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NATIONAL RENEWABLE ENERGY LABORATORY

TECHNICAL ASSISTANCE






Issue Brief: A Survey of State Policies to Support Utility-Scale and Distributed-Energy Storage

Introduction

Energy storage has the potential to offer multiple benefits[1] to the power grid and to be a complimentary technology to variable renewable energy resources such as solar and wind. As these variable generation technologies increase in market penetration, storage technologies could provide ramping support to moderate a steep change in electricity demand, as well as regulation support to smooth moment-to-moment volatility.

In recent years, several states have introduced policies related to the support and development of energy storage technology markets. In addition, a growing number of states have included storage in their energy assurance plans, created programs, and co-funded storage projects without enacting policy or regulations. This Issue Brief provides a summary of state policies and regulatory actions[2] that focus on energy storage and highlights some emerging trends.

U.S. Energy Storage Policy Activity

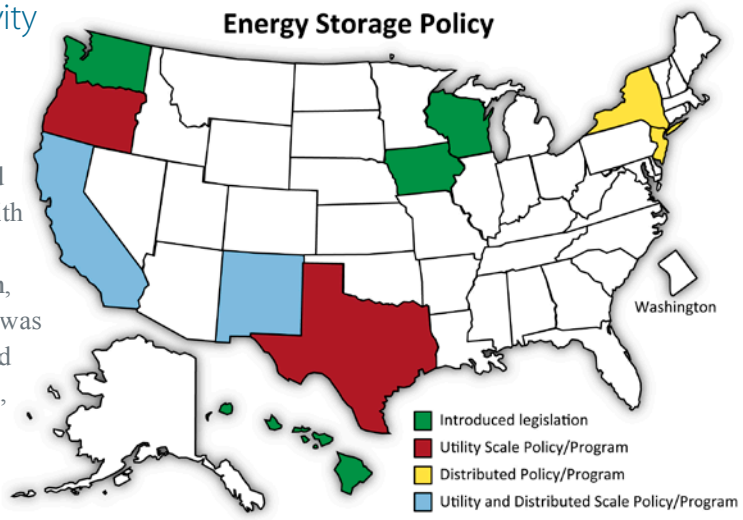
Since 2011, at least ten states[3] have introduced a total of 14 bills related to energy storage, four of which passed. Nine of the bills introduced were related to utility-scale storage (large projects with the primary goal of providing services required at the transmission, distribution, and utility-scale generation levels); one was related to distributed-energy storage; and the remainder pertained to both. Overall, the 14 bills tended toward:

1. Establishing financial incentives for both utility-scale and distributed storage facilities
2. Initiating technical potential analysis and possible policy pathways
3. Using specific energy storage procurement standards or adding multipliers to existing renewable portfolio standard (RPS) policies in order to encourage storage adoption.

In addition, other regulatory proceedings and research reports are in progress, some of which are driven by legislative interest and some of which are emanating from regulatory bodies.

State-by-State Energy Storage Policy Activities

This document summarizes proposed and enacted legislation and activities related to energy storage for nine states, which are presented alphabetically. These states were selected to provide a high-level view of various energy storage efforts taking place across the United States.



The National Renewable Energy Laboratory (NREL) tracks trends in renewable energy markets, particularly those related to state and local policy development, as a way of providing timely and credible information to state and local decision makers through the Solar Technical Assistance Team (STAT).

[1] See NREL's The Value of Energy Storage for Grid Applications for a discussion of the benefits available at http://www.nrel.gov/docs/fy13osti/58465.pdf

[2] Current as of August 2014.

[3] Research did not reveal any localities focused on storage activities.

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California (Utility-Scale and Distributed Energy Storage)

In September 2010, California Assembly Bill 2514 was signed into law, which required the California Public Utilities Commission (CPUC) to open a proceeding to determine appropriate utility procurement targets, if any, for commercially available and cost-effective energy storage systems. In response, the CPUC opened Docket 10-12-007, held a series of workshops, issued various reports, proposed decisions, and reviewed stakeholder input.

Ultimately, the CPUC adopted a 1.325 gigawatt (GW) procurement target for electricity storage by 2020, with targets increasing every two years from 2016 to 2020. The targets were broken into three "use case buckets" (transmission-connected, distribution-connected, and behind-the-meter) and divided by each of California's three investor-owned utilities (IOUs). Additionally, electric service providers and community choice aggregators were directed to procure energy storage resources equivalent to 1% of their peak capacity by 2020.

Because the intent of the storage mandate is to promote emerging technologies, the CPUC restricted some technologies and project sizes from the procurement order. For example, pumped hydropower projects greater than 50 megawatts (MW) in capacity are not eligible. The CPUC did expand eligibility to energy storage projects that are approved as part of the Resource Adequacy[4] program and noted that such approved projects would not be required to bid into the competitive solicitation process. The bill identified several reasons for an energy storage procurement target, including energy storage's ability to support renewable energy deployment, which can support California's renewable portfolio standard[5]. In 2014, NREL will publish a case study on the California energy storage mandate.

In April 2014, the commission issued a proposed decision in rulemaking 12-11-005, which clarified the policy on storage that is paired with net-metering-eligible systems. The proposed ruling exempts the storage systems from interconnection fees, supplemental review fees, costs for distribution upgrades, and standby charges. To ensure that the stored energy comes from renewable sources, the decision places certain sizing and metering requirements on the systems. Third-party providers had previously suspended the marketing of storage paired systems because utilities had imposed interconnection fees of up to $800. Following the proposed ruling, third-party providers resumed marketing the systems[6], which should support progress toward the customer-sited targets.

Regulatory Action in California

The Long-Term Procurement Plan (LTPP) process also contains energy storage considerations. Within the LTPP proceeding, the CPUC evaluates the current and future needs of the system. Long-term energy storage procurement is being tied to need determinations as they are being finalized. In a recent LTPP rulemaking (12-03-014), the CPUC directed Southern California Edison (SCE) —a California-based investor-owned utility—to procure 50 MW of energy storage capacity. This was the first state decision directing an IOU to procure a certain amount of energy storage capacity. Additionally, the CPUC authorized SCE to procure between 500 MW and 700 MW of capacity and mandated that the utility procure at least 400 MW from preferred resources or energy storage. Moreover, there were no restrictions placed on using storage to fulfill the remaining 100 MW to 300 MW.

Florida (Distributed Energy Storage)

As a state with exposure to natural disasters, Florida is one of several states that have recognized the role energy storage may play in resiliency planning. In order to provide for critical needs during power outages, the Florida Department of Agriculture and Consumer Services created the SunSmart Schools and Emergency Shelters Program. As part of the program, 115 emergency shelter schools have installed solar PV systems with battery storage. Florida utilities are providing additional funding for the effort.

Hawaii (Utility-Scale and Distributed Energy Etorage)

HB 2618 died in conference committee while awaiting signature from the governor. The bill would have established tax incentives for energy storage projects. The incentives amounted to a 20% investment tax credit or a utilization credit equal to 8 cents per kilowatt-hour (kWh) of capacity for the first 10 years of the

[4] The CPUC's Resource Adequacy program guides resource procurement and infrastructure investment by requiring that load serving enterprises, including IOUs, procure sufficient resources to ensure the safe and reliable operation of the grid.

[5] For an analysis of how storage may support renewables penetration see NREL's Grid flexibility and storage required to achieve very high penetration of variable renewable electricity and/or the California Energy Commission funded report Research Evaluation of Wind Generation, Solar Generation, and Storage Impact on the California Grid.

[6] http://www.renewableenergyworld.com/rea/news/article/2014/04/solarcity-resumes-storage-applications-after-california-decision?cmpid=WNL-Friday-April18-2014.

project. Projects could only take one form of credit, but neither would be reduced by any applicable federal incentives[7]. The credit may have been carried forward if it exceeded the storage owner's state income tax liability. Because there are no capacity minimums or maximums, the credit could apply to any size system and would also have been applicable to electric vehicles if they were used to store and transmit energy back into the grid. The incentives declined for projects placed into service after 2020.

The text of the bill notes that Hawaii recognizes energy storage as a key factor in maximizing the use of renewable energy and that the purpose of the bill is to facilitate further renewable energy penetration. During the 2014 session, SB 2932 was also introduced, which would task the PUC with establishing an energy storage portfolio standard. The bill subsequently failed. However, in its 2013 Integrated Resource Planning Report, the Hawaiian Electric Company (an investor-owned utility) explicitly recognized energy storage as part of a suite of actions necessary to both modernize the state's generation and to support additional renewable energy capacity. This utility has already issued an RFP for energy storage systems sized from 60 MW to 200 MW.

New Jersey (Distributed Energy Storage)

A 2012 study released by the New Jersey Board of Public Utilities (NJBPU) identified energy storage as a potential opportunity to support increased renewable energy penetration in the state. Because of this study and the impacts of Hurricane Sandy, the NJBPU recommended that $2.5 million be allocated for energy storage incentives in the New Jersey Clean Energy Program (NJCEP) 2014 budget. The program solicitation is expected to last for four years and total $10 million.

The NJCEP issued a 2nd Revised Straw Proposal in July 2014 for projects that could be integrated with new or existing behind-the-meter renewable energy resources, and would provide an incentive payment equal to 30% of the project's installed cost. Because the comment period on the revised proposal is open for 30 days, the earliest this can be approved is in September 2014.

Also in July 2014, the state launched a $200 million Energy Resilience Bank, which is set up to fund and finance resilient power projects, including solar coupled with storage.

New Mexico (Utility-Scale and Distributed Energy Storage)

During 2013, New Mexico passed House Joint Memorial 10 and Senate Joint Memorial 43. A memorial is a formal expression of legislative desire usually addressed to another governmental body. In this case, the memorials tasked the Energy, Minerals, and Natural Resources Department with convening a working group to study existing energy storage policy and develop legislative and regulatory recommendations to encourage energy storage development within New Mexico. The resulting working group published a report in November 2013, though no related energy storage legislation was introduced during the 2014 legislative session. Recommendations included establishing financial incentives for energy storage and supporting a large-scale demonstration project.

New York (Distributed Energy Storage)

The NY Battery and Energy Storage Consortium (NY-BEST) was created in 2010 by the New York State Research and Development Authority (NYSERDA) to catalyze and grow the energy storage industry while also positioning the state as an industry leader. The group includes members from the public and private sectors and financially supports research and development as well as policy initiatives.

Most recently, NYSERDA and ConEdison partnered to create an energy storage incentive program that provides utility customers with $2,100/kW for battery storage and $2,600/kW for thermal storage. The proposal was initially part of the larger Indian Point retirement contingency plan[8], but has been integrated into the state's demand management program. Eligible projects need to be operational by June 1, 2016 and provide peak reduction of at least 50 kW with bonus incentives available to projects that achieve a peak reduction of 500 kW.

Oregon (Utility-Scale Energy Storage)

In March 2014, the Oregon Department of Energy and the Oregon Public Utility Commission (PUC) held an energy storage workshop. One outcome from the workshop is a comment inquiry for a planned funding opportunity for an energy storage demonstration project. The Oregon PUC is seeking comments on its project criteria. The funding program will likely be limited to utility-scale battery projects that provide resiliency and regulation services, but there is no indication of a proposed budget. The comment deadline is listed, but there was no information available on the timeframe for implementation of the funding opportunity.

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[7] The Storage Act of 2011 would have provided a 20% federal investment tax credit for grid-connected energy storage projects, but it did not pass.

[8] Indian Point is a nuclear power plant that generates more than 2,000 MW of electricity, and supplies some of New York City's and Westchester County's energy needs. Its license expires in 2015 and New York has developed a contingency plan should the license not be extended .

Texas (Utility-Scale Energy Storage)

Texas, a high-penetration renewable energy state, has been exploring energy storage through policy and regulation for several years. In 2011, Texas passed Senate Bill 943 and the state's PUC opened project number 39657 to address the legislation. The bill classifies energy storage installations as generation assets if they are intended to provide energy and/or ancillary services in the wholesale market. Such a classification affords storage projects a number of rights including:

1. The right to interconnect
2. The right to obtain transmission service
3. The right to sell electricity or ancillary services at wholesale.

This classification method improves storage project economics because the Electric Reliability Council of Texas (ERCOT) lays the burden of interconnection costs on transmission utilities.

Also in 2011, the Texas PUC held a workshop to collect information on energy storage technologies and identify avenues to support their deployment. The feedback gathered led to further rulemaking in 2012 regarding how charging and discharging would be treated. Under Project Number 39917, the PUC decided to treat the energy as a wholesale market resource because, even though energy storage can be considered a load during charging, the facilities are not consuming the energy. Rather, they feed it back into the grid at a later time. Furthermore, the PUC exempted storage purchases from transmission and ancillary services charges, reasoning that such charges are only allocated to retail loads.

Washington (Utility-Scale and Distributed Energy Storage)

In 2013, the state of Washington introduced HB 1289, which would amend the current renewable portfolio standard to establish a 2.5 multiplier for energy storage output that is charged using eligible renewable resources and dispatched back into the grid during peak hours. As defined in the bill, energy storage is a broad category with the only limitation being that the technologies must have low greenhouse gas emissions. The bill is in the Environment Committee.

Another bill, HB 1296, was introduced during the same session and is currently in committee. This bill would require utilities to include energy storage assessments in their integrated resource plans to provide ancillary services and/or to complement renewable energy facilities. There are already efforts underway in the state aimed at better integrating renewable energy into the grid. Washington's Clean Energy Fund provides financial support to energy storage projects that aim to achieve this goal. As part of its 2014 funding round, three battery storage projects were awarded matching grant funds totaling $14.3 million.

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