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SUBMITTED VIA EMAIL

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Aida Camacho-Welch, Secretary of the Board
Board of Public Utilities
44 South Clinton Avenue, 9th Floor
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RE: Docket No. QO20020184 – Solar Successor Program

Dear Secretary Camacho-Welch,

The U.S. Energy Storage Association ("ESA") thanks the New Jersey Board of Public Utilities' ("Board") for the opportunity to offer comments on the Solar Successor Program and commends the staff for the inclusion of energy storage in its Straw Proposal. In these comments, ESA recommends the following incentive designs to ensure the most successful deployment of storage resources collocated with solar projects in the Successor Program:

- A separate energy storage incentive for solar-plus-storage projects that are selected through the competitive solicitations, up to a storage capacity target totaling 100 MW per year.

- A one-time fixed incentive of $350/kWh for energy storage attached to solar projects that qualify for the administratively-set programs.

Furthermore, ESA recommends that the BPU act without further delay to initiate an energy storage proceeding to achieve the full benefits of energy storage and the targets required by the Clean Energy Act of 2018, which were subsequently reiterated in Governor Murphy's Energy Master Plan.

ABOUT THE ENERGY 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 over 200 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. Further, our members work with all types of energy storage technologies and chemistries, including lithium-ion, advanced lead-acid, flow batteries, zinc-air, liquid air, compressed air, and pumped hydropower, among others. A number of ESA members have offices and/or operations in New Jersey.

TO MEET ITS STATUTORY ENERGY STORAGE GOAL, THE BPU SHOULD INITIATE A SEPARATE STORAGE PROCEEDING AS REQUIRED BY LAW WITHIN 30 DAYS

On May 13, 2018, Governor Murphy signed the New Jersey Clean Energy Act ("CEA"), which directed the Board to prepare a report concerning energy storage's needs and opportunities in the state, and no more than six months after the completion of the report to initiate a proceeding on how to achieve a goal of 600 MW of energy storage by 2021 and 2,000 MW of energy storage by 2030.[1] The Board contracted with Rutgers University to prepare the report, which was published on May 23, 2019.[2] Since then, the Board has made significant progress implementing the Clean Energy Act, opening proceedings and issuing orders to advance energy efficiency, offshore wind, solar, and electric vehicles. However, the Board has taken no further action to achieve the CEA's 2021 or 2030 energy storage targets, despite statutory direction in the CEA to open such docket within 6 months of the publication of the Rutgers University report. On January 27, 2020, Governor Murphy issued an Energy Master Plan that reiterated the state's commitment to the goals of 600 MW of energy storage by 2021 and 2000 MW by 2030.[3]

As ESA requested in our comments filed on October 29, 2020, in the Board's Investigation of Resources Adequacy Alternatives, we urge the Board to expeditiously advance an energy storage proceeding that will comprehensively address compensation, incentives, and regulatory reforms needed to achieve the state's energy storage goals and effectively leverage the many applications of energy storage. While we appreciate inclusion of storage considerations in the instant proceeding, it does not adequately satisfy the Board's requirements under law. Energy storage incentives will be most effectively designed for meeting the public interest if addressed through a comprehensive approach that covers the diversity of

[1] Clean Energy Act (A3723), Signed by Governor Murphy in May 2018, available at http://www.njleg.state.nj.us/2018/Bills/AL18/17_.PDF. Section 1(d) states: "No later than six months after completion of the report, the board shall initiate a proceeding to establish a process and mechanism for achieving the goal of 600 megawatts of energy storage by 2021 and 2,000 megawatts of energy storage by 2030."
[2] New Jersey Energy Storage Analysis Final Report, Rutgers University, May 2019, available at https://www.bpu.state.nj.us/bpu/pdf/commercial/New%20Jersey%20ESA%20Final%20Report%2005-23-2019.pdf
[3] Energy Master Plan, Issued January 2020, available at https://nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf

storage applications, sizes, levels of interconnection, and system types, including solar-plus-storage hybrids.

To the Board's credit, the Straw Proposal in the instant proceeding discusses a "Stage Two" energy storage program that would address "Non-wires Alternatives/Storage as a Transmission Asset; a 'clean peak' program that uses energy storage resources to shave system peaks; increased integration of renewable energy (including distributed energy such as net metered solar); long-duration storage; and other comparable programs," and that the straw proposal for such an energy storage program will be issued in mid-2021.

As the BPU was required to initiate this proceeding nearly two years ago under the Clean Energy Act, ESA respectfully requests that this proceeding be initiated within 30 days, either through the issuance of a straw proposal or the commencement of stakeholder meeting and/or technical conference.

SOLAR-PLUS-STORAGE HYBRIDS OFFER BENEFITS TO THE POWER SYSTEM AND CUSTOMERS

Solar-plus-storage hybrids are quickly becoming the new normal for front-of-the-meter solar projects. At of the end of 2020, 19 percent of solar projects in PJM were hybrids. However, in CAISO, where solar penetration and storage deployment is several years ahead of PJM, the hybrids made up 89 percent of solar projects.[4] Storage-generation hybrids are planned for a variety of reasons, including adapting to federal investment tax credit (ITC) rules, overcoming barriers to interconnection and market participation, and providing project cost-savings and hedging opportunities.

Storage can also add critical financial value to solar by offsetting the value deflation that occurs when more solar on the grid at midday hours reduces the marginal cost of electricity during those hours. In a study published this May, Lawrence Berkeley National Lab ("LBNL") found that adding storage nearly offset all value deflation in CAISO and ERCOT.[5]

Finally, adding storage to solar can also help strengthen New Jersey's resilience to extreme weather and other outage events. For short-term outages, energy storage can provide sufficient energy and power for key critical loads (e.g., police stations, emergency shelters, hospitals). For longer-term outages, energy storage can serve as a fast-acting solution to bridge the gap in electric service when used as

[4] "Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2020," Lawrence Berkeley National Laboratory, May 2021, https://emp.lbl.gov/publications/queued-characteristics-power-plants

[5] "Are coupled renewable-battery power plants more valuable than independently sited installations?" Lawrence Berkley National Laboratory, May 2021, https://emp.lbl.gov/publications/are-coupled-renewable-battery-power

back-up generation or when islanded in microgrid system. As part of a microgrid, renewable energy coupled with energy storage can provide unique resiliency value with specific advantages over traditional diesel degeneration. Diesel fuel must be maintained on-site and can be challenging to refuel during an event. For longer duration outages, diesel fuel may run out, while renewables-plus-storage is less vulnerable to fuel supply disruptions and can be leveraged indefinitely.

Notably, much of the current value associated with hybrids comes from the current structure of the investment tax credit (ITC) for solar, which is provided for solar-plus-storage hybrids but not standalone systems. Indeed, LBNL found significant additional locational value in standalone systems. However, given the benefits listed above, we do not anticipate that hybridization trend will dissipate if the ITC is extended to standalone storage. Rather, we would see more of both standalone and hybrid storage systems.

ENERGY STORAGE INCENTIVES IN THE SOLAR SUCCESSOR PROGRAM SHOULD BE AWARDED BY COMPETITIVE SOLICITATIONS

Use a Separate Capacity-Based Incentive for Storage Integrated with Solar

ESA recommends that energy storage systems integrated with solar power facilities be compensated through a separate capacity-based incentive, rather than a single output-based incentive to solar-plus-storage projects as staff proposes. Energy storage is not generation but rather a distinct asset class that offers unique attributes. Importantly, it is bidirectional and completely controllable resource. Accordingly, it does not make sense to incentivize energy storage per unit of electricity output, but rather per unit of installed stored energy capacity, which may then be used to charge, discharge, or sit in standby mode as the circumstances require to maximize value. Numerous solar-plus-storage projects have announced contracts that specify capacity payments separate from energy payments.[6] Additionally, storage incentives should be accounted for separately from solar incentives to meet the Board's administrative needs for program budgeting. Since the cost cap does not apply to storage, funding storage incentives out of the solar cost cap budget would unnecessarily constrain the amount of solar achievable under the limited budget of the program.

[6] These contracts typically specify a $/kW-month payment for capacity in addition to a $/kWh payment for delivered electricity. See for example Xcel Colorado 2017 All Source Solicitation 30-Day Report, https://assets.documentcloud.org/documents/4340162/Xcel-Solicitation-Report.pdf

ESA recommends that the energy storage incentive be a separate payment based on the stored energy capacity of the system, measured in installed kWh,[7] and paid either upfront or amortized annually over a period not greater than 5 years. As PSEG notes in its comments,[8] providing a single, output-based incentive for solar-plus-storage projects would lead bidders to limit battery storage capacity to reduce project costs below optimal levels. PSEG proposes a minimum storage capacity of 25% of solar nameplate capacity, which would prevent bidders from proposing very small system sizes. While ESA agrees with PSEG on the need to account for system sizing in incentive design, ESA disagrees with PSEG's proposal, as it would bias the market to install storage systems of exactly 25% of solar capacity and provide no differentiation for varying storage durations. Different storage configurations will maximize value across different parts of the power system. The Board should incent the market to select the most efficient relative sizing and duration by making the incentive proportionate to system size and duration as measured in installed kWh, which corresponds most directly with the value that the associated storage equipment is able to provide.

Use Competitive Bidding to Determine Storage Incentive Levels Annually

ESA appreciates staff's interest in administrative simplicity in its proposal for a single incentive. Simplicity, transparency, and certainly are important characteristics of any program design. ESA recommends the following competitive solicitation of solar-plus-storage to achieve simplicity while providing an incentive to the solar-paired energy storage based on its capacity.

- Any bidder in any one of the three competitive solicitation tranches – grid supply, desired land use, and large net-metered – may include energy storage in the project and propose a distinct and severable capacity-based energy storage incentive alongside the solar output-based incentive.
- The solar bids would be evaluated first, without consideration of the storage incentive. After the winning solar bids are selected, the storage bids that are attached to the selected solar bids would be ordered from lowest to highest $/installed kWh incentive, up to a 100 MW annual capacity target. Setting the target units in MW will best allow the Board to measure progress towards the Clean Energy Act and Energy Master Plan goals of 600 MW by 2021 and 2000 MW

[7] Note that, in this instance, "installed kWh" refers to the maximum volume of electricity that a storage unit can deliver. It should not be confused with the use of the term "kWh" that describes electricity deliveries, such as in a power purchase agreement.
[8] Comments submitted by Joseph Shea Jr. on April 30, 2021

by 2030. Bidders would still be incentivized to submit a variety of durations of energy storage, based on project and grid needs, as the incentive would be in $/installed kWh. The highest incentive underneath the MW capacity target would be the clearing price, and all energy storage bids under the MW capacity target would receive the same $/installed kWh at the clearing price.

- If the storage capacity target is not met after all bids are cleared, the remaining unused capacity would be added to the storage capacity target of the next program year.
- For any solar-plus-storage project that is selected in the solicitation but for which the storage incentive is not awarded, the solar project associated with that storage incentive bid may still receive an output-based incentive as a solar-only proposal.

Project Maturity Criteria Should Allow Applicants to Change Projects Based on Incentive Award Decisions

ESA recommends that the maturity requirements for interconnection and permitting afford developers the option to alter their solar-plus-storage interconnection application if they are not awarded the incentive for the storage component. ESA recommends the following requirements, which are presently used for energy storage in the New York Solicitations for Large-Scale Renewables:[9]

"The Proposer must have discussed Energy Storage with the relevant interconnecting utility company and have identified the applicable requirements. Proposer has either: (1) submitted a valid Interconnection Request for Energy Storage and demonstrates that all initial fees have been paid, or (2) prepared drafts of all initial Energy Storage interconnection application documents such that the Interconnection Request can be submitted within 3 months following an award from NYSERDA."

Storage Incentives Should be Available for All Three Competitive Solicitation Tranches

Another advantage of the proposed separate incentive design for competitive solicitations is that energy storage may be proposed alongside a project in any of the three other competitive solicitation tranches, not just basic grid supply projects, as proposed in the Straw. Storage will be particularly valuable for desired land applications, as it may add more value per acre than solar-only. Moreover, limiting hybrid projects to only grid supply would likely not provide enough storage to catch up on New Jersey's progress toward 2000 MW by 2030.

[9] 2021 Renewable Energy Standard RFP, NYSERDA, https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Generators-and-Developers/RES-Tier-One-Eligibility/Solicitations-for-Long-term-Contracts

Accordingly, ESA recommends that the Board set energy storage capacity targets for each of the three tranches of competitive solicitations, for a total of 100 MW per year. The 100 MW total target would allow New Jersey to make up the ground that it has lost over the last two years toward the targets of 600 MW by 2021[10] and 2,000 MW by 2030. This target should be subdivided amongst the three tranches at the same proportion given to the solar capacity targets. For example, using the distribution of the tranches proposed by staff in the Straw Proposal, each target would be as follows:

Tranche	**Year 1 Solar Capacity Target (MW)**	**Year 1 Storage Capacity Target (MW)**
Non-Residential Net Metered > 2 MW	40 MW	12 MW
Basic Grid Supply	130 MW	44 MW
Desired Land Use Grid Supply	130 MW	44 MW

Aggregated Energy Storage Participation Should be Incorporated into Subsequent Programs

ESA appreciates the interest of Staff in the aggregation of BTM and smaller front-of-the-meter ("FTM") energy storage systems that provide capabilities similar to that of large front-of-the-meter systems. ESA members aggregate energy storage to participate in wholesale markets, and the advent of FERC Order 2222 ensures that aggregations will play an important role in the development of energy storage and other distributed energy resources. However, due to continuing delays in PJM's implementation or Order 2222, a program that would allow aggregations to effectively compete in the competitive solicitation is not possible to develop in the implementation timeframe of the solar successor program. We encourage the Board to explore this issue further in the subsequent storage-only proceeding.

ADMINISTRATIVELY-SET INCENTIVES FOR SOLAR PROJECTS SHOULD ALSO BE AVAILABLE FOR INTEGRATED ENERGY STORAGE

New Jersey's considerable investment in solar would be best leveraged by ensuring that any project incentivized under the Solar Successor program have the opportunity to add energy storage, including those that qualify for administratively-set incentives, not for those that participate in competitive solicitations.

[10] Though New Jersey will not achieve the 600 MW target by 2021, the Board should not ignore the goal, and instead seek to achieve 600 MW as soon as possible.

As previously discussed, a comprehensive energy storage proceeding is best suited to developing a cost-effective, outcome-driven program for energy storage deployment at all interconnection levels, system sizes, and configurations. However, even if a proceeding is initiated in June as ESA is requesting, the instant proceeding presents a critical opportunity to leverage the Solar Successor program to launch a behind-the-meter ("BTM") energy storage market. New Jersey would miss a critical opportunity to leverage the solar successor program to launch a behind-the-meter ("BTM") energy storage market.

Administratively-set incentives have played a leading role in standing up new state storage markets. Though behind-the-meter energy storage deployments have grown nationally in recent years, they have been concentrated in markets with strong local incentives, such as California, New York, Massachusetts, and Hawaii.[11] In New York, incentives have helped to to reduce "soft costs" such as marketing, permitting, and interconnection, which can account for over half of total installed costs of energy storage systems.[12] The New York Public Service Department found that soft costs declined 55 percent for customer-sited systems and 36 percent for bulk hybrid systems from 2019 to 2020. While storage hardware costs are expected to decline regardless of local market conditions, soft costs will only decline significantly in New Jersey with local deployment.

ESA recommends that BPU offer a one-time incentive of $350 per installed kWh for energy storage attached to solar projects that qualify for the administratively-set solar incentives. In the course of the energy storage proceeding, $350 per installed kWh could be replaced with a declining block incentive based on modeling to achieve the lowest possible ratepayer cost over time. This is the proposal in the recently-introduced Consumers and Climate First Act in Illinois,[13] which sets a $350 per installed kWh tariff in legislation, to be replaced with a tariff developed by the Illinois Commerce Commission. New York began its Bridge incentive at $350 per installed kWh[14] and reduced the incentive as deployed capacity increased and soft costs have declined, as previously mentioned.

[11] Energy Storage Monitor Q1 2021, Energy Storage Association and Wood Mackenzie, March 2021, https://www.woodmac.com/research/products/power-and-renewables/us-energy-storage-monitor/
[12] Second annual "State of Storage" report, New York Public Service Commission, April 1, 2021, http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={AFCF8BDC-F0A5-4DA5-AB40-EB26C0D7F123}
[13] Consumers and Climate First Act, SB 2896 of 2021, introduced April 29, 2021 https://www.ilga.gov/legislation/102/SB/PDF/10200SB2896lv.pdf
[14] https://www.nyserda.ny.gov/All-Programs/Programs/Energy-Storage/Developers-Contractors-and-Vendors/Retail-Incentive-Offer/Incentive-Dashboard

ESA also recommends that the Board consider requiring that energy storage systems that receive an administratively-set incentive demonstrate grid benefits beyond providing back-up power for the customer, as such grid benefits can improve incentive program cost-effectiveness. Since available grid benefit programs will vary by utility service territory, the Board could offer energy storage owners a menu of potential pathways to demonstrate grid benefit, such as any one of the following:

- Enrollment in a time-of-use rate, which encourages charging during off-peak hours and dispatch during on-peak hours, while allowing customers to effectively target customer peaks or;
- Participation in wholesale markets, which can reduce emissions and increase Demand Reduction Induced Price Effect (DRIPE) benefits or;
- Agreement not to charge during certain hours of the day correlated with higher emissions.

CONCLUSION

ESA thanks the Board for the opportunity to offer these comments. New Jersey is poised to see the rapid deployment of energy storage resources if it acts quickly and aggressively to seize the opportunity. The recommendations herein will help ensure that New Jersey successfully leverages the Solar Successor Program to launch an energy storage market that will provide significant value to ratepayers and help the state meet its public policy goals.

Sincerely,

Julian Boggs

State Policy Director

Energy Storage Association