

ENERGY STORAGE

SAFETY MEASURES

Between cell phones, laptops, power tools, and even toys, many people have a lithium-ion battery in their pockets or hands at all times.

No battery technology is completely risk-free, but the technologies we use for energy storage projects are considered safe for the public when designed and operated correctly.



Safe, Well-Tested Technology

Energy storage systems of varying types have been a part of our electricity grid for decades and enjoy a safety record that is similar or better than other electricity generation, distribution, or management methods. The United States has more than 8,800 MW of battery storage capacity currently online.¹ In Canada, energy storage accounted for 214 MW by year-end 2022 and continues to grow.²



24/7 Monitoring

Energy storage systems are equipped with Battery Management Systems (BMS) that monitor the operational and fault status of the system for all parameters required to ensure safe operation of the energy storage system, including State of Charge (SOC), voltage, current, power limits, and temperatures. Parameters are monitored at the appropriate level of the battery cell, module and rack as applicable. The BMS functions to prevent potential hazards by shutting down battery modules/racks if monitored conditions are outside of those permissible for safe operation, similar to how a phone pauses functions whenever it overheats. In addition to these built-in systems, EDP Renewables (EDPR) also monitors all of its projects from a 24/7 Remote Operations Control Center (ROCC) located at the Houston headquarters.



Scarlet Solar Energy Park | Fresno County, CA



Managing Fire Risk

Energy storage battery fires are very rare and their rate of frequency is decreasing, while the deployment of energy storage increases. Between 2017 and 2022, U.S. energy storage projects increased by more than 18 times, from 645 MWh to 12,191 MWh, while worldwide safety events over the same period increased by a much smaller number, from 2 to 12.³

No deaths have resulted from energy storage facilities in the United States.

BESS systems are highly regulated and subject to stringent certification and testing requirements. All of EDPR's batteries are UL 9540 & UL 9540 A compliant. This regulation is typically much more strict than that which many other lithium-ion battery powered electronics, such as e-mobility devices, undergo. Having more regulations around the quality and safety of utility-scale energy storage projects greatly reduces the risk of fire or bodily harm.³



Chemical Considerations

Energy storage facilities are designed to safely manage chemicals on site. In the unlikely event of a leak, containment measures such as bunding, spill trays, and chemical absorbents are in place to capture materials on site for their safe removal.

Lithium-ion batteries do not emit electromagnetic fields or contain radioactive materials. Even if an extremely rare emergency situation were to occur, there is no significant risk of radiation as the system would be powered down, and the sensitive materials inside the batteries are thoroughly insulated and highly resilient to high heat and force impacts.

Past energy storage incidents (not at EDPR facilities) and their subsequent lab testing demonstrate that when fires occur, air quality in neighboring areas remains at safe levels.³

1. U.S. Energy Information Administration, *Electricity explained: energy storage for electricity generation*. August 2023.

2. Canadian Renewable Energy Association, *NEWS RELEASE: Canada added 1.8 GW of wind and solar in 2022*. January 2023.








3. American Clean Power, *Energy Storage Leading on Safety*. 2023

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EMERGENCY PREVENTION MEASURES

Energy storage systems must have a variety of emergency prevention measures in place to ensure safe operation in a variety of conditions.

-  Utility-scale energy storage systems are located within secure facilities with site plans explicitly designed around maximizing safety of those operating the facilities and their neighbors.
-  Each energy storage system features smoke and temperature sensors as well as internal fire suppression systems. These are monitored 24/7 and are rigorously tested prior to operation.
-  Energy storage systems feature internal containment trays to capture any dripping liquids from internal fire suppression systems and battery cell electrolytes which prevents spillage.
-  If an unforeseen event were to cause damage to one the containers, a rapid shutdown of the system would occur, causing it to go offline until EDPR has repaired the damage and retested it for quality and safety.
-  Energy storage containers are built of fire retardant materials with exterior steel walls and interior insulation for better cooling and fire containment.
-  In case of fire, storage containers feature pressure relief systems, such as deflagration panels, which automatically vent any gases generated and allow the flames to vent out in a controlled manner, preventing a buildup of gases and damage to the surroundings.
-  The energy storage layout is designed to have adequate spacing between containers to minimize the chance of fire spreading to adjacent infrastructure.

Emergency Response Plan

EDPR prepares an Emergency Response Plan for every project.

The Emergency Response Plan ensures that project site employees and local first responders are up to date on the best methods for responding to potential emergencies such as fire, severe weather, or injury. The Emergency Response Plan also establishes protocols with local services for communicating increased risk and the required response with project neighbors to ensure the community's safety during rare emergency events.

? WHAT ABOUT SPECIAL EQUIPMENT & TRAINING?

No special equipment other than regular firefighting equipment is required during an emergency. Extra safety features and internal fire suppression systems are already installed inside the energy storage containers.

EDPR's Health & Safety Department works with local emergency responders to facilitate written and on-site emergency trainings and drills. During a project's construction, EDPR and local services reevaluate the Emergency Response Plan and organize on-site training and drills every 6 months. Once a site is operational, the updates, trainings, and drills occur at least once annually.