

## **PDEOZE PowerContainer**

# **Energy Storage Power Product Benchmarking**



## Overview

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What is a techno-economic assessment of energy storage technologies?

Techno-economic assessments (TEAs) of energy storage technologies evaluate their performance in terms of capital cost, life cycle cost, and levelized cost of energy in order to determine how to develop and deploy them in the power network.

Where can I find performance and testing protocols for stationary energy storage systems?

The United States has several sources for performance and testing protocols on stationary energy storage systems. This research focuses on the protocols established by National Labs (Sandia National Laboratories and PNNL being two key labs in this area) and the Institute of Electrical and Electronics Engineers (IEEE).

How is energy storage capacity calculated?

The energy storage capacity,  $E$ , is calculated using the efficiency calculated above to represent energy losses in the BESS itself. This is an approximation since actual battery efficiency will depend on operating parameters such as charge/discharge rate (Amps) and temperature.

What is the energy storage operators' Forum guide?

This report is based on individual project outputs exchanged within the Energy Storage Operators' Forum in the United Kingdom. The Guide is designed as a reference document, with chapters relating to each stage of the project life cycle (e.g., procurement, installation, safety assessment, business case development).

How much does energy storage cost?

The study by Schmidt et al. projected the future prices of several energy storage technologies based on the experience curves. The capital costs for

stationary systems and battery packs are  $\$340 \pm 60/\text{kWh}$  and  $\$175 \pm 25/\text{kWh}$ , respectively, regardless of storage technology in the years 2015–2040 .

What is the electrical energy storage guide?

The Guide is designed as a reference document, with chapters relating to each stage of the project life cycle (e.g., procurement, installation, safety assessment, business case development). It also introduces various electrical energy storage technologies and the ways in which they can be used.

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