
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Case 18-E-0130 – In the Matter of Energy Storage Deployment Program.

March 20, 2023

AES Clean Energy Development, LLC (“AES”), submits these comments in response to New York State Energy Research and Development (“NYSERDA”) and the New York Department of Public Service’s (“the Commission”) publication, *New York’s 6 GW Energy Storage Roadmap: Policy Options for Continued Growth in Energy Storage*¹ (“Roadmap”) on December 28, 2022. AES is committed to renewable energy in New York and the success of the Climate Leadership and Community Protection Act (“CLCPA”). AES commends the work of NYSERDA staff and New York Department of Public Service staff in their efforts in drafting a thorough Roadmap. As New York diversifies the portfolio of clean energy technologies available to meet the CLCPA goals, AES recognizes the vital role of energy storage in the energy transition. AES encourages the Commission to urgently approve the Roadmap and codify the expanded 6 GW of energy storage by 2030 goal. In addition to offering these comments, AES supports the comments submitted concurrently by the Alliance for Clean Energy – New York (“ACE NY”) as well as New York Battery and Energy Storage (“NY BEST”) in this proceeding.

I. Background on AES Clean Energy

AES was founded in 1981 and is a U.S.-based Fortune 500 global energy company with headquarters in Arlington, Virginia and offices in many locations in the U.S., including New York City. AES owns and operates a portfolio of more than 4.4 GW of renewable energy projects including more than 400 utility-scale and community solar, wind, energy storage and hybrid projects across 21 states. With more than two decades of experience working in New York, AES operates 60 projects with approximately 852 MW of nameplate capacity. AES’s development portfolio in New York includes more than 2 GW of utility-scale solar, 50 MW of community solar, and 400 MW in storage capacity. AES owns and operates Valcour Wind, a portfolio of 612 MW of operating wind projects. AES is motivated to lead the industry in developing and growing solutions that will enable the transition to carbon-free sources of energy and achieving the Climate Leadership and Community Protection Act (“CLCPA”) goals of 70% of the State’s electricity generated by renewable energy sources by 2030 and 100% zero emission energy by 2040.

II. Energy Storage Procurement

AES applauds the Roadmap’s nuanced approach to achieving the 6 GW energy storage goal in New York. A successful energy storage procurement should not simply be defined as the least cost method to reach the

¹ New York Department of Public Service and NYSERDA. New York’s 6 GW Energy Storage Roadmap: Policy Options for Continued Growth in Energy Storage.

<https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7D4753BA-916B-483E-9E35-6749B20384A6}>.

6 GW goal. A successful energy storage program in New York will replace fossil fueled “peaker” plants, provide immediate and long-term benefits to reliability, ensure renewable energy can be the primary source of electricity, and provide long-term savings to rate payers. These crucial needs should be considered as “non-price” factors in NYSERDA’s evaluation of energy storage projects.

NYSERDA should consider the procurement criteria its most recent Tier 1 request for proposal (“RFP”) on September 21, 2022, to inform its upcoming energy storage Implementation Plan and subsequent RFP. To meet the 6 GW of energy storage goal, NYSERDA needs to select the energy storage projects that demonstrate a clear and transparent plan for success based on price and non-price factors. Project attrition will hinder New York’s ability to meet its energy storage goals. Energy storage projects that are mature and well thought out will be less likely to experience attrition. Given the tight timeline for the energy storage program, NYSERDA should carefully consider how to create successful procurement criteria.

AES offers suggestions for NYSERDA to consider in its future energy storage RFPs. Bidders should:

- Offer a comprehensive, transparent analysis of strike price including a thorough analysis of basis and optimization/revenue assumptions such as day-ahead energy, real-time energy and ancillary services. NYSERDA needs to be able to evaluate if all bidders have a similar view of the future and are not relying on historical data;
- Present reasonable assurance that the project is bid ready. Challenges, like cost of batteries, can radically change the assumptions of a project. If the project cannot present reasonable assurance that the project is bid ready and has evidence for its capital expenditures costs by a certain date after being awarded the project, NYSERDA should consider removing or canceling the project;
- Explain their market participation strategy in the wholesale market;
- Demonstrate their operating experience, perhaps through an Operation and Maintenance Plan which would include how mechanical issues would be handled;
- Provide evidence of technological feasibility and benefits of the battery technology;
- Show progress on environmental planning including outreach and coordination with local fire departments, local permitting and site control; and
- Explain the projects’ benefits to disadvantaged communities (DACs), as required by the CLCPA.

III. Questions for Stakeholder Comment

- a. Should action be taken on the remaining JU Bulk Storage Dispatch Rights procurement requirement? Numerous utilities have yet to fulfill their requirement from the 2018 Storage Order and NYSERDA and DPS Staff are currently assessing the ramifications of future programs on these procurements.

AES believes that NYSERDA should act on the remaining JU Bulk Storage Dispatch Rights procurement requirement. As noted in the Roadmap, numerous utilities have not fulfilled their requirements from the 2018 Storage Order and, to date, only 120 MW of utility energy storage projects have been awarded and contracted² through the utility bulk storage dispatch rights procurement. When NYSERDA calculated how many remaining GW of energy storage projects needed to be procured, it assumed that the 1300 MW of deployed, contracted, and awarded storage projects (including 130 MW of installed projects) would all become operational.³ If there are delays or issues with the awarded and contracted projects, including those of the utilities, NYSERDA will not have set up its procurement schedule (1 GW of bulk storage per year in

² Roadmap at p. 11.

³ Roadmap at p. 11, Table 1.

2024, 2025, 2025)⁴ correctly and will need to adjust. NYSERDA should consider strict parameters for removing or canceling awarded projects. The Commission has approved extensions to in-service dates from December 31, 2022, to December 31, 2025. However, if there are further delays, the corresponding storage capacity will not be available when anticipated and, therefore, there would be MW that are not accounted for in future NYSERDA procurements. This would hinder the ability of New York to meet the goals of the CLCPA.

AES supports the Commission's previously established position on utility ownership of energy storage as outlined in the Commission's, *Adopting Regulatory Policy Framework and Implementation Plan REV Framework Order*.⁵ Given the challenges of utility-led procurements, which also are seen as unfavorable to developers, NYSERDA should build flexibility into their energy storage procurements to compensate for any utility-led projects that are not viable.

- b. What methods should be used in each program to attract storage projects in preferred locations and durations? For example, should procurements seeking 8-hour duration assets utilize a TB8 mechanism, or should all resources compete with the same reference prices in the same solicitations? What impacts do duration or location carve-outs have on competitive procurements?

AES encourages NYSERDA to be flexible in its procurements and believes that specific carve outs should be required for location and duration based on cost and reliability considerations.

For location, AES understands that the Roadmap's locational allotment of 40% in New York City, 25% in Long Island and 35% spread evenly around the rest of the state in 1 GW/year increments from 2024-2026,⁶ is an estimate and might need to be adjusted to ensure downstate energy storage needs are met. AES suggests incorporating a +/-10% margin to those locational targets based on reliability needs and a fundamental analysis. AES encourages forward looking policies and procurement for energy storage not only to meet the needs in 2030, but beyond 2030 beyond as well. As discussed in the long-duration storage (LDS) responses below, 4-hour and 8-hour duration energy storage will be a part of the energy transition in New York, while future procurements also will incorporate other technologies and durations.

AES agrees with the Roadmap that the considerations for location are cost, emissions impacts and reliability.⁷ AES also agrees with the Roadmap's assessment that "energy storage deployed in the right areas of the electric grid has the potential to reduce the cost of operating and balancing the grid while integrating renewable resources more efficiently by increasing deliverability and reducing curtailment. This Roadmap is focused on ensuring future programs consider the incremental benefit that arises from certain projects and target deployment of the highest-value projects."⁸

The Roadmap discussed creating allocations or carve-outs that would allocate a given amount of the targeted procurements to projects based on factors such as duration or geography.⁹ AES agrees that carve-outs should be used and suggests that projects that will be located in the same carve-out should be further grouped for competitive selection based on the New York Independent System Operator ("NYISO") New

⁴ Roadmap at p. 98.

⁵ New York Public Service Commission, Order Adopting Regulatory Policy Framework and Implementation Plan, Case 14-M-0101 (February 26, 2015).

⁶ Roadmap at p. 98.

⁷ Roadmap at p. 61.

⁸ Roadmap at p. 61.

⁹ Roadmap at p. 50, 61-62.

York Control Area Load Zone (“zone”) in which they will be located for several reasons.¹⁰ First, the Roadmap explained that “the cost to deploy energy storage is not the same across geographies; local land costs, taxes, interconnection, etc., may all cause similarly sized projects to have dramatically different costs and development timeframes.”¹¹ Project costs also differ among the zones, which are spread throughout the state. Comparing costs of projects from different zones would make project selection challenging because it would not be a direct comparison and it would be harder to highlight the benefits and advantages of the projects in distinct locations. A geographic carve out that also reflects zonal location would better enable NYSERDA to compare different projects.

It may be appropriate in certain zones to establish a maximum plant size to encourage geographic diversity within the zone. Diversity of project size would avoid a single point of failure scenario in case there is project attrition, making the 6 GW goal harder to meet. Size diversity would support reliability needs and consider N-1 contingency situations that might arise if large storage projects that are intended to provide needed relief to the grid are not able to provide that support. AES also agrees that “each of the location-based consideration and values of energy storage must be evaluated thoroughly by NYSERDA, NYISO and the utilities.”¹²

In the Index Storage Credit (ISC) Program Design Considerations section of the Roadmap, NYSERDA points out that reference capacity price varies between control areas.¹³ This disparity supports the recommendation that zones not be compared against each other in the review process. AES supports the ISC procurement option and agrees with the Roadmap’s assessment that the ISC would be the most feasible, create long-term certainty and increase financing opportunities, and its compatibility with the market.¹⁴

For duration, AES encourages NYSERDA to compare the same durations against each other in their own carve out. 4-hour and 8-hour durations support different functions on the grid and should be treated as such. AES suggests that round-trip efficiency (“RTE”) be included in the reference energy arbitrage price (REAP) calculation. Energy storage systems have RTE less than 100%, so some spreads will not be sufficient to generate positive arbitrage revenue. If an RTE factor is not incorporated, the REAP calculation may include hours where the arbitrage spread is only 10-15 %. In that case, the REAP will erroneously assume revenue that is unrealizable for most energy storage systems. AES agrees with NY-BEST’s suggestion that the RTE factor be a uniform assumption that is part of the monthly ISC calculation.

If NYSERDA does not meet its proposed trajectory to procure 2 GW of 4-hour duration storage installed evenly from 2028-2030 and 1 GW 8-hour duration storage to be installed in 2030,¹⁵ it should consider additional future procurements with specific duration-based carve outs to ensure that energy storage projects can adequately compensate for the increased renewable generation on the grid. The post-2030 energy storage needs will continue to increase - the Roadmap predicts that New York will need 6.8 GW of 8-hour storage by 2050,¹⁶ and that Zone J alone will require approximately 4.7 GW of energy storage by 2050.¹⁷ Thus, if longer duration storage will be more and more necessary, NYSERDA should consider the

¹⁰ New York Independent System Operator.

https://www.nyiso.com/documents/20142/1397960/nyca_zonemaps.pdf/8c3807e1-5bab-ab44-3c71-2c8e61b5748b

¹¹ Roadmap at 61.

¹² Roadmap at p. 61.

¹³ Roadmap at p. 54.

¹⁴ Roadmap at p. 46.

¹⁵ Roadmap at p. 98.

¹⁶ Roadmap at p. 31.

¹⁷ Roadmap at p. 79.

role of 4-hour duration storage, as a place holder for longer duration storage that will be used in the long-term and adjust their procurement expectations accordingly for future procurements.

- c. For programs supporting bulk and off-site retail projects, how should incentive programs and procurements be best designed towards ensuring that at least 35% of proposed program funding is utilized to benefit disadvantaged communities and drive peaker plant emissions reductions, beyond a program focus on Zone J as proposed in Section 7.2?

AES agrees that DACs should realize the benefits associated with at least 35% of proposed program funding for the 6 GW of energy storage projects that will be procured by NYSERDA to comply with the CLCPA, and for the economic, health and social welfare benefits for New York. In each annual procurement, NYSERDA should aim for 35% of the projects to benefit DACs. If these DAC targets are met naturally, based on the location of the energy storage projects, there would be no need for a specific carve out.

NYSERDA should consider the added benefits to bulk and off-site retail projects that emphasize locational selection based not only on reliability, but also on that benefits they would provide to DACs. Bidders should be required to demonstrate the benefits for DAC in explaining their site selection for energy storage projects. NYSERDA should give these projects additional “non-price” bonus considerations when selecting energy storage bulk and off-site retail projects. If proposed energy storage projects are not located in DACs, NYSERDA should encourage developers to submit alternative plans that describe their commitments to investing in DACs.

As the Roadmap points out, Zone J likely will receive much of the DAC benefits of energy storage projects. AES agrees that the rest of State would benefit from energy storage projects located in Zone J because they would provide a means to achieve New York’s transition to a clean energy future. Since many of the “peaker” plants are located in Zone J, it is reasonable that the energy storage projects to replace them will also benefit the local communities. AES supports mechanisms that might attract energy storage projects to the rest of the State but understands that all New Yorkers will benefit from the clean energy transition supported by storage, wherever it is located.

- d. For programs supporting on-site retail and residential projects, how could programs be optimally designed so as to ensure that at least 35% of the funding and associated benefits of these projects are directed to projects sited in DACs?

AES agrees with the Roadmap, that for on-site retail and residential projects, the site owners benefit from the projects and that programs should be designed so at least 35% of funding and associated benefits are used in the DACs.¹⁸

- e. What type and size of LDS demonstration projects should be considered in future programs, and how should the program be designed to maximize value and learning?

Since the Roadmap has identified “24 GW of 100-hour battery-type storage with 50% RTE to replace the contributions of the 18 GW of a fully dispatchable hydrogen-based resource,¹⁹” NYSERDA should prioritize demonstration projects for 100-hour battery-type of varying technologies that would help meet these requirements. To incent the development of new technologies, NYSERDA could consider adopting smaller scale projects, for instance less than 24 MWh, to determine how the market would respond and be able to manage solutions to reliability or operational issues that might arise. Based on energy storage

¹⁸ Roadmap at p. 62.

¹⁹ Roadmap at p. 70.

innovation experience, AES believes NYSERDA could consider multiple 5-10 MW pilot projects to understand the potential and limitations of different technologies at a relatively low cost. These pilot projects could include a redox flow battery for the 6-10-hour discharge range, a metal-hydrogen storage solution could be tested for 12-hour duration, and an iron-air solution could be tested for 100-hour duration.

Demonstration projects should specify and request non-lithium storage proposals to incent new technologies. As well, NYSERDA, in close coordination with NYISO and the utilities, could consider proposing the location for demonstration projects and asking the bidders to propose energy storage solutions for that specific location. Such measures might make the bid evaluation more straightforward.

- f. What mechanisms need to be considered when evaluating options for operating and compensating LDS projects on the grid?

NYSERDA's goal should be to provide clarity on how LDS will be compensated and need to specifically include how that technology will be filled. NYSERDA should consider that if compensation is tied to operation, it should be flexible because operating history would not exist yet and initial compensation rules may be based on inaccurate assumptions. For similar reasons, the program should afford developers some flexibility if the RTE is different than expected because operating guarantees are an educated guess given the lack of operating history.

Comparing different technologies against each other is also challenging; bidders should be able to clearly define the technical aspects that make their technology superior. Technologies of the same duration in future procurements should be able to compete against each other.

As the market advances and the grid continues to evolve, NYSERDA should want to acquire a diversity of technologies not only to ensure proven technologies are in use, but also to incent the future technologies that support LDS that needs non-lithium-based energy storage. NYSERDA could adopt a Total Readiness Level²⁰ ("TRL") criteria to review projects and aim to take a certain number of projects from each group. TRL (1-9) criteria demonstrate different maturity levels for new technologies, 1 being the scientific research phase and 9 being a proven technology through successful operations. NYSERDA should aim to select a variety of TRLs to ensure new technologies are incentivized while more established technologies are supported as well.

²⁰ https://www.nasa.gov/directorates/heo/scan/engineering/technology/technology_readiness_level.