



December 12, 2022

New Jersey Board of Public Utilities
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Board.secretary@bpu.nj.gov
Attn: Acting Secretary of the Board

**Re: Docket No. OO22080540; In the Matter of the New Jersey
Energy Storage Incentive Program**

Dear Madame Secretary,

Pursuant to the Board's Notice of September 29, 2022, in the above-referenced docket, Energy Management, Inc. ("EMI") and Starwood Energy Group Global, Inc. ("SEG") (collectively, the "Companies") hereby jointly submit comments regarding the Straw Proposal ("Straw Proposal" or "Straw") for the New Jersey Storage Incentive Program ("SIP.") These comments offer suggestions to help assure that the SIP allows storage to better fulfill the urgent policy objectives of New Jersey's climate and clean energy goals, including New Jersey's Clean Energy Legislation of 2018 (the "2018 Act") and New Jersey's Energy Master Plan (the "Master Plan"), which plan codifies the Governor's goal of achieving 600 MW of energy storage by 2021 and 2,000 MW by 2030. As set forth below, the Straw Proposal should be modified to (i) more rapidly implement meaningful volumes of storage, (ii) utilize economies of scale to allow New Jersey to meet its storage goals at the lowest possible cost, (iii) encourage the use of deactivated generation sites with existing transmission facilities that minimize cost, community impacts and permitting delays, and (iv) implement the SIP in a way that allows all market participants to compete on a level playing field.

I. The Companies

EMI is a privately held company with a more than 40-year history of developing, owning and operating clean energy projects, with combined project capital costs of over \$2 billion, including major solar, biomass and storage projects. SEG and its investment affiliates have raised in excess of \$3 billion of equity capital and has executed transactions totaling more than \$8 billion in enterprise value, inclusive of enterprise value related to the development and construction of renewable energy infrastructure. EMI and SEG have jointly developed major renewable projects, including two of the New Jersey's largest solar projects at the McGuire-Dix-Lakehurst Joint Base. The Companies recently worked together to structure the transactions that led to the permanent shutdown of the last two coal-fired generation plants in New Jersey, the 219 MW Logan Generating Plant and the 262 MW Chambers Cogeneration Plant .¹

II. There should be larger and earlier annual procurement amounts.

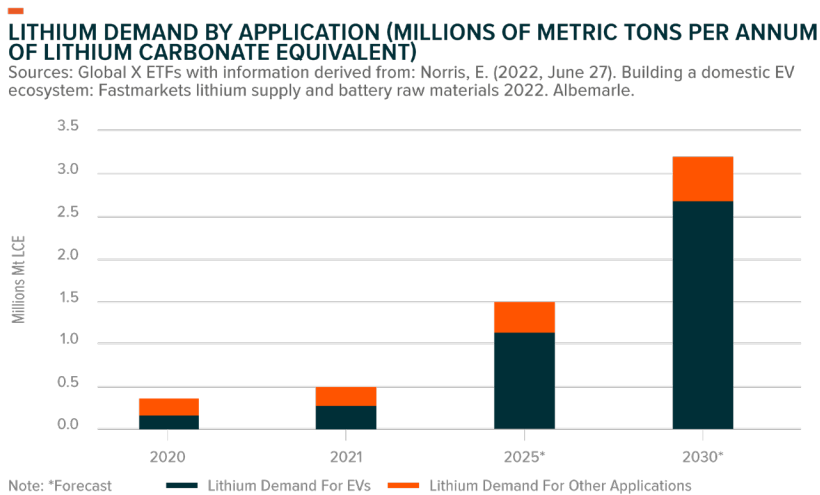
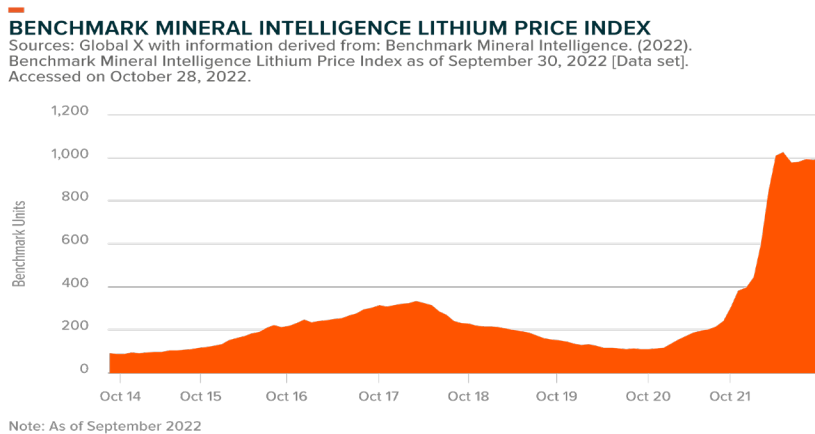
Most importantly, the Straw Proposal should be revised to expedite and enhance the scale of annual procurements in order to realize the urgently needed reliability and environmental benefits of storage-to-grid energy. In proposing the annual SIP procurement amounts set forth in the Straw, Staff recognized the trade-off that scaling the program slowly by limiting volumes in early program years (i.e., with only 30 MW of Grid Supply Procurement in year one) might lower future costs, but would delay the system and environmental benefits of accelerated storage implementation:

Staff weighs three main factors: (i) expected declines in the installed cost of storage over time (recognizing the disruption to this trend caused by recent supply chain issues); (ii) the **environmental, public health, and grid benefits of quickly scaling storage**; and (iii) the need to gain operational experience in New Jersey's storage program.

Straw at 12. The Straw Proposal would thus set the procurement timeline in a way that delays the public benefits of storage in the hope and expectation that there might be lower costs in future years. In doing so, the Straw relied heavily upon the U.S. Department of Energy's National Renewable Energy Lab ("NREL") 2021 forecast of future battery costs (the "NREL Report"). In light of more recent shifts in pricing and long-term market demands, however, the NREL forecast is now highly questionable, and the public benefits of acting sooner are real and certain, while the benefits of delayed implementation are speculative and dependent upon price declines that may never occur.

¹ With regard to recently retired generation facilities, within the period of one year from deactivation, PJM rules allow the transfer of capacity interconnection rights ("CIRs") associated with deactivated units to new projects. That allowance may provide a uniquely advantageous window of opportunity for the development of major facilities at recently retired locations. See, PJM Manual 14G, Section 4.4.1 Transfer of CIRs from a deactivated unit, [m14g.ashx \(pjm.com\)](http://m14g.ashx(pjm.com))

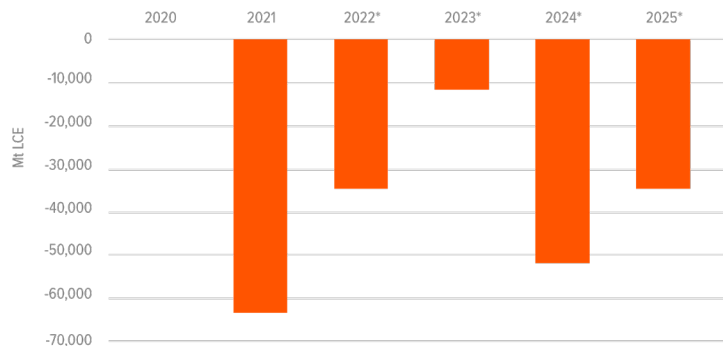
The NREL annual reports do indicate a historical trend of declining costs, but recent and largely unforeseen increases in the cost and long-term demand for batteries and their essential components, including lithium, make the continued assumption of future cost declines highly questionable. For example, the Lithium Market Update published by Global X, an ETF provider with over \$40 billion under management, on November 4, 2022² reported that “lithium prices have surged 123% year-to-date and are up as much as 10x versus historical levels” and that “lithium miners have been unable to scale supply as rapidly” and “bringing new capacity on line can take 3-5 years or more.” The following graphics from the Global X report show the dramatic increases in lithium cost and demand, as well as forecasts of continuing shortfalls in global supply:



² <https://www.globalxetfs.com/lithium-market-update-elevated-prices-are-creating-favorable-dynamics-for-miners/>.

LITHIUM MARKET BALANCE (METRIC TONS PER ANNUM OF LITHIUM CARBONATE EQUIVALENT)

Sources: Global X ETFs with information derived from: Benchmark Mineral Intelligence. (2022). Benchmark Quarterly: Q2 Review 2022, Issue 30.



Note: Negative number indicates supply deficit. Supply and demand were effectively balanced in 2020. *Forecast

The Global X report further indicates that the shortages driving the price increases are expected to be a continuing and “longer run” situation: “Over the longer run, demand for lithium is forecast to far exceed the scale of the industry’s capacity today. More lithium could be needed on a monthly basis in 2040 than all of the lithium mined in 2021.”

Numerous recent sources similarly indicate that increases in demand for essential storage components will continue over the term of the SIP, including BloombergNEF’s projection of a fifteen-fold increase in global storage facilities by the time of the 2030 SIP procurement: “Energy storage installations around the world are projected to reach a cumulative 411 gigawatts (or 1,194 gigawatt-hours) by the end of 2030, according to the latest forecast from research company BloombergNEF (BNEF). That is 15 times the 27GW/56GWh of storage that was online at the end of 2021.”³

The CEOs of leading battery development companies at a recent 2022 policy forum similarly concurred that the industry no longer anticipates future declines in battery prices, but, to the contrary, forecasts a thirty-fold increase in demand for lithium and rising battery prices for the foreseeable future so that, importantly, delaying battery procurement is not expected to lower costs:

There are some forecasts that say in order to meet the demand in the next several years, we will need 30 times the current mining capacity of lithium. That means **we may not see storage cost again what it did last year for another 10 years**. Add interest rates, and the cost skyrockets. ... I don’t think their models adequately forecast where costs are headed.

³ BloombergNEF, [Global Energy Storage Market to Grow 15-Fold by 2030](https://about.bnef.com/blog/global-energy-storage-market-to-grow-15-fold-by-2030), October 12, 2022, <https://about.bnef.com/blog/global-energy-storage-market-to-grow-15-fold-by-2030>. Also see, e.g., BloombergNEF, December 6, 2022, <https://www.bloomberg.com/news/articles/2022-12-06/rising-battery-prices-threaten-to-derail-the-arrival-of-affordable-evs>

We are an industry that has relied on declining prices over time for its equipment. We are in an environment now where, certainly on the storage side, **we are going to see cost inflation** until sodium or some other new stationary technology takes hold that is **not even visible yet on the horizon.**

It is reasonable to assume that if you delay a solar project several years, there is a reasonable chance that we will be in a better solar supply situation than we are today. That is not true of batteries. **Delay may solve your panel problem. It will not solve your battery problem.**⁴

Thus, updated storage market information, as well the increased long-term demand for batteries and their essential components, make the pricing rationale for postponing sizeable SIP procurement blocks highly questionable. Notably, the NREL Report itself indicates the limited reliability of its forecast, noting that it is based “solely on literature projections” and “does not take into account other factors that might impact costs over time, such as material availability, market size and policy factors.” NREL Report at 4. The New Jersey Energy Storage Analysis (ESA) Final Report published by Rutgers University in 2019 (the “Rutgers Report”) similarly noted the uncertainty of assumptions regarding future cost projections: “Data on capital costs for ES is sparse, especially for New Jersey, and thus there is significant uncertainty surrounding estimates of future deployment and cost scenarios.”⁵

Moreover, swift and accelerated storage procurement is consistent with New Jersey’s recognition of the urgency of addressing the challenges of climate change and implementing emission-free energy sources. The New Jersey Energy Master Plan expressly recognizes the need for storage implementation to be “accelerated” through “rapid deployment” to allow the grid to accommodate the increasing volumes of renewable energy, including 7,500 MW of offshore wind and 17,000 MW of solar which are needed to confront the urgent challenges of climate change:

Governor Murphy recently committed New Jersey to building 7,500 MW of offshore wind by 2035; energy system modeling further supports that New Jersey should optimally build 17,000 MW of solar energy and 2,500 MW of energy storage by 2035, as well as support a moderate amount of investment in clean resources out-of-state.

[T]he **rapid deployment** of renewable energy generation and further development and installation of electric and thermal energy storage systems (Strategy 2) [**Accelerate** Deployment of Renewable Energy and Distributed Energy Resources] coupled with proper planning via Integrated Distribution Plans (IDP) (Strategy 5) and the programs and objectives listed above to reduce

⁴ Norton Rose Fulbright, Project Finance, The evolving energy storage market, August 27, 2022, <https://www.projectfinance.law/publications/2022/august/the-evolving-energy-storage-market/>.

⁵ Rutgers, The State University of New Jersey, New Jersey Energy Storage Analysis (ESA), Final Report, May 23, 2019, at 139, <https://nj.gov/bpu/bpu/pdf/commercial/New%20Jersey%20ESA%20Final%20Report%2005-23-2019.pdf>.

and manage load, will be critical factors in reaching 100% clean energy by 2050.

[T]he increased **urgency** around climate change led the state to take an innovative, systematic, and inter-agency approach that, for the first time, holistically considers the complete energy system in New Jersey, including electricity generation, transportation, and buildings, and their associated greenhouse gases.⁶

In light of updated market information and New Jersey’s recognition of the urgency of accelerating storage in the near term, we urge the Board to revise the Straw to **expedite the program by opening each annual procurement to the full amount allocated to each segment of the SIP** (i.e., so that the full SIP allocations for Grid Supply and DER would be subject to award in the first annual procurement), with unawarded volumes carried forward to subsequent annual procurements. Under this scenario, New Jersey will realize in the near-term the urgently needed “environmental, public health, and grid benefits of quickly scaling storage” noted by the Staff, which, unlike the potential benefit of future price declines, are immediate, known and measurable.

III. The SIP should minimize procurement costs through the economies of scale.

(i) Procurement from larger projects lowers cost.

The Board should also minimize the cost to ratepayers by making SIP storage procurements primarily from larger Grid Supply projects that reduce costs through economies of scale. While some commenters have suggested limitations on project size, the SIP should realize the benefits of large-scale projects with capital costs lower than those of those of smaller projects. The relationship of project scale to cost containment was highlighted by a recent economic analysis of the World Bank Group:

Scale matters because it can impact both the choice of technology used and the LCoS. **Costs per kW typically increase for smaller scale energy storage**, but how costs scale to meet smaller loads depends on the technology. For example, Li-ion batteries and flow batteries are considered potential competitors at a utility scale. A Utility scale Li-ion battery system might have a CAPEX cost of between \$400 and \$500/kWh for 4 hours of storage, but the same technology at small residential scale may cost over \$1,000/kWh.

Economic Analysis of Battery Energy Storage Systems, World Bank Group (2020), at 31.⁷ We also note in this regard the comments of the New Jersey Office of the Rate Counsel at the second stakeholder meeting in favor of meeting the target mandate through “larger scale lower cost projects”:

⁶ State of New Jersey, 2019 New Jersey Energy Master Plan, Pathway to 2050, at 13, 38, https://nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf.

⁷ <https://documents1.worldbank.org/curated/en/222731592289791721/pdf/Economic-Analysis-of-Battery-Energy-Storage-Systems.pdf>.

Rate counsel recognizes that distributed storage has an important role to play, but we do stress that there's a balance [between] the benefits of distributed storage and the lower cost of meeting the legislative mandate with **larger scale, lower cost projects.**⁸

The Rutgers Report similarly referenced the NJRDC's earlier recognition that larger-scale storage projects would lower costs to ratepayers:

The FERC Order allows storage to be on the same playing field 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.**

Rutgers Report at Appendix 6. Notably, in addition to lowering costs, the Rutgers Report also indicated the environmental benefit of larger-scale storage projects noting that, under the current PJM system mix, small-scale lithium storage projects could lead to increases in critical emissions:

Under the current PJM generation mix, use of Li-ion batteries in small-scale standalone installations could result in slight **increases** to CO2 and other emissions.

Rutgers Report at 139.

(ii) Allocating more MWs to the SIP would lower the costs.

The Companies further suggest that overall costs can also be reduced by allocating a greater share of New Jersey's 2,000 MW storage target to the SIP. The Straw indicates that the proposed 1,000 MW size of the SIP program was determined by subtracting Staff's assumed volume of 1,000 MW of the CSI program⁹ from New Jersey's target of 2,000 MW. By allocating 1,500 MW of New Jersey's target to the SIP program and 500 MW to the CSI program, the Board would lower costs by shifting procurement to larger-scale and less costly SIP projects, as opposed to the smaller scale projects of the CSI program.

(iii) Procurement contract terms of 15 years would lower costs.

While the Straw Proposal suggests contract lengths of "between 10 and 15 years," the Companies urge the Board to adopt the longer term of at least 15 years. As the Straw Proposal states, "Staff recognizes that projects are likely to require higher contract prices if the length of the contract is shorter, given that there is a shorter time over which to recover the capital costs of the project." Straw at 15. The Companies concur that longer contract terms will lower procurement costs in the capital-intensive storage market. The Companies also believe that procurements should not be based upon declining block pricing. While the Straw Proposal at page 16 indicates that declining block pricing is based largely upon the premise that "costs are

⁸ Comments of Sarah Steindel, New Jersey Asst. Deputy Rate Counsel, Stakeholder Meeting: Energy Storage Meeting 3, November 14, 2022, at 1:50:15 in the recording.

⁹ The Straw at page 13 indicates that "the size of future solar+storage [CSI] procurements have not yet been established."

generally expected to decline over the next decade,” that expectation, as discussed above, is no longer a reliable premise for setting public policy.

(iv) Summary on lowering costs.

We thus urge the Board to revise the Straw to minimize costs through economies of scale, by:

- (i) Making SIP procurements primarily from larger-scale projects;
- (ii) Not imposing limits on SIP project size;
- (iii) Increasing the size of the SIP program from 1,000 MW to 1,500 MW;
- (iv) Allowing procurement contract terms of 15 years or more; and
- (v) Not utilizing declining block pricing.

IV. The SIP Should Encourage Projects at Deactivated Fossil Plants and Should Recycle Existing Grid Injection Capacity.

The public benefits of the SIP would be enhanced by encouraging storage to be located at the sites of deactivated fossil plants, which by utilizing existing sites would minimize adverse effects to communities and reduce costs.

Further, to the extent that they can utilize existing transmission facilities and/or rights, these projects would also present a much greater likelihood of successful and timely development. As the Straw indicates, projects without pre-existing interconnection rights or queue positions would be unlikely to be come on-line in the near future:

Assuming that PJM’s queue reform, or some version of it, is adopted, it seems likely that projects not already in the PJM queue will be unable to demonstrate any queue position (other than a submitted application) until 2026. **Such projects will likely not achieve commercial operation until at least 2028.** due to the additional time needed to complete the interconnection process and final interconnection, including the construction of any required transmission upgrades.

Straw at 28. Staff’s concern is further validated by the shortage of suitable points of interconnection and the permitting challenges and often prohibitive costs of new interconnection facilities. Moreover, FERC’s recent order¹⁰ conditionally accepting the PJM queue reforms referenced by the Straw (with acceptance of new PJM queue applications deferred until 2026) confirms Staff’s concern as to the practical challenges in the timely development of storage projects at newly proposed sites and further supports the benefits of procurement from projects at deactivated sites in order to meet the timelines of New Jersey’s goals.

Recently deactivated fossil plants provide a unique opportunity to utilize existing interconnection points with existing deliverability of energy and capacity into the grid. Given there is a very limited window of time in which replacement projects on these sites can use the

¹⁰ United States Federal Energy Regulatory Commission, PJM Interconnection, L.L.C., Docket Nos. ER22-2110-000 & ER22-2110-001, Order Accepting Tariff Revision Subject to Condition, November 29, 2022, 181 FERC ¶ 61,162.

same interconnection points and capacity, it will become imperative to maximize use of this interconnection capacity before it is permanently “lost.” This can be a massive value issue to New Jersey and, therefore, limiting SIP procurement to smaller amounts in upfront years is not optimal. NJ should attempt to maximize SIP procurement in the upfront years to utilize any of such stranded transmission capacity.

The public policy of prioritizing deactivated generation sites was also recognized by Congress in the recently adopted **Inflation Reduction Act**, which allows an additional 10% ITC for qualifying projects located in an “**Energy Community**,” defined to include a census tract “where [a] coal-fired electric generating unit has been retired.” I.R.C. § 45(b)(11) (“**Special Rule For Qualified Facility Located In Energy Community**”). Among other things, Congress recognized the public policy of incentivizing the development of projects in areas where job and property tax loss will be most felt by the transition away from traditional energy generation sources. The same policy interests for locational preference for Energy Communities are equally applicable to the SIP and the adoption by the Board of a similar siting priority would coordinate state and federal policy in a synergistic fashion. Moreover, the additional 10% tax credit has the added benefit of reducing the cost of storage projects located in Energy Communities and would thereby lower the cost of SIP compliance.

Preferred procurement from deactivated sites with would also address the Staff’s objective to “eliminate projects that cannot reasonably be expected to reach commercial operation within three years of registering for a megawatt allotment.” Straw Proposal at 27. In addition to interconnection and queue issues, many projects at new sites face serious permitting delays and challenges that prevent them from reaching commercial operation on time, if at all. The Board can have far greater confidence that projects located at deactivated sites will achieve commercial operation on schedule and contribute to the urgent goals of the SIP.

V. Franchised Electric Utilities Should not participate in the SIP.

The Companies concur with the Straw’s objective to “achieve the 2030 energy storage goal of 2,000 MW by 2030, as set forth in the [Clean Energy Act] in a manner that is consistent with New Jersey’s competitive electricity markets” and “promote deployment of private capital by establishing a stable market structure that attracts low-cost capital,” as well as Staff’s recommendation that the SIP be driven by competition and at-risk private capital:

This Straw recommends that the Board adopt a storage business model that encourages private ownership and operation of energy storage devices, consistent with New Jersey’s restructured competitive market structure. While ratepayers will support investment in storage resources, the commercial and operational risks will largely be borne by private investors.

Straw at 10-11. In a properly functioning competitive market, all participants operate on a level playing field, with comparable investor risk exposure and access to market information. In that regard franchised electric distribution companies have structural advantages and should not participate in the competitive SIP procurements. The New Jersey Legislature addressed these concerns in deregulating the state’s energy markets by (i) restricting utility pre-enactment involvement in competitive markets, noting concerns as to “strict separation and allocation of the

utility's revenues, costs, assets, risks and functions between the electric public utility and its related competitive business segment" and (ii) disallowing post-enactment entry by electric utilities or their related business segments into additional competitive markets:

Any other provision of this act to the contrary notwithstanding, commencing on the effective date of this act, **an electric public utility or a related competitive business segment of that electric public utility shall not offer any competitive service except those approved or pending approval as of July 1, 1998** pursuant to subsections a. and f. of this section.

Electric Discount and Energy Competition Act, N.J.S. 48:3-55(i), (h). The very same concerns that preclude franchised utilities from the deregulated and competitive generation market apply with equal force to the newly formed competitive storage markets. The potential for utility ownership of storage as a "transmission alternative" asset, however, presents different issues outside the scope of the SIP that are properly being addressed elsewhere in other proceedings.

VI. Conclusion.

As set forth above, the Companies urge that the Straw Proposal be modified to (i) more rapidly implement meaningful volumes of storage, (ii) utilize economies of scale to allow New Jersey to meet its storage goals at the lowest possible cost, and (iii) encourage the use of deactivated generation sites and existing transmission facilities to minimize cost, community impacts and delays (especially in light of the deferral of accepting new PJM queue applications until 2026), while maintaining provisions for private ownership and operation of energy storage projects, consistent with New Jersey's restructured competitive market structure. The Companies commend Staff's efforts and believe the SIP can become a national model for expediting storage resources in order to enhance reliability and mitigate climate change.

Respectfully Submitted,

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