

Seren Technologies Acquisition and Outlook for 2022

IonicRE Shareholder Webinar

Cautionary Statement



Important Notice and Disclaimer

This presentation should be considered in its entirety. If you do not understand the material contained in this presentation, you should consult your professional advisors. The sole purpose of this presentation is to provide shareholders with an update on current activities of the Company and the current state of exploration at the Makuutu Rare Earths Project in the Uganda.

Any statements which may be considered forward looking statements relate only to the date of this presentation document. Such forward looking statements involve known and unknown risks, uncertainties and other important factors beyond the Company's control that could cause actual results, performance or achievements of the Company to be materially different from future results, performance, or achievements expressed or implied by such forward looking statements. As a result of these factors, the events described in the forward-looking statements in this document may not occur.

Notwithstanding the material in this presentation, shareholders should consider that any investment in the Company is highly speculative and should consult their professional advisers – whether scientific, business, financial or legal – before deciding whether to make any investment in the Company.

The Company may at its absolute discretion, but without being under any obligation to do so, update, amend or supplement this presentation or any other information to the recipient. No person has been authorised to give any information or make any representation other than contained in this document and if given or made, such information or representation must not be relied on as having been so authorised.

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 March 2021 and is available to view on 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 Scoping Study results and production targets was first released to the ASX on 29 April 2021 and is available to view on 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 Time is Now

DEVELOPING A SECURE, TRACEABLE, CRITICAL AND HEAVY RARE EARTH SUPPLY CHAIN TO FACILITATE CARBON NEUTRALITY



The Mine – Makuutu

Multi-generational CREO and HREO supply potential from Makuutu, one of **very few global ionic adsorption clay (IAC) deposits**

Simple mining and low capex processing to produce Mixed Rare Earth Carbonate (MREC)

No radionuclides

Progressing towards MLA in 2022



The Refinery to Magnets

Maximise value of unique basket → downstream study expanding through full REE value chain

Alternative CREO / HREO refiner targeting western markets

Development of secure and traceable REO supply chain

Incorporation of NdFeB magnet recycling



The Basket – High Margin

One of the **highest value REO baskets of all projects** in evaluation today

43% magnet REOs

44% Heavy REOs

93% of forecast value derived from magnet REOs plus Y

Major future source of **Scandium** production



Increasing Demand, Reducing Supply – Becoming Urgent

World accelerating to carbon neutrality, with 8-fold demand increase in both EVs and offshore wind turbine forecast by 2030

ESG drive globally to **source sustainable critical raw materials**

Limited future HREO supply from declining reserves of IACs in southern China

Sustainable Rare Earth Supply Chain

ENVIRONMENT, SOCIAL AND GOVERNANCE (ESG) FOUNDATION LAID AT MAKUUTU

- Environmental and Social Impact Assessment (ESIA) draft submitted in Uganda
- Focus on carbon footprint reduction using renewable power
- Water treatment for reagent recovery and rehabilitation strategy
- Rehabilitation plans aim to ensure net positive climate legacy, including developing new industries aimed at future employment and increasing food security
- Community engagement programs well received and ongoing, with contributions across local districts that host the Project
- Capacity building programs underway in Uganda
- Local investment and local hiring
- Engagement of Ugandan service providers



Acquisition of Seren Technologies

REE separation, refining &
magnet recycling capability

Acquisition of Seren Technologies

ADDS IMMEDIATE CAPABILITY FOR DOWNSTREAM RARE EARTH SEPARATION, REFINING & MAGNET RECYCLING

Acquisition of leading edge technology solution to provide new global and sustainable supply of rare earth metals for a Green Economy



RARE EARTH MINING CONCENTRATES & INTERMEDIATES (MREC)



VIRGIN GRADE RARE EARTH OXIDES



RARE EARTH MAGNETS



QUEEN'S
UNIVERSITY
BELFAST



Acquisition of Seren Technologies – People, IP and Know-How

ADDS IMMEDIATE CAPABILITY FOR DOWNSTREAM RARE EARTH SEPARATION, REFINING & MAGNET RECYCLING

- Technology based upon Ionic liquids, similar to solvent extraction
- Technical team of 6 chemists and 2 chemical engineers located between Belfast and Teesside in UK
- Queens University Belfast, Northern Ireland (R&D)
 - Synthesis lab, Mixer-settlers, TXRF, XRF, NMR, ICP
- Wilton Centre, Teesside, England (Scale-up)
 - Centrifugal separator pilot, 50 litre dissolution stage, Demagnetisation furnace and ICP
- Proprietary separation modelling software program and Techno-Economic analysis capability



Prof. Peter Nockemann

- Inventor
- Rare Earths expert
- R&D group head



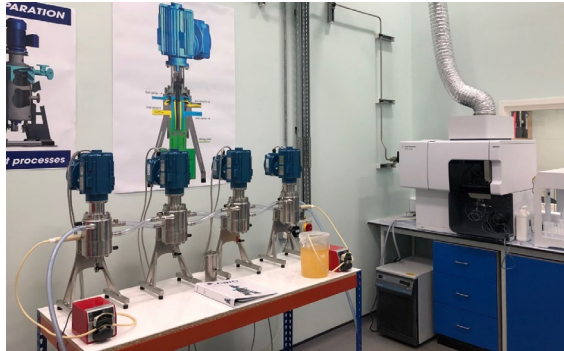
Andrew Holmes

- Sales and marketing
- Commercialisation
- Business Development



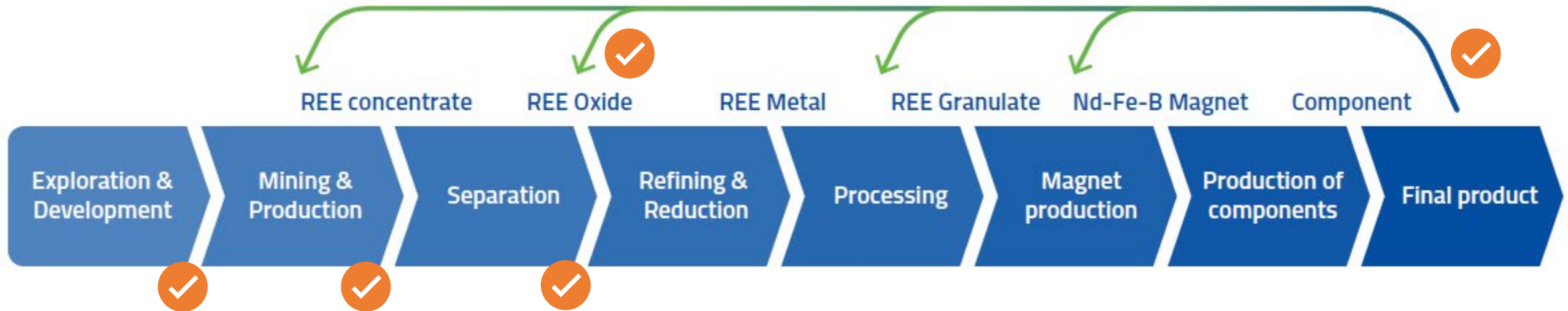
Dr Fergal Coleman

- Director of technology
- Process optimisation
- Scale-up



REE Supply Chain and IonicRE Activity

IONICRE ADDING CAPACITY TO BECOME MORE INTEGRATED IN NEW FUTURE RARE EARTH SUPPLY CHAINS



1. Makuutu Rare Earths Project

- Low Capital, modular development enables IonicRE to bring on highly sought-after basket of REEs
- Expandable with free cash flows and growing market demand
- MLA planned for late 2022
- Commencing operations in 2024

2. IonicRE Refinery

- Under Evaluation now assessing potential economics
- Targeting separation of MREC from Makuutu to produce refined REOs for downstream conversion to metals and alloys
- Potential to receive MREC feed or HREO products from other producers

3. Magnet Recycling

- Low capital development to recycle spent magnets and swarf to produce separated and refined 99.99%+ REOs
- Near term magnet REO production capacity (Nd, Pr, Dy and Tb – potential for Sm, Gd, Ho)
- Modular recycling plants located in numerous jurisdictions

REE Value Chain and Demand to 2030

DEMAND FOR NEW SUPPLY OF Nd-Fe-B PERMANENT MAGNETS CREATES GROWING IMPORTANCE FOR MAGNET RECYCLING

- Rare earths are amongst the most resource-critical raw materials: they are of highest economic importance and at the same time feature a high supply risk – **supply chain dominated by China**
- NdFeB magnets play a vital role in the industrial economy of the world, with about 130,000 tonnes produced in 2019 worldwide which corresponds to **a market value of about US\$7.5B**
- In 2019 ~ 5,000 tonnes of rare earth permanent magnets were used in EVs worldwide
- **By 2030, the number may rise to between 40,000 and 70,000 tonnes on a global scale**
- A global EV market worth about **US\$700B – US\$1,100B (and growing!)** would depend on securing access to sustainably produced rare earth magnets – a **comparatively small but specialised market of about US\$2.3B – US\$3.4B billion**
- Wind turbine generator supply will add to demand, with **expected addition of 235 GW (25% CAGR) to 2030**

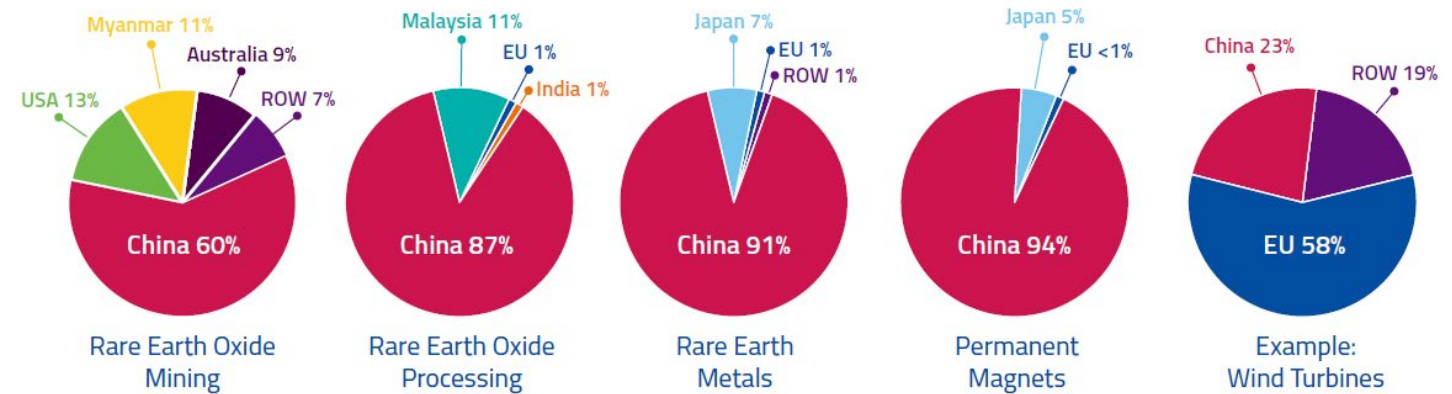
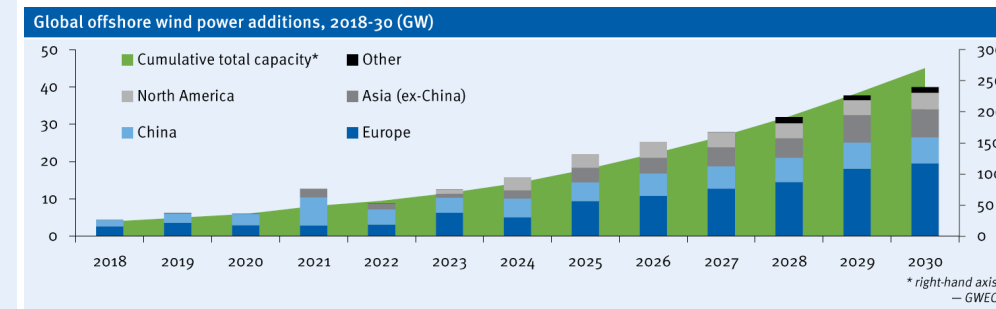
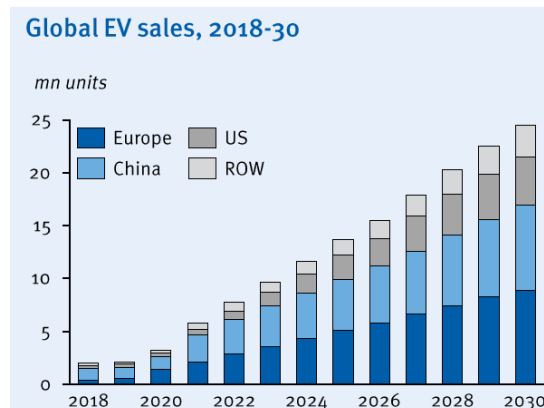


Fig. 3: From rare earths mining to wind turbine manufacturing: estimated market shares in 2019. Sources: Team analysis and Roskill 2018; Adamas Intelligence 2019; Peteves 2017; Carrara et al. 2020; IEA 2021; USGS 2021.

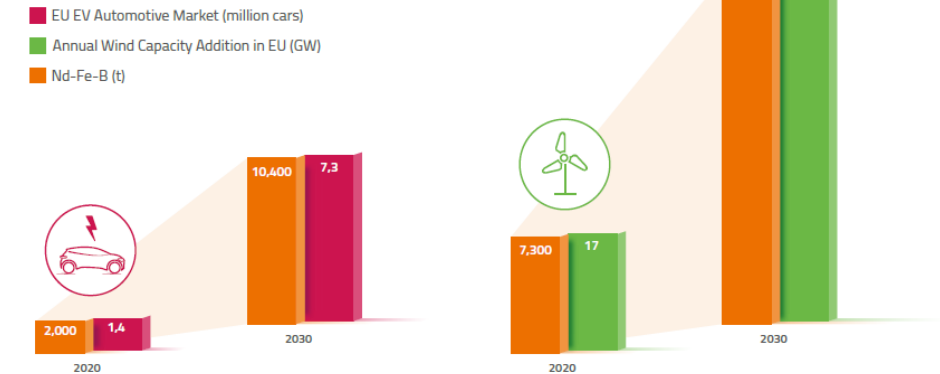


REE Demand – Magnet Recycling to help fill the void

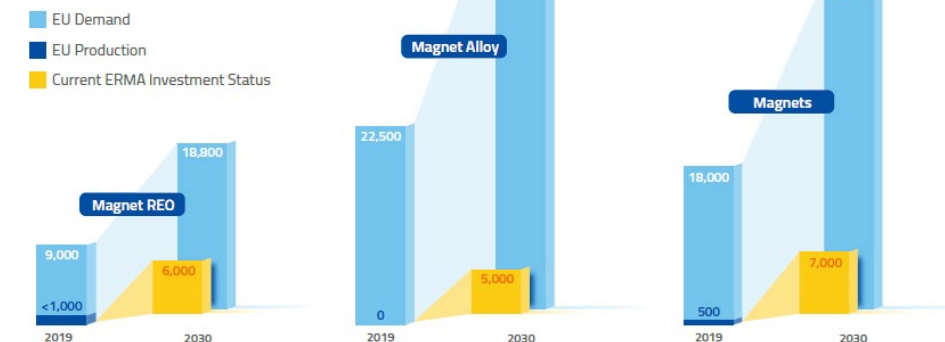
LAG IN INVESTMENT OF PRIMARY RARE EARTH EXTRACTION & POTENTIAL FOR NEAR TERM MAGNET RECYCLING

- Lack of historical investment will result in near term demand far exceeding supply
- Installation of **primary extraction (i.e. mining) of rare earths from new or existing mining projects (by-product) is significant**, with estimations up to 8-15 years
- Significant time advantage with low-cost modular Ionic Adsorption Clay (IAC) capacity also producing a more balanced basket of magnet REEs required magnet production
- New primary REO production will lag demand creating an **opportunity for secondary sources (i.e. magnet recycling) to help fill the void**
- **> 100,000 tonnes of rare earth permanent magnets** are consumed each year in renewable energy, machine tools, robotics, loudspeakers, water pumps, mobility, and ICT
- 16,000 tonnes of rare earth permanent magnets are exported from China to Europe each year, representing approximately 98% of the EU market
- **< 1% recovery of rare earth permanent magnet scrap in Europe**, which represents a large **potential resource at a low carbon footprint**
- Similar opportunity exists in **Nth America and Asia** to deploy low cost, REE recovery from waste and spent permanent magnets
- As magnet production increases, so to does longer term opportunity for magnet recycling, which could make up **20-25% of REO supply chain by 2030**

EU rare earth magnet demand in the emerging wind energy and automotive markets



Total EU rare earths materials demand and potential ERMA contribution (invest cases submitted so far)



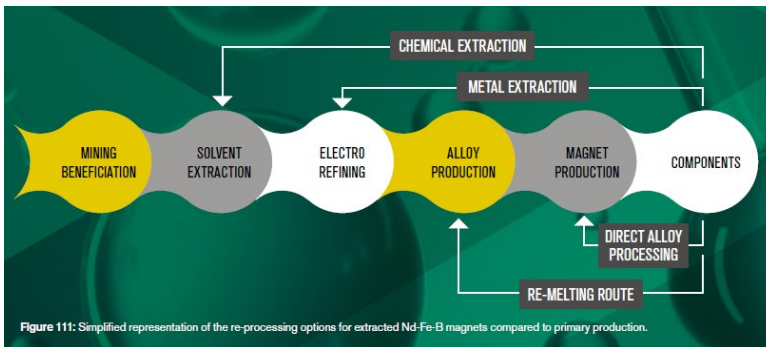
NdFeB Magnet Recycling – low cost, modular to separated REOs

FIRST MOVER CAPABILITY FOR DOWNSTREAM MAGNET RECYCLING TO SEPARATED 99.99%+ MAGNET RARE EARTH OXIDES

- Seren Technologies patented process uses **chemical extraction** to extract the magnet REE from the spent magnets to **enable recycling back to the refined 99.99%+ REO quality**
- **Unique technology that has significant advantages over existing technologies** which can not separate the individual REOs
- Recycled REO can then be used to make higher quality magnets with greater proportions of heavy rare earths Dy and Tb for high-cost applications such as offshore wind turbines
- Low capital and modular production of **Nd, Pr, Dy and Tb oxides** (plus Sm and Gd)



FULL THIRD PARTY TECHNO-ECONOMIC FEASIBILITY STUDY COMPLETED



RARE EARTH MAGNETS



100% RECYCLED RARE EARTH OXIDES

Magnet Recycling – a lower risk, responsive REO supply source

MAGNET RECYCLING CAN ACHIEVE REO PRODUCTION WITH SIGNIFICANTLY REDUCED ENVIRONMENTAL BURDEN

- A secondary economy for magnets significantly **reduces the environmental burden** compared to the primary sources
- Secondary materials can be sourced from a much wider array of companies and countries, which **reduces the risk of supply shortages** when the supply chain is narrow
- The **material that is extracted will only contain the magnet REEs in demand**, unlike a primary ore, where all 17 rare earth elements are mixed together and need separating
- A recycled source of materials **will not contain radioactivity**, a problem with some primary hard rock REE resources
- **Lower capital and faster to market**

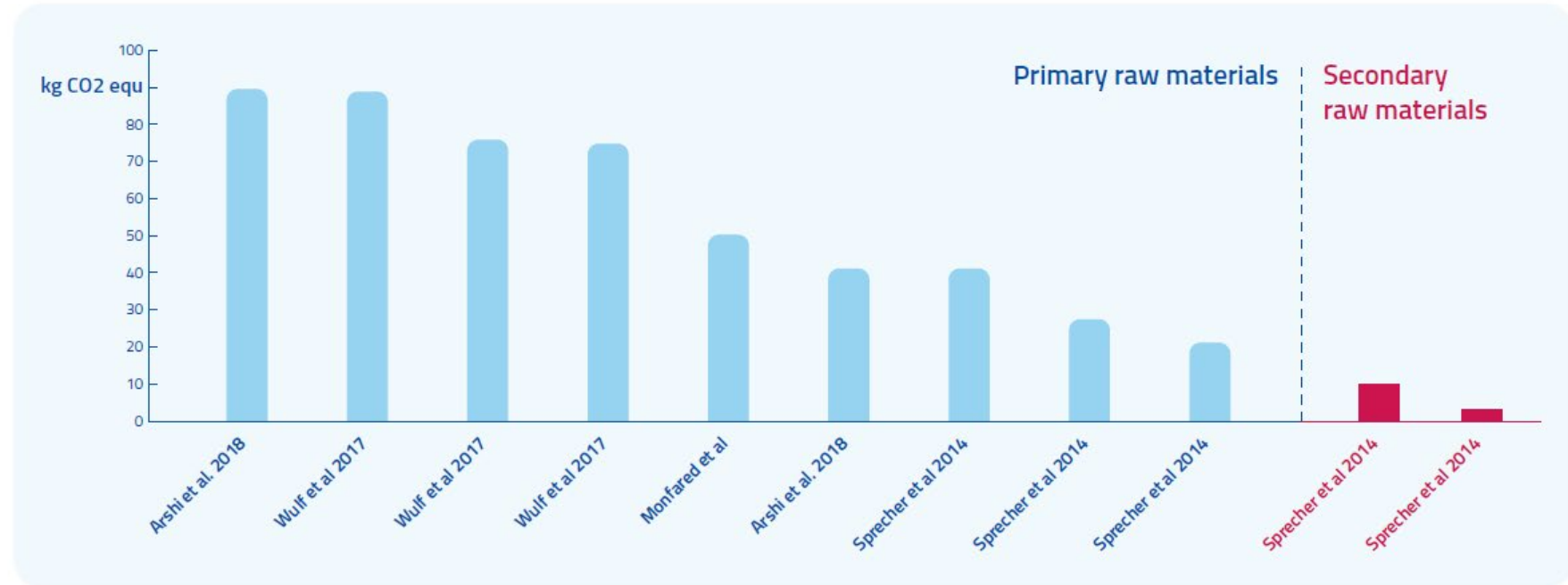


Fig. 6: Global Warming Potential of 1 kg Nd-Fe-B (kg CO2 equ.) according to various LCA reports. The scores vary greatly depending on the raw materials, the processing routes, and the LCA methodology used. There is a lack of a standardised LCA approach to rare earths. For direct quantitative comparison of processing routes, only consider each data of the same publication to ensure comparability. The authors of each report are shown beneath the individual data columns.

MAGNET RECYCLING ENABLES THE CIRCULAR ECONOMY FOR RARE EARTHS THAT WILL INCREASE IN TIME TO REPRESENT 20% + OF THE REO SUPPLY CHAIN

Makuutu Basket is Balanced, CREO+HREO Dominant and High Value

DOWNSTREAM PROCESSING TO REO AND VALUE ADDED PRODUCTS UNLOCKS SIGNIFICANT UPSIDE

IonicRE progressing evaluating downstream REE separation and refining circuit

Test work underway to feed into **process modelling and optimisation** – iterative process

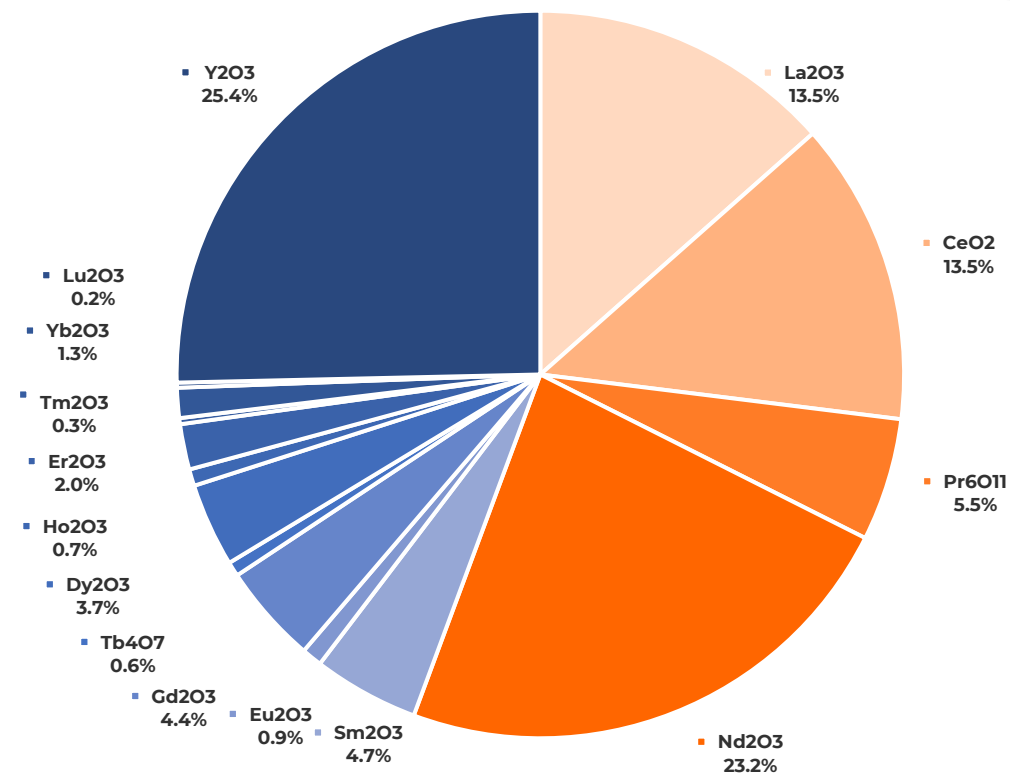
Exploring opportunities to value add beyond REOs

- MREC product typically has payability ~ 70%
- Refined REO payability increased to 100%
- Value added **metals and alloys** creates significant step change in revenue potential from

Scandium upside represents potential increase of 25-50% additional revenue potential from Makuutu LOM

Rare Earth Oxide		Makuutu Basket Composition	REO Pricing (China) Argus Metals 10-DEC-2021 US\$/kg
La ₂ O ₃	%	13.5%	1.52
CeO ₂	%	13.5%	1.58
Pr ₆ O ₁₁	%	5.5%	144.50
Nd ₂ O ₃	%	23.2%	145.00
Sm ₂ O ₃	%	4.7%	5.00
Eu ₂ O ₃	%	0.9%	32.00
Gd ₂ O ₃	%	4.4%	80.50
Tb ₄ O ₇	%	0.6%	1,810.00
Dy ₂ O ₃	%	3.7%	465.00
Ho ₂ O ₃	%	0.7%	205.00
Er ₂ O ₃	%	2.0%	63.00
Tm ₂ O ₃	%	0.3%	850.00
Yb ₂ O ₃	%	1.3%	16.30
Lu ₂ O ₃	%	0.2%	850.00
Y ₂ O ₃	%	25.4%	11.00
Sum Total		100%	
Magnet REO	%	43%	
LREO	%	56%	
HREO	%	44%	
CREO	%	54%	
CREO+HREO	%	73%	
Basket Value	REO/kg	\$ 87.10	

MAKUUTU BASKET CONTENT HIGH VALUE CREO / HREO PRODUCT



Note. Rounding Applied to nearest 0.1%.

IonicRE REE Separation & Refining Capacity Evaluation

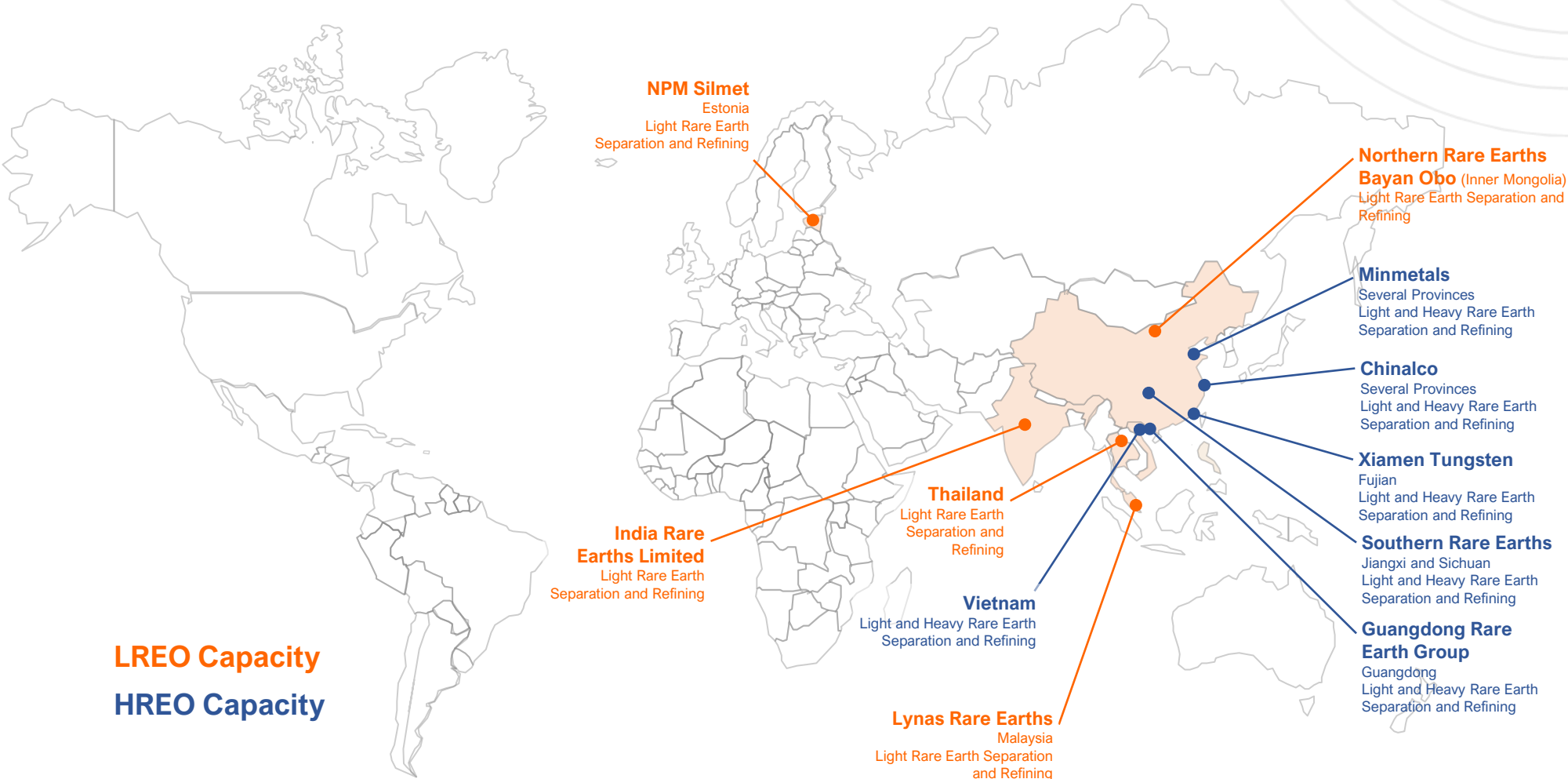
INVESTIGATING KEY WESTERN MARKETS WITH GROWING DEMAND FOR BOTH CRITICAL & HEAVY REO OVER NEXT DECADE

Global HREO separation and refining capacity operated and controlled by China¹

Small capacity identified in Vietnam

HREO refining plants in US under consideration but no committed timelines as yet

IonicRE to consider best global Refinery location with direct access to sell product to partners in US, UK, Europe, and Asia



The background of the slide is a photograph of a lush green landscape. In the foreground, a person stands on a large, grey, rounded rock, looking out over a valley filled with dense green trees and small houses. The sky is overcast and grey. On the right side of the image, there are several white, concentric, semi-circular lines that fade out towards the right edge.

PROGRESSING MAKUUTU TOWARDS PRODUCTION LOOKAHEAD FOR 2022

Phase 4 Drill Program and Mineral Resource Estimate Update

DRILL ASSAYS EXPECTED OVER NEXT 3 MONTHS TO CULMINATE IN MATERIAL UPGRADE OF MAKUUTU MRE

279 drill holes (4,754 metres) completed between October 2019 and October 2020 defining **JORC MRE¹ of 315 Mt @ 650 ppm** Total Rare Earths Oxide (TREO), at a cut-off grade of 200 ppm TREO-CeO₂

67 RAB drill holes (Phase 3) announced in July **confirmed extension of mineralisation east to EL00147, between previous identified radiometric anomalies, and to northwest (EL00257)**

Phase 4 infill drilling program completed (8,200 m, 432 holes) with **4 Tranches of assays pending** to feed into **MRE update planned for Q2 2022**

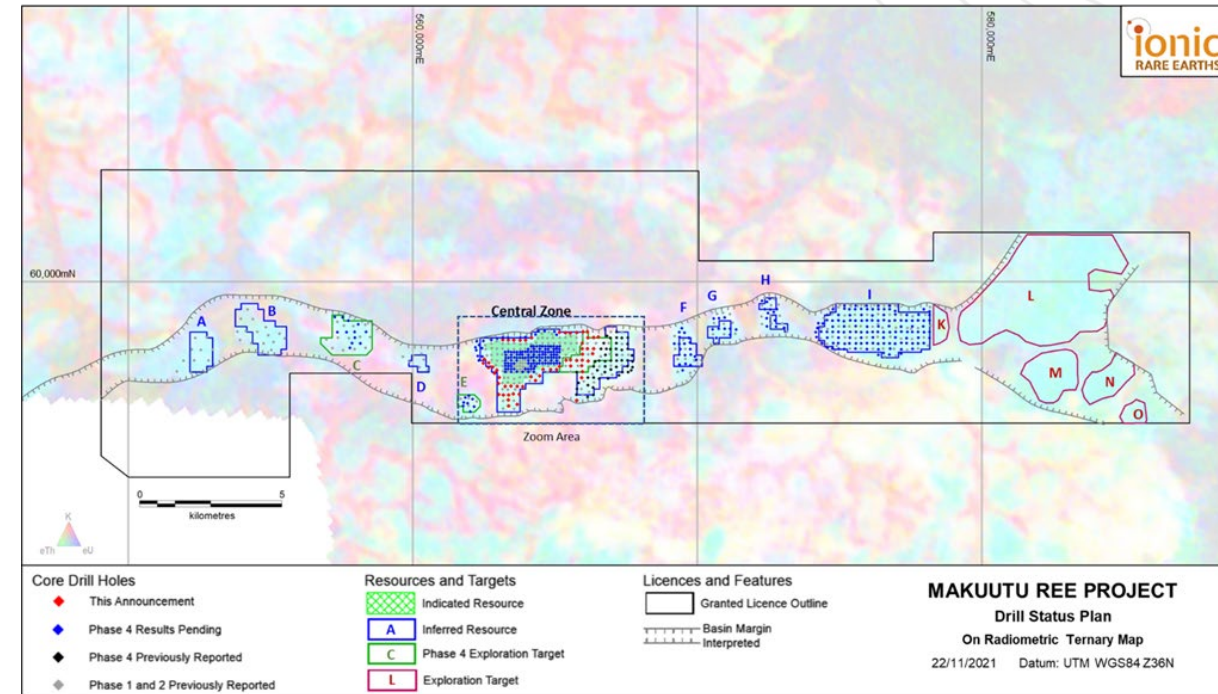
Objective to **increase Indicated and Mineral Resource classifications to greater than 250Mt** to support Feasibility Study in 2022

Near term exploration extension from areas that haven't yet converted (Areas C, E, Central Eastern Zone) so expecting total MRE will increase

Shallow, near surface IAC mineralisation, with clay layer averaging 5 to 12m thick under cover approximately 3m deep. Average hole depth ~17m

Longer term, **numerous exploration targets identified** for drilling in 2022

Scandium currently not included in cut-off grade determination



Category	Estimation Domain	Tonnes (Mt)	TREO (ppm)	TREO no CeO ₂ (ppm)	LREO (ppm)	HREO (ppm)	CREO (ppm)	Sc ₂ O ₃ (ppm)
Indicated	Clay	66	820	570	590	230	300	30
Inferred	Clay	248	610	410	450	160	210	30
Total Resource	Clay	315	650	440	480	170	230	30

Looking Forward to 2022

KEY ACTIVITIES OVER NEXT 6 TO 12 MONTHS THAT UNLOCK SUBSTANTIAL VALUE AT IONIC RARE EARTHS

- Drill assays from remaining Phase 4 infill program – 4 tranches to be reported (next 2-3 months)
- Environmental & Social Impact Assessment submitted Q4 2021 (progressing Q1/Q2 2022)
- Mineral Resource Estimate update (Q2 2022)
- Phase 2 Metallurgical variability and testwork (Q2 2022)
- Ongoing Exploration Activity – RAB Phase 3 metallurgical testwork to inform exploration drilling at EL00147 and EL0257
- Finalise Makuutu Project Approvals (Q2/Q3 2022)
- Makuutu Feasibility Study (Oct 2022)
- Makuutu Mining Licence Application submission (Oct 2022)
- Refinery Scoping Study (Q3 2022) → Downstream value chain
- Magnet Recycling Opportunities, including integration within proposed Refinery

Makuutu Timeline to Production

ACCELERATING MAKUUTU TOWARDS PRODUCTION IN 2024

ACTIVITY	2021	2022				2023				2024	
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Resource Drilling (Phase 4)	Completed	Assays									
Metallurgy Testwork											
MRE Update											
ESIA	Submitted										
Feasibility Study											
Landowner Agreements											
Demonstration Plant											
Funding Agreements											
Mining Licence Application											
Final Investment Decision											
Site Early Works											
Construction											
Mining Commences											
Commissioning											
Plant Production											

IonicRE Value Proposition

MAKUUTU'S STRATEGIC IMPORTANCE WILL INCREASE LONG TERM

- Long-life, low-CAPEX, high-value basket asset
- Planned operations in 2024
- Exposure to 43% magnet REOs & 44% heavy REO basket

THROUGH ACQUISITION OF SEREN TECHNOLOGIES, IONICRE NOW ON PATH TO VERTICAL INTEGRATED RARE EARTH COMPANY

- Addition of REE separation and refining capacity has increased internal capability to deliver refinery solution for new supply chains into western markets
- Technology applicable to both mineral concentrates, intermediate products (MREC) and magnet recycling

MAGNET RECYCLING

- Potential for near term supply of magnet REOs sourced from environmentally favourable magnet recycling
- Will play a growing role in future REO supply chain, up to 25% by 2030

"When peering into the outlook for the next decade to come, it becomes quickly apparent that the rapid demand growth of the 2020s will soon be dwarfed by the astronomical demand growth of the 2030s – and therein lies the real defining challenge and opportunity facing the global rare earth industry today.

If the global industry continues to operate myopically – preparing, anticipating and investing only for a three to five-year outlook – the rate of demand growth for magnet rare earths will soon reach 'escape velocity'; a point at which annual demand growth becomes so great (i.e. >6,000 tonnes per annum) that it is simply implausible for the already-lagging supply-side to catch up and keep up."

Adamas Intelligence, Sept 28, 2020



Ionic Rare Earths Limited
Level 1, 34 Colin Street
West Perth WA 6005 Australia

www.ionicre.com.au

T +61 8 9481 2555

F +61 8 9485 1290