NEW JERSEY BOARD OF PUBLIC UTILITIES

COMMENTS OF THE ENERGY STORAGE ASSOCIATION

Pursuant the Jersey Board of Public Utilities ("BPU") Office of Clean Energy's Notice Requesting Comments on the New Jersey Energy Storage Analysis issued on March 6, 2019, the Energy Storage Association ("ESA") submits the following comments intended to assist the BPU in the preparation of an Energy Storage Analysis. In our comments, ESA describes the potential benefits provided by energy storage for the State of New Jersey and provides guidance on how the Energy Storage Analysis can identify and model those values. ESA also describes the current regulatory and market barriers to the deployment of energy storage systems in New Jersey and includes a discussion of policy prescriptions for overcoming those hurdles, including additional information on the development of the State's 2,000 MW energy storage goal.

I. ABOUT THE ENREGY STORAGE ASSOCIATION

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 170 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.

II. INTRODUCTION

The key pillars of Governor Murphy's ambitious vision of a clean, resilient, flexible and affordable grid for New Jersey include 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 will enable Governor Murphy's vision to be realized, outlines the regulatory and market hurdles currently preventing a robust deployment of energy storage in New Jersey, and submits recommendations to overcome those obstacles by (1) determining the values provided by energy storage, (2) creating mechanisms to capture that value, and (3) 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. ESA also addresses questions submitted to stakeholders in the March 6 Notice, including recommendations related to eligible technologies, minimum duration requirements, and calculation of benefits in the Energy Storage Assessment.

III. COMMENTS ON MARCH 6 STAKEHOLDER QUESTIONS

In its March 6, 2019 Notice, the BPU included 13 questions to stakeholders related to the Energy Storage Assessment, or cost-benefit study being conducted in collaboration with Rutgers University. ESA recognizes that the questions asked are ones that are described in the legislation and looks forward to reviewing the modeling results expected from the economic analysis conducted by Rutgers University to be able to work collaboratively with the BPU in answering these questions.

ESA notes that it is premature for stakeholders to provide answers to several of the questions at this time, as doing so would require knowing the results of rigorous economic modeling expected to be conducted by Rutgers University. For example, the cost-benefit study is supposed to model various deployment scenarios and provide cost estimates as well as a stacking of benefits for each of those deployment scenarios. With those results, stakeholders may be able to adequately answer question number 5, which asks: "What might be the optimal amount of energy storage to be added in New Jersey over the next five years in order to provide the maximum benefit to ratepayers." Similarly, it is the cost-benefit modeling that will yield an accurate answer to question number 7, which asks: "What might be the calculated cost to New Jersey's ratepayers of adding the optimal amount of energy storage."

ESA looks forward to reviewing the findings of the modeling conducted by Rutgers that will provide the quantitative foundation to answer such questions. In the comments below, ESA aims to answer the questions issued in the March 6 Notice to the best of our ability. Our comments provide an explanation of the benefits of energy storage for the State of New Jersey, a review of regulatory hurdles, and potential policy prescriptions to overcome those regulatory hurdles in order to achieve the energy storage goal of 2,000 MW by 2030.

To make a state-specific cost-benefit study effective, the final report must include a comprehensive review of the regulatory and market barriers, a review of existing policies being employed in other states to break down those barriers, and a thoughtful list of policy recommendations for how to overcome those barriers in the state. This is also in line with the requirements of the 2018 Clean Energy Act, which notes the report must "recommend ways to increase opportunities for energy storage and distributed energy resources in the State, including any recommendations for financial incentives to aid in the development and implementation of these technologies by public and private entities in the State." We note that the March 6 Notice does not include questions related to regulatory barriers and policy prescriptions. It is possible that the BPU intends on engaging with stakeholders on these questions before submitting the report. Nonetheless, in our comments below, ESA provides a survey of the existing regulatory and market barriers specific to the State of New Jersey and policy recommendations for the BPU's consideration.

IV. STORAGE BENEFITS FOR THE STATE OF NEW JERSEY

Identifying Storage Benefits

Energy storage of all types are critical to achieving a clean and reliable grid and meeting New Jersey's goal of 2,000 MW by 2030. There are a diverse set of technologies that provide energy storage, from pumped hydro and flywheels to flow batteries and lithium-ion batteries. The diversity of these technologies is critical to achieving the State's ambitious energy and environmental goals because a wide variety of storage applications will be required, and there is no single technology that is able to address all those applications. Advanced 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 Rutgers is currently undertaking the important analysis to quantify the benefits of storage deployment specific to the State of New Jersey, it is instructive to note that Massachusetts' 2016 state-commissioned storage cost-benefit analysis found that nearly half of the $2.3 billion in benefits to its ratepayers with a deployment of 1,766 MW of storage came from reducing system and local peak demands.[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 period in the afternoon and early evening, potentially only seasonally—can also provide grid services for the many hours when its

[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.

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 Alternatives ("NWA") 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

[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.

require additional transmission infrastructure. Transmission deferral is an important value, of the many to consider for energy storage. For example, National Grid plans to deploy 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 ("APS") deployed a 2 MW / 8 MWh (4-hour duration) energy storage system to defer investment on a 20-mile transmission line in Punkin 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. Storage can serve not only 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 but will also reduce curtailment of renewable energy and other clean energy resources. 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.

<u>Quantified Benefits in Other Cost-Benefit Studies</u>

Seven states beside New Jersey have embarked on similar exercises to study the costs and benefits of energy storage to determine the optimal levels of deployments that provide a net benefit to ratepayers. New York, Massachusetts, Nevada, North Carolina, and Maryland have

[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.

completed their studies, while Virginia and Colorado are currently in the process of conducting such an analysis. The studies conducted in Massachusetts, New York and Nevada provide important insight into the types of benefits that have been studied, as well as their magnitude in terms of overall benefits to the states. These benefits include: avoided capacity investment, deferral of distribution and transmission investment, energy or generation cost reduction, wholesale market price reductions, customer outage reduction, integration of renewable generation, and avoided greenhouse gas emissions. Avoided capacity investment provided the most significant value in the stack of values, representing 48% of the overall benefits in the case of Massachusetts, 24% in New York, and approximately 40% in Nevada. Ability to reduce the costs of distribution and transmission provided another important tranche of savings in these studies, representing 46% of the value in New York (which did not include transmission deferral potential in their modeling and therefore likely represents an even larger value proposition), 13% in Massachusetts and approximately 10% in Nevada. States took different approaches to quantifying values related to resiliency and environmental benefits that merit consideration. New York, for example, quantified the avoided greenhouse gas, and Nevada quantified, but did not include as ratepayer benefits, the societal-cost impacts associated with changes in carbon and other emissions. Nevada's study also tried to provide a quantitative value to resiliency in the form of avoided distribution outages.

V. REGULATORY AND MARKET OBSTACLES FOR ENERGY STORAGE

Despite its potential benefits, significant regulatory and market hurdles remain that hinder the full deployment potential of energy storage in the State of New Jersey. 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 include behind-the-meter energy storage systems that are 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 receive a price signal for when they generate the greatest stress on the grid, and therefore are not incented to 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 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 several 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.

Bulk System Storage

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 rules 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.

Finally, like distribution interconnection, interconnection challenges can mean a bulk storage asset is not built based on onerous and expensive interconnection costs that are based on false assumptions on the asset's expected behavior. 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. This is in part an issue at the wholesale market level, and Federal Energy Regulatory Commission Order 745 that is underway may address some of these issues, but also includes the utilities and state jurisdiction.

Federal Energy Regulatory Commission

Wholesale market rules continue to create a hurdle for energy storage technologies at all points of interconnection. Several processes related to energy storage are open at the Federal Energy Regulatory Commission ("FERC") relating to the market hurdles for energy storage, including FERC Order 841, Order 845, and consideration for DER aggregation. While ESA's comments below provide recommendations for the Commission to engage with PJM in the implementation of FERC Order 841 and any forthcoming order on DER aggregation, ESA strongly recommends that ongoing activity at both the PJM and FERC not delay other necessary regulatory work to overcome regulatory hurdles for energy storage. For example, since dual market participation is critical – the ability to provide retail and wholesale market services from the same asset – the BPU can embark upon regulatory changes to facilitate multiple use from the same asset within the distribution system for assets that may not depend on participating in the wholesale market for favorable cost-benefit analysis. Such a multiple use application ("MUA") framework is already being advanced by regulators in California and New York. Finally, as our recommendations below underscore, given the ambitious clean energy goals of the State of New Jersey for the deployment of clean energy and energy storage, there are a few tools in the BPU and State's toolbox that can be used to ensure that bulk system energy storage is deployed in the State.

VI. POLICY RECOMMENDATIONS TO OVERCOME BARRIERS

ESA applauds Governor Murphy, the Board of Public Utilities, 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 goal 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 storage today can provide system value and drive learning-by-doing while longer-term reforms are completed. 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—and thus bridge incentives should phase out over time. Finally, all programs should be developed in a way that provides clarity and certainty regarding long-term compensation in order to ensure that projects are financeable.

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. The Con Edison Rider Q Pilot provides a useful example.

- 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, which allows the utility to call on a customer's energy storage asset in exchange for an on-bill credit. National Grid and Eversource's "Daily Dispatch" programs in Massachusetts provide another useful models. Under this program, the utility commits to a five year contract with a customer, which allows the customer to make the capital investment in energy storage, and commit to using the storage to provide grid services for five years. 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 incentive program carries potential to stimulate the energy storage market and address the State of New Jersey's critical grid resilience needs. However, additional funds are needed to support this program. In addition to increased financial support, significant reforms are needed, including a revision to the developer cap, an increase of the project funding cap, and expanded eligibility to include residential and standalone energy storage systems. A rolling program application process (i.e., first-come, first serve rather than ad-hoc solicitations or auctions) with clarity that long-term funding will be available to developers 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 NWA solicitation program to facilitate storage solutions to deferring or replacing the need for cost distribution investments. An effective NWA program is one that hones in on the eligible distribution investments through a thoughtfully developed selection criteria and addresses the utility business model by providing a mechanism to compensate the utility for selecting a non-wires alternative over traditional investment.

Bulk System Storage Recommendations

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 appropriate duration qualification requirements of storage that align with the New Jersey grid's peak demands and reflect the capacity value provided by storage in the near-term. ESA notes that PJM seeks to require 10 hours' duration for bulk storage to be able to sell its full capacity in the market.[6]

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

- 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.[7]

However, as noted in earlier comments, the process underway at PJM and FERC should not hold state action back, especially considering the State's ambitious storage deployment and

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[6] See *Order No. 841 Compliance Filing ESR Markets and Operations Proposal of PJM Interconnection* in FERC Docket No. ER19-469-000 (Dec. 3, 2018)

[7] 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

broader clean energy and environmental goals. Given the uncertain outcome of 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. ESA respectfully recommends that the BPU 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.

To this end, ESA recommends that the BPU explore specific use cases for bulk system storage assets that may justify a bridge incentive or a clean capacity solicitation that provides additional value streams. ESA encourages BPU to undertake such analysis through the Energy Storage Assessment to ensure that the analytical foundation to design an effective bulk incentive is available. The New York State Energy Research & Development Authority ("NYSERDA") has recently submitted such an innovative proposal to support the New York Public Service Commission requirement that the state's utilities procure 350 MW of bulk storage.[8] This incentive provides financial support for new energy storage systems over 5 MW that primarily provide wholesale market energy, ancillary services and/or capacity services. The incentive was developed in recognition of the benefits to the state of deployment of these assets, particularly in specific locations that provide environmental benefits such as carbon savings, hosting capacity improvements, improvements in system resiliency, and peak capacity savings.

[8] NYSERDA Energy Storage Market Acceleration Incentives Implementation Plan, March 11, 2019, Docket No. 18-00516, available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7A8EAF89-2E50-4A1D-8B45-D1736AD6310D}; New York Public Service Commission Order Establishing Energy Storage Goal and Deployment Policy, December 13, 2018, Docket No. 18-00516, available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FDE2C318-277F-4701-B7D6-C70FCE0C6266}.

Finally, 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 a minimum be considered.

Consideration of Energy Storage Targets

One tool in the toolbox of policy makers to stimulate a robust energy storage market in the state is to set a long-term deployment target. A long-term storage deployment target provides a signal of a steady commitment to overcoming the regulatory barriers facing the industry in the state, which would drive significant market investment and hiring by diverse firms. A deployment goal recognizes that not all the value provided by energy storage is captured in today's regulatory and market frameworks and should be complemented by a commitment to address the other barriers described in our comments above. Finally, a target can jumpstart a learning-by-doing process that forces all stakeholders to work out and become familiar with any issues related to permitting, interconnection, valuation and planning.

In the 2018 Clean Energy Act (P.L.2018, c.17) the New Jersey legislature set an energy storage goal of 600 megawatts by 2021 and 2,000 megawatts by 2030. ESA looks forward to working with the Board of Public Utilities to develop the programmatic elements and accountability mechanisms that will support the realization of such a goal. ESA's interpretation is that this goal is intended to stimulate the energy storage market and ensure that deployment of energy storage supports the State of New Jersey's clean energy and environmental goals. As such, the goal should be assessed on the deployment of new projects and not include existing projects. ESA urges the BPU to consider a technology-neutral approach that allows all technologies to compete to provide ratepayers with the most innovative and cost-effective solutions to meeting the state's goals. Such a technology neutral approach is necessary to achieve the deployment goals called for in the legislation. ESA notes that to achieve this goal, the definition of energy storage should be the following:

> Energy Storage System: Commercially available technology that is capable of retaining energy, storing the energy for a period of time, and delivering the energy at a later time, including, without limitation, by chemical, thermal or mechanical means.

ESA also recommends that the BPU abstain from requiring certain durations for storage technologies to meet state goals. In fact, to achieve the state's energy and environmental goals, a wide variety of project durations will be needed based on the service the resource is providing and its location. As such, all duration resources should be allowed to participate and meet the energy storage goals.

ESA notes, however, that in order to ensure that a variety of technologies, projects and applications are deployed to meet the state's storage goal, it may be appropriate to incorporate certain forms of controls within the program to ensure that the goal is not met by a limited number of projects. These types of controls can be achieved in the form of sub-categories within the target (for example, distribution connected) or a limit on project sizes. Similarly, incentive programs or other programs intended to attract certain projects can be designed to reward specific storage durations identified by the Energy Storage Assessment modeling that provide important benefits to the state. It is critical that any programmatic considerations for storage duration are based on a robust analysis and modeling that demonstrates that there is a public policy need for certain durations.

Finally, ESA notes that to make the storage goal required by the legislature effective, it must be made up of programs to help achieve that goal and mechanisms that create some measure of accountability. For example, the BPU can institute a range of activities to increase the likelihood of successful attainment of a storage deployment target, such as directing electric distribution companies to file plans for how they intend to meet their portion of the goal, directing money to incentive programs, or requiring competitive solicitations for specific applications.

VII. CONCLUSION

ESA appreciates the opportunity to provide these comments to the BPU in support of its Energy Storage Assessment. We look forward to working with the BPU and stakeholders to develop an Energy Storage Assessment that provides a robust analysis of the regulatory hurdles preventing deployment of energy storage in New Jersey and proposes a blueprint for overcoming those regulatory and market hurdles.

Respectfully submitted on this 20th day of March, 2019.

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