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New Jersey Storage Incentive Program (NJ SIP) "Straw" Proposal (STRAW)

New Jersey Board of Public Utilities (BPU) or (Board)

Cogentrix Energy Power Management, LLC (CEPM)'s Comments on the NJ SIP Straw

Cogentrix Energy Power Management, LLC (Cogentrix) is pleased to be able to provide these comments in support of the New Jersey Energy Storage Incentive. Cogentrix appreciates the Board of Public Utilities' (BPU) national leadership in effecting the transformation of the power sector in New Jersey and looks forward to remaining an industry partner in the transition.

By way of background, Cogentrix ' affiliates own, and Cogentrix and its subsidiaries operate and sell energy and capacity from, approximately 12,000 MW of electric generation facilities throughout the United States, including two natural gas fired plants in Lakewood, New Jersey. Lakewood Cogeneration, a combined-cycle facility consisting of two combustion turbines and one steam turbine, has a base capacity of 265 MW. Essential Power OPP consists of two, simple-cycle configuration combustion turbines, and has a base capacity of 336 MW. As a peaking facility, OPP is specifically designed to quickly reach full output to when the highest level of electricity is consumed in our region within a specific timeframe.

Cogentrix is actively engaged in developing conventional and renewable resources to physically pair large-scale battery storage devices with existing generating capacity. Cogentrix currently has five projects totaling 425 MW of battery storage resources undertaking the interconnection processes in ISO-NE and PJM. In New Jersey, Cogentrix is proposing a 100 MW – 400 MWh battery installation located on the Lakewood, New Jersey site. Federal and state regulations, as well as the existing regional transmission tariff, do not yet seamlessly integrate these types of resources into the dispatch and operation of the market. Similarly, existing tariff-based wholesale market revenue is insufficient to support the project without additional state programmatic revenue. Accordingly, Cogentrix is appreciative of the BPU's efforts in this proceeding and is available to provide any support necessary.

In keeping with presentation of the forthcoming NJ Storage Incentive Program (NJ SIP) Cogentrix is providing these comments in the context of the Program Goals[1] detailed by the BPU. Cogentrix fully supports these goals without reservation but does have concerns as

[1] NJ BPU Notice September 29, 2022 p.10 at V. A.

discussed here with certain aspects of the NJ SIP Straw Proposal (Straw) and its ability to achieve these Program Goals fully, efficiently, and at the lowest cost possible. Given Cogentrix's position and experience as an independent power producer, these comments are focused on the Grid Supply component of the Straw.

Cogentrix manages power assets located in nearly every ISO/RTO in the nation and has first-hand experience with developing and financing resources such as these envisioned by the BPU. In that experience, we have found that the achievement of emission reductions should be balanced with the reality of consumer cost and system reliability. Our concern with the Straw Proposal is whether that balance could be achieved at a lower cost by focusing on the source of the energy used for charging rather than being tied to the historical emissions profile as the basis for future energy discharge or even as reserve capacity.

The following is a list of the NJ SIP Program Goals along with Cogentrix's corresponding comments provided in italics.

I. New Jersey Energy Storage Program Straw Proposal:

A. Program Goals

Energy storage is a rapidly evolving technical and economic solution to key challenges presented by the energy transition. This Straw presents a policy framework designed to meet the following goals:

1. Achieve the 2030 energy storage goal of 2,000 MW by 2030, as set forth in the CEA in a manner that is consistent with New Jersey's competitive electricity markets;

a) Decarbonization of the power sector will require much more than 2,000 MW of storage and especially more than 880 MW directly visible to PJM or the physical market that dispatches it. While the quantity of storage is important, how it is used at any given instant determines its impact on emissions.

b) As a nation leading proponent of offshore wind ("OSW"), over the next 20 years the BPU will be shepherding some 11,000 MW of OSW into operation. The Grid Supply component should be analyzed in this context. While the optimal amount of complimentary storage for this amount of OSW is difficult to determined, the Grid Supply component of the NJ SIP should be structured in a way that more than the initial Block size quantities can be procured without having to open a new regulatory proceeding. The Clean Energy Act of 2018 does not stipulate a maximum target for storage capacity only a minimum of 2,000 MW.

c) A key aspect for the efficacy of storage as an emissions reduction tool is that it be dispatchable on the same basis as the other supply resources such that fossil fired resources are not used in a way sub-optimal to overall emissions reduction. This means that the storage resources must be "visible" and available for centralized dispatch.

d) Considering the amount of storage - certainly more than 2,000 MW - needed for full decarbonization emphasis should be placed on re-use of existing grid supply infrastructure. Cost economies of scale that can maximize use of existing, in-service, fully depreciated capital assets such as existing generation interconnection infrastructure can deliver an overall lower capital cost per MW of storage. Re-use of an existing power site can be anticipated to reduce the development time considerably; this time savings could be as much as two to three years that the local siting approvals can take.

2. Promote deployment of private capital by establishing a stable market structure that attracts low-cost capital;

a) De-Risking Investments to Lower the Cost of Capital - The cost of capital is one of the largest project cost components in the overall price of storage that ultimately will be passed to consumers. Lowering this cost is a function of lowering the overall risk profile of the project and primarily of the revenue stream needed to pay those capital costs. Investors will avoid revenue that is transient or dependent on ephemeral policies. Traditionally, the risk profile of the revenue stream is lowest when provided by a company with an investment grade credit rating and for a term long enough for capital investors to recover their investment, say 20 years. This is a structure such as the BPU provides for the offshore wind PPAs.

b) Contracted Revenue - A long-term financial contract with a set price would offer the lowest risk profile and could be used to procure Grid Supply storage at the quantities that will eventually be needed to fully decarbonize the electric sector. Structuring the price around fixed and performance based quotas is feasible.

c) Proportion of Contracted Revenue - The proportion of the total revenue requirement subject to a programmatic contract in relation to the other revenue streams however, will be crucial to the success of the NJ SIP. The BPU has posited use of a fixed payment equivalent to approximately 30% of total costs; this suggests that 70% of the revenue required would be at market risk or merchant risk. It is Cogentrix' experience that currently PJM and other ISO physical market revenues may supply approximately 40% of the necessary revenue, but those are commodity markets and have capacity prices reset every year. To counter-balance this merchant risk and its impact on the cost of capital, setting a BPU sanctioned fixed payment to a much higher percentage of project capital costs would be required. Before setting out a suggested percentage for that fixed portion, the design of performance requirements need to be discussed.

d) Emissions Based Performance Criteria - Directly tying storage payments to emissions in the manner suggested in the Straw is very

problematic. The concept of performance criteria for payments is very reasonable, but linking those criteria to PJM's reporting of nodal marginal emissions is fraught with risk that will render the SIP un-financeable. For all the reasons set out by PJM in the referenced Primer[2] tying future dispatch of storage to past emissions (un-adjusted for the proportion of zero-emitting to emitting supply in any given 5-minute increment) will not achieve the greatest level of emission reductions. And such a practice could forsake higher PJM market revenue otherwise available to the project and that would otherwise reduce the amount of SIP revenue required. The most compelling rationale for Grid Supply storage is as a complimentary supply resource with offshore wind; thus, a simple performance requirement that charging of the storage resource be accomplished (subject to certain variances) during wind production hours should be considered. This will ensure that regardless of when the storage is discharged it will be doing so with as little emissions impact as possible. This concept is established in the Massachusetts Clean Peak Standard Program which despite criticisms of imperfection is good enough to be incentivizing development of GWs of new storage resources for the state.

e) Availability Performance Criteria – An overall in-service availability criterion of 95% is appropriate.

f) Project Maturity / Award Lead Time - Designation of contract awards should exceed 3 years because of delays in the PJM interconnection queue. Given that queue reform is an ongoing process, the BPU should maintain flexibility to accommodate changing circumstances in project interconnection timelines.

g) Award Terms – revenue certainty of 15 to 20 years would lower financing costs, have lower impact on monthly consumer utility bills, and would align the storage costs better with the OSW contract terms. In the case of li-ion battery storage, it would also incentivize continued lifetime augmentation to preclude a precipitous drop in storage capacity after 7 to 10 years.

h) Fixed Price Level – Given the fundamental nature of the energy sector as a commodity business a "pay-as-bid" structure would be preferable as the most certain means of ascertaining current storage cost levels. Qualified projects competing for contracts will deliver the lowest cost and avoid the practical difficulties associated with the BPU having to administratively set prices. Competing for awards also mitigates the possibility of a failed procurement altogether based on administratively set prices. As we have seen in the 2020-2022 time frame, it is not a given that li-ion prices will only go down and we are seeing contracts in other markets having to be re-priced to preclude non-performance. Given the

[2] marginal-emissions-primer.ashx (pjm.com)

long lead times between committing to significant development capital spend[3] and achieving commercial operations and revenue flow a more flexible approach that acknowledges the commodity aspects of storage costs would be more realistic.

3. Ensure that energy storage devices are deployed in a manner that decreases GHG emissions by tying operations to pay-for-performance metrics;

a) Emission Reductions vs Metrics – The objective of the CEA is emission reduction irrespective of the metrics applied and the SIP design needs to allow for flexible application of performance criteria over time. As noted above, the PJM emissions reporting system is retrospective, not prospective. As such, the PJM system is only capable of reporting the historical marginal emission rate not the next future marginal rate and not the weighted marginal rate that allows for the proportion of non-emitting supply. Thus, using the historical data to make future dispatch decisions that are then measured retrospectively could effectively penalize storage providers for taking decisions prudent at the time they made.

b) Market Price Signals - For the PJM market as it exists today the most accurate measure of performance in emission reductions would be simple market price of the power product inclusive of DA reserve products. For instance, holding storage capacity in reserve, and thus NOT running in the energy market based on PJM emission signals at any given interval, might be the most efficient means of GHG emission reduction overall.

c) Charging Energy – a simpler way to ensure storage is not aggravating overall emission rates might be to focus on the charging side of the storage cycle. If the charging supply of energy is low or zero emission then regardless of the time or manner of its discharge it remains low or zero emission supply. Obtaining the optimal balance between market based charging and overall emission rates is difficult, and one successful storage program has based it simply on time-of-day charging[4]. For instance, careful application of the predicable offshore wind generation profiles and the inevitable real time curtailment of some of that generation (due to congestion or simple over-supply) could provide a charging profile based on the daily load curve.

d) Location Energy Price Impact and Emission Reductions – All supply resources interconnect at a certain physical point and are dispatched in relation to that node. However, the value of that supply both in terms of

[3] FERC's recent approval of the PJM Tariff changes for interconnection procedures will increase the upfront cost of interconnection applications dramatically.

[4] The Massachusetts Clean Peak Standard stipulates charging times in the day based on likely solar and wind energy generation profiles.

energy cost as well as its attributes such as emissions is experienced across a much wider area. The value of storage say as a reserve resource in one location may facilitate the supply of non-emitting energy elsewhere, but that value cannot be captured via the node into which that storage resource dispatches[5]. For instance, in 2021 Cogentrix undertook a third party production cost analysis of storage resources at Lakewood, NJ in the context of the 2021 PJM RTEP NJ SAA in support of OSW.[6] At the point in time the study was undertaken the physical PJM market revenue realized at the Lakewood node was not sufficient to sustain the storage project; however, the value of energy savings measured across all of NJ when combined with the physical market revenue would have sustained the project. And in the production cost simulation, this project caused a reduction of approximately 35,000 tons in CO_2 emissions. Unfortunately, absent a program such as the SIP there is no way for an individual supplier to realize that value.

4. Support deployment of energy storage devices interconnected to the transmission or distribution system of a New Jersey EDC;

a) While all storage under the SIP will be interconnected to either the transmission or distribution utility within New Jersey, the most cost-effective solutions will be achieved with storage that can participate in the PJM wholesale market. Wholesale market revenues, as one of the main revenue sources, are a key component within the overall storage value stack. The least cost solution for consumers will be derived from energy rates reduced by load-shifting of low(er) and zero-marginal cost renewable energy.

5. Grow a sustainable energy storage industry that gradually requires decreased incentives to deploy additional storage resources, in order to ensure that the benefits of energy storage last well beyond the term of this initial program;

a) Storage assets on the ground in New Jersey will serve to price in the externalities of emission as well as the arbitrage value of simple load-shifting. It is clear that PJM as a whole is transitioning to a new paradigm of zero marginal cost supply and by leading that process New Jersey will ensure that the benefits of storage will accrue to New Jersey rate payers for years to come.

6. Support overburdened communities with energy resilience, environmental improvement, and economic opportunity benefits derived from energy storage; and

a) This needs to be evaluated on a case by case basis; a community

[5] A simple price on CO_2 would minimize or eliminate this disparity, but that is not the focus of this proceeding.
[6] 2021 PJM Regional Transmission Expansion Plan under the State Agreement Approach in support of NJ's procurement of offshore wind supply resources.

defined as "overburdened" community might prefer to retain certain aspects of existing energy infrastructure for purposes of retaining the property tax revenues. Incenting existing resources to participate in the transition will provide tangible economic and environmental benefits to existing host communities.

b) At a minimum, there needs to be a carve-out for existing facilities to the extent that their adaptive reuse actually improves quality of life in those communities:

(1) Improvement in local air quality resulting from reduction of fossil-fired generation caused by newly installed, co-located grid-scale storage devices that discharge preferentially to existing turbines,

(2) Potential view-shed improvement resulting from possible removal of certain generation equipment,

(3) Continued or increased property tax revenues.

7. Encourage storage deployment that accelerates the clean energy transition, including facilitating deployment of renewable energy, electric vehicle or other DERs.

a) Clearly, emission reductions ensuing from the electrification of other sectors o NJ's economy are dependent on a clean grid. Just as NJ has established some of the nation's leading solar and offshore wind programs, facilitating deployment of Grid Supply storage resources will ensure that NJ realizes all the benefits of emission-free energy.

8. Establish a Program Administrator at the BPU who would oversee the efficient implementation of the program and stay current on all technology and processes used for energy storage.

a) As a general rule, minimizing the need for additional administrative apparatus and its associated costs to consumers should be considered as a principle for the SIP.

Conclusion:

Cogentrix appreciates the BPU's consideration of these comments. We support NJ's transition to a clean grid and look forward to partnering with the state in this endeavor. For the Grid Supply component we prefer to see a competitive "pay-as-bid" procurement structure for long-term contacts that will be incentivized to derive maximum revenue from the PJM market while being compensated to load-shift energy from lowest price and / or lowest emission periods.