

7 December 2023

## **WSP GLOBAL APPOINTED TO MANAGE FEASIBILITY STUDY ON COMMERCIAL MAGNET RECYCLING FACILITY IN BELFAST, UK**

- **Ionic Technologies has selected WSP Global as the service partner to deliver the feasibility study for a first-of-kind magnet recycling facility, utilising our patented Rare Earth Element (REE) separation technology;**
- **WSP is a leading global provider of consultancy, engineering and project delivery services to the chemicals sector;**
- **The UK government is supporting the feasibility study through a £1 million grant as part of the Innovate UK circular critical materials supply chains (CLIMATES) program, to evaluate the construction and supply side dynamics of a magnet rare earth recycling plant in the UK in collaboration with the British Geological Survey (BGS);**
- **The plant will be located in Belfast, UK, where it has access to excellent infrastructure, and positive policy support through the Windsor Framework providing dual market access across the UK and EU;**
- **The move is an important step towards sovereignty for the UK, in developing market leading technology and building a supportive pathway for Ionic Technologies to commercialise the first magnet recycling facility in Belfast to feed escalating supply chain appetite for circular economy magnet rare earth oxides (REOs); and**
- **Ionic Technologies' Belfast magnet recycling facility has the potential to be a significant contributor to the benchmark target set out within the EU Critical Raw Materials Act 2023, being 25% magnet rare earths annual consumption from recycling by 2030.**

The Board of Ionic Rare Earths Limited (“IonicRE” or “The Company”) (ASX: IXR) is pleased to advise that Ionic Technologies International Ltd (“Ionic Technologies”), a 100% owned subsidiary based in Belfast, UK, has progressed the delivery of a feasibility study for a commercial magnet recycling facility, based in Belfast, UK. Ionic Technologies has developed rare earth element (REE) separation

and refining technology and applied this to the recycling of spent permanent Neodymium-Iron-Boron (NdFeB) permanent magnets to enable the creation of sustainable and traceable rare-earth supply chains.

Following the successful award of grants from the UK Government's CLIMATES program (ASX: 12 September 2023), Ionic Technologies has selected WSP as the engineer and project manager for delivery of the feasibility study for the magnet recycling facility in Belfast.

The feasibility study forms the most significant single output of the CLIMATES project that Ionic Technologies will complete in partnership with the British Geological Survey (BGS), which will provide a comprehensive assessment of the feasibility and supply side dynamics of a magnet recycling facility, within the UK.

Ionic Rare Earth's Managing Director, Tim Harrison, commented;

"Ionic Rare Earths' focus is on securing critical elements for supply chain in the new economy. We are harnessing our technology to accelerate mining, refining and recycling of magnet and heavy rare earths critical for energy transition, advanced manufacturing, and defence."

"The confirmation of WSP as the service provider tasked with delivering the feasibility study into a first-of-kind commercial magnet recycling facility in Belfast, utilising our patented technology, represents a significant step towards the construction of a commercial scale magnet recycling facility, and in doing so establishing a domestic supply chain of secondary Rare Earth Oxides (REOs) for the UK."

"We will be working in partnership with WSP on the feasibility study, using our patented processes and knowledge gained through operation of our Demonstration Plant and we expect to have a costed solution by mid-2024".

"We are pleased that we have achieved this key milestone of selecting a suitable partner as part of the CLIMATES program, in collaboration with British Geological Survey, which will deliver on not only this feasibility study, but also the supply side dynamics of a magnet recycling facility, within the UK."

"The decision to select WSP as the service partner on this landmark study was made because of WSP's prominence, experience and reputation in the chemical industry, as well as their demonstrable capability to deliver a study that is closely aligned to our overall project objectives."

"WSP is a world leading engineering professional services business, and has technical expertise in engineering, science, architecture, planning, surveying and environmental management; all of which will represent key deliverables for this project, which will be served by their UK-based Process Engineering Centre for Excellence."

The feasibility study will commence this month and is expected to be completed in mid-2024.

## **Defining Supply Side Dynamics of a Magnet Rare Earth Recycling Plant in the UK**

Ionic Technologies and BGS are undertaking an ambitious and advanced study into the REE ecosystem within the UK and the feasibility of a first-of-kind commercial magnet rare earth oxide (REO) production facility in Belfast.

Ionic Technologies and BGS have created a collaborative working group to develop strategies for the establishment of a secure supply of REEs for the UK, as well as satisfying Ionic Technologies' technical requirements to enable the next phase of rapid growth to commercial scale in the UK.

The project will expand on the existing BGS material stocks and flows model for REEs by incorporating new, pertinent data on wind turbines, electric vehicles (EVs) and other automotive sources, all containing significant REE content, which could be recycled within the UK. With this data, Ionic Technologies will be able to specify a commercial facility, capable of receiving both end-of-life and waste (swarf) magnet material of varying quality, processing this material through a plant designed using our patented technology, to produce REOs with purity of 99.5%+ quality. REOs of this quality can be used in the production of high specification magnets, utilised in EVs, wind turbines, defence and other applications.

In addition to a significant expansion of publicly owned data on the REE eco-system in the UK, the project will also equip Ionic Technologies with essential technical data to create a source of REOs that has the potential to provide the UK with a secure, sovereign supply of magnet rare earths, independent of geo-political influence and supply chain insecurity.

### **Technology Overview**

Since its founding in 2015, as a spinout from Queens University Belfast (QUB), Ionic Technologies has developed processes for the separation and recovery of REEs from permanent magnets.

The technology developed is a step up in efficient, non-hazardous, and economically viable processing with minimal environmental footprint.

Ionic Technologies has demonstrated capability to achieve near complete extraction of REEs from spent magnets and waste (swarf) to produce high value, separated magnet REO products exceeding 99.9% REO content.

Ionic Technologies now has “first mover” advantage in the industrial elemental extraction of separated REOs from spent magnets and waste (swarf), enabling near term magnet REO production capability to satisfy growing demand from the energy transition, advanced manufacturing, and defence sectors.

Ionic Technologies' proprietary technology provides 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 modern high-performance and high specification permanent magnets required to support substantial growth in both EV and wind turbine deployment.

## Our Path to Commercialisation

Rapid acceleration of our technology ready to scale globally

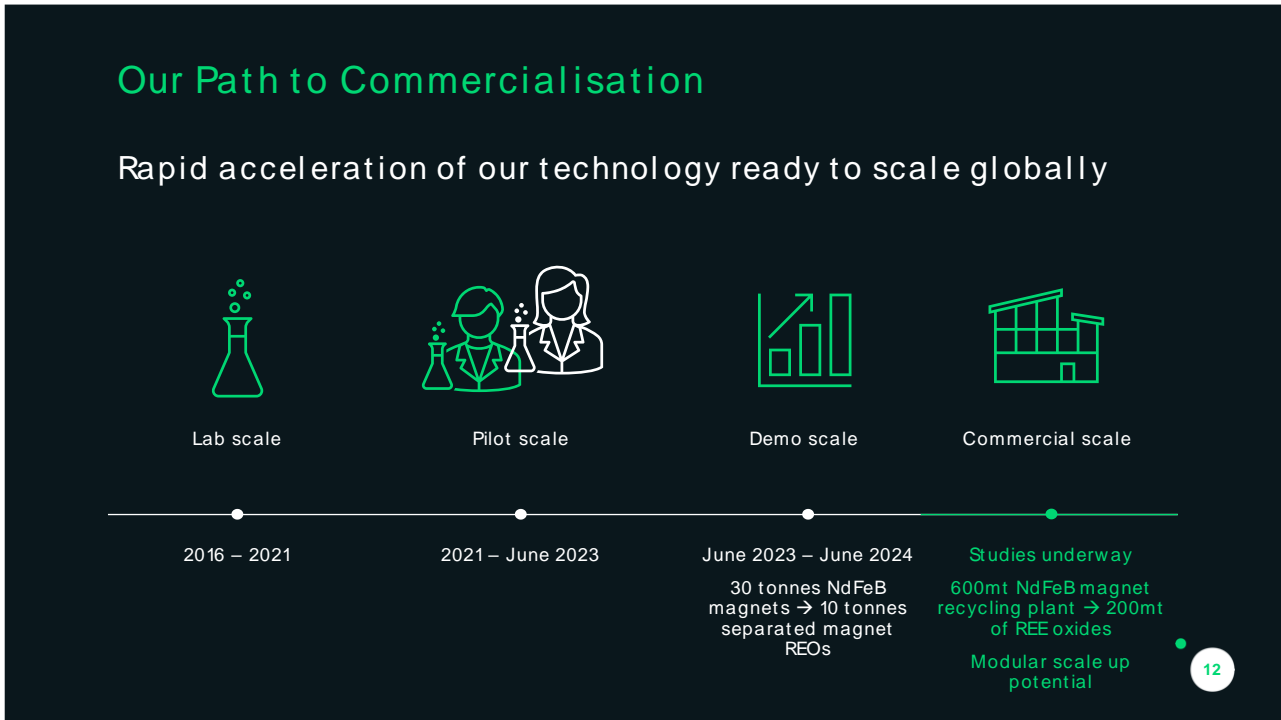


Figure 1: Ionic Technologies path to production.

## About Ionic Technologies

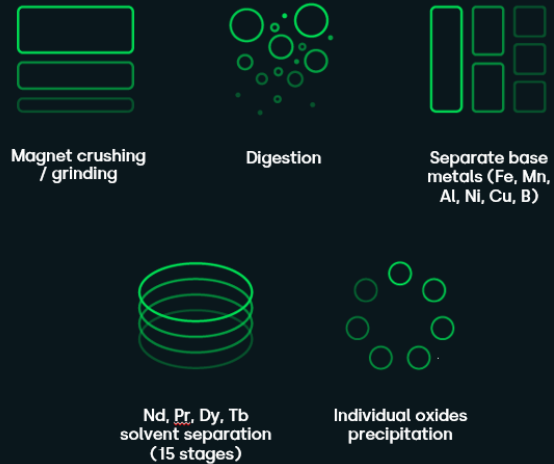
Ionic Technologies has developed separation and refining technology that can be applied to the recycling and refining of individual magnet rare earths from used permanent (NdFeB) magnets.

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.



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Figure 2: Ionic Technologies technology overview.

Authorised for release by the Board.

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**About WSP**

WSP Global Inc. (TSX: WSP, “WSP”) develop creative, comprehensive and sustainable engineering solutions for a future where society can thrive. Equipped with an intimate understanding of local intricacies, world-class talent and proactive leadership, WSP plan, design, manage and engineer long lasting and impactful solutions to uniquely complex problems.

WSP has 68,000 people in more than 550 offices across 40 countries. WSP is one of the world’s leading engineering professional services consulting firms Their technical experts and strategic advisors include engineers, technicians, scientists, architects, planners, surveyors and environmental specialists, as well as other design, programme delivery and construction management professionals.

WSP has been active in the UK chemical sector for over 100 years. WSP’s experience includes fine chemicals, polymers and coatings, solvents, highly toxic chemicals, metals refining, fibres, resins and crude oil working with clients such as Lenzing AG, Breedon, Johnson Matthey, Cabot and Ensus.

Find out more at <https://www.wsp.com/en-gl>

**About British Geological Survey**

The British Geological Survey is a world-leading geological survey and global geoscience organisation, focused on public-good science for government and research to understand earth and environmental processes.

British Geological Survey is the UK’s premier provider of objective and authoritative geoscientific data, information and knowledge to help society to use its natural resources responsibly, manage environmental change and be resilient to environmental hazards.

Find out more at <https://www.bgs.ac.uk>

## 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 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 six (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 (“Ionic Technologies”), 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. Ionic Technologies is 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). In June 2023, Ionic Technologies announced initial production of high purity magnet REOs from its newly commissioned Demonstration Plant. This technology and operating Demonstration Plant 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. In September 2023, Ionic Technologies announced with the support of the UK government, collaboration partnerships to build a domestic UK supply chain, from recycled REOs to metals, alloys and magnets and supplying UK based electric vehicles (EV) manufacturing, with potential to replicate across other key markets.

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 integrated strategy completes the circular economy of sustainable and traceable magnet and heavy rare earth products needed to supply applications critical to EVs, 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.

## 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.*