Sodium-Ion Battery Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 120 pages | Mordor Intelligence

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Report description:

The sodium-ion battery market is expected to register a CAGR of around 14.68% during the forecast period, from USD 244 million in 2020 to USD 609 million in 2027. The outbreak of the COVID-19 pandemic in Q1 of 2020 negatively impacted the market for sodium-ion batteries. Lockdown restrictions imposed by governments worldwide have lowered the demand from end-user industries like energy storage, adversely affecting the growth. On the other hand, restrictions on non-essential trading, manufacturing factory shutdowns, and supply chain disruptions negatively impacted the sodium-ion battery market. The primary driver of the market is the increasing demand for cleaner energy, with rising greenhouse gas emissions around the world. Additionally, the use of sodium-ion batteries for electricity storage, generated through solar or wind, is likely to drive the market. However, the non-matured technology of the storm is expected to hinder the market growth during the forecast period.

Key Highlights
Stationary energy storage is expected to dominate the market during the forecast period, and it is expected to be a significant application of sodium-ion batteries. The amount of energy generated by renewable sources, such as solar and wind, is increasing, and energy stores are essential to ensure the continuity of energy supply.
Wind and solar PV power are expected to drive strong growth in renewable energy, while hydro is likely to remain a key source. By 2030, solar and wind are expected to produce more than 50% of the total generation in Australia, Germany, Mexico, and the United Kingdom. By 2050, solar PV, wind, and hydro are estimated to produce approximately 80% of the global electricity generation. As sodium-ion batteries are an alternative with additional benefits, storing the energy of solar and wind, they are expected to have an opportunity in the growing solar and wind energy market.
Europe is expected to dominate the market, with the majority of companies commercializing the battery technology being located in the region. Moreover, with the rising renewable energy generation, such as wind and solar, the region is expected to dominate the market during the forecast period.

Sodium-ion Battery Market Trends

Stationary Energy Storage is a Significant Segment for the Market

Batteries play a crucial part in energy storage systems and are responsible for a significant portion of the system's total cost, especially in residential energy storage systems. Properties of sodium-ion batteries, such as high energy density, low charging time, a higher number of charging cycles, etc., make it preferable for this application.?
Sodium-ion batteries are also a viable means of energy storage in large-scale energy storage applications. This is mainly due to the low cost of sodium compared to lithium, similar chemistry and intercalation kinetics to that of lithium, and the irreversible capacity of carbon anodes in sodium-ion batteries being less than that in lithium-ion batteries.?
The sodium-ion batteries are expected to have considerable potential in energy storage system applications during the forecast period. The amount of energy generated by renewable sources such as solar and wind is witnessing massive growth, and energy storage is essential to ensure the continuity of energy supply.?
According to the International Renewable Energy Agency (IRENA), the world's total installed solar PV capacity reached around 843 GW in 2021, witnessing a 19% growth compared to the previous year. Likewise, the global wind installed capacity was more than 769 GW in 2021, recording more than 10% growth compared to 2020.?
Furthermore, the renewable energy growth is likely to continue with the increasing support from the government and their ambitious renewable power targets. Moreover, according to the International Energy Agency (IEA), by 2050, solar PV, wind, and hydro are estimated to produce approximately 80% of the global electricity generation. ?
As sodium-ion batteries are an essential energy storage technology with additional benefits, storing solar and wind energy is expected to provide a vital opportunity in the growing solar and wind energy market.?
On the other side, the cycling efficiency of sodium-ion batteries is not well-known, mainly since the rate capability obtained from hard carbon anodes is poor. ?
However, in early 2020, scientists from Skoltech and the Moscow State University identified the electrochemical reaction associated with charge storage in the anode material for sodium-ion batteries (SIB), a promising class of electrochemical power sources. The findings and the anode manufacturing method developed by the team help bring closer the sodium-ion battery commercialization for stationary energy storage in Russia and beyond.?
Furthermore, in December 2021, UK-based battery tech company Faradion Limited announced that it signed definitive agreements to be acquired by Reliance New Energy Solar Ltd for an enterprise value of USD 135.2 million. The company has an intellectual property portfolio covering several sodium-ion (Na-ion) cell technology aspects. It offers similar performance to conventional chemistries while replacing expensive materials such as cobalt and lithium with far more abundant sodium.?
Hence, the surging growth in renewable energy generation and the rising number of ongoing research development activities and investments in sodium-ion batteries for stationary energy storage are expected to drive the market during the forecast period.?

Europe is Expected to Dominate the Market

In 2021, Europe is the largest region in the sodium-ion battery market owing to the ongoing research and increasing deployment of battery energy storage systems and electric vehicles. ?
In January 2020, the new EU-funded project NAIMA, "Na Ion materials as essential components to manufacture robust battery cells for non-automotive applications," had kickstarted in France. The European Commission had awarded this project a Horizon2020 program grant of almost EUR 8 million.? The duration of the program is 36 months, which started in December 2019 and is expected to end in December 2022. ?

The NAIMA project is expected to demonstrate that two new generations of highly-competitive and safe sodium-ion cells developed and tested during the project are some of the most robust and cost-effective alternatives to current and future Li-based technologies for storage applications.
NAIMA brings together a consortium, including 15 partners from eight European countries (including France, Germany, Sweden, Bulgaria, Spain, the Netherlands, Slovenia, and Belgium): Five being R&D organizations (including CNRS, CEA, NIC, IHE, and VITO), six SMEs (including TIAMAT, BIOKOL, IEIT, GOLDLINE, ACC, and ZABALA IC), and four large companies (including EDF, GESTAMP, SOLVAY, and UMICORE). These partners' profiles cover the entire battery value chain and the diverse fundamental R&D fields required in the project. ?
The project is led by the French company TIAMAT, which is specialized in the design, development, and manufacture of sodium-ion battery cells and targets fast charging, and high discharge current applications in mobility, and stationary storage sectors.?
Within the project framework, six sodium-ion battery prototypes are expected to be tested in three multi-scale business scenarios to provide solid evidence about the competitiveness of the technology in three natural environments (renewable generation, industry, and private household).?
The United Kingdom-based company Faradion Ltd is one of the leading sodium-ion battery manufacturers worldwide. The company is one of the beneficiaries of the United Kingdom government's GBP 246 million Faraday battery challenge and is gearing up to supply sodium-ion batteries with an annual capacity of more than 1 GWh by 2024-25, worth more than approximately USD 100 million per year.?
Hence, the ongoing research work, increasing investments, and increasing demand for electric vehicles are expected to create ample opportunities for the players involved in the European region in the near future.?

Sodium-ion Battery Market Competitor Analysis

The sodium-ion battery market is moderately consolidated. The key players in the market include Faradion Limited, Contemporary Amperex Technology Co. Limited, NGK Insulators Ltd, TIAMAT SAS, HiNa Battery Technology Co. Ltd, Altris AB, and Natron Energy Inc., among others.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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