

07 June 2023

## IONIC TECHNOLOGIES ON TRACK TO BECOME MAGNET RARE EARTH PRODUCER THIS MONTH

- **Process commissioning progressing well at 66% complete with an inventory of intermediate products prepared and on schedule;**
- **First magnet recycling Demonstration Plant production of separated and refined, high purity magnet rare earth oxides (REO) expected this month;**
- **Wet commissioning of Solvent Extraction circuit commenced with operations moved to 24/7 this week;**
- **Pilot plant activities continuing in parallel to help confirm operational parameters for the separation circuit; and**
- **Magnet inventory continues to build with in excess of 50 tonnes of NdFeB permanent magnets now on hand to provide feedstock for the Demonstration Plant trials.**

The Board of Ionic Rare Earths Limited ("IonicRE" or the "Company") (ASX: IXR) is pleased to advise on progress at Ionic Technologies International Ltd ("IonicTech") Belfast facility in the UK, and the development of a Magnet Recycling Demonstration Plant to scale up the technology.

IonicTech is a 100% owned subsidiary based in Belfast UK, which the Company acquired in H1 2022 (formerly Seren Technologies Ltd). IonicTech has developed rare earth element separation and refining technology and applied this to the recycling of spent permanent Neodymium-Iron-Boron (NdFeB) magnets. The process uses a hydrometallurgical process to extract the rare earth elements (REE), then separate the individual magnet REEs within – Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy) and Terbium (Tb) – and finally refine to high purity individual magnet rare earths oxides (REO).

In September 2022, IonicTech was 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. The magnet recycling Demonstration Plant represents a scale up of the successful pilot plant campaigns completed to date and will provide further data for the development of a commercial facility(s).

Over the past six weeks, the Demonstration Plant equipment have been sequentially dry commissioned (94% complete) with safety systems installed prior to process commissioning

activities which are now tracking at 66% complete. As part of process commissioning, several intermediate products and streams have been prepared to enable the overall circuit to progress on schedule with the target of producing first separated high purity Rare Earth Oxides (REOs) by the end of this month.

IonicTech continues to build upon its inventory of feedstock Demonstration Plant trials, which has now increased to in excess of 50 tonnes of NdFeB permanent magnets and swarf material.

The variable magnet REE content within the feed stock materials, with fluctuating compositions of magnet REEs, Nd, Pr, Dy and Tb, along with other REE detected in the magnets after analysis, will provide IonicTech with a solid foundation to demonstrate the technology's attributes. Unlike many other recycling technologies, the IonicTech magnet recycling process is agnostic on magnet quality, can process oxidised magnets and can manage coatings and films, to produce individually separated and refined high purity REOs, which is providing significant interest to potential downstream users.

Over the past six-weeks, IonicTech has continued to implement safety systems and protections ahead of commissioning and operation activities as shown in Figure 1 to Figure 5.

IonicRE's Managing Director Mr Tim Harrison commented on progress at IonicTech:

*"The progress at IonicTech continues to plan with process commissioning on track to achieve the production of first separated oxides by the end of this month in Belfast."*

*"The successful commissioning and production of recycled high purity individual magnet REOs from our Magnet Recycling Demonstration Plant in Belfast facility will be a key catalyst for the Company in being able to establish further collaboration platforms and supply chain partnerships with magnet manufactures and end user customers."*

*"Additionally, the successful commissioning and production of magnet REOs will be an important milestone for several discussions progressing to deploy the modular technology across western markets looking to develop domestic, secure, and sustainable supply chains from secondary sources through recycling."*

### **Demonstration Plant Update and Technology Overview**

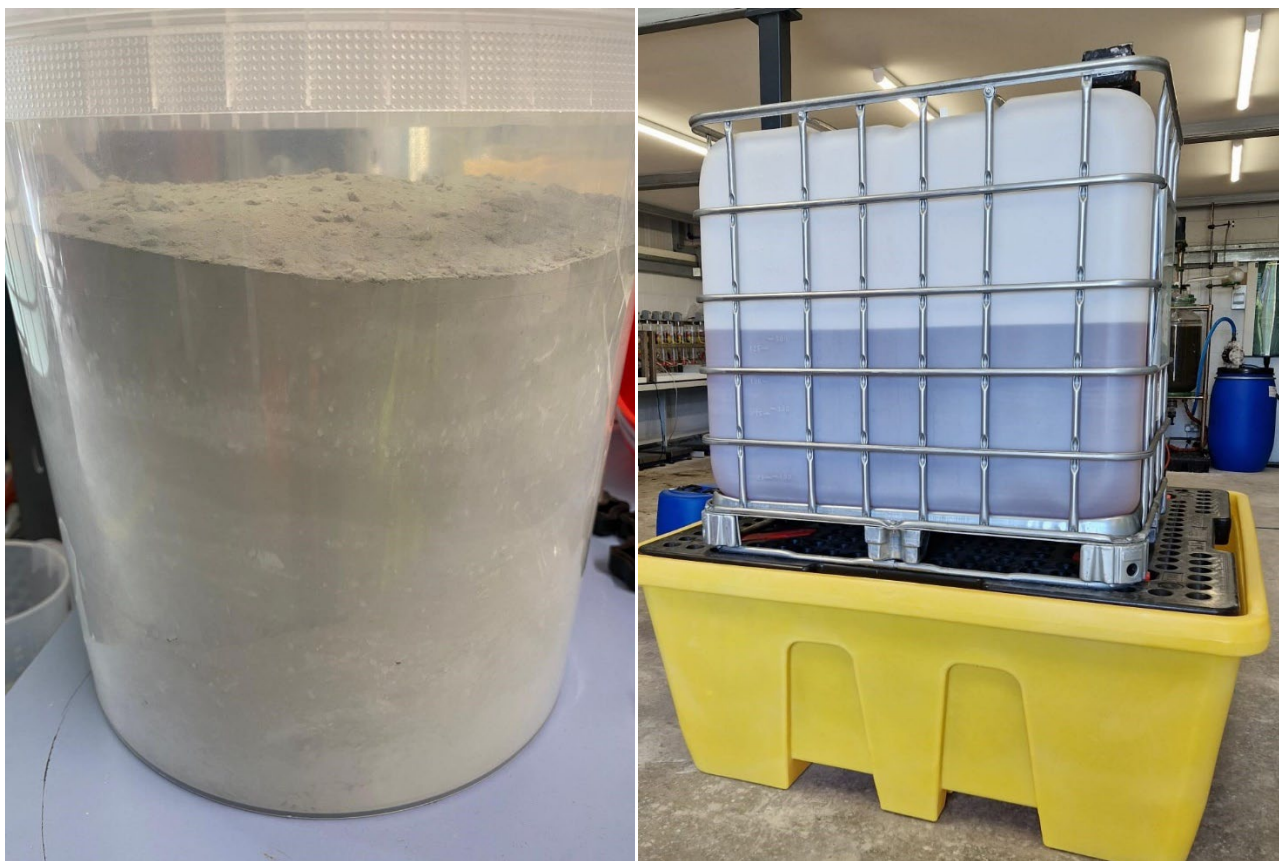
Since its founding in 2015, as a spinout from Queens University Belfast (QUB), IonicTech has developed processes for the separation and recovery of REEs from mining ore concentrates and waste permanent magnets. The technology developed has the potential to provide a step change in efficient, non-hazardous,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

Impressively, IonicTech's work to date has demonstrated capability for REEs to achieve near complete extraction of REO's from lower quality spent magnets and waste (swarf) to a remarkable recovery of high value magnet REO product quality exceeding 99.9% REO.

This presents an opportunity for IonicTech to have "first mover" advantage in the industrial elemental extraction of REEs from spent magnets and waste, enabling near term magnet REO production capability to satisfy growing demand from lagging new supply chains.

The technology developed by IonicTech provides considerable benefits over alternative magnet recycling technologies presently being marketed and operated, including hydrogen decrepitation, which simply breaks down spent magnets and swarf to be recast as magnets of lesser quality.

The advantage of the technology developed by IonicTech is to provide a universal method for the recovery of high purity grade rare earth elements from lower quality and variable grade magnets, to be used in the manufacture of high-performance and high specification magnets for EV and wind turbine production.



**Figure 1: Intermediate mixed REO product, and liquid-liquid extraction circuit feed streams ready for process commissioning.**





**Figure 2: Leach reactors and Solvent Extraction circuit electrical installation completed, with process commissioning underway.**

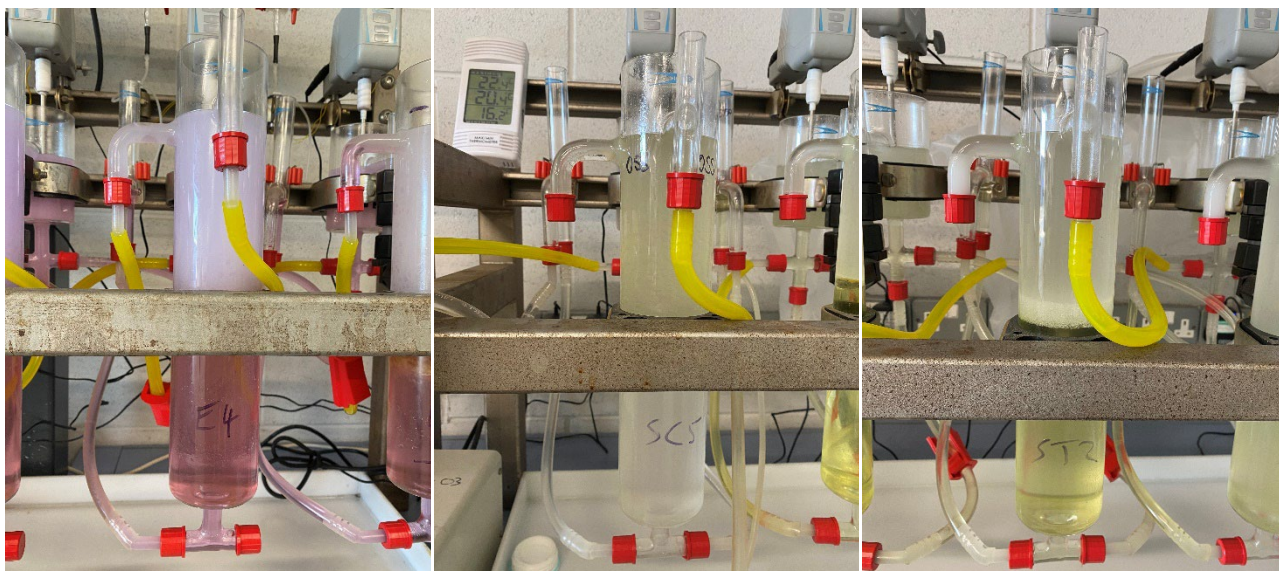


**Figure 3: Safety screens installed around pressure filters and Solvent Extraction circuits.**





**Figure 4: Pilot plant activities progressing in parallel, with solution samples analysed to finalise parameters for Demonstration Plant SX circuit commissioning and optimisation.**



**Figure 5: Pilot plant activities showing separation of neodymium (Nd) away from dysprosium (Dy), across extraction (left), scrubbing (centre) and stripping (right).**

Authorised for release by the Board of Ionic Rare Earths Limited.

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## About Ionic Rare Earths Ltd

Ionic Rare Earths Limited (ASX: IXR or IonicRE) is set to become a miner, refiner and recycler of sustainable and traceable magnet and heavy rare earths needed to develop net-zero carbon technologies.

The flagship Makuutu Rare Earths Project in Uganda, 60% owned by IonicRE, is well-supported by existing tier-one infrastructure and is on track to become a long-life, low Capex, scalable and sustainable supplier of high-value magnet and heavy rare earths oxides (REO). In March 2023, IonicRE announced a positive Stage 1 Definitive Feasibility Study (DFS) for the first of 6 tenements to progress to a Mining Licence Application (MLA) which is pending in Uganda. The Makuutu Stage 1 DFS defined a 35-year life initial project producing a 71% rich magnet and heavy rare earth carbonate (MREC) product basket and the potential for significant potential and scale up through additional tenements.

Ionic Technologies International Limited ("IonicTech"), a 100% owned UK subsidiary acquired in 2022, has developed processes for the separation and recovery of rare earth elements (REE) from mining ore concentrates and recycled permanent magnets. Post-acquisition, IonicTech is now focusing on the commercialisation of the technology to achieve near complete extraction from end of life / spent magnets and waste (swarf) to high value, separated and traceable magnet rare earth products with grades exceeding 99.9% rare earth oxide (REO). This technology provides first mover advantage in the industrial elemental extraction of REEs from recycling, enabling near term magnet REO production capability to support demand for early-stage alternative supply chains.

As part of an integrated strategy to create downstream supply chain value, IonicRE is also evaluating the development of its own magnet and heavy rare earth refinery, or hub, to separate the unique and high value magnet and heavy rare earths dominant Makuutu basket into the full spectrum of REOs plus scandium.

This three-pillar strategy completes the circular economy of sustainable and traceable magnet and heavy rare earth products needed to supply applications critical to electric vehicles, offshore wind turbines, communication and key defence initiatives.

IonicRE is a Participant of the UN Global Compact and adheres to its principles-based approach to responsible business.

## Competent Persons Statement

*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.*

### **Forward Looking Statements**

*This announcement has been prepared by Ionic Rare Earths Limited and may include forward-looking statements. Forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions which are outside the control of Ionic Rare Earths Limited. Actual values, results or events may be materially different to those expressed or implied in this document. Given these uncertainties, recipients are cautioned not to place reliance on forward looking statements. Any forward-looking statements in this document speak only at the date of issue of this document. Subject to any continuing obligations under applicable law and the ASX Listing Rules, Ionic Rare Earths Limited does not undertake any obligation to update or revise any information or any of the forward-looking statements in this document or any changes in events, conditions, or circumstances on which any such forward looking statement is based.*