

# What Is Energy Storage?

## Energy storage powers our daily lives

We use energy storage all the time in our everyday lives. The batteries that power your phone, computer, and other electronic devices are small-scale forms of the battery energy storage systems connected to our electrical grid. The same technology that powers your personal devices is used today to provide back-up power to homes and businesses, limit power outages, make our electrical grid more resilient, and to enable our communities to run on reliable, affordable energy.

## How does it work?

Just like charging your phone while you sleep, energy storage systems efficiently and conveniently capture electricity so that it can be used when it's most needed. Grid-connected energy storage doesn't move or emit any pollution. A grid-connected battery storage system consists of batteries, racks for the batteries, inverters that convert DC energy to AC energy, communications equipment that allow control and monitoring of the batteries, and equipment that ensures the batteries can operate safely. These components and battery systems are housed in specially engineered enclosures and are regulated by comprehensive safety standards and codes. Various types of energy storage technologies have been utilized for more than a century, and the oldest battery storage projects currently in operation have been serving the electrical grid for more than a decade.

## What does it look like and where is it located?

Energy storage systems connected to the electrical grid are housed in specially engineered containers, outdoor-rated cabinets, or purpose-built buildings. While customer-sited residential systems are generally installed on the exterior of homes and about the size of whole-home HVAC systems, grid-scale facilities vary in size. A typical new utility-scale project can have dimensions ranging from a hockey rink or basketball court to a soccer field. There are currently hundreds of utility-scale energy storage projects operating and in construction throughout the entire United States, including in extremes of arctic and desert environments, each tailored for the unique setting and community it serves. Energy storage facilities are located in dense, urban centers as well as rural and remote areas. These operating energy storage projects, wherever they are located, provide valuable services to electrical grids in communities across the country.



To learn more about energy storage technologies, visit [cleanpower.org](https://cleanpower.org).

# How is energy storage useful?

## Enhancing Reliability, Reducing Costs, Protecting the Environment, and Supporting Local Economies

Energy storage systems enable a more efficient and resilient electrical grid, which produces a variety of benefits for consumers, businesses, and communities. Deployment of energy storage:

- **Reduces outages and enhances resilience:** Similar to household devices operating with back-up batteries, like smoke alarms, or back-up generators, energy storage systems can support entire buildings or even the larger electrical grid during extreme weather events and other disruptions. Keeping the lights on, air-conditioning or heating systems operating, and critical infrastructure working is crucially important to keeping people safe.
- **Reduces costs & saves money:** By storing energy when the price of electricity is low and discharging that energy later during periods of high demand, energy storage can reduce costs for utilities and save families and businesses money. Additionally, by enhancing grid resilience and providing back-up power, energy storage can prevent costly damages to families and businesses associated with power outages.
- **Bolsters new and existing electric generation:** As a standalone resource or co-located with generation assets, energy storage enables electricity to be saved and used when and where it is most needed. By introducing more load flexibility into the electrical grid as a technology-neutral resource, energy storage helps integrate new power sources—like solar, wind, and hydropower—and increases the efficiency of existing thermal generation resources on the grid. Maximizing the usefulness all generation resources with energy storage helps meet rising energy demands on our electrical grid.
- **Supports local economies:** Energy storage projects boost local economies and broaden tax bases with significant infrastructure investments, reducing local tax burdens without adding pressure on other governmental services. With over \$100 billion committed to expanding a domestic manufacturing base, the U.S. energy storage industry is on track to create more than 350,000 jobs by 2030 and meet 100% of domestic demand for energy storage projects.

