Energy Storage System Market By Technology (Pumped Hydro Storage, Battery Energy Storage, Compressed Air Energy Storage, Flywheel Energy Storage), By Application (Stationary, Transport), By End-Use (Residential, Non Residential, Utilities): Global Opportunity Analysis and Industry Forecast, 2023-2032

Market Report | 2024-03-01 | 250 pages | Allied Market Research

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Report description:

The global energy storage system market was valued at $198.8 billion in 2022, and is projected to reach $329.1 billion by 2032, growing at a CAGR of 5.2% from 2023 to 2032.

Introduction

Energy Storage Systems (ESS) are pivotal in maintaining the delicate balance between electricity supply and demand within the power grid. By storing excess electricity during periods of high production and low demand, ESS effectively smooths out fluctuations in supply and demand dynamics. This stored energy can then be released back into the grid during times of heightened demand or reduced production, helping to prevent brownouts and ensuring grid stability. Various storage technologies offer unique advantages from pumped hydroelectric and compressed air systems, which utilize gravitational potential and pressurized air respectively, to innovative solutions like flywheels and batteries. These technologies provide flexibility and reliability to the grid, enhancing its efficiency and allowing for greater integration of renewable resources.

Among the diverse array of energy storage methods, each has its own set of benefits and applications. Batteries, ranging from lithium-ion to lead acid variants, offer scalability and versatility, making them suitable for both residential and grid-scale deployments. Thermal energy storage systems leverage heat and cooling to provide on-demand energy, particularly useful for managing temperature fluctuations in buildings and industrial processes. As technology advances, emerging solutions like flow batteries, supercapacitors, and superconducting magnetic energy storage promise even greater efficiency and performance, paving the way for a more resilient and sustainable energy future.

Market Dynamics

Decentralization and the rise of microgrids are reshaping the energy landscape, offering opportunities for energy storage systems

to play a significant role in localized energy management. Energy storage enables microgrids to balance supply and demand, optimize renewable energy utilization, and provide backup power during grid outages. Decentralization also allows for greater autonomy and control over energy resources, empowering communities, and businesses to manage their energy needs more effectively and sustainably.

The technological maturity of energy storage systems also serves as a restraint on market expansion. While considerable progress has been made in developing various storage technologies, such as lithium-ion batteries, flow batteries, and pumped hydro storage, many emerging technologies are still in the initial stages of development and lack proven commercial viability at scale. The relative immaturity of some technologies introduces uncertainty regarding performance, durability, and cost-effectiveness, deterring widespread adoption and investment. In addition, the pace of technological advancement outpaces regulatory frameworks and industry standards, further complicating deployment, and integration efforts. As a result, potential customers hesitate to commit resources to energy storage projects until technologies mature and demonstrate reliability and cost competitiveness in real-world applications.

Rural electrification initiatives aim to extend access to reliable and affordable electricity to underserved communities, particularly in remote and off-grid areas. Energy storage systems offer a viable solution for overcoming the challenges associated with rural electrification by providing decentralized power generation and storage capabilities. By deploying microgrids powered by renewable energy sources such as solar and wind, coupled with energy storage, rural communities can gain access to clean and sustainable electricity. Energy storage systems enable energy independence, resilience against power outages, and the integration of productive end-uses such as agricultural processing and small-scale enterprises. As governments and organizations continue to invest in rural electrification projects, the demand for energy storage solutions in these areas is expected to grow, driving market expansion, and contributing to socio-economic development and poverty alleviation efforts.

Segments Overview

The energy storage system market is segmented into technology, end-use, application, and region. On the basis of technology, the market is divided into pumped hydro storage, battery energy storage, compressed air energy storage, flywheel energy storage, and others. As per end-user, the market is segregated into residential, commercial, and industrial. On the basis of application, the market is bifurcated into stationary and transportation. Region wise, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

The major players operating in the energy storage system market include Scheider Electric, SMA Solar Technology AG, Exide Industries Ltd., SK Holdings, Autobat, Enerbrax Acumuladores Ltda, Eguana Technologies, Imergy Power Systems, Ionotec Ltd, and Tata Power.

Recent Developments in Energy Storage System Industry

-In December 2022, the Australian Renewable Energy Agency (ARENA) announced funding support for a total of 2 GW/4.2 GWh of grid-scale storage capacity, equipped with grid-forming inverters to provide essential system services that are currently supplied by thermal power plants.

-In September 2022, India released its draft National Electricity Plan, setting out ambitious targets for the development of battery energy storage, with an estimated capacity of between 51 to 84 GW installed by 2031-32.

-The U.S. Inflation Reduction Act, passed in August 2022, includes an investment tax credit for stand-alone storage, which is expected to boost the competitiveness of new grid-scale storage projects.

-In July 2021, China announced plans to install over 30GW of energy storage by 2025 (excluding pumped-storage hydropower), a more than three-fold increase on its installed capacity as of 2022.

Key Market Trends

-By technology, flywheel energy storage technology is the fastest-growing segment with a CAGR of 6.3% during the forecast period.

-By end-use, utilities segment dominates the market accounting for more than four-fifths of the energy storage system market, during the forecast period.

-By application, the transportation segment is the fastest growing with a CAGR of 5.7% during the forecast period.

-By region, Asia-Pacific is the fastest-growing market.

Key Benefits For Stakeholders

-This report provides a quantitative analysis of the market segments, current trends, estimations, and dynamics of the energy storage system market analysis from 2022 to 2032 to identify the prevailing energy storage system market opportunities.
-The market research is offered along with information related to key drivers, restraints, and opportunities.
-Porter's five forces analysis highlights the potency of buyers and suppliers to enable stakeholders make profit-oriented business decisions and strengthen their supplier-buyer network.
-In-depth analysis of the energy storage system market segmentation assists to determine the prevailing market opportunities.
-Major countries in each region are mapped according to their revenue contribution to the global market.
-Market player positioning facilitates benchmarking and provides a clear understanding of the present position of the market players.
-The report includes the analysis of the regional as well as global energy storage system market trends, key players, market segments, application areas, and market growth strategies.

Additional benefits you will get with this purchase are:
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- Historic market data
- Import Export Analysis/Data
Key Market Segments
By Technology
- Pumped Hydro Storage
- Battery Energy Storage
- Compressed Air Energy Storage
- Flywheel Energy Storage
By Application
- Stationary
- Transport

By End-Use
- Residential
- Non Residential
- Utilities
By Region
- North America
? U.S.
? Canada
? Mexico
- Europe
? Germany
? UK
? Spain
? Italy
? France
? Rest of Europe
- Asia-Pacific
? China
? Japan
? India
? South Korea
? Australia
? Rest of Asia-Pacific
- LAMEA
? Brazil
? Saudi Arabia
? South Africa
? Rest of LAMEA
- Key Market Players
? Schneider Electric
? SMA Solar Technology AG
? EXIDE INDUSTRIES LTD.
? SK Holdings
? Autobat SACI
? Enerbrax
? Eguana Technologies
? Imergy Power Systems
? Ionotec Ltd
? Tata Power Company Ltd

Table of Contents:

Energy Storage System Market By Technology (Pumped Hydro Storage, Battery Energy Storage, Compressed Air Energy Storage, Flywheel Energy Storage), By Application (Stationary, Transport), By End-Use (Residential, Non Residential, Utilities): Global Opportunity Analysis and Industry Forecast, 2023-2032

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