The Southern Tier Central Regional Planning & Development Regional Conference
Thursday June 11, 2026

BATTERY ENERGY STORAGE SYSTEMS 101

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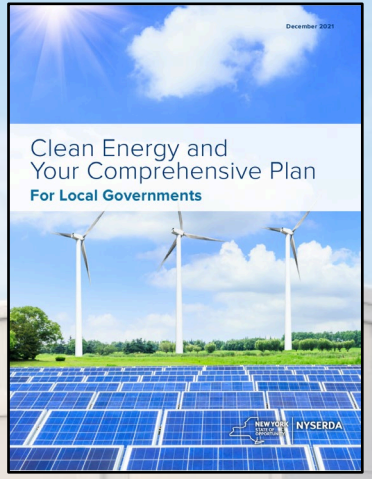
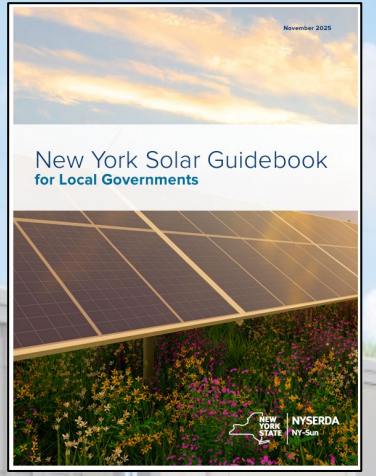
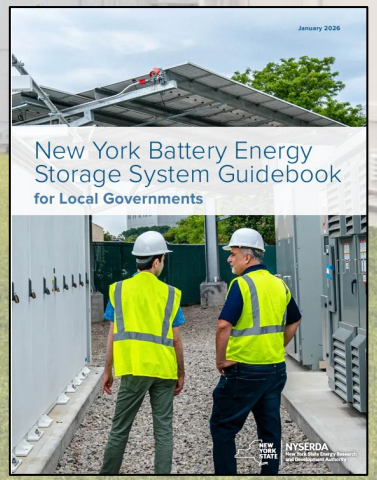
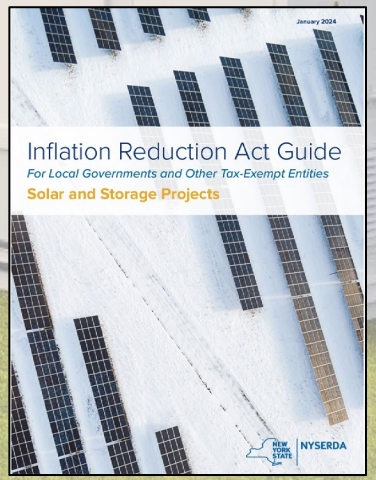
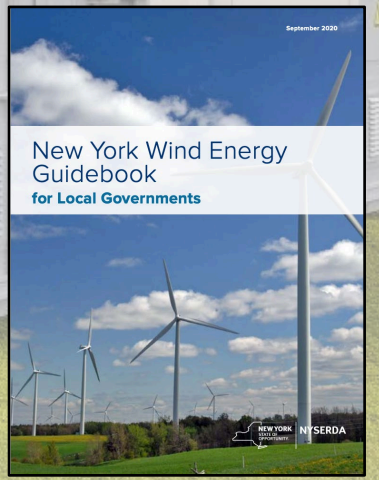










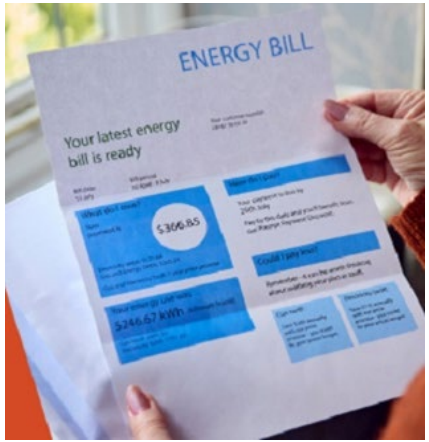
ENERGY STORAGE PROVIDES A VARIETY OF BENEFITS

SUSTAINABILITY

Reducing pollution by replacing peaker plants

RELIABILITY

Supporting the grid, preventing blackouts



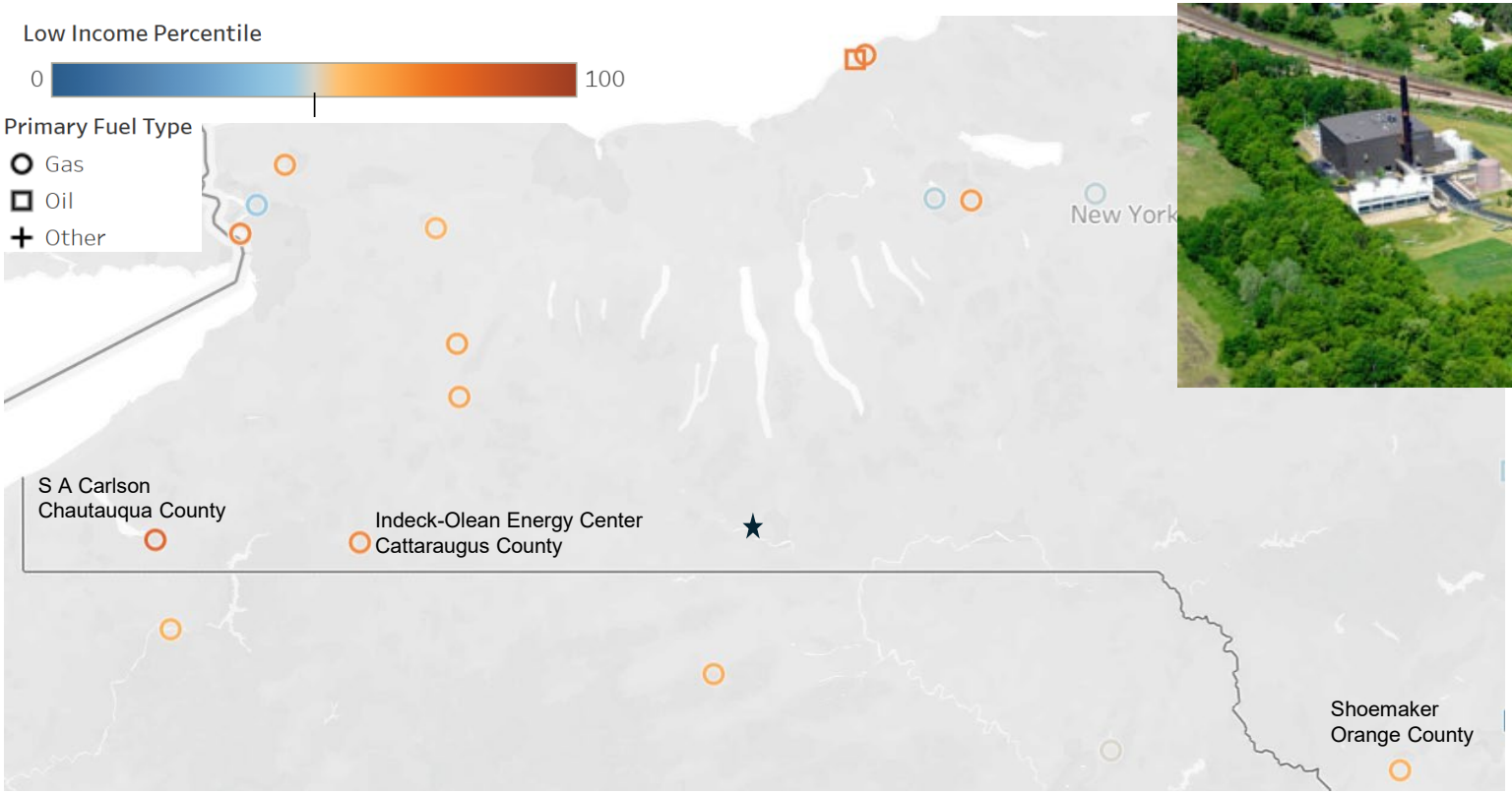
AFFORDABILITY

Improving grid efficiency, lowering bills, creating jobs

INDEPENDENCE

Reducing vulnerability by enabling renewables

SUSTAINABILITY: PEAKER PLANTS



PEAKER PLANT EMISSIONS

Indeck-Olean Energy Center

Cattaraugus County, NY

Utility: **Niagara Mohawk Power Corp.**
Nameplate capacity: **91 MW**
Fuel type: **Gas**
Capacity factor: **12.70%** (~1113 hours per year)

Annual Emissions:

CO2e: **53,649 tons**	Rate: **1,068 lb/MWh**
NOx: **16.86 tons**	Rate: **0.34 lb/MWh**
SO2: **0.27 tons**	Rate: **0.01 lb/MWh**
PM2.5: **0.94 tons**	Rate: **0.04 lb/MWh**

Surrounding population: **20039 residents**

Demographic index: **26%**	Percentile: **47**
People of color: **12%**	Percentile: **24**
Low income: **39%**	Percentile: **69**

From EPA's 2022 operating and emission data

CO_2 emissions from

6,602,147 gallons of gasoline consumed	**62,609,969** Pounds of coal burned	**777** tanker trucks' worth of gasoline
8,664 homes' electricity use for one year	**312** railcars' worth of coal burned	**2,079,875** Incandescent lamps switched to LEDs

Carbon sequestered by

1,520,585 tree seedlings grown for 10 years	**55,540** acres of U.S. forests in one year	**468** acres of U.S. forests preserved from conversion to cropland in one year

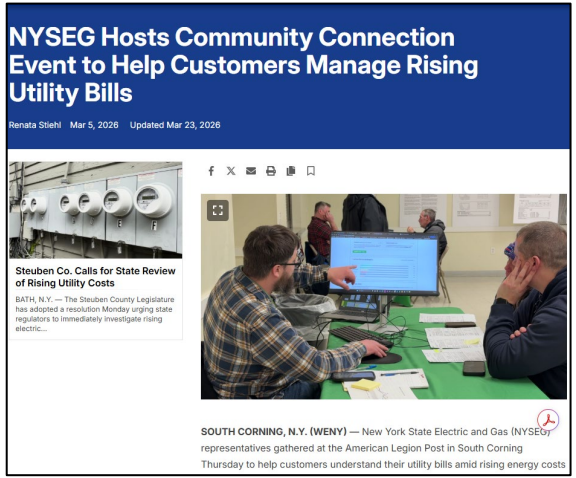
RELIABILITY: SUPPORTING THE GRID

- **Reduces grid stress during peak demand, helping avoid blackouts and brownouts**
- **Provides fast-response voltage and frequency support**
  - **Operating within 100-500 milliseconds to absorb or release energy**
  - **Reduces fluctuations that could damage sensitive equipment**
- **Can provide backup power during emergencies**

Headquarters of the NYISO, the grid operator for NYS

AFFORTABILITY: PROTECTION AGAINST PRICE SPIKES

- **Reliance on imports of fossil fuels like natural gas make New York vulnerable to:**
  - **Supply disruptions**
  - **Fossil fuel price volatility**
  - **Geopolitical conflicts**
- **Renewables + energy storage will support energy independence & affordability**



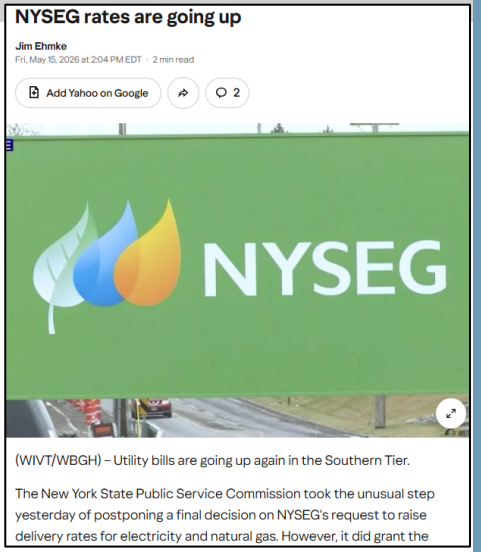
NYSEG Hosts Community Connection Event to Help Customers Manage Rising Utility Bills

Renata Stiehl Mar 5, 2026 Updated Mar 23, 2026

Steuben Co. Calls for State Review of Rising Utility Costs

BATH, N.Y. — The Steuben County Legislature has adopted a resolution Monday urging state regulators to immediately investigate rising electric...

SOUTH CORNING, N.Y. (WENY) — New York State Electric and Gas (NYSEG) representatives gathered at the American Legion Post in South Corning Thursday to help customers understand their utility bills amid rising energy costs



NYSEG rates are going up

Jim Ehmke

Fri, May 15, 2026 at 2:04 PM EDT · 2 min read

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NYSEG

(WIVT/WBGH) – Utility bills are going up again in the Southern Tier.

The New York State Public Service Commission took the unusual step yesterday of postponing a final decision on NYSEG's request to raise delivery rates for electricity and natural gas. However, it did grant the

What's Driving Up New York's Electricity Bills?

Francesca Hsie, Maya Gibbs, Dr. Florian A. Schneider, & Carson Ohlen

JUMP TO SECTION...

Energy Prices in...

NEW YORK

RECORD

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Project RECORD

VIEW SERIES

It's no wonder that 68% of New Yorkers described energy prices as 'out of control' in a recent poll. The typical New Yorker pays over 50% more for electricity than the average American—and

EMPIRE CENTER

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PRESS RELEASES

New York's Residents Hit with Record Electricity Prices

March 4, 2026

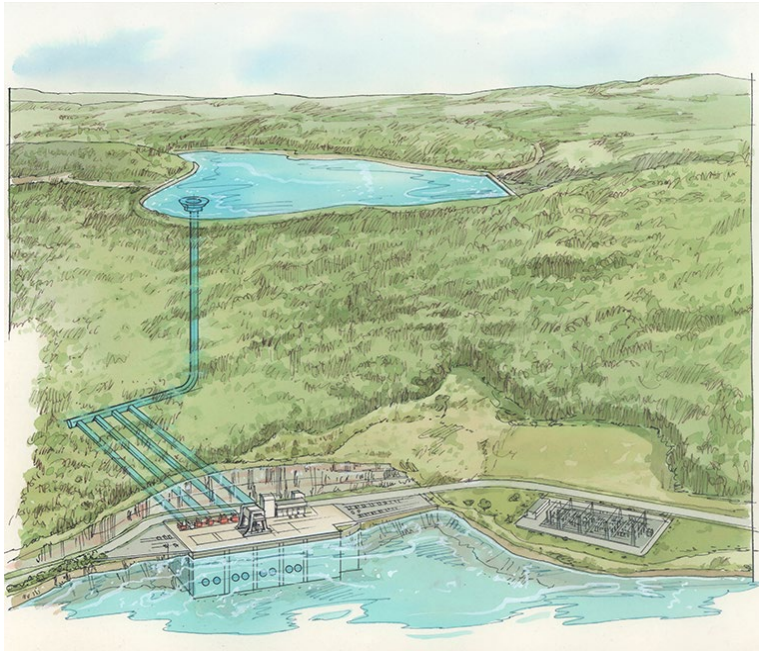
New York has some of the highest household energy prices in the nation, according to Empire Center and U.S. Energy Information Administration data. In December, the state's average residential electricity price reached 27.39 cents per kilowatt-hour—sixth highest in the U.S. and 59 percent above the national average. Prices increased 3.7 percent from November and 12 percent over the past year, rising twice as fast as the national average and four times faster than

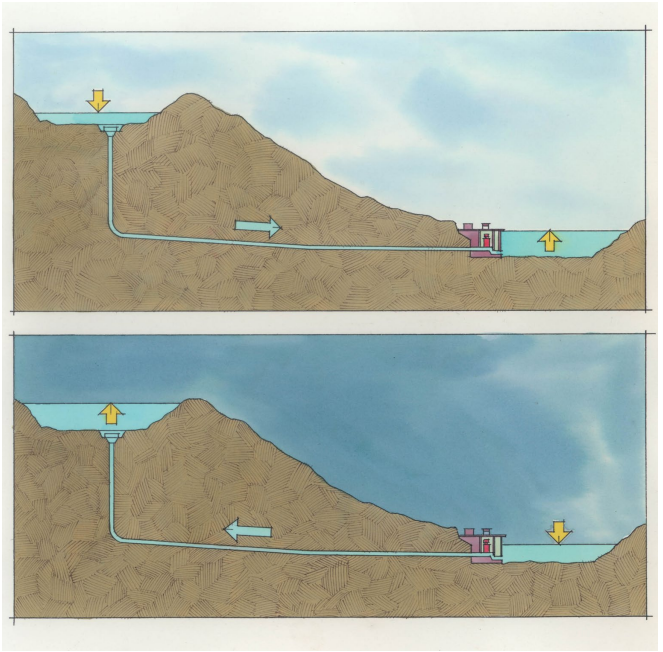
NEW YORK'S ELECTRIC GRID IS FACING SIGNIFICANT STRAIN…

- In-balance between generator deactivation and additions
- Aging infrastructure, with much of it built in the 1960s-70s
  - Forcing maintenance or retirements
- 80% of transmission lines were installed before 1980
- From rising demand
  - Electrification of the building and transportation sectors
  - New large-load customers
- From increased summer and winter demands

NEW YORK HAS BEEN A LEADER ON ENERGY STORAGE SINCE 1973

NYPA Blenheim-Gilboa Pumped Storage Power Project (1,160 MW)





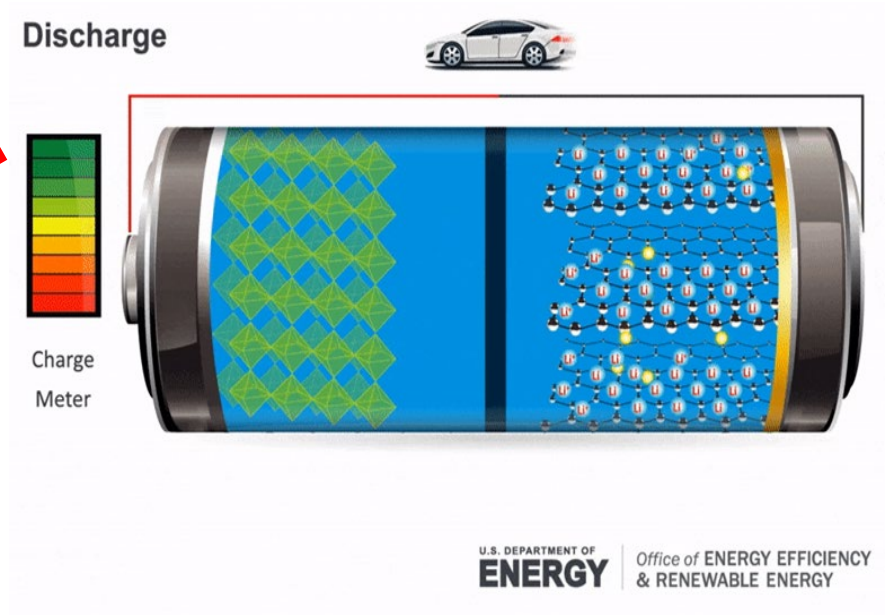
Images courtesy of NYPA

HOW DOES A BATTERY WORK?

Discharging

…To your building, when it's most needed

…To the grid, when electricity is most expensive/dirtiest



Charging

…From paired renewables, when there's extra electricity generated

…From the grid, when electricity is cheapest/ cleanest

BESS COMPONENTS

Cells

Module

Rack

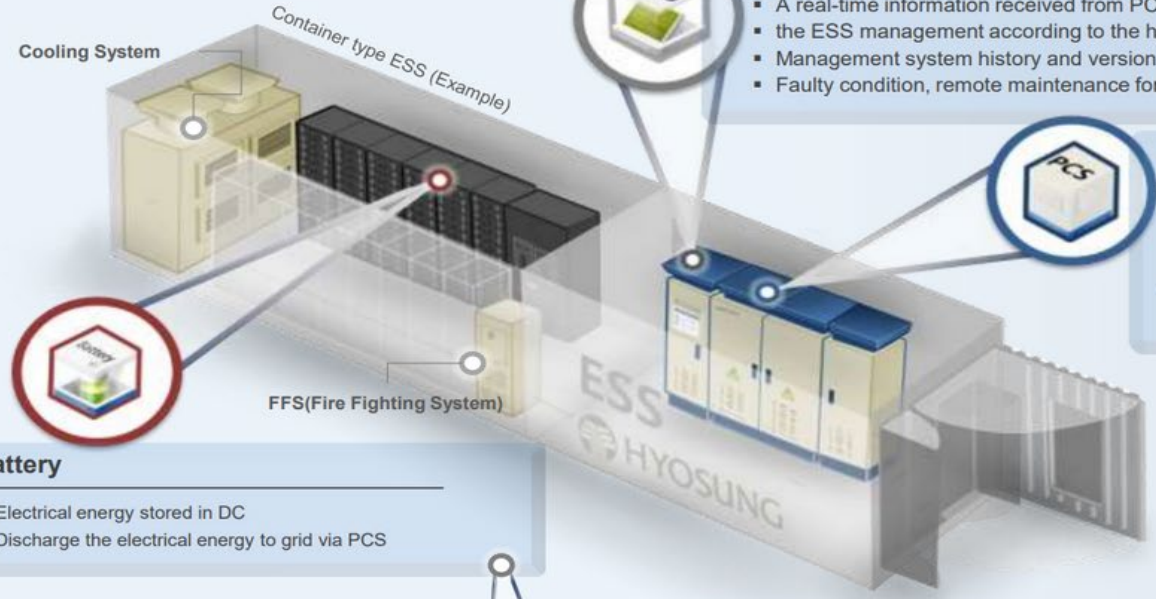
Unit/ System

BATTERY MANAGEMENT SYSTEM (BMS)

- BMS is the eyes, ears, and brain of the system
- Monitors multiple levels of the BESS
  - Monitors from system level to each individual cell
  - Capable of monitoring thousands of data points per second
- Will alarm if there are potential issues
- If required, can isolate affected cells or modules from the total system and activate fire protection systems, preventing further failure

BATTERY ENERGY STORAGE SYSTEM

The main configuration of ESS



PMS(Power Management System)

- Monitor and estimate power consumption and active operation
- A real-time information received from PCS to monitor the ESS
- the ESS management according to the host controller command
- Management system history and version
- Faulty condition, remote maintenance for recovery available

PCS(Power Conditioning System)

- Invert DC power stored in batteries to AC power with voltage and frequency of commercial
- Convert AC power to DC and charged in batteries

Battery

- Electrical energy stored in DC
- Discharge the electrical energy to grid via PCS

BMS(Battery Management System)

- Monitoring battery's current, voltage, temperature, SOC, devices status
- Exchange information and data to communicate with PCS

TYPES OF BATTERIES / CHEMISTRIES

Nickel-based

Lead Acid

Sodium-ion

Solid-state

Sodium-Sulfur

Lithium-ion

Zinc-air

Flow

WHY IS LITHIUM-ION THE PREFERRED CHEMISTRY?

1. Size: Can store a large amount of energy in a small, lightweight package
2. Speed: Can be charged and discharge quickly
3. Lifetime: Last longer with lower long-term costs thus requiring less frequent replacement
4. Charge Retention: Loses charge very slowly when not in use
5. Cost: Less expensive than alternative forms
6. Technologically Maturity: Tremendously high market penetration

STATIONARY ENERGY STORAGE BY INSTALLATION TYPE

Residential
"Behind the Meter"
~5-10 kW

Serves 1-2 family homes

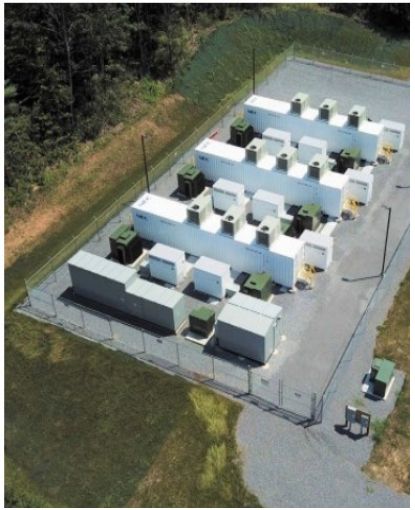
On-Site Retail
"Behind the Meter"
~50-750 kW

Serves buildings

Off-Site Retail
"Front of the Meter"
~1-5 MW

Serves local distribution grid

Bulk
"Front of the Meter"
~20-100 MW



Serves high-voltage transmission grid

NYS INTER-AGENCY FIRE SAFETY WORKING GROUP

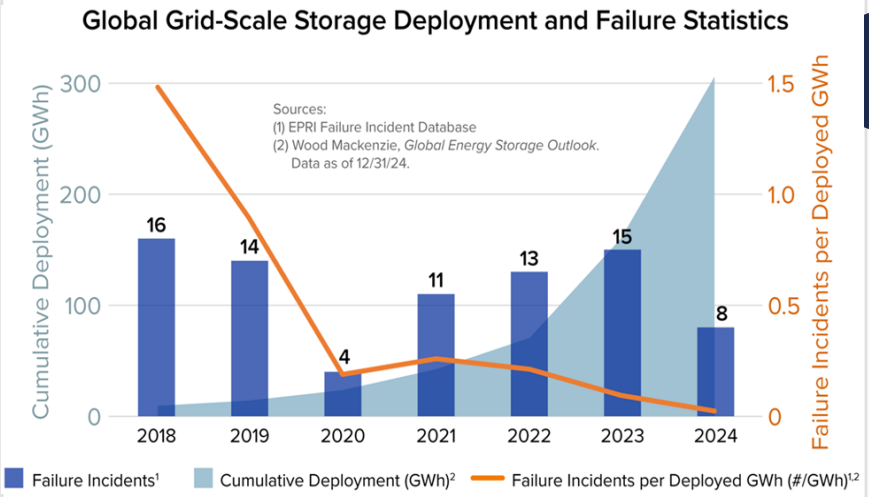
Working Group Milestones

1. **Release Air, Soil, and Water Data Findings Report. No reported injuries, no detected harmful levels of contaminants linked to the fires.**
2. **Issuance of final Fire Code Recommendations for NYS Uniform Code. Resulted in 11 recommendations for large, grid-scale systems. Final code language includes the recommendations.**
3. **Field Inspections and Quality Assurance – inspected 57 in-service projects with SME collaboration resulting in an enhanced NYSERDA inspection process.**
   - ***Through lessons learned, incorporated peer review into NYSERDA program***
4. **Field inspection summary report outlining findings and improvements.**
5. **State-wide webinar for local communities.**


MYTHS
DEBUNKED

MYTH

Battery storage systems easily catch fire.



VS

FACT

- **All electrical infrastructure comes with inherent risk.**
- **While high-profile in the news, battery fire incidents are rare!**
- **The ratio of incidents reported to BESS capacity deployed has declined significantly due to improved system design and new, broadly applicable safety standards designed to reduce risk.**

MYTH

What happened at Moss Landing could happen here.

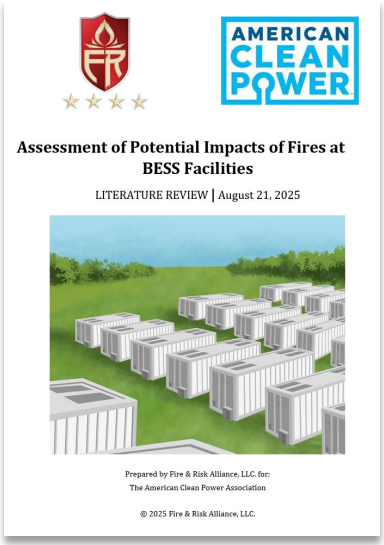
VS

FACT

- **The Moss Landing battery facility's structure was globally unique.**
- **New York's battery facilities are sited only in buildings or enclosures that were specifically designed to safely house them.**
- **New York has strict equipment testing and listing requirements designed to ensure that fires do not spread.**

MYTH

Battery storage fires release toxic fumes that are extremely hazardous to nearby residents and will negatively impact air, soil, and water.



VS

FACT

- **Studies show battery storage fires results in emissions similar to a house or building fire.**
- **Environmental reviews of soil, water, and air consistently show no harmful contamination from battery fires.**
- **Fossil fuel plants, which emit fumes by design whenever in operation, are of greater concern to human health and safety.**

MYTH

A battery storage fire would require evacuation of everyone in the immediate vicinity.

VS

FACT

- **Safety experts DO NOT RECOMMEND evacuations in response to a battery storage fire.**
- **Instead, the same precautions are taken as for a structure fire, with residents advised to avoid smoke inhalation or shelter in place, depending on the severity of the event.**

MYTH

Battery energy storage systems should not be located near residents or schools.

VS

NineDot community storage installation sited across the street from a school in the Bronx

FACT

- **Battery storage projects that comply with testing and safety regulations are safe to site near residences and schools when following all applicable rules and regulations.**

- **Community storage can provide important services to the neighborhood grid and utility bill discounts to community members.**

MYTH

Firefighters are not trained or prepared to deal with a battery fire.

VS

FACT

- **All projects are required to have emergency response plans and annual training must be offered to local fire department.**
- **Hazard Support Personnel must be en route to an incident within 15 minutes and arrive on site within 4 hours (2 hours in NYC).**
- **Battery fires don't require special equipment, apart from standard haz-mat emergency response tools.**

LAND USE VS FIRE CODE

Land Use

- **Regulates the use of land, the density of land use, and the siting of development**
- **Ensures residential, commercial, and industrial developments coexist in a plan**
- **Enc**
  red

Fire C

- **Esta** **dings, facilities, and processes across New York State (excluding NYC)**
- **It regulates fire prevention, hazardous materials, emergency preparedness, and building safety**

The Primary Difference

Land use governs *where and what* you can build (zoning & development location), and

Fire code governs *how* that building/structure is designed, maintained, & operated to prevent fires

PERMITTING BATTERY ENERGY STORAGE SYSTEMS

In New York State, the permitting process varies based on size and whether system is paired with generation.

- **Paired with Renewable Generator < 25 MW:**
  Permitted at local level (State Environmental Quality Review (SEQR), municipal/county requirements)
- **Paired with Renewable Generator > 25 MW:**
  Permitted at State level (Article 10, Office of Renewable Energy Siting and Electric Transmission (ORES)
- **Standalone System < 80 MW:**
  Permitted at local level (SEQR, municipal/county requirements)
- **Standalone System > 80 MW:**
  Subject to licensing by the Public Service Commission (PSL §68) and SEQR (other State and local municipal reviews/approvals may apply)

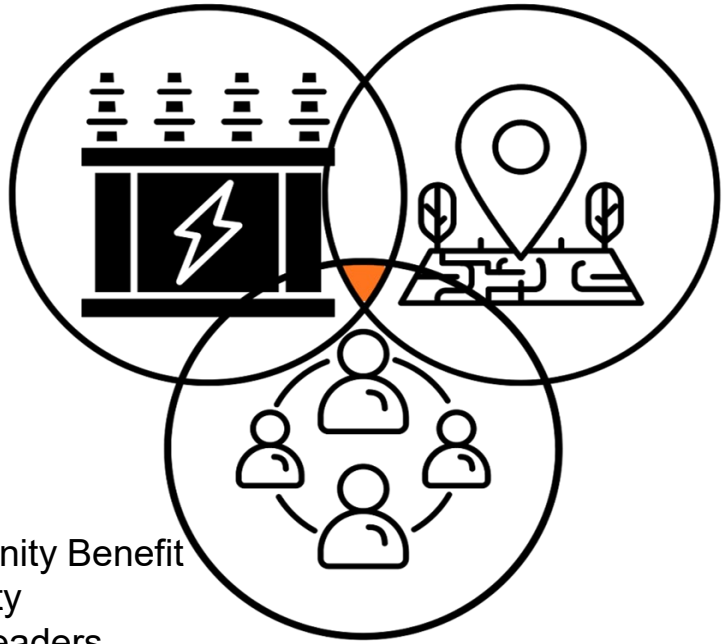
SITING CONSIDERATIONS

Interconnection

Grid Capacity
Infrastructure
Economics

Site & Permiting Viability

Zoning Laws
Site Access
Topography
Environment

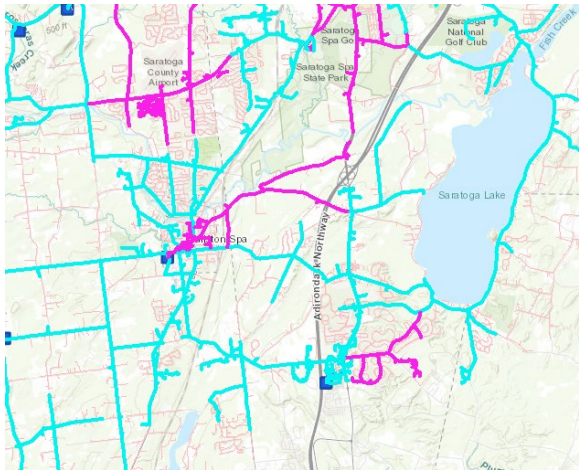


EJ
Community Benefit
Proximity
Local Leaders
Sentiment
Workforce

Host Community

Interconnection: Hosting Capacity Mapping

- **Visualize local energy distribution infrastructure**
- **Identify general potential locations for BESS development based on select criteria:**
  - **Grid proximity**
  - **Grid hosting capacity**
  - **Existing zoning**
  - **Proximal land use**



Hosting Capacity Maps: https://jointutilitiesofny.org/utility-specific-pages/hosting-capacity

Siting and Permitting Viability

- **Proximity to the substation to minimize**
  - **Generation tie (gen-tie) cost**
  - **Disturbance to surrounding communities / land**
- **Limited tree coverage**
- **Low to no slope, ideally flat**
- **Avoiding environmental areas: wetlands, waterbodies, floodplains**
- **Close to a public road for project access**

Host Community

- **Is there an opportunity to decommission hyper-localized polluters?**
- **What benefit does the project have on the community?**
- **How does the community interact with the site?**
- **What is the sentiment towards battery storage?**
- **Is it an environmental justice community?**
- **Are there local CBOs that should be engaged?**
- **What workforce development opportunities exist as a result of the project?**

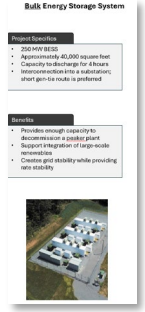
"Your mission–
should you
choose to
accept it..."

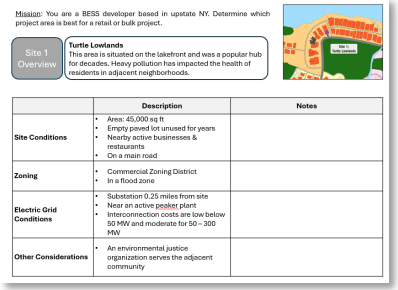
Battery Storage Siting Activity

Determine which site is best for each BESS project.

Directions

1. **Review the site map**
2. **Review the BESS cards (2)**
3. **Review the site reports (4)**
4. **Determine which site is best for each battery project**





POWERING THE SOUTHERN TIER'S CLEAN ENERGY FUTURE

Why BESS, why now

- U.S. electricity demand is rising faster than at any point in decades
- Electrification of homes, vehicles, and industry requires flexible storage
- Renewable generation alone can't meet peak demand without storage
- BESS bridges the gap between when energy is made and when it's needed

BESS & the Southern Tier

- Rural, grid-edge communities face the greatest risk from outages and aging infrastructure
- Local storage means local resilience: keeping power on through storms and emergencies
- Modern BESS has a strong and improving safety record
- Projects can be designed to complement the landscape, not to compromise

The goal isn't to override community concerns. The goal is to replace fear with facts.
The Southern Tier can lead on responsible, well-sited storage that protects both its residents and its landscape.

RESOURCE LIBRARY

- ACP: Assessment of Potential Impacts of Fires at BESS Facilities
- EPRI: Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database
- Joint Utilities: Hosting Capacity Map
- NY-BEST: Library of Best Practices
- NYSERDA: BESS Guidebook, FAQ, Inter-Agency Fire Safety Working Group