+357 96 030922
info@marketpublishers.com

Battery Energy Storage System Market Assessment, By Battery Type [Lithium-ion Batteries, Lead-acid Batteries, Flow Batteries, Others], By Connection Type [On-Grid, Off-Grid], By Application [Utility, Commercial, Industrial, Residential], By Capacity [Below 100 MWh, 100 – 500 MWh, Above 500 MWh], By Region, Opportunities and Forecast, 2022-2030F

https://marketpublishers.com/r/B133208BC8CBEN.html
Date: March 2025
Pages: 231
Price: US$ 4,500.00 (Single User License)
ID: B133208BC8CBEN

Abstracts

Global battery energy storage systems market size was valued at USD 21.64 billion in 2022 and is expected to reach USD 54.04 billion in 2030, with a CAGR of 12.12% for the forecast period between 2023 and 2030. The rising global energy demand necessitates a continuous and reliable power supply. The growing need has led to an uptick in adopting Battery Energy Storage Systems (BESS), a technology that stores electrical energy in batteries for future utilization. These systems are engineered to accumulate surplus electricity during times of abundance, such as when demand is low or when renewable energy sources like solar and wind generate excess power. They subsequently release this stored energy when required, contributing to grid stability, enhancing energy reliability, and cutting down peak electricity expenses.

Countries worldwide are increasing their reliance on renewable energy sources, like solar and wind, to mitigate carbon emissions and enhance grid stability. Nevertheless, the intermittent electricity from these sources poses a particular challenge, especially in regions like the Asia-Pacific and the Middle East & Africa, where energy production can be inconsistent. Key industries, such as data centers, healthcare facilities, and critical infrastructure, require uninterrupted power to maintain operations. Battery Energy Storage Systems (BESS) are critical for ensuring grid stability and a reliable power supply. The industrial sector relies on BESS for load balancing and operational

+357 96 030922
info@marketpublishers.com

continuity. BESS reduces peak electricity costs by storing excess energy during low demand and releasing it during peak usage hours. Advancements in battery technology enhance efficiency and cost-effectiveness, making BESS more attractive. BESS is crucial in smart energy management, promoting energy efficiency and sustainability, and expanding the global BESS market.

Clean Energy Growth Sparks Increased Interest in BESS

According to the Global Energy Alliance for People and Planet, nearly 3.6 billion people lack access to consistent and abundant energy resources. To tackle the energy disparity issue, generating an additional 2,000 terawatt-hours (TWh) of electricity each year is necessary. However, the increased electricity production could potentially contribute to higher carbon emissions and to offset it, the government is widely focusing on clean and renewable energy globally. It is evident from the fact that renewable energy capacity grew by 9.6% in 2022, adding a record 295 GW worldwide. Considering the situation, Battery Energy Storage Systems (BESS) can be a practical and improved solution to address global energy inequality as BESS stores electricity in a chemical format for later use, providing a more sustainable and efficient means of ensuring reliable energy access.

For instance, in July 2023, Hydro-Quebec subsidiary EVLO which specializes in battery energy storage systems, announced its inaugural 3 MW/12 MWh utility-scale storage project in Troy, Vermont USA, boosting local renewable energy integration. The project stores excess energy during high production times for later use during peak demand, mitigating renewable energy intermittent. It is backed by a USD 2 million partnership with the United States Department of Energy. EVLO will deliver an end-to-end solution, with project expected to be commissioned by the end of 2023, followed by 20 years of system maintenance. Such initiatives highlight the role of grid-connected renewable energy projects in the global battery energy storage system market's growth.

The Growth of Decentralized Microgrids Fuels the Battery Energy Storage System Market

The rapid development of decentralized microgrids is a significant catalyst for the Battery Energy Storage System (BESS) market. These decentralized microgrids are instrumental in curbing peak load demand, thereby alleviating the burden on the grid and elevating the overall quality of electricity provision. Simultaneously, it bolsters energy resilience, reducing reliance on centralized grids, and curbing the repercussions of power interruptions. In parallel, BESS benefits industries and critical institutions such

+357 96 030922
info@marketpublishers.com

as data centers and hospitals. It offers smart energy management solutions that empower users to fine-tune energy consumption and trim expenses. This harmonious synergy between decentralized microgrids and BESS is substantially propelling the growth of the energy storage sector.

As a testament to growing decentralization, Trina Storage in August 2023 secured multiple hundred-megawatt-hour BESS projects in the United Kingdom and German markets, introducing its flagship utility-scale battery storage system, Elementa, at Intersolar Europe 2023. This milestone marks the onset of the Elementa Gigawatt Era. Elementa integrates Trina's in-house LFP cells, a multi-level Battery Management System, and advanced fire mitigation systems, offering a state-of-the-art grid asset that enhances revenue generation, safety, and cost-efficiency.

Governments Regulations

Government regulations play a crucial role in overseeing the electricity sector, particularly concerning BESS. These rules ensure BESS's safety, efficiency, and reliability, establishing technical and operational standards. For example, in response to recent regulatory changes concerning energy security and preventing monopoly of critical material for battery manufacturing, numerous OEMs are considering establishing battery manufacturing plants outside China to diversify the global supply chain while adhering to tax and legal requirements.

Furthermore, these regulations introduced incentives and policies that stimulate investment in BESS, fostering the integration of renewable energy sources and grid stability. It addresses environmental concerns, encouraging sustainable energy practices. As an initiative to promote BESS in December 2022, the World Bank Group approved USD 311 million in financing for the Regional Emergency Solar Power Intervention Project (RESPITE). This project aims to enhance grid connectivity and promote clean energy in West African countries using solar and hydroelectric projects with battery energy storage systems. Additionally, acts like “the United States Inflation Reduction Act of August 2022” has catalyzed significant investments in the battery supply chain and clean energy, with a focus on supporting the domestic supply chain from raw materials to electric vehicles and energy storage. These regulations facilitate innovation and investment in the evolving BESS sector.

Power Quality Advancements Drive BESS Market Growth

The Battery Energy Storage System market's growth is linked to advancements in

+357 96 030922
info@marketpublishers.com

power quality. BESS technology enhances and stabilizes power quality in the electrical grid by mitigating voltage fluctuations and frequency variations. It is crucial for heavy industrial operations with high peak load demands. As renewable energy sources are integrated into the grid, BESS acts as a buffer to smooth out fluctuations, bolstering grid stability. Its interplay highlights energy storage's essential role in the evolving energy landscape, driving the BESS market's continued growth.

For instance, in August 2023, Hitachi Ltd. secured an order for grid energy storage systems from Matsuyama Mikan Energy LLC in Japan. The order involved the deployment of Hitachi Energy's grid edge solution, an e-mesh PowerStore, a Battery Energy Storage System (BESS) with a strong global track record. The e-mesh PowerStore BESS plays a vital role in high-quality power management and swiftly responding to power supply and demand fluctuations. As the demand for reliable, uninterrupted power continues to rise, BESS becomes an indispensable component in the global energy market.

Cost and Remote Installation Challenges Battery Energy Storage System Market

The BESS market faces significant challenges related to cost and deploying systems in remote locations. The substantial initial expenses associated with BESS technology can discourage many potential users, limiting its widespread adoption. Furthermore, installing BESS in remote areas, especially those with limited infrastructure and accessibility issues, can present logistical complexities. Developing countries are struggling with various obstacles, including an unreliable power supply, inadequate generation capacity, underdeveloped grid infrastructure, a lack of monitoring and control equipment, and a shortage of skilled personnel. However, the declining cost of renewable energy and government incentives are emerging as potential drivers to initiate projects in this sector, potentially alleviating these difficulties.

Leading such change in August 2022, Eskom, the South African electricity supplier, made contractor selections for 343 MW of battery energy storage projects. These projects are intended for remote areas with limited distribution network access but situated near large-scale renewable energy sources. Following a competitive solicitation process, Eskom chose Hyosung Heavy Industries from South Korea and Pinggao Group from China to handle the battery project design, supply, and installation. These companies were awarded five-year contracts to provide operation and maintenance services.

Impact of COVID-19

+357 96 030922
info@marketpublishers.com

The COVID-19 pandemic had a mixed impact on the BESS market, with supply chain disruptions and construction delays causing some projects to be delayed. However, the pandemic highlighted the importance of grid resilience and uninterrupted power supply, increasing interest in BESS for energy security. The market is expected to rebound and grow as economies recover, driven by a focus on resilient energy infrastructure and sustainable solutions. The integration of battery energy storage in power systems is rising, aligning with the expansion of renewable energy sources. In 2022, around 192 GW of solar and 75 GW of wind capacity were installed worldwide, leading to the deployment of 16 GW/35 GWh of new BESS to support and store this growing renewable energy output.

Impact of Russia-Ukraine War

The Russia-Ukraine conflict has reverberated through the Battery Energy Storage System (BESS) market, triggering multifaceted impacts. With an emphasis on energy security, nations are increasingly turning to BESS to bolster grid reliability amid geopolitical uncertainty. However, the conflict disrupted the supply chain for essential battery materials, as Russia controls a major share of key resources such as nickel, palladium, lithium, platinum, cobalt, neon gas, aluminum, and copper. To circumvent this disruption, companies actively diversify their supply chains, search for alternative material sources, and build resilient, multi-sourced supply routes. Moreover, the crisis has underscored the importance of mitigating geopolitical risks, further highlighting BESS's role as a resilience strategy and its significance in facilitating the integration of renewable energy sources, ultimately reducing dependence on fossil fuels in an unpredictable geopolitical landscape.

Key Players Landscape and Outlook

The BESS market is experiencing rapid growth, driven by innovations and partnerships. Industry leaders prioritize modular BESS systems and engage in research and development. Advancements in lithium-ion batteries, core to BESS, have improved energy density, charging speed, and cost-effectiveness. Alternatives like solid-state and sodium-ion batteries aim for higher energy density and lower costs. Companies like LG Energy Solution, CATL, SK, Solid Power, Prologium, and Quantumscape are pushing these technologies. These advancements fuel the BESS market's expansion, supporting grid stability, renewables integration, and electric vehicles.

For instance, in May 2023, TAE Power Solutions inaugurated a facility in the United

+357 96 030922
info@marketpublishers.com

Kingdom for developing battery packs used in electric mobility and energy storage, aiming to validate and industrialize modular battery solutions.

In June 2023, Honeywell unveiled Honeywell Ionic, a compact battery energy storage system with improved energy density and lower installation costs, featuring their Experion Energy Control System and adaptable Battery Management System.

Companies are introducing tailored product ranges to meet user needs, whether for residential, commercial, or utility-scale industrial BESS. Consumers warmly embrace these innovations, accelerating growth in the global BESS market.

+357 96 030922
info@marketpublishers.com

Contents

+357 96 030922
info@marketpublishers.com

8. GLOBAL BATTERY ENERGY STORAGE SYSTEMS MARKET OUTLOOK, BY REGION, 2022-2030F

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

9. MARKET MAPPING, 2022

10. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE

11. MARKET DYNAMICS

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

I would like to order

Product name: Battery Energy Storage System Market Assessment, By Battery Type [Lithium-ion Batteries, Lead-acid Batteries, Flow Batteries, Others], By Connection Type [On-Grid, Off-Grid], By Application [Utility, Commercial, Industrial, Residential], By Capacity [Below 100 MWh, 100 – 500 MWh, Above 500 MWh], By Region, Opportunities and Forecast, 2022-2030F

Product link: https://marketpublishers.com/r/B133208BC8CBEN.html

Price: US$ 4,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:
info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page https://marketpublishers.com/r/B133208BC8CBEN.html