



MEDALLION

Powering the energy transition through innovation in critical materials

June 2023

www.medallionresources.com

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The Company has exclusively licensed patented ligand assisted displacement (“LAD”) chromatography methodologies developed by Purdue University from Purdue Research Foundation (“PRF”) to separate minerals including rare earth elements from all raw material feed stocks excluding coal sources and excluding recycled materials from manufacturing wastes and recyclates from battery and magnet sources. The Company has to achieve certain milestones and make payments to PRF to maintain the license including securing US\$5 million of financing before September 30, 2023. If the Company fails to meet this milestone, PRF may issue notice of default, at which time the Company would have ten business days to cure the default or the license would terminate.

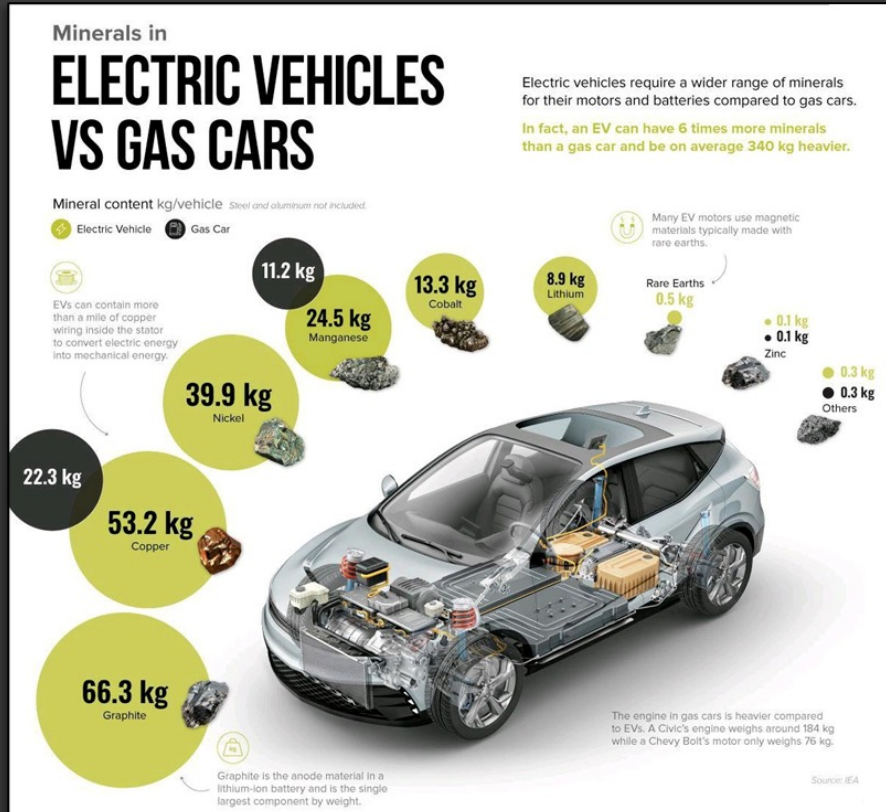
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CRITICAL MATERIALS

A New Strategic Resource in a Carbon Neutral World



- Clean energy transition requires greater volumes of specific raw materials
- EVs require 6 times as much nickel, cobalt, manganese, lithium, rare earth elements as ICE vehicles
- The supply of these *critical materials* will expand significantly to match the surging demand driven by the energy transition
- Automotive, consumer electronics and renewable power generation sectors will be the most hungry for critical materials

ENABLING THE ENERGY TRANSITION

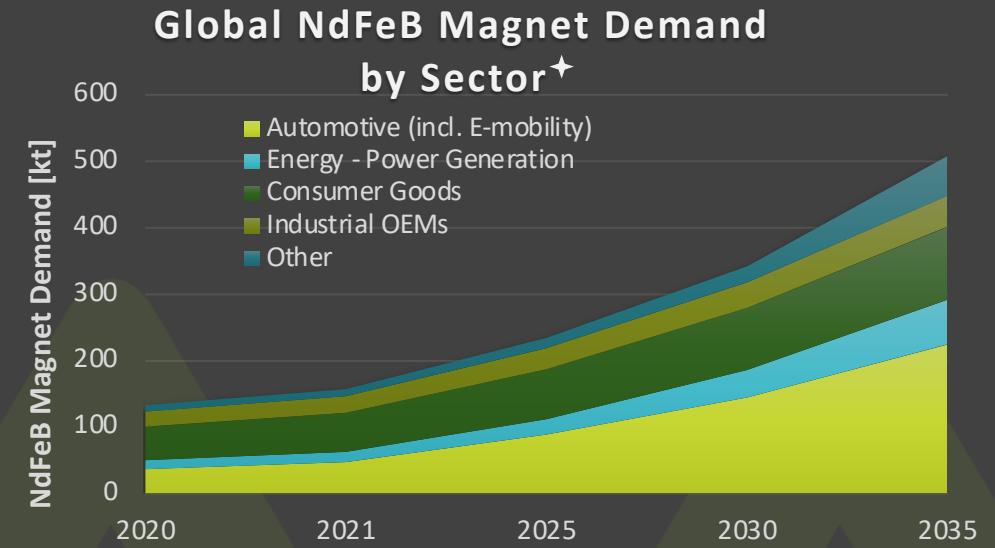
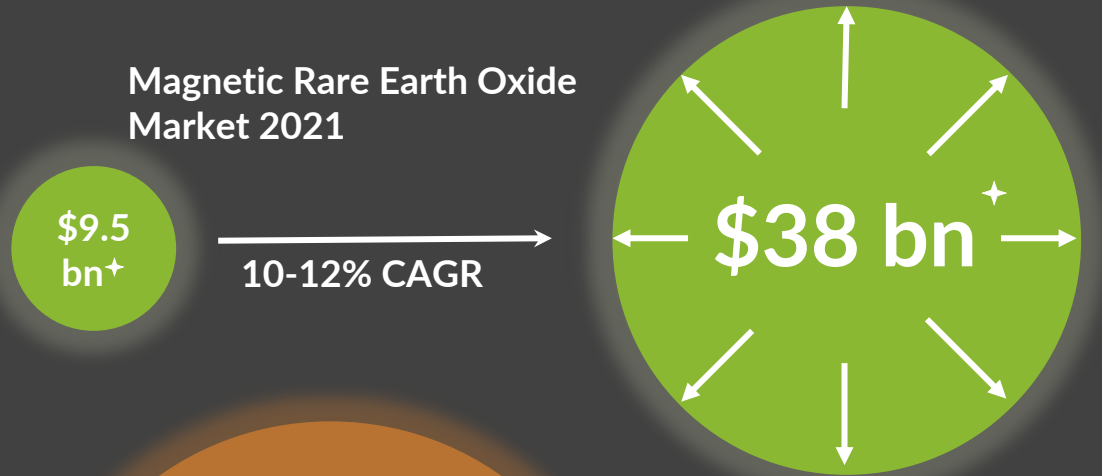
Key market opportunity and immediate Challenge: Rare Earth Elements

- Magnetic Rare Earth Elements in **permanent magnets for electric drives** are critical to the electrification of transport and to satisfy surging demand for electronic devices in an increasingly digital world
- Global Rare Earth Elements (REEs) supply chains suffer from
 - **undersupply**, which will be particularly severe if the forecast growth in EV and, therefore, permanent magnet demand is to be met
 - **concentration**, posing a stark geopolitical risk. In some parts of the supply chain >90% is processed in one country
- Incumbent REE processing technologies outdated and don't conform with acceptable **Environmental Social & Governance (ESG) standards**



MARKET ANALYSIS

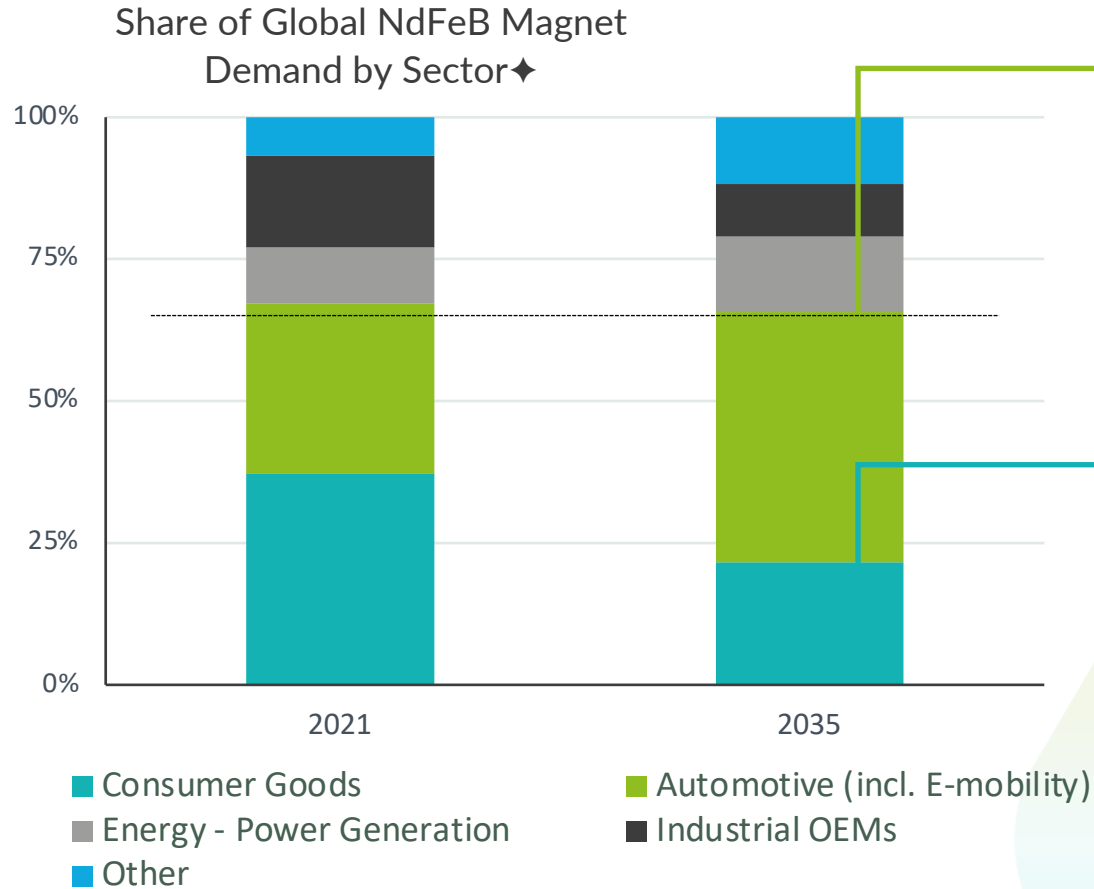
Dynamics



- Niche sector with ample growth potential driven by strong macro trends
- Small market size paired with strategic geopolitical relevance have kept mining majors away
- CAGR is driven by real demand growth and price appreciation
- As REE demand increases - driven by the energy transition - mining majors will take an interest in the REE market, offering optimal exit opportunities for established companies

MARKET ANALYSIS

End Customer segments - I



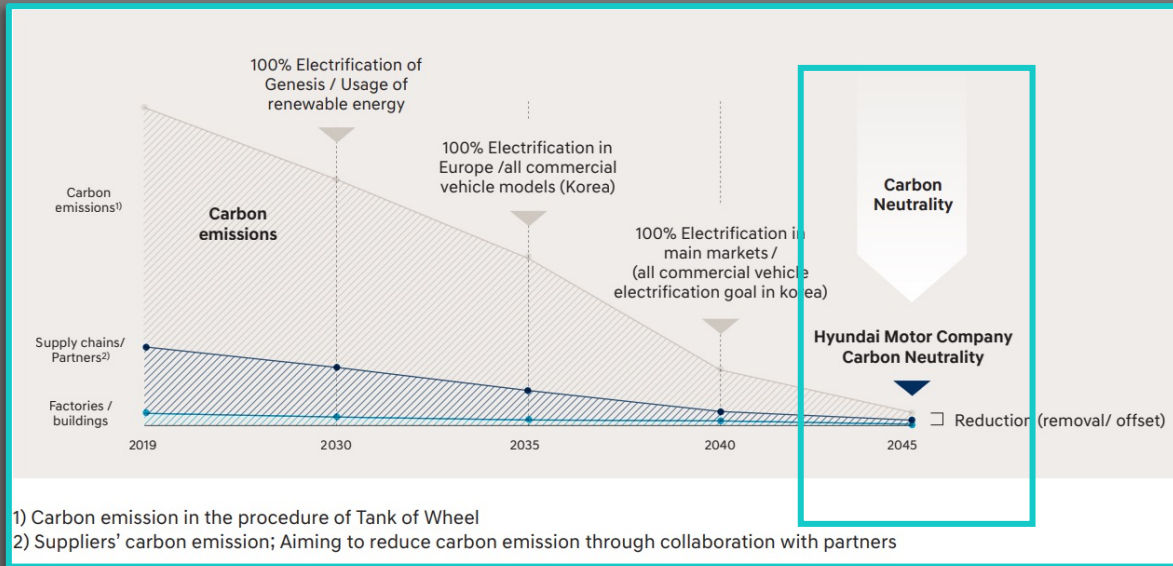
The Automotive and Consumer Goods segments will continue to make up over 65% of the magnetic REE market.

Both market segments are dominated by brands that are increasingly exposed to investor and consumer demands for clear environmental, social and governance (ESG) policies leading fostering the adopting of net zero strategies.



MARKET ANALYSIS

End Customer segments - I



Both market segments are dominated by brands that are increasingly exposed to investor and consumer demands for clear environmental, social and governance (ESG) policies leading fostering the adopting of net zero strategies.

Hyundai has pledged to be carbon neutral by 2045, including supply chains

The Automotive and Consumer Goods segments will continue to make up over 65% of the magnetic REE market.

MARKET ANALYSIS

End Customer segments - II

MERCEDES- BENZ



“The desire for individual mobility keeps growing. Our mission is to meet this need in a sustainable way. Mercedes-Benz has a clear roadmap how to become carbon-neutral. By 2030, we want to reach the half-way mark. In order to make faster progress in protecting the climate we need maximum dedication and more collaboration among governments, companies and society as a whole.”



Ola Källenius

Chairman of the Board of Management of Mercedes-Benz Group AG

With our Ambition 2039 we put a stake into the ground

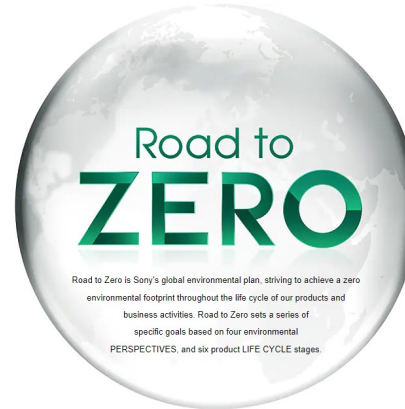
2039

Our goal: carbon neutrality



SONY

SONY



Road to Zero is Sony's global environmental plan, striving to achieve a zero environmental footprint throughout the life cycle of our products and business activities. Road to Zero sets a series of specific goals based on four environmental PERSPECTIVES, and six product LIFE CYCLE stages.

PERSPECTIVES × LIFE CYCLE



Toward zero-emission products

We reduce greenhouse gas emissions not just in operations but also throughout product life cycles. We aim to provide environmentally conscious products and services, and our workplace programs save energy and promote renewable energy. We engage our supply chain partners to share our commitment to curbing emissions.

APPLE



Behind every Apple product is a plan for the future.

Our goal of making products with net zero carbon impact by 2030 goes hand in hand with our commitment to those most affected by climate change — and to global communities that are finding solutions and taking inclusive action to fight it.

Low-carbon design

We're designing carbon impact out of our products by increasing recycled content, using material more efficiently and reducing the amount of energy they use.



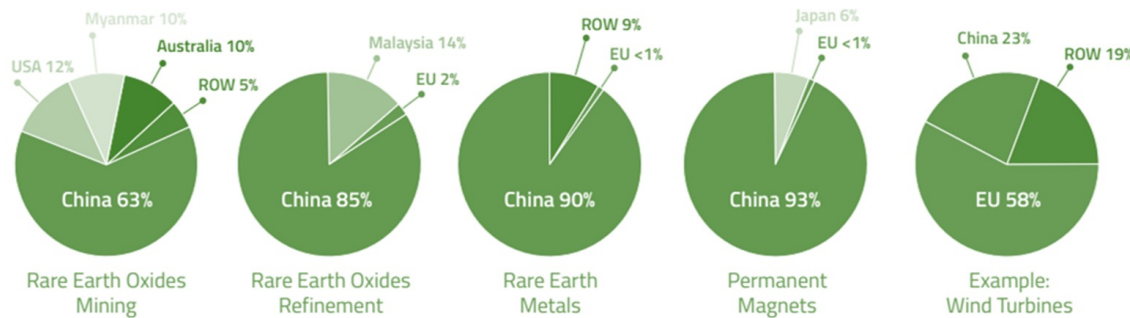
It will no longer be enough to supply Rare Earth Elements at the lowest cost. Brands will in future pay a premium for critical materials sourced in an environmentally and socially responsible way.



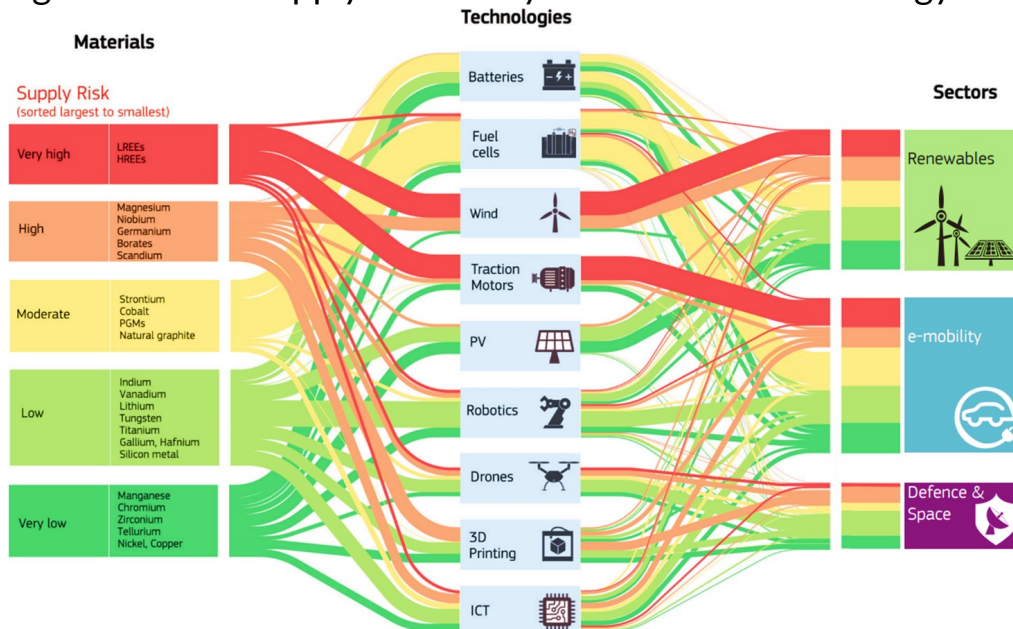
MARKET ANALYSIS

REE Supply Chain Risk and Onshoring Opportunity

A single country dominates the entire supply chain for permanent (neo) magnets:



Posing an extreme supply risk to key industries for the energy transition:



Geopolitically, security of supply-mandated *onshoring* requires processing technologies that deliver the necessary REE quantities at the right product specification

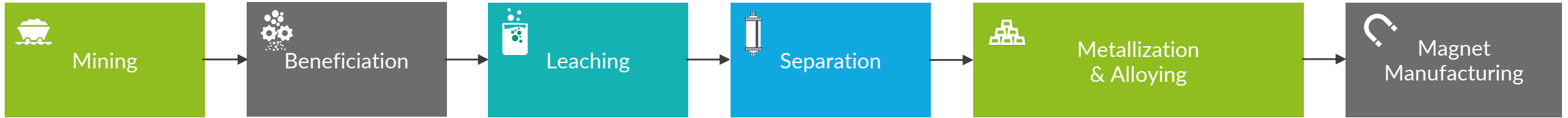
However, the technologies that were offshored during Industrial Globalisation over the last 30 years are not suitable to meet increasing ESG requirements from OEMs and their investors

Meeting ESG *insetting* requirements from end customers in the automotive and consumer electronics sectors will require innovative technologies addressing a 30-year technology development gap to deliver on CO2 emissions and wider environmental impact reductions (e.g. water consumption)

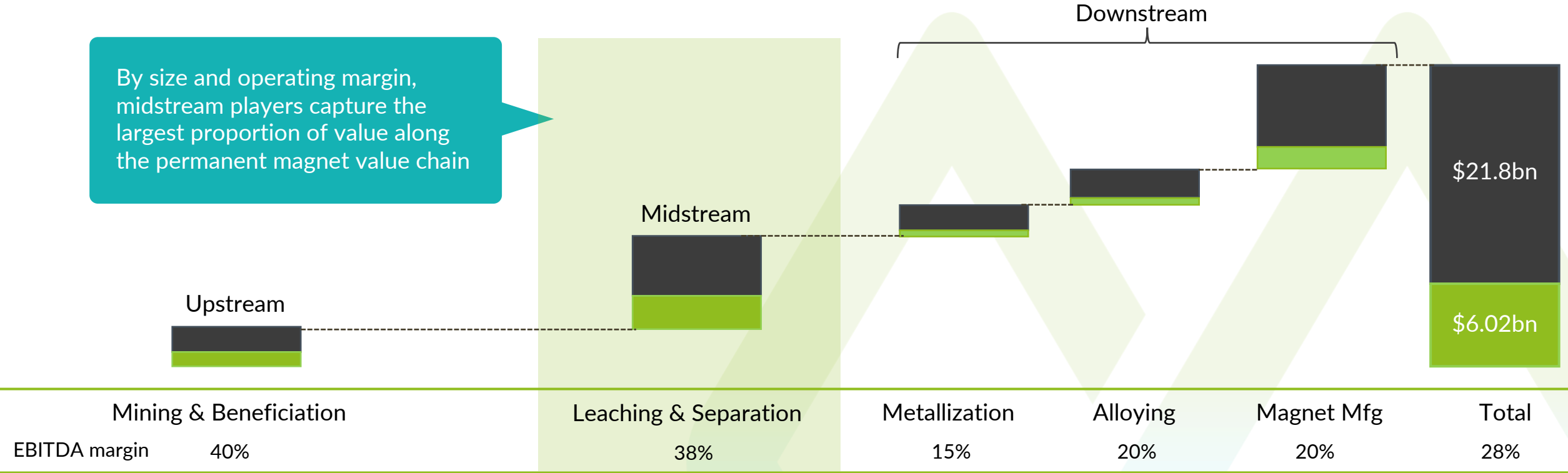


MAGNET REE VALUE CHAIN

NdFeB Magnet Market Size and Value Chain Profitability Analysis



By size and operating margin, midstream players capture the largest proportion of value along the permanent magnet value chain



UNMET NEED

- Structural increase in demand for electric motors and generators across the automotive, renewable power and consumer electronics sector will require magnetic rare earths for permanent magnets
- Security of supply – strong geopolitical need to diversify the supply chain
- Innovative technologies are required
 - improve economics and efficiency of recovery of materials
 - meet increasing ESG requirements from end customers, OEMs and their investors
 - enable the processing of by-products/ tailings to reduce additional mining



MEDALLION'S INVESTMENT THESIS

- **Structural increase in demand** for permanent magnets will fuel magnetic rare earths market growth
- **Strategic geopolitical value of REEs paired with supply chain resilience** considerations will require the emergence of an REE industry in developed economies
- **Corporate ESG targets will require the development of novel technologies** that reduce the environmental and social impact of incumbent processes
- The confluence of
 - high operating margins
 - relative lack of competition/global market participants and
 - a gap in sustainable technology

make the Midstream the most attractive entry point in the REE value chain.

MEDALLION'S INITIAL FOCUS

Disrupt midstream REE market through innovative separation technology and strategic upstream partnerships



VISION

A paradigm shift in the availability and security of supply of critical materials to accelerate the global energy transition

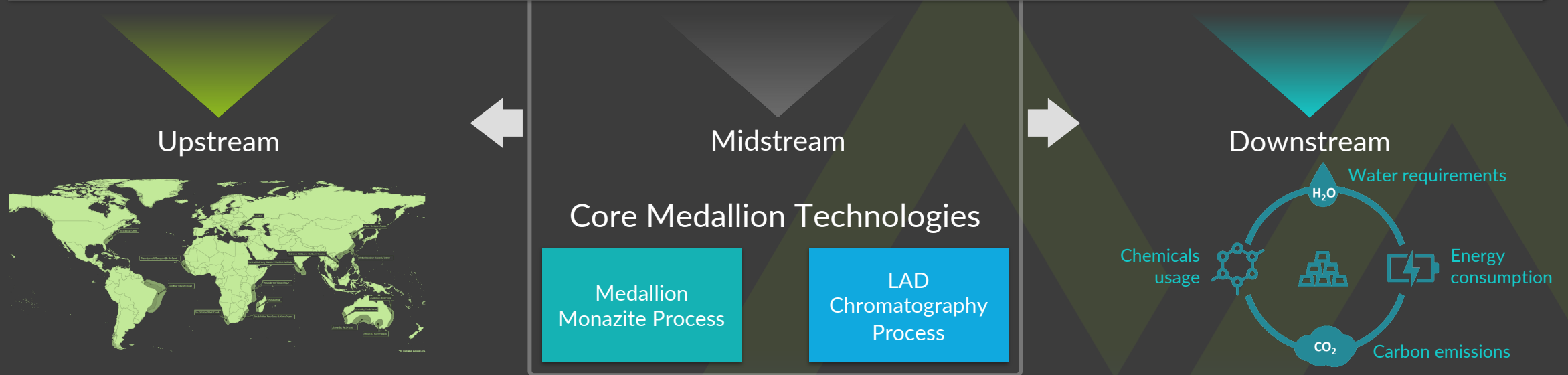
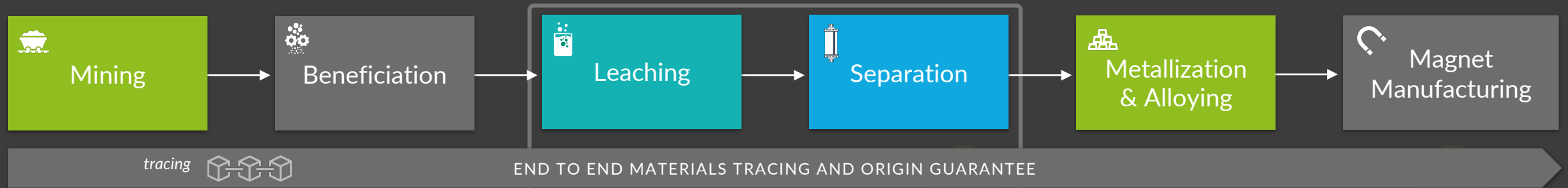
MISSION

To become the global platform providing the world economies with critical materials for the energy transition ensuring security of supply with minimal environmental impact



MEDALLION – OUR LONG-TERM STRATEGY

Partnership- and technology driven value chain integration enabled by our core technologies



A global execution engine to source, develop and operate economically viable primary and secondary resources for monazite and other REE-rich feedstocks, enabling end-to-end traceability of the REE supply

A separation platform refine magnetic rare earth oxides from primary and secondary resources for monazite and other REE-rich feedstocks

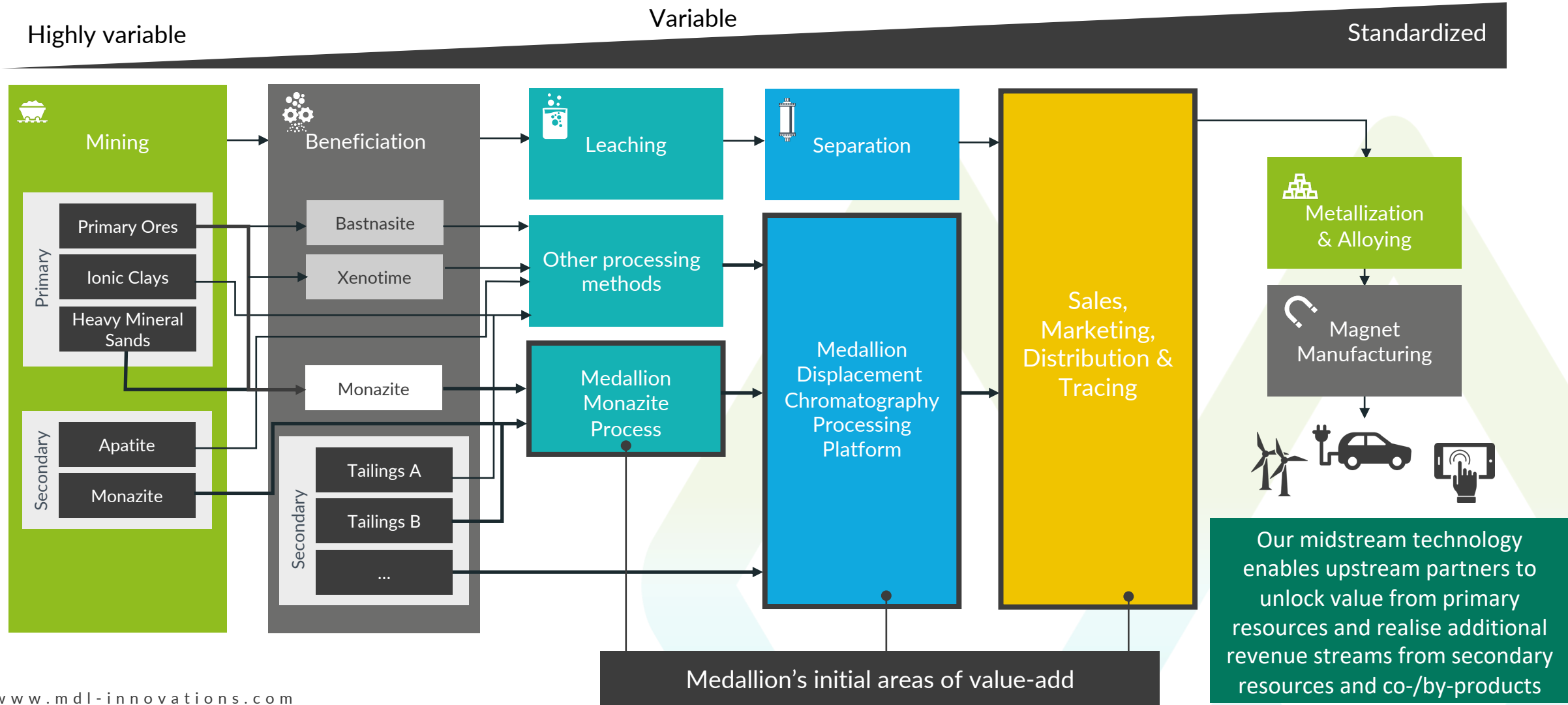
Partner ecosystem & technology portfolio to produce refined REOs and alloys matching the requirements for volume, product specification and key ESG indicators of the automotive, renewable power and consumer electronics sector



MEDALLION – OUR INITIAL FOCUS AND CONTRIBUTION

Integration of midstream refining technologies enabling access to multiple feedstocks

PRODUCT CHARACTERIZATION



PATH TO VALUE CREATION

- **REO separation with LAD chromatography technology platform as Core Business**
 - Focused on the highest margin part of the "mine-to-magnet" supply chain
 - Scalable and Replicable – objective to establish refining platform with multiple refineries (based on the same technology) with multiple sources of feedstock in strategic geographical areas
 - Cash-flow from operation of proprietary refining assets
- **Upstream Enablement**
 - Leverage MMP to secure long-term feedstock supply agreements
 - Superior processing technology enhances upstream viability, creating opportunity to expand and develop otherwise marginal projects
 - MDL secures life-of-mine feedstock supply
 - MDL benefits through equity participation, technical milestone payments and life-of-mine royalties – e.g. ACDC Metals
 - Enhanced industry-wide understanding supporting our platform model (unlike a strictly mine-to-magnet vertically integrated model)
- **Offtake agreements**

Medallion's business model is designed to create several sources of value including long-term cash flow and near-term asset appreciation.



THE MEDALLION TEAM

We have assembled a team seeking to build a Matrix of capabilities to exploit the opportunity space at pace. Medallion's executives bring in

- Breadth and depth of knowledge with over 75 years of experience in the sector
- A strong network in the up- & mid-stream REE market and research & development ecosystems
- Combined 40 years in technology development with strong track record in commercialization of novel technologies
- Extensive experience across cracking and separation



Alfredo Ramos, CEO

More than 20 years' experience in the development and commercialization of innovative digital technologies supporting design, engineering and operation of industrial assets. Extensive experience in R&D, engineering, and operational roles. MSc in chemical engineering from RWTH Aachen and MBA with distinction from London Business School.



Kurt Forrester, CTO

Nearly 20 years' experience in metals and minerals processing and technology development including rare earths and other critical minerals. BEng(Chemical) (first class) and PhD in Engineering from University of Sydney, Chartered Chemical Engineer and Chartered Professional Metallurgist.



Douglas Newby, CFO

40 years' experience in finance, financial management, project evaluation and implementation with extensive experience in rare earths and other critical minerals. Managed transitions to US exchanges and implementation of SOX. BSc (honours) in mathematics from King's College London.



Mark Saxon, VP Business Development

More than 25 years' experience in mineral development focused on rare earths and other critical minerals. Formerly President and CEO of Medallion, and previously President and CEO of Leading Edge Materials. BSc (honours) in geology from University of Melbourne, and Diploma of Applied Finance.

TECHNOLOGY CHALLENGE

■ Objectives

- improve economics and efficiency of recovery of materials
- meet increasing ESG requirements from end customers, OEMs and their investors
- enable the processing of by-products/ tailings to minimize additional mining

■ Incumbent Technology – Solvent Extraction

- liquid-liquid separation – uses hundreds of mixer-settlers to separate individual REOs
- uses organic solvents with large carbon footprint
- difficult to calibrate and inflexible operation
- long process time with large work-in-progress inventory

■ Alternatives

- chromatography (liquid-solid separation) – widely used in sugar refining, water treatment, and pharmaceutical industries
- conventional elution chromatography uses multiple separation phases that dilute solutions
- Medallion identified displacement chromatography as preferred alternative – displacement chromatography targets specific elements



MEDALLION SOLUTION

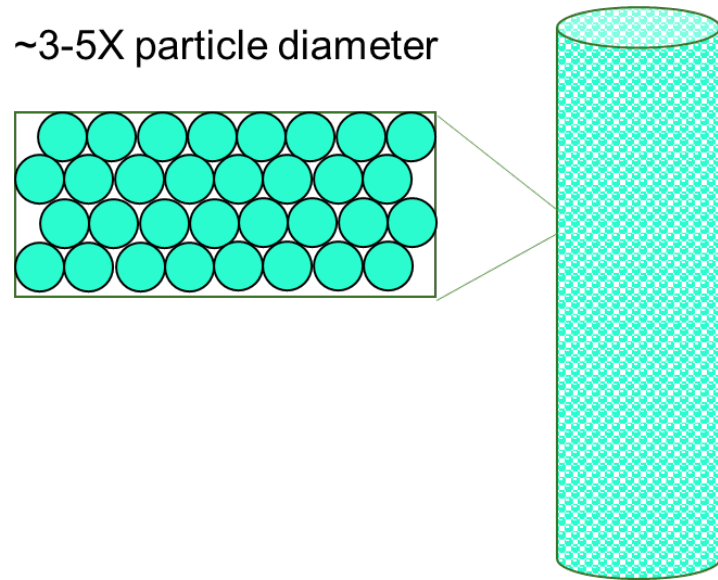
- Medallion team has broad and deep industry expertise
- Patented LAD chromatography licensed from Purdue University offers significant advantages with respect to traditional solvent extraction and elution chromatography
 - Transferable to different REE concentrates
 - Adaptable to changes in feedstock composition
 - No organic solvents
 - Rapid processing time – reduced inventory
 - Highly efficient with a smaller footprint
 - Easy to scale (modular and dimensional)



ADVANTAGES OF DISPLACEMENT CHROMATOGRAPHY

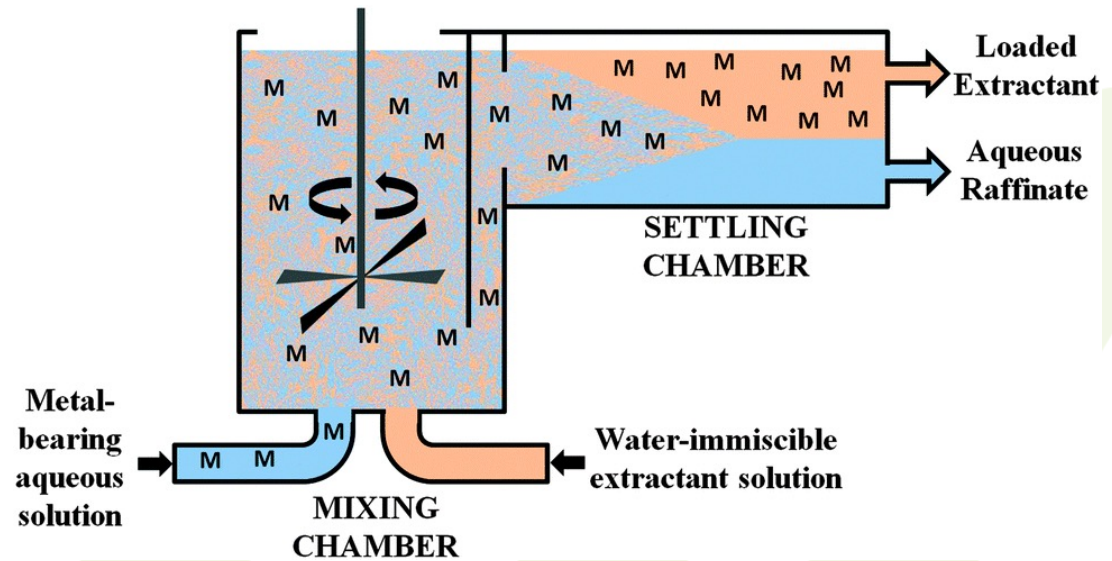
Ligand-Assisted Displacement (LAD) Chromatography Compared with Solvent Extraction

Displacement Chromatography



500 thermodynamic equilibrium stages in 1 m

Solvent Extraction (incumbent technology)



1 thermodynamic equilibrium stage

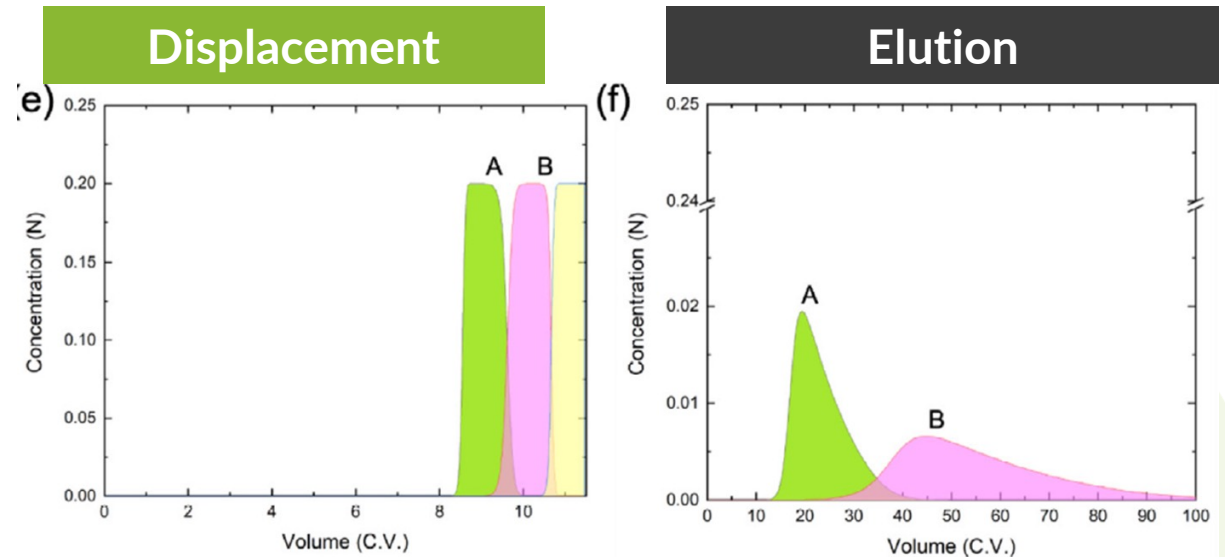
Medallion has exclusively licensed patented displacement chromatography methodologies, developed by Purdue University, from Purdue Research Foundation to separate minerals including rare earth elements from all raw material feed stocks excluding coal sources and excluding recycled materials from manufacturing wastes and recyclates from battery and magnets sources.



ADVANTAGES OF DISPLACEMENT CHROMATOGRAPHY

LAD Chromatography Compared with Elution Chromatography

- LAD targets specific elements whereas elution chromatography requires multiple separation steps
- LAD concentrates solutions, whereas elution chromatography dilutes the solution
 - increased productivity (per column)
 - reduced solvent consumption



	Displacement	Elution
Yield	Same	Same
Purity	Same	Same
Product concentration	Conc. (>10X)	Diluted
Productivity	2.66	1
Solvent demand	0.105	1

SUMMARY

- Targeting the fast-growing Magnetic Rare Earth Oxide market, forecast to hit US\$38 bn in 2035
- Focused on Rare Earth refining segment capturing ~40% of Total Mine-to-Magnet EBITDA in 2021
- We expect Medallion's feedstock-agnostic separation technology platform will enable us to process multiple resources
- Leadership team with proven combination of technical and commercial expertise and deep understanding of the Rare Earth supply chain





MEDALLION



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