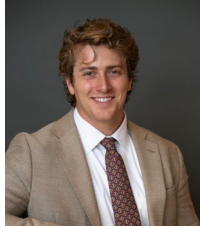


How much do batteries cost in 2024?

Ben Campbell, Research Manager, Battery Next

Shawn Wasim, Principal Researcher, Stationary
Energy Storage

Speakers



Ben Campbell

Research Manager, Battery Next

E Source



Shawn Wasim

Principal Researcher, Stationary Energy Storage

E Source



Agenda

- What do battery cells and energy storage systems (ESS) cost today?
- How can I use the E Source Battery Cost Model to track battery costs?
- What's does current battery pricing mean for customers?

E Source Solutions: Battery Next



Subscription-based access to curated market intelligence, industry-leading models, and global battery experts that can help inform your investment decisions and business strategies.

Technoeconomic models

Battery cost models

Leverage our industry-leading battery cost model to gauge current battery cell prices, review project or factory costs, and model the impact of new battery technology.

ESS economic models

Compare energy storage technologies or run site-specific analysis on how battery specs, costs and customer.

Forecast databases

Battery Forecast Database

Track the evolution of battery demand, review cathode and anode chemistry adoption, and learn about raw material requirements across more than 50 battery applications.

EV Forecast Database

Track the development of the global EV market with our model-by-model EV sales forecasts.

Access to reports and Battery Next analysts

Learn what's happening across the battery value chain and how it will impact the battery technology and prices available to you.

Submit custom research questions to our team of global battery experts.



Global battery demand

2.5 TWh

**Global battery
installations through
2023**

30 TWh

**Global battery
installations through
2033**

Note: TWh = terrawatt-hour

Stationary ESS installations in the US

62 GWh

**US ESS installed
through 2023**

762 GWh

**US ESS installed
through 2033**

Note: GWh = gigawatt-hour

Battery Next Cost Model

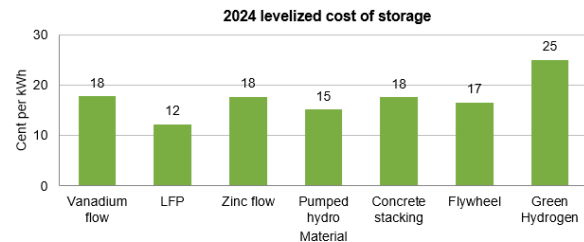
Levelized Cost of Storage

LCOS (xCharging)

VRB	(€/KWh)	12.9
Li Ion	(€/KWh)	8.5
ZBB	(€/KWh)	13.3
Pumped hydro	(€/KWh)	9.3
Concrete stacking	(€/KWh)	12.3
Flywheel	(€/KWh)	12.9
Green Hydrogen	(€/KWh)	14.6

LCOS (with charging)

Vanadium flow	(€/KWh)	17.7
LFP	(€/KWh)	12.2
Zinc flow	(€/KWh)	17.6
Pumped hydro	(€/KWh)	15.1
Concrete stacking	(€/KWh)	17.6
Flywheel	(€/KWh)	16.5
Green Hydrogen	(€/KWh)	25.0



© E Source (Battery Next LCOS model). Notes: kWh = kilowatt-hour; LFP = lithium iron phosphate; NMC = lithium nickel manganese cobalt oxide.

Project parameters

Project Size (Power)	(MW)	4
Duration	Hours	4
Project Size (Energy)	(MWh)	16
Charging Cost at Project Start	(€/KWh)	3
Annual Charging Cost Increase	%	0.5%
CPI	%	3.0%
Cycles/Day	Cycles	1
Operating Days/Year	Days	300
Project Start	Year	2024
System Lifetime	Years	25

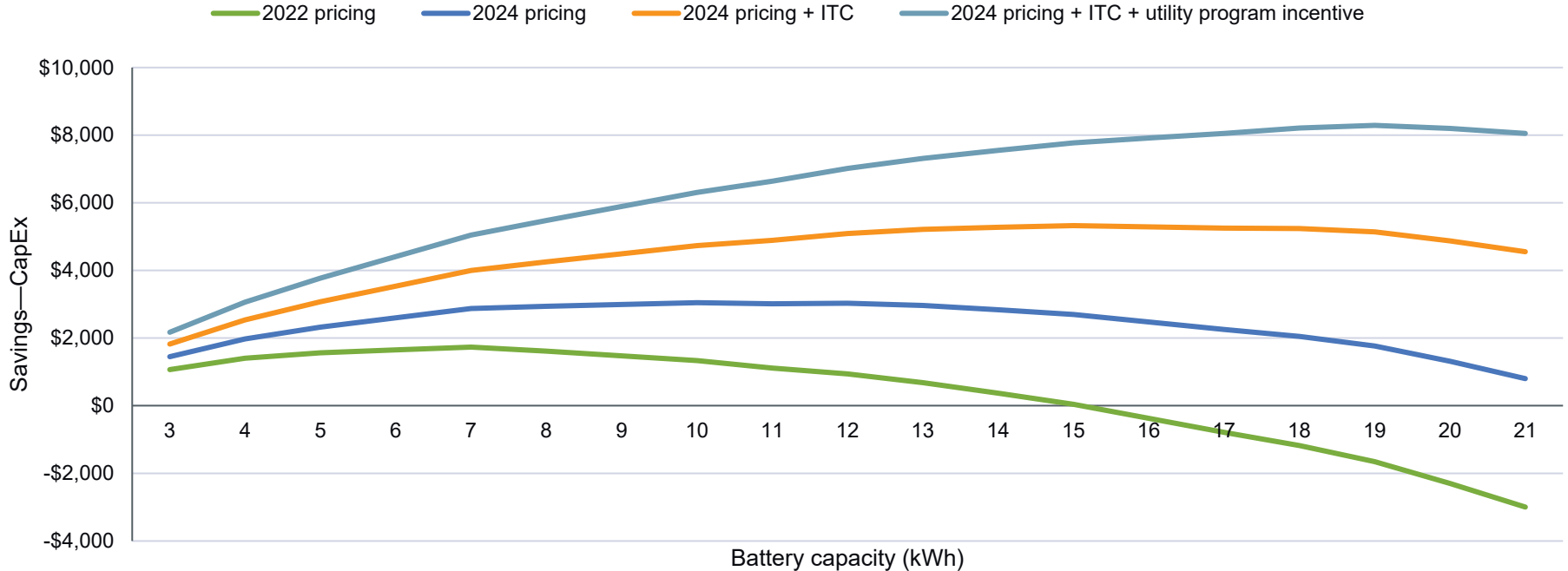
Capital structure

	VRB	Li Ion	ZBB	Pumped Hydro	Concrete Stacking	Flywheel	Green Hydrogen
Subsidy/Credit	30%						
Annual Discount Rate	8.0%						
Term (yr)	25						
Number of Payments per Year	12						
Total Number of Payments	300						
Loan Amount (\$)	\$3,954,923	\$2,022,763	\$4,473,670	\$2,800,000	\$3,343,200	\$5,065,200	\$2,425,949
Payment per Month	\$30,525	\$15,612	\$34,529	\$21,611	\$25,803	\$39,094	\$18,724

© E Source

Case study: Medium-sized grocery store

Lifetime benefit for demand charge reductions



© E Source. **Notes:** ITC = Investment Tax Credit; kWh = kilowatt-hour. We assume \$0.06 per kWh energy rate and \$20 per kW demand charge. We applied an 18 cents per watt-hour average upfront incentive. We assume a 30% ITC.

Additional resources

- [Batteries](#)
- [Battery price forecast 2024: How EV demand in China affects battery costs for US stationary storage projects](#)
- [The power within: Understanding the switch from nickel manganese cobalt to iron phosphate for grid storage applications](#)

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October 8–10

Sheraton Denver Downtown

www.esource.com/forum2024

forum

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