

New York's 6 GW Energy Storage Roadmap

February 2023

Schuyler Matteson

Schuyler.Matteson@nyserderda.ny.gov



NYSERDA

Contents

1. Climate Law
2. 6 GW Target: Role and Need
3. 6 GW Modeling Results: Locations and Durations
4. Roadmap Approach by Sector
5. Bulk Storage Program
6. Utility Ownership: Storage for T&D Services
7. Retail & Residential Programs
8. Process and Timing

New York's Climate Law

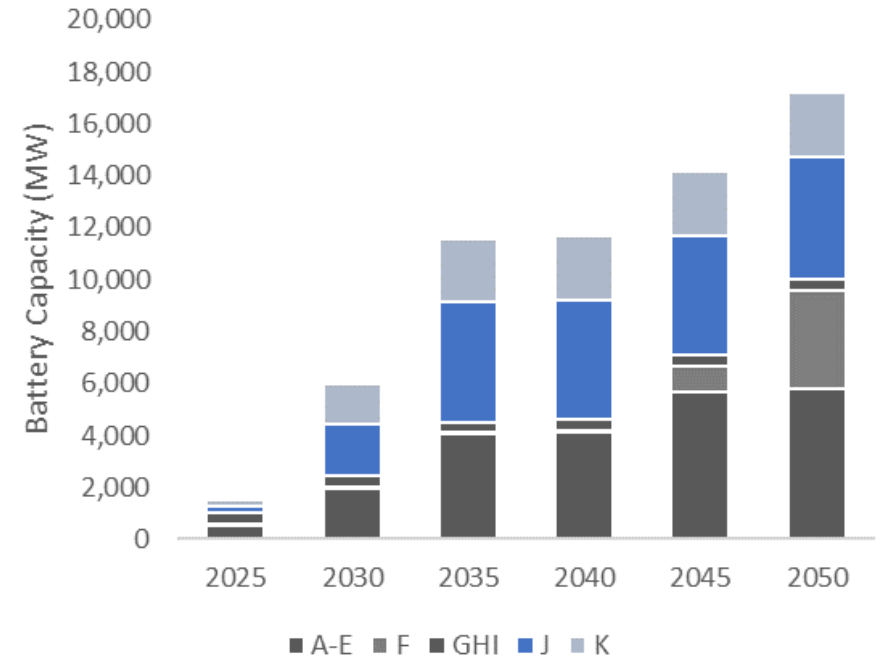
- Climate Leadership and Community Protection Act (CLCPA) signed into law June '19
- Key Climate Targets:
 - 85% reduction in GHG emissions & carbon neutrality by 2050
 - 100% zero-emission electricity by 2040
 - 70% renewable energy by 2030
 - 9 GW of offshore wind by 2035
 - *3 GW of energy storage by 2030
 - *6 GW distributed solar by 2025
- Ensure disadvantaged communities receive 35% of overall benefits of spending, with the goal of achieving 40%
- Storage: specify a minimum % of projects towards reducing fossil fuel peakers located in or near disadvantaged communities

6 GW Target: Role and Need

- Governor Kathy Hochul announced in her State of the State address an intention to double the state's 2030 energy storage deployment target, from the currently legislated 3 gigawatts (GW) of storage to 6 GW of storage by 2030.
- Forecasting the rapidly growing load from electrification, the Climate Act goals and expected fossil fuel retirements, Roadmap analysis indicates the need for ~12 GW of energy storage by 2040 and 17+ GW by 2050.
- Longer-duration (inter-day) storage could play a significant part in meeting zero-carbon firm capacity needs.
- A new 2030 target of 6 GW inclusive of long duration storage will play a critical role in achieving the order-of-magnitude growth increases needed post 2030 to put New York on a path towards these longer-term storage levels.

6 GW Modeling Results: Locations

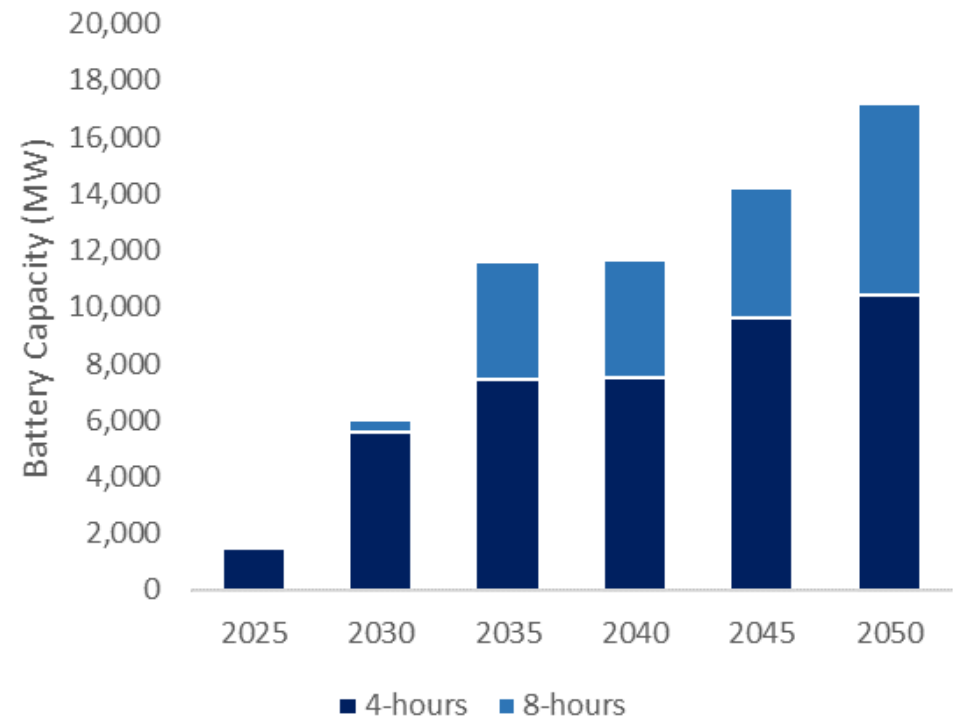
- NYSERDA commissioned E3 to conduct system modeling runs to determine optimal timing, locations and durational profile of 6 GW x 2030 buildout
- In 2030, model shows 66% of the 6 GW requirement is met with storage in downstate NY
- By 2050, the model shows storage selection shifts upstate, to help balance land-based renewables and cost-effectively meet the state’s reliability needs



Storage Summary by Zone						
	2025	2030	2035	2040	2045	2050
A-E	519	1,954	4,030	4,103	5,663	5,808
F	60	60	60	60	1,016	3,759
GHI	430	430	430	430	430	430
J	275	2,005	4,600	4,600	4,600	4,739
K	216	1,551	2,473	2,473	2,473	2,473
Total (MW)	1,500	6,000	11,593	11,665	14,181	17,208

6 GW Modeling Results: Durations

- Most storage builds by 2030 are 4-hr
- Model shows significant deployment of longer duration storage in the 2030's
- 60-70% of the statewide 8-hr storage is placed in NYC and LI as expensive peakers retire and to replace other expensive thermal capacity
- Resources needed by 2040 are pulled forward into the early-to-mid 2030's to capture ITC
 - Cheaper to build early with ITC than to wait for further technology cost reductions



Storage Summary by Duration						
	2025	2030	2035	2040	2045	2050
4-hours	1,500	5,600	7,413	7,486	9,606	10,448
8-hours	0	400	4,179	4,179	4,575	6,761
Total (MW)	1,500	6,000	11,593	11,665	14,181	17,208

Roadmap Approach by Sector

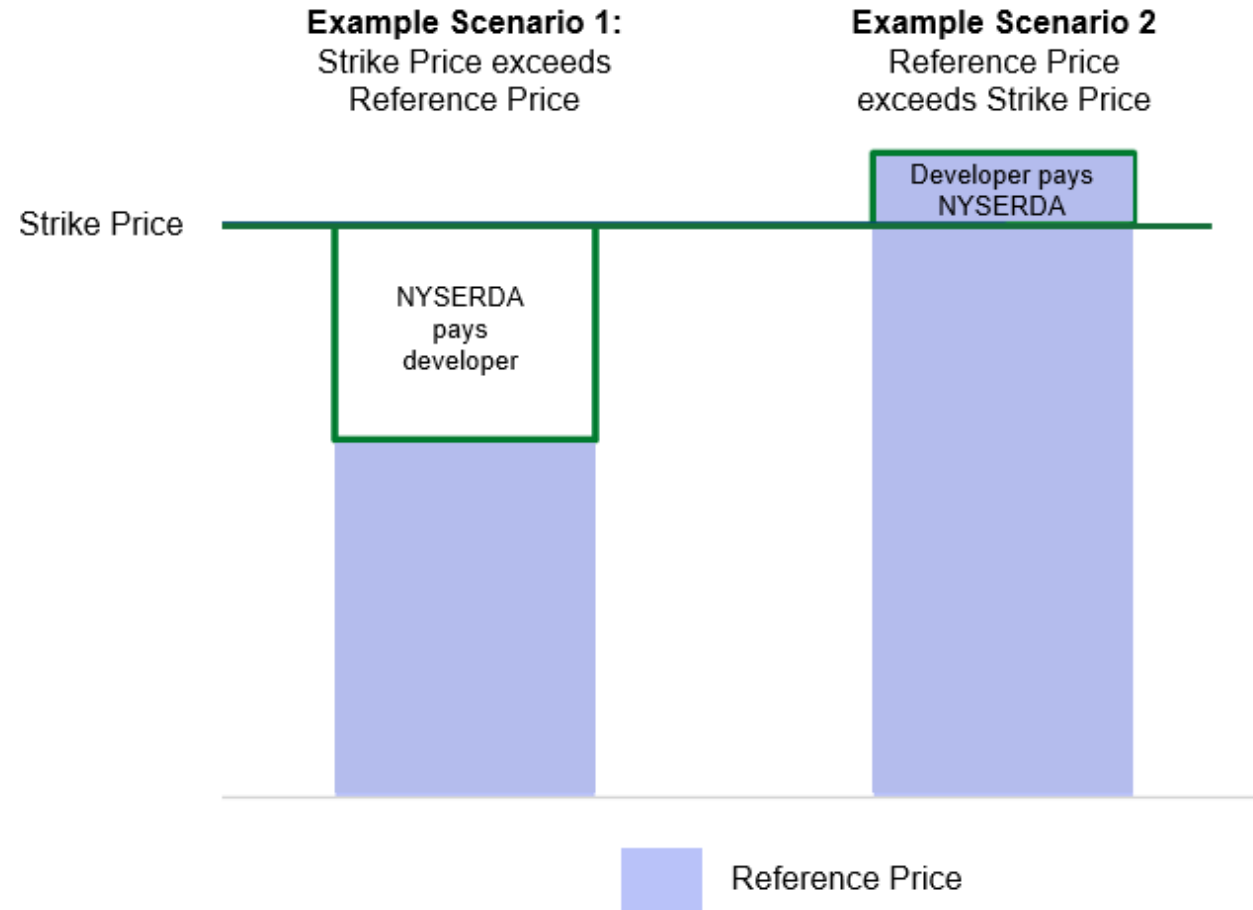
- We have a total of 1,301 MW of storage already awarded/contracted through Roadmap 1.0 and LSR Tier 1 procurements
- Approximately 12,000 MW of proposed energy storage projects are presently in either distribution-level or wholesale-level interconnection queues
- To reach the proposed 6 GW goal, **4,700 MW of new projects** will need to be awarded and deployed by 2030, at an estimated cost of \$1.0-\$1.7 billion
- The roadmap recommends new programs be developed for three different sectors: **Bulk, Retail, and Residential**

Sector	Capacity in MW	Incentive Mechanism	Funding Source
Bulk	3,000	Index Storage Credit	LSE
Retail (<5MW)	1,500	Upfront incentive	CEF Style
Residential	200	Upfront incentive	CEF Style
Total	4,700		

Proposed Bulk Mechanism: Index Storage Credit (ISC)

- Proposing 3 GW of bulk storage projects procured through a new Index Storage Credit (ISC) mechanism, which is anticipated to provide long-term certainty to projects while maximizing value to ratepayers
- Developers bid in a strike price which represents the required revenue for the project paid over a 15-year payout period
- NYSERDA selects and contracts with most viable/cost-effective projects; projects are free to participate in wholesale markets as they see fit to maximize revenue
- Payments to project determined by comparing strike price to a reference price, which would include:
 - (i) **Energy arbitrage** revenue component, based on top and bottom-priced four hours of the day in day-ahead market for four-hour duration (“TB4”; can be extended to other durations as well)
 - (ii) **Capacity** market revenue component
- **Index Credit = Strike Price – Reference Energy Arbitrage Price – Reference Capacity Price**
- Settlements executed monthly, based on monthly average energy arbitrage/capacity reference price

Bulk Index Storage Credit: Settlement Possibilities



Utility Ownership: Storage for T&D Services

- Certain use cases/revenue streams are not currently available to storage resources through any market, most notably T&D services (e.g., congestion reduction, deferral, transmission security support, curtailment reductions)
- Currently the only way for storage to provide these services would be through utility operations, enacted through utility ownership or some form of contracted arrangement
- NYSERDA and DPS Staff hence recommend that utilities be directed to study the potential of energy storage to provide non-market **transmission** and **distribution services** and identify projects that provide cost-effective services when compared to traditional alternatives
 - Some of this work is underway, with the JU drafting an RFP for consulting services to begin the analysis
 - Projects could be proposed/approved of through individual rate cases or CLCPA T&D proceeding

Retail & Residential Approach

- Due to the unique development pathways in various regions of the State, NYSERDA and DPS Staff recommend continuing a Market Acceleration Bridge Incentive Program implemented through region-specific, declining block incentives for energy storage systems up to 5 MW
- The retail and residential programs are expected to be designed in a way that pays projects the full contract amount at the time of commissioning

Process and Timing

- Roadmap Filed: December 2022
- 60-day SAPA comment period ending March 20th
- Followed by reply comments and deliberation of comments
- Technical stakeholder Sessions 2/28 at 3pm and 3/1 at 11am to describe proposals, plus Q&A to help inform stakeholder comments
- Commission consideration/ruling in Q2/Q3 2023
- Implementation Plan and Programs Launch: H2 2023