Energy Storage Association

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January 17, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street, 16th Floor
Baltimore, Maryland 21202

RE: In the Matter of Revisions to COMAR 20.50.02 and 20.50.09 – Small Generator Facility Interconnection Standards

Dear Mr. Collins:

The Energy Storage Association ("ESA") respectfully submits the attached comments in response to the Public Service Commission's ("Commission") Notice of Rulemaking and Notice of Rulemaking Session filed on December 12, 2017.

ESA was established 27 years ago to foster development and commercialization of energy storage technologies. Since then, its mission has been the promotion, development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers across the United States. ESA members represent a diverse group of entities, including electric utilities, energy service companies, independent power producers, project developers, technology manufacturers and component suppliers.

ESA's comments aim to supplement the record on several needed reforms related to energy storage that were not included in the proposed draft regulations for small generator facility interconnection processes and standards (Code of Maryland Regulations 20.50.02 and 20.50.09) filed on November 21, 2017 as a result of them being non-consensus items. We look forward to continuing to work with the Commission and the stakeholders in this proceeding to ensure that interconnection hurdles do not get in the way of a robust deployment of energy storage in the State of Maryland.

Sincerely,

Nitzan Goldberger
State Policy Director
Energy Storage Association

BEFORE THE PUBLC SERVICE COMMISSION OF MARYLAND

In the Matter of Revisions to COMAR 20.50.02 and 20.50.09 – Small Generator Facility Interconnection Standards	**)** **)** **)** **)** **)** **)**	**Administrative Docket RM 61**

COMMENTS OF THE ENERGY STORAGE ASSOCIATION

Pursuant to the Maryland Public Service Commission's ("Commission") Notice of Rulemaking and Notice of Rulemaking Session filed on December 12, 2017, the Energy Storage Association ("ESA") respectfully submits the following comments for the Commission's consideration in Docket RM 61 on the report and proposed draft regulations for small generator facility interconnection processes and standards (Code of Maryland Regulations 20.50.02 and 20.50.09) filed on November 21, 2017.

In these comments, ESA provides additional background on a several topics discussed by the Interconnection Workgroup ("Workgroup") that were identified as non-consensus items the report filed on November 21, 2017. Specifically, ESA makes the case for adding additional language in COMAR 20.50.02 and 20.50.09 related to "inadvertent export," "net system capacity" (also referred to as "net nameplate capacity") and "proposed use." Additionally, ESA provides comments on challenges with the current review levels and recommends further review and reform of the current study levels.

I. ABOUT THE ENERGY STORAGE ASSOCIATION

ESA was established 27 years ago to foster the development and commercialization of energy storage technologies. Since then, its mission has been the promotion, development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers. ESA's office is located in the District of Columbia. ESA members represent a diverse group of entities, including electric utilities, energy service companies, independent power producers, technology developers -- of advanced batteries, flywheels, thermal and compressed air energy storage, pumped hydro, and supercapacitors -- and component suppliers. ESA engages in regulatory and legislative policy efforts and includes leaders in the energy storage marketplace among its members.

II. COMMENTS ON THE REPORT AND DRAFT REGULATIONS

ESA commends the Commission and the Commission's leader of the Public Conference 44 ("PC44") Interconnection Workgroup, Mr. Jon Kucskar, for the work that has been done to date in engaging stakeholders on the issue of interconnection for distributed resources. ESA has greatly benefitted from participating in the Workgroup and appreciates the effort and time invested by the other participants. As the report rightly notes, while there was significant progress made in the Workgroup forum among stakeholders on a wide range of issues, the stakeholders were not able to reach agreement on a number of critical elements that are needed to ensure energy storage systems are deployed across the State of Maryland. ESA appreciates the opportunity to provide further information on these important modifications, and makes the case for their inclusion.

Advanced energy storage has a unique set of qualities. It is capable of both injecting and withdrawing electricity from the system, is highly controllable, and capable of fast response to

system needs and near instantaneous ramp to full capacity in either charge or discharge mode. The wide variety of applications of energy storage is what makes the technology so attractive to customers and what makes energy storage capable of providing immense grid benefits. Yet the variance in a customer's use requires thoughtful consideration in interconnection procedures to ensure that projects do not face onerous study timelines or trigger steep upgrade costs.

The regulations for small generator facility interconnection processes and standards currently in place in the State of Maryland were created without energy storage in mind. Unfortunately, the proposed revisions of the interconnection standards submitted for the Commission's consideration in this docket fall short of what is needed to ensure that potential customers and developers in Maryland are able to invest in energy storage with confidence that they will be able to interconnect in a timely and affordable manner that reflects their system's true impact on the grid. This could significantly undermine the important steps policymakers have taken to provide incentives for energy systems through policies like the first-in-the-nation tax incentive program for energy storage, Senate Bill 758, passed by the Maryland Legislature in 2017.

Allowing Inadvertent Exports for Non-Exporting Systems Enables Greater Load Management

As applications of behind-the-meter storage expand and energy storage systems become an integral part of the load management strategy for customers, modifications of the distribution interconnection rules for non-exporting systems are becoming increasingly necessary. Energy storage systems have historically been deployed to serve as a backup system for extreme conditions, and as such the system was small relative to the customer's load. As energy storage becomes more widely used as a means of managing and offsetting significant portions of on-site consumption needs, the systems being deployed are much more closely aligned with the size of the customer's load. This evolution holds enormous potential benefits to the grid in terms of peak

shaving, enhancing hosting capacity and potential for aggregated grid services. However, aligning storage systems more closely with load creates a new dynamic that – if not addressed through interconnection rules – will prevent customers from deploying systems that are optimally sized for self-consumption.

As an example, a residential customer may choose to install an energy storage system that charges from on-site generation such as a photovoltaic system, where the primary use of the battery is to support a customer's load behind the meter. Inadvertent export would be needed in situations where the customer's load drops unexpectedly, and the on-site generation or battery cannot ramp down quickly enough to adjust to the new load. In this situation there will be a few seconds of production that cannot be used on-site because the load is no longer there. In those situations, the ability to rely on inadvertent exports for those few seconds is critical for maintaining the balance of the system. In this situation, the battery system still functions as a non-exporting system, but the ability to inadvertently export in these rare occasions provides the customer with the ability to install systems that help them manage their on-site needs more effectively and potentially reduce the stress on the system. It is important to note that inadvertent exports are very different from planned grid exports. Because of the spontaneous nature of these fluctuations in load as a result of customer behavior patterns. These instances of inadvertent export have a zero coincidence factor and therefore claims that inadvertent exports propose a unique stress on the system because of their potential to happen coincidentally along the same portion of the grid are unfounded.

Drawing on interconnection standards in California and Hawaii, as well as draft interconnection standards in other states, ESA recommends that the Commission enable non-exporting systems to inadvertently export so long as they meet certain requirements proposed below. Incorporating a definition for inadvertent exports for systems that are non-exporting also

enables the utility to study a more realistic operational profile for the storage device while creating safeguards in the interconnection agreement that those systems maintain a safe and reliable grid. ESA proposes the following definition for consideration:

> Inadvertent Export: The unscheduled export of real power from the small generating facility in any single event for a duration exceeding 30 seconds and of a magnitude no more than the generating facility's gross nameplate rating multiplied by 0.1 hours per day over a rolling 30-day period. (e.g., for a 100 kVa gross nameplate generating facility, the maximum energy allowed to be exported for a 30 day period is 300 kWh).

Additionally, while the definitions proposed for generating unit and energy storage device included in the proposed modifications of COMAR 20.50.02 and 20.50.09 are a good first step, ESA recommends that should the Commission decide the inclusion of inadvertent exports is in the interest of the State, ESA recommends the following modifications to the existing language for the Level 3 review of non-exporting systems. COMAR 20.50.09.08(D)(1)(c) should read:

> The small generator facility utilizes reverse power delays, other protection functions, or both, that prevent the export of power into the area network, not including inadvertent export.

And COMAR 20.50.09.08(D)(2)(c) should be modified to read:

> The small generator will use reverse power relays or other protection functions that prevent power flow onto the electric distribution system, not including inadvertent export.

Studies Should Be Premised on Net System Capacity and Proposed Use to Prevent Unrealistic Assumptions on System Behavior

Customer-sited storage systems are unique in that the project owner is able in large part to control the system's operational profile. Given the fact that these systems are highly controllable, study processes that assume maximum export of the battery at times when the grid is most constrained will not accurately capture the expected behavior of the battery and will result in undue cost burdens and lengthy study timelines. This problem is particularly

pronounced for AC-coupled systems, where the aggregate nameplate capacity of the two inverters – the Photovoltaic ("PV") and the energy storage system – is too rudimentary a method for studying the system.

A study that assumes a customer will discharge their PV system and energy storage system at the same time during peak hours is not based on any realistic behavior of a customer and in some cases might be technically impossible. The aggregated nameplate capacity can be used for short circuit analysis within the technical review process, but is not a valid sizing method for hosting capacity analysis unless the aggregated system was designed to export to the grid. Export potential across the utility meter is likely missing from most interconnection applications, but is a key piece of information to properly asses the generator. Load offset, generation export, and aggregated nameplate rating must all be used in conjunction to properly analyze an energy storage project.

ESA and other stakeholders have proposed the Net System Capacity as an alternative method of determining study assumptions for energy storage systems in the Workgroup and have engaged in lengthy discussions on the topic. We believe that there are clear ways that regulators and utilities can reform interconnection rules and procedures to better capture the operational profile of an energy storage system while still maintaining the safe and reliable operation of the grid. This will require understanding for each project what the customer intends to do with the system and the unique configuration of the system ("Proposed Use").

In order to prevent onerous and unnecessary study timelines and potentially steep upgrade costs for unlikely system behavior, adoption of net system (or net nameplate) capacity is needed. ESA proposes the following language for the Commission's consideration and notes that a similar version of this language exists in the NV Energy Rule 15 update currently under

consideration in the State of Nevada as well as several other proceedings across the United States.

> Net System Capacity: Net System Capacity means the Nameplate Capacity of a Small Generator Facility or the total of the Nameplate Capacities of the generating units comprising a Small Generator Facility, as designated by the manufacturer(s) of the generating unit(s), minus the consumption of electrical power of the generating unit(s), and, if applicable, as limited through the use of a control system, power relay(s), or other similar device settings or adjustments. The utility review shall be based on Net System Capacity specified by the applicant in the interconnection request, based on the Proposed Use of the Small Generator Facility, provided the utility agrees that the manner in which the customer proposes to limit the maximum capacity that the facility is capable of injecting will not adversely affect the safety and reliability of the system, and provided the utility may use Nameplate Capacity or aggregate Nameplate Capacities for any short circuit analysis. The Net System Capacity and Proposed Use will subsequently be contained in the interconnection agreement between the customer and utility.
>
> Proposed Use: The operational characteristics of a Small Generating Facility upon which the applicant's technical review is based and under which the Small Generating Facility is bound to operate upon the execution of the interconnection agreement. The Proposed Use for a Small Generating Facility may include a combination of electric generators and/or energy storage devices operating in specified modes during specified time periods including but not limited to export, load management, backup, and/or market participation.

ESA believes this language strikes the right balance between the consideration of responsibilities of the utility to ensure system reliability and safety on the one hand and recognizing the wide variety of applications of energy storage that customers may want to employ on the other hand. Specifically, the language enables the utility to study net nameplate capacity if it is believed that studying net nameplate capacity (or net system capacity) would "adversely affect the safety and reliability of the system." Additionally, the operational controls (or Proposed Use) agreed upon by the customer and the utility would be memorialized in the interconnection agreement and a customer would have to maintain those operational controls for

the interconnection agreement to remain in place. UL1741SA allows for inverter manufacturers to certify capabilities that limit export, so there should be no concerns with developers specifying operational constraints if the inverter has been tested to manage export though the UL1741SA process.

Lastly, because customers can exert control over their energy storage systems and modify its operational profile, if a study results in significant upgrade costs, the project applicant may be able to modify the operating characteristics to mitigate some – or all – of the anticipated upgrade needs. In that case, the developer should be able to return to the utility with the proposed modification to the performance characteristics of the system, and the changes should be reflected in the utility's anticipated upgrades.

Additional Review and Reform of Study Levels Is Appropriate

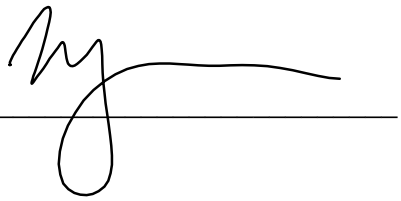
In addition to the non-consensus items discussed above, ESA notes that additional consideration is required to facilitate timely reviews for non-exporting systems. Several participants in the Workgroup have expressed an interest in further discussing reforms to the Study Levels, and ESA supports this recommendation. Specifically, ESA believes that the current requirements that non-exporting systems undergo a Level 3 process is burdensome and does not reflect the potential impact on the system on the grid, particularly smaller systems. ESA looks forward to further discussions on this important component of the interconnection study process.

III. CONCLUSION

ESA applauds the Commission for taking on the important task of updating the regulations for small generator facility interconnection processes and standards. Our comments are intended to complement the important work already undertaken in the Workgroup forum, and

we look forward to continuing to work with the Commission and Workgroup participants on this important endeavor.

RESPECTFULLY SUBMITTED this 17th day of January, 2018.

By 

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