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February 18, 2021

Via e-filing

Ms. Rosemary Chiavetta
Secretary
Pennsylvania Public Utility Commission
400 North Street
Harrisburg, PA 17120

**In Re: Utilization of Storage Resources as Electric Distribution Assets
Docket No. M-2020-3022877**

Dear Ms. Chiavetta:

The Advanced Energy Management Alliance (“AEMA”) hereby submits the attached comments pertaining to the consideration of utility investments in electric storage as a distribution asset.

We appreciate your consideration of these comments. Please do not hesitate to contact me at 202-524-8832 or katherine@aem-alliance.org should you have any questions or require additional information regarding this filing.

Sincerely,

A handwritten signature in black ink, appearing to read "Katherine Hamilton".

Katherine Hamilton
Executive Director
Advanced Energy Management Alliance

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Policy Proceeding-Utilization of Storage Resources as Electric Distribution Assets
Docket No. M-2020-3022877

COMMENTS OF THE ADVANCED ENERGY MANAGEMENT ALLIANCE

I. Introduction

The Advanced Energy Management Alliance (“AEMA”)¹ respectfully submits these comments to the Pennsylvania Public Utility Commission (“PUC” or “Commission”) on the Policy Proceeding for the Utilization of Storage Resources as Electric Distribution Assets. The comments below respond to the questions posed by the Commission in the Secretarial Letter released on December 3, 2020.²

AEMA is a trade association under Section 501(c)(6) of the federal tax code whose members include national distributed energy resource companies and advanced energy management service and technology providers, including demand response (“DR”) providers, as well as some of the nation’s largest demand response and distributed energy resources. AEMA members support the beneficial incorporation of distributed energy resources (“DERs”) into wholesale markets for purposes of achieving electricity cost savings for consumers, contributing to system reliability, and ensuring balanced price formation. This filing represents the collective consensus of AEMA as an organization, although it does not necessarily represent the individual positions of the full diversity of AEMA member companies.

II. Executive Summary

AEMA appreciates the Commission’s recognition of the importance of deploying energy storage systems at the distribution level and for exploring with stakeholders the programmatic designs that will overcome the barriers to energy storage deployment in Pennsylvania. Energy storage is uniquely positioned to provide multiple services to the grid that enhance grid efficiency, increase grid resilience, and accelerate Pennsylvania’s transition to an affordable clean energy economy. However, a lack of policy support has inhibited meaningful deployment in the Commonwealth to date. AEMA is encouraged by the Commission taking steps to develop a program that drives the deployment of energy storage in a cost-effective manner.

In response to the questions posed by the Commission below, we provide suggestions on how to best realize the many benefits of distributed energy storage resources, including the use of incentive

¹ AEMA is an alliance of providers and supporters of distributed energy resources united to overcome barriers to nationwide use of distributed energy resources, including demand response and advanced energy management, for an environmentally preferable and more reliable grid. We advocate for policies that empower and compensate customers to manage their energy usage to make the electric grid more efficient, more reliable, more environmentally friendly, and less expensive.

² Docket No. M-2020-3022-877, Pennsylvania Public Utility Commission Secretarial Letter, December 3, 2020 (herein referred to as the “Secretarial Letter”).

programs. Incentive programs can reduce the soft costs of energy storage development, are critical to fostering the sustained, orderly development of a state-based electric energy storage industry, and ultimately make the technology more affordable for Pennsylvania customers, while contributing to peak reduction savings.

III. Responses to Questions Posed by the Commission

a. What applications can electric storage provide as a distribution asset for utilities that would facilitate improved reliability and resiliency?

Enhanced Reliability and Resilience

Unlike traditional sources of generation, storage can be located on the distribution grid, and can therefore provide power even if there is a bulk power system outage or downed transmission lines.³ With increased extreme weather events, there is an increasing need for distributed energy resources. In the aftermath of Hurricanes Irma and Maria, a group of bipartisan US Senators wrote to Senate Leadership urging the use of more distributed energy resources as a way to strengthen reliability and resilience.⁴ Utilities can use storage within the distribution network to meet required reliability metrics by dispatching and storing energy rapidly in response to load balance changes, therefore avoiding the challenges that can create outages or poor power quality. For example, during unprecedented heat waves in California, hundreds of energy storage facilities at businesses and institutions across the State were called to operate collectively as a “virtual power plant,” reducing demand on an over-taxed grid.⁵

Energy storage can provide voltage support as an alternative or in conjunction with Volt Var Optimization (VVO). VVO are new data communication devices and they can automatically coordinate distribution level devices to more efficiently operate and reduce line losses. Utilities are currently considering VVO technologies to cost effectively reduce line losses. Voltage fluctuations can be effectively damped with minimal draw of real power from an energy storage system and such services can be offered by installed storage systems.

Peak demand management

One of the primary benefits that energy storage can provide to Pennsylvania ratepayers is reducing energy usage during peak hours. Peak hour usage drives high system costs and high emissions; studies have found the top 1% of hours drives 8%-10% of costs.⁶ The peak reduction benefits of energy storage can lower wholesale, transmission, and distribution costs, reduce greenhouse-gas emissions (“GHG”) and potential Regional Greenhouse Gas Initiative compliance payments, and increase public health benefits through the reduction of local NO_x and SO_x emissions.

³ While storage needs generation to charge, the generation could be provided by other distributed forms of power or the storage could remain at full state of charge and therefore have backup power when bulk power becomes unavailable

⁴ <https://www.franken.senate.gov/files/documents/171026RebuildingPuertoRicoInfrastructureLetter.pdf>

⁵ <https://www.energy-storage.news/news/stems-virtual-power-plants-take-heat-off-californian-grid>

⁶ See, for instance, [Massachusetts State of Charge Report](#), at 28. Or, the AEE Institute report, [“Economic Potential for Peak Demand Reduction in Michigan”](#) at 18.

Storage interconnected at the distribution level can provide much-needed distribution flexibility by charging when there is excess electricity on the grid and discharging when electricity demand is at its highest. Energy storage can facilitate the interconnection of additional clean energy at the distribution level and prevent an overgeneration event that could result in curtailment by shifting the energy to peak hours. However, in Pennsylvania, there is currently no effective market mechanism or program to incent that behavior. An energy storage program can specifically target peak demand in a way that supports and leverages the Commonwealth’s decarbonization efforts, while delivering benefits to ratepayers. For example, nearly all New England states now have so-called “Bring Your Own Device” or “Daily Dispatch” programs that leverage energy storage systems to manage electricity demand and reduce emissions.⁷

Non-Wires Alternative to Transmission and Distribution Infrastructure Investment

Energy storage can be a lower cost alternative to transmission and distribution infrastructure investment, often called a “non-wires alternative.” This application is especially compelling because the benefits can be quite significant. A small amount of storage can: a) delay the need for a significant replacement and/or a “lump” addition of Transmission and Distribution (“T&D”) capacity, or b) reduce loading on existing equipment such that the equipment’s life is extended. For example, an upgrade in the sub-transmission or distribution system may be needed to transport electricity to meet a peak load which only occurs for a limited number of hours in the year. Instead of building new “wires”, energy storage can modify the peak load by charging during non-peak hours and discharging during the peak period. For example, Consolidated Edison utilized demand response and distributed storage resources to avoid \$1.2 billion in system upgrades via their “Brooklyn-Queens Neighborhood Program.”⁸

Facilitate Growth in Clean Distributed Resources

Integrating storage into the distribution network could help increase DER growth while reducing costs. Following the national trend, annual installations of residential solar resources have grown dramatically in Pennsylvania in recent years.⁹ As solar has grown, utilities have cited an increase in feeder lines that have reached capacity due to a risk of reverse power flow. Historically the power flow has moved in a single direction: from the large power plants to the customer. With new distributed generation, power may now flow in the opposite direction than planned. When the number of distributed generation systems, such as solar PV, on one feeder generates more energy than the feeder’s customers’ demand, there is a risk that the generated power has to flow on the feeder back to the substation or “back feed”. If there will be too much generation at any time, the utilities will not allow the interconnection until the customer pays for the cost of a new transformer at the feeder’s substation. Storage can be used to avoid these costs by preventing the risk of reverse power flow and avoiding the cost of the transformer upgrade. Excess generation is either stored at the customer site instead of flowing to the substation or stored at the

⁷ New England utilities [National Grid](#), [Eversource](#) and [Unitil](#) all have programs.

⁸ <https://www.utilitydive.com/news/straight-outta-bqdm-consolidated-edison-looks-to-expand-its-non-wires-app/447433/>

⁹ “Pennsylvania”. Solar Energy Industries Association. <https://seia.org/state-solar-policy/pennsylvania-solar>

substation in storage equipment added to the substation. In addition to avoiding these costs, storage can increase the solar PV that can be hosted on any one feeder.

Demand Energy Resource Aggregation

Distributed storage systems can be aggregated operationally and combined with other DERs to provide a Virtual Power Plant for both distribution and wholesale purposes. If implemented properly in PJM, FERC Order 2222's new Wholesale DER Market framework should provide a participation framework for these DERs that allows dual participation in retail and wholesale markets across Pennsylvania.

Additional factors to optimize distributed storage benefits to Pennsylvania ratepayers

Distributed storage configurations for reliability

Beyond applications, it is important to touch on location and configuration of these distribution resources. Behind the meter and front of meter storage located on the distribution system should be fully evaluated to provide distribution service support in Pennsylvania. It's important that ratepayers benefit from existing competitive investments rather than solely fund new-utility owned projects. Evaluating the use of these resources (in conjunction with utility-owned traditional substation batteries) will answer the questions: (1) "What will be more beneficial to ratepayers?"; and (2) "Are there specific locations / applications where customer-sited storage is more cost-beneficial than a traditional utility-owned substation battery?"

Aligning incentives

Utilities should be incentivized to identify storage already in the market and leverage it for distribution services, and to stimulate the development of cost-effective third-party owned storage. Rather than incentivizing utilities to build their own storage resources, the Commission should be encouraging them to integrate storage into their distribution plans. The storage resources themselves should be procured competitively from third-party providers unless utilities can convincingly demonstrate that utility construction and ownership is less expensive and more reliable. Any utility owned storage devices used for distribution services should be subject to appropriate measures to assure that such resources do not participate in PJM operated energy markets. Such market activity would be inconsistent with Pennsylvania retail access rules.

The private market is already building distributed storage projects in Pennsylvania based on market economics. Many of these storage projects are combined with solar energy. This helps guarantee that the peak reduction service is supported through zero-emissions.

If the Commission developed a peak reduction program, private capital would be incentivized to alleviate distribution constraints and provide a new element to the value its already providing to the grid. After such a program is created and only if the private market was not providing distribution relief in response, should the Commission consider funding utility-owned projects.

Identification of existing storage

AEMA members are aware of at least three distribution-connected storage projects that exist or are in development in Pennsylvania operated by competitive market participants.

As an important step, the Commission should conduct an assessment of distribution connected storage projects existing now or in development in Pennsylvania. The Commission should request its EDCs and PJM to support this analysis. For instance, the New Services Queue at PJM does not clearly state which projects are solar-battery hybrids or which battery projects exist behind the customer meter and may be participating now via Demand Response but may soon be moving in front of the meter when PJM adopts its Order 2222 changes. The Commission should request explicit information from PJM to answer the question “What battery projects exist now or are in development in Pennsylvania that are located in front or behind the meter?” We recommend the Commission implement a continuing approach to updating this information for future distribution service alternatives.

b. What are the defining characteristics of electric storage used for distribution asset planning as distinguished from generation resources? What thresholds, if any, would classify electric storage as a generation resource and therefore outside permitted distribution ratemaking and recovery?

Storage is a new class of resource that has important common elements with traditional generation, for instance, its ability to discharge energy. The charging of storage itself also has impact on the energy market which creates other potential market-power concerns. Therefore, it is inappropriate to apply existing rules on utility ownership of distribution infrastructure to storage resources used for distribution. As a result, the Commission is wise to proceed cautiously in determining the proper role for storage in providing distribution services.

The defining characteristics include but are not limited to:

- Storage includes the charge and discharge of energy which by its nature impacts energy markets
- Storage can provide multiple services like a generator such as frequency regulation, reserves, energy market, capacity
- Traditional generation is not bi-directional, and therefore could not be used to resolve overgeneration, hosting capacity, and avoiding renewable curtailments. The ability for storage to consume energy allows storage to be used for these distribution-level purposes
- Storage does not itself produce emissions when it discharges, and therefore will not result in the same controversies and siting challenges of trying to cite a fossil generation resource at the distribution level
- Storage is modular in nature and can come in as small or as large a size as necessary. It does not require the same land footprint as traditional generation resources

Thresholds

AEMA believes that given the ability for storage to provide multiple services (distribution, capacity, energy market, etc.) it is vital for the Commission to develop approaches to leverage competitive markets to partner with EDCs to provide traditional distribution alternatives.

Creating a construct for utilities to own and receive rate recovery energy storage has the potential to diminish market investment in energy storage and other competitive energy resources in Pennsylvania. Thus, as a basic threshold, utilities should not be eligible to own their own energy storage resources. Instead, utilities should be eligible and incentivized to use storage when cost-effective. Utilities can contract with third parties to provide such distribution services. These third parties can then freely operate a storage resource to provide multiple services.

For instance, a storage resource providing distribution services may only be required to charge and discharge during the summer peak to avoid distribution system overloads. If this resource were utility owned it would only be used perhaps 1% of the hours in the year. However, if the resource was owned by a third party and could also provide services, the other 99% hours of the year would be available to provide those market services.

If storage is not located at the distribution level, but at the transmission level, it should be outside distribution ratemaking and recovery.

c. Is it prudent for utilities to include electric storage in their distribution resource planning and, if so, where and under what circumstances? Further, is it appropriate for utilities to include such investments in rate base?

Yes, it is prudent for utilities to include storage in their distribution resource planning. Storage has the potential to resolve distribution-level issues more cost-effectively than traditional “wires” investments, and therefore must be integrated into all aspects of distribution resource planning. It would be imprudent not to consider the most cost-effective solutions. Furthermore, we encourage the Commission to consider all potential use cases for distribution-connected storage, including wholesale services and local reliability and resilience, when performing benefit-cost analysis of storage. If storage is considered just in the silo of distribution-level purposes, Pennsylvania will not be able to realize the full benefits that storage can offer.¹⁰

AEMA supports aligning utility incentives with ratepayer incentives to ensure that storage is on a level playing field with traditional wires investments. AEMA does not believe it is necessary for utilities to own storage in order to align utility and customer incentives, or to enable reliable performance from storage. There are multiple mechanisms available to the Commission for aligning incentives and ensuring the reliable performance of third-party owned storage. For instance, The New York Public Service

¹⁰ Rocky Mountain Institute (RMI), [“The Economics of Battery Energy Storage: How Multi-Use, Customer-Sited Batteries Deliver the Most Services and Value to Customers and the Grid”](#)

Commission implemented an NWA shareholder incentive,¹¹ which combines the capitalization of service costs with a shareholder incentive consisting of a share of the benefits produced by the NWA relative to a traditional solution. If a utility chooses to defer or avoid a distribution upgrade through NWAs, the utility can recover the costs of the NWA, including the cost of incentive payments paid by the utility to customer and third-party owned resources, over 10 years and collect its carrying costs over that time.

Regardless of the regulatory mechanism for aligning incentives, all storage must be procured through competitive procurements.

IV. Conclusion

AEMA appreciates the opportunity to provide these comments. We commend the Commission for working to ensure Pennsylvania utility customers energy needs continue to be served by a reliable and resilient grid. We look forward to working with the Commission, utilities, and other stakeholders to maximize the potential for energy storage in Pennsylvania.

Respectfully Submitted,



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¹¹ Order Approving Shareholder Incentives, New York Public Service Commission, January 25, 2017, in proceeding 15-E-0229.