

The Global Market for Li-ion Battery Recycling 2024-2040

<https://marketpublishers.com/r/G5C4919AAFBEEN.html>

Date: October 2023

Pages: 168

Price: US\$ 1,225.00 (Single User License)

ID: G5C4919AAFBEEN

Abstracts

The battery recycling industry is starting to take off. Originally, companies recycled Lithium-ion (Li-ion) batteries from mobile devices in relatively small quantities. While this still accounts for the majority of the market, the huge growth in EVs and increase in materials prices plus concerns regarding supply has driven development of Li-ion battery recycling technologies. With new battery plants planned by companies including General Motors, Ford, Tesla, Toyota, Hyundai and Panasonic open over the next few years, lithium-ion battery production will increase greatly (with >1.2 million tons of lithium-ion batteries reaching end of life by 2030), presenting a significant opportunity for recycling.

The Global Market for Li-ion Battery Recycling 2024-2040 provides an in-depth analysis of market drivers, challenges, value chain, technologies, and competitive landscape. This 168 page market report provides a comprehensive analysis of recycling technologies, value chain, regulations, sustainability impacts, and competitive landscape. Detailed regional analysis covers Europe, China, Asia Pacific, and North America. The report examines battery collection, discharging, dismantling, and mechanical pre-processing. The competitive landscape is analyzed including market leaders and start-ups. Extensive demand forecasts are presented along with growth opportunity analysis. The future technology roadmap compares emerging recycling approaches versus conventional methods.

Report contents include:

Market Size by chemistry, ktonnes, revenues and region, forecast to 2040.

Market trends, drivers and challenges analysis.

In-depth analysis of recycling methods and technologies.

Recycling of beyond-lithium batteries,

Analysis of the current market and future outlook.

Recent news and market developments including funding and capacities.

Global production capacities current and planned.

Profiles of 88 companies. Companies profiled include Akkuser Oy, BASF, Battery Pollution Technologies, Circunomics, Cylib, Econili Battery, GEM Co., Ltd., Green Li-ion, Green Mineral, Li-Cycle, Neu Battery Materials, Redwood Materials, Renewable Metals, Sumitomo and Tozero.

Contents

1 INTRODUCTION

- 1.1 Lithium-ion batteries
 - 1.1.1 What is a Li-ion battery?
 - 1.1.2 Li-ion cathode
 - 1.1.3 Li-ion anode
 - 1.1.4 Battery failure
 - 1.1.5 End-of-life
 - 1.1.6 Sustainability
- 1.2 The Electric Vehicle (EV) market
 - 1.2.1 Emerging market for replacement battery packs
 - 1.2.2 Closed-loop value chain for EV batteries
- 1.3 Lithium-Ion Battery recycling value chain
- 1.4 Circular life cycle
- 1.5 Global regulations and policies
 - 1.5.1 China
 - 1.5.2 EU
 - 1.5.3 US
 - 1.5.4 India
 - 1.5.5 South Korea
 - 1.5.6 Japan
 - 1.5.7 Australia
 - 1.5.8 Transportation
- 1.6 Sustainability and environmental benefits

2 RECYCLING METHODS AND TECHNOLOGIES

- 2.1 Black mass powder
- 2.2 Recycling different cathode chemistries
- 2.3 Preparation
- 2.4 Pre-Treatment
 - 2.4.1 Discharging
 - 2.4.2 Mechanical Pre-Treatment
 - 2.4.3 Thermal Pre-Treatment
- 2.5 Comparison of recycling techniques
- 2.6 Hydrometallurgy
 - 2.6.1 Method overview

- 2.6.1.1 Solvent extraction
- 2.6.2 SWOT analysis
- 2.7 Pyrometallurgy
 - 2.7.1 Method overview
 - 2.7.2 SWOT analysis
- 2.8 Direct recycling
 - 2.8.1 Method overview
 - 2.8.1.1 Electrolyte separation
 - 2.8.1.2 Separating cathode and anode materials
 - 2.8.1.3 Binder removal
 - 2.8.1.4 Relithiation
 - 2.8.1.5 Cathode recovery and rejuvenation
 - 2.8.1.6 Hydrometallurgical-direct hybrid recycling
 - 2.8.2 SWOT analysis
- 2.9 Other methods
 - 2.9.1 Mechanochemical Pretreatment
 - 2.9.2 Electrochemical Method
 - 2.9.3 Ionic Liquids
- 2.10 Recycling of Specific Components
 - 2.10.1 Anode (Graphite)
 - 2.10.2 Cathode
 - 2.10.3 Electrolyte
- 2.11 Recycling of Beyond Li-ion Batteries
 - 2.11.1 Conventional vs Emerging Processes
 - 2.11.2 Li-Metal batteries
 - 2.11.3 Lithium sulfur batteries (Li-S)
 - 2.11.4 All-solid-state batteries (ASSBs)

3 MARKET ANALYSIS

- 3.1 Market drivers
- 3.2 Market challenges
- 3.3 The current market
- 3.4 Recent market news, funding and developments
- 3.5 Economic case for Li-ion battery recycling
 - 3.5.1 Metal prices
 - 3.5.2 Second-life energy storage
 - 3.5.3 LFP batteries
 - 3.5.4 Other components and materials

- 3.5.5 Reducing costs
- 3.6 Competitive landscape
- 3.7 Global capacities, current and planned
- 3.8 Future outlook
- 3.9 Global market 2018-2040
 - 3.9.1 Chemistry
 - 3.9.2 Ktonnes
 - 3.9.3 Revenues
 - 3.9.4 Regional
 - 3.9.4.1 Europe
 - 3.9.4.1.1 Regional overview
 - 3.9.4.2 China
 - 3.9.4.2.1 Regional overview
 - 3.9.4.3 Rest of Asia-Pacific
 - 3.9.4.3.1 Regional overview
 - 3.9.4.4 North America
 - 3.9.4.4.1 Regional overview

4 COMPANY PROFILES

5 TERMS AND DEFINITIONS

6 RESEARCH METHODOLOGY

7 REFERENCES

List Of Tables

LIST OF TABLES

- Table 1. Lithium-ion (Li-ion) battery supply chain.
- Table 2. Commercial Li-ion battery cell composition.
- Table 3. Key technology trends shaping lithium-ion battery cathode development.
- Table 4. Cathode Materials Used in Commercial LIBs and Recycling Methods.
- Table 5. Fate of end-of-life Li-ion batteries.
- Table 6. Closed-loop value chain for electric vehicle (EV) batteries.
- Table 7. Li-ion battery recycling value chain.
- Table 8. Potential circular life cycle for lithium-ion batteries.
- Table 9. Regulations pertaining to the recycling and treatment of EOL batteries in the EU, USA, and China
- Table 10. China regulations and policies related to batteries.
- Table 11. Sustainability and environmental benefits of Li-ion recycling.
- Table 12. Typical lithium-ion battery recycling process flow.
- Table 13. Main feedstock streams that can be recycled for lithium-ion batteries.
- Table 14. Comparison of LIB recycling methods.
- Table 15. Comparison of conventional and emerging processes for recycling beyond lithium-ion batteries.
- Table 16. Market drivers for lithium-ion battery recycling.
- Table 17. Market challenges in lithium-ion battery recycling.
- Table 18. Recent market news, funding and developments in Li-ion battery recycling.
- Table 19. Economic assessment of battery recycling options.
- Table 20. Retired lithium-batteries.
- Table 21. Global capacities, current and planned (tonnes/year).
- Table 22. Global lithium-ion battery recycling market in tonnes segmented by cathode chemistry, 2018-2040.
- Table 23. Global Li-ion battery recycling market, 2018-2040 (ktonnes)
- Table 24. Global Li-ion battery recycling market, 2018-2040 (billions USD).
- Table 25. Li-ion battery recycling market, by region, 2018-2040 (ktonnes).
- Table 26. Li-ion battery recycling market, in Europe, 2018-2040 (ktonnes).
- Table 27. Li-ion battery recycling market, in China, 2018-2040 (ktonnes).
- Table 28. Li-ion battery recycling market, in Rest of Asia-Pacific, 2018-2040 (ktonnes).
- Table 29. Li-ion battery recycling market, in North America, 2018-2040 (ktonnes).

List Of Figures

LIST OF FIGURES

- Figure 1. Li-ion battery cell pack.
- Figure 2. Lithium Cell Design.
- Figure 3. Functioning of a lithium-ion battery.
- Figure 4. LIB cathode recycling routes.
- Figure 5. Process for recycling lithium-ion batteries from EVs.
- Figure 6. Circular life cycle of lithium ion-batteries.
- Figure 7. Typical direct, pyrometallurgical, and hydrometallurgical recycling methods for recovery of Li-ion battery active materials.
- Figure 8. Mechanical separation flow diagram.
- Figure 9. Recupyl mechanical separation flow diagram.
- Figure 10. Flow chart of recycling processes of lithium-ion batteries (LIBs).
- Figure 11. Hydrometallurgical recycling flow sheet.
- Figure 12. SWOT analysis for Hydrometallurgy Li-ion Battery Recycling.
- Figure 13. Umicore recycling flow diagram.
- Figure 14. SWOT analysis for Pyrometallurgy Li-ion Battery Recycling.
- Figure 15. Schematic of direct recycling process.
- Figure 16. SWOT analysis for Direct Li-ion Battery Recycling.
- Figure 17. Schematic diagram of a Li-metal battery.
- Figure 18. Schematic diagram of Lithium–sulfur battery.
- Figure 19. Schematic illustration of all-solid-state lithium battery.
- Figure 20. Global scrapped EV (BEV+PHEV) forecast to 2040.
- Figure 21. Global Li-ion battery recycling market, 2018-2040 (chemistry).
- Figure 22. Global Li-ion battery recycling market, 2018-2040 (ktonnes)
- Figure 23. Global Li-ion battery recycling market, 2018-2040 (Billion USD).
- Figure 24. Global Li-ion battery recycling market, by region, 2018-2040 (ktonnes).
- Figure 25. Li-ion battery recycling market, in Europe, 2018-2040 (ktonnes).
- Figure 26. Li-ion battery recycling market, in China, 2018-2040 (ktonnes).
- Figure 27. Li-ion battery recycling market, in Rest of Asia-Pacific, 2018-2040 (ktonnes).
- Figure 28. Li-ion battery recycling market, in North America, 2018-2040 (ktonnes).

I would like to order

Product name: The Global Market for Li-ion Battery Recycling 2024-2040

Product link: <https://marketpublishers.com/r/G5C4919AAFBEEN.html>

Price: US\$ 1,225.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G5C4919AAFBEEN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970