Closing the loop on critical materials

Advanced Recycling & Refining of Rare Earths and Non-Ferrous Metals

From Scrap to Strategic Supply

M/s. Renocell Recycling Private Limited
east. 2023

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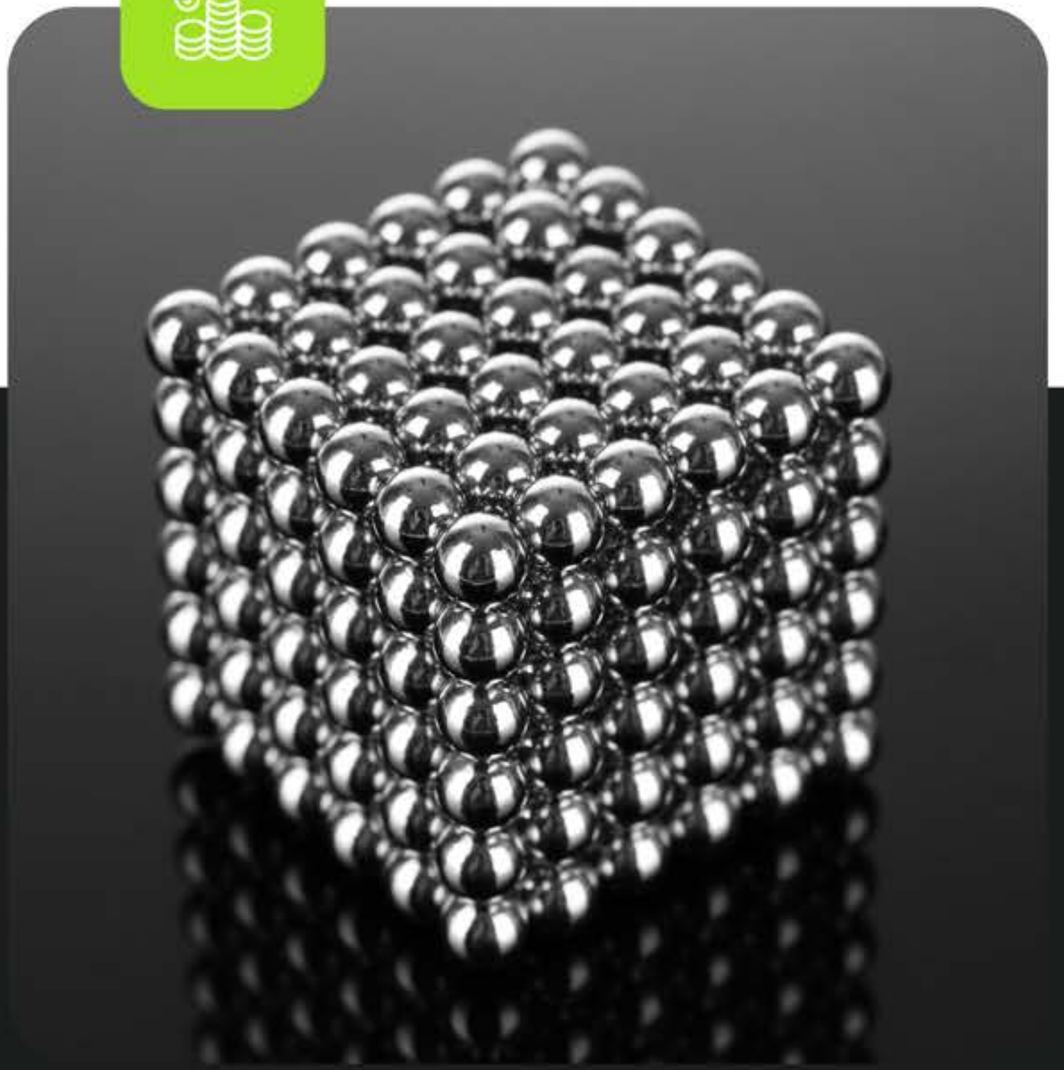
Vision & Mission Alignment



Vision

We are building a next-generation materials recovery company focused on:

- Rare Earth Magnet Recycling (NdFeB)
- Copper & Non-Ferrous Metal Recovery
- Strategic Scrap Supply Chains

Mission

Our mission is simple:

Turn global waste streams into high-purity, high-value critical materials.
Unlike traditional recyclers, we are not traders —
we are processors, refiners, and supply chain builders.

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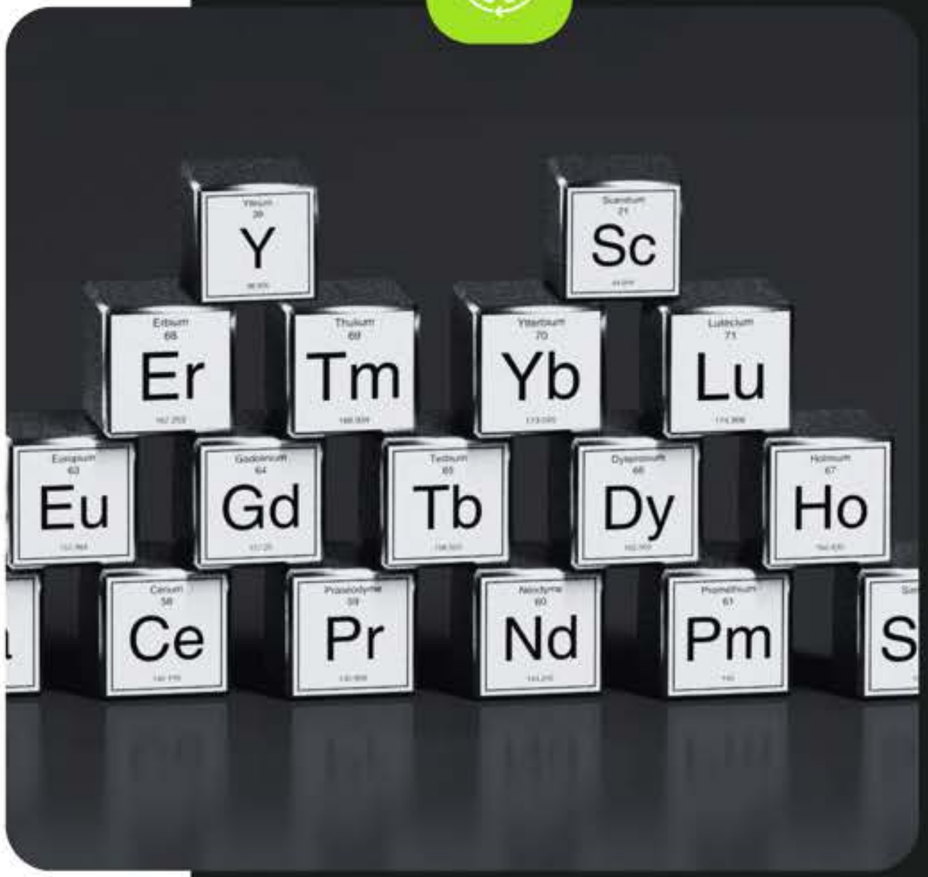
Rare Earth Elements

Heavy rare earth elements (HREEs), such as dysprosium and terbium, are used in smaller quantities but are critical for enhancing magnet performance, especially in high-temperature and high-reliability applications like defense and advanced motors.

Light rare earth elements (LREEs), such as neodymium and praseodymium, are the primary drivers of volume demand, widely used in permanent magnets for electric vehicles, wind turbines, and electronics.



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Market Analysis

China dominates primary + recycling → rest of world is underbuilt

The entire NdFeB recycling market sits on top of a massive structural imbalance:

- Demand for magnets → exploding
- Supply of primary rare earths → geopolitically constrained
- Recycling → the only scalable buffer

- Rare earth magnets market: $22B (2025) → $30B (2030)
- NdFeB magnet market alone: $15.7B → $25.6B by 2030 (~8.6% CAGR)
- Rare earth recycling market: ~$635M (2026) → $1B+ by 2035

The NdFeB recycling market is rapidly emerging as a strategic solution to a growing global imbalance between demand for rare earth magnets and limited primary supply. As of 2026, the market is still relatively small (around $600–700 million), but it supports a much larger magnet industry projected to exceed $30 billion by 2030.

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TOP RARE EARTH COMPANIES

As of 2026

- Neo Performance
- TDK Corporation
- Arnold Magnetic Technologies
- USA Rare Earths
- MP materials

- JL Mag Rare earth
- Proterial Ltd.
- Star Group
- Vacuumschmelze
- Lynas Rare Earths

Demand Engines

The demand side is primarily fueled by electrification trends, particularly the rapid adoption of EVs, each of which uses approximately 1–2 kilograms of NdFeB magnets, alongside the expansion of renewable energy infrastructure where wind turbines require hundreds of kilograms of such magnets per unit. At the same time, global supply remains highly concentrated, with China controlling around 70% of rare earth mining and nearly 90% of processing capacity, creating geopolitical vulnerabilities and supply chain risks for other economies.

EV /Drones

Electric vehicles and drones are the fastest-growing demand drivers, as both depend on compact, high-efficiency motors powered by NdFeB magnets, with EV production scaling rapidly worldwide.

Wind Energy

Wind energy creates large-volume demand, with each turbine requiring significant amounts of NdFeB magnets, driven by global renewable energy expansion.

Robotics/ Defense

Robotics and defense generate high-value demand, where precision systems, automation, and advanced military technologies rely on NdFeB magnets for performance and reliability.

Indian Market

Strengths

India's rare earth and NdFeB recycling market benefits from strong demand growth driven by electric vehicles, renewable energy, and defense manufacturing, along with government support for supply chain localization. Lower operating costs and increasing availability of industrial and electronic scrap provide a foundation for early-stage development.

Weaknesses

The market remains constrained by limited domestic processing capabilities, particularly in separation, metal refining, and alloy production. Dependence on imports for technology and high-purity materials, along with fragmented scrap collection systems, restricts efficiency and scalability.

Opportunities

Significant opportunities exist due to minimal domestic competition and a largely untapped market. Growing global interest in diversifying supply chains away from China, combined with future scrap generation from EVs and renewables, positions India for long-term growth in recycling and downstream processing.

Threats

Key threats include competition from China's established and cost-efficient ecosystem, volatility in rare earth prices, and inconsistent feedstock availability. Delays in policy implementation and infrastructure development could further impact the pace of market expansion.

Renocell Solution

Renocell is solving this by building a localized, integrated NdFeB recycling process that converts magnet scrap into high-purity NdPr oxides within India, reducing import dependence and creating a stable secondary supply. The process focuses on efficient recovery, cost optimization, and securing consistent feedstock through industrial and e-waste partnerships.

Beyond recycling, Renocell is moving into metal production, enabling vertical integration from scrap to metal. This improves margins, reduces exposure to global supply risks, and positions the company as a strategic supplier to magnet manufacturers, EV, and defense sectors.

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Renocell advantage

Renocell's core advantage lies in its positioning as a critical mineral recovery company rather than a conventional recycler. While most players focus on low-margin scrap processing, Renocell targets high-value outputs such as rare earth elements, battery materials, and refined metals. This integrated approach allows greater value capture across the recycling chain, transforming waste into strategic resources instead of just recovering base metals.

key strength is its urban mining and decentralized scalability model. Instead of relying on mining or bulk scrap imports, Renocell builds localized feedstock networks from e-waste, EVs, and magnet scrap. Combined with modular, lower-CAPEX plant designs, this enables faster expansion, reduced operational risk, and the flexibility to scale close to waste generation hubs —something traditional large-scale recyclers struggle to achieve efficiently

Renocell aligns strongly with future-facing sustainability and national priorities. By integrating process innovation, circular economy principles, and ESG alignment, the company is well-positioned to benefit from carbon markets, policy incentives, and global demand for ethical sourcing. In an import-dependent landscape like India, Renocell stands at the intersection of clean technology and resource security, making it both economically and strategically relevant

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Non Ferrous
Scrap Recycling

Aluminium recycling aids rare earth recovery by enabling easier dismantling of alloys and magnet-based systems in EVs and aerospace. It lowers energy use and enhances the overall efficiency of extracting rare earth elements from secondary sources.

“From copper and aluminium to critical minerals.”

Copper recycling supports rare earth recovery by helping separate and concentrate rare earth-containing components from complex systems like e-waste, motors, and EV parts. It improves process efficiency, reduces material loss, and strengthens urban mining for critical minerals.

Innovation & Technology

Renocell's technology is built on an optimized hydrometallurgical process designed by CSIR NML for efficient recovery of rare earth elements from NdFeB magnet scrap, with a focus on high yield, purity, and cost control. The process minimizes chemical consumption and energy usage while maintaining consistent output quality, making it scalable for industrial applications and adaptable to varying scrap compositions.

- Proprietary process optimization for high recovery efficiency (~99.5%)
- Designed for low chemical consumption and zero waste generation
- Modular plant design enabling easy scale-up from pilot to industrial level
- Capability to handle mixed and variable-grade NdFeB scrap
- Integration-ready for oxide to metal conversion within the same ecosystem
- Focus on cost-efficient processing to compete with global benchmarks
- Environmentally aligned process with lower emissions vs primary mining
- future feedstock agnostic like EV motors and wind turbine magnets

The innovation lies in Renocell's approach to vertical integration and process optimization, where recycling is combined with downstream metal production to capture higher value within the supply chain. By developing in-house capabilities and refining process parameters, the company is creating a modular and scalable system that can evolve with future feedstock sources such as EV and renewable energy waste, positioning it as a next-generation urban mining solution.

Operational Excellence

Renocell operates on a zero-waste, high-efficiency model, where every input is processed to maximize recovery and minimize losses. By extracting value from both primary and secondary materials, it improves yields while reducing environmental impact.

The system is modular and easily scalable, using smaller, repeatable units that can be deployed close to waste sources. This enables faster expansion, lower capital risk, and efficient growth without compromising performance.

Process flow

Key stages of our process flow to turn waste NdFeB magnets to RE Oxides

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Mixed Rare Earth Oxide

Mixed rare earth oxide (MREO) is a multi-element oxide blend produced after primary extraction, serving as a key intermediate before individual separation. At Renocell, we deliver 99.5%+ purity MREO, enriched with ~4–5%+ heavy rare earth oxides such as Dysprosium (Dy), Terbium (Tb), and Yttrium (Y)—critical for high-performance permanent magnets. This high-grade composition makes it a premium feedstock for applications in EVs, wind turbines, electronics, and advanced defense systems.

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Individual Rare Earth Oxide

Individual rare earth oxides are high-purity, separated forms of specific elements such as Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy), Terbium (Tb), and Yttrium (Y), each tailored for precise industrial applications. At Renocell, we focus on producing high-purity individual RE oxides (99.5%+ and above), enabling direct use in permanent magnets, batteries, phosphors, and advanced electronics. This level of refinement ensures consistent quality, higher performance, and strong alignment with critical sectors like EVs, wind energy, and defense technologies.

Sustainability Strategy

- Saves 60–90% energy vs primary mining and refining
- Reduces CO_2 emissions by 50–80% through urban mining
- Minimizes water usage and toxic tailings generation
- Enables carbon credit generation from avoided emissions
- Supports EPR compliance for electronics and motor producers
- Ensures ESG alignment with zero-waste and ethical sourcing
- Reduces dependence on environmentally intensive mining operations

Renocell's sustainability strategy is built on a low-carbon, circular model that delivers significant environmental savings compared to traditional mining. Recycling rare earths and associated metals can reduce energy consumption by ~60–90%, cut CO_2 emissions by ~50–80%, and eliminate large-scale land and water damage linked to mining. By recovering critical minerals from waste streams, Renocell not only conserves resources but also creates a cleaner, more efficient supply chain aligned with global sustainability goals.

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Project Timeline Path

Renocell Recycling future roadmap

Company Started

With clear vision we started research on procuring and refining critical metals

Lab and pilot validation

Conducted several lab trials with over 99.5% purity and pilot plant trials is being validated

Commercial scale up

Launch initial commercial facility, secure feedstock via EPR and partnerships, and generate steady revenue.

Modular Expansion

Move into individual rare earth oxide separation and high-value material processing for EV, wind, and defense sectors.

Full vertical Integration

Build an end-to-end critical minerals ecosystem—from waste sourcing to refined material supply—positioning Renocell as a global circular supply chain leader.

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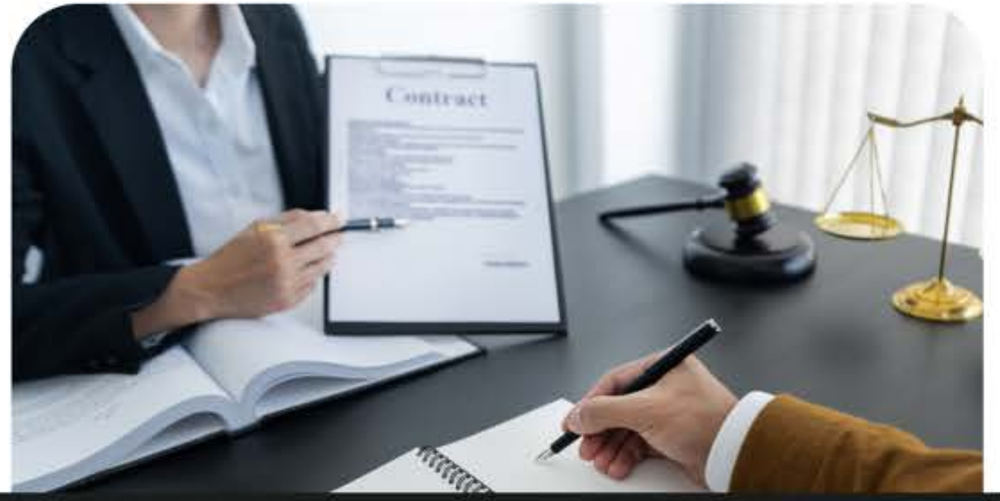
Financials & Investment

Renocell is currently operating at a capacity of ~6 tonnes/month (6,000 kg) of MREO, translating to an estimated ₹1–1.5 crore monthly revenue potential (₹12–18 crore annually) based on prevailing market prices and composition. With a high-efficiency, low-feedstock-cost model, the business can achieve 25–40% EBITDA margins. We have already invested in key assets, process development, and technical know-how, significantly de-risking the venture. We are now seeking strategic investment to scale operations and move into high-value rare earth metal production, unlocking the next phase of growth.

- Revenue potential: ₹1–1.5 Cr/month
- EBITDA margins: 25–40%
- Strong cost advantage via urban mining feedstock
- Capex already deployed in plant, technology, and know-how
- Next phase: capacity expansion + individual oxide separation + metal production
- Value upside: 2–3x increase from oxide to metal stage
- Investment focus: scaling infrastructure and downstream integration

Disclaimer



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