

Industrial Secondary Battery Market – Global Industry Size, Share, Trends, Opportunity, and Forecast Segmented by Technology (Lead-acid Batteries, Lithium-ion Batteries, and Other), By Region, By Competition 2018-2028.

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Abstracts

Global Industrial Secondary Battery Market was valued at USD 39.93 Billion in 2022 and is anticipated to project robust growth in the forecast period with a CAGR of 11.48% through 2028. The global Industrial Secondary Battery market is a dynamic and growing market, but it is also facing a number of challenges. Battery manufacturers and governments are working to address these challenges, but it is important to be aware of the potential impact on industry and consumers.

Key Market Drivers

Renewable Energy Integration:

The integration of renewable energy sources, such as solar and wind power, into the electricity grid is another significant driver. To manage the intermittency of renewables and ensure a stable energy supply, energy storage systems (ESS) are required. Secondary batteries play a crucial role in ESS by storing excess energy when supply exceeds demand and releasing it when demand surpasses supply. This integration not only promotes the utilization of clean energy but also enhances grid resilience and reliability, thereby driving the demand for secondary batteries.

Consumer Electronics and Portable Devices:

The proliferation of consumer electronics and portable devices is a long-standing driver

of the Industrial Secondary Battery market. Smartphones, laptops, tablets, and wearables all rely on rechargeable lithium-ion batteries, which have become lighter, more efficient, and longer-lasting over time. Consumer demand for longer battery life and increased device portability continues to fuel innovation in battery technology, leading to the development of more advanced and energy-dense batteries.

Energy Storage for Utilities:

Secondary batteries are increasingly used by utility companies for grid-scale energy storage. These large-scale energy storage projects are instrumental in stabilizing power grids, improving load management, and facilitating the integration of renewable energy sources. As utilities strive to reduce reliance on fossil fuels and transition to cleaner energy options, the demand for secondary batteries in utility-scale energy storage projects continues to grow.

Government Regulations and Incentives:

Government policies and regulations play a pivotal role in driving the Industrial Secondary Battery market. Many countries have implemented regulations to reduce greenhouse gas emissions and promote the adoption of electric vehicles and renewable energy sources. These regulations often include incentives such as tax credits, subsidies, and emissions targets that encourage the development and adoption of secondary batteries. Additionally, regulations regarding the disposal and recycling of batteries have led to increased research into sustainable battery materials and recycling technologies.

Advancements in Battery Technology:

Continuous advancements in battery technology are a fundamental driver of the Industrial Secondary Battery market. Researchers and manufacturers are constantly working to improve battery performance, energy density, safety, and cost-effectiveness. Innovations such as solid-state batteries, which promise higher energy density and enhanced safety, have the potential to revolutionize various industries, including EVs and consumer electronics.

Global Push for Energy Independence:

The desire for energy independence and reduced reliance on fossil fuels is a global driver that promotes the use of secondary batteries. Individuals and businesses are

investing in solar panels and other distributed energy generation systems coupled with energy storage solutions to reduce their dependence on centralized power grids and traditional energy sources.

Electrification of Industrial Processes:

Industries are increasingly electrifying their processes to reduce carbon emissions and improve efficiency. This trend spans various sectors, including manufacturing, agriculture, and mining. Electrification often involves the use of secondary batteries to power electric machinery and equipment, leading to increased demand for robust and long-lasting battery solutions.

Consumer Awareness and Environmental Concerns:

Growing consumer awareness of environmental issues, coupled with concerns about pollution and climate change, has a significant influence on the Industrial Secondary Battery market. Consumers are increasingly opting for products and technologies that align with their values, choosing electric vehicles and renewable energy solutions over traditional alternatives.

Supply Chain Considerations:

The global supply chain, particularly for critical raw materials like lithium, cobalt, and nickel, significantly impacts the Industrial Secondary Battery market. Geopolitical factors, mining regulations, and the availability of these materials can affect battery production and pricing. Efforts to diversify the supply chain and explore alternative materials are ongoing to mitigate supply chain risks.

In summary, the global Industrial Secondary Battery market is driven by a confluence of factors that include the rise of electric vehicles, the integration of renewable energy, the proliferation of consumer electronics, utility-scale energy storage, government regulations and incentives, technological advancements, the pursuit of energy independence, industrial electrification, consumer awareness of environmental concerns, and supply chain considerations. These drivers are interconnected and collectively shape the trajectory of the Industrial Secondary Battery market, making it a dynamic and rapidly evolving industry with profound implications for sustainability and the global economy.

Key Market Challenges

Energy Density and Capacity Limitations:

One of the primary challenges in the Industrial Secondary Battery market is the limitation in energy density and capacity of current battery technologies. Despite advancements in recent years, lithium-ion batteries, which dominate the market, still struggle to match the energy density of fossil fuels. This limitation impacts the range and efficiency of electric vehicles (EVs) and the duration of energy storage in grid-scale applications. Researchers are actively working on improving energy density through innovations such as solid-state batteries, but these technologies are not yet widely available and face their own set of challenges.

Cycle Life and Degradation:

Secondary batteries degrade over time, leading to reduced capacity and performance. This cycle life issue is especially critical in applications where batteries are cycled frequently, such as in EVs and portable electronics. Battery degradation not only affects the user experience but also contributes to increased costs as batteries need to be replaced more frequently. Research into extending battery cycle life and minimizing capacity fade is ongoing, but it remains a significant challenge.

Safety Concerns

Safety is a paramount concern in the Industrial Secondary Battery market, particularly for lithium-ion batteries. These batteries can be prone to thermal runaway, which can lead to fires or explosions under certain conditions, including physical damage or overheating. Ensuring the safety of battery technologies is a constant challenge, necessitating the development of effective thermal management systems, improved electrolytes, and advanced safety features. Addressing these safety concerns is essential to building consumer trust and facilitating the broader adoption of secondary batteries.

Raw Material Availability and Price Volatility:

The Industrial Secondary Battery industry relies heavily on critical raw materials like lithium, cobalt, nickel, and graphite. The availability and price of these materials can be volatile due to factors like geopolitical tensions, mining regulations, and supply chain disruptions. As demand for batteries continues to grow, there are concerns about potential material shortages and price spikes, which can impact the overall cost and

availability of secondary batteries. Research into alternative materials and recycling techniques is ongoing to mitigate these supply chain risks.

Environmental Impact and Recycling:

While secondary batteries are seen as a more environmentally friendly alternative to fossil fuels, they are not without environmental challenges. Battery production, particularly for lithium-ion batteries, can have significant environmental impacts, including resource extraction, energy-intensive manufacturing processes, and waste disposal concerns. Additionally, the recycling rates for batteries are relatively low, and improper disposal can lead to environmental contamination. The industry faces the challenge of developing more sustainable battery materials, improving recycling methods, and establishing a closed-loop supply chain to minimize its environmental footprint.

Cost and Affordability:

The cost of secondary batteries remains a barrier to widespread adoption in various applications. Electric vehicles, for instance, still have a higher upfront cost compared to traditional internal combustion engine vehicles, largely due to the cost of the battery pack. Reducing the cost of batteries is a critical challenge, as it would make electric vehicles and renewable energy storage more affordable and accessible to consumers. Economies of scale, technological advancements, and innovations in manufacturing processes are all contributing to cost reduction efforts.

Charging Infrastructure:

In the case of electric vehicles, the lack of a comprehensive charging infrastructure is a significant challenge. Range anxiety, or the fear of running out of battery power without access to charging, remains a concern for potential EV buyers. Developing a robust and widespread charging network is essential to the mass adoption of electric vehicles. Governments and private companies are working to address this challenge by investing in charging infrastructure, but it remains a work in progress.

Key Market Trends

Rise of Lithium-ion Dominance:

The most prominent trend in the Industrial Secondary Battery market is the continued

dominance of lithium-ion batteries. These batteries are favored for their high energy density, long cycle life, and reliability, making them the go-to choice for a wide range of applications, from electric vehicles to consumer electronics and grid-scale energy storage. As lithium-ion technology continues to improve, it reinforces its position as the industry standard.

The significance of this trend lies in the fact that lithium-ion batteries have become the de facto choice for energy storage, which has led to economies of scale, reduced costs, and accelerated technological advancements. However, it also highlights concerns about the supply of critical materials like lithium, cobalt, and nickel, as well as the need for sustainable and safe recycling methods.

Advancements in Solid-State Batteries:

Solid-state batteries are a promising technology that represents a major trend in the Industrial Secondary Battery market. These batteries replace the liquid or gel electrolyte in traditional lithium-ion batteries with a solid electrolyte, offering advantages such as higher energy density, faster charging, longer cycle life, and improved safety. Solid-state batteries have the potential to revolutionize various industries, including electric vehicles, consumer electronics, and renewable energy storage.

The significance of this trend lies in the potential of solid-state batteries to address some of the limitations of traditional lithium-ion batteries, particularly in terms of safety and energy density. However, commercializing solid-state batteries at scale remains a challenge, and overcoming manufacturing and cost barriers is crucial for their widespread adoption.

Increased Focus on Sustainability:

Sustainability is a growing trend in the Industrial Secondary Battery market, driven by environmental concerns and regulatory pressure. Manufacturers are increasingly emphasizing the use of sustainable materials in battery production, as well as improving recycling processes to reduce the environmental impact of batteries. This trend is particularly relevant given the massive quantities of batteries used in electric vehicles and renewable energy storage.

The significance of this trend is twofold. First, it addresses the environmental concerns associated with battery production and disposal, aligning with global efforts to reduce carbon emissions. Second, it helps ensure a stable and sustainable supply chain for

critical battery materials by promoting recycling and responsible sourcing.

Segmental Insights

Lithium-ion Battery Technology Insights

Among different types of battery technologies, lithium-ion battery (LIB) is expected to dominate the Industrial Secondary Battery market in the latter part of the forecast period, majorly due to its favourable capacity-to-weight ratio. Also, other factors that play an important role in boosting the LIB adoption include better performance, higher energy density, and decreasing price. Due to its high energy density, the price of lithium-ion batteries decreased considerably from USD 668/kWh in 2013 to USD 123/kWh in 2021, making it a lucrative choice among all batteries. Lithium-ion batteries have traditionally been used in consumer electronic devices, such as mobile phones, notebooks, and PCs. However, they are increasingly being redesigned for use as the power source of choice in hybrid and the complete electric vehicle (EV) range, owing to factors such as low environmental impact, as EVs do not emit any CO₂, nitrogen oxides, or any other greenhouse gases. LIB manufacturing facilities are majorly located in Asia-Pacific, North America, and Europe. Major market players, such as BYD Company Limited and LG Chem Ltd, have plans to set up new manufacturing facilities in the Asia-Pacific region, primarily in India, China, and South Korea. Therefore, based on such factors, lithium-ion battery technology is expected to dominate the Industrial Secondary Battery market during the forecast period.

Regional Insights

Asia Pacific is expected to dominate the market during the forecast period. The Asia-Pacific battery market as a whole is expected to grow significantly over the coming decade due to increased electrification activities in the region. The Battery Recycling has not yet penetrated the market on a significant level. The battery market in this region is mainly driven by developments in the electronics manufacturing, power generation, communication, and information industries in countries like India, China, Japan, and South Korea. Developing countries, like India, lack a firm grid infrastructure, which causes power cuts and blackouts frequently, mostly in rural areas. Thus, the lack of grid infrastructure, high demand for steady power, and the need for power backup solutions are expected to drive the demand for industrial dual carbon batteries. Moreover, the governments of various countries have taken initiatives to finance energy storage projects to fulfill the energy requirements in their countries. China and a few South Asian countries are coming up with new business models and associated

financing instruments to invest capital in battery energy storage projects. In a short-term scenario, however, the region is likely to witness challenges from rising prices of graphite carbon, which is a major raw material used in the Battery Recycling manufacturing process. Rising prices of graphite carbon are majorly a result of a sharp cut in the supply of graphite electrodes from China. In the present scenario, the demand for graphite electrodes is significantly higher compared to the supply. Research on Battery Recycling technology is also underway in the region. For instance, in April 2021, researchers at IIT Hyderabad, India, developed a Battery Recycling that can cut the overall battery cost by as much as 20-25%, along with being environment-friendly. Further research is underway to increase the energy density of the battery. Therefore, based on the above-mentioned factors, Asia-Pacific is expected to witness significant growth during the forecast period.

Key Market Players

Umicore

Retriev Technologies

American Battery Technology Company (ABTC)

Li-Cycle

Aqua Metals

Battery Solutions

Recupyl

Gopher Resource

Glencore Recycling

Report Scope:

In this report, the Global Industrial Secondary Battery Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Global Industrial Secondary Battery Market, By Technology:

Lead-acid Batteries

Lithium-ion Batteries

Other

Global Industrial Secondary Battery Market, By Region:

North America

United States

Canada

Mexico

Asia-Pacific

China

India

Japan

South Korea

Indonesia

Europe

Germany

United Kingdom

France

Russia

Spain

South America

Brazil

Argentina

Middle East & Africa

Saudi Arabia

South Africa

Egypt

UAE

Israel

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Industrial Secondary Battery Market.

Available Customizations:

Global Industrial Secondary Battery Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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