



**NYSERDA**

# Energy Storage in New York

September 18, 2019  
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# CLCPA by the Numbers, Targets Codified into Law

**Carbon neutral economy by 2050, mandating at least an 85 percent reduction in emissions below 1990 levels**

**40 percent reduction in emissions by 2030**

**100 percent clean electricity by 2040**

**70 percent renewable electricity by 2030**

**9,000 MW of offshore wind by 2035**

**6,000 MW of distributed solar by 2025**

**3,000 MW of energy storage by 2030**

**185 TBTU energy savings**

# How did we get here?

**1Q 18**     **Governor Andrew M. Cuomo announces 1,500 MW storage target**  
Acelerex Energy Storage Study completed

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**2Q 18**     Voice of customer/stakeholder meetings  
Stakeholder engagement  
**NYS Energy Storage Roadmap released June 2018**

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**3Q 18**     Technical conferences  
Formal public comments  
PV + storage adder in NY-Sun launched in Nov 2018

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**Dec 2018**     **PSC Storage Order**

**Apr 2019**     **Broader storage incentive programs launched**

# Advanced Energy Storage Deployed in NYS

Operational	In the Queue	Goals
<ul style="list-style-type: none"> <li>• 80 MW Total               <ul style="list-style-type: none"> <li>○ 20 MW Thermal</li> <li>○ 20 MW Flywheel</li> <li>○ 40 MW Chemical</li> <li>○ Roughly 15 MW in NYC, 10 MW in LI, remainder rest of state</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 5.5 GW Total               <ul style="list-style-type: none"> <li>○ 5,100 MW in NYISO queues, remainder in utility queues</li> <li>○ ~140 MW approved in NYSERDA incentive programs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 1500 MW by 2025</li> <li>• 3000 MW by 2030</li> </ul>

- Near term deployments in community solar plus storage & single family residential
- Mid/long-term market focus on bulk storage procurements & NYISO participation

# NYSERDA Market Acceleration Incentives

## \$405 million in incentive funding available through 2025

- \$350M for Investor Owned Utility service territories
  - \$149M for retail storage incentives < 5 MW project size
  - \$150M for bulk storage incentives
  - \$51M is currently unallocated
  - Flexibility to adopt to market conditions and project economics
- Approximately \$55M in funds were also made available by NYSERDA for use on Long Island



# NYISO Market Considerations

- **Buyer-side Mitigation**
- **Capacity Value Determinations**
- **“ISO-managed” requirement**
- **Storage Market Model Timing**
- **Storage Bid Parameters**
- **Opportunity Cost evaluation and mitigation**
- **Pairing with Renewables or other resources**
- **DER Integration, control, scheduling, etc.**



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# Appendix



## Incentive Design

# Retail Energy Storage Incentive Program

- **Funding for new, permanent, grid-connected energy storage systems up to 5 megawatts of alternating current, either BTM or FTM on the distribution system**
  - > Systems can be installed alone or paired with another DER
- **Primary use case must be load management or shifting on-site electric generation to more beneficial time periods (resiliency may be secondary)**
  - > Compensated under a utility tariff (VDER Value Stack tariff or a granular delivery rate)
  - > Projects may be eligible for utility and/or NYISO programs and markets (demand response or utility contracts)

## Incentive Structure

# Retail Energy Storage Incentive Program

- **100% of incentive up to first 4 hours duration, 50% for hours 5-6, 0% thereafter**
  - > 100 kW/600 kWh system (6 hours duration) under NYC Block 1:  
 $(400 \text{ kWh} * \$300/\text{kWh}) + (200 \text{ kWh} * \$150/\text{kWh}) = \$150,000$
- **Block 1 is closed. NYSERDA's dashboard shows available incentives [nyserdera.ny.gov/retailstorage](https://nyserdera.ny.gov/retailstorage)**

Current Rates	Rest of State IOUs			New York City		
	Incentive	MWh	\$ Budget	Incentive	MWh	\$ Budget
Block 2	\$250/kWh	125 MWh	\$31M	\$300/kWh	60 MWh	\$18M
Block 3	\$200/kWh	150 MWh	\$30M	\$240/kWh	65 MWh	\$15.6M

# Two Paths to Receive a Bulk Incentive

1. NYSERDA Standard Offer declining incentive (not currently available in Con Ed / Long Island), **or**
  2. Utility Bulk Dispatch Rights contract
- Both offerings draw from same budget
  - In addition, projects may alternatively seek a NYSERDA REC payment for a paired renewable + storage project

# Incentive Structure

## Incentive Levels for Projects *Up to 20 MW* in Total Size

2019	2020	2021	2022	2023	2024	2025
\$110/kWh	\$100/kWh	\$90/kWh	\$80/kWh	\$70/kWh	\$60/kWh	\$50/kWh

## Incentive Levels for Projects *Greater than 20 MW* in Total Size

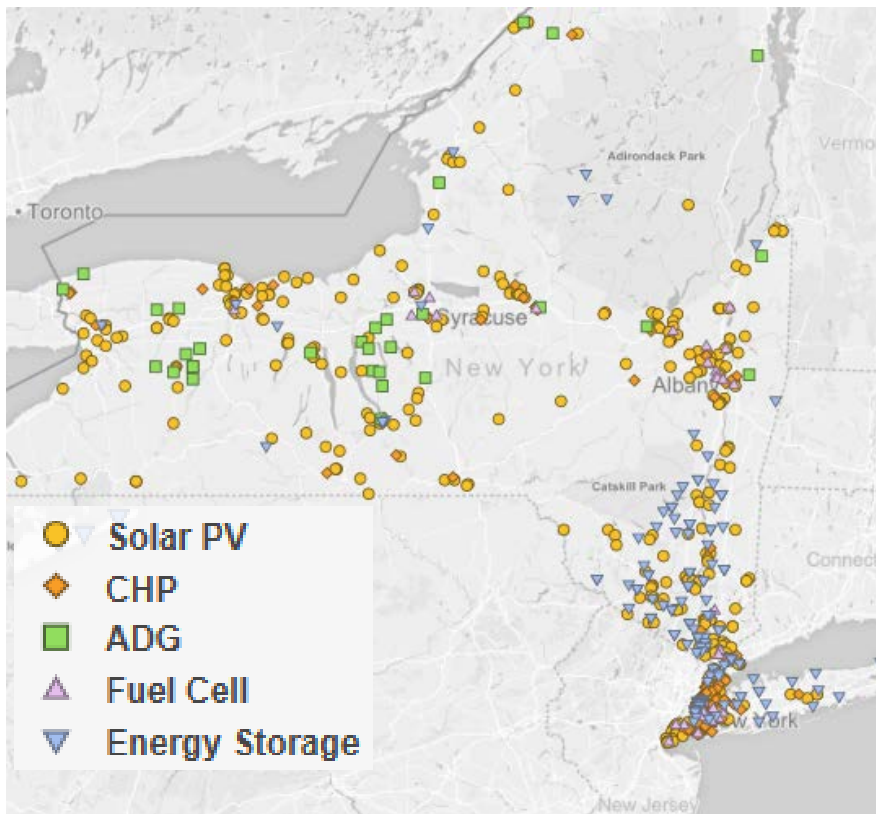
First NYISO Class Year to Begin After Filing of this Plan (estimated to begin in 2019)	Second NYISO Class Year to Begin After Filing of this Plan (estimated to begin in 2021-22)
\$85/kWh	\$75/kWh

# IOU Bulk Storage Dispatch Rights RFPs

- NYSERDA will work with IOU to provide incentive funding as required based on an economic evaluation of bids
- Incentive will consider NYSERDA standard offer incentive levels in effect at that time and lower cost of capital resulting from a fixed utility revenue stream
- Developer may not apply for funding under NYSERDA Bulk Storage Standard Offer Incentive; any NYSERDA incentive will be provided through IOU Dispatch Rights contract
- Draws from Bulk Storage budget

# NYSERDA Distributed Energy Resources Portal

<https://der.nyserda.ny.gov>



## Lockheed Martin Syracuse

497 Electronics Pkwy  
Liverpool, NY 13088



1,000 kW  
ESS 1,400 kWh

### Facility Details

**Category** Manufacturing: Miscellaneous

**Electric Utility** National Grid - Upstate NY (Niagara Mohawk)

**NYISO Zone** C - Central

### Energy Storage System

Elec. Stg. Capacity  
1,000 kW  
1,400 kWh

**Program** Energy Storage

**Developer/Installer** ENGIE Storage (fka Green Charge)

**Commercial Operation Date** 2016

**Value Streams** Demand Charge Reduction

**NYSERDA-funded**

1,000 kW | 1,400 kWh Distributed Energy Resource

**Electric Stg. Disch. Rate** 1,000 kW

**Electric Stg. Energy Cap.** 1,400 kWh

**No. of Units** 1

**ESS Type** Battery: Lithium Ion (LI-ION)

# Reported Lithium Ion System Costs

Source: NYSERDA 2018 Market Evaluation DRAFT Results & Program Data

	Unit	Behind the meter/ Customer Sited Downstate (1 MW or less)	Storage Systems Paired Community Solar (1-5 MW)
<b>Average Total Installed System Cost in NYS</b>	\$/kWh	\$850-\$1000	\$450-600

Source: Compiled Industry Data on 4-hour Utility Scale Systems

	Unit	2017	2019	2021
<b>Average Total Hardware Only Aggregated in US</b>	\$/kWh	\$375	\$250	\$200

# Technical Assistance Resources



## Siting

- > Help local AHJs with developing permitting processes and considering applications
- > Statewide storage guide and best practices



## Customer Assistance

- > Customer outreach and education
- > Technical assistance: high-level assessment of fit for energy storage



## Vendor Assistance

- > One-on-one outreach on market rules, opportunities, and project guidance
- > Digital resources, and informational events also made available



## Quality Control

- > Measurement and verification for energy storage installations
- > Increase confidence in deployed systems
- > Deployed systems listed on DER Data System



## PON 1746 - FlexTech

# Energy Storage Feasibility Studies

- > Technical (sizing/potential) and economics examined
- > NYSERDA will contribute up to 75% of study costs, up to \$100,000
- > Commercially available technology
- > Managing customer load, deferring distribution system upgrades, or pairing with other DERs
- > For behind-the-meter projects, interval load data logging may be a first step
- > Details available [here](#)

# Clean Energy Siting

## Assistance for Local Governments



New York Battery Energy  
Storage System Guidebook  
for Local Governments



Chapter 1 – Battery Energy Storage Model Law

Chapter 2 – Battery Energy Storage Model Permit

Chapter 3 – Battery Energy Storage Inspection Checklist

***NYSERDA offers local governments free one-on-one technical assistance to help implement Guidebook Chapters.***

If you have a question on the Guidebook, or need help siting your project, email [cleanenergyhelp@nyserda.ny.gov](mailto:cleanenergyhelp@nyserda.ny.gov) and we'll respond to you within 24 hours.



NYSERDA

Department  
of Public Service

# NY Green Bank – Overview

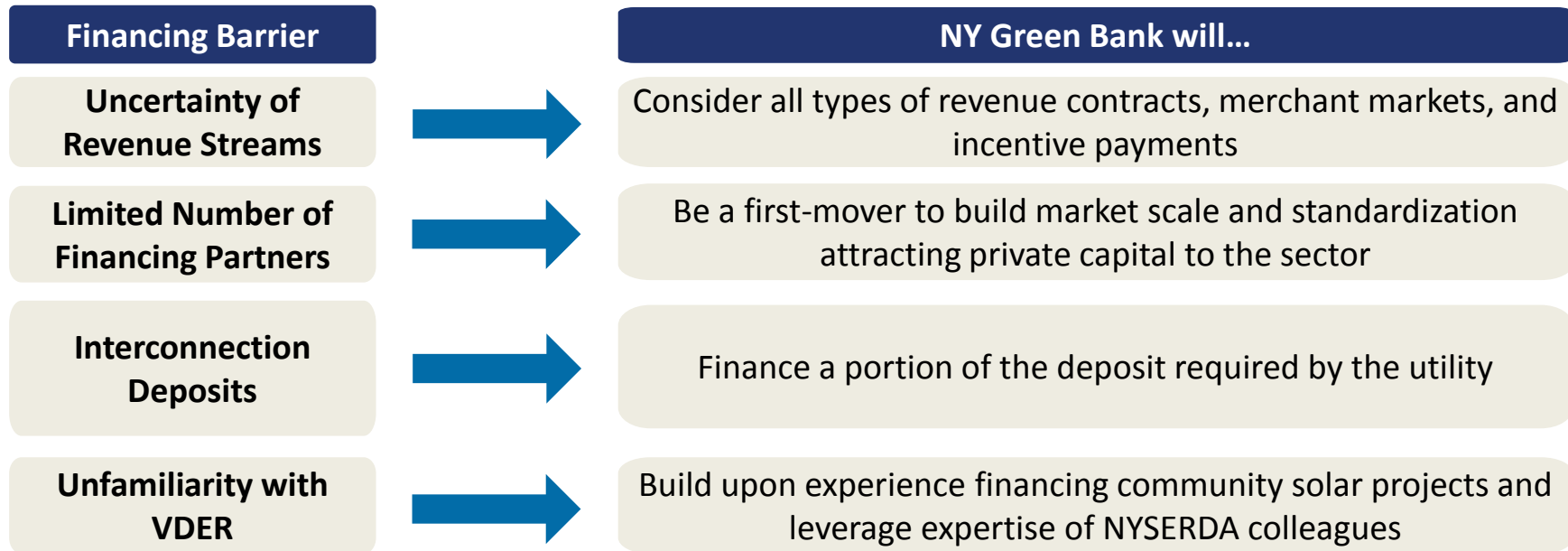
## Mission:

To accelerate clean energy deployment in New York by working in collaboration with the private sector to transform financing markets

- **What:** A \$1 billion State-sponsored investment fund that is a division of NYSERDA
- **Why:** To alleviate financing gaps in New York's clean energy markets and create a cleaner, more resilient and affordable energy system
- **How:** By mobilizing greater private sector activity to increase the availability of capital for clean energy projects

Supporting the expansion of energy storage in New York State  
is a strategic priority for NY Green Bank

# NY Green Bank – Overcoming Barriers to Financing Energy Storage



# NY Green Bank – Financing Options

- Interconnection financing
- Construction financing
- Term debt, including:
  - Senior project-level debt
  - Backleverage
  - Subordinated / mezzanine
- Revolving warehouse and aggregation facilities
- Credit enhancements
- Project-level equity / preferred equity

**Contact us at [info@greenbank.ny.gov](mailto:info@greenbank.ny.gov)  
to discuss potential investment  
opportunities**

# Further Resources For Reference

[NYSERDA Energy Storage Homepage](http://www.nyserda.ny.gov/energystorage) [www.nyserda.ny.gov/energystorage](http://www.nyserda.ny.gov/energystorage)

[NY Green Bank Open Solicitations](#)

[NYS Battery Energy Storage System Guidebook](#)

[Energy Storage Proceeding at the Public Service Commission](#)

Contact NYSERDA: [energystorage@nyserda.ny.gov](mailto:energystorage@nyserda.ny.gov)

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