

Macao utility scale battery storage cost per mw

Do utility-scale lithium-ion battery systems have cost and performance projections?

In this work we describe the development of cost and performance projections for utility-scale lithium-ion battery systems, with a focus on 4-hour duration systems. The projections are developed from an analysis of recent publications that consider utility-scale storage costs.

What are base year costs for utility-scale battery energy storage systems?

Base year costs for utility-scale battery energy storage systems (BESSs) are based on a bottom-up cost model using the data and methodology for utility-scale BESS in (Ramasamy et al., 2023). The bottom-up BESS model accounts for major components, including the LIB pack, the inverter, and the balance of system (BOS) needed for the installation.

How are battery storage cost projections developed?

The projections are developed from an analysis of recent publications that include utility-scale storage costs. The suite of publications demonstrates wide variation in projected cost reductions for battery storage over time. We use the recent publications to create low, mid, and high cost projections.

Are battery storage costs based on long-term planning models?

Battery storage costs have evolved rapidly over the past several years, necessitating an update to storage cost projections used in long-term planning models and other activities. This work documents the development of these projections, which are based on recent publications of storage costs.

How much does battery storage cost?

The suite of publications demonstrates wide variation in projected cost reductions for battery storage over time. We use the recent publications to create low, mid, and high cost projections. Projected storage costs are \$245/kWh, \$326/kWh, and \$403/kWh in 2030 and \$159/kWh, \$226/kWh, and \$348/kWh in 2050.

Do battery storage technologies use financial assumptions?

The battery storage technologies do not calculate levelized cost of energy (LCOE) or levelized cost of storage (LCOS) and so do not use financial assumptions. Therefore, all parameters are the same for the research and development (R&D) and Markets & Policies Financials cases.

Figure ES-2 shows the overall capital cost for a 4-hour battery system based on those projections, with storage costs of \$143/kWh, \$198/kWh, and \$248/kWh in 2030 and \$87/kWh, \$149/kWh, and \$248/kWh in 2050.

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Grid-scale battery costs can be measured in \$/kW or \$/kWh terms. Thinking in kW terms is more helpful for modelling grid resiliency. A good rule of thumb is that grid-scale lithium ion batteries will have 4-hours of storage duration, as this minimizes per kW costs and maximizes the revenue potential from power price arbitrage.

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Figure 2. 2022 U.S. utility-scale LIB storage costs for durations of 2-10 hours (60 MW DC) in \$/kW. Scenario Descriptions. Battery cost and performance projections in the 2023 ATB are ...

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Cost details for utility-scale storage (4-hour duration, 240-megawatt hour [MWh] usable) Current Year (2022)
: The 2022 cost breakdown for the 2024 ATB is based on (Ramasamy et al., 2023) and is in 2022\$.

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