



# Grid tied storage system capital expenditure estimate 2030

Which energy storage technologies are included in the 2020 cost and performance assessment?

The 2020 Cost and Performance Assessment provided installed costs for six energy storage technologies: lithium-ion (Li-ion) batteries, lead-acid batteries, vanadium redox flow batteries, pumped storage hydro, compressed-air energy storage, and hydrogen energy storage.

How does energy storage impact the grid and transportation sectors?

Energy storage and its impact on the grid and transportation sectors have expanded globally in recent years as storage costs continue to fall and new opportunities are defined across a variety of industry sectors and applications.

Will 9% of energy storage capacity be added by 2030?

We added 9% of energy storage capacity (in GW terms) by 2030 globally as a buffer. The buffer addresses uncertainties, such as markets where we lack visibility and where more ambitious policies may develop that we haven't predicted. We revised our buffer calculation methodology in this market outlook.

How much does grid integration cost?

Grid integration including transformers, meters, safety disconnects, and nominal labor costs added at \$19.89/kW, same as for 100 MW lithium-ion battery system. Table 35 shows input values for capital cost obtained from Hunter et al. (In Press) for a 100 MW, 120-hour HESS.

Why did the storage industry's performance metrics and cost estimates change?

This research effort will periodically update tracked performance metrics and cost estimates as the storage industry continues its rapid pace of technological advances. Due to intra-annual uncertainty, the reported costs may have changed by the time this report was released.

How much does gravity based energy storage cost?

Looking at 100 MW systems, at a 2-hour duration, gravity-based energy storage is estimated to be over \$1,100/kWh but drops to approximately \$200/kWh at 100 hours. Li-ion LFP offers the lowest installed cost (\$/kWh) for battery systems across many of the power capacity and energy duration combinations.

Modern and digital grids are vital to safeguard electricity security during clean energy transitions. As the shares of variable renewables such as solar PV and wind increase, power systems need to become more flexible to accommodate ...

Base year installed capital costs for BESS decrease with duration (for direct storage, measured in \$/kWh), while system costs (in \$/kW) increase. This inverse behavior is observed for all energy storage technologies and highlights the ...



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2023 ATB data for utility-scale PV-plus-battery are shown above. Details are provided for a single configuration, and supplemental information is provided for related configurations in order to reflect the uncertainty about the dominant ...



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