

# ionic rare earths

ASX: IXR | FSE: 6UH

## Sustainably Sourcing Magnet and Heavy Rare Earths for the New Economy

Paydirt Battery Minerals Conference

16 April 2024



# Cautionary Statement

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### Competent Person Statement

Information in this report that relates to previously reported Exploration Targets and Exploration Results has been cross-referenced in this report to the date that it was originally reported to ASX. Ionic Rare Earths Limited confirms that it is not aware of any new information or data that materially affects information included in the relevant market announcements.

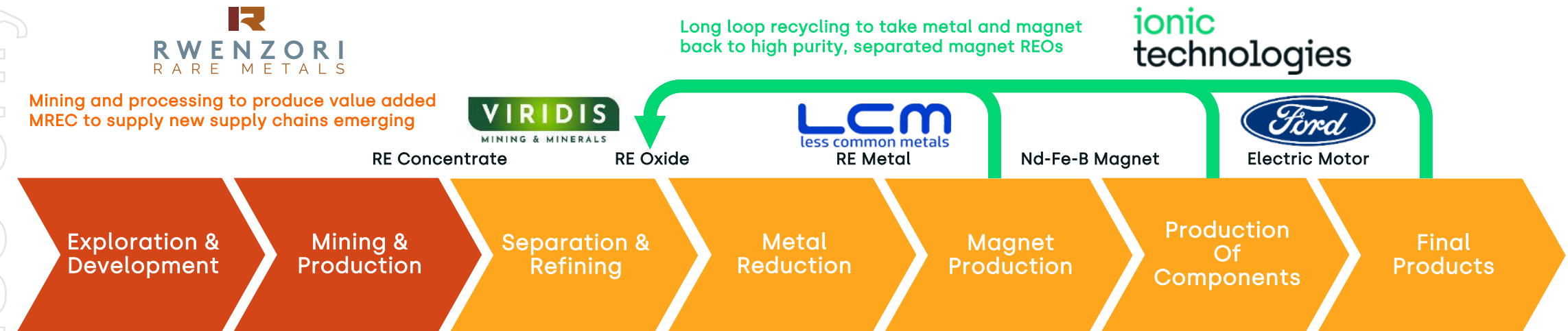
The information in this report that relates to Mineral Resources for the Makuutu Rare Earths deposit was first released to the ASX on 3 May 2022 and is available to view on [www.asx.com.au](http://www.asx.com.au). Ionic Rare Earths Limited confirms that it is not aware of any new information or data that materially affects information included in the relevant market announcement, and that all material assumptions and technical parameters underpinning the estimates in the announcement continue to apply and have not materially changed.

The information in this report that relates to Ore Reserves for the Makuutu Rare Earths deposit was first released to the ASX on 20 March 2023 and is available to view on [www.asx.com.au](http://www.asx.com.au). Ionic Rare Earths Limited confirms that it is not aware of any new information or data that materially affects information included in the relevant market announcement, and that all material assumptions and technical parameters underpinning the estimates in the announcement continue to apply and have not materially changed.

The information in this report that relates to Production Targets or forecast financial information derived from production the production target for the Makuutu Rare Earths deposit was first released to the ASX on 20 March 2023 and is available to view on [www.asx.com.au](http://www.asx.com.au). Ionic Rare Earths Limited confirms that all material assumptions and technical parameters underpinning the Production Targets or forecast financial estimates in the announcement continue to apply and have not materially changed.

# REE Supply Chain and IonicRE Integration

IONICRE ADDING PRIMARY AND SECONDARY SOURCED CAPACITY TO BECOME INTEGRATED IN FUTURE RARE EARTH SUPPLY CHAINS



## Makuutu Rare Earths Project (60% IonicRE → 94% IonicRE in H2 2024)

- Low capital, modular development IAC enables IonicRE to bring on highly sought-after, value added MREC basket of magnet and heavy REEs
- Mining Licence LML00334 Awarded
- Demonstration Plant producing MREC now, with immediate demand for product – offtake negotiations underway
- Expandable asset through free cash flow and growing market demand

## IonicRE/ VMM Refinery

- 50/50 JV with Viridis Mining & Minerals Ltd (ASX: VMM) to develop refining and recycling footprint in Brazil
- Leveraging Ionic Technologies IP to be an early mover and first step towards establishing greater presence in emerging Brazilian rare earth market
- IXR is a 4.5% shareholder in VMM

## Magnet Recycling (100% IonicRE)

- Low capital development to recycle spent magnets and swarf to produce separated and refined 99.9%+ REOs
- Demonstration Plant operating 24/7 - Magnet REO production now (Nd, Pr, Dy and Tb)
- Addressing domestic supply chain / sovereign capability need with global opportunities, focus on EU and US
- Likely first to revenue, supply independent of mine permitting
- Several JVs and partnerships on the table

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## ionic technologies

Leading Magnet  
Recycling and the  
Circular Economy  
of Rare Earths

Belfast now first  
producer of recycled  
magnet REOs in  
Western world

# Recycling Neodymium Permanent [NdFeB] Magnets

Commercialising ex-China rare earth separation, refining and recycling

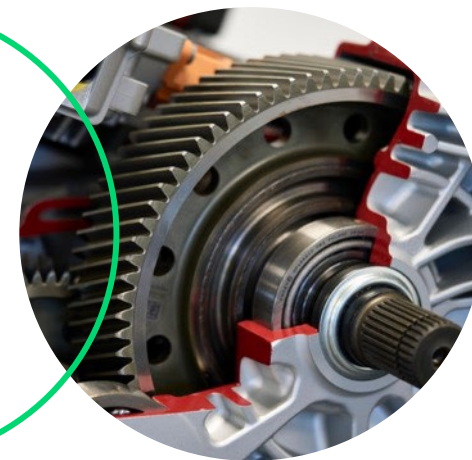


Mixed grades of waste permanent magnets and swarf from existing metal, alloy and magnet manufacturing



100% recycled separated high purity (>99.5%) grade magnet rare earth oxides

- ✓  $\text{Nd}_2\text{O}_3$
- ✓  $\text{Pr}_6\text{O}_{11}$
- ✓  $(\text{NdPr})_2\text{O}_3$
- ✓  $\text{Dy}_2\text{O}_3$
- ✓  $\text{Tb}_4\text{O}_7$
- ✓  $\text{Ho}_2\text{O}_3$



High spec permanent magnets for net zero carbon technologies such as EV motors and off-shore wind turbines

# About Ionic Technologies

Ionic Technologies has developed separation and refining technology that can be applied to the recycling and refining of individual magnet rare earths from used permanent (NdFeB) magnets.

Our hydrometallurgical process is able to deliver high purity separated magnet rare earth oxides, independent of variability in composition of magnet feedstock.

Ionic Technologies is 100% owned by Australian rare earth resources company **Ionic Rare Earths Limited** (ASX: IXR).

## Intake flexibility

Unlike other recycling processes, our technology can recycle any form of mixed waste magnets and production swarf regardless of type, age or coatings. We are not reliant on a single feedstock stream.



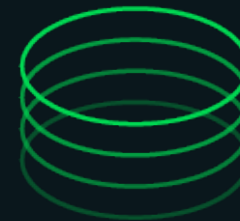
Magnet crushing  
/ grinding



Digestion



Separate base  
metals (Fe, Mn,  
Al, Ni, Cu, B)



Nd, Pr, Dy, Tb  
solvent separation  
(15 stages)



Individual oxides  
precipitation

# Strategic Location Belfast Harbour

Ionic Technologies is strategically located within the Belfast Harbour Estate, which is the **UK's largest single port estate** comprising 2,000 acres.

## Dual Market Access

- **UK** - Windsor Framework and Critical Minerals Strategy and Refresh
- **EU** - Critical Minerals Act, and Shared Island Fund

## USA

Atlantic Declaration  
US Directives on supply chains,  
£5bn potential US funding

### Renewable Hub

Belfast Harbour is home to many world-class companies who play a key role in the global renewable energy sectors.

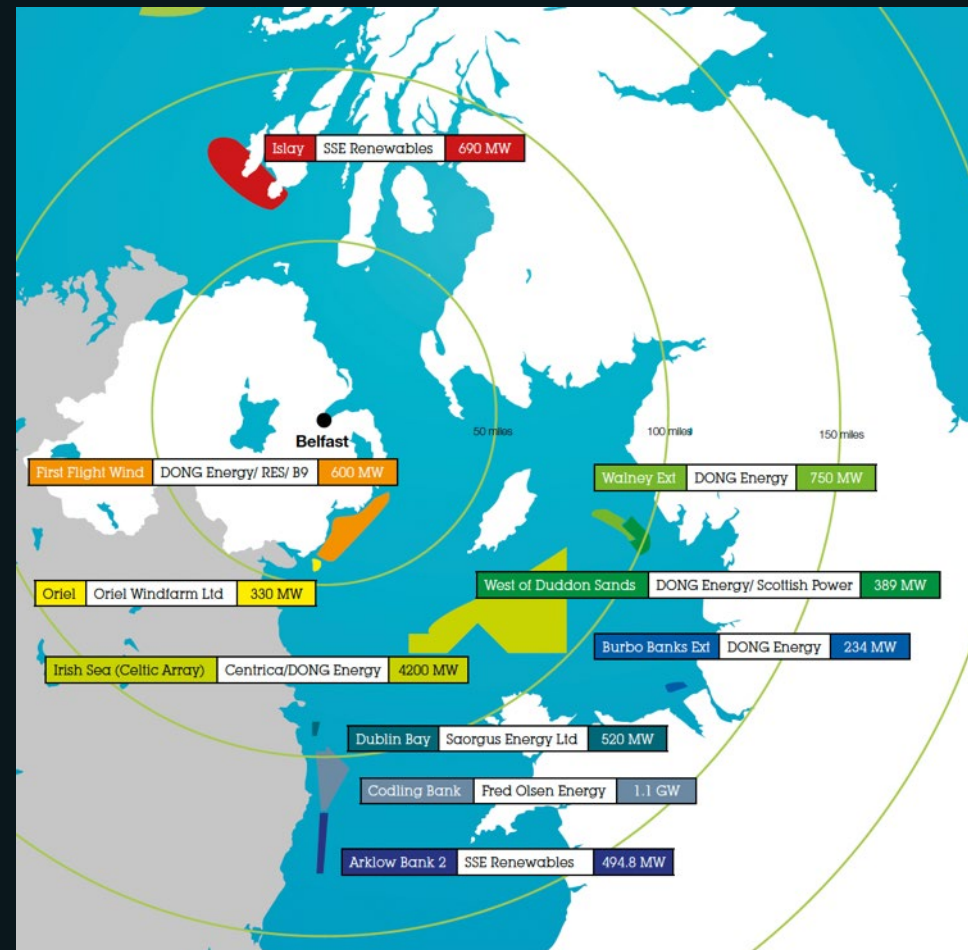
### #1 Port in UK

Belfast Harbour is home to the UK's number one port for offshore wind.



### Infrastructure

Belfast Harbour has unrivalled port infrastructure encompassing the UK's first offshore wind terminal.



# Strategic Location

## Belfast Harbour



# Our Path to Commercialisation

Rapid acceleration of our technology ready to scale globally



# European Critical Raw Materials Act (CRMA) – “The Race is On!”

EUROPEAN COMMISSION'S CRITICAL RAW MATERIAL ACT TO UTILISE GLOBAL GATEWAY INSTRUMENT, A €300 BILLION INITIATIVE AIMED AT COUNTERING THE CHINESE BELT AND ROAD INITIATIVE

- The Act identifies a list of **strategic raw materials** crucial to Europe's green and digital ambitions and for defence and space applications – while being subject to potential supply risks in the future.
- The Regulation sets clear benchmarks for domestic capacities along the **strategic raw material supply chain** and to diversify EU supply by 2030:



At least **10%** of the EU's annual consumption for extraction



At least **40%** of the EU's annual consumption for processing



At least **25%** of the EU's annual consumption from recycling



Not more than **65%** of the Union's annual consumption of each strategic raw material at any relevant stage of processing from a single third country

- On Monday 13 November 2023, the co-legislators reached a political agreement on the EU CRMA and **increased the recycling component from 15% to 25%**

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Makuutu Rare Earths Project

Now producing magnet and heavy  
rare earths from Demonstration Plant



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## Makuutu – Delivers first MREC Product

- Demonstration Plant producing first MREC in Q1 2024 in Uganda for offtake negotiations to de-risk Makuutu ahead of Final Investment Decision
- Update MRE expected Q2 2024 to include upgraded classification on RL 00007 to support next MLA area (Nov 2024)
- Makuutu Strategic Partnering
- Final Investment Decision planned Q4 2024



# The Makuutu Rare Earths Project (60% IonicRE)

## PRIMARY MAGNET AND HEAVY RARE EARTHS FOR THE NEW ECONOMY

- Large scale Ionic Adsorption Clay (IAC) project with 71% magnet plus heavy REO basket
- IonicRE owns 60% of the asset through local Ugandan entity Rwenzori Rare Metals Ltd → IonicRE agreed with partners to increase Project stake to 94% through script deal announced late 2023
- 300 km<sup>2</sup> of mineral tenements, covering IAC mineralisation trend 37km long
- Excellent infrastructure already installed
- Mineral Resource Estimate and stage 1 Ore Reserve Estimates completed
- Environmental Permits approved, ESG Certified by Digbee ESG™, upgraded from BB to BBB in early 2024
- Stage 1 Feasibility Study Completed
- Mining Licence 00334 approved January 2024
- Demonstration Plant producing MREC March 2024



# Makuutu Stage 1 Feasibility Study

## BASE CASE LAYS FOUNDATION, EXTENSION OF LIFE POTENTIAL

- Large Scale Mining Licence LML00334 awarded in January 2024;
- Stage 1 production of a value-added mixed rare earth carbonate (MREC) product (including Scandium), via a modular heap desorption processing plant, amounts to a total Capital Expenditure (CAPEX) of US\$121 million;
- Stage 1 plant capacity is 5.0 million tonnes per annum (Mtpa) Run of Mine (ROM) throughput;
- Maiden Ore Reserve for the Makuutu Stage 1 over RL 1693 classified as a Probable 172.9 Mt at 848 ppm TREO, or 584 ppm TREO – CeO<sub>2</sub>, and 30 ppm Sc<sub>2</sub>O<sub>3</sub>; and
- Further staged development at Makuutu with additional tenements.

## Stage 1 DFS Metrics

Stage 1 Life  
**35 Years**

Post-Tax Free  
Cash Flow  
**US\$1.02 billion**

EBITDA  
**US\$1.28 billion**

Pre-Tax Net  
Present Value (8)  
**US\$406 million**

Product Basket  
(magnet + heavy)  
**71%**

Pre-Production  
CAPEX  
**US\$120.8 million**

IRR (Post-Tax)  
**32.7%**

## Brazilian Joint Venture – Refining and Recycling

- IonicRE and Viridis Mining and Minerals Ltd (ASX: VMM) announced 50/50 JV on 3 April 2024
- JV aims to construct a refinery and magnet recycling facility in Brazil utilising Ionic Technologies' separation technology
- Viridis' Colossus Rare Earth Project ("Colossus"), located in Poços de Caldas, Brazil, is potentially a major high grade IAC deposit
- Viridis agrees to supply mixed rare earth carbonate (MREC) processed from the Colossus Project on standard market terms; no offtake as yet
- IonicRE will supply separation technology expertise to ensure successful commercial operation for the JV
- Ongoing discussions with Brazilian government agencies for accelerated approvals process, leveraging access to government funding support
- JV cements IonicRE as an industry first leader on a path to REE production and supply
- Scoping Study for the Refinery and Recycling project, targeted for completion by Q4 2024

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50%



50%

### JV Company

- Magnet and Heavy Rare Earth Refinery
- Magnet Recycling Facility
- Further integration into Brazilian RE footprint



# Board and Leadership Team



**Brett Lynch**  
**Executive Chairman**

A highly experienced international company director and executive with over 30 years experience, a strong background in mining and mining-related businesses across Australia, Asia and North America and a proven track record in advancing shareholder value.



**Tim Harrison**  
**Managing Director / CEO**

A mining executive with over 20 years' experience and an extensive and successful track record specialising in the fields of both mineral processing and hydrometallurgy across multiple commodities across Australia, Africa and Asia.



**Max McGarvie**  
**Non-Executive Director**

A distinguished and extensive career spanning 45 years in the mining sector covering broad range of senior roles ranging from Production Manager, Registered Mine Manager through to CEO across the globe in Australia, Africa and the Middle East.



**Sufian Ahmad**  
**Non-Executive Director**

A highly experienced legal, business and marketing executive with over 10 years' experience in the resource sector in the provision of corporate advisory services. A founder of Sixty Two Capital, an advisory firm specialising in the growth and funding of emerging ASX companies.



**Nitin Tyagi**  
**Non-Executive Director**

A highly experienced supply chain executive from the automotive and technology sectors with a career working for the world's biggest corporations such as Apple, CREE, Rivian Automotive. Mr Tyagi is the co-inventor of 12 US patents and VP of supply chain at US-based battery company Our Next Energy (ONE).



**Lynden Polonsky**  
**Chief Development Officer**

A mining executive with over 20 years' experience in the finance industry. He has experience with mine development and portfolio optimisation, merger, acquisition, divestment and capital markets advice across a range of industries and sectors including natural resources, infrastructure and renewable energy.



**Tommie van der Walt**  
**Chief Operating Officer**

A mining executive with over 20 years and a proven track-record in mining project development and a deep understanding of project delivery in Africa. His key focus is to oversee all aspects of the Makuutu Rare Earths Project, which will include further growth strategies for the mine.



**Mark Licciardo**  
**Company Secretary**

A corporate executive with 40 years experience working with Boards of ASX listed companies in the areas of corporate governance, accounting and finance and company secretarial practice and executive roles in banking and finance, funds management, investment and infrastructure development.

# Corporate Snapshot

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Share Price	Market Capitalisation	Shares on Issue	Various Options / Performance Rights	Cash Position	12-month Range (min – max)
\$0.019	\$84m	4,446,685,724	190,7000,000	A\$4.5m	A\$0.016–A\$0.034
15 April 2024	15 April 2024	15 April 2024	Exercisable at 3.15 to 6.4 cents	31 December 2023	

Ionic Rare Earths (ASX: IXR) Price / Volume Chart



## IonicRE Value Proposition

- Direct exposure to heavy rare earths market growth
- Ionic Technologies → producing now and providing entry into a circular economy for magnet REOs, with partnerships announced, and more to come
- Low capital, development options ready access to magnet and heavy REOs
- Strategic importance as one of the few ex-China supply options
- Geopolitical tensions driving demand for secure and resilient alternative supply
- Downstream refining potential to unlock value of the Makuutu basket

*"With current global heavy rare earth oxide production increasing just marginally each year and the outlook for Myanmar (miner of 40% of the world's dysprosium and terbium) uncertain, heavy rare earth elements remain a massively under-addressed blind spot in the automotive supply chain."*

*"By 2035, Adamas projects the global rare earth market will be short more than one China's worth of NdPr oxide supply, and over five China's worth of Dy and Tb oxide supply, annually (referring to China's 2022 production levels) should supply not increase substantially more than what is currently anticipated."*

**Adamas Intelligence, 2022**

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