POWERS BUTTE
ENERGY CENTER

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 to stabilize the grid. The electric grid works by matching supply and demand at every moment for the grid to function reliably. Energy storage systems store excess energy in times of low demand to be used later when it is needed, especially during peak demand hours and in times of emergency or grid outages. Storage helps to place energy on the grid when it is needed, instead of only when it is being produced when the wind is blowing or the sun is shining.

Why is energy storage important?

Energy storage fundamentally improves the way we generate, deliver, and consume electricity. Energy storage helps during emergencies like power outages from storms, equipment failures, accidents or even terrorist attacks. But the game-changing nature of energy storage is its ability to balance power supply and demand instantaneously – within milliseconds – which makes power networks more resilient, efficient, and cleaner than ever before. *(ESA, 2019)*

How is energy storage useful of 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 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?

In the most basic explanation, an energy storage system charges by taking AC power from the grid or co-located 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 clean?

Yes. Energy storage has no direct emissions. It requires no pipelines. Its systems typically require a minimal footprint. It recycles electricity. Energy storage will also help cut emissions as it takes more of the load off traditional fossil-fuel based generation. *(ESA, 2019)*

Why here?

We site energy storage facilities to maximize benefits to the grid and to rate payers. Stand-alone storage facilities are typically closer to electrical load and/or connected to the bulk transmission system (transmission lines/substations) in order to service energy users efficiently. 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. Co-location can also reduce costs related to site preparation, land acquisition, labor for installation, permitting, interconnection, and developer overhead.

Technical Q&A

Are battery systems cost-effective?

Yes. 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 forecast to continue to fall, with increasing demand, which will lead to an increasing number of installations throughout the U.S.

Will batteries be added to a solar system at start of construction? Or later?

Battery storage can be installed at the time a solar energy facility goes into operation or at a later time to an existing solar system.

How does energy or battery storage work with solar?

The solar panels absorb the energy created by the sun, creating direct current electricity. The energy battery charges in times of excess energy production and discharges when energy is needed. Energy storage helps to balance the grid, creating a more reliable and stable transmission and distribution system. Clean, reliable energy is delivered to commercial, industrial, and residential customers.

What maintenance do batteries need? How often?

Annual maintenance is conducted that involves visual inspections, various system checks and tests, and cleaning and adjustment as required.

What are the different types of battery storage installation layouts?

Energy storage installations will either utilize outdoor containers or dedicated-use buildings. For the outdoor container design, batteries will be installed in climate- controlled outdoor containers, with multiple containers daisy-chained to central inverters. An alternate higher density system will utilize a dedicated-use climate-controlled building(s) that will house multiple aisles of batteries in an open-rack configuration connected to inverters outside of the building. There are advantages to both systems depending on local codes and site considerations, but the bulk of the systems to date have been pre-engineered containerized systems.

What type of batteries will be used?

Generally, all projects will use lithium-ion batteries, with cells similar to those found in cell phones, electric vehicles, and computers.

Decommissioning Q&A

What happens to them at the end of life?

At the end of life, batteries are removed from the system and recycled in accordance with applicable requirements.

Fire & Safety Q&A

How will our local fire department be prepared or trained to handle a fire situation at a battery storage system?

An emergency response plan will be developed which will provide detailed response procedures. This plan will be reviewed by the local Fire Marshall and fire department, and training will be conducted to familiarize the local responders with this plan.

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

In addition to the measures mentioned above, 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 Marshall and fire department, and training will be conducted to familiarize the local responders with this plan.

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 Marshall and will include site equipment and hazard overview and map, list emergency contacts, document the proper reporting and response procedures, describe the location and descriptions of alarm indication, signage, and emergency switches, describe the fire protection and firefighting equipment, and list required personal protective equipment (PPE) and safety data sheets.

What kind of chemicals would be used if a fire does start? Concerns about groundwater and these chemicals?

Self-contained, outdoor enclosures are not required to have fire suppression installed as these units are designed to contain the fire through other means. While also not required, clean agent suppression such as FM-200 or NOVEC 1230 are additional countermeasures to limit internal damage that are nonwater-based solutions that may be deployed.

To date, we are not aware of any ground water contamination issues associated with energy storage systems. Ground water contamination has not been an issue in the market with energy storage facilities. Similar to other equipment used in the electrical systems, the units are designed to hold any potential liquids through multiple layers of containment.

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.