

Date of Hearing: June 27, 2018

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY

Chris Holden, Chair

SB 1347 (Stern) – As Amended May 10, 2018

SENATE VOTE: 28-10

SUBJECT: Energy storage systems: procurement

SUMMARY: This bill requires the California Public Utilities Commission (CPUC) by January 1, 2020, to direct certain load-serving entities (LSE) to procure a total of 2,000 megawatts (MW) of energy storage. This bill establishes criteria for utilities to own and operate a portion of the procured storage and recover costs from the procurements through rates. Specifically, **this bill:**

- 1) Requires the CPUC by January 1, 2020, to direct electrical corporations, CCAs, electric service providers, and larger electrical cooperatives to file applications to procure a total of 2,000 MW of energy storage.
- 2) Requires the CPUC to allocate the 2,000 MW procurement based on each LSE's prorata share of customer demand as of July 1, 2019.
- 3) Authorizes the CPUC to direct additional energy storage procurement to support state energy and climate goals.
- 4) Allows the electrical corporations to own and operate up to 50 percent of their proportion of the 2,000 MW.
- 5) Allows the electrical corporations to own and operate up to 50 percent of the additional required energy storage that has an expected commercial operation date before 2031.
- 6) Allows the electrical corporations to own and operate up to 35 percent of the additional required energy storage that has an expected commercial operation date on or after January 1, 2031.
- 7) Requires the CPUC to enable LSE cost-recovery for energy storage investments if the electrical corporation competitively sources the energy storage equipment and installation, the storage systems are connected to the grid in front of the electrical corporation's consumers' meters, and the electrical corporation has proposed a schedule for competitive solicitations to contract for an equivalent or greater amount of third-party-owned storage in its filing to the CPUC.
- 8) Requires the CPUC to expedite review and approval of contracts for third-party ownership and operate of energy storage through a Tier 3 advice letter process.
- 9) Allows net costs for energy storage systems to be recovered via nonbypassable charges.

EXISTING LAW:

- 1) Requires the CPUC to determine appropriate targets for each load-serving entity to procure viable and cost-effective energy storage systems to be achieved by December 31, 2015, and December 31, 2020, reevaluate the determinations made pursuant to this subdivision not less than once every three years, and ensure that the energy storage system procurement targets and policies that are established are technologically viable and cost effective. (Public Utilities Code §§ 2836, 2836.2)
- 2) Requires POU to determine appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems to be achieved by December 31, 2016, and December 31, 2020. (Public Utilities Code § 2836)
- 3) Requires the CPUC to direct the IOUs file applications for programs and investments to accelerate widespread deployment of distributed energy storage systems for a total capacity not to exceed 500 megawatts. (Public Utilities Code § 2838.2)
- 4) Requires the CPUC to identify a diverse and balanced portfolio of resources needed to ensure a reliable electricity supply that provides optimal integration of renewable energy in a cost-effective manner. The portfolio shall rely upon zero carbon-emitting resources to the maximum extent reasonable and be designed to achieve any statewide greenhouse gas (GHG) emissions limit established pursuant to the California Global Warming Solutions Act of 2006 or any successor legislation. (Public Utilities Code § 454.51[a])
- 5) Directs the California Energy Commission (CEC) and the CPUC, where feasible, to authorize procurement of resources to provide grid reliability services that minimize reliance on system power and fossil fuel resources and, where feasible, cost effective, and consistent with other state policy objectives, increase the use of large- and small-scale energy storage. (Public Utilities Code § 400)
- 6) Requires the CPUC to adopt a process for each LSE to file an IRP to ensure each meets (a) GHG emissions reduction targets for the electricity sector, (b) the Renewables Portfolio Standard (RPS), and (c) other goals and obligations. Requires each LSE to submit an IRP to the CPUC. (Public Resources Code § 454.52)
- 7) Requires the governing board of a local POU to adopt an IRP and a process for updating the plan at least once every five years to ensure the utility meets (a) the GHG emissions reduction targets for the electricity sector, (b) the RPS, and (c) other goals and obligations, to be submitted to the CEC for review. Requires the CEC to provide recommendations to correct the deficiencies in the IRP. (Public Resources Code §§ 9621, 9622)
- 8) Authorizes the CPUC to require the IOUs to collect funds from ratepayers, through December 31, 2019, to be used to provide incentives through January 1, 2021, under SGIP, for distributed energy resources and energy storage systems, the CPUC, in consultation with ARB, determines will achieve reductions in emissions of GHGs. (Public Utilities Code § 379.6)

- 9) Requires the CPUC and CEC to where feasible, authorize procurement of resources to provide grid reliability services that minimize reliance on system power and fossil fuel resources and, where feasible, cost effective, and consistent with other state policy objectives, increase the use of large- and small-scale energy storage with a variety of technologies, targeted energy efficiency, demand response, including, but not limited to, automated demand response, eligible renewable energy resources, or other renewable and nonrenewable technologies with zero or lowest feasible emissions of greenhouse gases, criteria pollutants, and toxic air contaminants onsite to protect system reliability. (Public Utilities Code § 400)
- 10) Requires the CPUC to evaluate and analyze the potential for all types of long duration bulk energy storage resources to help integrate renewable generation into the electrical grid. (Chapter 680, Statutes of 2016)

FISCAL EFFECT: According to the Senate Committee on Appropriations, this bill would result in new costs of about \$839,000 (ratepayer funds). Of this amount, \$589,000 would support four new positions to manage new proceedings, administer workshops, conduct analysis, advise on the energy storage market and policy developments, and provide legal assistance. The remaining amount would pay for a two-year contract to model flexible energy storage capacity, integrate renewable energy, and develop cost recovery models to achieve the state's energy and climate goals.

BACKGROUND:

California Energy Storage Roadmap. In late 2014, the California Energy Commission (CEC), the ISO, and the CPUC, developed an energy storage roadmap (Roadmap) that identifies policy, technology and process changes to address challenges faced by the energy storage sector. The comprehensive roadmap assesses the current market environment and regulatory policies for connecting new energy storage technology to the state's power grid. It is the result of collaboration by the three organizations and input from more than 400 stakeholders, including utilities, technology companies, environmental groups, and interested parties.

The roadmap focuses on activities that address three critical categories of challenges:

- Expanding revenue opportunities for energy storage providers;
- Reducing costs of integrating and connecting to the power grid; and
- Streamlining and defining policies and processes to increase the certainty of expected benefits of energy storage systems.

CPUC Energy Storage Roadmap. The CPUC has developed a comprehensive strategy on storage which builds on the joint agency energy storage roadmap and is reflected in several CPUC decisions the last of which was issued in March.¹ The IOU energy storage procurements were revised in this decision and each was directed to plan for procurement of its share of AB 2868 (Gatto) distributed energy storage systems which will be reflected in the 2018 IOU energy storage procurement and investment plans due before March 1, 2018. The next track of this

¹ <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M183/K277/183277651.PDF>

proceeding will consider rules for “multiple-use applications” which are behind-the-meter storage resources participating in the wholesale market.

Utility Storage Procurement Mandates. AB 2514 (Skinner, Chapter 469, Statutes of 2010) required the CPUC to determine appropriate targets for load-serving entities (LSEs) to procure energy storage systems. The bill required LSEs to meet any targets adopted by the CPUC by 2015 and 2020. The bill also required POUs to set their own targets for the procurement of energy storage and then meet those targets by 2016 and 2021.

The CPUC, in implementing AB 2514, established the following procurement targets for the three largest electric IOUs totaling 1,325 MW. (D.13-10-040) The CPUC reported in 2017 that the IOUs have each progressed in meeting their energy storage procurement goals. However, none has yet met its final procurement goal in any category, other than Southern California Edison (SCE), which has already exceeded the procurement goal for customer-side storage several times over.

<i>Service territory</i>	<i>Customer</i>	<i>Distribution</i>	<i>Transmission</i>	<i>Total by Utility</i>
PG&E	85	185	310	580
SCE	85	185	310	580
SDG&E	30	55	80	165
TOTAL BY DOMAIN	200 MW	425 MW	700 MW	1325 MW

AB 2868 (Gatto, Chapter 681, Statutes of 2016) – The mandate requires the IOUS to file applications with the CPUC for programs and investments in distributed energy storage systems. The total capacity of the programs and investments in distributed energy storage systems approved by the CPUC shall not exceed 500 megawatts, divided equally among the state’s three largest IOUs.

Integrated Resource Planning – Among the policies of SB 350 (De León and Leno), Chapter 547, Statutes of 2015, was the requirement that all LSEs and POUs prepare integrated resource plans. This "umbrella" process combines all of the state's electric procurement mandates, policies, and programs into one umbrella plan to achieve goals and ensure California has a safe, reliable, and cost-effective electricity supply.

The plans are intended to show how the LSEs and POUs will achieve GHG reduction targets and RPS mandates. And the plans must also at the same time: fulfill the obligation of just and reasonable rates, minimize ratepayer impact, ensure system and local reliability; strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities; enhance distribution systems and demand-side energy management; and

minimize localized air pollutants and other GHG emission, with early priority on disadvantaged communities.

Ideally, this “integrated” approach to resource planning will help California transition away from its history of resource-specific, siloed procurement mandates. Prior to SB 350, IOUs submitted long-term procurement plans (LTPPs) to the CPUC, which evaluated the need for new resources to meet system and local area reliability needs. The CPUC established up-front standards for the LTPPs, pursuant to AB 57 (Wright, Chapter 835, Statutes of 2002), and directed IOUs to procure best-fit and least-cost resources.

COMMENTS:

- 1) Author’s Statement. California’s power sector is currently undergoing wide-ranging transformations. With increasing amounts of renewable energy resources coming on to the grid, many of which generate energy intermittently, energy storage systems will be necessary to integrate these renewable resources, ensure the grid operates reliably and efficiently, and facilitate a transition towards a clean energy grid. Specifically, SB 1347 requires all load-serving entities to procure 2,000 MW of energy storage systems. Furthermore, SB 1347 strikes a balance between utility and third-party ownership by requiring at least 50% of energy storage to be owned and operated by third parties. By promoting diverse ownership models, SB 1347 will provide market certainty for technological innovation across all ownership models. The state has set ambitious goals to drive down greenhouse gas emissions and SB 1347 is an important step towards a cleaner power sector.
- 2) Not All Storage is Created Equal. Storage can and is being used to meet multiple needs on California’s grid and it generally falls in two applications. First, energy that is stored for later injection back to the grid to provide grid services. These wholesale uses have been defined by the CPUC as charging energy, resistive losses, pumps (flow batteries and pumped hydro), power conversion system, transformer, battery management system, thermal regulation, and vacuum (for flywheels). Critical to the grid and ratepayer value is the location of the storage as well as time of use. To ensure ratepayer value for the investment in storage it is important that the optimization of the grid, including peak reduction, contribution to reliability needs, or deferment of transmission and distribution upgrade investments is needed.

The second application is energy stored and injected at different times of the day to change consumption patterns which is a retail use. This typically occurs at a customer facility to help mitigate demand charges and minimize consumption during higher rate periods. These customer-sited storage applications are currently funded by the SGIP program.

- 3) Silos v. Integrated Resource Plans. A foundational policy objective of the integrated resource planning process is that this “integrated” approach to resource planning will help California transition away from its history of resource-specific, siloed procurement mandates such as the RPS (a kilowatt hour-based program) and instead plan for carbon reduction. Storage is and will be a critical part of procurement under these plans for most load-serving entities and POUs but there are many paths to meeting carbon reduction goals.

As required by SB 350, the CPUC conducts modeling and analysis to recommend a GHG emissions target for the electricity sector, identify the optimal portfolio of resources to meet the target, and calculate a GHG Planning Price for use in IRP planning and demand side resource cost effectiveness evaluation.

The load-serving entities then prepare and file IRPs with the CPUC based on the statewide, optimal portfolio approved by the CPUC. Each LSE then develops a conforming portfolio to be presented in its IRP. But each LSE may also present an alternate portfolio, or more than one, justifying why that portfolio is preferable to serve its load. So the CPUC model is a guidepost, not a mandate.

This is key because this bill uses the CPUC's IRP model, which in 2017 identified 2,000 MWs of storage as part of the optimal mix of resources to meet 2030 GHG and RPS goals as a mandate for procurement on each LSE which it is not. This bill does not offer LSEs flexibility in meeting demand for their customer base. It presupposes that every LSE will use storage. But they may determine that it's not the right fit for their customer base and show why in their IRP. The prescriptive terms of this bill would preclude, for instance, one LSE 50 or 60% geothermal and the remainder from large hydro.

- 4) Pumped Hydro. Much discussion and analysis has occurred regarding the need for pumped storage hydropower. Projects come in many sizes but can be hundreds of megawatts in capacity. The largest pumped hydro project of which the committee is aware of in California is the Helms Pumped Storage Plant in Fresno County. The plant commenced construction in 1977, came online in 1984, and has a capacity of 1,212 megawatts.

The plant operates by moving water between two reservoirs, an upper and a lower. When energy demand is high, water is released from the upper reservoir to the plant where electricity is generated before the water is discharged into the lower reservoir. When demand is low (such as at night), water is pumped back up to the upper reservoir to be used as stored energy at a later time. This is accomplished by pump-generators which serve a dual role: both pumps which can reverse, for use as generators. The plant can go from a stand-still to operational in eight minutes which allows it to meet peak energy demand. It consumes more electricity pumping versus generating electricity but pumping occurs during periods of low demand, making the plant economical.

This bill requires each LSE to procure its proportionate share of 2,000 megawatts of storage. If this procurement mandate were to go forward, it would effectively squeeze out any large pumped hydro storage project from being considered for the next decade or two. If a pumped hydro project were to move forward, no one utility or CCA would likely be able to fund the effort. It would likely need one entity in the state to procure the resource for the system and then spread the costs among all benefitting customers.

- 5) An Alternative. *To ensure that the priorities of the Legislature in mandating the integrated resource planning requirement and the flexibility for a range of storage resources and funding options is maintained, the committee may wish to amend the bill as follows:*

2837.5. In addition to the requirements of Sections 2836 and 2838.2, on or before January 1, 2020, the commission shall consider procurement strategies for up to a statewide total of 2,000 megawatts of energy storage systems.

(a) The commission shall consider appropriate targets, if any, for each load-serving entity to procure viable and cost-effective energy storage systems to be achieved by December 31, 2030. As part of this proceeding, the commission may consider a variety of possible policies to encourage the cost-effective deployment of energy storage systems, including refinement of existing procurement methods to properly value energy storage systems.

(b) The commission shall reevaluate the determinations made pursuant to this subdivision not less than once every three years.

(c) Nothing in this section prohibits the commission's evaluation and approval of any application for funding or recovery of costs of any ongoing or new development, trialing, and testing of energy storage projects or technologies outside of the proceeding required by this chapter.

(d) Each load-serving entity may meet up to fifty percent of its distribution system procurement target through utility-owned energy storage and propose the energy storage asset within its applicable integrated resource plan, but must make a showing of cost-effectiveness and viability.

6) Related Legislation.

SB 338 Requires the CPUC and the governing board of each local POU to each consider the role of a variety of energy technologies and resources in meeting energy and reliability needs during and around the hour of peak demand while reducing the need for new generation and transmission resources. (Chapter 389, Statutes of 2017)

7) Prior Legislation.

AB 2868 (Gatto) requires IOUs to file applications with the CPUC for programs and investments to accelerate widespread deployment of distributed energy storage systems. (Chapter 681, Statutes of 2016)

AB 33 (Quirk) obligated the CPUC, in consultation with the CEC, to evaluate and analyze the potential for all types of long-duration bulk energy storage resources to help integrate renewables into the electric grid. (Chapter 680, Statutes of 2015)

SB 886 (Pavley) would have required appropriate energy storage system procurement targets; requires each load-serving entity POU to plan for the procurement of energy storage systems before fossil-fuel-based generation; and requires each electrical corporation to propose measures to encourage customers to install energy storage systems. Status: Held in Assembly Committee on Appropriations.

AB 2514 (Skinner) required the CPUC to determine appropriate targets, if any, for LSEs to procure energy storage systems. The bill required LSEs to meet any targets

adopted by the CPUC by 2015 and 2020. The bill required POUs to set their own targets for the procurement of energy storage and then meet those targets by 2016 and 2021. (Chapter 469, Statutes of 2010)

REGISTERED SUPPORT / OPPOSITION:**Support**

California Energy Storage Alliance (Co-Sponsor)
Southern California Edison (Co-Sponsor)
Advanced Energy Economy
Advanced Microgrid Solutions, Inc.
AltaGas
Amber Kinetics
E.ON
Enel Green Power North America
Greensmith Energy
LG Chem
NEXTracker
Solar Energy Industry Association
Tesla Inc.

Opposition

San Diego Gas & Electric
The Utility Reform Network

Oppose Unless Amended

California Community Choice Association
California Wind Energy Association
Independent Energy Producers Association

Analysis Prepared by: Kellie Smith / U. & E. /