes in its markets.

The Commission must recognize that changes in wholesale prices alone will not be enough. Retail rate design can stand as a significant impediment to the development of competitive storage alternatives by giving retail consumers inaccurate price signals that may impact their decisions as to whether or not to invest in on-site storage. The staff white paper

notes that, from the consumer's viewpoint, the economic value of certain types of storage will be driven by, among other things, the applicable tariff. For example, in the context of behind-the-meter customer generation, current net metering tariffs specifically allow the consumer to depend on the utility to provide storage services, but these integration storage services are provided at no cost to the consumer.^{4/} The free integration services net metering customers receive allows them to ignore the impacts of the intermittency of their generation and transfers the costs that are incurred to address that intermittency to other consumers, specifically those consumers that have not, or cannot, add behind-the-meter generation themselves. Staff specifically notes that customers with PV systems might be able to use on-site storage as a substitute for this utility storage service. However, consumers with behind-the-meter PV receive no price signals for the cost the utility incurs to provide storage and reliability services and, accordingly, are given the message that there is no cost to those services. As long as these customers receive free storage and reliability service under current tariffs, it is unlikely that they will be willing to pay for distributed electricity storage resources which will create inherent obstacles to competitive storage comparison. One of the key objectives of AB2514 in considering how to facilitate cost-effective storage development is to ensure that those with competitive alternatives receive the price signals necessary to assess and choose among the available options.

Before the State can expect to eliminate the obstacles to the development of cost effective storage, it needs to repair the structural flaws that prevent the comparison of costs of competing

^{4/} The CAISO arranges ancillary services sufficient to accommodate generation intermittency. The costs incurred by the CAISO to arrange these ancillary services are passed on to consumers in proportion to metered consumption. Since the current net metering tariffs permit behind-the-meter generation to reduce metered consumption, consumers whose behind-the-meter generation completely offsets consumption would be assessed no ancillary service costs even though their behind-the-meter generation may be intermittent (rooftop photovoltaic for example).

alternatives and impose the costs of intermittency on the wrong customers. Accordingly, this issue needs to be a high priority in the Storage OIR.

3) Different Types of Storage

The White Paper does not distinguish between the different uses for cost effective storage and the different locations where storage may be used. SDG&E recommends that any discussion of storage should look at storage in the various areas it may be deployed. These include:

- a) *Behind the meter storage:* The electric grid will be impacted by the deployment of storage technologies by customers. For the most part this storage will be added by customers to meet their specific need. This could include reliability, minimizing their energy costs, shifting or levelizing usage patterns, or for other reasons. Storage devices behind the meter could be devices that are designed for short term or long term storage service. The use of storage devices behind the meter would not be regulated by the Commission, however, Commission adopted rate design could influence how much or for what applications customers find this type of storage to be cost effective. The Commission may have some impact in this area through demand response programs. The Commission is currently looking at a Permanent Peak shift program that would provide customers with an incentive to invest in thermal storage.
- b) *Distribution Level Storage:* Storage devices will likely be added to the distribution system to help maintain reliability and voltage support. SDG&E is already seeing issues related to maintaining voltage on distribution circuits where the amount of photovoltaic (PV) generation on the circuit becomes large in relation to the total load on the circuit at times of maximum PV system output. Storage devices on the distribution system will be devices that will need to charge and discharge very rapidly, potentially changing from one state to another in seconds, based on the operating conditions of the specific circuit it is on. The addition of storage on distribution will be driven by its ability to be the least cost, best fit solution to managing the intermittency issues associated with PV. The Commission's roll in reviewing utility owned distribution storage would be through review and approval of utility requests in general rate cases and other applications where utilities seek cost recovery of these investments.
- c) *Transmission Level Storage:* With regards to the transmission system, storage may be added to maintain reliability and stability on the transmission grid. Storage devices on transmission will likely have to react to the condition on the transmission grid. These storage devices may need to be able to discharge quickly as opposed to over long periods of time. The need for these devices should be assessed as part of the transmission planning process. Storage should be assessed against other potential solutions to determine if it is the most cost

effective solution for the transmission grid. Transmission level storage would be FERC jurisdictional in nature

- d) *Generation Level Storage:* Storage technologies are also likely to be deployed in the wholesale power market. These could come as stand-alone power plants based on storage technologies such as pumped hydro or compressed air plants. Storage could also be added at other facilities, such as solar thermal plants, which would change the delivery pattern and potentially reduce the intermittency of these sources. Generation storage is likely to require technologies that move power from one time period to another or can be dispatched to meet the CAISO ancillary services market. Thus the cost benefit of generation storage will be driven by well defined and clear wholesale market prices for energy and ancillary services. The CPUC would like have a role through its oversight of utility procurement.

SDG&E points out these varying uses to illustrate that storage may get deployed for many different reasons, to address many different problems and require many different technologies. Thus any analysis by the CPUC on storage should look to separate the analysis into major areas, where the distinctions between needs can be explored. Treating storage a single homogeneous product will not result in the best outcome for California. However, in each instance, energy storage should be compared to many alternatives to determine and achieve a more cost-effective approach in specific situations.

4) White Paper – Section 6: Recommendations

Understanding that Electric Energy Storage (EES) technologies are quite varied, have different costs and provide varied types of services and functions is important to understanding how EES can provide different values to the entities that adopt EES, including utilities and other LSEs and their ratepayers. In attempting to develop a roadmap of an EES strategy in the OIR, SDG&E suggests that the Commission limit the focus of the OIR on two major topics. First is the clearly identify the issues, and the causes of those issues, where storage may have a role in addressing. It is only after we know what problems we are looking to address can an informed discussion of storage take place. Second, the Commission should address the potential

cost/benefits of storage. In this process the Commission needs to get a better understanding of how storage looks compared to other technologies and what its needs to do to support cost-effective development. In this section the Commission needs to look at everything from alternatives to storage and to the current structures that may not be providing clear prices for the evaluation of storage alternatives.

SDG&E would highly recommend that the Commission make it very clear in future ruling that the purpose of the OIR is not to pick specific projects or storage winners and losers. The Commission needs to be clear that this OIR will not be selecting specific technologies that must be deployed or approve specific projects. These would all be subject to different applications or processes that best fit the specific application.

IV. PRELIMINARY SCHEDULE OF THE RULEMAKING

SDG&E believes that the proposed schedule is a good starting point. The Commission may also want to consider dividing the proceeding into two phases. The first phase should focus on understanding both the various storage technologies and the various applications for energy storage. Armed with this knowledge the Commission can then proceed to accurately and effectively determine what policies, standards or guidelines are best suited to remove or lessen any barriers to “Cost-Effective Energy Storage Systems” development and deployment and assessment of different approaches to integrating least-cost best-fit measures and how these costs and benefits are distributed among stakeholders and how the various outcomes are valued.

V. OTHER PROCEDURAL MATTERS

Again, based on prior experience developing proposed rules in CPUC-sponsored workshops, SDG&E has found that having a skilled facilitator present at workshops is invaluable. A post-workshop written report is also very useful to all participants, and having a

facilitator greatly aids in creating this written output. SDG&E urges the Commission to make all reasonable attempts to have a facilitated workshop, followed by a workshop report.

Respectfully submitted,

By: /s/ Allen K. Trial
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January 21, 2011

CERTIFICATE OF SERVICE

I hereby certify that I have on this day served a true copy of the foregoing **COMMENTS OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902-E) ON ORDER INSTITUTING RULEMAKING** on each party named in the official service list for proceeding **R.10-12-007** by electronic service, and by U.S. Mail to those parties who have not provided an electronic address.

Copies were also sent via Federal Express to Commissioner Nancy E. Ryan and to Administrative Law Judge Amy Yip-Kikugawa.

Executed this 21st day of January 2011 at San Diego, California.

/s/ Jenny Norin
Jenny Norin



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