

---

## Battery Energy Storage Systems (BESS) FAQ Reference

8.23.2023

### Health and safety

#### **How does AES approach battery energy storage safety?**

At AES' safety is our highest priority. AES is a global leader in energy storage and has safely operated a fleet of battery energy storage systems for over 15 years. Today, AES has storage systems operating in multiple countries, supporting multiple use cases in diverse operating environments. Our approach to battery safety includes being at the forefront of the industry in developing best practices and utilizing the most advanced technologies. AES participates on the NFPA 855 technical committee on Energy Storage Systems, which establishes standards for mitigating hazards associated with energy storage systems.

#### **Will the site be fenced in? What physical and cyber security measures will be in place?**

The site will be designed to meet local authority and NERC security compliance. The site will have a secured perimeter fence or wall (dependent on local requirements), security cameras, access gates, and access control. The site will be monitored 24/7 and only accessible to approved personnel.

#### **Will local emergency response personnel be trained on BESS safety and incident protocol?**

AES always develops an Emergency Response Plan in collaboration with the local fire departments and emergency response personnel in accordance with National Fire Protection Association (NFPA) safety standards. As part of this emergency management preparation, appropriate local fire and EMS personnel are trained on the equipment and emergency response protocols.

A Hazard Mitigation Analysis (HMA) will be performed as part of the detailed engineering process. This HMA will include site and product specific fire risk assessment and a first responder plan. Local first responders will have access to these reports. AES will provide on-site and in-person training to the local responders prior to commercial operation of the system. There are no special materials required to respond to a fire event for the containerized BESS units. Only standard water application to the adjacent BESS containers is required and this is only in the case where all internal fire suppression systems may fail. All information required by the first responders will be included in the first responder plan part of the HMA.

#### **Is there a concern for fire risk or thermal runaway?**

When mitigating risk, the first step is always to prevent the hazard, which is done by establishing rigorous codes and standards for all energy storage systems. AES participates on technical committees such as the NFPA 855 on Energy Storage Systems that establishes standards for mitigating hazards associated with energy storage systems, continually improving industry safety best practices. Further, AES implements a multitude of risks management layers in its system designs: the battery management system maintains nominal operations and separates a battery string from hazards when necessary; site SCADA systems identify hazardous conditions and can automatically stop the system and alert response personnel; and non-battery fires that may result in a battery fire are dealt with by the same measures as non-battery sites (defensive posturing and material-specific suppression). If a thermal runaway event or battery fire were to occur, the enclosures planned for this site would release fire suppressant in large concentrations directly into the initiating cell, removing heat and preventing thermal runaway throughout the enclosure. The AES energy storage solution integrates battery modules inside steel containers equipped with fire-rated insulation and several redundant layers of

---

hazard controls, including passive and active measures that both inhibit and (when necessary) suppress hazardous conditions. The UL 9540 certification addresses safety and requires UL 9540a test results to be available for review. The 9540a tests of this system indicate adequate prevention of thermal runaway. The AES energy storage system will achieve UL 9540 certification prior to site commercial operation.

All battery cells are inspected during manufacturing. The plant's layered risk mitigation mechanisms are designed for the planned failure of any one battery cell. The systems in place maintain system stability and integrity in the event of a cell failure. It is an unfortunate reality of lithium-ion batteries, and in order to make use of their benefits, we have taken great care to understand, quantify, and address their risks. We accept the possibility and then design and test safety measures to mitigate the probability and severity of the result.

### **Are there any health concerns associated with lithium-ion energy storage systems?**

The same lithium-ion battery technology used in energy storage systems is present in many of today's most commonly used electronics, including cell phones, laptops, and electric vehicles. Since we rely on batteries daily, they are heavily studied and have some of the most advanced safety considerations. Batteries used in energy storage systems are no different and must meet strict codes and standards for health and safety that ensure they can operate safely.

### **Community experience**

#### **As the developer and long-term owner and operator of the project, who is AES?**

The AES Corporation (AES) is a Fortune 500 global energy company accelerating the future of energy. Founded in 1981, AES is headquartered in Arlington, Virginia, and is a publicly-traded company listed on the New York Stock Exchange (NYSE: AES). AES employs more than 9,000 people and operates across 14 global markets. Together with our many stakeholders, we're improving lives by delivering the greener, more innovative energy solutions the world needs. In the US, AES' clean energy business unit is a leading provider of clean energy solutions. At the end of 2022, our 4.9 GW operating portfolio represented more than 540 clean energy projects across 24 states. Our development pipeline includes 51 GW of solar, wind, energy storage, hydro, and green hydrogen solutions. Learn more at [www.aes.com](http://www.aes.com).

#### **What is AES' experience with battery energy storage systems?**

AES is a global leader in energy storage through our project portfolio and Fluence Energy, our joint venture with Siemens. AES pioneered the technology and has operated a fleet of battery energy storage systems for over fifteen years. Today, AES operates energy generation facilities in multiple countries, uses and environments coupled with energy storage systems, extending the reliability of renewable energy sources. AES has more than 600 MW of operating battery energy storage systems with more than 2.2 GW contracted or under construction. Our storage projects have twice been awarded the Edison Electric Institute's prestigious Edison Award, for AES' Lawa'i Solar + Storage project in 2019 and for AES' Alamos Battery Energy Storage System in 2021. In 2017, AES and Siemens joined forces in a joint venture to form Fluence Energy, a global leader in energy storage technology and services with over 3.6 GW of battery energy storage systems deployed or contracted in 30 markets globally. We are co-creating innovative clean energy solutions with our customers that include energy storage systems. We will continue to see significant demand for this technology in transitioning to a smarter, greener energy future.

#### **What is AES' relationship with Fluence?**

In 2017, AES and Siemens joined forces in a joint venture to form Fluence, a global leader in energy storage technology and services with more than 3.6 GW of battery energy storage

---

systems deployed or contracted in 30 markets globally. In 2021, Fluence was recognized as the #1 Integrator of Utility-Scale Energy Storage Systems by Guidehouse Insights, reflecting AES' global leadership in energy storage.

AES does employ Fluence battery technologies in many of our projects, but AES does not exclusively utilize Fluence products. AES has also worked with Samsung and several other leading battery technology manufacturers.

### **What is AES' sustainability and environmental track record?**

Sustainability is core to AES' culture. Working with our communities, partners, and customers, we have transformed our company to be a leader in carbon-free energy solutions. AES was one of the first companies to voluntarily help reduce greenhouse gases, starting with carbon offset and reforestation efforts in the late 1980s. Our sustainability goals include an intent to exit generation from coal by year-end 2025 and achieve net zero carbon emissions from electricity by 2040. We design our clean energy projects to eliminate or minimize the impact on the local environment. Today, we are focused on improving lives to achieve a greener, smarter energy future.

### **Will the project generate any noise?**

AES utilizes best practices in noise reduction during construction and operations, and our energy storage systems are designed to meet local ordinance requirements on noise levels. AES conducts construction only during approved daytime hours to minimize impact. During operations, energy storage systems are quiet neighbors, and projects are designed to meet acceptable ambient noise levels at all points along the property line.

BESS Chiller Units – 70 db

Inverters – 61 db at 15 meters, 50 db at 50 meters, 44 db at 200 meters

### **Project design and site operations**

#### **What is the decommissioning plan for the project's end of life? Will materials be recycled?**

When a project reaches its end of life, the project owner is responsible for executing the approved Decommissioning Plan, including abiding by all local and state decommissioning requirements. This includes the removal, recycling, and/or disposal of all equipment and other structures associated with the project. The land surface within the project area will be sensitively restored to pre-project conditions to enable a return to agricultural use or other uses consistent with the land-use policies. Our supply chain process identifies and prioritizes equipment manufacturers that align with our environmental, safety, and human rights commitments. Some of these commitments include buying equipment from manufacturers whose supply chains and suppliers comply with a national recycling program. We also seek to buy high-efficiency products, which reduce the total volume of raw materials and parts required for each project.

### **Recycling at Scale**

SOLARCYCLE has launched a pilot program with AES to assess construction breakage and end-of-life solar panel waste across the company's portfolio. This industry-leading partnership allows AES the ability to send damaged or retired solar panels to SOLARCYCLE's state-of-the-art recycling facility in Odessa, Texas to be responsibly recycled and repurposed. AES is committed to sustainable best practices that contribute to building a domestic solar circular supply chain.

---

SOLARCYCLE's advanced patent-pending recycling technology extracts over 95% of the value in a panel, including high-quality aluminum alloy, low-iron glass, silver, silicon, and copper.

### **Battery energy storage systems technology**

#### **Proposed Battery Energy Storage System Equipment**

The proposed equipment for the BESS is Samsung SDI E5D Lithium-ion battery stored in CEN 20' ISO containers. The storage capacity is 48 MW, 4-hour duration. The system is currently undergoing final designs and may vary depending on design adjustments. Maximum batteries per container are designed to include 21 strings, with 12 battery modules, for a total of 252 modules. There will be 60 battery cells per string for a maximum total of 15,120 battery cells per 40-foot container, for a total of 574,560 cells.

#### **What is energy storage?**

Energy storage is a “force multiplier” for carbon-free energy. It enables the integration of more solar, wind, and distributed energy resources and increases existing plants' capacity factor to avoid the need for new thermal generation. AES's contributions to energy storage have enabled hundreds of utilities worldwide to reduce their reliance on thermal generation.

Energy storage increases grid reliability and resilience while minimizing power disruptions. Long-duration energy storage is now recognized as a critical component that will enable us to fulfill the promise of a 100% carbon-free future. AES is actively investigating many long-duration storage solutions to add to our portfolio.

Learn more and download [American Clean Power's “What Is Energy Storage?” fact sheet.](#)

#### **How does energy storage support grid reliability?**

Energy storage is often called the bridge between a clean energy future and a reliable power grid. Energy storage enables more resilient, cost-effective, and flexible electric grids by storing energy to be used later when and where it is needed most. Energy storage resources can also be sited near critical load centers, reducing power outages and enhancing local distribution resiliency.

#### **What are the advantages of co-locating storage with other renewables like solar?**

Co-locating energy storage with other renewables enables resources like solar to provide maximum power during the day while charging energy storage resources that will be later dispatched to the grid when the sun goes down, and people return home, and the demand for electricity peaks. This also addresses challenges for electric grids by increasing the penetration of renewables without oversaturating or destabilizing the grid.

#### **What opportunities and challenges exist for energy storage in the US?**

According to American Clean Power, large-scale battery storage has jumped from just 59 MW in 2010 to 4,588 MW in Q4 2021, with forecasted capacity doubling in 2023.

Electricity is one of the most significant sources of carbon emissions, and the EIA [reports](#) that global electricity use is expected to double by 2050. Energy storage is a critical component in achieving state and national goals to meet 100% of electricity needs with carbon-free energy. The price of energy storage technologies like lithium-ion batteries have fallen by about 80% over the past five years, further enabling the integration of these resources. Energy storage has proven to be a cost-competitive, flexible and reliable technology critical to enabling a 100% carbon-free future.

---

The industry continues to experience supply chain and interconnection constraints that have affected energy storage development pipelines. In 2023, AES is deeply focused on employing strategies to keep projects moving forward and work around these headwinds.