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VIA ELECTRONIC MAIL
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President Joseph Fiordaliso
New Jersey Board of Public Utilities
Office of Policy and Planning
44 S. Clinton Avenue
Trenton, NJ 08625

RE: Comments by the Energy Storage Association on the New Jersey 2019 Energy Master Plan

Dear President Fiordaliso:

The Energy Storage Association ("ESA") respectfully submits for the New Jersey's Board of Public Utilities' ("BPU") consideration a blueprint for achieving the energy storage deployment goals as outlined by Governor Murphy. Energy storage will be a critical pillar in a strategy for achieving the State of New Jersey's ambitious goals of 100% clean energy by 2050.

ESA is the national trade association dedicated to energy storage, working toward a more resilient, efficient, sustainable and affordable electricity grid – as is uniquely enabled by energy storage. With more than 160 members, ESA represents a diverse group of companies, including independent power producers, electric utilities, energy service companies, financiers, insurers, law firms, installers, manufacturers, component suppliers and integrators involved in deploying energy storage systems around the globe.

In our comments, ESA recommends a set of policy actions over the next ten years that are needed to develop a more resilient grid, specifically focusing on policies to unlock the energy storage market in the State of New Jersey. By carrying out these policy steps, ESA believes energy storage will ensure the State can advance its clean energy vision affordably, while maintaining grid reliability and enhancing the State's resiliency.

Respectfully,

Nitzan Goldberger
State Policy Director
Energy Storage Association

ESA Comments on the New Jersey 2019 Energy Master Plan

I. INTRODUCTION

Executive Order No. 28 calls for the development of an action plan to reach Governor Murphy's ambitious vision of a clean, resilient, flexible and affordable grid for the State of New Jersey. The key pillars have been set by several policy goals, including a 100% clean energy goal by 2050 and a storage deployment goal of 600 megawatts (MW) by 2021 and 2,000 MW by 2030. In these comments, ESA describes how energy storage can enable Governor Murphy's vision to be realized, outlines the regulatory and market hurdles currently preventing a robust deployment of energy storage in the State, and submits recommendations to overcome those obstacles by determining the values provided by energy storage, creating mechanisms to capture that value, and leveling the playing field for energy storage technologies to compete fairly against other technologies. This new regulatory rubric can serve as a catalyst for a modern grid in the State of New Jersey.

II. STORAGE BENEFITS FOR THE STATE OF NEW JERSEY

Energy storage of all types are critical to achieving a clean and reliable grid. Energy storage technologies are highly flexible and controllable resources, capable of fast response to system needs and near instantaneous ramp to full capacity in either charge or discharge mode. Storage has zero direct air and water impacts and a small footprint, and it can be deployed rapidly at megawatt scale – in some cases in as little as 6 months – which can help manage grid risks efficiently. Projects can be scaled in size to match any site—be that co-located with a power plant, installed at a substation, directly connected to a transmission or distribution line, or sited at customer premises—and can provide services interchangeably to wholesale markets, distribution grids, and end users.

Greater deployment of energy storage in the State of New Jersey will provide significant economic, environmental and societal benefits. Storage can avoid costs to ratepayers of excess grid capacity in the form of power plants and wires, as well as integrate more variable wind and solar power and distributed energy resources (DERs) onto the grid. Storage provides back-up power to critical facilities and enhances the resilience of the grid to hurricanes and other extreme events. Moreover, the State of New Jersey's residents and businesses can use energy storage to reduce their demands on the system during peak periods, saving money while relieving the grid.

Our electric system currently is bound to a simple reality of physics—supply must precisely match demand at every moment, everywhere. If it does not, the result is equipment damage, service disruption, or blackouts. As a result, the electric system has been overbuilt with significant spare power plant capacity—much of which burns polluting fuels like oil, coal, or gas—to reliably meet demands of businesses and households at all times. These peaking plants sit on standby most hours and are underutilized electric system assets that provide expensive electricity.

Since storage can charge off-peak when system demand and electricity costs are lower, and then deliver that electricity during peak periods of demand to relieve grid stress, energy storage can save consumers in the State money by reducing the amount of spare power plant capacity needed to meet system peak demands while better utilizing generation resources available during off-peak periods. While the economic benefits of storage deployment specific to the State of New Jersey have not yet been quantified, Massachusetts' 2016 state-commissioned energy study of widespread energy storage deployment found benefits to its ratepayers of $2.3 billion over 10 years, most of which comes from reducing system and local peak demands. Given that New Jersey has a system peak 40% greater than Massachusetts, a similar order of magnitude in benefits to ratepayers is reasonably expected.[1]

In addition to providing affordable capacity that reduces ratepayer costs in the State, energy storage can facilitate a more flexible grid by providing high-value grid flexibility services such as frequency regulation or ramping support. A large-scale energy storage resource dedicated to providing peak capacity when needed—typically a four-hour period in the afternoon and early evening, potentially only seasonally—can also provide grid services for the many hours when its peak capacity is not needed. Similarly, behind-the-meter (BTM) energy storage systems aggregated into a Virtual Power Plant could provide valuable grid services, including ramping, local and system capacity, voltage support and frequency response. Storage resources can do this because they are "always on" and available for service, in contrast to traditional generation units that need to be started up and shut down to provide peak capacity and other services.

Energy storage also has a unique role to play in enhancing efficiency and reducing costs at the distribution level. DERs such as energy storage can be deployed as a cost-effective solution for deferring or avoiding costlier distribution system upgrades, increasing power quality on distribution circuits, and can serve as a critical resource for increasing circuit and substation hosting capacity to meet the system demands posed by increasing proliferation of DERs, particularly non-dispatchable generation. Several utilities have begun to demonstrate the use of energy storage as a distribution asset, most notably New York's Con Edison plans to defer a $1.2 billion substation upgrade through its non-wires alternative program, the Brooklyn-Queens Neighborhood Program, by contracting for 52 MW of demand reductions and 17 MW of distributed resource investments, including energy storage.[2] PSEG Long Island has made similar solicitations to reduce peak demand as a means of avoiding network upgrades[3] and has plans to make direct use of energy storage sited at substations for this purpose as well.[4]

Energy storage can facilitate deferral and avoidance of transmission build out as well. This is particularly important in the context of New Jersey's renewable energy goals, which may require additional transmission infrastructure. Transmission deferral is an important value, of the many to consider for energy storage. For example, National Grid is deploying a 6 MW / 48 MWh (8-hour duration) energy storage system on the island of Nantucket that is expected to delay adding a third submarine transmission line by at least a decade. Similarly, Arizona Public Service deployed a 2 MW / 8 MWh (4-hour duration) energy storage system to defer investment on a 20-mile transmission line in Punkin

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[1] Massachusetts Department of Energy Resources, *State of Charge* report, September 2016, available at: https://www.mass.gov/files/documents/2016/09/oy/state-of-charge-report.pdf.

[2] Con Edison, Distributed System Implementation Plan (DSIP), 30 June 2016, available at: https://www.coned.com/-/media/files/coned/documents/our-energy-future/our-energy-projects/ceconydsip.pdf?la=en.

[3] See PSEG LI 2015 South Fork RFP, available at: https://www.psegliny.com/aboutpseglongisland/proposalsandbids/2015southforkrfp.

[4] See Section 3.3. of PSEG, Utility 2.0 Long Range Plan 2018 Annual Update, June 2018, available at: https://www.lipower.org/wp-content/uploads/2018/06/2018-06-29-PSEG-LI-Utility-2.0-2018-Annual-Update.pdf.

Center. Again, as noted previously, PSEG Long Island has plans to use energy storage directly to avoiding transmission upgrades.[5]

Significant new renewable capacity is anticipated to meet Governor Murphy's 2050 goal of a grid made up of 100% clean energy resources. We noted earlier that storage can serve as a cost-effective and low impact solution for integrating growing levels of large scale renewable energy by obviating the need for traditional transmission buildout. In addition, energy storage will also reduce curtailment of renewable energy and other clean energy resources by storing that resources at times when there is potential overgeneration, for use at a later time. This applies not only to intermittent resources but also to inflexible baseload resources such as nuclear energy as the net load curve changes with the anticipated changes in the State's resource portfolio. And at the distribution level, energy storage systems can facilitate great adoption of clean energy resources such as customer-sited photovoltaic (PV) systems by *enhancing* hosting capacity along the distribution grid.

III. EXISTING REGULATORY AND MARKET OBSTACLES FOR ENERGY STORAGE

Despite the potential benefits outlined above and a program already in place to support energy storage coupled with solar, significant hurdles remain that hinder its full deployment potential in the State of New Jersey. The State's rules and regulations that govern its electric system were designed before cost-effective energy storage was available.

The regulatory and market hurdles for energy storage in the State of New Jersey fall into three categories. *First*, current rules do not fully value and compensate the flexibility of energy storage, and therefore the market signals to otherwise encourage consumers and utilities to adopt and deploy it are not in place. *Second*, storage is not effectively included in New Jersey's grid planning and resource procurements, and therefore is precluded from competing with traditional resources under consideration. *Third*, barriers to market and grid access (for example, distribution interconnection) limit the ability of energy storage systems to interconnect and offer their full range of services at the residential, commercial and industrial levels, as well as at the distribution and transmission levels.

<u>Behind-the-Meter and Front-of-the-Meter Distribution Connected Storage</u>

Distribution-connected energy storage systems are made up of behind-the-meter energy storage systems that are customer-sited and deployed by residential, commercial, industrial or public entities, as well as front-of-the-meter distribution-connected energy storage systems. As outlined in the section above, distribution-connected resources – whether customer-sited or in front-of-the-meter – can provide grid services, wholesale market products, and defer or replace the need for traditional distribution investment. The main hurdles for these assets stem from their inability to provide those values or capture the revenue stream associated with those value, either because there is no mechanism for compensating them for it, or because no mechanisms exist for them to provide those values that would result in additional compensation in the first place.

Rate design and utility programs are important factors that drive these opportunities to provide value for customer-sited resources. For example, without greater use of time-varying rates, customers do not

[5] See Section 3.3. of PSEG, Utility 2.0 Long Range Plan 2018 Annual Update, June 2018, available at: https://www.lipower.org/wp-content/uploads/2018/06/2018-06-29-PSEG-LI-Utility-2.0-2018-Annual-Update.pdf.

receive a price signal for when they generate the greatest stress on the grid, and therefore are not incented time the use of their batteries to avoid stress on the grid at peak hours and charge during off-peak hours. Those storage systems could provide services to the grid by actually discharging during peak hours, but there are no programs in place to facilitate that service. Customer-sited resources (either by the customer or an aggregator) can serve a number of grid services, but beyond demand response programs, the regulatory construct for providing those services – both the utility program to call on customer or third party owned resources and the mechanism to compensate a utility for foregoing traditional distribution asset investment – is not in place.

Both customer-sited and front-of-the-meter distribution-connected assets face a critical challenge in being considered and selected as distribution assets. This is due in large part to the fact that they are not always included or effectively assessed in distribution planning processes. Energy storage assets, and in particular aggregation of distributed resources to serve distribution needs, have not become part of the utility planning process as of yet in the State of New Jersey.

Distribution-connected assets face significant challenges of participating in the wholesale market when they are not used for either customer bill management needs or grid services. The most notable question for customers and developers is whether the same asset will be allowed to participate both in the retail market and the wholesale market. A lack of dual market participation rules for storage assets in PJM and at the state-level that enable storage to be optimized across a number of applications and receive financial compensation for those values creates an additional barrier to the economics of distribution-connected assets. While some of these barriers are the result of interconnection, metering and telemetry requirements that PJM currently seeks, the BPU also lacks regulations that affirmatively enable distribution-connected storage to conduct wholesale market operations in addition to distribution grid services. The result is not only reduced efficiency since these assets are not optimized for all the applications they can serve, but also reduced revenue streams that will limit the total number of energy storage assets that will be deployed.

Lastly, distribution interconnection rules in the State of New Jersey, much like the rest of the country, were crafted before the widespread deployment of energy storage and therefore do not provide fair and timely interconnection of energy storage assets. Greater clarity on how energy storage systems will be considered in the interconnection process is needed. Without accurately evaluating energy storage system performance, interconnection studies may trigger unfair and unnecessary upgrade costs, as well as long study timelines that can be cost prohibitive for a project.

<u>Bulk System Storage</u>

Value stacking will be critical for bulk-system energy storage assets, where there are potentially fewer opportunities to provide products into the market. The energy storage industry faces a number of challenges to participating in PJM, which impacts the deployment of utility-scale projects in the State of New Jersey. These challenges include eligibility rules that do not allow energy storage to participate, a lack of market products that value the flexibility that energy storage can provide, and unclear rule around dual market participation. For example, PJM's current requirements to qualify storage for capacity market participation require a 10-hour duration, even though PJM manual language has not made this clear and even though a proper study of estimated load carrying capacity of storage has not yet been conducted, presenting an unwarranted barrier to gaining capacity value for storage. Similarly, PJM is presently considering changes to energy price formation that would reduce price signals for energy market flexibility that storage can provide, rather than enhancing such price signals for flexibility.

Despite its competitiveness, utility-scale energy storage is often not fairly considered (or not considered at all) against traditional resources and "wires" transmission solutions in planning processes. Proposals for utility investments in natural gas peaking capacity have not demonstrated a robust exploration of energy storage as a cost-competitive solution. Price assumptions and analysis of energy storage applications do not generally match the latest data, largely because innovation and cost curves are changing so rapidly. Similarly, transmission plans do not consider non-wires alternatives and therefore do not contemplate energy storage as a solution.

IV. BLUEPRINT FOR POLICY ACTION TO ACHIEVE ENERGY STORAGE DEPLOYMENT GOALS

ESA applauds Governor Murphy, the Board of Public Utilities (BPU), and the state legislature for recognizing the importance of energy storage and beginning the important work of jumpstarting the energy storage market in the State. Notably, setting a long-term energy storage target of 2,000 MW by 2030 and allocating additional funds for the Renewable Energy Storage incentive in 2019 are an important first step to providing the rapidly growing U.S. energy storage industry with the signal to invest and hire the State of New Jersey.

There are additional policy actions that the BPU and the Murphy Administration can take to advance the energy storage market, enabling a more efficient, resilient, sustainable and affordable grid. Initiating a more robust and long-term review of the rules and regulations that govern the electricity system is a critical first step to ensuring that energy storage is fairly valued, is able to compete on a level playing field with traditional investments and is provided an opportunity to interconnect. As these long-term regulatory and market reforms are underway, the BPU may consider a bridge incentive to be appropriate. A bridge incentive recognizes that the deployment of these assets can provide value and trigger learning-by-doing, and as such should be limited in duration. Once reductions in soft costs are achieved through increased deployment and a regulatory framework is in place to provide mechanisms for storage assets to capture those values, the incentive will no longer be needed. ESA respectfully submits the following set of recommendations to overcome the regulatory and market hurdles for distribution connected and bulk system energy storage resources, in the immediate and longer term.

<u>Behind-the-Meter and Front-of-the-Meter Distribution Connected Storage Recommendations</u>

The BPU could initiate a process for reviewing rate design and utility programs for customer-sited energy storage resources.

- Consider more dynamic rate design that aligns system costs with rates while still aligning with cost causation principles. This can include greater use of time-varying rates to provide greater granularity for customers about when they are placing the greatest stress on the grid. This can also potentially include rate design that facilitates energy storage charging, while still staying within the confines of cost causation principles.

- Consider the development of utility programs to facilitate customer-sited energy storage system contribution to supporting the grid's needs. This could be in the form of the "Bring Your Own Device" program currently available for Green Mountain Power's customers in Vermont. Under such a program, customers could allow the utility to call on their energy storage asset in exchange for an on-bill credit. Other programs may include a “Reverse demand response” program as is currently being explored by APS in Arizona.

- Initiate a review of distribution interconnection rules to include the unique technical attributes of energy storage systems. This will require consideration for the proposed use of the energy storage asset in the study assumptions, rather than a simple aggregation of nameplate capacities.

- Incorporate energy storage as an eligible resource for all existing programs available for customer-sited resources (for example, demand response).

To meet the energy storage goals and timeline outlined by the Governor, modifications to existing programs and increased funding levels of those programs to accelerate deployment will be necessary. The existing Renewable Energy Storage program carries potential to stimulate the energy storage market and address New Jersey’s critical grid resiliency needs. However, additional funds are needed to support this program. In addition to increased financial support, the program should be expanded to include residential energy storage systems and standalone energy storage systems. ESA recommends other reforms to the program, including a revision to the developer cap and an increase of the project funding cap. While an emphasis on critical facilities is important, creating a higher incentive through an incentive adder for critical facilitates would make the program is attractive to those facilities. This would encourage more third-party developers to enter the State of New Jersey to conduct their business.

Distribution planning processes must also be reviewed to determine if reforms are needed to increase consideration of distributed energy resources and energy storage for distribution system needs. The BPU could consider a requirement that for traditional investments beyond a certain dollar threshold, distribution utilities must demonstrate that they have adequately considered energy storage systems before selecting the traditional investment. The BPU may also consider a separate non-wires alternatives (NWA) solicitation program to facilitate storage solutions to deferring or replacing the need for distribution investment. An effective NWA program is one that narrows the eligible distribution investments through a thoughtfully developed selection criteria, and also addresses the utility business model by providing a mechanism to compensate the utility for selecting a non-wires alternative over traditional investment.

<u>Bulk System Storage Recommendations</u>

Recognizing the importance of effective PJM market rules to achieve the deployment levels outlined by Governor Murphy and the state legislature, ESA recommends that the BPU confer with PJM to guarantee that market reforms, most notably those driven by compliance of FERC Order 841, level the playing field for energy storage and enable those resources to participate in the wholesale market. These critical reforms to PJM rules include:

- Capacity market changes that enable energy storage to effectively participate, such as shorter duration qualification requirements of storage that align with the New Jersey grid's peak demands.

- Absent energy market price formation that signals the greater need for flexibility, the development of a fast-ramping product to capture the benefits technologies such as energy storage can provide to the wholesale market.

- An effective means for DER storage interconnection and participation in wholesale markets with reasonable metering and telemetry requirements.

ESA also respectfully recommends that the BPU engage PJM to include energy storage as a potential transmission solution in PJM's Transmission Expansion Planning process. In particular, inclusion of storage as a potential transmission solution and clarity on how storage solutions will be studied and evaluated is critical to making sure that transmission planning takes advantage of it.[6]

Given the uncertain outcome of these reforms at PJM, we underscore the importance of building flexibility into the BPU and Governor Murphy's strategy for achieving the State's energy storage deployment goals, even without effective wholesale market rules. The BPU should therefore explore ways to facilitate bulk system storage assets in recognition of the benefit those assets will provide to the State of New Jersey's electricity grid. Specifically, the BPU might explore specific use cases for bulk system storage assets that may justify a bridge incentive or a Clean Peak type program that provides additional value streams. This sort of analytic exercise could be conducted through the energy storage cost-benefit analysis required under An Act Concerning Clean Energy (Assembly Bill 3723), which was signed into law this year.

The BPU may wish to consider revision to its rules for prudency determination of investments to include an explanation of how and whether flexible resources such as energy storage were evaluated, and if applicable, why they were not selected. Energy storage is well positioned to address peaking capacity needs and should at minimum be considered.

V. **CONCLUSION**

ESA appreciates the opportunity to provide these comments to the BPU to support the development of New Jersey's 2019 Energy Master Plan. We look forward to working with the BPU and stakeholders to develop a long-term plan that realizes Governor Murphy's energy and environmental vision, and that provides the residents of New Jersey with the benefits of a more resilient and sustainable grid.

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[6] ESA notes similar considerations underway in CAISO that PJM can draw from with the BPU's assistance. See CAISO's initiative on storage as a transmission asset:
http://www.caiso.com/informed/Pages/StakeholderProcesses/StorageAsATransmissionAsset.aspx