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STEFANIE A. BRAND
Director

March 20, 2019

VIA ELECTRONIC MAIL (Energy.Storage@bpu.nj.gov)
AND HAND-DELIVERY
Honorable Aida Camacho-Welch, Secretary
New Jersey Board of Public Utilities
44 S. Clinton Avenue, 3rd Floor, Suite 314
Trenton, New Jersey 08625-0350

Re: New Jersey Energy Storage Analysis

Dear Secretary Camacho-Welch:

Enclosed please find the original and ten copies of the comments of New Jersey Division of Rate Counsel ("Rate Counsel") in connection with the above-captioned matter.

We are enclosing one additional copy of the comments. Please stamp and date the extra copy as "filed" and return it in our self-addressed stamped envelope. Thank you for your consideration and assistance.

Respectfully submitted,

STEFANIE A. BRAND
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STATE OF NEW JERSEY

BEFORE THE BOARD OF PUBLIC UTILITIES

New Jersey Energy Storage Analysis	)

COMMENTS OF THE NEW JERSEY DIVISON OF RATE COUNSEL

March 20, 2019

INTRODUCTION

The Division of Rate Counsel ("Rate Counsel") would like to thank the Board of Public Utilities ("Board" or "BPU") for the opportunity to provide comments on the New Jersey Energy Storage Analysis ("ESA") topics issued by Staff in its Request for Comments dated March 6, 2019. On May 23, 2018, P.L.2018, c.17 (the "Clean Energy Act" or the "Act") was signed into law and directed the BPU to conduct an ESA concerning the energy storage needs and opportunities in the State. The Act also directs the Board to initiate a proceeding to establish a process for achieving a goal of 600 megawatts ("MW") of energy storage by 2021 and 2,000 MW by 2030.

In October 2018, the Board approved a contract with Rutgers University to perform this analysis.[1] The report is expected to provide the data needed to achieve the energy storage targets set by the Clean Energy Act. It is also expected to discuss and quantify the potential benefits and costs associated with increasing energy storage and distributed energy resources. The questions offered by Board Staff in its Request for Comments dated March 6, 2019 mirror the requirements of the ESA as directed by the Clean Energy Act and currently being performed by Rutgers. Rate Counsel's comments are offered in response to Staff's list of questions below.

RATE COUNSEL 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?

Comment:

Renewable electric energy storage has the potential to enhance the efficiency, resiliency and affordability of the electric grid. It can provide multiple benefits such as balancing short-

[1] https://www.nj.gov/bpu/newsroom/2018/approved/20181029a.html

term power fluctuations, offsetting peak demand, and providing back-up power in emergency situations. Electric generation and demand must always be in balance to ensure a consistent and reliable power supply, so as more intermittent, renewable generation comes on line, it becomes increasingly difficult to maintain this balance. In addition, most renewable installations only generate power when the sun is shining, or the wind is blowing. Energy storage technologies can provide the flexibility to manage and use the generation from intermittent renewable resources at any time of day. It also allows for energy generated during low cost off-peak periods to be used during more expensive peak periods, thus improving the efficiency of the electric grid. Electric storage can also assist with emergency back-up services in the event of an outage. Energy storage opportunities may also provide financial benefits to ratepayers by reducing electricity prices, lowering peak demand, potentially deferring utility investment in new capacity as well as transmission and distribution, and increased reliability.

However, Rate Counsel cautions that a comprehensive study is needed to evaluate the overall need for storage within the state, the costs of various storage technologies and the quantifiable benefits these technologies would provide. Rate Counsel looks forward to reviewing the analysis prepared by Rutgers and specifically the estimates of storage technology costs and benefits.

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?

Comment:

The intent of this question is unclear to Rate Counsel. Electric vehicles ("EV") are both users of electricity and a potential storage technology.

As more renewables and distributed energy resources ("DER") are being installed and deployed, the electric grid is becoming more of a mix of traditional centralized power generation

and decentralized power generation or technologies. One of these decentralized technologies may be EV. Researchers are starting to look at the use of EVs as potential mobile energy storage units in that EVs consume electricity when they are being used, but could also export their stored power back to the grid, or provide back-up power during outages and emergencies. Again, quantifying the benefits of using EVs as mobile storage would require a comprehensive study of the overall need for storage within the state, the cost of EV technologies and implementation throughout the state; the upgrades needed to EV charging stations and the quantifiable benefits this technology would provide. Rate Counsel looks forward to reviewing the analysis prepared by Rutgers and specifically the estimates of storage technology costs and benefits.

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

Comment:

Rate Counsel is not aware of a publicly-available source that provides a comprehensive list of energy storage technologies currently being implemented in New Jersey and other states. It should be noted, however, that energy storage technologies include low-cost options such as ice energy technologies and hot and chilled water storage, in addition to high-cost technologies such as battery storage.

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?

Comment:

See Rate Counsel response to item 1.

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?

Comment:

As noted in the Introduction, the Board approved a contract with Rutgers University to perform an analysis of the state's energy storage needs and opportunity. The report is expected to discuss and quantify the potential benefits and costs associated with increasing energy storage and DER. Thus, Rate Counsel finds this question to be premature, and recommends that the Board wait for Rutgers to present the results of its study.

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

Comment:

This question is best answered through a cooperative effort involving the State's electric distribution companies ("EDCs") as they would hold the most valuable information as to what would be the optimum points of entry into the electric distribution system. EDCs and DER project developers should work together with Board Staff and other stakeholders to identify areas of constraint as well as areas where capacity and/or resiliency may be needed and may provide the highest value. As an example of this approach, in California the three largest utilities have provided online interconnection maps. The maps are intended to show developers key information about the interconnection potential for solar, as well as electric vehicles and battery storage.[2] Maps include general locations of distribution circuits, substations, sub-transmission systems, and areas of transmission constraints along with associated voltage, available capacity and current and queued DG interconnections amounts. Similarly, Pennsylvania's largest electric and natural gas utility, PECO, offers a "DER Interconnection Viability" map to help customers and developers determine the preliminary feasibility of installing DER at a certain location.[3] And in Hawaii, the utilities have shared Locational Value Maps with the goal of integrating "as

[2] For further information see Greentech Media. 2015. California's new interconnection maps are a huge win for distributed energy. Available at: https://www.greentechmedia.com/articles/read/californias-new-interconnection-maps-are-a-huge-win-for-distributed-energy#gs.RF5o4sQ.

[3] https://www.peco.com/MyAccount/MyService/Pages/DERInterconnectionViability.aspx.

much consumer-sited renewable generation as possible while maintaining reliable service to all customers."[4]

7. What might be the calculated cost to New Jersey's ratepayers of adding the optimal amount of energy storage?

Comment:

See Rate Counsel's response to item 5. Without knowing what the optimal amount of energy storage might be, Rate Counsel is not able to estimate a specific "calculated cost" to ratepayers.

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

Comment:

See Rate Counsel's response to items 5, 6 and 7.

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

Comment:

See Rate Counsel response to item 6.

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

Comment:

FERC Order 841 issued in February 2018 defines an electric storage resource as a resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid. Rate Counsel agrees that the resources included this definition should be included, but also believes that any definition of Energy Storage should include low-tech and low-cost options such as thermal energy storage technologies, ice energy technologies and hot or chilled water storage, which can be used to shift load at a fraction of the cost of technologies such as battery storage. Rate Counsel also emphasizes that the Board should avoid

[4] https://www.hawaiianelectric.com/clean-energy-hawaii/integration-tools-and-resources/locational-value-maps.

earmarking incentives for specific technologies. Any development initiatives for storage should rely on competitive market mechanisms to assure that the most cost-effective technologies are implemented.

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?

Comment:

Rate Counsel believes this questions would be best answered by: (1) the Rutgers study; (2) New Jersey EDCs; and (3) PJM. Rate Counsel notes that the PJM compliance filing (see last question below) requires that energy resources must be capable to providing 10 hours of continuous energy in order to bid into the capacity market. The FERC is still reviewing this proposal and a final Order has not been issued to date.

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?

Comment:

All storage systems currently in place plus those placed into operation after the May 23, 2018 enactment date of the statute should be counted towards achievement of the State's goal. The Clean Energy Act specifies a goal of 600 MW of energy storage by 2021 and 2,000 MW of energy storage by 2030, but does not state that this would only apply to systems placed into operation after the enactment of the statute. Any incentives for storage technologies however, should be available to new systems only.

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

Comment:

FERC Order 841 was issued in February 2018 and is intended to "remove barriers to the participation of electric storage resources in the capacity, energy and ancillary services markets operated by Regional Transmission Organizations and Independent System Operators."[5] The Order directs regional grid operators to revise their tariffs and develop rules that recognize the physical and operational characteristics of electric storage resources and facilitate their participation in regional markets. Regional grid operators were required to submit their compliance filings by December 3, 2018.

FERC Order 841 outlines five core concepts that each grid operator must adhere to:

1) ensure that a storage resource is eligible to provide all capacity, energy, and ancillary services that the resource is technically capable of providing;
2) ensure that a storage resource can be dispatched and can set the wholesale market clearing price as both a wholesale seller and wholesale buyer;
3) account for the physical and operational characteristics of electric storage resources through bidding parameters or other means;
4) establish a minimum size requirement that does not exceed 100 kW; and
5) specify that a storage resource will pay the wholesale locational marginal price for charging energy.

The FERC Order allows storage to be on the same playing level as traditional generation resources and potentially compete with resources like peaking plants. This could encourage larger utility-scale projects and lead to a decrease in cost. It may also allow projects located in

[5] https://www.ferc.gov/media/news-releases/2018/2018-1/02-15-18-E-1.asp#.XIlNlNF7k2V

New Jersey to provide service throughout PJM and reduce the need for state-provided incentives. Again, Rate Counsel looks forward to reviewing the analysis prepared by Rutgers, its estimates of storage technology costs and benefits and the potential impacts of FERC Order 841 and PJM compliance.