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EV Battery Recycling Market by Material Extraction (Lithium, Nickel, Cobalt, Manganese, Iron, Cobalt, Graphite, Steel, Aluminium), Battery chemistry (LFP, NMC, NCA), Vehicle Type, Recycling process & Region - Global Forecast to 2035

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Abstracts

The global EV battery recycling market, by value, is estimated to be USD 0.54 Billion in 2024 and is projected to reach USD 23.72 Billion by 2035, at a CAGR of 40.9% from 2024 to 2035.

companies in the market are leveraging innovative technologies such as hydrometallurgy and direct recycling to extract materials efficiently, ensuring the recycled materials meet the quality standards for reuse in new batteries. Further, The market's growth is also supported by strategic collaborations among automotive manufacturers, battery producers, and recycling firms. In January 2024, Iveco Group (Italy) announced the selection of BASF (Germany), as its first partner to provide a recycling solution for the lithium-ion batteries of Iveco's EVs. Similarly, many automakers are investing in closed-loop recycling systems, ensuring a steady supply of critical raw materials for new battery production. In October 2024, Mercedes-Benz (Germany) opened Europe's first battery recycling plant with an integrated mechanical-hydrometallurgical process, making it the first car manufacturer worldwide to close the battery recycling loop with its in-house facility.

"NMC battery segments hold the prominent market share in the forecast period."

The increasing use of Nickel Manganese Cobalt (NMC) batteries in electric vehicles has a significant impact on the EV battery recycling market. Recycling of Nickel Manganese Cobalt batteries in electric vehicles involves the extraction of valuable metals, such as

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nickel, cobalt, and manganese, which can be reused in new batteries. To enhance the recycling process, recyclers are adopting advanced techniques such as hydrometallurgical and pyrometallurgical methods, which separate these metals from the battery components efficiently. Some companies are also developing closed-loop recycling systems, where the extracted materials are directly returned to the production of new batteries, minimizing waste and reducing the need for virgin raw materials. The percentage of NMC battery material that can be extracted through recycling processes typically falls within the range of 80-95% for the combined metals (nickel, manganese, cobalt, and lithium), depending on the specific recycling method and the quality of the spent battery materials used. For instance, in April 2024, Toyota Motor North America announced that it has entered a Cooperative Research and Development Agreement (CRADA) with the U.S. Department of Energy's Argonne National Laboratory to investigate the development of a direct recycling process for lithium-ion batteries, which are prevalent in new electric vehicles. The focus of the research will be on cathode chemistries made of nickel, manganese, and cobalt. Further, Recyclers are also focusing on improving the overall efficiency of the process to reduce environmental impact and increase the economic viability of NMC battery recycling, as demand for these materials continues to grow with the rise in EV adoption.

"By Material Extraction, Copper hold the significant market share in EV Battery recycling market."

Copper hold the significant market share in material extraction of EV Battery recycliong market. Recycling copper from EV batteries is critical in resource conservation and reducing environmental impact. Copper is extensively used in EV battery packs, accounting for approximately 20–30 kilograms per vehicle, depending on the model and battery capacity. Recycling efforts focus on recovering high-purity copper through hydrometallurgy, pyrometallurgy, or direct dismantling and separation techniques. Modern recycling facilities can achieve recovery rates of over 95%, ensuring minimal wastage. The recycled copper can be reintroduced into manufacturing, supporting the circular economy and reducing reliance on mining, which is energy-intensive and environmentally harmful. The demand for copper recycling will grow exponentially, potentially reclaiming millions of metric tons of copper and mitigating supply chain pressures and carbon emissions associated with raw material extraction.

"Germany hold the prominent market share in European EV battery recycling market."

Germany holds a prominent market share in the European EV battery recycling market, driven by its robust automotive industry and strong presence of OEMs like Volkswagen,

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BMW, and Mercedes-Benz. These manufacturers are actively investing in sustainable practices, including battery recycling, to align with stringent EU regulations on waste management and carbon neutrality. For instance, in October 2024, Mercedes-Benz Group AG has opened a battery recycling plant with an integrated mechanical hydrometallurgical process in Kuppenheim, Germany. Further, advanced infrastructure, government incentives for circular economy initiatives, and partnerships with leading recycling companies further bolster its position. The country's focus on innovation and R&D in battery technologies and recycling processes solidifies its leadership in the European market.

In-depth interviews were conducted with CEOs, marketing directors, other innovation and technology directors, and executives from various key organizations operating in this market.

By Company Type: Tier I - 39%, Tier II - 39%, and OEMs - 22%

By Designation: C Level Executives - 45%, Directors - 35%, and Others - 20%

By Region: Asia Pacific-52%, Europe-20%, North America-28%

The EV battery recycling market is dominated by major players such as Contemporary Amperex Technology Co., Limited. (China), GEM Co., Ltd. (China), Umicore (Belgium), Glencore (Switzerland), Fortum (Finland).

Research Coverage:

The Market Study Covers the EV battery recycling market by Material Extraction (Lithium, Nickel, Cobalt, Manganese, Iron, Cobalt, Graphite, Steel, Aluminium), Battery chemistry (LFP, NMC, NCA), Vehicle Type (PC, CV, 2-Wheeler), Recycling process (Hydrometallurgical, Pyrometallurgy, & Direct recycling) & Region (Asia Pacific, Europe, and North America). It also covers the competitive landscape and company profiles of the major EV battery recycling market ecosystem players.

Key Benefits of the Report

The study also includes an in-depth competitive analysis of the key players in the market, along with their company profiles, key observations related to product and business offerings, recent developments, and key market strategies.

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The report will help the market leaders/new entrants with information on the closest approximations of the revenue numbers for the overall EV battery recycling market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. The report also helps stakeholders understand the market pulse and provides information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

Analysis of key drivers (Creation of stable supply chains for EV battery materials, Rising government initiative related to lithium-ion battery recycling, Rising demand for recycled products and materials), restraints (Limited Collection and Recycling Infrastructure), opportunities (Creation of Uniform Recycling Procedures, Advancements in Artificial Intelligence in Battery Recycling), and challenges (Complexity of battery chemistries).

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, in the EV battery recycling market.

Market Development: Comprehensive information about lucrative markets – the report analyses the EV battery recycling market across varied regions.

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the EV battery recycling market.

Competitive Assessment: In-depth assessment of market shares, growth strategies and service offerings of leading players like Contemporary Amperex Technology Co., Limited. (China), GEM Co., Ltd. (China), Umicore (Belgium), Glencore (Switzerland), Fortum (Finland) and among others in the EV battery recycling market Page 25 of 34 strategies. The report also helps stakeholders understand the pulse of the adjacent reports such EV Battery Market, EV market and provides them with information on key market drivers, restraints, challenges, and opportunities.

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