

30 September 2022

SERENTECH TO BE RE-BRANDED IONIC TECHNOLOGIES THE NEW NAME IN MAGNET RECYCLING

- **Ionic Rare Earths Limited has rebranded its 100% owned, UK based subsidiary to align with the Company's corporate strategy of becoming a sustainable circular economy miner, refiner and recycler of magnet Rare Earth Oxides (REOs)**
- **Ionic Technologies International Limited ("IonicTech"), formally known as Seren Technologies, offers first mover capability for downstream magnet recycling – separating 99.9%+ magnet REOs to feed Electric Vehicle (EV), offshore wind, and defence applications**
- **Recycling of magnet REOs presently makes up 40% of the current supply chain, of which greater than 99% is conducted in China**
- **IonicTech will recycle and refine magnet REOs, providing a secure and traceable solution to providing the inputs, in separated and high purity form, needed to accelerate the world towards carbon neutrality**
- **Pilot plant commissioning progressing with test campaigns to be completed over the remainder of 2022, and recently awarded grant of £1.72 million accelerating the magnet recycling demonstration plant for H1 2023**

The Board of Ionic Rare Earths Limited ("IonicRE" or the "Company") (ASX: IXR) is pleased to advise the launch of Ionic Technologies International Ltd ("IonicTech"). IonicTech is the rebranded 100% owned subsidiary (formerly Seren Technologies Ltd) based in Belfast UK, which the Company acquired earlier in 2022. IonicTech has developed separation and refining technology, and applied this to magnet rare earth extraction and refining recovery from permanent magnet recycling.

The new brand consolidates upon IonicRE's strategy to become a fully integrated circular economy participant for critical magnet and heavy rare earths. Increasing supply of these critical elements by providing localised modular recycling developments represents a strong opportunity for IonicRE to develop an early mover advantage on the back of their advance technology. This technology can hydrometallurgically extract the elemental rare earth element (REE) content from the waste material, and then separate and refine to produce the individually separated 99.9% grade REOs – Nd₂O₃, Pr₆O₁₁, Dy₂O₃ and Tb₄O₇.

IonicTech is now accelerating the scale up of the technology, completing a new pilot plant at its new facility at the Titanic Quarter in Belfast UK. The Company was recently awarded a grant of £1.72 million (approximately A\$2.9 million) from the UK Government's Innovate UK Automotive Transformation Fund Scale up Readiness Validation (SuRV) program, to develop a demonstration scale magnet recycling plant, a significant step towards securing the UK supply of critical rare earth metals for EV manufacture.

IonicRE sees the commercialisation of the technology offering from IonicTech into modular magnet recycling initiatives and partnerships, with global governments looking to develop domestic magnet REO supply chains to empower localised manufacturing, including EV and renewable energy transitions. Such partnerships will also provide more secure and traceable supply chains for critical raw material.

On the renaming of the 100% owned UK subsidiary, Ionic Technologies, **Mr Tim Harrison, Managing Director of Ionic Rare Earths commented:**

"We are delighted to be able to now formally progress with the change of name to Ionic Technologies International Limited, and to commence building the brand from which we will commercialise a leading edge, patented technology to help deliver a viable alternative solution for the processing of waste agent and swarf to produce separated and refined REOs to be used in new permanent magnets."

"The latest statistics from Wood Mackenzie and Adamas Intelligence suggest the magnet REO supply is sourced between 30-40% from recycled materials, with China dominating over 99% of the magnet recycling landscape. IonicRE through IonicTech aims to provide an alternative option, with a low cost, modular entry for recycled magnet REOs deployable close to sources of secondary material."

"The circular economy of rare earths will become increasingly more important over years to come, with the current production of magnet rare earths in significant deficit to forecast demand, and with no new supply coming into production, and no new projects in construction today, the deficit is expected to further increase."



Figure 1: New logo and strapline developed for Ionic Technologies.

Rare Earths for Life

The adopted strapline of “Rare Earths for Life” refers to the circular economy of the products expected to be produced by IonicRE; firstly, from its flagship Makuutu Rare Earth Project in Uganda, which has the potential to produce magnet and heavy rare earths for decades to come, and secondly from its unique recycling technology, providing a true circular economy of magnet rare earth production.

The Existing Magnet Recycling Landscape

According to Wood Mackenzie, the secondary production of rare earths from recycled sources is almost entirely derived from China due to the high level of integration between magnet producers, rare earth metal producers and recyclers.

Currently, most secondary supply is sourced from offcuts and grinding media produced during magnet manufacturing, known as swarf. The use of end-of-life material is restricted by component design and challenges during disassembly. Wood Mackenzie estimates that growth in recycling will continue to accelerate at a growth rate around 9% to 2026 and continue to be dominated by China.

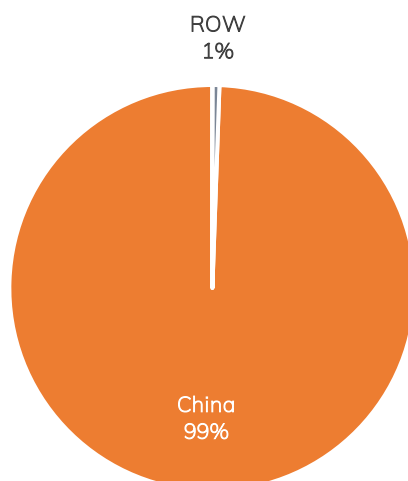


Figure 2: Secondary sourcing (recycling) of rare earth oxides market share dominated by China¹.

When looking at existing global production of REO from refined primary sources and secondary recycled sources, the global content of recycled materials equates to approximately 15% of the total REO production at present and forecast to 2026 (refer Figure 3).

When exploring the magnet REO content, which is that from which the bulk of the value is being derived in the rare earths market, published data, as illustrated in Figure 4 suggest the secondary

¹ Wood Mackenzie, Global rare earths short-term outlook July 2022.

sourcing of magnet REO makes up 40% of the current market, again an area which is completely dominated by China, underscores the scale of the opportunity being explored by IonicTech.

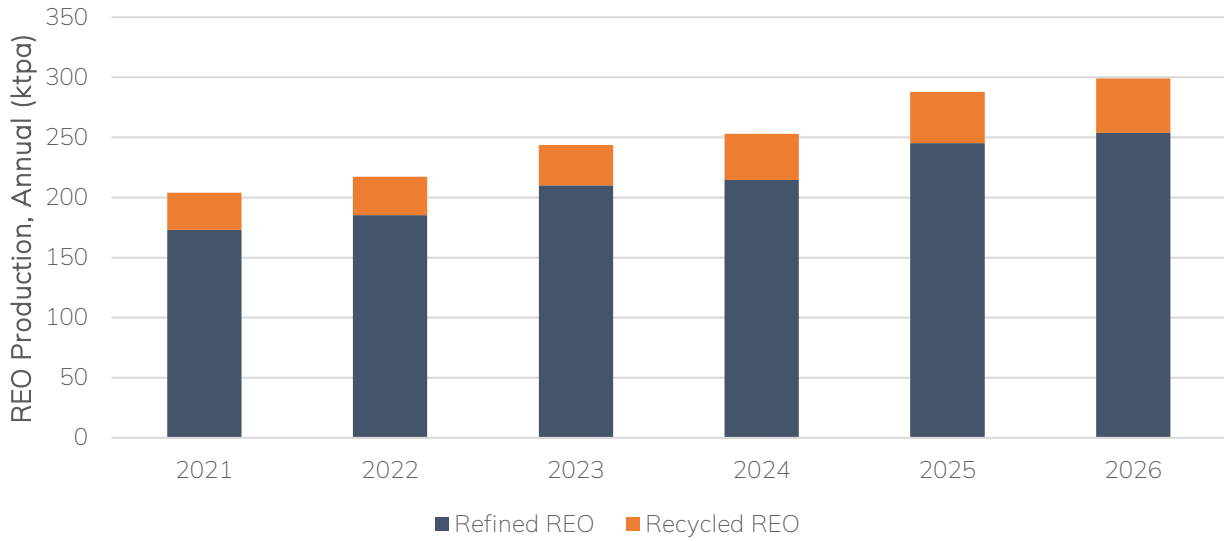


Figure 3: Current breakdown and forecast to 2026 of global REO production by refined vs recycled sources globally (source; Wood Mackenzie).

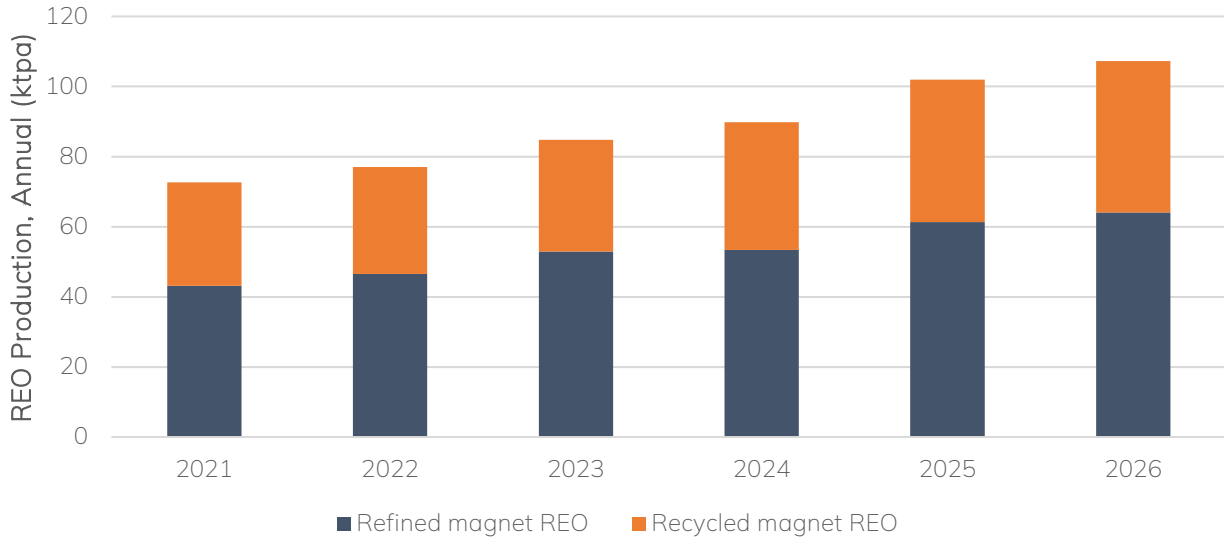


Figure 4: Current breakdown and forecast to 2026 of global magnet REO production by refined vs recycled sources globally (source; Wood Mackenzie).

Authorised for release by the Board.

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About Ionic Rare Earths Ltd

Ionic Rare Earths Limited (ASX: IXR or IonicRE) is focused on developing its flagship Makuutu Rare Earths Project in Uganda into a significant, long life, high margin, supplier of high-value magnet and heavy rare earths oxides (REO).

Makuutu is an advanced-stage, ionic adsorption clay (IAC) hosted rare earth element (REE) project highlighted by near-surface mineralisation and significant exploration upside. The clay-hosted geology at Makuutu is similar to major IAC rare earths projects in southern China, which are responsible for the majority of global supply of low-cost rare earths, specifically the high value Heavy REOs (>95% originating from IAC). Metallurgical testing at Makuutu has demonstrated a proven ionic fraction, which provide multiple avenues for a low-CAPEX process route. Makuutu is well-supported by tier-one existing infrastructure which includes access to major highways, roads, power, water and a professional workforce. IonicRE announced a substantial 70% increase to the MRE at Makuutu in May 2022, with potential for a 50+ year life of mine (LOM).

IonicRE plans to become a vertically integrated magnet and heavy rare earths supply chain early mover. In August 2021, IonicRE announced plans to develop its own heavy rare earth refinery, or hub, to market its unique and high value magnet and heavy rare earths dominant basket (~73%). Now with the addition of Ionic Technologies, a 100% owned UK subsidiary company with patented technology for traceable permanent magnet recycling, completes the circular economy of rare earths.

About Ionic Technologies International Limited

Ionic Technologies International Limited ("IonicTech") is a 100% owned subsidiary of IonicRE, with unique and leading-edge rare earth separation and refining technology. Early in September 2022, The UK Government's Advanced Propulsion Centre (APC) awarded IonicTech a grant of £1.7 million (approximately A\$2.9 million) to develop a demonstration scale magnet recycling plant.

APC is supporting the UK Government deliver its aspiration for net-zero across the automotive industry. IonicTech's new facility in Belfast, UK, will house magnet recycling technology at demonstration scale to secure critical rare earth metals for renewable energy applications and reduce sovereign risk.

The demonstration scale plant will produce separated individual high purity rare earth oxides (REO) from recycling waste magnets and swarf, suitable for high specification magnets in the EV and offshore wind sectors.

Since its founding in 2015, as a spinout from Queens University Belfast (QUB), IonicTech has developed processes for the separation and recovery of REEs from mining ore concentrates and waste permanent magnets. The technology developed has the potential to provide a step change in efficient, non-hazardous, and economically viable processing with minimal environmental footprint compared to current practices.

IonicTech has developed a toolkit of separation techniques and solvent systems incorporating both conventional organophosphorus extractants and ionic liquids (ILs) that can be combined to and applied to different mixed rare earth feeds.

Impressively, work to date has demonstrated capability for REEs to achieve near complete extraction from lower quality spent magnets and waste (swarf) to near complete recovery to high value rare earth oxide (REO) product quality exceeding 99.9% REO.

This presents a potential opportunity to provide a first mover advantage in near term to IonicRE in the industrial elemental extraction of REEs from spent magnets and waste, enabling near term magnet REO production capability to satisfy growing demand and lagging new supply chains.

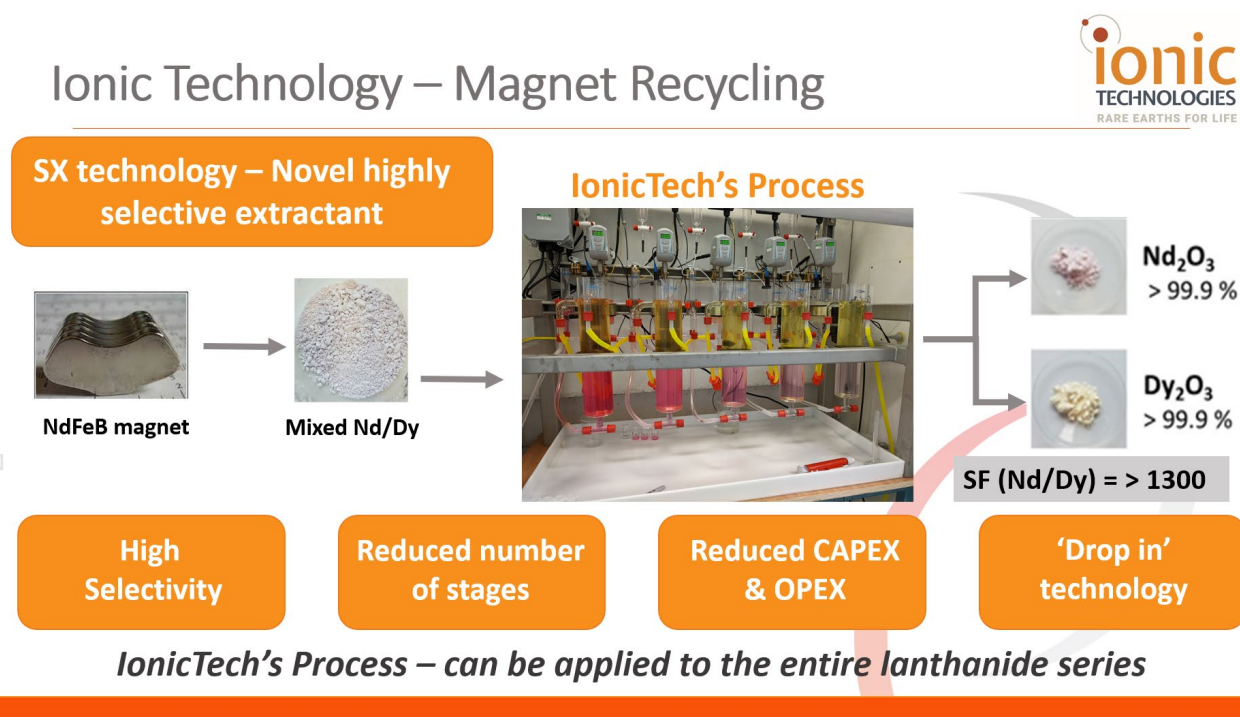


Figure 5: Magnet recycling potential of ionic liquids technology developed by Ionic Technologies.

The technology developed by IonicTech provides considerable benefits over alternative magnet recycling technology presently being marketed and operated, including hydrogen decrepitation, which simply breaks down spent magnets and swarf to be recast as magnets of the similar or lesser quality. The advantage of the technology developed by IonicTech is to provide potential for magnets REEs to be extracted from lower quality and variable grade magnets, to then be recycled into newer higher content REE containing permanent magnets, used in higher value applications.



Figure 6: Mixer-settler circuit as part of the magnet recycling pilot plant being commissioned at the new Ionic Technologies facility located at the Titanic Quarter in Belfast, UK. The first 5 stages show the separation of Didymium (NdPr) from Dysprosium (Dy) in the last two stages.