

# What is a grid-scale energy storage system?

Grid scale energy storage helps lower electricity costs and increase efficiency of the American power supply. Think about using a portable charger for your phone. You charge it up when you can, and save the power to use when you need it later. A grid-scale energy storage system works the same way, but at a much larger scale, storing and discharging enough energy to power thousands of homes and businesses every day.

When paired with a solar farm (one of the cheapest forms of energy), a grid-scale energy storage system can “charge” with low-cost energy during times of excess production, and send affordable power to the grid later when people need it most.

## 5 benefits for you and your community

- Minimizing power outages with energy reserves.
- Growing the local property tax base.
- Creating a more modern and reliable grid for all.
- Adding more affordable energy to the mix.
- Advancing American energy security.



▲  
Visit our website for more in-depth information on energy storage

## Components

Every grid-scale battery energy storage system looks a little different but contains the same essential components.

### 1. Storage enclosure

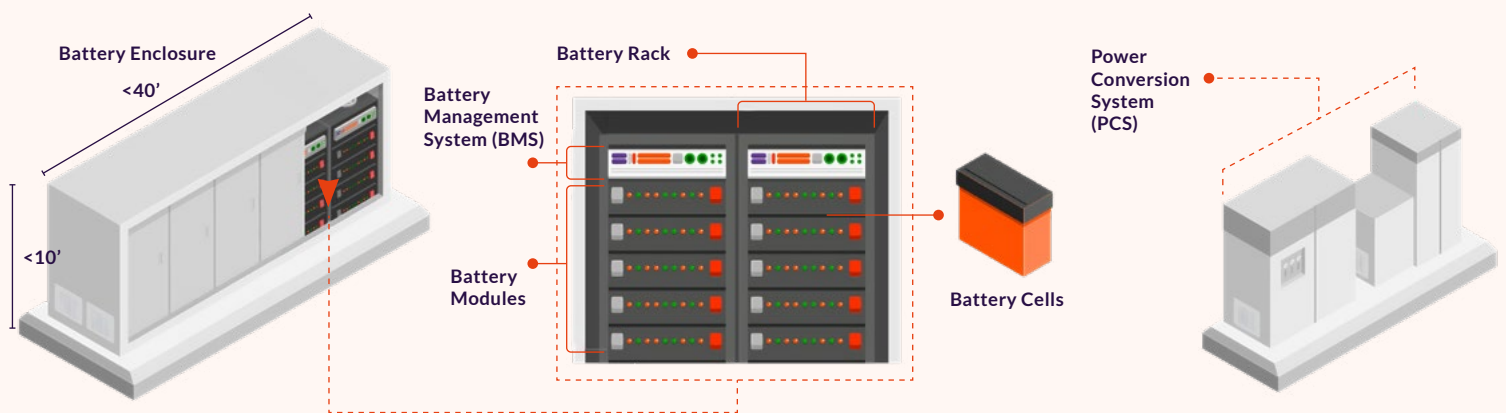
From the outside, battery storage enclosures look a lot like shipping containers, typically less than 40'x10' in size. The containers must meet rigorous safety codes and standards to ensure they are fire-safe and able to withstand the elements. The enclosures are also temperature controlled, and the system will automatically shut down if it gets too hot.

### 2. Battery components

Inside the storage enclosure is the heart of the system – the batteries themselves – which store and discharge energy when it is needed. A battery is made up of lithium cells, wired together to create a module. The modules are then stacked and combined to form a battery rack. Each rack also contains a battery management system, the “brains” of the operation, which continually monitors the batteries to ensure they perform efficiently and safely.

### 3. Power Conversion System

Electricity travels through the power conversion system on its way between the batteries and the grid. Battery systems store and deliver electricity as direct current (DC), while our electric grid, home appliances and electronics operate on alternating current (AC). The Power Conversion system converts DC to AC to discharge batteries and converts AC to DC power to re-charge the batteries.



# Are energy storage systems safe?

Safety is our #1 Core Value at Lightsource bp. Keep reading to learn how we ensure safe, regulated and reliable energy storage systems in the USA.

## Key codes and standards

Like all electrical infrastructure, utility-scale battery energy storage systems are highly regulated. The batteries and equipment we use must be tested and meet rigorous codes and standards developed by international, U.S. and local experts.

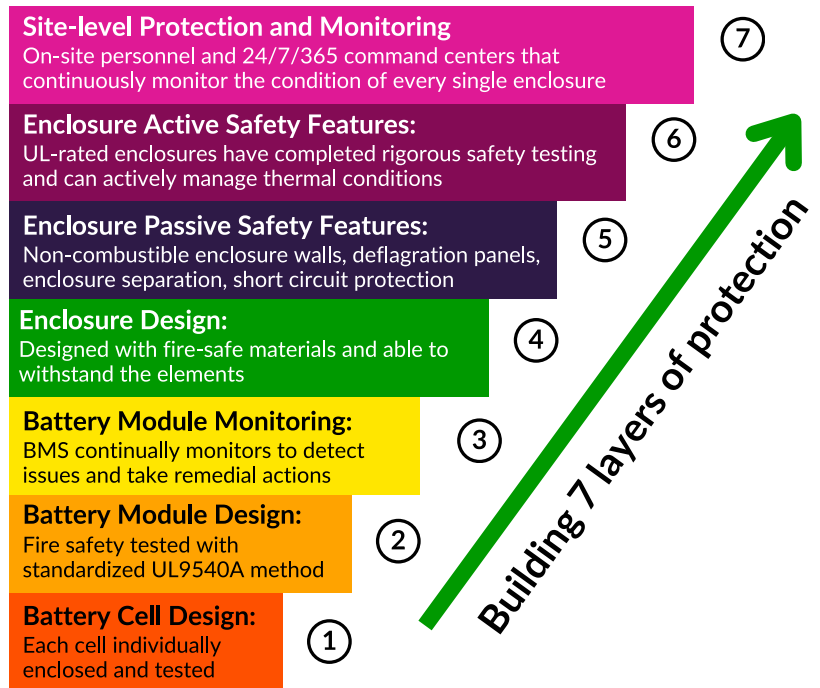
<p><b>NFPA 855</b> Standard for the installation of stationary energy storage systems</p>	<p>The National Fire Protection Association defines the minimum safety requirements for technology, equipment and testing to keep energy storage systems safe from hazards like earthquakes, weather and fire.</p>
<p><b>International Fire Code</b></p>	<p>These regulations safeguard energy storage systems against fires and other hazards. The code also addresses general precautions, emergency planning and preparedness, fire department access and water supplies, automatic sprinkler systems, fire alarm systems and special hazards.</p>
<p><b>UL9540</b> Qualification standard for technology and equipment</p>	<p>The technology and equipment used in energy storage systems must meet the safety standards defined by this series of standards to be compliant and certified. "Underwriters Laboratories," a global third-party safety company, defines these standards and provides certification.</p>
<p><b>UL9540A</b> Standardized fire safety test method</p>	<p>The recognized method for fire safety testing systems at the cell, module, unit and installation level.</p>

## Seven layers of safety

We follow a seven layer approach to protecting our energy storage systems. This starts well before construction begins, with proactively vetting our equipment at the cell, module and enclosure levels. We install additional safety features during construction. During the project's operational life, we monitor each battery and the site as a whole 24/7 to detect and respond to any potential abnormalities.

## Partnerships for emergency preparedness

Lightsource bp works with regional governmental authorities to understand their requirements and concerns as they may relate to battery safety. Such requirements and expectations are ultimately included in our design. We also work with local fire departments to provide specialized training and ensure that a response plan is in place for the unlikely case of an emergency.



Read about our approach to BESS safety and standards.