ENERGY STORAGE

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Achieving New York's ambitious energy storage goals demand proactive, all-hands on deck approach and out of the box thinking among all stakeholders.

HOW NEW YORK CAN BRIDGE THE GAP BETWEEN AMBITIONS AND REALITY OF ENERGY STORAGE DEVELOPMENT

New York's energy storage ambitions are far from reality, with less than 1 GW installed and/or contracted—just 16% of the 6GW target outlined in the 2024 Storage order. Although achieving the 3GW goal set by the 2018 Storage Order[1] proved challenging, policymakers and regulators have further doubled the goal to showcase New York's leadership in clean energy transition. However, failure to deliver on goals can lead to setbacks in the agenda and open the state to criticism for announcing lofty goals. A practical implementation framework and a hands-on-deck approach must support ambitious goals. So, the key question is, what is New York's framework for accelerating energy storage deployments?

NYSERDA and the NY Public Service Commission (NYPSC) took several key actions, including the Bulk and Retail Incentive Programs and directives for IOUs to procure at least 350 MW through Bulk Storage Dispatch Right RFPs. Further, to support ambitious goals, the 6 GW Energy Storage Order[2] mandated the development of an additional 3 GW bulk, 1.5 GW retail, and 200 MW residential storage by 2030. Additionally, the Order introduced new mechanisms such as Index Storage Credit (ISC) to accelerate development and continue to build on existing IOUs' Dispatch Rights Framework RFPs. The order also carved out 20% of bulk storage procurements through long-duration energy storage (LDES).

Despite significant efforts by New York, only 35% of projects procured through NYSERDA's retail and bulk storage incentives have been interconnected, and approximately 50% of projects remain in the pipeline with an active application.[3] Furthermore, out of the 350 MW required through the Bulk dispatch rights RFP, only 28% have been successfully awarded.

Storage development in New York faces several challenges:

- In 2024 alone, 36% of projects were withdrawn from interconnection queues due to **delays in obtaining approvals and/ or high upgrade costs**, highlighting ongoing challenges in project development.
- **NYISO's market design treats storage as a generator,** restricting its flexibility, market participation, and grid support potential. Siting and permitting are challenging due to **community opposition**, perceived fire hazards, and safety concerns.
- The value of the DER (VDER) model for **storage valuation does not capture the full stack** offered by storage applications, which prevents evaluating all possible storage use cases.
- **Utility incentives are in their infancy** and do not reflect developers' ongoing challenges resulting from supply chain issues and high inflation. Also, there is no framework for LDES development in New York.
- **Utility's role in energy storage is underutilized** in meeting storage goals. Given the steep target, anemic market-led growth, and specific use cases of storage in New York, utility ownership is not a market power issue.

Addressing these and many other challenges requires an actionable framework encompassing inputs from all energy storage stakeholders. In this article, Vrinda's team analyzed challenges and identified opportunities for storage development in New York and proposed a framework based on in-depth research and inputs from industry experts, utilities, and developers in pursuit of a model that can translate the ambitious Energy Storage vision of New York into a reality.

In this Issue

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KEY CHALLENGES TO ENERGY STORAGE DEVELOPMENT IN NEW YORK

1. Interconnection- High Costs and Uncertainty

The interconnection process for energy projects in New York has become increasingly complex. Between 2018 and 2023, approximately 74% of initiated projects were withdrawn, and 22% remained incomplete (Figure 1 highlights the locations of projects exceeding 1MW).[4] Since 2018, Zone J has experienced the highest withdrawal rate, with over 1.8 GW of withdrawn projects. The lack of regularly updated and limited hosting capacity data creates uncertainty for developers in siting and project sizing, forcing them to submit multiple interconnection applications in parallel, leading to costly delays and frequent withdrawals. Additionally, data provided in hosting capacity maps are not fully aligned with or capture all the inputs analyzed in the Standardized Interconnection Requirements (SIR).

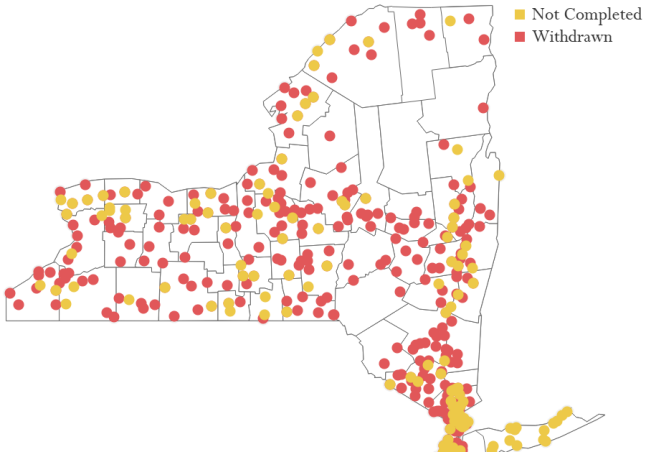

Figure 1: Interconnection status of the storage projects > 1MW in NY

Further, there are existing gaps within New York's SIR process in that it does not account for the flexibility of energy storage systems. For example, it evaluates storage under extreme maximum and minimum loading conditions on the feeder instead of analyzing the operating conditions/ dispatch profile of the proposed storage use case. This can result in inflated interconnection costs, prolonged study negotiations, and high project attrition rates.

2. NYISO's Market Design – Suboptimal Treatment of Storage Resources

NYISO's current rules do not optimize storage participation, leading to inefficient dispatch, revenue uncertainty, and barriers to providing wholesale market services. Treating storage as a generator limits its full potential as a bidirectional resource (generator and load). Further, it limits participation in different markets (day ahead, real-time market, and ancillary services) during the day.

CAISO's market design uses a multi-interval optimization approach to efficiently dispatch energy storage by anticipating future system needs. The day-ahead market schedules resources over a 24-hour horizon, while the 15-minute market looks ahead up to two hours, and the 5-minute market optimizes dispatch for 65 minutes across 13 intervals. This structured approach enables the market to strategically manage state-of-charge, even directing batteries to charge at a loss in one interval if higher prices are expected later.

Furthermore, NYISO has been slow to adopt the storage as transmission asset (SATA) model, which could enable storage assets to provide grid reliability services and defer costly infrastructure upgrades. The lack of clear pathways for storage to participate as both a market and regulated transmission asset creates uncertainty, limits investment, and prevents New York from fully leveraging storage.

3. Utility-Owned Storage – A Missing Piece in NY's Energy Storage Roadmap

Storage ownership by utilities is a significant missing opportunity in achieving New York's storage targets. Given anemic storage deployment over the past 7 years, New York can argue that a market failure warrants utilities to step in and deploy storage to achieve the steep 6GW target. Strategically deployed storage by utilities is essential in certain use cases, such as the requirement to transfer power between the feeders to balance load, reactive power support at the local level, enhancement of hosting capacity to accommodate multiple DERs, and n-1/n-2 resilience enhancement. At such low storage penetration, ownership should not be viewed as a market power issue. Instead, a well-defined utility ownership model could complement private sector investments by addressing systemic gaps in storage deployment. Further, utilities long experience in interconnection permitting and siting coordination with local agencies can facilitate faster deployment and remove barriers for future market-based deployments. Utilities need to be compensated for this initiative in line with existing capital expenditure approved by the regulator, even if it is perceived as a little expensive for initial deployments to develop a storage market in New York.

4. Storage Valuation – Incomplete Storage Value Stack

The current economic model in NY does not capture the full value of energy storage. New York's VDER has valuing components, but they are not optimized for storage characteristics, do not reflect evolving system peaks driven by

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electrification trends, and do not incorporate the latest distribution system values. Key limitations are due to the following issues:

- Demand Reduction Value (DRV) Compensation is misaligned. The 10-year DRV compensation period is not aligned with the typical 15-year term of storage procurements and ISC contracts that NYDPS agrees upon.
- Most utilities except NYSEG do not offer winter-peaking DRV compensation. As heating electrification expands, winter electric loads are expected to rise substantially, making energy storage increasingly valuable during that period.
- Locational System Relief Value (LSRV) Rates are based on old marginal cost of service (MCOS) studies and do not reflect current distribution system needs.
- Most utilities have not identified eligible LSRV zones in their hosting capacity maps, limiting value stack compensation for developers.

5. Financing – Lack of Utility Incentives

New York lacks dedicated utility incentive programs for retail and bulk energy storage, making it difficult for developers to overcome high upfront costs. While DLM programs like CSRP and DLRP offer performance revenue, they fail to offset the high upfront storage cost. Utilities have struggled to establish viable retail storage incentives due to inaccurate input assumptions within Benefit-Cost Analysis (BCA) models. These models rely on nationwide cost assumptions rather than accounting for New York-specific system costs and avoided generation benefits. For example, NREL commercial battery cost assumptions[5] used by BCA models at utilities have 26% higher costs than the latest New York-specific cost reported by NYSERDA, making the storage program seem unviable by most utilities.

6. Siting, Permitting, and Community Opposition

Siting and securing locations for energy storage projects, specifically downstate NY, is an ongoing challenge. Layers of reviews and approvals create long permitting timelines and regulatory uncertainty due to multi-agency processes. This, coupled with community opposition in pockets, results in long delays and project cancellations. The NYC Department of Buildings (DOB) mandates construction and electrical permits, zoning analyses, and special inspections. In contrast, the Fire Department of New York (FDNY) requires fire suppression compliance and site inspections that can take more than 40+ business days for review. These uncoordinated process reviews can extend project timelines, as shown in Figure 2.

Further, retail storage projects face community opposition due to fire safety concerns and noise at prospective sites. For example, New Leaf Energy withdrew its plan to install six units of 20MWh Li-ion ESS in Staten Island following community backlash over fire safety and proximity to schools. Moreover, nearly half the towns in Suffolk County, Long Island, have adopted BESS moratoriums, most of which have been extended to mid-2025. A single-point coordination mechanism is either lacking or ineffective, forcing developers to navigate complex permitting, safety, and community concerns independently.

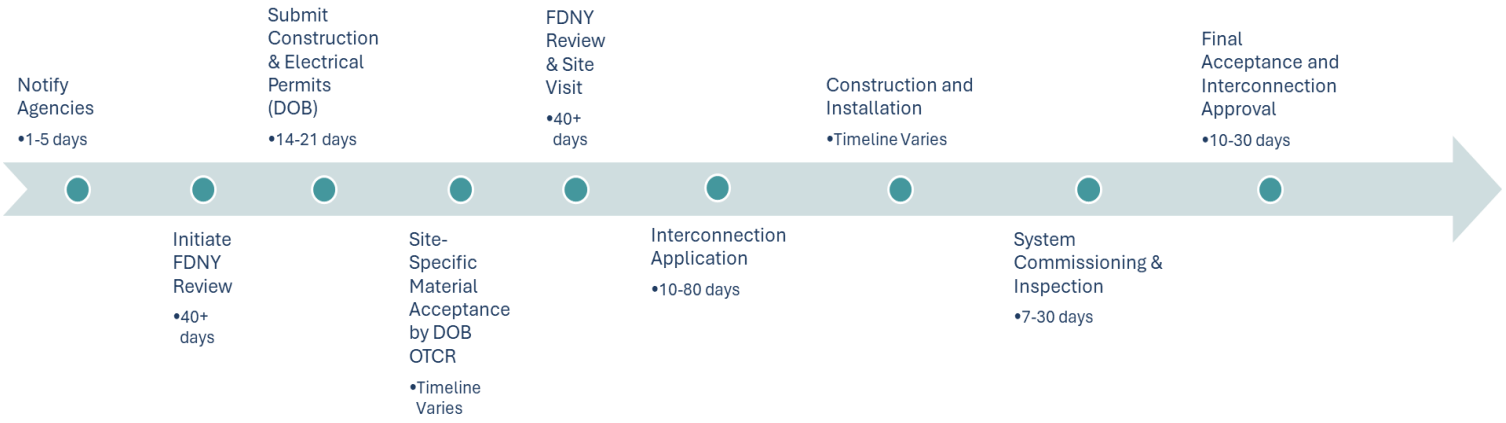

Figure 2 Timeline of ESS Siting, Permitting and Commissioning Process in NYC

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OPPORTUNITIES AND ACTIONABLE FRAMEWORK FOR ACHIEVING TARGETS.

An all-hands approach is needed, which warrants proactive and out-of-the-box thinking, innovation in incentive designs, skin in the game by developers, and changing the attitude of communities. Proposed framework in Figure 3 outlining actions and stakeholder collaboration are key to achieving the ambitious goal of 6GW by 2030 in New York. Below are some key opportunities for stakeholders to accelerate energy storage deployments in New York

Regulators and Policymakers should

- ✓ **Convene a stakeholder working group** as a single point authority to resolve permitting, siting, and interconnection issues.
- ✓ Mandate **proactive interconnection studies with full cost recovery for utility as CAPEX** to expedite site selection and interconnection.
- ✓ Develop and/or promote successful business models, such as the Commercial Front of the Meter Battery Storage Model and BQDM Prescriptive ESS incentive offerings.

ERCOT allows the DERs to connect without transmission built out and manages the output of the renewables by curtailing on an as-needed basis. Interconnection customers take studies conducted by the grid operator and use them to assess their curtailment risk.

- ✓ Carve out specific targets for energy storage deployment under utility ownership to accelerate storage deployment. Specific use cases related to grid capacity enhancement, load transfer capabilities, and (n-1/n-2) reliability/ resiliency enhancement should be prioritized.

Utilities should

- ✓ **Conduct proactive interconnection studies** and publish more accurate/ binding hosting capacity maps within a timeframe. Innovate in incentivizing early movers with concepts like declining block incentives.
- ✓ Make BCA assumptions public to allow developers to assess the economics of storage projects.
- ✓ Rationalize DLM and VDER participation to provide opportunities for maximizing value for storage deployment.
- ✓ Develop a program that provides phased declining incentives for each storage project through its development till the soft costs associated with permitting, interconnection, and approvals are reduced
- ✓ Proactively engage with communities to educate and alleviate opposition to storage deployments.

Developers/ Technology providers should

- ✓ Prioritize community outreach and public education campaigns to mitigate potential community opposition.
- ✓ Pre-certify storage chemistries for fire safety, such as TM-2 certification, and promote suitable technologies for New York-specific needs.

In **California**, developers can design an export schedule known as a **Limited Generation Profile (LGP)** to connect storage projects to the grid without incurring costly infrastructure upgrades. This is made possible as utilities in CA are required to produce hourly models of power generation capacity at each node.

Customers/ Communities should

- ✓ Proactively identify properties ideal for hosting energy storage.
- ✓ Work with stakeholders to design innovative business models such as site leasing.

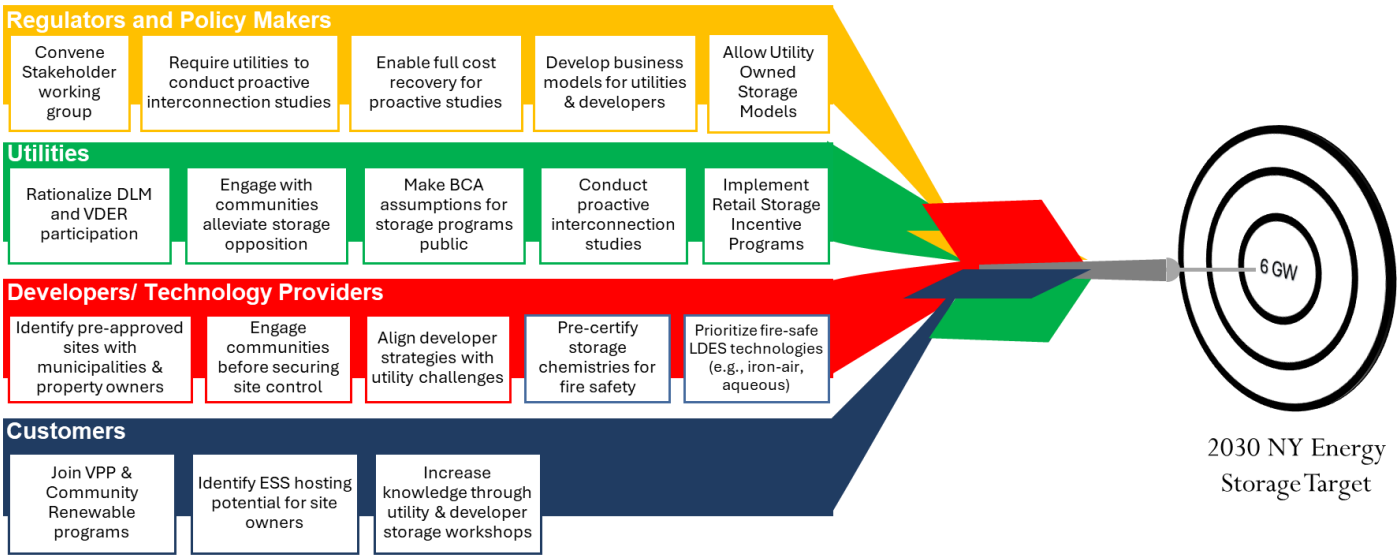

Figure 3 An actionable framework for energy storage stakeholders to achieve New York's 6GW target

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RECOMMENDATIONS FOR ENERGY STORAGE SUCCESS IN NEW YORK

- State should create a mechanism to streamline interconnection, permitting, and incentive processes as a single point of contact for developers. Regulators should design and monitor this process. An approach similar to NYS's Unified Solar Permit should be evaluated for ESS.
- State should establish an expedited process to approve new storage technologies suitable for New York through an interagency process.
- Regulators should direct utilities to conduct proactive interconnection studies and publish monthly binding hosting capacity analysis.
- Regulators should establish UIS (Utility Integrated Storage) deployment targets in long-term planning and require utilities to demonstrate how UIS solutions are more cost-effective than traditional utility wires investments (UWI).
- Regulators should allow utilities to capitalize costs related to proactive interconnection studies, and tools with accountability to ensure tool's accuracy of results
- Utilities need to publish more detailed hosting capacity maps which are required for accurate interconnection studies and decisions by the developers.
- Utilities should design and implement sustained community engagement to educate about storage value, safety, and benefits.
- Utilities should develop implementation strategies and concrete action plans for LDES deployment.
- Developers should understand utility needs, specific New York characteristics and available value streams and opportunities to maximize value of storage and hence propose viable projects.
- Developers should develop, adopt, and standardize successful innovative business models for New York

New York can achieve its 2030 energy storage goals by proactive

- ✓ *Engagement with* ***Communities / site hosts***
- ✓ ***Developers*** *who are willing to put skin in the game*
- ✓ ***Utilities*** *with accurate hosting capacity maps / simplified interconnection process and programs which incentivize early movers.*

ABOUT AUTHORS

About Vrinda Inc.

Vrinda Inc. is a New York-based business and technology firm. Vrinda creates success for your business through a focus on value creation by providing trusted, actionable advice, and practical solutions. We provide business and technology consulting services to the Energy, Utility, and Transportation sectors. Vrinda operates in the United States and Latin America and brings innovative expertise. www.vrindainc.com

Navneet Trivedi – Co-Founder and Chief Operating Officer, Vrinda

Navneet co-founded Vrinda Inc. leveraging 30 years of international energy and utility sector experience working with 100+ utilities in 7 countries across the value chain of the utility industry. Navneet is an electrical engineer and holds a master's degree in renewable energy systems from IIT Bombay, India, and business certification from Columbia University, New York.

Bonny Xavier - Analyst, Vrinda

Bonny holds a master's degree in electrical engineering from the City College of New York. Bonny has 3 years of experience researching and integrating distributed energy resources (DERs) with the NYC transit system (MTA) and developing medium- and heavy-duty vehicle (MHDV) charging infrastructure with on-site storage in the Bronx.

REFERENCES:

[1] New York Public Service Commission. (2018). Order establishing energy storage goals and deployment policy (Case 18-E-0130).
[2] New York Public Service Commission. (2024). Order establishing updated energy storage goal and deployment policy (Case 18-E-0130).
[3] New York State Energy Research and Development Authority. (2024). Retail and bulk energy storage incentive programs 2019 [Dataset]. NY Open Data.
[4] New York State Department of Public Service. (2024). SIR inventory information: Utility interconnection queue data (November 2024).
[5] National Renewable Energy Laboratory. Commercial Battery Storage: 2024 Annual Technology Baseline (ATB). Golden, CO: U.S. Department of Energy.

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