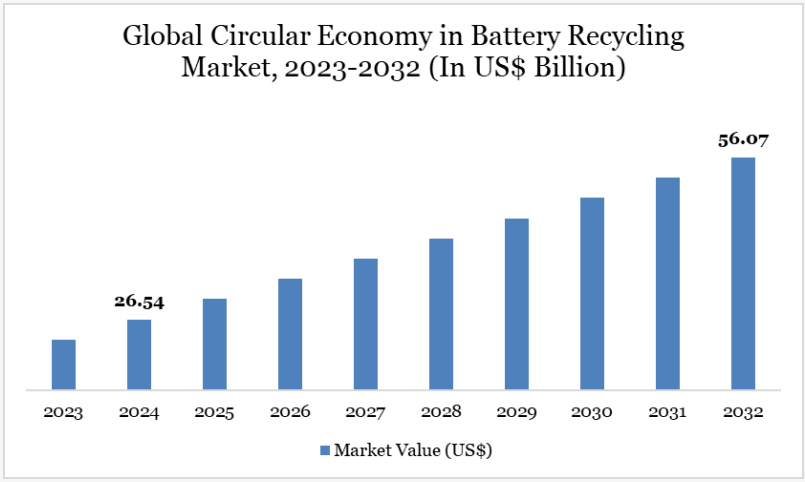
Circular Economy in Battery Recycling industry To Hit $56.07 Bn by 2032 | CAGR 9.80% Growth

Circular Economy in Battery Recycling Market offers strong growth, nearly doubling to $56.07 Bn by 2032, driven by eco-friendly policies.



Circular Economy in Battery Recycling Market

DETROIT, MI, UNITED STATES, August 28, 2025 /EINPresswire.com/ -- Market Overview

The global shift toward electrification has placed battery recycling at the core of a circular economy model. As electric vehicles (EVs), renewable energy storage systems, and consumer electronics proliferate, so too does the challenge of managing end-of-life (EOL) batteries.

Market Size and Growth

> The U.S. Circular Economy in Battery Recycling Market is set to surge as EV adoption and sustainability goals drive demand, crossing USD 56.07 billions by 2032."
>
> *DataM Intelligence 4Market Research LLP*

According to DataM Intelligence, The Circular Economy in Battery Recycling Market was valued at USD 26.54 billion in 2024 and is projected to climb to USD 56.07 billion by 2032, expanding at a CAGR of 9.80% from 2025 to 2032.

The circular economy approach design, reuse, remanufacture, and recycle reframes batteries not as hazardous waste but as a critical raw material reservoir. Lithium, cobalt, nickel, and manganese can be recovered through advanced recycling, feeding back into the supply chain, reducing environmental impact, and lowering dependence on primary mining.

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Technical Insights: How Recycling Powers Circularity

Battery recycling technologies fall into three primary categories:

1. Pyrometallurgy (smelting): A conventional method that recovers cobalt, nickel, and copper. However, it consumes large amounts of energy and loses much lithium content.

2. Hydrometallurgy (leaching): Uses chemical solutions to extract lithium, cobalt, nickel, and manganese. Direct Recycling: Preserves cathode materials without breaking them down, offering the highest circularity potential, though still at pilot scale.

Recent breakthroughs in hydrometallurgical efficiency are especially promising. For instance, U.S. Department of Energy (DOE)-backed studies in 2024 showed 95–98% recovery rates for lithium and cobalt when optimized leaching solvents are used. Japan's R&D institutions, such as AIST, are simultaneously developing hybrid techniques that combine hydro- and bio-leaching to cut costs and improve recovery yields.

Commercial Drivers

• EV Boom: Global EV sales exceeded 14 million units in 2023 (IEA), generating a parallel rise in battery EOL projections. By 2030, more than 11 million metric tons of used lithium-ion batteries are expected to be available for recycling.

• Critical Mineral Shortages: The U.S. Geological Survey (USGS) estimates global lithium demand could reach 3.8 million tons by 2035, far outpacing mined supply. Recycling bridges part of this gap.

• Regulations: Japan and the U.S. have both introduced frameworks mandating responsible recycling. The U.S. Inflation Reduction Act (IRA, 2022) incentivizes recycled content in EV supply chains, while Japan's Ministry of Economy, Trade and Industry (METI) has updated its 2024 roadmap to integrate recycling capacity within domestic gigafactories.

Market Trends

• Second-life batteries: Before recycling, many EV batteries are being repurposed for stationary storage, extending their lifespan and easing grid integration of renewables.

• Automation in dismantling: Robotics are increasingly used to disassemble EV packs safely, reducing labor costs and improving yield.

• Localized recycling hubs: Both Japan and the U.S. are investing in regional plants to reduce the environmental footprint of shipping bulky EOL batteries overseas.

• Urban mining offers clear economic advantages, with copper recycling costing around $3,000 per ton versus $5,500 through traditional mining. With EV demand surging, North America's forward-looking strategies are positioning it as a global leader in sustainable battery recycling.

Key Players

1. Umicore
2. Li-Cycle
3. Redwood Materials
4. Accurec Recycling
5. American Manganese Inc.
6. Recylex
7. Retriev Technologies
8. Ganfeng Lithium Recycling
9. AEA Technology
10. Glencore

Recent Developments

• Japan: Toyota partnered with Panasonic in July 2025 to scale domestic circular recycling of EV batteries, linking recovery directly to local cathode production.

• Japan: Sumitomo Metal Mining announced a new pilot line in August 2025 targeting 100% recovery of cobalt and nickel from spent EV packs.

• USA: Redwood Materials secured $1 billion funding in July 2025 to expand Nevada operations, boosting lithium recovery capacity.

• USA: Li-Cycle Holdings signed an August 2025 supply agreement with General Motors, ensuring recycled nickel and lithium feedstock for U.S. gigafactories.

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Competitive Landscape

• Japan: Dominated by Toyota, Panasonic, Sumitomo Metal Mining, and NEC with strong ties to domestic EV supply chains.

• USA: Key players include Redwood Materials, Li-Cycle, and Ascend Elements, all of which

benefit from U.S. federal funding and automaker partnerships.

• Global entrants: CATL (China) and BASF (Germany) are expanding recycling facilities, highlighting cross-border competition.

Market Segments

By Battery Type: Lithium□ion, Lead□acid, Nickel□metal hydride, Others.

By Recycling Process: Mechanical & pyrometallurgical, Hydrometallurgical, Direct recycling.

By Application: Electric vehicles (EVs), Consumer electronics, Industrial & stationary energy storage, Others.

DataM's Recommendations

For Policy Makers:

• Japan should integrate recycling into national EV adoption programs, ensuring that gigafactory scaling does not outpace recycling readiness.

• The U.S. should accelerate IRA-linked subsidies for recyclers, lowering costs for automakers sourcing sustainable materials.

For Industry Leaders:

1• Invest in hydrometallurgical and direct recycling they promise higher recovery rates and lower costs than pyrometallurgy.

2• Develop closed-loop partnerships: automakers, recyclers, and material suppliers must co-design supply chains to lock in recycled content.

3• Explore second-life applications (e.g., grid storage) before recycling to maximize asset value.

For Investors:

1• Prioritize companies with end-to-end integration (collection, dismantling, refining).

2• Look for firms with regulatory alignment in Japan and the U.S., where policy tailwinds are strongest.

Conclusion

The circular economy in battery recycling is no longer optional - it is an industrial necessity. Japan and the U.S. are emerging as leaders, aligning regulatory mandates, industrial capacity, and innovation ecosystems. With EV adoption accelerating, recycling not only addresses critical mineral shortages but also reinforces environmental and public health benefits.

DataM Intelligence concludes that stakeholders must focus on advanced recovery technologies, policy alignment, and cross-industry collaboration. This integrated approach will ensure that the circular economy in battery recycling evolves from a compliance requirement into a competitive advantage driving both profitability and sustainability.

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