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Sodium-Ion Battery Market Assessment, By Type [Sodium-Oxide Battery, Sodium-Sulfur Battery, Sodium-Salt Battery], By Application [Stationary Energy Storage, Transportation], By Region, Opportunities, and Forecast, 2018-2032F

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Abstracts

The global sodium-ion battery market size was valued at USD 446.06 million in 2024. The market will grow to USD 1579.23 million in 2032 with a CAGR of 17.12% during the period between 2025 and 2032. Sodium-ion batteries are rechargeable batteries which requires sodium-ion movement between electrodes during the charging and discharging of the battery and the cathode for these batteries is manufactured using sodium. These batteries are an effective form of energy storage, particularly for large-scale electric storage applications.

The market is expected to grow significantly over the coming years because of a number of driving factors such as an increased requirement for constant power supply, rise in demand for consumer electronics, increased production of renewable energy and sodium-ion battery research & development efforts. Due to increasing awareness about climate change and rising need for reduction of carbon emissions; governments of several countries are promoting the usage of electric vehicles and creating the necessary charging infrastructure. Additionally, the demand is rising because sodium is readily available and more ecologically friendly to source. Also, increased focus on renewable energy sources has led to an increased demand for sodium-ion batteries.,

Sustainability and Environmental Concerns Driving Global Sodium-ion Battery Market

Sustainability and environmental concerns are among the most important driving forces for the global sodium-ion battery market. Sodium-ion batteries are considered an

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ecofriendly variant of lithium-ion batteries as sodium is a more abundant resource and creates less environmental impact. These batteries thus reduce dependency upon scarce materials such as lithium and cobalt, encourage responsible sourcing, and lower adverse impacts on the environment1. As global awareness of climate change grows, the demand for sustainable energy storage solutions is increasing, making sodium-ion batteries a preferred choice for consumers and businesses aiming to adopt cleaner technologies.

For instance, In January 2024, BYD began constructing its first sodium-ion battery plant in Xuzhou, with a planned annual output of 30 GWh and an investment of 10 billion yuan (USD 1.4 billion). This gigafactory, developed in collaboration with Huaihai Group, aims to produce sodium-ion batteries for micro vehicles and scooters. This initiative highlights BYD's commitment to sustainability and environmental concerns by offering eco-friendly energy storage solutions. The project underscores the shift towards sustainable technologies in response to growing environmental awareness and the need for responsible resource use in the battery industry.

Advantages Over Lithium-Ion Battery

Sodium-ion batteries are fast emerging as a commercially viable alternative to lithium-ion batteries as sodium is available in abundance and much cheaper compared to Lithium. In comparison to lithium-ion batteries, sodium-ion batteries have the potential to offer higher capacity than normal lithium-ion cells. Sodium holds similar chemistry and intercalation kinetics to lithium. Furthermore, the irreversible carbon anode capacity of sodium-ion batteries is lower than that of lithium-ion batteries. Despite being heavier and bulkier than lithium-ion batteries, sodium-ion batteries can be used in stationary energy storage systems where volume and weight are less crucial.

Europe Dominates the Sodium-Ion Battery Market

With the growing interest in electric vehicles by the European population, the Sodium-Ion battery market has been experiencing rapid growth. In terms of regional share in Sodium-Ion battery market, Europe holds the highest market share followed by Asia Pacific and then North America. However, the Latin American and Middle East & Africa region are way behind in terms of regional share. With the aim of zero carbon emission, the European Union (EU) has banned the sale of diesel and petrol vehicles from 2035. Therefore, increasing demand for battery operated electric vehicles will be witnessed in the next 10-12 years.

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Increasing Usage of Sodium-Ion Batteries in Electric Vehicles

Lithium-ion batteries have continued to be the favoured option for manufacturers when it comes to powering electric vehicles due to their various attributes such as relatively lower weight and volume, low maintenance requirements, low self-discharge rate and higher energy density. However, the volatile nature, temperature sensitivity, and eco-unfriendliness of lithium-ion batteries, among other drawbacks, can eventually limit the widespread use of these batteries. On the other hand, the benefits of sodium-ion batteries such as stability in temperature changes and longevity makes them suitable for the light-duty EVs.

Impact of COVID-19

The COVID-19 outbreak caused supply chain disruptions, production halts and manufacturing activity interruptions, all of which had a detrimental effect on the sodium-ion batteries market in 2020. In addition, several end-use industries, such as the automotive, industrial, and others, closed their operations, which decreased the need for batteries in 2020. During the pandemic, the revenues of major sodium-ion battery manufacturers declined. In addition, the global renewable energy sector was significantly impacted, which led to a decline in the growth of renewable technologies.

Due to a drop-in economic activity, the pandemic posed adverse impact on the solar energy industry too. The market for sodium-ion batteries, which is used in the solar energy industry as stationary storage systems, was also impacted by this decline. Post-COVID-19 ease in lockdown restrictions and removal of social distancing norms contributed to the smart recovery of the market.

Impact of Russia-Ukraine War

The global sodium-ion battery market has been severely impacted by the Russia-Ukraine war. In direct relation to the EV and automotive industries, Russia and Ukraine manufacture semiconductor and battery materials on a large scale. The war between the two nations had a direct influence on slowdown as well as in some cases stoppage of production facility and supply chain disruption due to damaged Russia's shipments impacting the global sodium-ion battery market particularly Europe.

Key Players Landscape and Outlook

In order to stay ahead of the competition, key players are making significant

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investments in R&D projects to introduce technologically advanced products and increase production capabilities. The industry is growing through both organic and inorganic business strategies including alliances, mergers & acquisitions, joint ventures, etc. The global sodium-ion battery market is led by companies such as Reliance New Energy Solar Limited (Faradion Limited), Tiamat Energy and HiNa Battery Technology Co., Ltd.

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