

Solid-State Lithium Battery Market By Manufacturing Type (Thin-Film Battery, Bulk Battery, Others), By Application (Consumer Electronics, Electric Vehicles (EVs), Energy Storage Systems, Medical Devices, Others) : Global Opportunity Analysis and Industry Forecast, 2024-2030

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Abstracts

The solid-state lithium battery market was valued at \$0.4 billion in 2023, and is projected to reach \$1.3 billion by 2030, growing at a CAGR of 18.2% from 2024 to 2030.

A solid-state lithium battery is an advanced form of lithium-ion battery technology that uses a solid electrolyte instead of the conventional liquid or gel electrolyte found in standard lithium-ion batteries. This shift to solid materials enhances energy density, safety, and battery longevity, making it a promising solution for applications ranging from electric vehicles (EVs) to portable electronics and renewable energy storage. Leading automakers and tech companies are exploring this technology as a next-generation energy storage solution, aiming to overcome the limitations of current lithium-ion batteries and accelerate the transition to a more sustainable energy future.

The growth of the global solid-state lithium battery market is majorly driven by increase in penetration of EVs. Solid-state lithium batteries, with their higher energy density, faster charging, and improved safety compared to conventional lithium-ion batteries, are seen as a solution to enhance the range and efficiency of EVs. According to the International Energy Agency, a Paris-based autonomous intergovernmental organization, over 3 million electric vehicles were sold in the first quarter of 2024, around 25% higher as compared to 2023. This number is estimated to reach 17 million by the end of 2024, exhibiting a 20% year-on-year increase. Moreover, surge in demand

for portable consumer electronics is significantly contributing toward the growth of the global market. This is attributed to the fact that solid-state batteries are increasingly being integrated in smart devices to mitigate the risk of combustion and leakage, thus offering superior safety by replacing liquid electrolyte. Moreover, solid-state batteries prevent the formation of dendrite, which are needle-like structures that lead to short-circuit in batteries. Furthermore, increase in sustainability and environmental concerns boosts the growth of the market. This is attributed to the fact that these batteries offer high energy efficiency and significantly lower environmental impact. In addition, some solid electrolytes are made from nontoxic and abundantly available materials, which make them sustainable and cost-efficient. A 2022 lifecycle analysis conducted by Massachusetts Institute of Technology found that solid-state lithium batteries could reduce carbon emissions by 39% compared to traditional lithium-ion batteries over their entire lifecycle, from production to disposal. However, high manufacturing cost associated with solid-state lithium batteries due to the complexity of materials, such as solid electrolytes and lithium metal anodes, and the need for specialized manufacturing processes significantly hampers the growth of the market. Lack of an established supply chain and infrastructure for solid-state battery production, testing, and deployment further restraints the market growth. Moreover, the market growth is significantly hampered by improper disposal practices of batteries that can lead to several environmental and health issues due to toxicity of chemical additives. On the contrary, implementation of supportive government initiatives for proper battery disposal is expected to offer remunerative opportunities for the expansion of the global market during the forecast period. For instance, the Government of India has implemented the Hazardous Waste Management Rules, 2016, issued under the Environmental Protection Act (EPA) of 1986, which ensure strict adherence to the disposal and recycling of lead-acid batteries in India. Furthermore, continuous advancements in materials and manufacturing processes, such as breakthroughs in solid electrolyte development and cost-effective production techniques, are expected to provide lucrative opportunities for the growth of the market.

The global solid-state lithium battery market overview is segmented by manufacturing type, application, and region. By manufacturing type, the market is classified into thin-film battery, bulk battery, and others. On the basis of application, it is divided into consumer electronics, electric vehicles, energy storage systems, medical devices, and others. Region wise, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

Key Findings

By manufacturing type, the thin-film segment held the highest market share in 2023 and is expected to maintain its leadership status from 2024 to 2030.

On the basis of application, the EVs segment was the major shareholder in 2023 and is anticipated to dominate during the forecast period.

Region wise, Asia-Pacific was the fastest growing region in terms of revenue in 2023.

Competition Analysis

Competitive analysis and profiles of the major players in the global solid-state lithium battery market include Solid Power Inc., SAMSUNG SDI CO., LTD, Blue Solutions., Ilika, Toyota, SES AI Corporation, Hitachi Zosen Corporation, Johnson Energy Storage, Inc., QuantumScape Battery, Inc., and Excellatron. These major players have adopted various key development strategies such as business expansion, new product launches, and partnerships to sustain the intense competition and gain a strong foothold in the global market.

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Manufacturing Capacity

Product Life Cycles

Go To Market Strategy

New Product Development/ Product Matrix of Key Players

Regulatory Guidelines

Additional company profiles with specific to client's interest

Historic market data

Key player details (including location, contact details, supplier/vendor network etc. in excel format)

SWOT Analysis

Key Market Segments

By Manufacturing Type

Thin-Film Battery

Bulk Battery

Others

By Application

Consumer Electronics

Electric Vehicles (EVs)

Energy Storage Systems

Medical Devices

Others

By Region

North America

U.S.

Canada

Mexico

Europe

France

Germany

Italy

Spain

UK

Rest of Europe

Asia-Pacific

China

Japan

India

South Korea

Australia

Rest of Asia-Pacific

LAMEA

Brazil

South Africa

Saudi Arabia

Rest of LAMEA

Key Market Players

Solid Power Inc.

SAMSUNG SDI CO., LTD

Blue Solutions.

Ilika

Toyota

SES AI Corporation

Hitachi Zosen Corporation

Johnson Energy Storage, Inc.

QuantumScape Battery, Inc

Excellatron

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