

Energy storage is becoming an integral part of electric supply, transmission, and distribution infrastructure. In 2018, the U.S. energy storage industry employed over 60,000 people, and this number continues to grow as storage systems are increasingly deployed around the country. Energy storage technologies provide valuable flexibility to our electric system and ensure uninterrupted power to customers. Due to its wide range of applications and benefits, energy storage is receiving increasing attention by a range of stakeholders, including utilities, customers, grid operators, and policymakers.

**What is Energy Storage?** Energy storage refers to a variety of technologies that can collect electricity at one point in time for later use when it is most valuable—batteries, pumped hydro, flywheels, and so forth.

**Why Storage Matters:** Electric grids across the U.S. have little or no storage, having been designed prior to the wide availability of technologies to store electricity at scale. The way our electric system works is that supply and demand must match at every moment for the electric grid to function reliably. Without energy storage capacity, the electric grid must be overbuilt with significant spare capacity to manage supply and demand fluctuations, which creates system inefficiencies, underutilization of assets, and additional costs to customers.

**Declining Costs:** The costs of most forms of storage are declining in recent years due to rising global demand. Battery storage is currently the fastest growing type of storage, largely due to rapidly declining costs. As a result of this trend, conversations have shifted from focusing on costs, to focusing on the value that energy storage provides.

**Benefits:** Energy storage is a critical hub for the entire electric grid, enhancing all power supply resources—wind, solar, hydro, nuclear, and fuel-based generation—as well as grid infrastructure. Ultimately, energy storage is an enabling technology. Key benefits include:

- **Cost Savings:** Energy storage can extend the capabilities of existing power plants and electric infrastructure, deferring or avoiding the costs of building more. And consumers can save money on electric bills by storing energy when it costs less and using that stored energy when energy prices are high.
- **Resilience:** Energy storage can provide backup power during disruptions to the electric system and other emergencies.
- **Flexibility:** When demand changes quickly and flexibility is required, energy storage can inject or extract electricity as needed to exactly match demand. Energy storage can also help integrate more variable solar and wind generation and more distributed energy resources, like electric vehicle chargers and rooftop solar.
- **Lower Environmental Impacts:** Energy storage helps existing fuel-based generation facilities operate more efficiently, which can reduce fuel use and lower emissions. Additionally, when fuel-based supply is replaced by an energy storage system that is paired with a clean energy resource, this too results in decreased emissions.

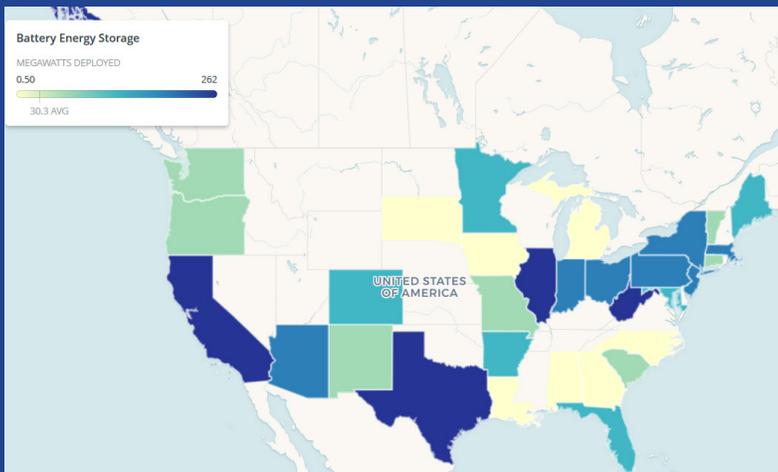
## Examples of Energy Storage Technologies



Battery storage technologies operate by converting electricity into stored chemical energy and then back into electrical energy.



Pumped hydroelectric storage uses electric energy to power pumps that push water up to an elevated retaining pool. When electricity is less abundant and more expensive, the water flows down from its elevated position through a turbine, generating electricity.



### ***Where Energy is Storage Growing in the U.S.:***

Despite policies not keeping pace with advancements in energy storage technologies, storage deployments are still growing around the country. Utilities in states including California, Illinois, Texas, New York, Hawaii, and many others, are deploying battery storage technologies to capture the array of benefits offered. Energy storage can be sited at all levels of the grid. For example, it can be connected to the transmission system, sited at a substation, or hosted in a building. It can also be deployed at any size, from a unit in your garage to a power plant-scale facility.

About ESA: The U.S. Energy Storage Association is the national trade association dedicated to energy storage. With more than 190 members, ESA represents a diverse group of companies, including independent power producers, electric utilities, energy service companies, financiers, insurers, law firms, installers, manufacturers, component suppliers and integrators involved in deploying energy storage systems around the globe. For more information contact ESA at [info@energystorage.org](mailto:info@energystorage.org).