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Energy Storage for New York

Priorities for the 2025 Budget and Legislative processes

New York State has established nation-leading climate, energy, and equity policy and programs. Energy storage is a critical technology to achieving a clean energy transition, and must be deployed urgently at significant scales to meet decarbonization mandates. For example, even as the Department of Environmental Conservation makes strides to restrict air pollutants from fossil fuel power plants, the NYISO is calling for four peaker plants in New York City to remain online, past planned 2025 retirement, to maintain reliability.[1] Energy storage can help fill that gap, directly contributing to the State's climate and equity mandates.

Last June, NY-BEST applauded the leadership of the Hochul Administration and the Public Service Commission in approving the *6 GW by 2030 Energy Storage Roadmap.* We are eager to collaborate with policymakers on the achievement of this ambitious target, and call on decision-makers to support the following opportunities as part of the budget and legislative processes in 2025:

I. **Safety and permitting**
   A. Incorporating energy storage permitting under ORES
   B. Embedding Hazard Support personnel into government emergency infrastructure

II. **Financing and deployment**
   A. Passing a Sales Tax Exemption
   B. Contracting Long-Duration Energy Storage resources

III. **New York's economic opportunity**
   A. Investing in battery manufacturing in New York State

More detail on each of these proposals is included below. Join us in supporting energy storage to ensure New York continues to lead the nation toward a more equitable, sustainable and resilient future!

[1] NYISO Press Release, "NYISO Identifies Solution to Solve New York City Reliability Need," November 2023. Accessed online: https://www.nyiso.com/-/press-release-%7C-nyiso-identifies-solution-to-solve-new-york-city-reliability-need#:~:text=Rensselaer%2C%20NY%20%E2%80%93%20The%20New%20York,reliable%20in%20New%20York%20City

Executive Summary

Thanks largely to the foresight of New York policymakers who have incentivized clean energy technology innovation and deployment, energy storage installations in our State have begun to accelerate in recent years. However, as of 2024, less than 400 MW projects are operational in New York––in other words, with five years remaining to achieve our 6,000 MW by 2030 target, we are just 6% of the way there. Significantly more policy support is needed to meet this target and, more broadly, to ensure compliance with the climate and equity mandates of the Climate Leadership and Community Protection Act (CLCPA). Specifically:

I. **Safety and permitting:** The lamentable accidents of 2023, which resulted in four energy storage fires at three locations in New York State, highlight the necessity of stringent and consistent permitting and emergency response structures. Many localities in the State lack the technical training and expertise required to appropriately review, inspect, and permit energy storage systems, or to respond in the event of an emergency. To address this gap, NY-BEST recommends:
   - A. **Incorporating safe energy storage permitting under the jurisdiction of the Office of Renewable Energy Siting and Electric Transmission (ORES).** While ORES was established to streamline and expedite the environmental review and permitting of major renewable energy projects, energy storage was not included under ORES purview. Hiring experts under ORES to review energy storage plans and ensure Code compliance will ensure the highest levels of safety are upheld at all stages of design, installation and operation, while providing greater certainty and consistency for energy storage developers, thereby accelerating progress toward clean energy goals.
   - B. **Embedding Hazard Support personnel into government emergency infrastructure.** Requiring energy storage developers to contract Hazard Support services on a project-by-project basis, as currently proposed in the New York Fire Code amendment, is an inefficient use of ratepayer funds. Instead, a permanent Hazard Support staff line embedded in existing government infrastructure offers a more strategic and holistic solution, and empowers communities by institutionalizing technical expertise in their region.

II. **Financing and deployment:** Though energy storage costs have declined significantly in the last decade, development continues to face exceedingly tight margins. To ensure projects are financeable, the State must help reduce project costs and increase certainty of revenue.
   - A. **Passing a Sales Tax Exemption.** While fossil generators, solar panels, and fuel cells enjoy a sales tax exemption, commercial energy storage systems are ineligible. The State must align tax exemptions with policy goals. A sales tax exemption for commercial energy storage systems will reduce reliance on discretionary abatements, increase deployments and reduce costs to ratepayers.
   - B. **Contracting Long-Duration Energy Storage resources.** New York State will need at least 20 GW of Dispatchable Emissions-Free Resources (DEFRs) by 2040 to meet clean electricity mandates. The State should support Long-Duration Energy Storage

(LDES), a critical DEFR technology, by significantly expanding demonstration programs to enable early LDES development, and by launching a procurement program to support the commercial deployments of mature LDES technologies.

III. New York's economic opportunity

A. Investing in battery manufacturing in New York State. Battery manufacturing is one of the fastest growing industries, projected to generate 310,000 U.S. jobs by 2030. However, to date, most of these are not being generated in New York. By investing in a Battery Manufacturing Expansion and Attraction Program, the State can secure its place on the "battery belt" as a top location for domestic battery manufacturing, ensuring New York retains the jobs and economic development that will power our clean energy transition.

About NY-BEST

The New York Battery and Energy Storage Technology Consortium (NY-BEST) is a not-for-profit industry trade association with a mission to grow the energy storage industry in New York. We act as a voice of the energy storage industry for more than 180 member organizations on matters related to advanced batteries and energy storage technologies. Our membership includes global corporations, start-ups, project developers, leading research institutions and universities, and numerous companies involved in the electricity and transportation sectors.[2]

[2] NY-BEST comments represent the interests of the organization as a whole and not the views of any single member. Our members have diverse interests and the organization's views are intended to be reflective of the energy storage industry collectively.

I. Safety and Permitting

A. Incorporating safe energy storage permitting under the jurisdiction of the Office of Renewable Energy Siting and Electric Transmission (ORES)

New York State established the Office of Renewable Energy Siting and Electric Transmission (ORES) in 2020 to streamline and expedite the environmental review and permitting of major renewable energy projects to help the state meet the Climate Leadership and Community Protection Act's (Climate Act) goals and timelines. Under the RAPID Act, which went into effect in April 2024, ORES also incorporates the siting and permitting process for electric transmission facilities as well.

However, to date, **the permitting process for energy storage installations has been excluded from ORES's purview.** This is a significant gap that must be addressed to ensure the safe and timely deployment of energy storage in support of Climate Act mandates. By overseeing energy storage permitting, ORES will support safer energy storage deployments, improved regulatory consistency, and accelerated progress toward climate and equity targets, as further detailed below.

1. **Safer Deployments**
    a. Challenge: Reviewing site design plans and conducting inspections requires significant training and technical expertise. Many local jurisdictions across the State lack the personnel, funding, and/or expertise to be able to handle energy storage permitting applications and safety reviews appropriately.
    b. Solution: Hiring experts under ORES to review energy storage plans and ensure compliance with the New York State Uniform Fire Prevention and Building Code will ensure the highest levels of safety are upheld at all stages of design, installation and operation.

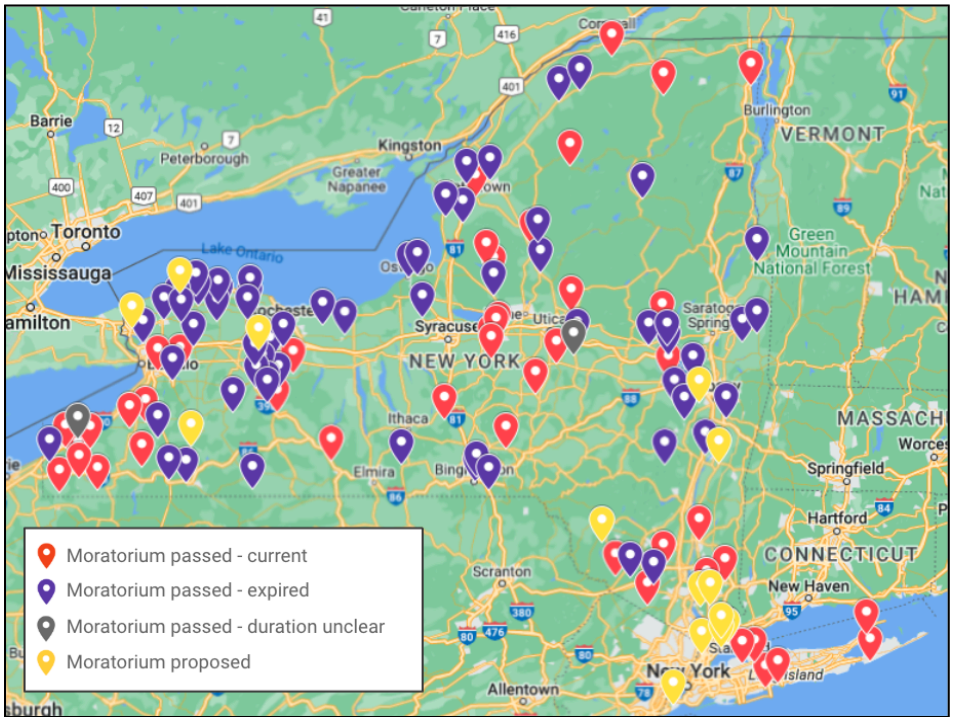
2. **Improved Regulatory Consistency**
    a. Challenge: Inconsistent permitting processes across local jurisdictions contribute to uncertainty in the market, discouraging ESS deployment and slowing clean energy progress. NYSERDA has recognized this challenge and published a Battery Energy Storage System Model Permit to help local government officials establish permitting requirements, but not all jurisdictions have adopted or enforced requirements consistently.
    b. Solution: ORES already provides a coordinated review of siting permit applications for renewable energy generators. Allowing energy storage facilities to access the same standardized and streamlined process will accelerate progress toward New York's clean energy goals.

3. **Accelerated Climate and Equity Progress**
    a. Challenge: In many cases responding to fear and misinformation, over 100 jurisdictions across the State have enacted local moratoria on energy storage, and

over a dozen more are currently considering enacting one (see map below). Current moratoria are impacting an estimated 1,067 MW of energy storage projects[3] in the interconnection queue Statewide, severely threatening the achievement of climate and equity mandates. Further, towns are currently able to change their ordinances and/or to pass moratoriums at will, impacting all projects that haven't yet broken ground. Notably, a developer must commit financially to the NYISO interconnection process at least two years in advance of breaking ground. The lack of permitting certainty results in high investment risk and strongly discourages energy storage development in the State.

b. Solution: By expanding ORES's purview to include energy storage, the State will provide greater certainty and consistency for energy storage developers. This will ensure that once a project enters the interconnection process, it will not be not subject to unanticipated local changes that could derail the project. Not only would this reduce an individual project's risk, but it would also prevent delays for other projects in the same NYISO interconnection Cluster Study, thus safeguarding progress toward New York's clean energy goals. Further, the enhanced safety review that technical experts within ORES can provide can help to address local concerns and get clean energy progress back on track, reducing reliance on fossil fuels and supporting air quality and equity targets.

NY-BEST Map of Energy Storage Moratoria in New York State



[3] This may be a conservative estimate, as many projects intending to participate in the next NYISO Cluster Study are not yet represented in the queue data.

Over 1GW of energy storage projects in the interconnection queue are in jurisdictions currently under moratoria. Last updated September 2024.

Next Steps

NY-BEST recommends the State consider amending Public Service Law to provide ORES with authority to permit energy storage projects as follows:

- Definition: Energy storage should be defined in accordance with Section 74: " 'Qualified energy storage system' shall mean commercially available technology that is capable of absorbing energy, storing it for a period of time, and thereafter dispatching the energy using mechanical, chemical, or thermal processes to store energy that was generated at one time for use at a later time."
- Size threshold: All projects 25 MW or greater should be directed to pursue permitting through ORES, in line with the size threshold of "major renewable energy facility" under Section 94-C. However, energy storage systems between 5-25 MW are also critical to achieving the State's climate goals, and also require significant technical expertise to permit safely and consistently. NY-BEST recommends these projects be allowed to "opt-in" to the ORES process at the developer's discretion. Not requiring ORES permitting for these projects would allow jurisdictions where local AHJs are well-staffed and trained to maintain a local permitting option, reducing the burden on ORES and potentially providing a less expensive permitting pathway to developers.
- Location: Projects sited in localities with populations of one million or more should be exempt from permitting through ORES. New York City is a nationally-recognized leader in safe energy storage permitting. Given the dense urban environment and the need for permitting processes to align with unique FDNY emergency response infrastructure, local authorities should retain control of permitting in NYC. Facilities should also be required to be sited less than ten miles from, and interconnect into, the New York State electric grid, in line with requirements for renewable energy facilities permitted under ORES.
- Fee: Each application for a siting permit should be accompanied by a fee of $1,000 dollars for each MW capacity of the proposed facility, with a minimum fee of $25,000 and a maximum fee of $100,000. NY-BEST supports including the opportunity for the State to update the fee periodically to account for inflation.

Appropriate funds would need to be provided to ORES in the January 2025 Executive Budget to hire and train new staff to expeditiously draft energy storage regulations and establish permitting and review processes.

NY-BEST appreciates the work by the Department of Public Service to administer ORES in support of the State's climate and equity mandates. We appreciate the opportunity to provide our input and feedback on this matter. We stand ready to assist with any questions you may have.

B. Embedding Hazard Support personnel into existing Emergency Response infrastructure

The State is currently undergoing a review and amendment of the New York State Uniform Fire Prevention and Building Code, with proposed language incorporating recommendations from the Interagency Fire Safety Working Group July 2024 report.

Included in the proposed amendment is a requirement for Hazard Support personnel to be provided by the owner or developer of an energy storage system, and, in the event of an emergency, for these personnel to be ready to arrive on-site within 4 hours. The proposed amendment reads:

> ***1207.1.8.1 Hazard Support personnel.*** *The system owner, agent or lessee shall dispatch within 15 minutes one or more hazard support personnel to the premise, and arrive within 4 hours, as required and approved, at their expense. These personnel shall remain on duty continuously after the fire department leaves the premise until the damaged energy storage equipment is removed from the premises, or earlier if the fire code official indicates the public safety hazard has been abated. (Material based on NFPA 855 2023 Ed.)*

This language is intended to address the fact that local fire departments often lack the necessary staffing and expertise to handle lithium-ion battery fires. While NY-BEST agrees with the intention of this language, we are strongly concerned that the requirement as written is not efficient or practical, and will have severe unintended consequences on achieving New York State's climate and energy targets. Specifically, our concerns include:

a. Having companies contract these services on a project-by-project basis is an inefficient use of funds, particularly compared to having a centralized response infrastructure that functions more holistically. Project-by-project contracting will result in duplication of services and staff in the same geographic area, driving up total costs. Given that most energy storage systems will receive NYSERDA incentives, this would be an inefficient use of ratepayer funds.
b. Likelihood of a fire is extremely low. Given strict safety regulations, most batteries will not experience fires––but would still need to execute a 15-25 year contract with a private fire response company for these services. This means the contracted services may not be called upon for many years, if at all, resulting in possibility of miscommunication, improper response, or even the response company no longer being in business.
c. Assuming private fire response personnel can integrate seamlessly with local emergency responders is misguided. Tensions or miscommunications may arise between local first responders and outside private sector responders who are less familiar with local conditions. Indeed, this was seen to be the case in Warwick in response to the battery fire incident in August 2023. Private sector responders lack local relationships and trust, and are therefore not set up for success.
d. Ineffective code enforcement. Current code requires that developers provide documentation of a contract with "personnel who are qualified to service, maintain and decommission the energy storage system and respond to incidents involving the energy storage system" (see

FCNYS 2020 Section 1206.9.1 #11). However, it is unclear whether local Authorities Having Jurisdiction have adequately enforced this requirement to date. Public sector personnel to fill this role would mitigate the effect of lax code enforcement at the local level.

e. Expertise of Hazard Support personnel should not be limited to Stationary Energy Storage System applications. Stationary energy storage systems are not the only type of modern technology that can potentially present safety hazards if improperly installed or operated. It is inefficient to require energy storage installations to separately provide Hazard Support personnel, rather than ensuring more holistic experts are locally available who can also address risks from other technologies, such as electric vehicles and e-bikes.
f. Compliance may not be feasible for all areas. Particularly in rural areas, it may be difficult to guarantee a private company can arrive within 4 hours. Companies that specialize in this type of work have indicated that, given the diversity of BESS locations within the State, it is not currently feasible to cover the wide geographical area within the 4hr time frame.

Instead of requiring Hazard Support personnel to be provided by the private sector, as currently written in the proposed Fire Code, **permanent Hazard Support staff lines should be funded and embedded within existing State or County emergency response infrastructure.** NY-BEST supports this idea for several reasons:

a. Greater feasibility and efficiency: Having Hazard Support personnel based within each county, or otherwise clearly geographically distributed across the State, will greatly increase the chances that they can be on-site within 4 hours in the event of an emergency. Further, this strategic distribution of Hazard Support personnel will be a much more efficient use of resources than stationary energy storage developers contracting these services separately on an ad-hoc basis.
b. Institutionalization of knowledge: A locally-based Hazard Support expert could serve as a resource to local AHJs in understanding and ensuring Code compliance, and to local first responders who may not be as familiar with protocol in the event of an emergency due, for example, to high reliance on volunteers and high rates of turnover. In the event of an emergency, this expert could also facilitate communication between first responders and the on-call industry SME (available remotely within 15min) as well as with industry representatives once they arrive on site.
c. Trust: Most of the State's fire departments are volunteer-based, and lack required funding or expertise to respond to battery fires. A locally-embedded permanent staff line would empower communities by bringing this expertise to the local level. Further, communities and local first responders are much more likely to trust a locally-based, publicly-funded hazard support expert than one from an outside private-sector company hired by a developer.
d. Broader use-case: A locally-based Hazard Support expert would be able to support local jurisdictions in addressing risks and ensuring safe proliferation of other technologies as well, including electric vehicles, e-bikes, mobile batteries, battery-integrated smart appliances, and other new critical climate technologies. As noted in the Interagency Fire Safety Working Group Report, "the utility of battery experts integrated into existing

emergency response infrastructure could be far more comprehensive than relatively infrequent fires associated with grid-scale energy storage systems."

Implementation of Hazard Support staff lines at State or County level

Industry would be eager to support the successful implementation of this proposal, including by:

a. Supporting funding for Hazard Support personnel embedded in government emergency response infrastructure. While NY-BEST proposes including funding for the Hazard Support personnel in the January 2025 Executive budget, we are happy to work with policymakers to identify appropriate pathways for industry to help defray public costs, such as through increased local permitting fees. In addition, if the Office of Renewable Energy Siting and Electric Transmission (ORES) purview is expanded to include energy storage, this could include an industry fee as part of a Lithium-ion system's ORES application.
b. Providing immediate access to expert assistance in response to an incident. NY-BEST agrees that expert hazard support can and should be provided remotely within 15 minutes of a triggering event. This Subject Matter Expert should be coordinated by the developer and/or manufacturer, at their expense, as specified in the Emergency Response Plan.
c. Providing training for first responders. NY-BEST agrees with the proposed Fire Code language that industry be required to offer annual local first responder training for every BESS installation. We recommend developers be permitted to coordinate their efforts and combine trainings for fire departments in adjacent municipalities to make most effective use of time and resources. While industry cannot compel local fire responders to participate in training, if our local Hazard Support personnel proposal is adopted, these personnel should be required to attend annually.
d. Providing fire watch teams. NY-BEST supports a requirement for industry representatives to serve as "fire watch" to relieve local first responders after an incident has been contained, monitoring the project during the window of a potential re-ignition hazard and throughout successful decommissioning. It may be costly and impractical to embed this fire watch service into public sector Hazard Support or emergency response infrastructure. Thus, NY-BEST believes it is reasonable for the language in the Code to include fire watch support from industry representatives to complement the Hazard Support personnel and other State, county, and local emergency response efforts.

Next Steps on Hazard Support Personnel

NY-BEST defers to the expertise of the teams at the Governor's Office, the Department of State, and the Division of Homeland Security and Emergency Services (DHSES) Office of Fire Control and Prevention (OFPC) to determine the best way to deploy and integrate the Hazard Support personnel within existing government infrastructure. In some places in the State, county-level staff lines may make the most sense. In areas that are more densely populated and counties are geographically smaller, personnel could be designated to cover multiple counties. Some jurisdictions, such as those currently home to industrial institutions or those with highly active Fire Marshalls, may already

have more sophisticated emergency response personnel. Opportunities to leverage existing infrastructure and expertise should be taken into account when planning new Hazard Support lines.

NY-BEST proposes setting up a series of meetings this Fall to bring together policymakers, regulators, and industry representatives to determine the best path forward for inclusion of this proposal in the January 2025 Executive Budget. To ensure the proposed Hazard Support clause is not included in the Fire Code as currently written, which is likely to lead to unintended consequences on energy storage deployment in New York, it is essential to establish and fund an alternative pathway for government Hazard Support personnel before the adoption of the new Uniform Code in mid-2025.

NY-BEST appreciates the work by the Department of State to update the Uniform Code of New York State to lead on national best practices when it comes to BESS safety and sustainability standards. However, NY-BEST urges the State to eliminate the Hazard Support personnel requirement in the Fire Code, in tandem with a broader budgetary process to integrate such personnel into State and/or county emergency response infrastructure, as described above.

II. Financing and Deployment

A. Passing a Sales Tax Exemption for commercial energy storage systems

New York State offers a Sales Tax exemption for a range of electric generation technologies, including fossil generators, solar panels, and fuel cells. However, energy storage is not considered to be an electric generator, and is therefore ineligible for existing abatements. As part of the FY 2024-2025 State Budget, a standalone sales tax exemption was granted for residential energy storage systems, but commercial energy storage systems, which will comprise the bulk of the systems needed to meet the 6 GW by 2030 target, was not included.

NY-BEST strongly recommends providing a Sales Tax Exemption for commercial energy storage systems for the following reasons:

1. Alignment with Climate Act and environmental justice goals. Given the necessary transition away from fossil fuels and the criticality of energy storage in achieving a clean and reliable electric grid, it no longer makes sense to subsidize fossil generators and not energy storage. Energy storage systems can help reduce energy system costs, create green jobs, increase grid reliability, and improve air quality and public health, particularly in DACs. Indeed, in New York City alone, the health benefits of retiring the City's peaker plants would create savings of more than $1 billion by 2035.[4] Retiring peaker plants is central to achieving environmental justice goals, but retirement timelines established by the Department of Environmental Conservation Peaker Rule have already been delayed due to limited replacement capacity. Energy storage would directly contribute to addressing this gap and accelerating the transition away from fossil fuels. To this end, the State should ensure Tax Exemptions are aligned with broader policy goals.

2. Unlocking energy storage projects. A Sales Tax Exemption is key to making commercial energy storage projects financially viable, and would directly increase the number of energy storage projects that can be built in support of New York's 6 GW by 2030 target. Unlike other State incentives, which are not made available until after the project begins operation, a Sales Tax Exemption provides support early in the development process, reducing project risk and facilitating continued investment.

3. Reducing reliance on discretionary abatements. Currently, the majority of commercial energy storage systems under development have applied for and received discretionary Sales Tax Abatements from Industrial Development Authorities or other local entities. However, achieving the discretionary abatement is a time- and resource-intensive process. In New York City, for example, after considering fees and expenses, the average discretionary abatement value for a 5MW project is approximately $1M, with the application process taking 3-12 months to complete for 30+ projects approved to date. An as-of-right

[4] The Fossil Fuel End Game, Peak Coalition, 2021.

benefit would be instantaneous and provide additional benefits by eliminating the fees and staff time associated with obtaining discretionary benefits. Additionally, an as-of-right benefit would free up the resources of Industrial Development Authorities for other uses, which in many cases are currently being monopolized by energy storage applications.

4. Reduced costs to ratepayers. The commercial energy storage incentive program outlined in the 6 GW Energy Storage Roadmap and approved by the Public Service Commission in June 2024 is being funded by ratepayers. Providing a Sales Tax Exemption for commercial energy storage systems will reduce project costs, allowing incentive dollars to be spread across more projects and saving ratepayer money.

5. Minimal foregone State revenue. A commercial energy storage Sales Tax Exemption would result in minimal foregone State revenue. Given the nascent state of the storage industry, sales tax revenues from storage equipment have not been a meaningful part of State budgets to date. As other electric infrastructure assets have also historically been exempted from paying sales tax, there will not be a need to replace tax revenues. Further, any potential revenue is likely to ultimately be foregone via discretionary award processes, as most projects to date have not paid sales tax and the cost of avoiding sales tax does not accrue to the State.

Next Steps

NY-BEST proposes including the language from S.4547 / A.4954 in the January 2025 Executive Budget. This would amend section 1115 of the tax law to exempt commercial energy storage systems and the cost of installing such systems.

B. Contracting Long-Duration Energy Storage resources

Dispatchable Emissions-Free Resources (DEFRs) are key to achieving climate mandates.

Clean electricity is the pillar upon which all our climate and equity goals rest. Electrification of buildings and transportation will only help achieve carbon neutrality if the electricity powering it is zero-emissions.

While the State has demonstrated national leadership in procuring and supporting the deployment of renewable energy and short-duration energy storage, a significant gap remains, namely in developing the Dispatchable Emissions-Free Resources (DEFRs) that the NYISO will rely on to achieve 100% zero-emissions by 2040. DEFRs will play a critical role in maintaining reliability in the event of a multi-day reduction in solar and/or wind output, particularly as electrification drives our grid to become winter-peaking.

Further, **DEFRs can directly support equity and public health goals by facilitating the timely retirement of fossil-based power plants, which are disproportionately sited in Disadvantaged Communities (DACs).** Indeed, in New York City, over 500 MW of fossil-based peaking capacity that was scheduled to retire in 2025 in compliance with the 2019 Peaker Rule will continue to operate due to reliability margin deficits.[5] The PEAK Coalition has noted that these generators are located in areas that already face considerably higher concentrations of air pollution and rates of respiratory disease. Deploying DEFRs to increase firm capacity will ensure polluting power plants can be retired as quickly as possible.

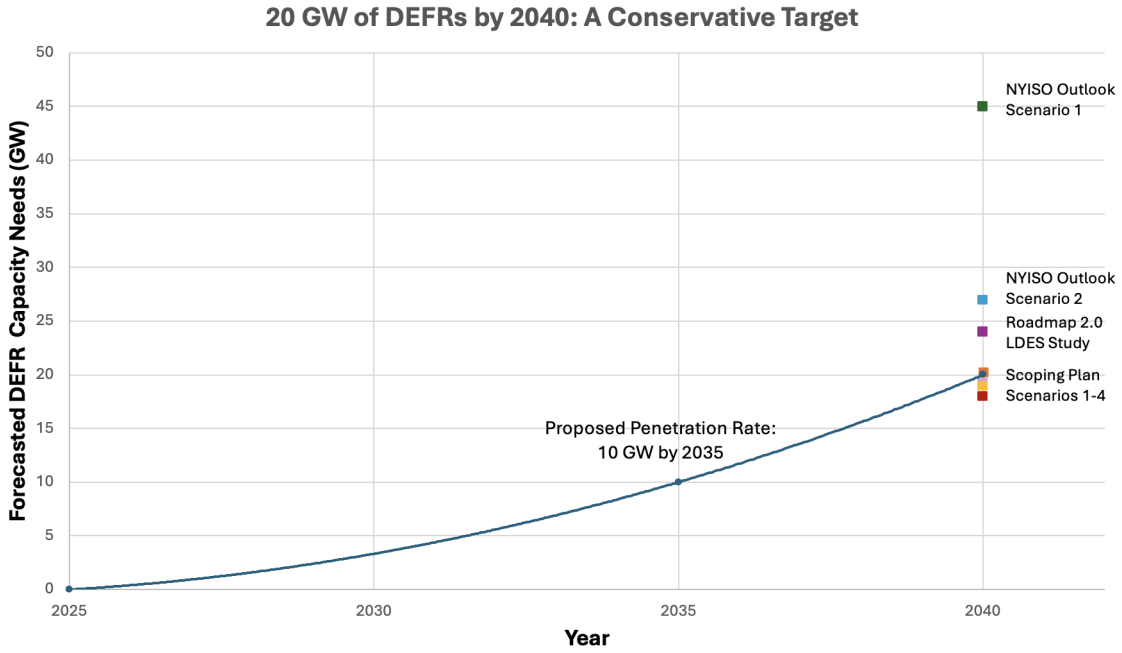
DEFRs can be defined as meeting the following two criteria:

- Dispatchable, meaning that the resource can ramp up from zero discharge to full power output within ten minutes, and similarly reduce from full power to zero output within ten minutes; and
- Fully emissions-free, meaning that no carbon or criteria emissions are emitted from the resource. Technologies relying on combustion of Renewable Natural Gas or hydrogen, which release emissions of greenhouse gases, nitrous oxides, and/or other air pollutants, should not be considered DEFRs. However, fuel cells operating on green hydrogen should qualify.

In New York, modeling conducted for the *Climate Action Council Scoping Plan*, the *6 GW Energy Storage Roadmap*, and the *NYISO System and Resource Outlook* indicates that, to ensure the State is on track to achieve a reliable zero-emissions electric grid by 2040, **we must deploy at least 20 GW of DEFRs by 2040**, as illustrated in the chart below**.** Accounting for faster deployment in 2035-2040 as compared to 2025-2035, it is reasonable to assume **10 GW of DEFRs should be deployed by 2035** to ensure that New York is on track to transition to a reliable, least-cost 100%

[5] Robert Walton, Utility Dive. *NYISO to keep 4 NYC peakers running past planned 2025 retirement to maintain reliability,* November 2023. Accessed online: https://www.utilitydive.com/news/nyc-peakers-planned-2025-retirement-remain-online-reliability-must-run-nyiso/700417/

zero carbon electric grid by 2040. These ambitious but achievable metrics underscore the urgency of the investment needed and the importance of establishing near-term programs to encourage private sector investment.



Based on existing modeling conducted by the State and the NYISO, New York State will need at least 10 GW of DEFRs by 2035 and 20 GW by 2040 to meet climate targets.

Long-Duration Energy Storage (LDES) is a critical DEFR technology New York State will rely on to meet its climate mandates.

The U.S. Department of Energy defines LDES as storage systems capable of delivering electricity for 10 or more hours in duration. This diverse resource includes energy storage that can provide dispatchable power on intra-day and/or multi-day time-scales, and includes various types of mechanical energy storage, thermal energy storage, electrochemical energy storage, and hydrogen fuel cells paired with electrolyzers.

Nationwide, the U.S. Department of Energy's *Pathways to Commercial Liftoff: Long Duration Energy Storage* report (*DOE Liftoff Study*)[6] found that the U.S. grid may need 225-460 GW of LDES resources by 2050, resulting in $10-$20 in annualized system cost savings compared to portfolios that do not include these dispatchable, firm resources.

[6] U.S. Department of Energy. *Pathways to Commercial Liftoff: Long-Duration Energy Storage,* March 2023. Accessed online: https://liftoff.energy.gov/long-duration-energy-storage/

In New York, a 2023 study by NY-BEST member company Form Energy similarly found that integrating more LDES would result in considerable annual cost savings. The study, which extended the *6 GW Energy Storage Roadmap* modeling to include a more diverse set of LDES resources, found that as much as 35 GW of LDES by 2040 could result in $8.7 billion per year in cost savings (2020 dollars) by reducing the total amount of new resources needed to meet New York's energy demands.[7]

Many LDES technologies are already mature and ready for deployment, and as the *DOE Liftoff Study* makes clear, a range of emerging technologies will also become available at increasing scale in the coming years. For example, in New York, NYSERDA has recently awarded demonstration funding to three new LDES technologies of 10-100 hour duration that will soon be deployed.[8]

However, despite the clear need to deploy LDES to meet climate mandates, the multifaceted benefits that LDES technologies would bring to New York's grid are not currently fully valued in the NYISO markets, nor fully incentivized by the State. To meet this need, New York State must fund programs that support LDES and other DEFRs, which will directly displace power plants and support the climate and equity mandates of the Climate Act.

NY-BEST recommends supporting LDES and other DEFRs as follows:

1. Funding procurement programs to catalyze a robust market for mature and commercially-available DEFR technologies like LDES in New York State.
2. Facilitating the expansion of Research, Development, and Demonstration (RD&D) programs for LDES innovation.

These initiatives are further detailed below. While NY-BEST defers to the State on the best way to fund these initiatives, one opportunity could be by leveraging proceeds from New York State's economy-wide Cap-and-Invest Program (NYCI). NYCI will establish a declining cap on greenhouse gas emissions, invest proceeds in programs that drive emission reductions in an equitable manner, and maintain the competitiveness of New York businesses and industries. Leveraging NYCI to support an equitable transition to a 100% zero-emissions grid could facilitate funding for these programs.

1. Funding procurement programs to catalyze a robust market for mature and commercially-available DEFR technologies in New York State.

Many LDES technologies are mature today and ready for deployment as DEFRs, including but not limited to zinc, iron and other battery chemistries, flow batteries, compressed air, and advanced

[7] Form Energy. *Modeling Multi-Day Energy Storage in New York*, 2023. Accessed online: https://formenergy.com/wp-content/uploads/2023/09/Form-Modeling-Multi-Day-Energy-Storage-in-NY-whitepaper-8.8.23.pdf

[8] NYSERDA News. *Nearly $15 Million Awarded to Four Demonstration Projects To Advance Long Energy Duration Energy Storage Technology Solutions,* August 2023. Accessed online: https://www.nyserda.ny.gov/About/Newsroom/2023-Announcements/2023-08-17-Governor-Hochul-Announces-Nearly-15-Million-in-Long-Duration-Energy-Storage

pumped hydropower. However, the multifaceted benefits that these technologies bring to the grid are not currently fully valued in the NYISO markets, meaning that developers are not incentivized to bring these projects to New York State. While the NYISO undergoes longer-term processes to reform market rules to better capture and monetize DEFR services, the State must launch programs in the near-term to support rapid DEFR technology deployment, to ensure climate and equity mandates are achieved.

New York State should develop a procurement program for DEFRs similar to the Large-Scale Renewable program or the Bulk Storage program, in support of a 10 GW of DEFR by 2035 target. Such a program has a high potential to significantly lower electric system costs over the long-run and to result in net-savings to the State, and should therefore be a high priority.

Given the multi-year time lag that it takes manufacturers and project developers to respond to new policy signals, NY-BEST recommends this procurement program should be launched in 2027 at the latest to ensure that projects are first deployed no later than 2030. Ideally, NYSERDA would establish such a program sooner, with procurement to occur as soon as 2025 or 2026.

A DEFR procurement program could be modeled after the Bulk Storage procurement program in the Storage Roadmap, as follows:

a. NYSERDA would issue annual DEFR solicitations, targeting 1GW per year for three or more years. Eligibility should be limited to technologies that align with the DEFR definition above, namely dispatchable (e.g. can ramp up and down within 10 min) and fully emissions-free.
b. Solicitations could be divided into technology-neutral buckets based on duration (for example, 10-24hr resources; 24-200hr resources; >200hr resources). After an initial round of procurement, the bucket durations and sizes could be adjusted based on additional grid modeling to determine the optimal duration mix required to meet climate targets over time.
c. Developers bid a Strike Price ($/kwh) that reflects anticipated required revenue to justify construction and financing of the project.
d. NYSERDA develops an Index DEFR Credit (IDC) equivalent to the difference between the Strike Price and the Reference Price. Unlike the Reference Price used for the Bulk Storage program Index Storage Credit, the IDC would use a Reference Price based on projected Capacity revenue rather than Energy Arbitrage revenue, reflective of the DEFR use-case to provide firm capacity.

Although the costs of such a program require further analysis, we preliminarily estimate that, for a participating LDES resource, the program would need to provide $80-150 per kW-yr in revenue additional to existing NYISO conditions (equivalent to $80-150M per year to support 1 GW in new LDES). However, by 2040, we anticipate LDES resources would generate at least $200/kW-yr in incremental annual value in the form of avoided resource needs to meet New York's zero carbon electricity goals––value that is not currently captured in the NYISO market––potentially resulting in significant savings to the State.

2. ***Facilitating the expansion of Research, Development, and Demonstration (RD&D) programs for LDES innovation.***

NYSERDA has launched successful LDES demonstration programs, including $15M via PON 5472 in 2023 and $5M via PON 5779 in 2024. However, funding levels have remained too low to catalyze the transformative innovation needed to achieve DEFR and zero-emission grid targets. Additionally, innovation is continuously occurring, with various technologies at different stages of technology readiness, so it is important to have regularly occurring funding solicitations.

New York State will need to exponentially increase investment in RD&D programs for LDES technologies to meet DEFR and climate targets. California has already authorized more than $300M in demonstrating LDES projects.[9] To support both R&D and technology demonstrations in New York at a relevant commercial scale, a minimum $150M program would position NYS as a leader in LDES technologies. Further, it would enable larger and more diverse projects, drastically expanding the pool of mature candidates for future DEFR procurement programs.

Conclusion

Given the urgent need to deploy DEFRs in support of a 100% zero-emissions grid, NY-BEST recommends funding procurement programs and expanded RD&D programs for DEFRs like LDES, which will directly displace power plants and support the climate and equity mandates of the Climate Act. We appreciate the opportunity to provide our feedback and input. Please do not hesitate to reach out with any questions or concerns; we'd be happy to discuss.

[9] California Energy Commission. *Long Duration Energy Storage Program.* Accessed online: https://www.energy.ca.gov/programs-and-topics/programs/long-duration-energy-storage-program

III. New York's economic opportunity

A. Investing in battery manufacturing in New York State

New York must compete for battery jobs

Battery manufacturing is one of the fastest growing industries, projected to generate 310,000 jobs across the U.S. lithium-ion battery supply chain by 2030, in support of rapid electric vehicle (EV) and battery energy storage system (BESS) deployment and a transition to a clean energy economy.[10] Hosting a robust New York-based battery supply chain will ensure the State retains the jobs and economic benefits of the clean energy transition.

Thankfully, New York State is ideally positioned to become a leading destination for advanced battery and BESS manufacturing. In addition to establishing a nation-leading commitments on EV and BESS deployment, the State has demonstrated core manufacturing competencies, is home to strong education and labor institutions, and boasts a veteran workforce.

Despite these advantages, however, **New York is currently being significantly outcompeted by other states when it comes to top destinations for private sector battery manufacturing investments.** Driven by recent federal policy, the U.S. has witnessed unprecedented private sector investments in battery, EV, and BESS manufacturing totaling over $180 billion since 2021. These investments have largely taken place outside of New York, with nine states— AZ, GA, IL IN, KY, MI, NV, OH, and TN —accounting for over 80% of the total investments to date. While some of these "battery belt" states have clear advantages stemming from their incumbent supplier networks and end users (notably auto makers), not all do. Analysis shows that large State incentive packages, not systemic advantages, are largely driving manufacturer investment decisions.[11] Simply put, other states are out-bidding New York.

Launching a Battery Manufacturing Expansion and Attraction Program

To close this gap, NY-BEST recommends the State launch a Battery Manufacturing Expansion and Attraction Program to ensure a spot on the short-list for future job-creating battery manufacturing facilities. Analysis demonstrates that with an upfront investment of approximately $1 billion in New York State funds, such an initiative could **unlock a total private sector investment of $22.5 billion** and **create 22,250 high-paying jobs** across the State, spread across three stages of the battery manufacturing supply chain, as illustrated in the following table.[12]

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[10] E. Vasilauskas, D. McCracken, & M. Horrigan, W.E. Upjohn Institute for Employment Research. *Projecting the Demand for Workers in the Production of Lithium-Ion Batteries in the United States,* May 2024. Accessed online: https://research.upjohn.org/cgi/viewcontent.cgi?article=1308&context=reports

[11] Customized Energy Solutions (CES) for NY-BEST. *Analysis And Recommendations For New York State Supply ChainFor Battery Cell Manufacturing*, April 30, 2024. Available upon request.

[12] Ibid.

Forecasted Potential of the Battery Manufacturing Expansion and Attraction Program

Supply Chain Stage	Manufacturing focus	Private sector investment potential	Jobs creation potential
Upstream	Anode/cathode materials processing	$1.45 billion	525
Midstream	Battery cells, packs and components	$16.7 billion	11,700
Downstream	EVs, BESS, controls	$4.37 billion	10,000
	Total potential	**$22.5 billion**	**22,250**

NY-BEST proposes $1.035 billion in funds be allocated for a five-year Battery Manufacturing Expansion and Attraction Program, as follows:

1. **Co-Investment Funds ($900 million):** To establish a robust battery supply chain, New York must first attract an "anchor tenant"–that is, a prominent battery manufacturer– to establish operations within the State, thereby driving job creation and future investment. Co-investment funds are critical to making that happen; by providing leverage for company funds, State co-investment funds are often the key factor driving a large manufacturer's facility siting decisions. Thus, they are the centerpiece of the proposed program.

   Co-investment funds can include a range of investment types, including tax breaks, infrastructure and capital equipment investments, and worker training funds. Currently, New York offers a maximum incentive rate of 5% of total capital expenditures, which is significantly lower than the 10-20% inventive rates offered by other states. By offering expanded co-investment funds, New York will secure its ability to close deals and bring manufacturing jobs to our State.

2. **Targeted Grants and Outreach ($130 million):** In addition to establishing a prominent anchor tenant, New York must attract smaller manufacturers to ensure a robust battery manufacturing supply chain. Targeted grants can serve the same role as co-investment funds, but with a focus on the needs of smaller manufacturers.

   In addition, strategic outreach can drive manufacturer investment decision-making, as demonstrated by New York's success in attracting investment in other sectors, such as semiconductor manufacturing. NY-BEST recommends the State engage experts with knowledge of companies who have intent to establish U.S. operations to inform outreach strategy. Further, to increase its attraction potential, the State should fund senior government representatives and staff to attend premier international trade shows and establish a high-quality exhibit presence at major industry events.

3. **Battery Ombudsman Support ($5 million):** The regulatory landscape to permit and construct manufacturing facilities is lengthy and complex. Many States leading the battery manufacturing field have instituted Battery Ombudsman programs, which have been repeatedly cited by manufacturers as a key success factor.[13] Providing prospective manufacturing companies with a single point of contact throughout a facility's development process (from site identification and permitting through construction and operation) can ensure a streamlined regulatory process and increase the likelihood of successful manufacturer establishment.

4. **FAST-NY for Battery Businesses:** Empire State Development already offers a FAST NY Shovel-Ready Grant Program to increase New York's attractiveness to manufacturing employers. NY-BEST recommends the State actively hone the program to focus on the needs of battery manufacturers and conduct outreach to raise the profile of the program. In addition, the program could proactively develop a portfolio of shovel-ready sites, strategically focused on needs for the battery and energy storage manufacturing and supply chain. Given that this initiative could include leveraging or redirecting existing funds, the proposed budget for this is to be determined.

5. **NYPA Low-Cost Power for Regional Economic Development:** Many battery manufacturers require significant power for their operations. NYPA offers a number of programs to provide low-cost, clean power for Regional Economic Development for exactly these kinds of businesses. NY-BEST recommends expanding and/or honing these programs to provide low-cost power to battery manufacturing facilities. Again, given that this initiative could include leveraging or redirecting existing funds, the proposed budget for this is to be determined.

[13] Ibid.

Proposed Budget for New York's Battery Manufacturing Expansion and Attraction Program

The breakdown of the proposed five-year budget required to support these activities is shown in the table below.

Components	Dollars ($ million)					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1. Co-Investment Funds	100	100	300	300	100	**900**
2.a. Targeted Small Manufacturer Grants	25	25	25	25	25	**125**
2.b. Targeted Outreach/Attraction Efforts	1	1	1	1	1	**5**
3. Battery Ombudsman Support	1	1	1	1	1	**5**
4. FAST-NY for Battery Businesses	*Amounts are to be determined and could include leveraging or redirecting existing funds*					
5. NYPA Low-Cost Power for Economic Development	*Amounts are to be determined and could include leveraging or redirecting existing funds*					
Total	***127***	***127***	***327***	***327***	***127***	***1,035***

New York State has a strong record of support for the battery and energy storage sector. By investing in a Battery Manufacturing Expansion and Attraction Program, the State can secure its place on the "battery belt" as a top location for domestic battery manufacturing, ensuring New York retains the jobs and economic development that will power our clean energy transition.