

# Standalone energy storage investment return analysis





## Overview

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Do investors underestimate the value of energy storage?

While energy storage is already being deployed to support grids across major power markets, new McKinsey analysis suggests investors often underestimate the value of energy storage in their business cases.

What are business models for energy storage?

Business Models for Energy Storage Rows display market roles, columns reflect types of revenue streams, and boxes specify the business model around an application. Each of the three parameters is useful to systematically differentiate investment opportunities for energy storage in terms of applicable business models.

How do I evaluate potential revenue streams from energy storage assets?

Evaluating potential revenue streams from flexible assets, such as energy storage systems, is not simple. Investors need to consider the various value pools available to a storage asset, including wholesale, grid services, and capacity markets, as well as the inherent volatility of the prices of each (see sidebar, “Glossary”).

Is energy storage a profitable business model?

Although academic analysis finds that business models for energy storage are largely unprofitable, annual deployment of storage capacity is globally on the rise (IEA, 2020). One reason may be generous subsidy support and non-financial drivers like a first-mover advantage (Wood Mackenzie, 2019).

What economic inputs are included in the energy storage model?

The economic inputs into the model will include both the revenue and costs for the project. Revenue for the energy storage project will either be expressed as a contracted revenue stream from a PPA (Power Purchase Agreement), derived from merchant activity by the facility, or some



combination thereof.

How does energy storage affect Roi?

The cost of electricity, including peak and off-peak rates, significantly impacts the ROI. Energy storage systems can store cheaper off-peak energy for use during expensive peak periods. Subsidies, tax credits, and rebates offered by governments can enhance the financial attractiveness of ESS installations.



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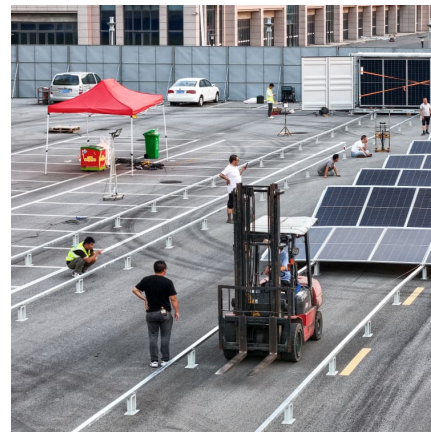


### [The Standalone Energy Storage Market in India 1](#)

Key Findings Standalone Energy Storage Systems (ESS) are rapidly emerging as a key market, with 6.1 gigawatts of tenders issued in the first quarter of 2025 alone, accounting for 64% of the ...

### [Empirical Study on Cost-Benefit Evaluation of New ...](#)

Energy storage technology is a critical component in supporting the construction of new power systems and promoting the low-carbon transformation of the energy system. Currently, new energy storage in China is ...



### **Subsidy Policies and Economic Analysis of Photovoltaic Energy Storage**

Taking a specific photovoltaic energy storage project as an example, this paper measures the levelized cost of electricity and the investment return rate under different energy ...



### [Business Models and Profitability of Energy Storage](#)

Here we first present a conceptual framework to characterize business models of energy storage and, thereby, systematically differentiate



investment opportunities.



### ['Early days' for storage ITC to impact US market](#)

The 'Keynote Panel: The Inflation Reduction Act - What Changes Have We Seen Since Last Year?' session at Energy Storage Summit USA last month. Image: Solar Media. There is a long way to go before the new ...



### [Energy Storage Financial Model in Excel \[Updated 2025\]](#)

Breakeven Analysis Energy storage investment analysis involves conducting detailed research and calculations to determine the return on investment (ROI) for battery storage projects. This includes evaluating grid storage costs, ...



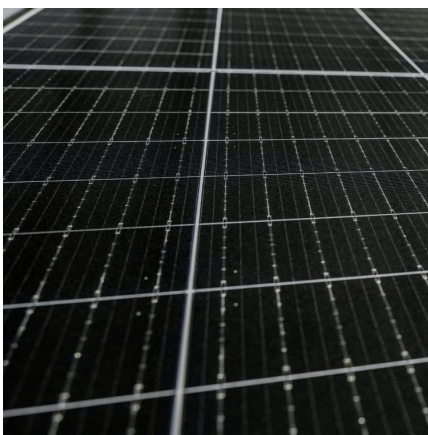
### **StoreFAST: Storage Financial Analysis Scenario Tool , Energy ...**

The Storage Financial Analysis Scenario Tool (StoreFAST) model enables techno-economic analysis of energy storage technologies in service of grid-scale energy ...



### [Energy Storage Financial Model in Excel \[Updated 2025\]](#)

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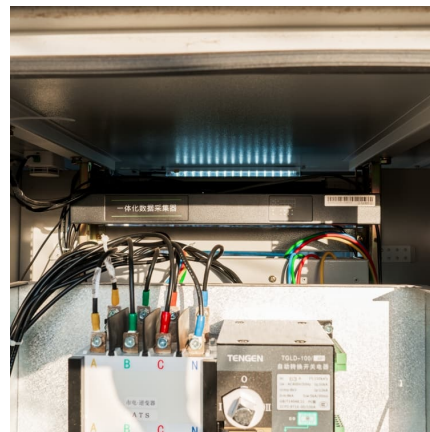


### [2022 Grid Energy Storage Technology Cost and ...](#)

Acknowledgments The Energy Storage Grand Challenge (ESGC) is a crosscutting effort managed by the Department of Energy's Research Technology Investment Committee. The project team ...

### [Energy Storage Excel Financial Model](#)

Empower your energy storage ventures with The Energy Storage Financial Model template. Tailored for efficiency, this powerful tool simplifies financial planning, budgeting, and project analysis. Seamlessly project costs, ...



### **Energy Storage Financial Model**

Fractal provides robust energy storage financial models to utilities, energy companies and investors. Fractal has spent years developing and optimizing powerful models that simulate performance, degradation, costs and revenues ...



### Understanding the Return of Investment (ROI) of Energy Storage ...

Several key factors influence the ROI of a BESS. This article explores the various factors influencing the return of investment of BESS.



### Lazard LCOE+ (June 2024)

The results of our Levelized Cost of Storage ("LCOS") analysis reinforce what we observe across the Power, Energy & Infrastructure Industry--energy storage system ("ESS") applications are ...

### [Co-location and standalone storage both 'good ...](#)

"I think co-location or standalone BESS are both good hedges under a single, central power price model," said Scott Berrie. Image: Solar Media. While the co-location of solar and storage





## Energy Storage Grand Challenge Energy Storage Market ...

This data-driven assessment of the current status of energy storage markets is essential to track progress toward the goals described in the Energy Storage Grand Challenge and inform the ...

### [The Economics of Grid-Scale Energy Storage](#)

The transition to a low-carbon electricity system is likely to require grid-scale energy storage to smooth the variability and intermittency of renewable energy. This paper investigates whether private incentives for operating and investing ...



### [The State of Play for Energy Storage Tax Credits](#)

The IRA enacted the long-sought investment tax credit (ITC) under Section 48 and 48E of the Internal Revenue Code (the Code) for standalone energy storage facilities.

### [Evaluating energy storage tech revenue potential](#)

The revenue potential of energy storage technologies is often undervalued. Investors could adjust their evaluation approach to get a true estimate.



### [Financial Investment Valuation Models for ...](#)

Energy production through non-conventional renewable sources allows progress towards meeting the Sustainable Development Objectives and constitutes abundant and reliable sources when combined with storage ...



### [Inflation Reduction Act: An energy storage system ...](#)

This 5MW/10MWh LS Energy Solutions project for Strata Clean Energy in Vermont availed of the new ITC for standalone energy storage. Image: Strata Clean Energy. Just over a year ago, the passing of the Inflation ...



### **World Bank Document**

Alternating current Asian Development Bank  
Battery energy storage system (see Glossary)  
Battery management system (see Glossary)  
Balance of System (see Glossary) British Thermal  
...



## Energy Storage Rides a Wave of Growth but Uncertainty ...

Continued expansion of intermittent renewable energy, ESG-focused investments, the growing versatility of storage technologies to provide grid and customer services, and declining costs ...



## ['Landmark' financing deal achieved for 400MWh](#)

A debt financing deal closed by independent power producer (IPP) sPower for a 100MW / 400MWh battery storage project in California demonstrates that significant project ...

## Solar-Plus-Storage: The Future Market for Hybrid Resources

The Economic Potential for Energy Storage in Nevada Brattle's 2018 assessment for the PUCN and the Governor's Office of Energy identified at least 1,000 MW of cost-effective storage ...



## [Energy Storage: Connecting India to Clean Power on ...](#)

Executive Summary transition away from fossil fuel-based power generation. To this end, a new demand-driven capacity tender model for firm and dispatchable renewable energy (FDRE) ...



### [Performance Analysis of Hybrid Energy Storage](#)

the strengths of individual components. This paper presents a comprehensive performance analysis of various hybrid energy storage configurations integrated within standalone PV-based ...



### [Berkeley Lab study asks whether standalone](#)

Standalone battery energy storage can potentially offer better value to the US electricity system than pairing batteries directly with solar or wind generation, but the pros and ...

### [Subsidy Policies and Economic Analysis of ...](#)

Taking a specific photovoltaic energy storage project as an example, this paper measures the levelized cost of electricity and the investment return rate under different energy storage scenarios.





### Potential and challenges of Battery Energy Storage (BESS): ...

Hence, identifying the research gaps, an analysis of standalone storage system for grid applications in Poland is performed. In this study the NPV, IRR and PP for different scenarios ...

### Energy.gov

The portion of capital financed with debt DOD  
Depth of discharge The energy discharged as a percentage of the rated energy capacity of the storage system. DT Discharge time The ratio of ...



### Battery Energy Storage Financing Structures and Revenue ...

Battery Energy Storage Revenue Streams The varying uses of storage, along with differences in regional energy markets and regulations, create a range of revenue streams for battery energy ...

### [The Economics of Grid-Scale Energy Storage](#)

The transition to a low-carbon electricity system is likely to require grid-scale energy storage to smooth the variability and intermittency of renewable energy. This paper investigates whether ...



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