September 11, 2023

Sherri L. Golden, Secretary of the Board
State of New Jersey Board of Public Utilities
44 South Clinton Ave., 1st Floor
PO Box 305
Trenton, NJ 08625

RE: Docket No. QO22080540; In the Matter of the New Jersey Energy Storage Incentive Program

Dear Ms. Golden,

Alternative Energy Systems Consulting, Inc. (AESC) is submitting these comments to the New Jersey Board of Public Utilities in response to the Request for Information regarding the Straw Proposal on the New Jersey Energy Storage Incentive Program (NJ SIP).

Founded in 1994, Alternative Energy Systems Consulting, Inc. (AESC) is an energy engineering and consulting firm that delivers solutions in energy efficiency, renewable energy, and software for utilities, governments, and the private sector. AESC combines technical excellence, integrated demand side management experience, and a broad skillset to provide a complete suite of engineering and management services. AESC's 70+ person team includes engineering and program experts in energy efficiency, distributed energy resources (DERs), demand response and load management, measurement and verification (M&V), codes and standards, and emerging technologies.

AESC played a key role in the initial design and implementation of California's Self-Generation Incentive Program (SGIP) a regional program administered jointly the Working Group which is comprised of members from the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), the four CA investor-owned utilities (IOUs), and the Cetner for Sustainable Energy (CSE). Currently, AESC is the primary consultant to the SGIP Working Group providing technical comment on impactful CPUC legislation, developing, and revising the SGIP handbook to accurately represent program rules and updates, reviewing new technologies for inclusion in the program, and providing engineering support for public workshops. Since the program's launch in 2001, AESC has completed thousands of incentive application reviews and equipment verification field inspections, making us the longest-serving and best-informed utility program customer generation inspection contractor in California. Additionally, AESC developed and maintained web-based incentive calculation tools to support applications for solar PV systems.

Responses to the questions posed in the Request for Information were provided by AESC's Senior Manager Engineering, Dara Salour. Mr. Salour has 32 years of experience in the energy industry, and currently manages AESC's decarbonization practice. As part of his Program Management responsibilities, he oversees application reviews and inspections for the SGIP and California Solar Initiative (CSI) Thermal Program. Mr. Salour has worked with local and state governments to plan and scope energy resiliency solutions including energy efficiency, microgrids, interconnection hubs, and back-up generation. He was responsible for the economic life cycle assessment of distributed generation technologies for the AmerenUE integrated resource plan. Mr. Salour has also worked on the environmental life cycle assessment of distributed generation technologies such as wind, biogas, fuel cell power, and energy storage. Mr. Salour has conducted training sessions for Pacific Gas and Electric's Pacific Energy Center on energy resiliency and energy storage. He is a Professional Engineer and holds an MBA from Arizona State University, a Master of Science in Mechanical Engineering from University of California, Davis, and a Bachelor of Science in Mechanical Engineering from California State University, Sacramento.

AESC appreciates the opportunity to provide input on the design of this program.

Sincerely,

Antonio Corradini, PE
CEO and Principal Engineer

Responses to the Request for Information

1.0 Utility Ownership/Dispatch Control

The Straw "does not propose to allow for utility ownership or operation of devices," but notes that "EDCs will play a key role in building the grid infrastructure necessary to enable the effective dispatch of energy storage devices." This proposal was intended to encourage private ownership and operation of energy storage devices and the development of a robust energy storage sector in New Jersey's restructured competitive market.

1.1 What are the advantages and disadvantages of utility control versus non-utility control of energy storage systems?

Response: Utility control enables more effective participation in demand response programs from a utility perspective. It also enables more effective participation in ancillary markets such as frequency and voltage regulation when the energy storage systems are aggregated. This could have benefits for both the customer and the utility.

Non-utility control means that aggregators will have to take on the role of the utility in finding customers willing to participate in demand response programs and ancillary markets and then controlling the energy storage systems based on signals from the utility. The costs of the installation and the benefits of participation would need to be shared between the customers and the aggregators.

1.2 For Distributed resource Performance-based Incentives, should responding to a utility signal be compulsory or voluntary?

Response: It depends on what the performance metrics are. If the metrics are demand reduction and energy arbitrage then no, response to a utility signal should not be mandatory, it should be voluntary.

If the metric is providing grid support or greenhouse gas reduction, then responding to a utility signal should be compulsory.

1.3 For Grid Supply resources Performance-based Incentives, should responding to a market signal be compulsory or voluntary?

Response: It should be compulsory.

2.0 Installed Storage Targets, Deployment Timelines and Capacity Blocks

The Straw set annual installed energy storage targets that increase over time (see section V. D. of the NJ SIP Straw Proposal for details).

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2.1 How should capacity blocks be structured and proportioned, both within each component of the NJ SIP (Grid Supply and Distributed) and relative to each other?

Response: Capacity blocks should be structured and proportioned based on congestion on the distribution system. The size and location of the capacity blocks can be based on the locational marginal price of electricity on the distribution grid.

2.2 Should the proposed first-come, first-served application process be changed to a "First-Ready, First-Served" process?

Response: It should remain as first-come first-served with a window of 18 months for the projects to be completed. It should allow for no more than two or three six-month extensions based on extenuating circumstances.

2.3 How should the program be designed to avoid or minimize interconnection delays? Should the interconnection process be modified for accommodating energy storage and if so, how?

Response: It is important to have permission to operate from the interconnection department as part of the application incentive claim process. However, the interconnection process should be modified to accommodate energy storage by allowing the simultaneous submittal of the project single line diagram and the building inspectors report to the program and to the utility interconnection department. It would also be beneficial to allow one common inspection of the project for both the interconnection department and the energy storage program.

3.0 Incentive Structure

The NJ SIP incentives are proposed to be comprised of two incentive payments, a Fixed Incentive and a Performance-based Incentive (see section V. E. of the NJ SIP Straw Proposal for details).

3.1 Incentives are meant to cover a portion of the fully installed cost of an energy storage system. What is the fully installed unit cost (in $/kWh) for energy storage systems at present, and estimated to be each year through 2030? How do New Jersey-specific costs vary from these estimates? Please provide links to your references.

Response: Fully installed unit cost for energy storage in California is around $1.25/kWh today. This can be escalated with the projected inflation rate over the next 7 years. AESC does not have access to New Jersey specific costs at this time.

3.2 What are the best public data sets for energy storage costs?

Response: The California SGIP public reports.

3.3 Should Fixed Incentives be assignable to an aggregator? Why or why not?

Response: Yes. This would provide an incentive to aggregators to go out and sell projects resulting in a proliferation of projects throughout the state. Aggregators can reap the benefits of participation in ancillary markets and demand response on a much larger scale than individual customers. This financial benefit can also be shared with their customers providing a winning proposition for the aggregator, their customers, and the State of New Jersey.

3.4 Should a Distributed energy storage resource that can provide grid services have the ability to opt in to either the Grid Supply or the Distributed storage program, for both the Fixed and Performance-based incentives?

Response: Yes. We think it is best to provide multiple options so that each developer can select the option that best fits their business model.

3.5 The Straw proposes the use of the PJM Marginal Emission Rate ("MER") signal as a basis for Performance-based Incentives for Grid Supply energy storage systems. Is or will the PJM MER be sufficiently developed to use to calculate NJ SIP Performance-based Incentives?

Response: If the marginal emission rate is being used to time charging and discharging of the energy storage systems in order to reduce greenhouse gas emissions, then yes, the PJM MER can be used to calculate the amount of greenhouse gas reduction over the course of the year for each project and the performance-based incentive can be paid out on a $/kg CO2 reduced basis.

3.6 Is there a different methodology that can be used to determine Performance-based Incentives, such as a Peak Demand Reduction program?

Response: Yes, if you establish a baseline for energy consumption within a building using 15-minute (or even hourly) electricity consumption data for one year, and you determine that the load in the building is primarily driven by temperature (i.e., dominated by HVAC loads) then you can establish a correlation between building load and ambient temperature using regression analysis. Once this correlation is established it can be used as a baseline in subsequent years once the energy storage system is installed to determine the amount of peak demand reduction on a daily basis. The daily reduction can be used to pay out the performance-based incentive on a $/kW basis.

3.7 If a Peak Demand Reduction program were to be developed, how should it be structured? What other states have similar programs that New Jersey should use as a benchmark?

Response: Please see response to question 3.6. In the California SGIP, the performance-based incentive is paid based on kWh discharged by the battery on an annual basis. Since commercial/industrial customers are on Time of Use rates most of their discharges occur during peak periods to reduce energy and demand charges.

3.8 What degree/percentage of Peak Demand should be targeted for reduction? What effect would such a program have on GHG emissions?

Response: We think it would be reasonable to target a 30-40% peak demand reduction. The effect on GHG emissions depends on how closely peak demand is correlated with GHG marginal emission rates. An analysis of this would need to be done for New Jersey.

3.9 The Straw proposed that each EDC establish its own level of Performance-based Incentives. Should EDCs establish EDC-specific performance incentives, or should the incentive be standardized and common to all EDCs?

Response: In order to maximize grid support, it may be beneficial to establish EDC-specific performance incentives based on the locational marginal price within their distribution systems.

3.10 Should energy storage owners be permitted to opt in, or be subject to utility control, in order to be eligible for Distributed performance incentives?

Response: They should be allowed to opt in.

3.11 How should incentives be structured for thermal storage systems?

Response: Thermal energy storage systems should be based on kW or kWh offset. If for example, a thermal energy storage system is offsetting the compressor energy consumption for an air conditioning system, the methodology explained in the response to question 3.6 should be used to establish a baseline and calculate the performance-based incentive.

3.12 Under what circumstances, if any, should Distributed resources be able to opt-in to Grid Supply Performance-based Incentives?

Response: There should be a capacity limit, for example 100 kW, below which distributed resources should not be allowed to opt into grid supply performance-based incentives. If however, an aggregator is able to aggregate a number of small projects so as to exceed the capacity limit they should be allowed to opt in.

3.13 Large projects and long duration projects have the potential to qualify for significant incentives. Should incentive caps be applied in this program? If so, how (for example, by customer, project, developer, duration or meter), or other method?

Response: The incentive structure should be tiered. For example, the first 2 MWh of energy capacity can be at a higher incentive. Then from 2 MWh to 4 MWh the incentive can be reduced by half of the original incentive. Then from 4 MWh to 6 MWh the incentive can be reduced to a quarter of the original incentive. Energy capacity beyond 6 MWh will not receive an incentive. This approach will incentivize large and long duration projects while at the same time preserving funds for smaller projects.

3.14 Should a cap be set such that the sum of federal and state incentives does not exceed a certain amount? If so, please provide details.

Response: The cap should be the total eligible project cost. Eligible costs should include design, installation, permitting, interconnection, commissioning, and metering and monitoring costs.

3.15 What provisions should be included in the program for monitoring, reporting and evaluation in order for deployed projects to maintain eligibility for incentives that are paid over time?

Response: Monitoring and reporting should be done for 5 to 7 years after installation and commissioning. Monitoring should be done by eligible performance data providers (PDP). These PDPs should apply to the program for approval. Project developers should also be eligible to apply to become their own PDPs.

3.16 How can BPU structure NJ SIP Performance-based Incentives to both promote value stacking and prevent double compensation?

Response: BPU can structure NJ SIP incentives so that there is a cap for the total incentives paid out for the project that does not exceed the total eligible project cost. In addition to which the NJ SIP should require applicants to report other incentives and subtract them out from the NJ SIP incentive while observing the cap.

Value stacking will naturally occur by developers pursuing demand charge management, energy arbitrage, demand response, and other grid services within their operational plans.

4.0 Overburdened Community Incentives

The Straw proposed three methods to support OBCs with energy storage incentives.

- An incentive adder in kWh
- A separate incentive block
- An additional up-front incentive

4.1 Staff is considering establishing both an adder and a capacity block for OBCs. What size should the capacity blocks be over time as a percentage of the overall Distributed segment? How much should the adder be in 1) $/kWh or 2) as a percentage of the base incentive?

Response: The capacity blocks for OBCs should be no less than 30% and no more than 60% of the overall distributed segment. AESC's recommendation is to start with 30% and see what kind of participation there is. If participation is high, then you can raise the percentage closer to 60% during the next funding cycle.

The adder should be no more than $0.85/kWh.

4.2 How can BPU assure that the incentive structure chosen will in fact provide benefits to OBCs?

Response: To do that you have to ensure participation, which means to structure the eligibility criteria in such a way that overburdened communities can easily participate. In addition, it would be beneficial to educate, collaborate, and coordinate with community-based organizations that can help overburdened community members apply for the incentives.

5.0 5.0 Other Questions

5.1 What actions, if any, should BPU take to improve access to the energy storage value stack as part of implementing the NJ SIP?

Response: It is important to recognize that if aggregators and larger customers are providing ancillary services like frequency regulation and voltage regulation with their energy storage systems to PJM, that the timing of these services may not coincide with optimizing charge/discharge cycles to reduce greenhouse gas emissions.

Therefore, it is imperative that the BPU have a clear understanding of what its priorities are with respect to the operational impacts of energy storage systems it is incentivizing, so that it sends clear signals to developers, as this will impact the economics of their projects and ultimately the success of the NJ SIP.

5.2 How will Federal Energy Regulatory Commission ("FERC") Order 2222 affect New Jersey's energy storage market? What changes should the Board make to the NJ SIP to take advantage of PJM's pending implementation of FERC Order 2222?

Response: It should allow aggregation of energy storage systems to meet the minimum participation capacity size set by the order.

5.3 Are modifications to the NJ SIP needed to maximize the ability of energy storage developers to access federal investment tax credits or other federal incentives?

Response: The NJ SIP should account for the taking of the federal investment tax credit by developers in the calculation of its incentive.

5.4 What provisions, if any, should be established for interconnection of zero-export energy storage facilities (that is, energy storage facilities that do not inject power back into the grid and only supply power to on-site load)?

Response: The capacity of the energy storage systems in kilowatts should be less than the peak demand of the facility it is serving over the previous twelve months.

5.5 What specific best practices regarding rates and tariffs from other states should be incorporated?

Response: In California's SGIP all new residential energy storage systems regardless of system size must have a single cycle round trip efficiency (SCRTE) of 85% or greater. Additionally, all new residential customers are required to enroll in a time-varying rate with a peak period starting at 4 pm or later and with a summer peak to off-peak price differential of 1.69, if such a rate is available. SGIP eligible customers may not utilize time-of-use (TOU) bill protection measures.

These measures were adopted based on modeling of residential energy storage systems in order to ensure adequate greenhouse gas emission reductions.

5.6 Should energy storage be utilized and compensated in the Triennium 2 Energy Efficiency /Demand Response proceeding as an allowable Demand Response resource? If so, what changes, if any, should be made to the NJ SIP design to avoid potentially providing double compensation for the same service?

Response: No comment.

5.7 How should energy storage systems be metered and measured? Can an inverter serve this function? What role should advanced metering infrastructure ("AMI") play in the NJ SIP?

Response: For larger than 10 kW energy storage systems deployed at commercial/industrial facilities external revenue grade meters that meet the accuracy standards of ANSI C12.2 should be deployed.

For residential energy storage systems smaller than 30 kW in size inverter-based metering should be sufficient.

Utility AMI should not play a role in the metering and monitoring of the charge/discharge cycles of the energy storage systems.

5.8 Please provide any other comments on the NJ SIP.

Response: No additional comments.

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