

STATE OF CALIFORNIA

Public Utilities Commission
San Francisco

M e m o r a n d u m

Date: May 14, 2009

To: The Commission
(Meeting of May 21, 2009)

From: Pamela Loomis, Director
Office of Governmental Affairs (OGA) — Sacramento

Subject: **AB 44 (Blakeslee) Energy storage facilities.
As Amended March 31, 2009**

LEGISLATIVE SUBCOMMITTEE RECOMMENDATION: SUPPORT WITH
AMENDMENTS

SUMMARY OF BILL:

This bill would require the Commission to approve an increase in the rate of return for investment by a corporation in energy storage facilities. It would also require the Commission to develop a time-variant tariff that creates incentives for eligible energy storage facilities and imposes additional cost-effectiveness and technical requirements on storage facilities that qualify for these incentives.

SUMMARY OF SUPPORTING ARGUMENTS FOR RECOMMENDATION:

AB 44 addresses a critical policy gap related to energy storage. Energy storage can help integrate new renewable energy generation, lower peak demand, and provide other benefits to California ratepayers and the environment while helping the grid to work more efficiently. However, the bill as currently written is too narrowly focused and provides an unnecessarily limited definition of energy storage. The bill would be more effective if it instead directed the Commission to consider energy storage broadly and to develop policy tools and programs to facilitate efficient levels of energy storage on the grid.

SUMMARY OF SUGGESTED AMENDMENTS:

The bill should be modified to direct the Commission to develop a broad set of appropriate policies relative to the development of storage facilities, including but not limited to modifying tariffs and increasing the rate of return. Furthermore, the bill should

include all important market segments and should facilitate and allow appropriate comparisons to other resources. More expansive language was contained in the March 18, 2009 version of the bill, which allowed the Commission to consider rebates for the capacity and use of energy storage systems. The rebates for energy storage are now contained in AB 1536 (Blakeslee), which proposes to modify the Self-Generation Incentive Program (SGIP) to include storage as an eligible technology for customer-side incentives. The Commission recommends the following amendments:

- 1) **Allow the Commission flexibility to consider other regulatory and policy tools to support the deployment of energy storage technologies, as appropriate, in the context of broader energy policy objectives, such as renewable energy integration and greenhouse gas emissions reduction.** Increasing the rate of return on investment in energy storage systems and/or providing time-variant tariffs may not by themselves be sufficient to spur necessary deployment of storage technologies, therefore the bill should encourage the Commission to develop a variety of policy tools to support energy storage. Further, the bill should encourage the Commission to consider other policies that may be impacted by and also impact energy storage deployment.
- 2) **Provide a broader, more general definition of energy storage.** The bill narrowly defines the attributes or services that an “eligible storage facility” can provide, including specific definitions of the storage time (2 hours) and dispatch characteristics. Energy Storage includes a diverse and rapidly changing set of technologies that can provide a broad range of benefits to the grid. A simpler definition of energy storage (e.g. energy storage includes any technology capable of storing electricity to be dispatched at a later time) should be provided in this bill, rather than a definition based on technical requirements that might preclude beneficial technologies and require changes in the future.
- 3) **Allow the Commission flexibility to determine the appropriate cost-benefit test for storage.** The Commission should be given more flexibility to apply an appropriate cost-benefit test, taking into account all costs and benefits associated with energy storage systems and as compared to other resource procurement options.
- 4) **Allow "third party owned" storage systems to qualify.** Proposed PUC Section 2835.4 (e) specifically calls out the intent of the Legislature to support "customer-owned" and "utility-owned" energy storage facilities, but omits any mention of third-party-owned facilities. Third-party, or independently-owned energy storage facilities, like independently-owned generation facilities that have helped to spur growth in the market for solar photovoltaics, may play an important role in this emerging area, and this bill should not preclude these.

DIVISION ANALYSIS (Energy Division):

- The bill allows the Commission to increase a utility's rate of return for investment in energy storage facilities that are: a) "used and useful"; b) less costly to construct and operate than alternative providers of the same services; and c) able to provide any of 4 specified purposes (see below).
- The bill establishes a definition of "energy storage system" for the purposes of that chapter to include "any technology that is capable of absorbing energy from a generation facility, storing it for a period of time, and dispatching the energy onto the grid." In addition, Section 2835.2(b) defines an "eligible storage facility" as providing at least one of the following: 1) Storage of energy from an eligible renewable energy resource; 2) Capacity to absorb or dispatch energy onto the grid on command from the CAISO with at least two hours of storage time; 3) Frequency or area control error regulation to facilitate reliable integration of renewable resources on the grid; 4) Storage of energy during off-peak periods and dispatch during on-peak periods.
- The bill finds that energy storage systems can provide renewables integration, load shifting, dispatchability, and ancillary services as above and establishes the "intent of the Legislature to facilitate the expansion and deployment of both customer-owned and utility-owned energy storage systems,..."
- The bill requires the CPUC to develop a time-variant tariff that creates appropriate incentives for eligible storage facilities *and* provides incentives to invest in energy storage facilities. Costs for ratepayers are not expected to rise, but may go up providing they do not exceed the economic benefits provided by the energy storage facilities.
- Lastly, the bill as currently written specially allows "customer-owned" and "utility owned" energy storage facilities, but precludes eligibility of third-party-owned systems.

California's energy policy goals may be better served if the Commission is given the flexibility to explore appropriate regulatory treatment and incentives to encourage investment in energy storage. Electric energy storage offers the possibility to solve a number of major obstacles to the achievement of a sustainable electricity future. It can effectively address thorny problems such as the integration of intermittent renewables and can provide quick-response ancillary services from non-GHG-emitting facilities. Determining the appropriate role for energy storage in achieving the state's renewable energy and greenhouse gas emissions goals, may best be achieved through a comprehensive energy storage proceeding at the Commission. To best capture the value of energy storage for the grid requires consideration of how it impacts and influences generation, demand response, transmission, and distribution. Out of such a

proceeding, the Commission could determine appropriate policies, programs and incentive mechanisms.

The bill as currently written establishes unnecessary constraints on the definition of eligible storage technologies. It also narrowly defines the attributes or services that an “eligible storage facility” can provide, including specific definitions of the storage time (2 hours) and dispatch times (from off-peak to on-peak). Section 2835.2(b) does allow the flexibility to meet any one of the four conditions listed there rather than all, but energy storage would be better served by more general language.

The bill as currently written limits the types of policies the Commission should use to promote the efficient deployment of energy storage technologies. Providing a general mandate to the Commission to explore appropriate regulatory treatment of energy storage would be more appropriate. The amended version of the bill retains language constraining the tools available to Commission to enhanced rate of return (ROR) and time-of-use (TOU) tariffs. Increasing the rate of return on a utility’s investment in energy storage systems and/or providing time-variant tariffs may not by themselves promote efficient levels of deployment. By limiting the tools to enhanced ROR and TOU tariffs and by placing detailed constraints on their use, this bill may ultimately not be as successful as it could be. The Commission currently has the authority to encourage utility procurement of energy storage and to design TOU tariffs, and the language in this bill would provide unnecessary constraints on that authority. Appropriate deployment of storage is an important goal and a multi-faceted approach would be required to have a significant impact.

The Commission should be provided the flexibility to determine the appropriate cost-benefit test for storage. The Commission, in approving IOU procurement, must be able to compare resources on an “apples to apples” basis. This bill places constraints on the ability of the Commission to use appropriate cost-benefit comparisons of energy storage to alternative resource procurement options.

As written, 454.35(b) requires that the energy storage facility’s “*cost of construction and operation over its useful life are less than the cost of construction and operation of other facilities that provide load shifting, voltage support, and scheduling and shaping services for intermittent renewable energy resources, taking into account the costs of emissions of greenhouse gases and other air emissions from those other facilities,*” in order to qualify for increased rates of return. Further, 2835.6 requires that any tariff used to incent energy storage systems “*shall not result in ratepayers paying increased costs for energy storage facilities that exceed the economic benefits provided by the energy storage facilities through load shifting, voltage support, and scheduling and shaping services for renewable energy resources.*”

The proposed language limits the ability of the Commission to fully assess the costs and benefits of energy storage systems and compare that to alternative resources. The Commission’s current Long Term Procurement Planning process may provide a more appropriate framework for accurately and consistently comparing these resources. For

example, the language above does not allow for Peak to Peak load shifting, which may be important for demand-side applications. Solar PV peak production occurs mid-day, but system peak and much of residential demand occurs much later in the day. Storage, in addition to allowing night time wind generation to be used when needed, could allow day-time PV generation to be used in the early evening when the energy is most needed.

A more appropriate formulation would give the Commission authority to conduct proper cost-benefit analyses, and compare all-in costs, also considering benefits of a storage facility beyond the services listed or GHG and emissions benefits. The goal should be to establish at a minimum the indifference of ratepayers to procurement of an energy storage facility against some other resource providing the same services.

The proposed language excludes third-party-owned systems which could play an important role in this area. The existing customer-side incentive programs, like the California Solar Initiative (CSI) or the Self-Generation Incentive Program (SGIP), specifically allow third-party ownership of eligible systems, an important factor in providing capital and liquidity to the market. In the CSI program, for example, approximately 41% of the MW in the applications is third-party owned. Third-party development of energy storage systems, whether for public or private institutions, wholesale or retail, must be included in any incentive plan to maximize the effect on the market and address the full potential of these systems to benefit the grid and consumers.

PROGRAM BACKGROUND:

Coordinated utility procurement resumed in 2003 and has been guided by the biennial Long-Term Procurement Plans (LTPP) beginning in 2004 (D.04-12-048). The LTPP allows for greater head-to-head competition and provides guidelines on all-source solicitations, resolves cost recovery issues, and begins integrating renewables procurement with general procurement. Resource Adequacy promotes infrastructure investment by requiring that Load Serving Entities procure capacity so that it is available to the California Independent System Operator (CAISO) when and where needed.

Renewable Portfolio Standard (RPS)

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires electric corporations to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they reach 20% by 2010.

Demand Response (DR)

DR is a resource that allows end-use electric customers to reduce their electricity usage in a given time period, or shift that usage to another time period, in response to a price signal, a financial incentive, an environmental condition or a reliability signal. DR saves

ratepayers money by lowering peak time energy usage, which are high-priced. This lowers the price of wholesale energy, and in turn, retail rates. DR may also prevent rolling blackouts by offsetting the need for more electricity generation and can mitigate generator market power.

This proceeding (a multi-agency effort that involves the participation of the California Energy Commission) develops DR programs and dynamic pricing tariffs as a resource to enhance electric system reliability, reduce power purchase and individual consumer costs, and protect the environment. The proceeding authorized the State Pricing Pilot (SPP) research project, a two-year pricing research project designed to estimate the demand response and price flexibility for a representative sample of residential and small commercial customers (approximately 2,000 customers) on time differentiated rates (TOU and CPP rates), information, and/or technology treatments. The SPP will also evaluate customers' preferences to different tariff attributes, and market shares for specific TOU and dynamic rates, control technology, and information treatments under alternative deployment strategies. The SPP results will provide key inputs for the Advanced Metering Infrastructure (AMI) business case analysis and rate design options. The proceeding also reviews the utilities' applications for the implementation of an Advanced Metering Infrastructure (AMI) and associated recovery and proposed dynamic pricing tariffs.

Distributed Generation Programs

The Self-Generation Incentive Program was established in 2001 and is one of the largest distributed generation incentive programs in the United States, with approximately 1,200 projects totaling 300 megawatts on-line at the end of 2007. The program provides up-front, capacity-based incentives for clean, distributed generation technologies at customer sites.

Historically SGIP eligibility has been determined by the Commission and has included both renewable and highly efficient fossil fuel powered systems¹. Eligible technologies have included solar photovoltaics (PV), wind, fuel cells, microturbines, internal combustion engines and small gas turbines. With the passage of SB 1 (Murray, 2006) and the creation of the California Solar Initiative in 2007, solar PV was removed from SGIP. Additionally, AB 2778 (Lieber, 2006) further limited SGIP eligibility to wind and fuel cell technologies only which became effective January 1, 2008.

Per D. 08-11-044, SGIP now provides incentives for energy storage systems that are coupled with eligible SGIP technologies, currently wind and fuel cell technologies. Due to limitations established in AB 2778, energy storage systems not connected with wind or fuel cells (for example, stand-alone storage or storage coupled with solar) are not eligible under the program.

¹ All fossil fuel powered combustion technologies that have participated in SGIP have been required to operate in a combined heat and power application, which maximizes operating efficiency by capturing and utilizing waste heat.

California Solar Initiative (CSI)

The CSI provides incentives for solar system installations to customers of the state's three IOUs. The CSI Program provides upfront incentives for solar systems installed on existing residential homes, as well as existing and new commercial, industrial, government, non-profit and agricultural properties within the service territories of the IOUs.

The CSI Program expanded state support for solar technology and is the product of Governor Schwarzenegger's "Million Solar Roofs" vision for the State of California. The CSI Program was authorized by the Commission through a number of regulatory decisions throughout 2006. In addition, the legislature expressly authorized the Commission to create the California Solar Initiative in 2006 in Senate Bill 1 (SB1, Murray). When it launched in January 2007, the CSI Program built upon nearly 10 years of state support for solar, including other incentive programs such as the Emerging Renewables Program (ERP) and the Self-Generation Incentive Program (SGIP), both programs still exist, but have been closed to new solar projects as of the end of 2006.

Distributed roof-top solar, such as is incented by CSI, would have enhanced economic viability if combined with energy storage technology that could reduce the impact of natural fluctuations in the energy supplied to the grid or customers. Currently, no energy storage technologies attached to solar PV systems are eligible for incentives.

LEGISLATIVE HISTORY:

None.

STATUS:

AB 44 is on the Assembly Appropriations Committee Suspense File upon passage from the Assembly Utilities and Commerce Committee on March 23, 2009.

SUPPORT/OPPOSITION:

Southern California Edison – Support as amended

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Date: May 14, 2009

BILL LANGUAGE:

BILL NUMBER: AB 44 AMENDED
 BILL TEXT

 AMENDED IN ASSEMBLY MARCH 31, 2009
 AMENDED IN ASSEMBLY MARCH 18, 2009

INTRODUCED BY Assembly Member Blakeslee
 (Coauthor: Assembly Member Harkey)
 (Coauthor: Senator Benoit)

 DECEMBER 1, 2008

 An act to add Section 454.35 to, and to add Chapter 7.7
(commencing with Section 2835) to Part 2 of Division 1 of, the Public
Utilities Code, relating to energy.

 LEGISLATIVE COUNSEL'S DIGEST

 AB 44, as amended, Blakeslee. Energy storage facilities.

 (1) Under existing law, the Public Utilities Commission is vested
with regulatory authority over public utilities, including electrical
corporations, and the commission is authorized to fix the rates and
charges for every public utility. Existing law authorizes the
commission to approve an increase of one-half of 1 percent to 1
percent in the rate of return otherwise allowed an electrical
corporation for investment by the corporation in generation
facilities using renewable resources.

 This bill would authorize the commission, after a hearing, to
approve a similar increase in the rate of return for investment by a
corporation in energy storage facilities, as defined, that
~~meet~~ *(A) are used and useful, (B) have costs of
construction and operation over their useful life that are
less than other facilities that provide load shifting, voltage
support, and scheduling and shaping services for intermittent
renewable energy resources, and (C) perform any of 4
specified requirements, and to establish additional
incentives for eligible energy storage facilities, as defined
purposes .*

 The bill would require the commission to develop a time-variant
tariff that creates incentives for eligible energy storage
facilities.

 Under existing law, a violation of the Public Utilities Act or an
order or direction of the commission is a crime. Because the
provisions of this bill would require an order or other action of the
commission to implement, and a violation of that order or action
would be a crime, the bill would impose a state-mandated local
program by creating a new crime.

 (2) The California Constitution requires the state to reimburse
local agencies and school districts for certain costs mandated by the
state. Statutory provisions establish procedures for making that
reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority. Appropriation: no. Fiscal committee: yes.
State-mandated local program: yes.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 454.35 is added to the Public Utilities Code, to read:

454.35. ~~(a)~~ The commission, after a hearing, may approve an increase of one-half of 1 percent to 1 percent in the rate of return otherwise allowed an electrical corporation for investment by the corporation in energy storage facilities that meet ~~any~~ all of the following requirements:

(a) The facility is used and useful.

(b) The facility's costs of construction and operation over its useful life are less than the costs of construction and operation of other facilities that provide load shifting, voltage support, and scheduling and shaping services for intermittent renewable energy resources, taking into account the costs of emissions of greenhouse gases and other air emissions from those other facilities.

(c) The facility does one of the following:

(1) The facility stores energy generated from an eligible renewable energy resource pursuant to Article 16 (commencing with Section 399.11) of Chapter 2.3.

(2) The facility is capable of responding to Independent System Operator commands to either absorb or dispatch energy from the grid and is capable of storing the energy for a minimum of two hours.

(3) The facility is capable of providing frequency or area control error regulation required to integrate intermittent renewable resources and maintain reliable operation of the electrical grid.

(4) The facility stores energy during off-peak periods and dispatches the energy during on-peak periods.

~~*(b) The commission may establish additional incentives for eligible storage facilities, as defined in Section 2835.2, including, but not limited to, the following:*~~

~~*(1) Tariffs or contracts providing for energy storage metering.*~~

~~*(2) An increased rate of return for investments in eligible storage facilities, in addition to the amount authorized pursuant to subdivision (a).*~~

~~*(3) Rebates for storage capacity and use.*~~

SEC. 2. Chapter 7.7 (commencing with Section 2835) is added to Part 2 of Division 1 of the Public Utilities Code, to read:

CHAPTER 7.7. ENERGY STORAGE SYSTEMS

2835. This chapter shall be known and may be cited as the Integration of Renewable Energy Act.

2835.2. For the purposes of this chapter the following terms have the following meanings:

(a) "Energy storage system" means any technology that is capable of absorbing energy from a generation facility, storing it for a

period of time, and dispatching the energy onto the grid. Energy storage systems include, but are not limited to, hydrogen storage, pumped hydroelectricity storage, compressed air energy storage, thermal storage, solar thermal storage superconducting magnetic energy storage, batteries, super capacitors, and ~~fly wheels~~ flywheels .

(b) "Eligible storage facility" or "eligible facility" means any facility that employs an energy storage technology that meets at least one of the following requirements:

(1) The facility stores energy generated from an eligible renewable energy resource pursuant to Article 16 (commencing with Section 399.11) of Chapter 2.3.

(2) The facility is capable of responding to Independent System Operator commands to either absorb or dispatch energy from the grid and is capable of storing the energy for a minimum of two hours.

(3) The facility provides frequency or area control error regulation required to integrate intermittent renewable resources and maintain reliable operation of the electrical grid.

(4) The facility stores energy during off-peak periods and dispatches the energy as electricity during on-peak periods.

2835.4. The Legislature finds and declares all of the following:

(a) Energy storage systems can potentially enable higher percentages of renewable energy to be included in California's power supply portfolio by transforming intermittent generation, such as wind and solar power, into dispatchable resources, allowing the state to more fully utilize its abundant renewable resources.

(b) Energy storage systems can serve as load shifting technologies by absorbing energy during off-peak periods, such as from wind resources at night, and delivering the energy when demand is greatest, thereby potentially reducing the need for, and associated greenhouse gas emissions from, gas-fired peaker plants.

(c) Energy storage systems can greatly enhance the flexibility of the operation of the power grid by quickly absorbing or dispatching energy when needed.

(d) Energy storage systems that have an inverter can deliver reactive power as well as real power. This is particularly useful when the storage systems are located in load centers as they can help support the voltage in a transmission-constrained area.

(e) It is the intent of the Legislature to facilitate the expansion and deployment of both customer-owned and utility-owned energy storage systems, which are critical to the timely and cost-effective achievement of the state's ambitious renewables portfolio standard, greenhouse gas emissions reduction targets, and regional air quality objectives while maintaining reliable operation of the power grid.

2835.6. The commission shall develop a time-variant tariff that creates appropriate incentives for eligible storage facilities *and provides incentives to invest in energy storage facilities. The tariff developed pursuant to this section shall not result in ratepayers paying increased costs for energy storage facilities that exceed the economic benefits provided by the energy storage facilities through load shifting, voltage support, and scheduling and shaping services for renewable energy resources* .

SEC. 3. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because

the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.