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December 16, 2016

Commissioner Judith Judson
Massachusetts Department of Energy Resources
100 Cambridge Street
Boston, MA

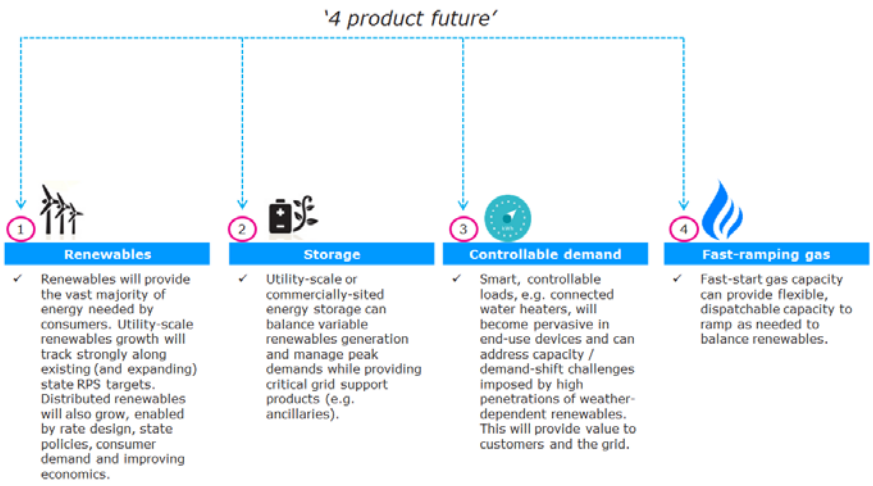
Re: An Act Relative to Energy Diversity – Storage Targets

Dear Commissioner Judson:

In response to a request for stakeholder input issued by the Department of Energy Resources ("Department") on November 16 regarding whether Massachusetts should adopt targets for energy storage systems pursuant to *An Act Relative to Energy Diversity*, signed into law by Governor Baker on August 8, 2016, NRG Energy, Inc. ("NRG") is pleased to provide the following comments. NRG supports the establishment of energy storage system targets as a means to begin the deployment of energy storage at the scale that will be necessary to support the low-carbon, highly-responsive energy grid that will enable a high-performance Massachusetts economy in the 21st century.

The 'Four-Product' Future

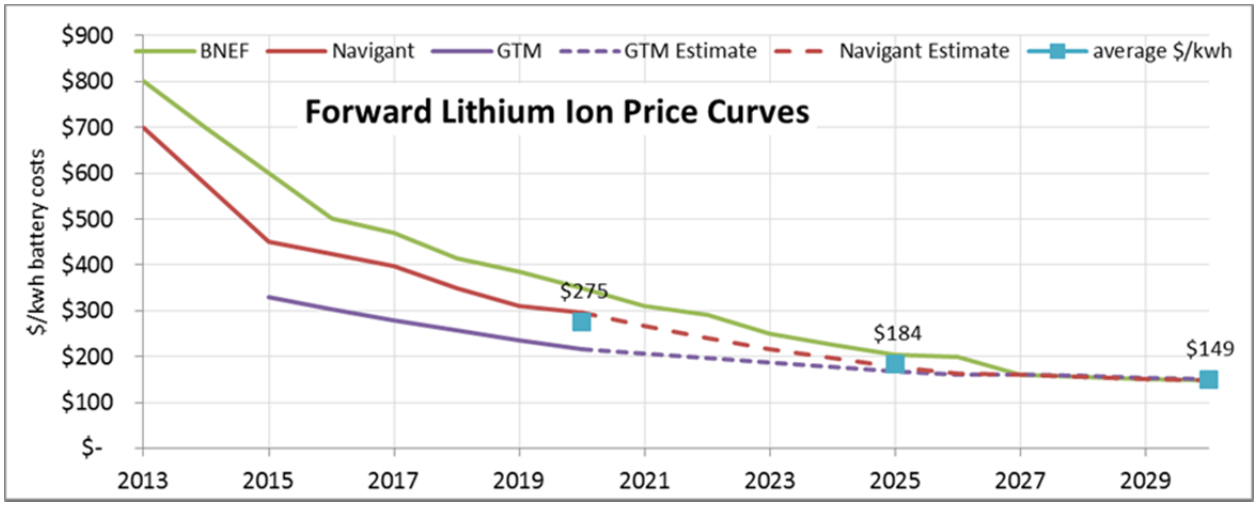
NRG envisions the electric grid of the future as comprising four major elements, depicted in the graphic below. The foundation of the clean energy grid is renewables, such as wind and solar, to provide the vast majority of the energy needs of the system with no emissions and no long-lasting alteration of the environment. Because of the weather-dependent nature of these energy sources, storage is the second major building block, both at grid scale and in distributed applications, to store renewable energy when renewable production exceeds that needed to serve demand and to serve demand when renewable energy production is not sufficient to serve demand. At the same time, pervasive load management at the end-user level will greatly enhance the ability to match demand to variable supply. A complement of flexible and fast-responding peaking plants will provide the additional balancing capability for short-term ramping and contingency needs.



Storage is an essential part of the 21st century electrical grid, where it will enable the widespread use of renewable energy and improve the performance and responsiveness of the grid to the power quality needs of consumers. Massachusetts is correct to embrace storage as a key pillar of the new grid, and should adopt targets to encourage near-term deployment of a variety of energy storage technologies in a variety of use cases to ensure that utilities, storage technology providers, third-party investors and operators, and customers all can gain experience with storage and its interactions with the grid, with markets, and with end-use customer demand.

Energy Storage Targets

Energy storage system costs are declining rapidly, and further cost reductions are anticipated as increasing demand fuels aggressive research towards improving storage technology and manufacturing efficiencies, as well as improving balance-of-system controls and analytics to optimize storage resources. The chart below is an aggregation of three industry forward curves on battery pricing.



Improving economics of energy storage, coupled with increased demand, will continue to bring storage closer to cost parity with 'traditional' forms of energy supply and delivery. As this happens, the need for state mandates will naturally decrease and storage will become a 'mainstream' technology on the grid and in customer applications, which should be the Department's goal. To ensure that this technology continues to advance, and that Massachusetts is well-positioned to take advantage of it, the Department should establish aggressive but achievable targets for the distribution utilities to procure energy storage under long-term purchase agreements. The structure of the agreements should provide sufficient revenue certainty to enable cost-effective financing of projects, and should emphasize third-party and customer-owned projects rather than direct utility ownership. The experience gained by third parties and by the financial community will be extremely valuable in supporting the evolution to a voluntary, market-based environment for energy storage in future years.

As an example, California's mandate for 1,325MW of energy storage, adopted in 2013, has shown the effectiveness of a state-supported goal for expanding the deployment of a variety of storage technologies, chemistries and business models. NRG and a large number of other companies have participated in the competitive procurements run by the California utilities, and are in the process of deploying a large number of energy storage projects that will advance California's ability to integrate renewables and manage the ramping and other flexibility needs of a modern grid. The competitive approach used in

California, and the creativity and innovation that result, offer some useful lessons for Massachusetts. The existence of the mandate has enabled projects that would not have been economic or financeable strictly on the monetizable revenue streams available from wholesale markets and customer savings. The open, competitive form of the solicitations that have been used to meet the mandate targets, which require a high percentage of projects to be owned and financed by customers or third parties, further expands the potential for learning and establishing energy storage as a mainstream technology familiar to a broad swath of the energy and finance community. Utility solicitations for energy storage in CA have seen robust participation, with competition aggressively driving down price in a very short timeframe.

Complementary Initiatives

In addition to directing utility procurement of energy storage through competitive means from independent storage project developers, the Department should continue to engage with the utilities, ISO-NE and other stakeholders to ensure that storage projects are able to efficiently interconnect to the grid, to effectively participate in markets for the multiple products that storage can provide, and to monetize the other values that storage provides to the grid (e.g., through the deferral of transmission and distribution investment). Among the priorities in this regard are accessible and granular maps or similar documentation from the utilities describing high-value areas for storage, such as areas with high penetration of renewables and areas with particularly high peak demands relative to average loading, and refined ISO-NE market rules that facilitate participation by storage resources in the wholesale markets and fully value the flexibility and responsiveness of storage. These foundational elements will need to be firmly in place and well-understood by the development and financing communities to enable an effective transition to a market-based environment for energy storage, independent of state mandates.

NRG appreciates the opportunity to provide these comments and will continue to engage and support the Department and the Commonwealth as Massachusetts pursues a modernized electricity system. Please feel free to contact me with any additional questions.

Sincerely,

Peter D. Fuller

Peter D. Fuller
Vice President