Docket No. QO22080540, IN THE MATTER OF THE NEW JERSEY ENERGY STORAGE INCENTIVE PROGRAM

December 12, 2022

New Jersey Board of Public Utilities
Acting Secretary of the Board
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Submitted electronically to Docket No. QO22080540

Re: Docket No. QO22080540: Public Comments of Form Energy in response to New Jersey Energy Storage Incentive Program Straw Proposal

Dear Board Secretary,

Form Energy, Inc. ("Form Energy") appreciates the opportunity to comment on the New Jersey Storage Incentive Straw Proposal (SIP Program). Energy storage technologies can provide a range of services that can benefit customers and help New Jersey achieve its greenhouse gas reduction goals. Incentives like those proposed by the Board of Public Utilities (BPU) staff have the potential to accelerate the timeframe for storage technologies to deliver these public benefits. To improve the ability of diverse storage classes to access the SIP Program, Form Energy encourages the BPU to establish storage incentive program procurement targets specifically for long-duration storage (8-24-hr duration) and multi-day storage (>24-hr storage), in addition to short-duration targets. This program change will help build a more diverse storage portfolio in New Jersey, which several studies have identified can lower both electric system costs and greenhouse gas emissions.

About Form Energy

Form Energy, Inc. ("Form Energy") is a U.S. energy storage technology and manufacturing company that is commercializing a new class of multi-day energy storage systems that will enable a reliable and fully renewable electric grid year-round. Our first commercial product is an iron-air battery capable of continuously discharging electricity for 100 hours at a total installed cost per unit of energy that is less than 1/10th of today's lithium-ion battery technology. Form's battery can achieve these low costs by using iron, one of the most abundant and cheapest

minerals. Our iron-air battery is modular, safe, and can be sited anywhere on the grid. Form's first project will be a 1.5 MW, 150 MWh pilot project with utility Great River Energy in Minnesota. This pilot project will demonstrate the repeatable, scalable building block of our system, and how it can provide firm energy delivery to address grid reliability needs. We expect this project to go online in 2024, immediately followed by larger systems with partners across the country.

Multi-day storage is a diverse resource class that includes iron-air batteries like Form's, as well as hydrogen energy storage, thermal storage, compressed air energy storage, and other novel technologies. In addition to being able to provide guaranteed firm energy delivery at rated capacity over consecutive days, multi-day storage can also provide other benefits and services to the grid, including: flexible, dispatchable capacity to provide hourly and sub-hourly load balancing; rapidly-deployable solutions to uneconomic grid congestion and renewable energy curtailment; resilience for critical loads; black start and other ancillary services; and a physical hedge to protect market participants and retail customers from price shocks.

Create separate procurement targets for short-duration, long-duration, and multi-day energy storage

Form Energy recommends that the BPU create separate and equal procurement targets for short duration, long-duration, and multi-day energy storage resources. We encourage BPU staff to work with energy storage companies and storage trade organizations to further define these categories, and we provisionally propose that the BPU classify short-duration resources as those with durations <12 hours, long-duration storage as those with durations between 12 and 24-hrs, and multi-day storage as >24-hr duration storage resources. We anticipate these classifications will align both with distinct grid needs and with technology divisions designed to meet these needs.

The straw proposal rightly indicates that it should weigh three factors: expected storage cost declines; the many benefits of quickly scaling storage; and the need to gain operational experience in New Jersey. New Jersey can balance these factors and build a broad storage portfolio needed to cost-effectively achieve its greenhouse gas reduction goals by cultivating diverse storage classes from the beginning of the program.

If the BPU seeks only four-hour storage in the first program years, it will not have any experiential basis to further evaluate other classes of storage, which, as the straw proposal notes, can have significantly different cost structures and provide different grid services. Specific goals to support long-duration and multi-day energy storage can help New Jersey build a market for multiple storage technology classes and avoid the promotion of one specific technology class over others.

A growing body of analysis is available to help the BPU characterize both long-duration and multi-day energy storage resource classes and to understand their benefits to New Jersey. These analyses show that to achieve grid decarbonization goals, states must cultivate a diverse

portfolio of storage classes that together provide the firm dispatchable capacity needed to replace fossil-fueled power plants and maintain grid reliability.

A study by McKinsey for the Long Duration Energy Storage (LDES) Council illustrates the different $/kW and $/kWh cost structures of different 8-24-hr and >24-hr storage archetypes.[1] Another study of long-duration storage needs in California highlighted that having a portfolio of diverse storage classes, including short-duration, long-duration, and >24-hour multi-day storage, could enable California to accelerate its greenhouse gas reduction goals, lower overall needs for new generation resources, and eliminate existing fossil-fueled resources at cost-parity with existing state policy goals, with additional benefits including an 80% reduction in renewable curtailment and reduced land-use impacts to achieve clean energy goals.[2]

The variety of use-cases, applications, and benefits that can be provided by energy storage technologies with substantially longer durations than four hours demonstrates the importance of complementing the SIP Proposal with goals and incentives specifically for long-duration and multi-day energy storage.

Considering that New Jersey has not yet conducted a study of long-term storage needs that includes emerging long-duration storage technologies, Form Energy recommends that the BPU initially establish co-equal procurement targets for short-, long-, and multi-day storage on a MW basis, and then adjust these targets over time as the state gains experience with these different resources. We likewise recommend that the BPU avoid setting a single MWh target, which has little physical significance absent additional analysis. For example, an 8,000 MWh target would equate to only 80 MW of Form Energy's 100-hr storage system.

Increase procurement quantities for initial program years, and accelerate procurement

Form Energy recommends that the BPU increase procurement quantities in the initial program years and seek to contract at least 200 MW of storage annually from 2023 through 2028. New Jersey's storage target seeks to "achieve" 2,000 MW of storage by 2030, which the BPU correctly interprets to mean that its programs should result in 2,000 MW being *installed* by 2030. As the BPU indicates in the straw proposal, storage projects may require three years from the time of executing a storage incentive until a commercial online date. Considering this time-lag, Form Energy recommends that the BPU accelerate the proposed annual procurements such that it contracts for a minimum 1,000 MW of grid supply and distributed storage by the 2027/2028 program year.

Form Energy accordingly recommends that the BPU create annual procurement quantities of at least 200 MW per year, from 2023/2024 through 2027/2028. This flat structure will provide for

[1] *See* "Net-zero power: Long duration energy storage for a renewable grid," November 2021, available at https://www.ldescouncil.com/assets/pdf/LDES-brochure-F3-HighRes.pdf

[2] *See* E3's "Assessing the Value of Long Duration Energy Storage" presented at the California Energy Commission's March 29, 2022 workshop, available at https://www.energy.ca.gov/event/workshop/2022-03/staff-workshop-research-assess-long-duration-energy-storage-deployment.

competition in the early years while providing increased market certainty necessary to attract project developers to make the financial investments necessary to build project pipelines in New Jersey.

We appreciate New Jersey's leadership in supporting the energy storage industry and advancing progress towards a clean energy future, and we look forward to continuing to support BPU staff in developing this impactful incentive program.

Sincerely,

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