

Grid-Scale Battery Market to Hit \$38.46 Billion by 2031 | Grid Modernization Fuels \$100B Investments in U.S. Batteries

Grid-scale battery market to grow from \$6.84 Billion (2023) to \$38.46 Billion (2031), driven by renewables and falling costs.

AUSTIN, TX, UNITED STATES,
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EINPresswire.com/ -- According to DataM Intelligence, the [grid-scale battery market](#) size was US\$ 6.84 billion in 2023 and is projected to reach US\$ 38.46 billion by 2031, growing at a CAGR of 25.74% during the forecast period (2024–2031). This impressive growth trajectory is fueled by declining battery costs, supportive policy frameworks, and rising renewable energy deployment across key regions.



The Grid-Scale Battery Market is experiencing exponential growth as countries worldwide

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Lithium-ion batteries, with >70% market share, remain the backbone of global storage due to efficiency, cost, and reliability.”

DataM Intelligence

prioritize clean energy, grid resilience, and energy transition goals. Grid-scale batteries are advanced energy storage systems that provide large-scale power backup, frequency regulation, and renewable energy integration. Their role has become increasingly crucial as nations expand renewable infrastructure, electrify transportation, and modernize power grids.

Lithium-ion batteries remain the leading segment due to

their cost-effectiveness, high efficiency, and wide availability. Meanwhile, Asia-Pacific leads the market geographically, primarily driven by China's massive energy storage targets, large-scale solar and wind integration, and domestic manufacturing strength. North America and Europe follow closely, benefiting from government incentives, clean energy mandates, and growing

investments in grid modernization.

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Key Highlights from the Report:

- The global grid-scale battery market was valued at US\$ 6.84 billion in 2023 and is forecast to hit US\$ 38.46 billion by 2031.
- The market is expected to grow at a robust CAGR of 25.74% during 2024–2031, according to DataM Intelligence.
- Lithium-ion batteries dominate due to their superior energy density, declining costs, and fast response times.
- Asia-Pacific leads the global market, driven by China, Japan, and South Korea's renewable energy commitments.
- Flow batteries are gaining momentum as a sustainable option for long-duration storage applications.
- Policies like the U.S. Inflation Reduction Act and EU Green Deal are propelling large-scale energy storage adoption.

Recent Developments:

United States: Recent Industry Developments

In July 2025, Peak Energy launched and shipped its first grid-scale sodium-ion BESS pilot, deployed with nine utilities and IPPs, marking the first passive NFPP battery system of its scale in the U.S.

In May 2025, ONE (Our Next Energy Inc.) introduced U.S.-manufactured grid products including 314 Ah LFP cells, integrated modules, and a battery management system to qualify for the domestic content ITC bonus, strengthening the domestic supply chain.

In 2025, U.S. energy storage industry stakeholders committed \$100 billion over the decade to build and buy American-made grid batteries, aiming to establish a full domestic supply chain.

In September 2025, Fluence shipped its first battery storage systems meeting U.S. domestic content requirements, with cells, modules, thermal management, controls, and enclosures all domestically produced.

Japan: Recent Industry Developments

On June 12, 2025, TotalEnergies' subsidiary Saft was selected to build a 1 GWh battery energy storage system in Fukushima, part of efforts to stabilize Japan's grid as renewable energy input

fluctuates.

On June 5, 2025, Banpu Japan ordered two grid-scale battery storage “Mega Power” sites (109.6 MWh each) in Fukushima and Miyazaki Prefectures to help with grid stability, expected to start operations in 2028.

On September 4, 2025, Erex announced investment in its first grid-scale BESS project: a 2 MW / 8 MWh facility in Miyazaki Prefecture, Japan, targeting commercial operation in Q2 FY2026.

As of end-March 2025, Japan had about 113 GW in grid-scale battery storage applications in connection assessment, with ~12 GW having applied for connection contracts, representing a tenfold increase since May 2023.

Market Dynamics:

Market Drivers

The strongest driver is the global transition toward renewable energy. Grid-scale batteries enable solar and wind energy to be stored and dispatched when needed, ensuring reliability. Additionally, the falling costs of lithium-ion technology and the availability of government subsidies are making adoption more attractive. Rising electrification of transport and the demand for grid modernization further push utilities and industries to integrate large-scale energy storage solutions.

Market Restraints

A major restraint is the high upfront capital investment, especially for long-duration energy storage systems such as flow or sodium-sulfur batteries. Raw material supply chain risks particularly lithium, cobalt, and nickel create volatility in production costs. Regulatory inconsistencies across regions also hinder investment confidence and project scalability.

Market Opportunities

Opportunities lie in the development of next-generation technologies like flow batteries, hydrogen storage, and hybrid systems that extend storage duration and capacity. Recycling initiatives and second-life EV batteries are unlocking cost-effective alternatives for grid storage. Moreover, the rise of AI-driven smart grids and microgrid solutions presents significant opportunities for efficient energy management and resilience.

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Major Companies:

Key players operating in the grid-scale battery market include:

ABB Ltd.

LG Chem, Ltd.
Samsung Sdi Co., Ltd.
Panasonic Corporation
Fluence Energy, LLC
BYD Company Limited
General Electric (GE)
Saft Groupe S.A.
S&C Electric Company
NGK Insulators

Market Segmentation:

The Grid-Scale Battery Market is segmented across technology, applications, and end-users.

By technology, lithium-ion batteries dominate the global share, backed by extensive research, economies of scale, and efficiency advantages. Flow batteries, sodium-sulfur, and lead-acid systems also contribute, especially in cases where long-duration storage and durability are essential. Flow batteries are increasingly seen as a game-changer due to their scalability and ability to store energy for extended periods.

By application, the renewable energy integration segment takes precedence as utilities adopt large-scale storage to manage variability in solar and wind power output. Other critical applications include frequency regulation, peak shaving, and backup power for grids under stress. Frequency regulation is particularly vital, as batteries provide instantaneous response, stabilizing grid operations.

By end-user, utilities lead the market, deploying storage at the grid level to enhance stability and efficiency. Independent power producers and commercial organizations are also increasingly investing in energy storage to lower costs, ensure reliability, and achieve sustainability commitments.

Regional Insights:

Asia-Pacific is the largest regional market, with China playing a dominant role. The country's energy policies mandate large-scale storage deployment alongside renewable installations. Domestic manufacturing of lithium-ion cells further supports affordability and capacity expansion. Japan and South Korea are also investing heavily in smart grids and backup storage technologies, strengthening the region's dominance.

North America is experiencing a surge in demand, driven by federal and state policies promoting renewable integration. The United States leads the region with major projects in California, Texas, and New York, supported by incentives like the Inflation Reduction Act. Canada is also adopting grid-scale batteries to strengthen resilience in remote and renewable-heavy regions.

Europe ranks as another critical market, underpinned by the EU's commitment to carbon neutrality and energy security. Countries like Germany, the UK, and Spain are investing in large-scale storage to balance increasing renewable penetration. The region also emphasizes sustainability, encouraging recycling and second-life applications for used batteries.

Emerging regions, including Latin America, the Middle East, and Africa, are gradually entering the market, especially for off-grid and hybrid renewable projects. These investments are vital for electrification efforts in rural and underserved areas.

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Reasons to Buy the Report

- In-depth insights with trusted market data from DataM Intelligence.
- Identifies high-growth opportunities across technology, applications, and regions.
- Provides comprehensive regional coverage with policy and investment trends.
- Profiles leading players with details on strategies, innovations, and partnerships.
- Offers long-term forecasts up to 2031 to support strategic decision-making.

Frequently Asked Questions (FAQs)

- How big is the global grid-scale battery market?
- Who are the key players in the grid-scale battery market?
- What is the projected CAGR of the grid-scale battery market during 2024–2031?
- What is the market forecast for grid-scale batteries by 2031?
- Which region is expected to dominate the grid-scale battery industry through the forecast period?

Conclusion

The Grid-Scale Battery Market is at the forefront of the global energy transition, enabling greater penetration of renewable energy and ensuring grid reliability. With the market valued at US\$ 6.84 billion in 2023 and expected to reach US\$ 38.46 billion by 2031, the sector represents one of the fastest-growing areas in clean energy infrastructure. Despite challenges such as high capital costs and raw material supply risks, advancements in technology, supportive policies, and emerging opportunities in recycling and smart grids are expected to propel the market forward. Companies that innovate and adapt to these evolving dynamics are well-positioned to lead in the decade ahead.

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