**Peter Fuller**
**NRG Energy, Inc.**
One International Place
Boston, Massachusetts 02199

January 27, 2017

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:

NRG Energy, Inc. ("NRG") applauds the decision by the Department of Energy Resources ("Department") on December 27, 2016 to adopt targets for energy storage systems pursuant to *An Act Relative to Energy Diversity* (the "Act"), signed into law by Governor Baker on August 8, 2016. 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.

NRG offers the following comments in response to the Department's request, issued concurrently with the notice announcing the decision to establish targets, seeking input regarding "the appropriate target scale, structure and mechanisms for the energy storage system targets."

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 this energy future, and should adopt achievable but aggressive targets to propel the Commonwealth into a leadership position among the states. The near-term focus on achieving significant deployment of a variety of energy storage technologies in a variety of use cases will ensure that customers, storage technology providers, third-party investors and operators, and utilities all can gain experience with storage and its interactions with the grid, with markets, and with end-use customer demand, to establish a sustainable ecosystem for using storage as an integral part of the grid.

<u>The Legislative Basis for Energy Storage Targets</u>

Section 15 of the Act establishes the framework for the energy storage targets, and directs that the targets should be for "electric companies to *procure* viable and cost-effective energy storage systems." (emphasis added) This legislative directive must be read to establish an affirmative obligation on the utilities to purchase energy storage to meet the targets. The Act provides the flexibility for the Department to "consider a variety of policies" to meet the targets, but also establishes a compliance obligation on the electric companies. The statute clearly envisions the

utilities actively seeking out and facilitating the deployment of energy storage to meet the numerical targets by 2020. To be effective, especially in the limited time between now and 2020, the Department must adopt long-term contracts as the basis for the electric companies to comply.

The legislative framework and directive also need to be read in the context of long-standing Massachusetts policies favoring competitive markets for energy services and competitive procurement of resources to meet state policy objectives. The Department's targets should require the electric companies to solicit proposals from customers and energy storage providers, to leverage innovation and private capital at risk, and execute long-term agreements that provide sufficient revenue certainty to enable cost-effective financing of projects. The focus on third-party and customer-owned projects rather than direct utility ownership is critically important to establish Massachusetts on a path to a sustainable ecosystem for energy storage growth. The experience gained by third parties and by the financial community in developing projects will be extremely valuable in supporting the evolution to a voluntary, market-based environment for energy storage in future years.

The legislative requirement for utilities to file reports showing compliance creates an explicit enforcement requirement, and the Department should provide for sanctions in the event utilities fail to achieve their targets.

Scale of the Energy Storage Targets

The State of Charge report[1] recommends that the Commonwealth seek to deploy 600MW of advanced energy storage by 2025, and estimates that 1,766MW can be deployed in Massachusetts cost-effectively. NRG recommends taking the 600MW goal for 2025 as a reference point in setting the 2020 target called for in the statute. The target should be aggressive and meaningful enough to attract sufficient interest among the technology and financial communities, but not so large as to be unachievable.

NRG recommends that the Department set the energy storage targets for 2020 to accomplish two objectives: move Massachusetts into the top 10 among states in terms of energy storage deployment, and address the highest peak hours to achieve energy cost reductions. According to the State of Charge Report[2], Massachusetts currently ranks 23rd among the states in advanced storage deployment. Moving into the top tier among the states would require an incremental deployment of 100 to 200MW of advanced storage. Also, as noted in the Report, the top 1% of hours of the year accounts for 8% of annual energy cost. With an estimated peak demand of approximately 12,300MW in 2020, deployment of advanced storage equal to 1-2% of that peak load, or 123MW to 246MW, would have a significant impact on state-wide energy costs. Thus, NRG recommends that the Department set a 2020 target of at least 150MW and up to 250MW of

[1] http://www.mass.gov/eea/docs/doer/state-of-charge-report.pdf
[2] id., Figure 6

new advanced storage deployment. This should be viewed as a minimum, and as a milestone on the path toward the State of Charge Report's recommended 600MW and 1,766MW targets. With 150 to 250MW of advanced energy storage deployed by 2020, the Commonwealth will be well-positioned to grow to the 600MW goal by 2025, given projections of continued growth in manufacturing and supply chains as well as declines in cost.

Structure for the Energy Storage Targets

The Department should set the 2020 targets such that 'achievement' of the targets is measured in terms of actual operations of the storage projects. While it will take concerted effort and coordination among developers, customers, the utilities, ISO-NE, the Department and the DPU to complete competitive solicitations and achieve these targets, it is important that the Department express a sense of urgency and shared purpose to advance the deployment of advanced energy storage in Massachusetts.

The targets should be separate and distinct from any advanced storage deployed in response to other policies or initiatives such as solar+storage incentives. With the procurement-based approach that is needed to effectively comply with the Act's directives, all parties will benefit from clarity and certainty in the target quantities and that the targets will not be reduced by other storage projects deployed through other means.

Targets should be distributed across the electric companies, and deploy a number of diverse use cases, with primary focus on grid-connected storage to support integration of renewables and other grid performance needs, C&I dispatchable storage (with or without associated solar), and storage co-located with MW-scale solar.

Mechanisms for the Energy Storage Targets

In all cases, third-party ownership and operation should be the preferred business structure. If utilities are allowed to own advanced storage at all, there should be a firm upper limit on the proportion of the target that they can own. For example, in California utilities are restricted to owning no more than 50% of the 1,325MW target in that state. Experience to date in California suggests that third-party projects are very competitive with utility-owned projects and are identifying innovative customer-oriented business models and technology configurations.

To ensure that this technology continues to advance, and that Massachusetts is well-positioned to take advantage of it, the distribution utilities should procure energy storage under long-term purchase agreements. Even for use cases that are targeted primarily to distribution grid support services, third-party ownership is possible and preferable. First, third-party storage will require clear definition, in commercial agreements, of roles, responsibilities, performance specifications and value drivers for use of storage in support of utility and ISO needs. This will lead to more rapid and more precise resolution of these issues, which will be needed in a more market-based environment for advanced energy storage, than if utilities own and operate. In addition, third-

party owners will be far better-positioned to take advantage of wholesale market participation and revenues.

On a very practical level, achieving the Commonwealth's larger future goals for advanced energy storage will not be possible through utility ownership, and engaging the developer and investor community in this initial deployment effort will inject innovation and advance the experience of independent developers and financiers, which will be necessary to support a sustainable energy storage industry.

Complementary Initiatives

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.

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 and services that storage can provide, and to successfully 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