09 August 2021

IONICRE TO EVALUATE STANDALONE DOWNSTREAM HEAVY RARE EARTH SEPARATION AND REFINING ASSET

- **Critical and heavy rare earth separation and refining facility will be a standalone, 100% IonicRE asset, to maximise potential revenue achieved from the Makuutu basket**
- **IonicRE has initiated a Downstream Scoping Study to confirm economics associated with developing a standalone facility**
- **Internal Desktop Study has indicated substantial upside to be gained from Makuutu critical and heavy rare earth basket**
- **Strong interest for development of mine to market source for western end users keen to get access to highly strategic basket via alternative, secure and traceable supply chain**

The Board of Ionic Rare Earths Limited ("IonicRE" or "the Company") (ASX: IXR) is pleased to advise that it has approved advancing to a formal evaluation of the business case for the development of a standalone rare earth Separation and Refining facility, to be developed for the downstream processing of mixed rare earth carbonate (MREC) product from its Makuutu Rare Earths Project ("Makuutu") in Uganda, to produce refined critical and heavy rare earth oxides (CREO, HREO).

A review of existing global HREO refining capacity indicated the majority of capacity exists in China, with minor capacity identified in Vietnam. IonicRE has concluded the development of a dedicated facility, strategically located, has the potential to be a substantially earnings accretive asset, which would enhance and strengthen the engagement and participation of potential strategic partners looking to secure access to product from IonicRE's Makuutu basket, whilst adhering to the highest ESG standards via a secure and traceable supply chain.

The scale of the Separation and Refinery facility is likely to be initially set at approximately 4,000 tonnes per annum REO equivalent feed, reflecting an alignment to the peak projected production capacity announced in the Makuutu Rare Earths Project Scoping Study (ASX: 29 April 2021). Given the potential for Makuutu to support long-life, low-cost REO production for a period of 27 years, and recent exploration results defining further scale for significant additional growth in resources at

Makuutu, the development of a standalone Separation and Refining asset provides greater long term strategic importance and upside for the Company.

IonicRE at present owns 51% of Makuutu, however the Company will move to 60% ownership of Makuutu on the completion of the Feasibility Study before October 2022 and has a pre-emptive right over the remaining 40% stake in Makuutu.

The proposed Separation and Refinery facility will be a 100% owned by IonicRE and will enable the company to increase payability attained from the MREC basket (70% payability) produced at Makuutu to 100% payability for refined individual REO products. The study will also include a location analysis to help refine the list of potential global sites against an identified criterion, with alignment to demands of potential strategic partners looking to ensure security of supply long-term.

Ionic Rare Earths Managing Director Mr. Tim Harrison commented:

"IonicRE has identified a clear opportunity to provide mine to market CREO and HREO capacity. The Company has been assessing options and desktop studies, to maximise returns from Makuutu's unique and highly valuable basket, especially given the potential for demand to dramatically exceed supply for the HREO in the future. Therefore, the opportunity to build a more integrated mine to market strategy for our CREO and HREO basket becomes far more compelling."

"Our timeline to production from Makuutu remains firm – the focus is set on 2024. As we ramp Makuutu up over the rest of the decade to 2030, IonicRE also wants to ensure we can build Separation and Refinery capacity to match that scale of production proposed at Makuutu. To meet those goals, now is the time to start this activity."

"IonicRE, through Makuutu, has the potential to produce a dominant 73% CREO/HREO basket, as an intermediate chemical MREC precipitate, free of the radionuclide issues that plague our hard rock rare earth peers, and with a substantially lower capital requirement for downstream refining. Everything points to a fantastic opportunity provided to IonicRE."

"Additionally, the Company sees the development of a standalone Rare Earth Separation and Refinery facility as being key to providing optionality for the future. With limited HREO refining capacity forecast to be developed outside China in the near term, the development provides direct exposure to maximising value from product with a CREO/HREO dominant basket with greater future demand forecast and diminishing existing supply in years to come."

IonicRE Separation and Refinery Project

The intention is to develop the standalone facility to convert the MREC feed to refined REO products. Specifically, the major focus being magnet REOs and other highly sought-after individual products suitable for other key strategic demands. The proposed IonicRE Separation and Refinery Project will look to provide the full suite of individual REOs, including;

- Lanthanum (La)
- Cerium (Ce)
- Neodymium (Nd)
- Praseodymium (Pr)
- Samarium (Sm)
- Europium (Eu)
- Gadolinium (Gd)
- Terbium (Tb)
- Dysprosium (Dy)
- Holmium (Ho)
- Erbium (Er)
- Thulium (Tm)
- Ytterbium (Yb)
- Lutetium (Lu)
- Yttrium (Y)
- Scandium (Sc)

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The scale of the proposed facility, for a nominal 4,000 tpa REO capacity, will look to stage individual separation and refining capacity with a key focus on an initial product suite that reflects approximately 93% of the Makuutu basket value. This includes the magnet REOs (Nd_2O_3, Pr_6O_{11}, Tb_4O_7 and Dy_2O_3) plus highly strategic product Y_2O_3 and high value Sc_2O_3.

Future expansion of the facility, and broadening of the separation capacity, will be developed in consultation with demand from potential strategic partners. The full list of initial proposed REO product potential capacity, with key market applications, are provided within Table 1.

Table 1: Proposed breakdown of REO production capacity on individual basis.

Rare Earth Element	REO Production Capacity (t/annum)	Major Applications and Uses
Lanthanum (La)	580	Battery alloys, metal alloys, auto catalysts, petroleum refining, polishing powders, glass additives, phosphors, ceramics, and optics
Cerium (Ce)	550	Battery alloys, metal alloys, auto catalysts, petroleum refining, polishing powders, glass additives, phosphors, and ceramics
Praseodymium (Pr)	220	Permanent magnets, battery alloys, metal alloys, auto catalysts, polishing powders, glass additives and colouring ceramics
Neodymium (Nd)	1,000	Permanent magnets, battery alloys, metal alloys, auto catalysts, glass additives and ceramics
Samarium (Sm)	180	Magnets, ceramics, and radiation treatment (cancer)
Europium (Eu)	35	Phosphors, optical fibres, flat panel displays
Gadolinium (Gd)	170	Ceramics, nuclear energy, and medical (magnetic resonance imaging X-rays)
Terbium (Tb)	25	Permanent magnets for high temperature applications, fluorescent lamp phosphors, defence applications
Dysprosium (Dy)	140	Permanent magnets, defence
Holmium (Ho)	30	Permanent magnets, nuclear energy and microwave equipment
Erbium (Er)	75	Nuclear energy, fibre optic communications, and glass colouring
Thulium (Tm)	11	X-rays (medical) and lasers
Ytterbium (Yb)	65	Cancer treatment and stainless steel
Lutetium (Lu)	10	Age determination, medical and petroleum refining
Yttrium (Y)	1,000	Battery alloys, metal alloys, phosphors, catalytic converters, ceramics and defence
Scandium (Sc)	120	High strength, low weight aluminium scandium alloys, solid state energy storage, 3D printing, high intensity lighting

The aim is to complete the Downstream Scoping Study ("the Study") by mid-2022, with preliminary metallurgical testwork already underway to support process modelling which will underpin the process design using conventional solvent extraction. The Company has commenced engagement with a global technology provider who has first-hand experience developing a REO separation and refining circuit. Additionally, the Company is reviewing alternative technology options which will be assessed during the Downstream Scoping Study.

The location analysis will be completed within the Study and will look at preferred global locations, supported by suitably developed infrastructure, technical capacity and business operating conditions

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to maximise the appeal for both IonicRE and potential strategic partners or joint venture partners located in Asia, Europe, the UK and US.

The standalone CREO/HREO separation and refining facility development would aim to provide longer term flexibility and optionality to downstream processing to maximise shareholder value long-term and should be seen as an alternative destination for Makuutu MREC product in the future.

Furthermore, the Company continues to progress activities with China Rare Earths Jiangsu on the development of Makuutu, as per the terms of the non-binding MOU (ASX: 7 April 2021). This agreement does not extend to the planned standalone CREO/HREO separation and refining asset, and as such, the nature of collaborative activities is focused solely on accelerating development of Makuutu.

The Company will provide updates to the market on the development of a standalone rare earth Separation and Refining facility, once all aspects of the evaluation process have been finalised.

Authorised for release by the Board.

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About Makuutu Rare Earths Project

The Makuutu Rare Earths Project is an ionic adsorption clay ("IAC") hosted Rare Earth Element ("REE") deposit located 120 km east of Kampala in Uganda and is well serviced by existing high quality infrastructure including roads, rail, power infrastructure and cell communications. The installed infrastructure is illustrated in Figure 1.

The Company will move to 60% ownership of Makuutu on the completion of the Feasibility Study and has a pre-emptive right over the remaining 40% stake in the Project.

The deposit stretches 37 km in length and has demonstrated potential for a long life, low-cost capital source of critical and heavy rare earths. These IAC deposits are prevalent in southern China which have been the source of the world's lowest cost critical and heavy REE production, however these deposits are gradually being exhausted and Makuutu represents one of only a handful of such deposits outside of southern China.

The Makuutu deposit is shallow, with less than 3 m of cover over a 9 m average thickness clay and saprolite zone which results in low-cost bulk mining methods with low strip ratio. A maximum thickness of 19.5 m has been identified at Makuutu. Processing is via simple acidified salt desorption heap leaching, breaking the chemical ionic bond which washes the rare earths (in a chemical form) from the ore into a pregnant leach solution ("PLS"). The PLS is concentrated up using membrane technology, from which the rare earths are precipitated as a mixed rare earth carbonate product; a product which attracts both a higher payability and achieves a high basket price due to the dominant high value critical and heavy rare earths which make up over 70% of the product basket (Figure 2).

Figure 1: Makuutu Rare Earths Project Location with major existing infrastructure.

The Project has the potential of generating a high margin product with an operation life exceeding 27 years. The Project is also prospective for a low-cost Scandium co-product.

Existing Infrastructure

One of the Makuutu Rare Earths Project's competitive advantages is its proximity to existing infrastructure. The Makuutu site is approximately 10km from Highway 109 which is a sealed bitumen road connecting to Kampala, to Kenya and on to the Port of Mombasa. All weather access roads connecting the site to the adjacent sealed bitumen highway are already existing. A rail line lies within 10 kilometres north of the Makuutu site near the town of Iganga. There are four hydroelectric power plants located within 65 km of the project area, with total installed generating capacity of approximately 810 MW, providing an abundant supply of cheap power to the Project.

Water will be sourced at the project by harvesting water from the Makuutu site, given the Project location in a positive rainfall environment, and a net positive process water balance will require membrane processes to be used to process site discharge water for reagent recovery. Excess water management will be a key focus of the Project the ensure environmental standards are met and reagent consumption is minimised.

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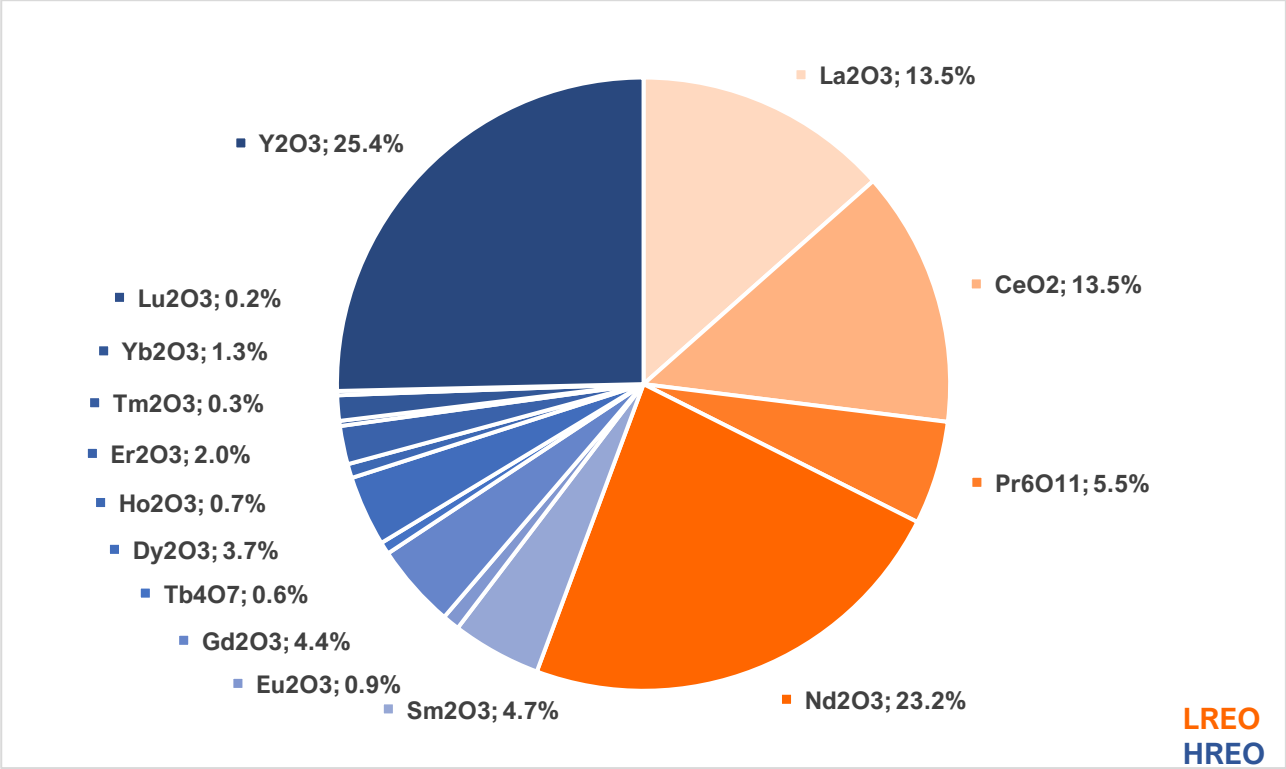

Figure 2: IonicRE basket defined by mixed rare earth carbonate (MREC) sourced from the Makuutu Rare Earths Project.

A workforce of semi-skilled and artisanal workers is available in nearby towns and population centres. The closest major population centre is Iganga, which has a population of 50,000. The town of Mayuge is approximately 10 km from the Project site and the intent is to source local operations staff from the immediate districts and train staff accordingly. The operation is to be staffed by a residential workforce. No fly in – fly out is envisaged, and the number of expatriate staff is intended to be low, and to be phased out over time. Industrial facilities are available in the city of Jinja, approximately 40 km from the Project area. Additional industrial facilities are available on the outskirts of Kampala.

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.

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