

Why are battery energy storage systems important?

Something went wrong while loading article metrics. Please try again later. Battery Energy Storage Systems (BESSs) are critical in modernizing energy systems, addressing key challenges associated with the variability in renewable energy sources, and enhancing grid stability and resilience.

What are battery energy storage systems?

Battery energy-storage systems typically include batteries, battery-management systems, power-conversion systems and energy-management systems²¹ (Fig. 2b).

Are battery energy-storage technologies necessary for grid-scale energy storage?

The rise in renewable energy utilization is increasing demand for battery energy-storage technologies (BESTs). BESTs based on lithium-ion batteries are being developed and deployed. However, this technology alone does not meet all the requirements for grid-scale energy storage.

What types of battery technologies are being developed for grid-scale energy storage?

In this Review, we describe BESTs being developed for grid-scale energy storage, including high-energy, aqueous, redox flow, high-temperature and gas batteries. Battery technologies support various power system services, including providing grid support services and preventing curtailment.

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