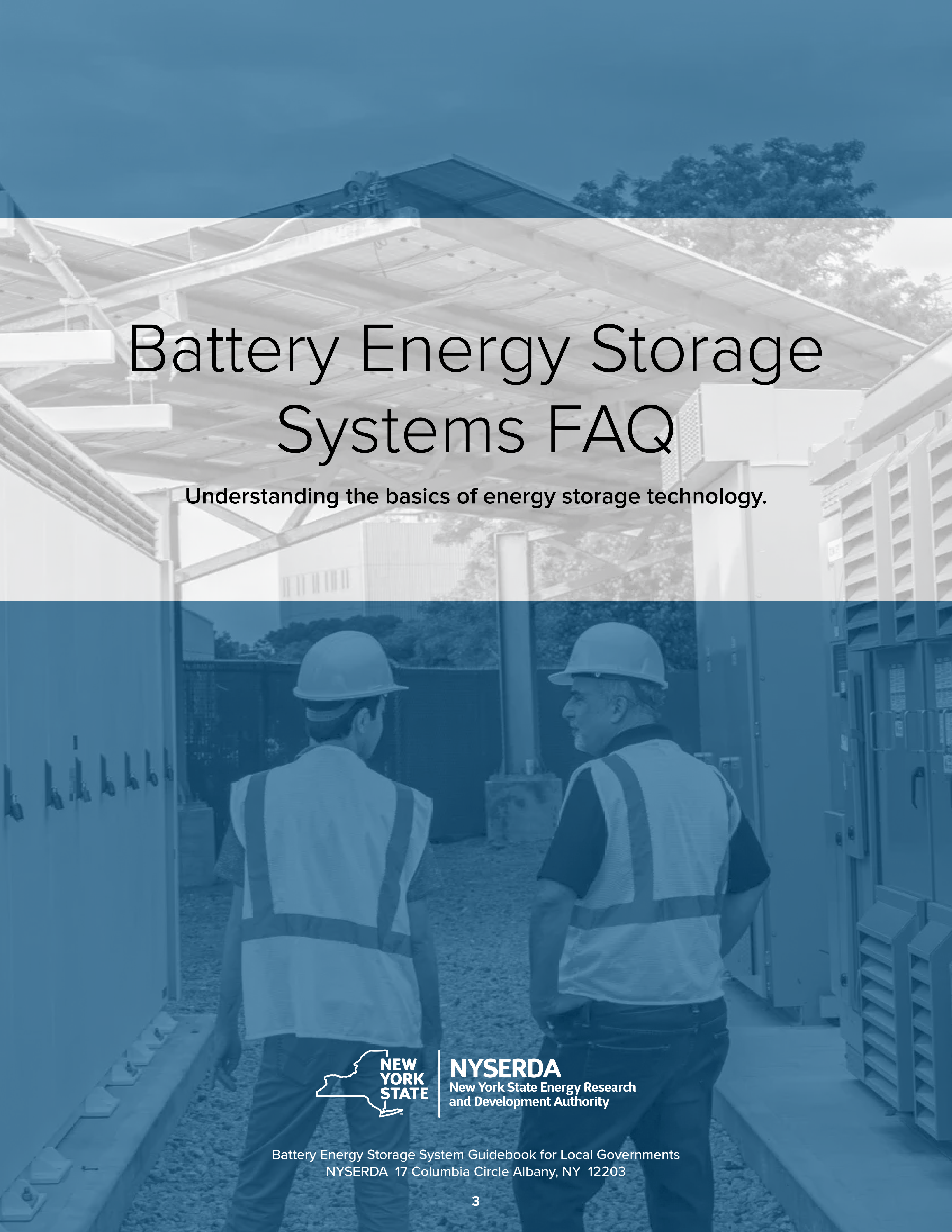


Battery Energy Storage Systems FAQ

Understanding the basics of energy storage technology.

NEW YORK STATE

NYSERDA
New York State Energy Research and Development Authority

Battery Energy Storage System Guidebook for Local Governments
NYSERDA 17 Columbia Circle Albany, NY 12203

Section Contents

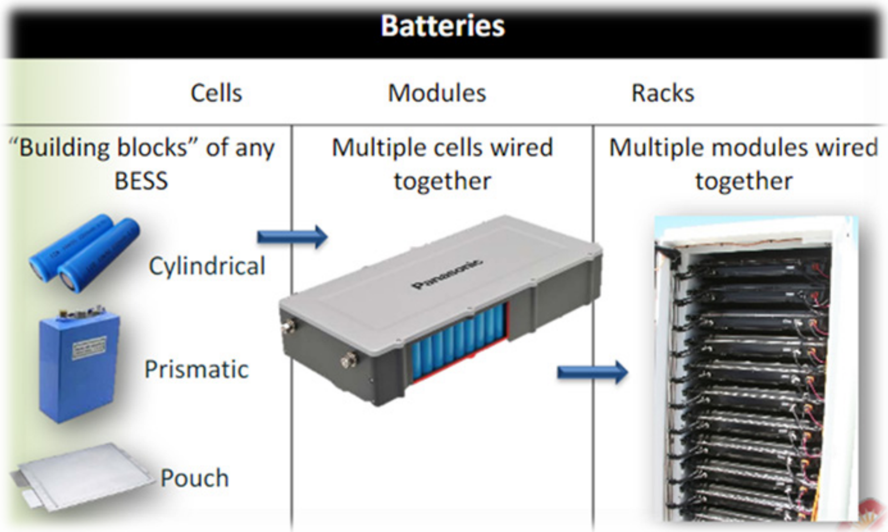
1. General Questions

1. What is a Battery Energy Storage System (BESS)?

A BESS is a group of battery cells organized into modules and then into racks that store electricity for future use via connection to the electric grid, a local electric load, or both. The energy stored can come from renewable sources (like solar or wind) or non-renewable sources (like natural gas or coal).

BESS can operate in two ways:

- Paired with a renewable energy source such as wind or solar – storing clean energy when it is produced and releasing it when needed. For example, a solar-plus-storage system may charge during sunny midday hours and discharge in the evening when demand spikes. This helps reduce curtailment, which occurs when there is an oversupply of clean energy that would otherwise be wasted.
- Standalone – charging directly from the grid during low-demand periods (for example, at night when electricity usage is much lower) and discharging during high-demand periods (for example, when many people turn on their AC units after returning home from work).



The Role of Storage and DER for California, Solar + Storage for Resiliency." Angelina Galiteva, Founder Renewables 100 Policy Institute, November 2017.

2. What are the different types of BESS?

- **Residential storage:** Primarily used for home resiliency to deliver back-up power, these systems can also shift energy consumption to off-peak hours and integrate home solar for a low-cost clean energy supply. These types of systems usually are up to 20kWh per unit.
- **Commercial storage:** Businesses can install storage systems onsite or separate from building loads, like a community solar project. These systems can be paired with solar, provide back-up power, and earn compensation from utilities for delivering grid benefits. These systems sizes vary and usually are up to 5 MW.
- **Bulk storage (utility scale):** These grid-connected storage projects enable increased integration of renewable energy sources while ensuring a resilient and reliable power supply when and where it's needed most. They provide multiple grid services which will be explained in detail in this document.

3. Why do we need BESS?

According to National Electrical Manufacturers Association study published April 2025 national electricity demand will steadily increase 2% annually, and will be more than 50% higher than 2025 by 2050 . Multiplying data centers, EV popularity and ongoing electrification of all buildings and manufacturing processes are the main drivers of this phenomenon. Additionally, New York State has a goal of achieving a zero-emissions grid by 2040. As electricity demand grows and the grid decarbonizes, ensuring power is available when and where people need it will become more challenging. Renewable sources like wind and solar are affordable technologies, but they don't always generate energy when demand for electricity is the highest. BESS can address this issue by capturing excess electricity when it's available and delivering it back to the grid when it's needed the most.

Beyond balancing variability, BESS systems also make the grid more resilient and efficient. They reduce reliance on expensive and polluting Peaker plants, lower the risk of blackouts and brownouts during times of stress on the grid and allow the grid to adapt more quickly to changing conditions. BESS makes the grid more flexible and capable of handling both growing electricity demand and a cleaner resource mix. Peaker plants are costly, highly polluting (releasing nitrogen oxide, sulfur dioxide and particulate matter), and disproportionately located in disadvantaged communities.

4. What are the components of a BESS?

BESS are carefully designed and thoroughly tested to ensure all its components work together and in harmony.
These components include but are not limited to:

- **Battery cells** – which are grouped into modules and racks.
- **Battery Management System (BMS)** – which monitors every single cell and their performance. One of the most important components of the BESS, BMS can locate and control faults as well prevent any issues with the whole system.
- **Power Conversion System (PCS)** – converts electricity from Direct Current (DC) to Alternate Current (AC) which makes stored energy usable.
- **Energy Management System (EMS)** – allows to decide when to charge or discharge.
- **Cooling Systems** – HVAC systems are there to cool BESS as needed.
- **Communication Interfaces** – BESS integrate communication systems that allow grid operators to remotely control these systems and monitor them 24/7.

5. How do BESS support the electric grid?

BESS support the grid by allowing grid operators balancing supply and demand in a reliable and safe way. These ancillary grid services include:

- **Distribution and Transmission Deferral:** Defer costly upgrades to utility infrastructure borne by ratepayers and contribute to emissions reduction.
- **Energy Arbitrage:** Charge when cost/demand is low, discharge when high.
- **Frequency Regulation:** Energy storage systems can respond instantaneously to fluctuations in grid frequency, stabilizing the system and maintaining the balance between generation and consumption. Fossil fuel technologies cannot act as both grid supply and demand, and they take minutes to begin generating electricity.
- **Black Start:** Help large generators come online following system failure.
- **Energy Reserves:** Dispatch energy as needed to ensure that grid supply equals electric demand. Energy storage is among the only technologies that can serve as both grid supply and demand, enhancing its ability to balance the grid.
- **Spinning Reserve Replacement:** Storage systems can act as a "spinning reserve," providing quick-start capabilities to support the grid when there's an unexpected loss of generation or a surge in demand.

6. How do BESS contribute to New York's climate and energy goals?

New York's Climate Leadership and Community Protection Act (Climate Act) introduced a goal of 1,500 MW of energy storage by 2025 and 3,000 MW by 2030. In June 2024, New York's Public Service Commission (PSC) expanded the goal to 6,000 MW by 2030. In 2022, NYSERDA and the PSC found that deploying 6,000 MW of energy storage capacity by 2030 would generate an estimated $2 billion dollars in ratepayer savings. Energy storage will also increase the resilience and efficiency of New York's grid, which aims to be 100% carbon-free electricity by 2040.

7. What is NYSERDA's role in the deployment of BESS across the State?

NYSERDA administers financial incentive programs that make storage projects more affordable. These incentives, authorized by the PSC, support residential, commercial, and bulk storage projects across the state. Details of how the funding works are available in the program manuals on NYSERDA's website. NYSERDA's Clean Energy Siting team provides model laws, guidebooks, various resources and provides free technical assistance to municipalities as they navigate the BESS permitting process. NYSERDA also leads Governor Hochul's inter agency fire safety working group, making substantive contributions to ensuring safe development of BESS in New York.

8. How do BESS work with renewable energy sources like solar and wind?

BESS complements variable renewable energy resources like wind and solar:

- **Solar plus storage:** Excess midday solar output can be stored and dispatched during evening peak demand.
- **Wind plus storage:** Pairing wind with BESS mitigates wind's inherent variability, allowing energy to be stored when wind is strong and discharged when it's not.
- **Hybrid plants:** Pairing more than one source of renewable energy with BESS can create dispatchable capacity that can be scheduled and dispatched like conventional generation.

9. What does "in front of the meter" or "behind the meter" mean?

- "**In Front of The Meter" (FTM)** – Utility scale systems connected directly to the utility grid. These systems charge when electricity is cheap (usually overnight) or through a collocated renewable generation, and they can discharge when demand is high. These systems help utilities avoid expensive, rate-based infrastructure upgrades, benefiting all ratepayers by keeping rates in check. This type of project is usually greater than 2 MW in capacity.
- **"Behind the Meter" (BTM)** – Smaller commercial systems or residential systems that serve the owner's (the end-user's) needs. They can reduce the owner's electricity bill, provide backup power in case of an outage, and indirectly support the grid by lowering overall demand during peak hours.

10. Are BESS needed only for storing renewable energy?

No, BESS can store any type of electricity. Standalone energy storage systems charge directly from the grid during periods of surplus generation. The type of energy that is stored depends on the local generation mix at the time of charging. For example, in places with high solar penetration, midday charging might be primarily from renewable sources. Regardless of power generation source, energy storage systems contribute to a clean, affordable, reliable electric grid for New Yorkers.

11. Do 'behind the meter' systems still serve the grid?

Yes, BTM systems are crucial for grid stability. These systems can use their stored energy during peak hours and therefore alleviate strain on the grid. Having multiple owners of BTM systems using their BESS during peak hours, via an aggregator or similar market stakeholder, can provide needed grid relief .

2. Types of Batteries

1. What types of batteries are used in energy storage systems?

Battery energy storage can comprise a variety of different electrochemical makeups: lithium-ion, flow, lead acid, sodium-ion, etc. that are designed to meet specific power and duration requirements for a project. Due to varying chemical characteristics, different types of batteries can have varying advantages and disadvantages.

2. Are there alternatives to lithium-ion batteries for energy storage?

Yes, there are other types of batteries that can be used for BESS. However, lithium-ion batteries are the dominant technology due to their advanced commercial market maturity and the following additional reasons:

- **Power output:** Li-Ion batteries can withstand high power demands and provide energy support when needed at a very short time.
- **Storage capacity:** Li-ion batteries are energy dense; therefore they can store more power in smaller space than some other available chemistries.
- **Cycle Life:** Li-Ion offers many charge/discharges cycles which play role in providing ancillary services and energy arbitrage for grid stability and lower rates.
- **Cost:** Due to market maturity and penetration, the cost for lithium ion is lower than many other battery chemistries.
- **Fire Risk:** Fire Code enhancements as well as overall technological advancement and safety features of systems made these systems much safer.
- **Commercial maturity:** this is one of the most important aspects of the technology when thinking about BESS. Lithium-Ion batteries have been used for decades. There are present in consumer products of daily use (personal phones, tablets, laptops, toothbrushes, power tools, etc.) and we carry them around every day. BESS utilize the same underlying lithium-ion electrochemical principles and cell chemistry, but are engineered and scaled up to provide grid-level energy storage. Unlike consumer devices, BESS incorporate multiple layers of safety, monitoring, and control systems, and compliance with nationally recognized safety standards. The technology has been deployed globally at utility-scale, community-scale, and behind-the-meter installations. This long operating history, combined with extensive testing, certification, and regulatory oversight, demonstrates that lithium-ion BESS is a commercially mature technology rather than an experimental or emerging one.

3. What are the differences between lithium-ion batteries and other chemistries?

There are many chemistries that are available on the market but with different technology maturity which dictates also their popularity:

	Lead Acid	Sodium-Sulfur	Flow Batteries	Lithium-Ion
Round-trip Efficiency	70–85%	70–80%	60–80%	85–95%
Typical Duration	2–6 hours	2–8 hours	4–12 hours	0.25–4 hours
Time to Build	6–12 months	6–18 months	6–12 months	6–12 months
Operating Cost	High	Moderate	Moderate	Low
Space Required	Large	Moderate	Moderate	Small
Cycle Life	500–2,000	3,000–5,000	5,000–8,000+	2,000–6,000+
Technology Maturity	Mature	Commercial	Early–Moderate	Commercial

4. What is the expected lifespan of different types of batteries used in BESS?

Lifespan of a BESS depends on type of battery, usage, climate and maintenance. The range can be 15 to 25 years. Various system components need to be replaced during system's operation.

5. What advancements are being made in next-generation battery technologies?

The constant increase in energy demand is spurring the advancement of multiple technologies which could be used for the BESS as well as for EV (Electric Vehicles). Some next-generation batteries include:

- **Solid-state batteries:** In these systems, liquid electrolytes are replaced with solid ones, enabling even higher energy density than lithium-ion batteries., They also offer faster charging, improved safety, and a longer operational lifespan. However, this technology is still under development and is not yet available for commercial use.
- **Sodium Ion:** Sodium is abundant and accessible; works well for large scale energy storage; performs well in cold weather. Has lower energy density than lithium-ion and technology has not reached the level of commercial maturity reached by lithium ion.
- **Zinc-Air:** Zinc is abundant material making this type of cost effective lower energy density and shorter lifespan. Right now, most of them are not rechargeable, but the technology is evolving. This technology is still immature to be implemented and used widely for BESS.

While all of these and more technologies are being developed, it is important to remember that these are still emerging technologies that have various characteristics that may not be feasible for immediate deployment due to their commercial immaturity.

3. Safety & Technical Aspects

1. What is a thermal runaway in BESS?

Thermal runaway is an exponentially self-accelerating temperature increase within a battery cell that can propagate and lead to off-gassing, fire, and/or explosion. It could be caused by different factors like:

- **Mechanical abuse:** physical damage of a battery
- **Electrical abuse:** short circuit, overcharging or some other faults
- **Thermal abuse:** exposure to extreme temperatures that could cause damage to the battery
- **Manufacturing defects**

Thermal runaway in BESS is rare because modern systems are designed with multiple layers of protection, including advanced battery management systems, thermal controls, and built-in safety features that detect and isolate faults before they escalate. In addition, stringent codes, standards and testing requirements further reduce the likelihood of uncontrolled heat events.

2. What safety standards do BESS projects follow in New York?

New York State is a national leader in BESS safety. The 2025 NYS Fire Code has some of the most rigorous safety standards in the nation which are based on NFPA 855 and the International Fire Code (IFC), in addition to recommendations from Governor Hochul's Inter Agency Fire Safety Working Group.

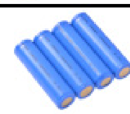
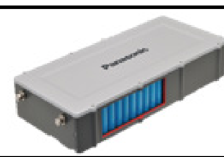
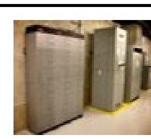
BESS safety regulations are based on multiple Codes and Standards*:

- Underwriters Laboratories (UL) 1741 – Inverters for utility interactive systems
- UL 1973 – Standard for batteries
- UL 1974 – Second use batteries.
- UL 9540 – "Standard for Energy Storage Systems and Equipment" certifies that all components of the system work safely in harmony together
- UL 9540A – Test method to evaluate system safety and inform installations
- The National Fire Protection Association (NFPA) 12 – Standard on CO2 Extinguishing Systems
- NFPA 13 – Standard for the Installation of Sprinkler Systems
- NFPA 15 – Standard for Water Spray Fixed Systems for Fire Protection
- NFPA 68 – Standard on Explosion Protection by Deflagration Venting
- NFPA 69 – Standard on Explosion Prevention Systems
- NFPA 70 – National Electric Code
- NFPA 72 – National Fire Alarm and Signaling Code
- NFPA 750 – Standard on Water Mist Fire Protection Systems
- NFPA 855 – Standard for the Installation of Stationary Energy Storage Systems
- NFPA 1142 – Standard on Water Supplies for Suburban and Rural Firefighting
- NFPA 2001 – Standard on Clean Agent Fire Extinguishing Systems
- NFPA 2010 – Standard for Fixed Aerosol Fire-Extinguishing Systems

**this is not an exhaustive list of all of applicable standards.*

3. What is a UL 9540A test?

UL 9540A is a performance test method (not a certification program) to evaluate fire characteristics of a BESS that undergoes thermal runaway It is not a pass/fail test, but a report describing BESS behavior during a thermal runaway event. The test is done separately at different levels of the system from the cells to the modules, the units and finally the whole BESS installations are tested to understand how and if propagate occurs within these different levels. This test is required as part of the UL 9540 equipment listing required by code for all projects. Other chemistries have different thresholds that trigger this testing and they are listed in the NYS Fire Code Section: 1207.

Level	Testing Hierarchy
Cell 	• Can cell exhibit thermal runaway • Thermal runaway characteristics • Flammability/composition of vent gas
Module 	• Thermal runaway containment/characteristics • Flammability/composition of vent gas • Heat and gas release rates
Unit 	• Evaluation of fire/thermal runaway spread • Heat and gas release rates • Deflagration and re-ignition behavior
Installation 	• Effectiveness of fire protection systems • Heat and gas release rates • Deflagration and re-ignition behavior

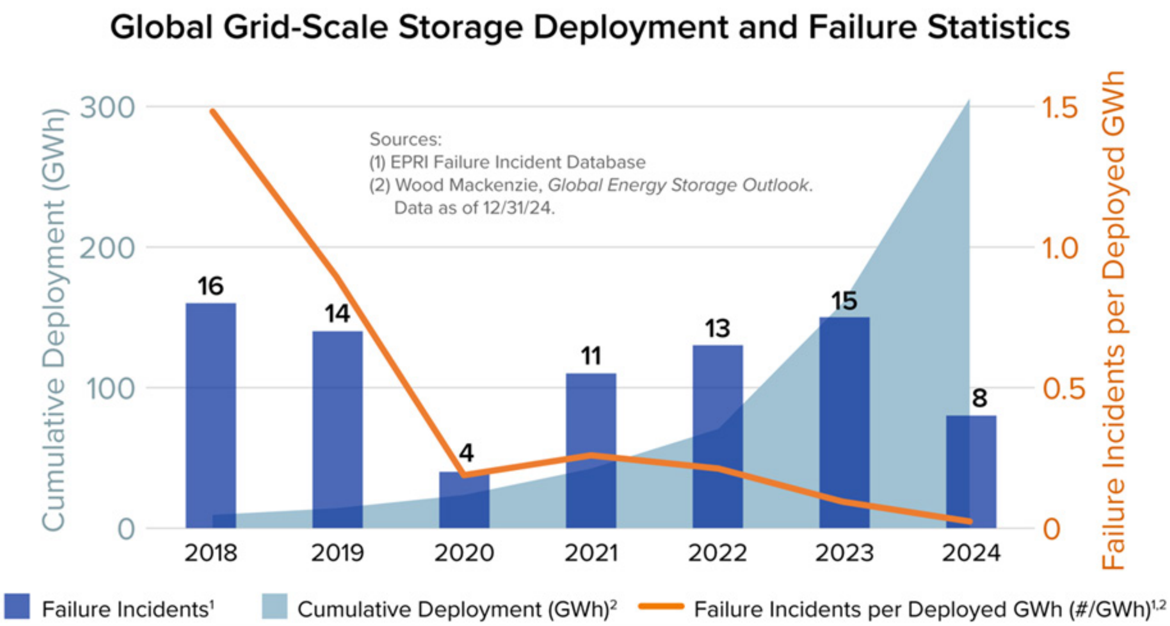
4. Do all energy storage systems need to be UL 9540 listed to meet code requirements?

It is required for types of BESS (including lithium-ion). UL 9540 is a system standard that certifies that all components of the energy storage system work safely in harmony together. UL 9540A large scale fire testing was required for UL 9540 equipment listings issued beginning in 2020.

5. Do BESS often catch fire?

BESS fires are extremely rare , and the number of incidents each year has decreased rapidly because of technological improvements and evolving safety standards f there is a failure in a battery or unit, the Battery Management System (BMS) and Central Station Monitoring is designed to inform the responsible parties of the failure and guide the response plan depending on the data provided by the EMS and the Emergency Response Plan (ERP).

Below there is a graph showing decline in the BESS incidents:



6. Are firefighters trained to respond to BESS incidents?

Yes, according to the 2025 New York State Fire Code, first responders need to be familiar with the BESS site, the ERP, and able to respond effectively if needed. Annual site trainings for local Fire Departments are required in addition to reviewing pre-incident plan. NYSERDA recommends that developers seeking approvals at a local level should contact Fire Department early with a thought-out plan for development and local emergency services engagement. In addition to site-specific training required by code, the New York State Office of Fire Prevention and Control (OFPC) offers a free lithium-ion awareness course to all first responders through the statewide learning management system.

7. What happens if a fire occurs at a BESS facility?

In the unlikely event of a fire, Hazard Support Personnel must be available to communicate with the local Fire Department. Hazard Support Personnel must be enroute to the event within 15 minutes and arrive at the site within 4 hours. Before the systems are energized, BESS developers are required to offer site familiarization, a site-specific ERP and site-specific emergency response training to local fire department. This training should occur annually for the useful life of the project. The hazard support personnel must remain on site after the incident is under control to oversee safe removal of the equipment from the property.

8. Who takes responsibility for the BESS facility in case of a fire?

The owner of the facility, their contracted Hazard Support Personnel and Remote Operations Center, and local emergency response personnel.

9. What is the 600 kWh threshold and why is it important?

This capacity is the Maximum Allowable Quantities (MAQ) threshold established by the International Fire Code and NFPA 855. Systems that are 600 kWh or greater must comply with additional safety measures or face more stringent code requirements. For lithium-ion BESS, this includes a Hazard Mitigation Analysis (HMA) and large-scale fire testing (UL 9540A).

An HMA is a report that identifies potential failure modes of a BESS under various circumstances and describes the mitigation and safety measures in place, as well as how those measures are expected to perform during such failures. The UL 9540A test will offer data that can inform safe siting decisions relating to a particular piece of equipment.

10. What is system augmentation?

BESS degrade with time and gradually lose their energy capacity (2–4% per year). Developers count on their revenue streams which are closely connected to the energy that BESS can discharge. At times, developers might decide to add new units to the system and remove the old ones. Each augmentation should be treated as new installation with the same activities: obtaining permits and filing appropriate amendments to original designs, shutdown of the BESS and re-commissioning.

4. Siting / Permitting

1. What is the process for permitting BESS in New York State?

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

- BESS paired with Renewable Generator < 25 MW: Permitted at local level (State Environmental Quality Review Act (SEQRA), 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 (SEQRA, municipal/county requirements)
- Standalone Systems > 80 MW: Subject to licensing by the Public Service Commission (PSL §68) and SEQRA (other State and local municipal reviews/approvals may apply)

In New York State, local Authorities Having Jurisdiction (AHJs) are responsible for enforcing Codes and Standards. NYSERDA provides resources to local AHJs like Battery Energy Storage Guidebook that includes Model Law and Model Permit. These are templates that can be used (and modified) by AHJs or other relevant local stakeholders to create their own law. Developers seeking approvals should contact AHJ they are seeking to obtain permits from in order to start the process. Contacting local Fire Department is also recommended to start the process.

2. What is SEQR and when is it needed?

State Environmental Quality Review (SEQR) requires all State and local government agencies to consider the environmental impacts and social and economic factors of specified actions. It is triggered whenever a “discretionary action” is proposed by any State or local government agency. The relevant agency must first determine if an action is a Type I, Type II or Unlisted Action. Type I and Unlisted Actions require further review under SEQR; Type II Actions require no further action under SEQR. See the NYS Department of Environmental Conservation’s SEQRA website for additional information.

3. Can a municipality create fire safety requirements that are more restrictive than the NYS Fire Code?

Yes, but the appropriate process for this action is not through zoning requirements, land use regulations, or local law. Any changes to the NYS Fire Code that would be specific to a local municipality must be made by petitioning the NYS Code Council through the Executive Law § 379 More Restrictive Local Standards process. It is imperative that Code Enforcement Officers and municipal attorneys are consulted in the EL 379 process. For example, requirements related to emergency personnel response times and recurring inspections are addressed in the NYS Fire Code, and they are not appropriate for a zoning requirements or inclusion in local law. Instead, Home Rule Authority would be leveraged through the More Restrictive Local Standards process with Department of State in these instances.

4. What lot size is typical and appropriate for commercial BESS projects?

Lot sizes vary depending on the total capacity of a BESS project and container sizes. Many suitable project locations can be smaller than an acre while the total project footprint of some BESS installations may occupy several acres.

For example, 5MW commercial BESS systems can typically fit in a quarter acre lot, including 10-foot clearance to exposures required by Fire Code.

5. What are important aspects when BESS site is chosen by a developer?

Choosing a suitable site for a BESS involves many technical considerations. One of the most important aspects of BESS siting is its proximity to existing grid infrastructure. The developers work with the utility company to perform a study to determine if grid infrastructure at a specific location will be able to host additional energy resources. The goal of the study is to determine whether the proposed system can safely connect to the grid without jeopardizing reliability. These studies can take several months to complete. If the study shows that existing grid infrastructure is insufficient to host additional capacity, significant upgrades costs are borne by the project developer. Developers also review all site characteristics and understand the permitting landscape (zoning, applicable codes and standards, environmental permits, etc.) before selecting a site.

6. How can an AHJ ensure that a BESS projects align with local comprehensive plans or zoning ordinances?

Local authorities must adopt local laws that will govern BESS development in their communities that will align with local comprehensive plans. Comprehensive plans are the legal basis for all zoning requirements. Zoning requirements that are not consistent with a community's comprehensive plan may be vulnerable to challenge in court. NYSERDA provides technical assistance and support to local municipalities in creation of local laws for clean energy including BESS.

7. What is the recommended minimum setback from neighboring properties?

UL 9540A test results can impact separation distances between units as well as and clearance to exposures. These test results can help in determining appropriate setback for a project. NYSERDA model law recommends that the setback requirements for BESS defer to the underlying setback requirement in the zoning district

8. Who is allowed access to a BESS facility?

Only authorized personnel are allowed to enter the BESS facility. Section 1207.4.9 Security of installations in the NY Fire Code requires that all BESS units need to be secured against unauthorized entry. Access to non-trained or non-qualified individuals must be restricted. In the event of an incident, there is not likely to be a threat to life, as it is exceedingly rare for personnel to be within the fenced perimeter of the project. Further, once batteries begin to burn, they cannot be salvaged. Therefore, there is almost never a reason to expect threat to life or property that can be addressed by emergency response personnel within the immediate vicinity of the project, so first responders should almost never have a reason to enter the project site during a fire or incident.

9. How does NYSERDA support permitting efforts of BESS?

NYSERDA supports BESS development in multiple ways:

- NYSERDA offers resources to empower local governments with knowledge, training, and best practices to manage responsible clean energy development in their communities.
- NYSERDA's Clean Energy Siting Team supports municipalities in person by offering trainings and one-on-one guidance. NYSERDA facilitates workshops and tailored education sessions for different audiences.
- NYSERDA offers "Contractor Pool" which consists of Subject Matter Experts (SME) who can help local governments with many different issues like local law drafting, zoning, permitting, siting, etc.
- NYSERDA provides different types of incentives for BESS projects.
- NYSERDA retail and bulk incentive programs require Peer Review of BESS projects – third party (SME) review of BESS design and inspection once project is built to confirm that it matches the original project plans.
- NYSERDA leads the NYS Inter-Agency Fire Safety Working Group to ensure the safety and security of energy storage systems across the State.

10. What is the Uniform Code, and how does it apply to BESS?

Uniform Code (Uniform Fire Prevention and Building Code) is state law that establishes minimum safety standards for construction, fire protection and other safety considerations in the built environment. The code is enforced by local governments and the Department of State to protect community members, property owners, and first responders. It ensures that developers address fire hazards, structural integrity and emergency access in their designs. Section 1207 of the New York State Fire Code specifically pertains to Battery Energy Storage Systems and outlines the requirements for their safe installation and operation.

11. What is a decommissioning plan? Is it required?

The decommissioning plan required by the fire code is a comprehensive description of how the BESS will be taken out of operation, removed from the site, and how the site will be returned to its previous condition There are multiple stages in the decommissioning plan: de-energization, disconnection from the utility grid, removal and disposal of the equipment, and site restoration. The decommissioning plan should address decommissioning at the end of a project's useful life and decommissioning in the event of a thermal or other incident involving the battery and identify who is responsible for it.

5. Local and Environmental Considerations

1. What types of local benefits can a community expect from hosting a utility scale BESS project? How are they taxed?

As part of New York's Real Property Tax Law (RPTL) § 487, BESS projects may be eligible to receive a 15-year real property tax exemption of the added value of the system. BESS projects are still required to pay property tax on the value of the land, as well as the special district taxes. Local AHJs who have not opted out of RPTL 487 are able to negotiate a payment in lieu of taxes (PILOT) agreement to compensate them for the tax exemption. Or a more common approach is having the County Industrial Development Agency (IDA) negotiate a PILOT agreement on behalf of all involved taxing jurisdictions which can provide more flexibility and can be longer than the 15 years RPTL 487 PILOT.

Host communities may also work directly with the project developer to negotiate Host Community Agreements (HCA). HCAs are usually developed in alongside a PILOT agreement but offer local benefits tailored directly to the community hosting the project. Such benefits may include direct payments to the community, contributions to local schools or environmental initiatives, local economic or workforce development, etc.

2. Are Battery Energy Storage Systems loud?

Only a limited number of BESS components generate sound, and when present, it is comparable to common equipment already found in everyday environments. Inverters and transformers create sound ranging usually from 50-60 dBA, cooling fans, like those used in everyday HVAC systems, could range from 60 to 90 dBA when measured very close to the equipment (within 3 feet from the source) . Under normal operating conditions, sound levels decrease significantly with distance and usually are not heard from outside of the fence line of the facility.

Developers may submit equipment and component manufacturers noise ratings to demonstrate compliance with local laws.

NYSERDA guidance recommends 1-hour average noise generated from the battery energy storage systems, components, and associated ancillary equipment shall not exceed a noise level of 60 dBA as measured at the outside wall of any non-participating residence or occupied community building.

3. In the event of a fire, what are the possible environmental impacts?

Based on the data gathered to date and findings presented by both the American Clean Power Association (Assessment of Potential Impacts of Fires at BESS Facilities) and the U.S. Environmental Protection Agency (EPA), there have been no reports of harmful levels of environmental contaminants detected following outside the immediate vicinity, or project fence perimeter, of BESS fire incidents in the United States. Air, soil, and water sampling conducted at multiple sites - including those investigated by the New York State by the Fire Safety Working Group (FSWG) found no evidence of pollutants requiring remediation or posing risks to public health. EPA's emergency monitoring following incidents such as the Moss Landing facility fire similarly reported no harmful concentrations of contaminants or particulates in surrounding communities. These reviews indicate that while emissions such as carbon monoxide, hydrogen fluoride, and trace metals can occur, they tend to dissipate quickly and to date have consistently remained in concentrations below the threshold of potential harm to human health.

It is important to recognize, however, that all fires carry inherent environmental risks. The severity and composition of emissions depend on the materials involved, fire duration, and suppression methods used. BESS fires present a different risk profile, but current monitoring and containment practices have proven effective in preventing off-site contamination. The evidence to date demonstrates that, under proper management and emergency response protocols, BESS fires do not result in lasting environmental harm.

Environmental analysis from real world energy storage fire incidents consistently shows that fire and harmful levels of smoke or other contaminants do not migrate outside the immediate vicinity, or fence line, of the project.

6. Fact vs. Fiction

1. MYTH: BESS easily catch fire

FACT: While high-profile in the news, battery fire incidents are rare! All energy infrastructure comes with inherent risk. 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.

2. MYTH: What happened at Moss Landing can happen here.

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.

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

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.

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

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.

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

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.

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

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.

7. MYTH: We shouldn't build battery storage because it requires critical mineral mining.

FACT: Promoting a sustainable and humane supply chain is critical to a just energy transition. Policy efforts underway include improved traceability standards and investment in domestic manufacturing. Critical minerals are also used for phones, TVs, AI data centers, EVs, and other technologies; avoiding BESS doesn't solve the problem.

8. MYTH: These systems are only needed or appropriate in dense population centers

FACT: Demand for energy is steadily growing and that will require new sources of energy everywhere. They are needed for resilience, grid stability, elimination of Peaker plans, integration of renewable energy.

Questions?

If you have any questions about the Battery Energy Storage Systems FAQ, please email questions to cleanenergyhelp@nyserda.ny.gov or request free technical assistance at nyserda.ny.gov/Energy-Storage-Guidebook. The NYSERDA team looks forward to partnering with communities across the State.