

BEFORE THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid)))))	D.P.U. 12-76
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COMMENTS OF THE ELECTRICITY STORAGE ASSOCIATION

Pursuant to the Notice for Comment on the Report to the Department of Public Utilities (the “Department”) from the Steering Committee (the “Report”) formed in the above-captioned matter, the Energy Storage Association d/b/a Electricity Storage Association (“ESA”), on behalf of its Advocacy Council, submits the following comments and information for the Department’s consideration. The ESA has previously intervened in this docket and is a member of the Steering Committee.

As detailed below, advanced storage technologies, such as batteries and flywheels, will assist the Department’s efforts to enhance system reliability, provide back-up power for grid resiliency, lower costs to ratepayers, integrate renewable resources and reduce CO2 greenhouse gas emissions. In addition to the New Technology Adoption Regulatory Model¹ submitted by ESA and included in the report, the ESA recommends (1) implementing a time-of-use rate structure; (2) establishing policies for multi-purpose storage uses; (3) allowing utilities to contract with third party storage developers; and (4) developing energy settlement rules for storage projects connected at distribution.

¹ Page 132 of the Report.

I. ABOUT THE ELECTRICITY STORAGE ASSOCIATION AND ITS ADVOCACY COUNCIL

The ESA is an international trade association that was established over 20 years ago to foster development and commercialization of electricity storage technologies. Since then its mission has been the promotion, development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers.

ESA members represent a diverse group of entities, including electric utilities, energy service companies, independent power producers, technology developers involved with advanced batteries, flywheels, compressed air energy storage, pumped hydro, supercapacitors and component suppliers, such as power conversion systems. ESA's members also include researchers who are committed to advancing the state-of-the-art in energy storage solutions.

The ESA's Advocacy Council engages in regulatory, legislative and policy advocacy efforts on behalf of the ESA and includes among its membership leaders in the energy storage marketplace. The Advocacy Council member companies have firsthand knowledge of the regulatory challenges that need to be overcome to finance and operate commercial-scale energy storage facilities and are working to promote the development and commercialization of competitive and reliable electricity storage systems within the United States.

II. THE BENEFITS OF ENERGY STORAGE

Energy storage resources are currently operating on the nation's grids and used in a variety of applications to balance generation and load in an efficient and cost-effective manner. Similarly, storage technologies are ideally suited to assist with grid resiliency and increased reliability. Additionally, storage can reduce greenhouse gas emissions. A study by Carnegie Mellon in October 2008 estimated that 20% of the CO₂ emission reduction and up 100% of the NO_x emission reduction expected from introducing wind and solar power will be lost because of

the extra ramping requirements they impose on traditional generation.² Storage provides the flexibility to integrate renewables.

Many energy storage facilities are in operations or under construction, providing a rich operating history across a range of applications and use cases. The table below lists over 200 MW of advanced energy storage projects in operation or under construction, including a project in Massachusetts participating in ISO-NE’s Alternative Technology Regulation Pilot Program. About 90% of the megawatts listed are projects for which an ESA Advocacy Council member is the developer/owner, storage supplier, inverter supplier or integrator.

Facility (Location)	Developer/Owner	Technology	COD	MW
Beacon Tyngsboro (MA)	Beacon Power	Flywheel – Beacon	2008	Up to 3
Stephentown Spindle (NY)	Beacon Power*	Flywheel – Beacon	2011	20
Laurel Mountain	AES*	Battery – A123	2011	32
Hazle Spindle (PA)	<i>Beacon Power</i>	<i>Flywheel - Beacon</i>	<i>2013</i>	<i>20</i>
Kahuku (HI)	First Wind	Battery – Xtreme	2011	15
Various U.S. Projects	AEP	Battery – NGK	2006-10	13
Auwahi (HI)	Sempra Generation	Battery – A123	2012	11
East Penn (PA)	East Penn/Ecoult*	Battery – Ecoult	2012	3
Notrees	Duke	Battery – Xtreme	2013	36
San Jose (CA)	<i>PG&E</i>	<i>Battery – NGK</i>	<i>2013</i>	<i>4</i>
Westminster (CA)	Southern Ca. Edison	Battery – A123	2011	4
Vaca Dixon (CA)	PG&E	Battery – NGK	2013	2
Borrego Springs (CA)	SDG&E	Battery – Dow Kokam	2013	1
Catalina Island (CA)	Southern Ca. Edison	Battery – NGK	2011	1
Borrego Springs (CA)	California Utility	Battery – Saft	2012	0.5
San Diego (CA)	California Utility	Battery – Saft	2012	0.07
Philadelphia (PA)	SEPTA	Battery – Saft	2012	1.5
Kona (HI)	HELCO	Battery – Saft	2012	0.2
New York City (NY)	Con Edison	Battery – Saft	2012	1
Wailea (HI)	<i>MECO</i>	<i>Battery – A123</i>	<i>2013</i>	<i>1</i>
* ESA Advocacy Council member		<i>Under Construction</i>		

² Katzenstein, W., and Jay Apt. Air Emissions Due To Wind And Solar Power. *Environmental Science & Technology*. 2009, 43, 253-258. <http://pubs.acs.org/doi/pdf/10.1021/es801437t>

It is anticipated that once the Department implements new rules that allows storage to be procured (through contracts or ownership) by utilities, there will be additional investment in the Commonwealth.

III. COMMENTS

A. **The ESA Supports the Findings in the Report and Recommends that the Department Allow Utilities to Procure Energy Storage Resources Imminently.**

As designed, the New Technology Adoption Regulatory Model contained in the Report as pertains to the adoption of new technologies will allow utilities to procure energy storage initially using demonstration programs, paid through rate base and thereafter, as the regulatory process moves through Phases 2 and 3, to be considered as part of the class of regular transmission and distribution assets, eligible for funding by the utility. By establishing an approved budget and framework for procuring new technologies, this regulatory model will provide utilities the regulatory certainty they need to invest in storage technologies.

The ESA fully supports this model and recommends that the Department approve this model to expeditiously begin the process of adding energy storage for use by Massachusetts utilities.

B. **ESA Recommends the Department's Implementation of Additional Policies that will encourage the continued development of energy storage technologies designed to mitigate numerous challenges impacting the Commonwealth's electric system.**

1. *The implementation of time-of-use rate structure*

Energy storage will enhance the benefits gained by time-of-use rate structures. Purchasing energy off-peak, storing that energy and using it when the cost of electricity peaks will result in lower electricity costs for consumers. This will accomplish one of the Department's stated goals to reduce electricity costs³ and the ESA recommends that the

³ See NOI at 1.

Department continue to develop a rate structure to take advantage of energy storage on the system.

2. *Establish Policies for Utilities to contract or own storage resources that provide multiple purposes.*

Energy storage technologies, by shifting the time in which energy is generated and consumed, is neither a traditional generation asset nor a traditional transmission and distribution asset. In fact many storage resources can provide numerous applications to mitigate multiple challenges currently impacting the Commonwealth's electric system. For example, storage technologies can provide "generation" type services (such as energy arbitrage, ancillary services and renewables firming) while at the same time providing "transmission and distribution" type benefits (such as reducing circuit and line overload, enabling grid resiliency by mitigating outages, and voltage support).

A unique benefit of storage is that it is capable of providing both T&D and Generation-type services (such as ancillary services). However, valuing multiple services can be complex in deregulated states such as MA. One way to enable this is to allow utilities to contract with third party storage developers for the T&D uses of the storage asset, which would allow the storage owner to provide cost-effective T&D services while also being able to bid the remaining portion of the storage resource into the wholesale markets to provide peak-shifting and/or ancillary services. This enables maximum benefit to be gained from the addition of flexible storage capacity on the grid. By establishing policies that allow utilities to either own or contract with storage that provides multiple purposes to the grid, Massachusetts will gain maximum benefit from the deployment of energy storage on its grid.

3. Develop energy settlement rules for storage projects connected at distribution.

Energy storage assets connected to the distribution system, that are solely storing energy for the purpose of returning electricity to the grid at a later time, should be able to charge at wholesale electricity market prices rather than at retail prices. This is not the case today. Currently, electricity storage at the distribution level must pay retail energy and demand charges to charge, making the operating cost of deploying storage, for peak shaving or ancillary services, at the distribution level higher than at the transmission level⁴, and providing a disincentive for storage investments at the distribution level.

Currently, the Transmission and Distribution charges are based on total energy (kilowatt-hours) withdrawn from the grid over a billing period, and do not net out the energy injected back to the grid as part of the storage project's operations. In essence, under this regulatory scheme, storage projects, which withdraw and inject energy as part of their normal operations and which only ultimately use or consume the net of their injections and withdrawals, are unduly penalized. Effectively, the energy is charged twice – once when initially withdrawn from the grid by storage projects, and then again later when the energy is injected back to the grid and is ultimately consumed by another end-user.

The benefits of electricity storage on the distribution level are great and include avoiding investments in distribution infrastructure, increased reliability, improved power quality, and lower costs. The MA DPU should implement a policy to allow energy storage connected at distribution to net its energy consumption to encourage distribution connected projects.

⁴ FERC allows storage connected at transmission to net its energy consumption at the wholesale price of electricity (LMP).

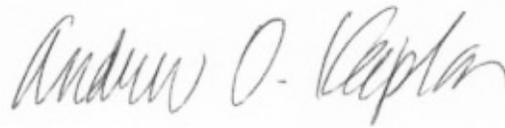
IV. CONCLUSION

ESA appreciates the opportunity to offer comments in this docket and looks forward to continuing to work with the Department and stakeholders to help develop a modern grid that includes a robust energy storage market in the Commonwealth.

Respectfully submitted,

THE ELECTRICITY STORAGE ASSOCIATION

By its attorney,



Andrew O. Kaplan
Brown Rudnick LLP
One Financial Center
Boston, MA 02494

On behalf of the members of its Advocacy Council

Judith Judson McQueeney, Chair
A123 Systems, Inc.
AES Energy Storage
Aquion Energy
Beacon Power, LLC
East Penn Manufacturing Co.
FIAMM
NextEra Energy
S&C Electric Company
Saft America Inc.
Temporal Power

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