

# The role of energy storage generator





## Overview

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Why do we need energy storage systems?

As a consequence, the electrical grid sees much higher power variability than in the past, challenging its frequency and voltage regulation. Energy storage systems will be fundamental for ensuring the energy supply and the voltage power quality to customers.

How does energy storage work?

Energy storage creates a buffer in the power system that can absorb any excess energy in periods when renewables produce more than is required. This stored energy is then sent back to the grid when supply is limited.

How is energy stored?

**Mechanical Energy Storage:** Energy is stored through mechanical means, such as compressing air or using flywheels. Compressed Air Energy Storage (CAES) and flywheels are examples of this technology. **Hydrogen Storage:** Surplus electricity is used to produce hydrogen through electrolysis.

Why is grid-scale energy storage important?

Without a way to store energy when these sources are plentiful and dispatch it when they're not, power systems can become unreliable and inefficient. The International Energy Agency (IEA) emphasises that grid-scale storage, notably batteries and pumped-hydro, is critical to balancing intermittent renewables like solar and wind.



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The Role of Energy Storage in Power Systems , SpringerLink

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