

# The cost of air energy storage per kilowatt-hour





## Overview

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How much does compressed air energy storage cost?

Our base case for Compressed Air Energy Storage costs require a 26c/kWh storage spread to generate a 10% IRR at a \$1,350/kW CAES facility, with 63% round-trip efficiency, charging and discharging 365 days per year.

How much does energy storage cost?

Cost data for most technology groups came from projects deployed globally between 2018 and 2024. At \$232/kWh, thermal energy storage was the cheapest technology group, followed by compressed air storage. At \$643/kWh, gravity storage had the highest average global capex cost, BNEF said.

How to calculate the cost of energy storage per kWh?

The cost of energy storage per kWh can be calculated using the formula: Total cost of the project / Total energy capacity. For example, if the total cost of the project is \$1000 and the total energy capacity is 69.5 kWh, then the energy storage cost for 1 kWh is  $\$1000 / 69.5 \text{ kWh} \approx \$14.40/\text{kWh}$ .

How much electricity can a compressed air energy storage system store?

While the product is exceptional, it can only store up to 10 MW of electricity. In contrast, a compressed air energy storage system is capable of storing 100-300 MW.



## The cost of air energy storage per kilowatt-hour



### [Energy Storage Cost and Performance ...](#)

hydrogen energy storage pumped storage  
hydropower gravitational energy storage  
compressed air energy storage thermal energy  
storage For more information about each, as well  
as the related cost estimates, please click ...

### [Optimizing industrial compressed air energy storage ...](#)

The exergy cost of each device is the cost per  
kilowatt-hour multiplied by the exergy rate in  
kilowatt-hours, or another meaning the relation  
between exergy and cost rate is ...



### [Energy Storage Cost-of-service Tool 2](#)

Key messages: Energy storage3 System-level  
battery storage costs fell 93% from USD 2 571  
per kilowatt hour (kWh) in 2010 to USD 192/kWh  
in 2024 owing to technological improvements, ...

### [Compressed Air Energy Storage Costs?](#)

Compressed air energy storage: costs and  
economics? Our base case for Compressed Air  
Energy Storage costs require a 26c/kWh storage



spread to generate a 10% IRR at a \$1,350/kW CAES facility, with 63% round-trip ...

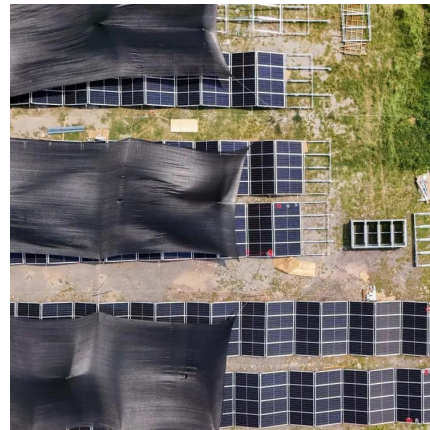


### [How do the costs of compressed air storage ...](#)

Compressed Air Storage Capex: BloombergNEF (BNEF) data from 2023-2024 highlights compressed air storage costs around \$293 per kilowatt-hour (kWh) of capacity in global averages, with some variation by ...

### [Analysis of cost per kilowatt hour and cost per mileage for](#)

Energy storage is important for promoting the renewable energy consumption and improving the grid resilience. Cost of energy storage system is a key factor to determine ...



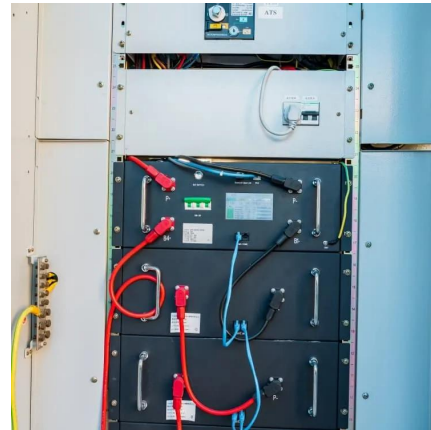
### [The Cost of Energy Storage](#)

The article lists figures in dollars per kilowatt-hour (\$/kWh), which can be converted to \$/MWh by multiplying by 1,000. For a grid aiming for 100% availability, the target energy storage capacity cost is stated as ...



### [How do the costs of compressed air storage compare to ...](#)

Compressed Air Storage Capex: BloombergNEF (BNEF) data from 2023-2024 highlights compressed air storage costs around \$293 per kilowatt-hour (kWh) of capacity in ...



### [Compressed air energy storage power station kilowatt-hour cost](#)

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### [Energy Storage Cost and Performance Database](#)

hydrogen energy storage pumped storage  
hydropower gravitational energy storage  
compressed air energy storage thermal energy storage  
For more information about each, as well as the ...



### [Thermal and compressed air storage cheaper than lithium ...](#)

Fully installed systems' global average capex costs were \$232/kWh for thermal energy storage and \$293/kWh for compressed air storage, compared with \$304/kWh for four ...



### Compressed Air Energy Storage Cost per kWh: A ...

As renewable energy adoption surges globally, the compressed air energy storage cost per kWh has become a critical metric for grid operators and project developers. With lithium-ion ...



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