

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

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Report description:

The flow battery market is expected to reach USD 736.78 million by the end of this year and is projected to register a CAGR of over 22% during the forecast period. The market was negatively impacted by COVID-19 in 2020. Presently the market has reached pre-pandemic levels.

Key Highlights

Over the long term, the applications of the flow battery market are likely to grow during the study period due to the growing penetration of the technology in long-duration energy storage applications, such as renewable power systems and long service life.

On the other hand, the market may see stunted growth in the near future due to the low energy density of battery cells. Nevertheless, the new technological innovations to diversify the scope of flow batteries in new commercial areas create tremendous opportunities for market growth.

The Asia-Pacific region is expected to grow at the fastest rate during the forecast period due to many upcoming renewable plus storage projects in the region.

Flow Battery Market Trends

Vanadium Redox Flow Batteries are Expected to Witness Significant Growth

The Vanadium Redox Flow Battery (VRFB) is a Redox Flow Battery (RFB) that stores energy by employing vanadium redox couples (V^{2+}/V^{3+} in the negative and V^{4+}/V^{5+} in the positive half-cells). The power and energy ratings of these batteries are independent of each other, and each may be optimized separately for a particular type of application.

Many countries have consistently focused on increasing energy demand without any intermittency; thus, numerous energy

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storage systems have been installed in standalone and renewable energy systems.

Over the last decade, the installed renewable energy capacity and generation have been rising steadily across the globe. During 2021, global installed renewable energy capacity stood at 3063.93 GW, increasing by nearly 9.1%. As renewable resources such as solar and wind generate power intermittently and at various levels, storing this energy during high demand is vital.

Due to this, modern energy-storing systems (ESS) are becoming indispensable in renewable energy projects. The rapid growth in the renewable energy sector is expected to be one of the strongest drivers for the growth of the global ESS market.

With the development of newer and more affordable battery technologies, the number of residential, commercial, and industrial solar rooftop PV systems coupled with ESS has increased significantly.

In July 2021, Canada-based Largo Resources signed an agreement with Enel Green Power Spain, the Spanish branch of Enel Green Power, to supply VCHARGE [®] vanadium redox flow battery system for the upcoming renewable power project of the company.

Largo Clean Energy is expected to provide a five-hour, 6.1 MWh battery system for a project in Spain, which is expected to get commissioned in the third quarter of 2022.

In September 2021, U.S. Vanadium commenced the capacity expansion project for the production of Ultra-High-Purity Vanadium Redox Flow Battery Electrolyte at its electrolyte manufacturing facility in Arkansas, United States. The project included an investment of USD 2.1 million. The initiative is expected to influence the vanadium redox battery sales of the entire region.

Such developments are expected to propel the market during the forecast period.

Asia-Pacific is Expected to Dominate the Market

Asia-Pacific is a major region for the manufacturing of batteries. The highest volumes of batteries worldwide are manufactured in this region. Countries like China and Japan have been instrumental in the development of batteries in the region. Another prominent driver for the region's battery market is the growing investments in energy storage projects, which are currently at the fastest pace in the region. Thus, many renewable and energy storage projects are expected to be announced in the coming years.

Flow batteries have the advantages of easy transportability, modularity, and high efficiency. The batteries can be deployed on a large scale and can easily span the kW to MW range. As a result, stakeholders in Asia-Pacific are focused on developing power systems or grid energy storage systems in combination with renewable energy generation.

Further, China made mandated energy storage systems for its solar and wind projects in its latest five-year plan (2021-25). This may also support the market to grow in the region during the study period.

In August 2022, Rogkepower announced the commissioning of a power project using a redox flow battery storage system in the city of Dalian. The battery system offers a capacity of 400 megawatt-hours to contain power produced by wind turbines and other sources. The investment in the project is estimated to be around CNY 1.9 billion (USD 281 million). As of August 2021, Rongkehas delivered a total of about 560 MWh worth of redox flow batteries. An additional 400 MWh worth of storage will be added to the Dalian project.

In September 2021, VRB Energy, the vanadium redox battery manufacturer, started the construction of a battery energy storage system with 100MW/500MWh capacity in Xiangyang, in China's Hubei province. It is installed for the Automobile Industrial Park of the Xiangyang high-tech development zone. The project is expected to be completed by late 2022.

Hence, with upcoming manufacturing facilities and renewable and energy storage projects, the region is expected to dominate the market during the forecast period.

Flow Battery Market Competitor Analysis

The flow battery market is moderately fragmented. Some of the major players in the market (in no particular order) VRB Energy, RedFlow Ltd, Invinity Energy Systems PLC, Primus Power Corporation, and ESS Tech Inc., among others.

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