India Advanced Energy Storage Systems Market Assessment, By Technology [Electrochemical Storage, Mechanical Storage, Thermal Storage], By Application [Transportation, Utility] By Region, Opportunities and Forecast, FY2018-FY2032F

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Report description:

India advanced energy storage systems market is projected to witness a CAGR of 8.80% during the forecast period FY2025-FY2032F, growing from USD 1.66 billion in FY2024 to USD 3.36 billion in FY2032. The market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years.

Factors contributing to market growth include the rising need for grid stability solutions in urban areas and the growing adoption of electric vehicles, both of which are driving the robust expansion of advanced energy storage systems in the Indian market. Furthermore, increasing investments in the power infrastructure sector and the country's goals for decarbonization and net-zero emissions are boosting the demand for advanced energy storage systems. Additionally, India is looking to integrate renewable energy sources into the power grid to achieve its energy mix targets. However, integrating renewable sources may pose significant challenges for maintaining a stable power supply.

Advanced energy storage systems can address the challenges of voltage fluctuations and peak power demand by storing excess renewable energy generated, which drives their demand in the market. Upcoming technological advancements in energy storage solutions are enhancing efficiency, further fostering demand. In addition, supportive government policies and incentives are promoting local manufacturing and making energy storage solutions more accessible, driving market share for advanced energy storage systems in the country.

For instance, in September 2024, currently, India has reached around 90 GW of installed solar capacity and is moving steadily forward toward the broader goal of 500 GW of renewable energy capacity by 2030. India requires an investment of USD 349.18 billion to achieve its target. The rise in investment in solar power generation in the country will drive the demand for advanced energy storage systems in the market.

Rising Demand for Grid Stability Solutions Accelerating the Market Growth

India is prioritizing and implementing strategies for adopting renewable energy sources into the electrical grid. The country aims

to integrate more renewable energy sources into the grid, which requires flexible and stable solutions to maintain grid stability. Advanced energy storage systems are one key solution for achieving grid stability by balancing electricity supply and demand. These systems can store excess energy generated during periods of low demand or high renewable energy output and release it during peak demand. This capability helps prevent blackouts and ensures a stable and reliable power supply.

Advanced energy storage systems provide voltage support, contributing to grid resilience and facilitating the integration of renewable energy sources into the grid. Additionally, developing hybrid energy systems that combine multiple renewable sources with advanced storage technologies is becoming increasingly common, boosting the demand for energy storage solutions. These systems stabilize voltage levels and ensure that the electrical system operates within safe parameters, driving their demand in the market.

Furthermore, supportive government policies and incentives are enhancing local manufacturing and making energy storage solutions more accessible, driving market growth for advanced energy storage systems in the country.

For instance, in April 2024, Indian states such as Gujarat and Karnataka are well-prepared to continue the electricity transition and have successfully integrated renewable energy sources into their power sectors. This development highlights the increasing demand for advanced energy storage systems necessary for enhancing the infrastructure required for renewable energy integration in the coming years.

Inclination Towards Urbanization and Smart Cities Propelling the Market Growth

With the rise in urbanization in the country, a corresponding rise in energy demand is expected in the coming years. The country is looking to modernize grids that could handle the variability associated with renewable energy sources, leading to the growing need for advanced energy storage systems.

The development of smart cities involves integrating innovative technology into power infrastructure to enhance efficiency and sustainability. Advanced energy storage systems are essential for the adoption of technology such as smart grids. The integration of advanced energy storage systems is crucial for achieving the objectives of smart city initiatives, hence driving the demand for the systems in the market.

For instance, in June 2024, according to India Energy Storage Week (IESW), India is gearing up for a major investment influx in the energy storage and advanced battery sector with over USD 268 million expected to be channeled into various smart projects which drive the growth of advance storage system systems market in coming years. One of the major investments is done by VFlowTech India Pvt Ltd which is planning to set up the largest long-duration energy storage manufacturing facility in Palwal, Haryana.

Upcoming Government Policies and Incentives Creating Market Opportunities

The Indian government and higher authorities are coming up with innovative policies for the adoption of storage technologies for the renewable energy market in the country. Supportive policies, such as the Production-Linked Incentive (PLI) scheme, are designed to boost domestic manufacturing of advanced batteries and energy storage technologies. The government initiatives provide financial incentives that encourage investment in advanced energy storage systems, leading to the growth of local manufacturing in the Indian market. In addition, the schemes include facilitating access to loans, lowering initial costs of battery technology, and providing economic incentives that create a market opportunity for advanced energy storage systems solutions.

As part of the Indian government's commitment to increase renewable electricity generation, the government has framed a variety of policies and frameworks for promoting the adoption of energy storage technologies in the country. For example, the introduction of VGF (viability gap fund) and support from the regulating body for the installation of BESS (battery energy storage systems) in urban areas facilitates the investment opportunities that help in the adoption of systems and provide an opportunity for the market to grow in the coming years. The initiatives are directly aligned with sustainability goals which create a conducive environment for expanding advanced energy storage solutions across the country.

For instance, in December 2024, as per the Global MSME Business Summit organized by the Confederation of Indian Industry (CII), the higher authority announced that the government is planning to introduce an initial requirement of 10% of a renewable energy plant's capacity for an energy storage unit which may be increased over time. India is following in the footsteps of other developing countries. It mandates the inclusion of battery storage capacity for future wind and solar energy projects, which drives the demand for advanced energy storage systems in the market.

Electrochemical Storage to Dominate the India Market

The electrochemical storage segment is experiencing a high adoption rate in the country, which makes it dominant in the Indian market. The demand for electrochemical storage technology is increasing at a higher rate due to the rise in demand for renewable energy in urban areas, which is driving the demand for scalable energy solutions. The system provides the support to manage peak loads and provide backup power during outages, which drives the demand for electrochemical storage technologies in the utility sector.

Furthermore, continuous advancements in battery technology are improving the efficiency of the segment, which is enhancing the market share of electrochemical storage. The advancements have made battery storage more accessible and attractive for various applications, further driving its demand in the market.

West and Central Regions Dominate the India Market

The west and central regions are expected to dominate India's advanced energy storage systems market, and this trend is anticipated to continue during the forecast period. The demand for these systems is rising due to various factors, such as industrialization, power infrastructure development, and government initiatives aimed at increasing the share of renewable energy in the energy mix. These regions exhibit high consumption of renewable energy, which drives the need for reliable energy solutions and makes advanced energy storage systems essential for ensuring an uninterrupted power supply.

Furthermore, the growing emphasis on electric vehicles (EVs) in urban areas increases the demand for charging infrastructure supported by energy storage systems. Moreover, local governments have implemented various policies to promote renewable energy and energy storage technologies, further propelling the market demand for advanced energy storage systems.

Future Market Scenario (FY2025 – FY2032F)

- The push towards smart grid technologies is one significant trend driving the demand for the advanced energy storage systems market.
- Government policies aimed at promoting renewable power infrastructure development and electrification are set to boost the demand for advanced energy storage systems in the country.
- Integration of renewable energy sources in large-scale industrial applications creates the opportunity for advanced energy storage systems market growth in coming years.
- Advanced energy storage systems align with government goals regarding energy efficiency and sustainability energy policies which drive its market in the forecast period.

Key Players Landscape and Outlook

Continuous innovation characterizes the landscape of advanced energy storage systems, as the companies compete in terms of energy efficiency, product life, and unique features. The market outlook remains positive, owing to increased demand for the integration of renewable energy and rising investment in EV charging stations. Advanced energy storage systems players are looking to improve the supply chain in the market which will help to define the industry's future. Product launches, agreements, business expansions, collaborations, and developing technologies are projected to increase competition in the fast-paced market. For instance, in March 2024, Good Enough Energy Private Limited is currently planning to build the largest Battery Energy Storage Systems (BESS) Gigafactory in India. The main goal of the factory is to ensure the stability of the power grid. Initially, the factory will have a capacity of 7GWh, which will increase to 20GWh by 2027. This development will help the company increase its revenue and production capacity for energy storage solutions.

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