



ENERGY STORAGE FACT SHEET

WHAT IS “ENERGY STORAGE”?

Battery Energy Storage Systems (BESS) or “Energy storage” is the capture of produced energy, stored for use at a later time to help minimize imbalances between energy production and energy usage.

WHAT TYPE OF BATTERY IS COMMONLY USED FOR ENERGY STORAGE?

Although there are different kinds of battery chemistries, lithium-ion batteries (similar to the ones in consumer electronics such as phones and laptops) have been the most commonly used technology for both residential and utility applications in the United States. This is because they offer a well-established combination of safety performance, reliability, and operational efficiency.

WHAT IS THE VALUE OF LARGE-SCALE BATTERY ENERGY STORAGE?

The electric grid functions by continuously matching supply and demand for electricity. Demand for power goes up and down over time – sometimes minute-by-minute – which means that the grid requires significant flexibility to manage those fluctuations. Adding battery energy storage to the electric grid provides flexibility, as batteries can store energy for use at times when generation is not otherwise readily available during periods of very high demand.

BOLSTER GRID RESILIENCE

Batteries can help deploy power during times of high electricity demand, such as the evening hours when demand for electricity increases with people utilizing appliances and in-home electronics, which can happen during periods of extreme hot or cold weather events. They may also shorten customer outage time and provide backup power during grid outages.

Battery storage can also support the grid by releasing energy during periods when renewable energy output is reduced due to weather conditions, such as cloudy days, low wind conditions, or shorter daylight hours.

PROVIDE GRID STABILITY

Energy storage can create a more stable grid with increased flexibility and less frequent interruptions to the power supply.

SUPPORT GRID SUSTAINABILITY

Paired with renewable energy, batteries enable greater use of renewables by storing excess generation and delivering that power at times other than when it is produced.

STRENGTHEN GRID FLEXIBILITY

Batteries are particularly valuable for the grid because they can act quickly to manage changes in energy demand, responding to signals and injecting power into the grid in less than a second, making them particularly effective at supporting grid operations nearly instantaneously.

WHY ARE ENERGY STORAGE SYSTEMS PAIRED WITH SOLAR PROJECTS?

Solar and energy storage systems are commonly paired with one another as an efficient way to meet the growing energy demands. In most cases, batteries will be co-located with solar – meaning they are located on the same site. The pattern of how solar arrays generate power across the day is predictable, which pairs well with battery storage, because battery systems are limited in the length of time they can discharge energy before needing to recharge. Pairing a dependable source of energy from the solar arrays and the ability to dispatch stored energy from the batteries quickly during high electricity demand results in an optimized, large-scale project.

ARE BATTERIES SAFE?

Yes. Lithium-ion batteries have been in use commercially for several decades and are widely deployed across multiple industries. They are found in our phones, cars etc. When properly designed, installed, and operated in accordance with applicable codes, standards and safety regulations, utility-scale battery systems are considered a mature and well-understood technology.



In addition to designing, planning and operating with safety as a priority, the Sandhill Solar Team will work with local First Responders to develop an Emergency Response Plan, as well as provide proper training prior to starting operations of the site to ensure all parties are familiar with the technology and its safety systems. Furthermore, Sandhill Solar will ensure the development team is familiar with the specs of the departments first responder equipment, allowing for proper design of access roads within the array so First Responders can efficiently maneuver within the site in the case of an emergency.

DESIGN. The purpose of a battery enclosure is to protect batteries from the elements, including excessive heat, cold, water intrusion from other weather elements, and to ensure that in the unlikely event of failure, damage to the system is contained to that enclosure. Containerized energy storage units are generally sealed, automated, and constantly monitored to ensure safe and reliable operation.

OPERATION. Preventative features exist to reduce the risk of safety incidents from the batteries such as fire, including a management system that continuously monitors sensors for temperature, voltage, and current down to the individual battery module level. This technology typically will automatically shut down a portion of batteries if a module is at risk of failure or if communication with the sensors monitoring them is lost. Energy storage systems incorporate a fire detection system which can consist of a fire alarm, smoke and heat detectors, heat activated sprinkler system, and fire rated insulation. HVAC systems are also incorporated in the battery systems to keep the batteries from experiencing overheating. The HVAC system will keep the batteries cool during the summer and at an appropriate temperature during the winter, to optimize battery production and system operations.

SOUND. Utility-scale battery energy storage systems are designed to comply with applicable noise standards. Batteries themselves produce virtually no sound; any operational sound typically comes from auxiliary equipment such as cooling or ventilation systems. Overall sound levels are generally comparable to those associated with an electrical substation.

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