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VIA ELECTRONIC DELIVERY
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Aida Camacho-Welch, Secretary
New Jersey Board of Public Utilities
44 S. Clinton Avenue
3rd Floor, Suite 314
CN 350
Trenton, NJ 08625-0350

Re: Energy Storage Analysis
Section 6 of the Clean Energy Act (P.L.2018, c.17)

Dear Secretary Camacho-Welch:

Public Service Enterprise Group, Inc. (“PSEG” or the “Company”), on behalf of affiliates Public Service Electric and Gas Company (“PSE&G”) and PSEG Power LLC (“PSEG Power”), appreciates the opportunity to provide input on the Energy Storage Analysis. PSEG has a long history of partnering with the state and aligning its interests with those of New Jersey. PSEG supports and applauds the policy objectives of the State of New Jersey and Governor Murphy – to significantly reduce greenhouse gas emissions with the goal of 600 MWs of energy storage by 2021 and 2000 MWs of energy storage by 2030. We thank you for this opportunity to provide input on this important undertaking.

Energy Storage Request for Comments

- 1. How might the implementation of renewable electric energy storage systems benefit ratepayers by providing emergency back-up power for essential services, offsetting peak loads, providing frequency regulation and stabilizing the electric distribution system;***

PSEG Response - Renewables and energy storage can be deployed at critical facilities to provide resiliency services. In its “Clean Energy Future: Electric Vehicle and Energy Storage” filing (“CEF-EVES”), PSE&G proposed piloting four Community Microgrid projects which will incorporate energy storage with solar energy to allow critical community facilities to operate independent of grid power during an extended outage. The electric distribution companies (“EDCs”) should continue to study microgrid deployment models as they could be well-suited to provide resiliency solutions to customers, either via traditional grid power or through the utilization of microgrids.

2. *How might the implementation of renewable electric energy storage systems promote the use of electric vehicles in New Jersey, and what might be the potential impact on renewable energy production in New Jersey;*

PSEG Response - Energy storage has the potential to enable more site locations for the deployment of DC fast charging stations, which will promote the use of electric vehicles (“EVs”) in New Jersey. Due to their role in providing high-powered, quick charging to customers, DC fast chargers can utilize a significant amount of capacity on a circuit. Deploying energy storage alongside these sites could reduce the peak demand, mitigating both capacity demands on the circuit, and customer demand charges. For these reasons, energy storage may play an important role in the expansion of electric vehicles in NJ. PSE&G has proposed piloting energy storage with DC fast charging sites in its CEF-EVES program.

3. *What types of energy storage technologies are currently being implemented in New Jersey and elsewhere;*

PSEG Response - Traditional and significant energy storage technologies are currently in use in New Jersey. For instance, the Yards Creek Generating Station is a 420 MW pumped-storage hydroelectric plant located in Warren County, New Jersey. The facility is jointly owned by subsidiaries of PSEG and FirstEnergy and has provided safe and reliable energy storage service for decades.

Newer battery energy storage technologies have been deployed for resiliency, such as PSE&G’s Solar 4 All pilot program, and for participation in PJM’s frequency regulation market. PSE&G’s pilot program has been utilized at (a) Hopewell Regional High School as a warming/cooling station, (b) Cooper Hospital to pre-service pediatric medicine stored in refrigerators, (c) Caldwell Waste Water Treatment facility to allow the facility to operate independently from the grid, in the event of an emergency, from one to three weeks, and (d) the Pennington Department of Public Works facility to allow township crews to refuel vehicles and maintain operations.

4. *What might be the benefits and costs to ratepayers, local governments, and electric public utilities associated with the development and implementation of additional energy storage technologies;*

PSEG Response - There are a number of potential applications for energy storage which can be incorporated into utility operations and should be explored. For instance, as described in PSE&G’s CEF-EVES filing, use cases involving solar smoothing, distribution investment deferral, community microgrids, outage management, and peak load reduction for public sector facilities would be useful to customers in the future. Ultimately, as these technologies continue to evolve, it will be critical that both the BPU and the EDCs have a core understanding of the potential benefits and system challenges associated with energy storage integration. The costs associated with implementation would include the cost of the energy storage, financing charges, and the expenses to maintain the energy storage system. Depending on where and how the storage is deployed, ancillary costs like site preparation, permitting, warranties, refurbishment, site rent, etc. will also need to be considered when implementing an energy storage system.

5. *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;*

PSEG Response – Aside from the Clean Energy Act’s goal of 600 MW of energy storage by January 1, 2021, use cases for storage should be conducted by the industry prior to determining the “optimal amount of energy storage” that should be constructed over the next five years. Many of the energy storage use cases that could be incorporated into utility operations, such as distribution deferral, have not yet been implemented by the New Jersey EDCs. The EDCs should initially pursue targeted deployments to see which applications bring the most value to New Jersey customers before setting broader targets. In implementing targeted deployments, EDCs will learn the most efficient and effective ways that storage can be applied to the existing distribution system.

6. *What might be the optimum points of entry into the electric distribution system for distributed energy resources (DER);*

PSEG Response - Distributed energy resources (DER) could be integrated within a substation, along a circuit, near large existing and future solar sites, or behind a customer’s meter. The specific use case for the energy storage application will determine the optimal point of interconnection. For example, if storage is being deployed by an EDC to address an overloaded circuit in a residential area, then the energy storage system may need to be deployed at the local substation due to siting challenges along the circuit. Conversely, if an energy storage device being deployed by an EDC is intended to address voltage issues due to intermittent solar energy, then the device may be most effective if deployed close to the interconnected solar array.

7. *What might be the calculated cost to New Jersey’s ratepayers of adding the optimal amount of energy storage;*

PSEG Response – Energy storage has the potential to be an important component of utility operations moving forward, and PSE&G looks forward to working with Rutgers and the BPU to address this issue and to explore optimal use cases for energy storage through the implementation of PSE&G’s CEF-EVES program. After this and other initial programs are assessed, the State can determine which specific applications for energy storage are the most reliable and cost effective for customers.

8. *What might be the need for integration of DER into the electric distribution system;*

PSEG Response – PSE&G’s Clean Energy Future filings proposed a number of DER initiatives that incorporate energy storage systems. The CEF-EVES filing included the Community Microgrid sub-program as well as the Peak Reduction for Municipal Facilities sub-program. The Clean Energy Future - Energy Efficiency filing includes a non-wire alternatives pilot sub-program that envisions deploying distributed storage along with energy efficiency and other methods to address overloads on the distribution system. These programs will allow PSE&G to

better understand the role DER could play in the ongoing management of the electric distribution system. While PSE&G does see a number of interesting use cases for DER, the existing generation, transmission, and distribution systems will continue to deliver the most value to customers and be the predominant method of generating and transporting electricity across the grid for the foreseeable future.

9. How might DER be incorporated into the electric distribution system in the most efficient and cost-effective manner.

PSEG Response - Please see response to question 8.

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*In addition to the legislatively prescribed questions above,
please also respond to the following questions:*

10. In the context of the ESA, what might be the definition of Energy Storage?

PSEG Response – Energy Storage might be defined as the means to capture and store energy for discharge in the future at prescribed intervals for grid operational benefits.

11. What discharge time duration could be applied to the State goals of 600 MW of energy storage by 2021 and 2,000 MW of energy storage by 2030? Four hours? Ten hours? Other?

PSEG Response - PSEG does not have an opinion on the optimal time duration to be applied to the State's goals. Most of the applications PSE&G proposed in its CEF-EVES filing utilize 4 hour duration storage systems because it was both suitable for the majority of likely applications and appeared to be the standard offered by many original equipment manufacturers.

12. What storage systems should be counted towards the achievement of the State's goal? Existing systems? Those systems placed into operation after the May 23, 2018 enactment date of the statute?

PSEG Response - PSEG defers to the BPU, the legislature and Governor Murphy as to whether existing storage systems should count towards the State's goal of 600 MWs by 2021.

13. How might Federal Energy Regulatory Commission's (FERC) Order 841 and the associated PJM compliance filing affect the foregoing?

PSEG Response - In December 2018, each of the nation's RTOs and ISOs submitted filings to FERC detailing how they plan to satisfy the mandate that they accommodate the participation of energy storage resources. PJM represented that while its markets already offer a number of products that participating storage resources can provide, it had to develop a series of tariff changes to ensure that such resources are eligible to provide all services they are technically capable of providing ("Energy Storage Resources (ESR) Participation Model") (ER19-49).

In a separate filing, (ER19-462), PJM submitted an accounting framework for storage resources capable of serving retail load ("Energy Storage Resources (ESR) Accounting Proposal"). Specifically, PJM proposed to define "Energy Storage Resource" as "a resource capable of receiving electric energy from the grid and storing it for later injection to the grid that participates in the PJM Energy, Capacity and/or Ancillary Services markets as a Market Participant" and to define a "Capacity Storage Resource" as "any Energy Storage Resource that participates in the Reliability Pricing Model or is otherwise treated as capacity in PJM's markets such as through a Fixed Resource Requirement Capacity Plan." Prior to this filing, PJM's Tariff limited an Energy Storage Resource to specific technologies (i.e., flywheel or battery storage facilities) and resources injecting "solely" to the wholesale grid. The proposed revisions included removing the "solely" concept to support the fact that the resource may also provide retail service yet still be eligible to buy and sell power at wholesale when not providing such retail service. PJM requested that the ESR Accounting Proposal revisions become effective February 3, 2019. The requested February 3, 2019 effective date was intended to allow PJM sufficient time to develop and test its metering and accounting practices prior to implementation of the ESR Participation Model on December 3, 2019.

On February 1, 2019, FERC issued a letter order accepting PJM's ESR Accounting Proposal compliance filing, effective February 3, 2019, as requested. The ESR Accounting Proposal should presumably help position the PJM markets to support the State's storage program. In this regard, the ESR Accounting proposal should help facilitate PSE&G's CEF-EVES filing. Addressing the complexity of implementing proper accounting and settlement practices is a critical piece to developing a strong and sustainable ESR market in New Jersey and throughout PJM.

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Once again, PSEG commends the Board for conducting this proceeding and appreciates the opportunity to submit comments in this matter. We look forward to continuing to work with the Board and all stakeholders on these important initiatives to cost-effectively achieve the Governor's and the Legislature's clean energy goals. We thank the Board for its consideration of our submission.

Respectfully submitted,



Joseph A. Shea, Jr.