CUMBERLAND ROAD NORTH
SOLAR PROJECT

FREQUENTLY ASKED QUESTIONS ON

BATTERY ENERGY STORAGE SYSTEMS

General Q&A

Why are batteries needed?

As the U.S. energy landscape evolves to more renewable energy sources, such as wind and solar generation, and less conventional fossil fuel generation, energy storage will play an essential role in stabilizing the grid. The electric grid matches supply and demand at every moment to function reliably. Energy storage systems store excess energy in times of low demand to be used later, especially during peak demand hours and emergency or grid outages. Storage helps place energy on the grid when needed instead of only when the wind is blowing or the sun is shining.

How is energy storage useful on a grid scale?

Energy storage is needed on a grid scale for three main reasons:

1. When charged with renewable energy like solar, energy storage delivers firm, flexible, clean energy and capacity.
2. Energy storage can store energy in times of excess production and discharge that energy when it is needed.
3. Energy storage provides a real-time balance of power supply and demand, creating more reliable, stable, and productive power grids for our country.

How does an energy storage system work?

sic explanation, an energy storage system charges by taking AC power from the grid or colocated generation facility and converting it to DC power to store in batteries. The system will automatically stop charging once the battery is at full charge. When there is an energy need on the grid, the system discharges energy back to the grid by converting the energy from DC back into AC.

Is energy storage technology safe?

Energy storage has been a part of our electricity grid since the 1930s and has a safety record that is similar to, or better than, other electricity generation, distribution, or management methods. Energy storage facilities have multiple layers of protection and monitoring systems in place to help mitigate any unsafe conditions. Additionally, these facilities are secured with perimeter fencing around the entire site to prevent unauthorized access.

Is energy storage clean?

Energy storage has no direct emissions, requires no pipelines, and recycles electricity. Its systems typically require a minimal footprint. It recycles electricity. But energy storage will also help cut emissions as it takes more of the load off traditional generation or allows it to operate in a more efficient manner.[1]

Why here?

1. We site energy storage facilities to maximize benefits to the grid and to customers.
2. Stand-alone storage facilities are typically closer to the electrical load and/or connected to the bulk transmission system (transmission lines/substations) in order to service energy users efficiently.
3. Co-locating solar and batteries at the same site helps to smooth the power supplied by the intermittent solar output and enables the two systems to share some hardware components, which can lower costs rather than having them at different sites.
4. Co-location can also reduce costs related to site preparation, land acquisition, labor for installation, permitting, interconnection, and developer overhead.

Technical Q&A

How do these batteries compare to the batteries in my phone or computer?

All batteries accept, store, and release electricity on demand. Batteries use chemistry, in the form of chemical potential, to store energy.

The batteries used for grid-scale applications are similar to the lithium-ion batteries in your phone or laptop computer, except they are much larger and monitored closely on a 24/7 basis by trained professionals. Grid-scale battery systems utilize the same types of battery cells found all around us but are incorporated into a state-of-the-art grid-scale resource. Grid-scale batteries are rechargeable, and the heavy-duty design of grid-scale batteries allows them to be charged and discharged daily for decades.

Are battery systems cost-effective?

Battery energy storage costs continue to decline as the production and supply chains increase efficiencies. Energy storage is at an attractive cost to utilities and other energy users, as evidenced by large increases in grid-scale energy storage installations over the last several years. Energy storage system costs are expected to continue to fall, thus leading to an increased number of installations throughout the U.S.

How are they protected from outside elements?

Outdoor enclosures are designed with outdoor ratings such as NEMA 3R / IP66 to prevent water ingress. These systems are also designed with appropriate anchor bolts and latching to comply with various wind ratings per the local building code, based upon ASCE 7. This is the same code other commercial and industrial facilities are designed to.

What type of batteries will be used?

Generally, all projects will use lithium-ion batteries, which are sealed rechargeable batteries ideally suited for decades worth of use. Grid-scale battery systems utilize the same type of battery cells found all around us incorporated into a state-of-the-art grid-scale resource. These rechargeable batteries are monitored closely on a 24/7 basis by trained professionals. Their heavy-duty design allows the grid-scale battery systems to be charged and discharged daily for decades.

Technical Q&A

Will I see lower electricity bills?

Energy storage can lead to cost savings in two primary ways. The first is by lowering the overall cost of providing electricity. The second is by allowing customers to avoid premium pricing (or "peak demand").Industry insiders call this saving money on "both sides of the electric meter."But broader energy storage deployment can save consumers money in additional ways. Shorter outages for residents after a storm or an equipment failure can help save not only money but lives. And fewer outages overall lead to less economic losses.[2]

Fire & Safety

What about thermal runaway and fires? What is the likelihood of a battery fire?

Lithium-ion cells rarely experience failure leading to fire, however, modern codes and standards such as NFPA-855 and UL-9540a require several independent preventative features to be included in order to minimize the risk of fire. With these features in place and fully operational, the likelihood of a fire is reduced even further. These features include a battery management system, remote monitoring, gas detection, ventilation, and in some installations, fire suppression. All of Savion's battery storage projects are designed to comply with the requirements of NFPA-855.

Energy storage safety incidents are very rare — there have been less than 20 incidents at operating energy storage facilities in the United States. However, as part of an effort for continuous improvement, the industry is prioritizing the incorporation of the latest best practices and strategies to maintain safety.[3]

How does the battery's control system help prevent fires?

All energy storage systems come equipped with a battery management system (BMS) that continuously monitors sensors for temperature, voltage, and current at the battery module level. If the sensors determine a failure is at risk of occurring, the BMS will automatically shut down the battery and alarm until the issue is resolved. The sensor groups also issue a failsafe 'heartbeat' signal, ensuring the system will shut down if communication to the sensors is lost.

If a fire does take place, what measures are taken to help minimize the extent of fires?

1. In most instances of a fire in a containerized battery system, fire water will be applied to the exterior of the container by the fire department in order to reduce the heat of the container and minimize the possibility of fire spread. Full details of the approach will be included in the emergency response plan and fire safety plan.
2. Battery installations also incorporate a form of flammable gas detection, elimination, or ventilation equipment. These sensors act to detect, eliminate, and/or ventilate flammable gases from the container atmosphere.
3. In instances where self-contained outdoor enclosures are utilized, the enclosures are tested per UL 9540a and equipped with relief mechanisms as required. Additionally, fire suppression may be employed to further reduce damage to internal components.

What does a developer do to work with the local fire protection personnel to prepare for a new energy storage system?

Emergency signage, emergency operations plans, and training are provided in conjunction with local fire services to ensure the hazards are communicated and planned for. An emergency response plan will be developed which will provide detailed response procedures. This plan will be reviewed by the local fire marshal and department, and training will be conducted to familiarize local responders.

What are the steps in a typical fire safety plan for a battery storage system?

A fire safety plan is an extensive document that will be approved by the fire marshal. It will include a site equipment and hazard overview and map; a list of emergency contacts; documentation of the proper reporting and response procedures; descriptions of location and alarm indication, signage, and emergency switches; description of the fire protection and firefighting equipment; and will list required protective equipment (PPE) and safety data sheets.

Does an energy storage system create noise?

The energy storage equipment will be designed to be consistent with local noise requirements. The noise emitted is no higher than most electrical transformers or HVAC condensers.

Once the construction phase of the energy storage system is complete and the facility is operational, the primary source of noise will be fans associated with the inverter and battery cooling systems and will be similar to the sound emitted from commercial rooftop HVAC units.

Environmental & Impacts

What is planned to ensure there are no environmental or visual impacts of an energy storage system?

During the development phase, we will look to minimize the impact on the surrounding community by:

- Reviewing adjacent land uses (current and future) to evaluate the compatibility of an energy storage project
- Minimizing environmental disturbance to the existing site through best management practices with respect to natural resources, stormwater, and sediment control. Environmental surveys will be conducted for all energy storage projects, and the projects will be coordinated with the appropriate environmental regulatory agencies
- Develop a comprehensive understanding of local zoning codes to design in accordance with existing requirements and pursue variances only when necessary
- Utilizing setbacks from property lines, public rights-of-way, and strategic landscaping to provide a landscape buffer that reduces and/or eliminates visual impacts of battery storage units from adjacent land uses
- Utilizing natural and native vegetation in the landscaping to preserve the rural character of the area

[1] American Clean Power, “Resources-Thought Leadership-FAQs-Is energy storage clean,” EnergyStorageAssociationArchive.org, 2023, http://energystorageassociationarchive.org/resources/thought-leadership/faqs/

[2] American Clean Power, “Resources-Thought Leadership-FAQs-How will energy storage cut power costs,” EnergyStorageAssociationArchive.org, 2023, http://energystorageassociationarchive.org/resources/thought-leadership/faqs/

[3] Electric Power Research Institute, Inc., “Insights from EPRI’s Battery Energy Storage Systems (BESS) Failure Incident Database,” EPRI.com, 2024, https://www.epri.com/research/products/000000003002030360