ENERGY STORAGE AT APEX

Frequently Asked Questions

Do energy storage projects produce sound?

Like the other components in and around electrical substations, battery storage facilities do produce some sound. The sound is generated by the storage facility's heating, ventilation, and air conditioning (HVAC) system, as well as its inverters. The sound produced by HVAC systems and inverters are not fundamentally any different than those produced by other commercial HVAC systems or electric inverters, but nonetheless, Apex designs its projects to minimize all sound impacts.

Apex minimizes the sound produced by its storage facilities by installing noise prevention barrier fences, properly orienting all equipment, and procuring high-quality equipment that produces less noise. Using these strategies, Apex ensures that its storage facilities do not have an adverse impact on host communities.

Will the project require the presence of heavy equipment?

Building a battery storage facility can take six to twelve months, depending on the size of the project. Transport of the batteries and other components does require some heavy equipment, which may be present throughout construction. During operation, the project will primarily be maintained by workers driving light trucks, though heavy trucks may return every two to three years to bring new batteries to the site.

How are storage projects decommissioned at the end of their useful lives?

Battery storage projects generally have a lifetime of between ten and thirty years, depending on a project's use case. The batteries used in battery storage projects are generally replaced every one to three years to ensure that the project maintains its initial capacity throughout its life. Once the useful life of the project is over, it is very easy to decommission these facilities because nearly all project components are located above the ground's surface. Once a battery storage project is removed, the land can be restored to its prior condition. Technology already exists to recycle lithium-ion batteries and, given the high value of the materials that constitute these batteries, enhanced battery recycling processes are beginning to develop more rapidly.

How are the materials for batteries mined?

Lithium-ion batteries are ubiquitous around the world. Because they are rechargeable, lithium-ion batteries are used to power computers, cell phones, electric cars, and many other commonly used devices and appliances. Unfortunately, most of today's lithium-ion batteries require cobalt for their chemistry, and the practices used to mine cobalt are not entirely benign. Efforts are under way to help address the current environmental and social impacts of cobalt mining, which is crucial given that global battery demand is expected to increase about ten times in as many years, primarily to power the growing electric car market. Furthermore, in every instance where it is possible, Apex will use a new type of rechargeable technology—batteries that use lithium iron phosphate (LFP), rather than nickel manganese cobalt. LFP batteries do not require cobalt as a raw material, and they are now becoming more widely available. The incorporation of LFP batteries will eliminate the need to mine cobalt for energy storage altogether.

Can chemicals leak or leach out of energy storage facilities?

Unlike standard lead-acid batteries (the kind of 12-volt batteries found in gasoline vehicles), rechargeable lithium-ion battery technology does not contain any liquid elements. Though conventional car batteries can leak acid under certain circumstances, lithium-ion batteries use a solid electrolyte, which does not liquify, even under intense heat. Because there are no liquid chemicals in lithium-ion batteries, it is not possible for these batteries to leak or leach chemicals, even when exposed to extreme heat or cold.

Can battery storage facilities catch on fire?

Like most electrical components, lithium-ion batteries are flammable, but modern battery storage projects employ effective methods for preventing and suppressing the risk of fire. Battery cells and battery modules are governed by UL safety certifications, and the design and installation of battery storage facilities must comply with National Fire Protection Association Standard 855, which regulates the "design, construction, installation, commissioning, operation, maintenance, and decommissioning of stationary [energy storage systems]."

There are four primary strategies that battery storage system designers utilize complementarily to minimize fire risk at battery storage projects:

- **Prevention:** Components built into batteries and battery systems that will minimize risk of ignition.
- **Compartmentation:** The creation of barriers between batteries and battery modules to limit the spread of any fire that does ignite.
- **Detection:** Tools integrated into battery systems to monitor voltage, temperature, and structural integrity of battery systems to quickly warn operators of potential ignition.
- **Suppression:** Mechanical or chemical processes for suppressing any fire that may ignite. Several vendors are developing fire suppression systems that can be fully integrated into the battery storage cabinet or container.

In addition, Apex Clean Energy ensures that local emergency response crews receive fire prevention and suppression training so they will be prepared to safely respond to an incident at an energy storage facility if necessary.

I heard there was an explosion at an energy storage facility in Arizona. What happened?

On the afternoon of April 19, 2019, there were reports of smoke from the building housing the energy storage system at an energy storage site in Surprise, Arizona. This was not an Apex Clean Energy project. An investigation of the cause of the incident found that a single rack of battery modules in the project did catch on fire, and the fire did not spread to surrounding racks. Because ventilation in the container holding the affected modules was not sufficient, however, a mixture of explosive gases, including oxygen, built up in the container as the modules burned, and these gases did explode.

Very important lessons have been learned from this event and have been incorporated into the design and operation of battery storage sites. Apex projects integrate improved temperature monitoring, management and control of module systems, improved fire detection and suppression systems, and greatly enhanced ventilation systems to ensure that the type of incident described here never happens at an Apex facility.

How does Apex ensure that local first responders are properly trained to address safety issues at its storage sites?

Apex ensures that local first responders in a storage project area receive First Responder Safety for Grid Energy Storage safety training as provided by Sandia National Laboratories and the U.S. Department of Energy. This program ensures that local fire and safety personnel are prepared to assess and respond to any incidents that may occur at or near an energy storage facility. Training includes hazard identification, recommended protocols for maintaining materials and safety data sheets for the specific facility, and emergency response planning. As Sandia National Labs explains, "Energy storage technologies are no more hazardous nor less safe than technologies with which you are familiar. Proper procedures can be applied to protect life and property when energy storage is involved in a fire or other safety incident."[1]

[1] Sandia National Laboratories, "First Responder Safety for Grid Energy Storage," October 13, 2015, https://www.osti.gov/servlets/purl/1334066.