RENEWABLE NORTHWEST

What Is BESS and How Does It Work?

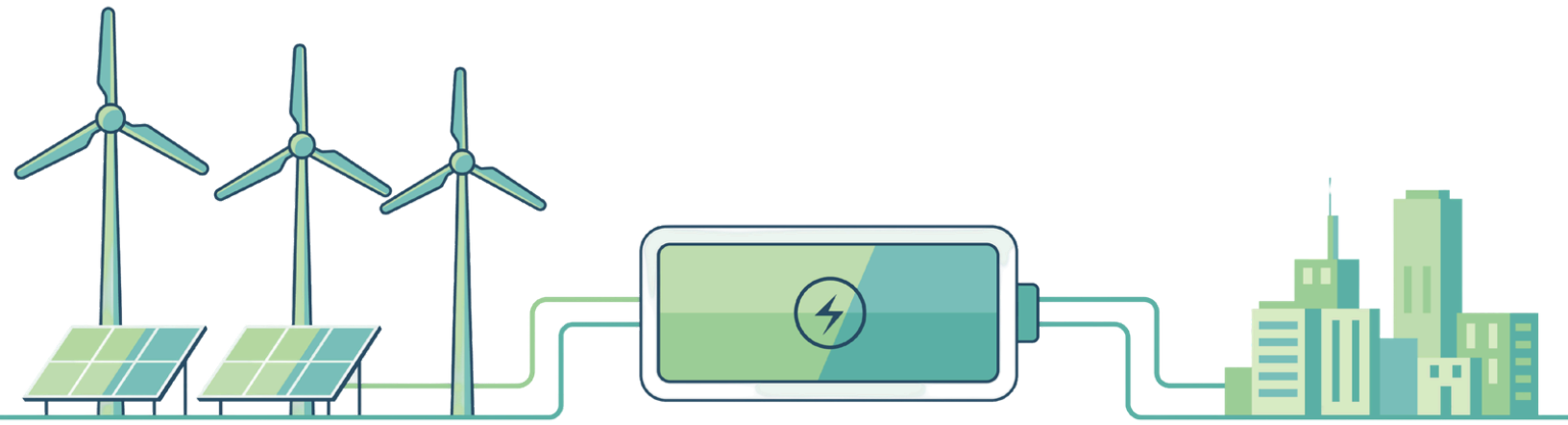
What is BESS?

Battery energy storage systems, often referred to as BESS, store electricity for later use. When electricity generation exceeds demand, electricity from all energy sources, including wind, solar, hydropower, geothermal, and natural gas, can be stored in batteries and discharged when additional power is needed.

How Does BESS Work?

BESS charges by taking electricity from the grid or nearby energy resources and storing it in battery cells. When energy demand increases, or when additional power is needed, the system can discharge stored electricity back to the grid quickly.

BESS helps save electricity for later so it can be used when demand is higher, the grid is under stress, or power would otherwise be more expensive.



Main Components of a BESS Facility

A typical utility-scale BESS facility includes several integrated systems that work together to safely store and deliver electricity

Battery units
Store electricity for later use

Inverters
Convert electricity between the form used by the battery system and the form used by the grid

Electrical equipment
Manages how electricity moves between the battery and the electric grid

Monitoring and control systems
Track system performance, temperature, and operating conditions in real time

Safety systems
Provide multiple layers of protection, including thermal monitoring, ventilation systems, fire detection equipment, and emergency shutdown controls



How Utilities Use BESS

BESS can help utilities and grid operators manage the electric system in several ways:

Peak demand management: Stored electricity can be delivered during periods of high energy use, helping utilities manage demand more efficiently.

Energy resource integration: BESS can store electricity generated from a wide range of resources, including wind, solar, hydropower, geothermal, and natural gas, so it can be used later when it is needed most.

Reliability and resilience: BESS can help support grid operations during outages, extreme weather, or other emergency conditions, but backup power or critical-service support depends on how the project is designed and connected to the grid.

Cost management: BESS can help utilities make better use of existing infrastructure and, in some cases, avoid or defer certain grid upgrades. Over time, depending on the project's purpose and how it is integrated into utility planning, this may help reduce financial pressure on ratepayers.

Supporting a modern electric grid: BESS is one of several tools utilities and grid operators can use to support a more flexible, reliable, and cost-conscious electric system. It works alongside transmission, generation, energy efficiency, demand management, and other grid investments.



BESS is not a standalone solution, and it is not a replacement for the broader electric system.

It is a flexible resource that can help utilities store electricity when it is available and deliver it when it is needed most.

Scan for sources

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SOURCES:

- American Clean Power (ACP) – What is Energy Storage?
- National Renewable Energy Laboratory (NREL) – Battery Storage for Resilience
- Electric Power Research Institute, Energy Storage Roadmap

QUESTIONS?

Contact renewables@renewablenw.org

