

Rare Earth Recycling Market Forecasts to 2034 – Global Analysis By Material Type (Neodymium, Dysprosium, Lanthanum, Cerium, Yttrium, Praseodymium, Terbium, and Other Rare Earth Elements), Recycling Process, Source of Waste, Recycling Type, Application, End-Use Products, and By Geography

<https://marketpublishers.com/r/R274CAD558B8EN.html>

Date: April 2026

Pages: 200

Price: US\$ 4,150.00 (Single User License)

ID: R274CAD558B8EN

Abstracts

According to Statistics MRC, the Global Rare Earth Recycling Market is accounted for \$0.68 billion in 2026 and is expected to reach \$1.66 billion by 2034 growing at a CAGR of 11.7% during the forecast period. Rare earth recycling involves the recovery of critical elements such as neodymium, dysprosium, and lanthanum from end-of-life products including permanent magnets, batteries, electronics, and industrial waste. These elements are essential components in electric vehicles, wind turbines, defense systems, and consumer electronics. As primary mining faces environmental scrutiny and geopolitical supply risks, recycling offers a sustainable secondary source that reduces dependence on virgin extraction while addressing the growing challenge of electronic waste accumulation worldwide.

Market Dynamics:

Driver:

Geopolitical supply chain vulnerabilities and trade restrictions

Dependence on limited rare earth mining regions, particularly China controlling over 80% of global refining capacity, has created acute strategic concerns for industrialized

nations. Governments are actively seeking alternative sources, with recycling emerging as a viable domestic solution to reduce import reliance. Trade disputes and export controls have repeatedly disrupted availability and caused price volatility, prompting manufacturers to secure closed-loop recycling systems. Defense departments in the United States and Europe now prioritize rare earth recycling as a national security imperative, directing funding toward facility development and technology commercialization.

Restraint:

Technological complexity and high recovery costs

Extracting individual rare earth elements from complex end-of-life products requires sophisticated separation processes that remain economically challenging compared to primary mining. The chemical similarity among these elements demands multiple refining stages, consuming significant energy and reagents while generating secondary waste streams. Many recycling facilities struggle to achieve purity levels matching virgin materials, limiting their application in high-performance magnets and lasers. These technical hurdles translate into operating costs that can exceed current market prices for primary rare earths when supply is abundant, discouraging private investment in recycling infrastructure.

Opportunity:

Rapid growth of electric vehicle and wind energy sectors

The accelerating transition to clean energy technologies is generating unprecedented volumes of rare earth-containing end-of-life magnets and batteries, creating a rich feedstock for recyclers. Each electric vehicle contains approximately one to two kilograms of neodymium and dysprosium, while direct-drive wind turbines require hundreds of kilograms per unit. As early-generation EVs reach retirement and turbine blades approach decommissioning, a massive secondary supply stream will become available. Recycling these components at end-of-life can recover over 95% of contained rare earths, reducing the need for new mining while embedding circular economy principles into green technology supply chains.

Threat:

Volatility in primary rare earth prices and illegal mining

When primary rare earth prices drop significantly due to oversupply or illegal mining operations, the economic viability of recycling collapses overnight. Recyclers face fixed operational costs that cannot compete with low-cost virgin material from regions with weak environmental and labor enforcement. Price fluctuations have historically been extreme, with some elements seeing thousand-percent swings within single years. This unpredictability makes long-term recycling investment planning nearly impossible, as facilities may become unprofitable before recovering capital costs. Without price stabilization mechanisms or subsidies, legitimate recycling operations remain vulnerable to market manipulation and predatory pricing from primary producers.

Covid-19 Impact:

The pandemic initially disrupted rare earth recycling operations through lockdowns limiting waste collection and facility closures across manufacturing regions. Supply chain interruptions for industrial chemicals used in hydrometallurgical processes created processing delays. However, the subsequent surge in electronics consumption and accelerated EV adoption generated larger end-of-life product volumes entering waste streams. Governments also increased strategic stockpiling of recycled rare earths after witnessing how export restrictions during the crisis affected technology production. These factors have permanently elevated recycling's perceived importance, with post-pandemic policies increasingly favoring domestic secondary recovery over foreign primary mining.

The Neodymium segment is expected to be the largest during the forecast period

The Neodymium segment is expected to account for the largest market share during the forecast period, driven by its dominant role in high-strength permanent magnets for electric vehicles, wind turbines, and hard disk drives. Neodymium-iron-boron magnets represent the most commercially significant rare earth application, with demand growing rapidly alongside global decarbonization efforts. Recycling neodymium from end-of-life motors and generators captures substantial economic value while addressing supply concerns for this critical element. The well-established collection pathways for electronics and automotive components, combined with improving recovery efficiencies, ensure neodymium maintains its leading position throughout the forecast timeline.

The Hydrometallurgical Recycling segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the Hydrometallurgical Recycling segment is predicted to witness the highest growth rate, leveraging acid or alkali leaching followed by solvent extraction or precipitation to achieve high-purity rare earth separation. This process excels at treating diverse feedstocks including shredded magnets, battery waste, and phosphor powders, offering flexibility that mechanical methods cannot match. Recent advances in selective leaching and ionic liquid extraction have reduced chemical consumption and improved environmental profiles compared to traditional hydrometallurgy. As facilities scale up to handle growing volumes of complex electronic waste, the adaptability and proven efficiency of hydrometallurgical routes make them the preferred choice for new recycling installations worldwide.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share, reflecting its position as both the world's largest rare earth consumer and the leading generator of electronic waste. China, Japan, and South Korea have established sophisticated recycling infrastructure driven by domestic manufacturing needs and limited primary resources. Government mandates requiring recycled content in electronics and automotive components further accelerate regional market development. The concentration of magnet production and battery manufacturing facilities in this region creates natural closed-loop opportunities, with waste streams available directly at industrial sites. This integrated ecosystem gives Asia Pacific an insurmountable advantage in recycling scale and efficiency.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, propelled by aggressive federal policies aimed at securing rare earth supply chains for defense and clean energy applications. Recent legislation provides tax incentives for domestic recycling facilities and mandates strategic stockpiling of recovered materials. Private investment has followed, with multiple commercial-scale hydrometallurgical plants under construction targeting magnet recycling. The region's growing electric vehicle fleet will soon generate substantial end-of-life motor volumes, creating localized feedstock. As automakers and electronics manufacturers seek certified recycled content to meet sustainability pledges, North America's recycling capacity is expanding rapidly from a small current base, delivering impressive growth percentages.

Key players in the market

Some of the key players in Rare Earth Recycling Market include Umicore, Solvay, Hitachi High-Tech, Shin-Etsu Chemical, REEtec, Geomega Resources, Ucore Rare Metals, Energy Fuels, Lynas Rare Earths, Iluka Resources, China Northern Rare Earth Group, MP Materials, American Rare Earths, Neo Performance Materials, and Arafura Rare Earths.

Key Developments:

In March 2026, Energy Fuels announced the first U.S. primary production of high-purity terbium oxide (a 'heavy' rare earth) in decades at its White Mesa Mill in Utah, utilizing ore sourced from Florida and Georgia.

In July 2025, MP Materials and Apple announced a \$500 million partnership to produce 100% recycled rare earth magnets in the U.S. MP Materials will build a dedicated recycling line at its Mountain Pass facility to process magnet scrap into feedstock for its Fort Worth, Texas, magnetics factory.

In June 2025, Geomega reached a major milestone in the integration of process equipment at its Quebec facility, marking a transition from pilot-scale research to demonstration-scale recycling operations.

Material Types Covered:

Neodymium

Dysprosium

Lanthanum

Cerium

Yttrium

Praseodymium

Terbium

Other Rare Earth Elements

Recycling Processes Covered:

Hydrometallurgical Recycling

Pyrometallurgical Recycling

Mechanical Recycling

Electrochemical Processes

Biotechnological Processes

Source of Wastes Covered:

Consumer Electronics Waste

Industrial Waste

Battery Waste

Automotive Components

Magnets

Fluorescent Lamps

Mining Residues

Recycling Types Covered:

Metallurgical Recycling

Direct Reuse/Closed-loop Recycling

Extraction-based Recycling

Applications Covered:

Electronics

Automotive

Renewable Energy

Aerospace & Defense

Industrial Equipment

Energy Storage Systems

End Users Covered:

Permanent Magnets

Catalysts

Phosphors

Glass & Ceramics

Alloys

Polishing Materials

Hydrogen Storage Alloys

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free

Rare Earth Recycling Market Forecasts to 2034 – Global Analysis By Material Type (Neodymium, Dysprosium, Lanth...

customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

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