

01 July 2024

Recycling Takes a Front Seat

NEED TO KNOW

- Belfast rare earth recycling and separation plant advances rapidly
- Makuutu produces first MREC – a major milestone
- Capital raise funds key priorities
- JV with Viridis for Brazilian REO Refinery

Belfast recycling plant advancing rapidly, potential cash flow in 2026:

Recent developments have shown there is strong interest in IXR's magnet recycling technology, demonstrating the value of a closed-loop chain for end-of-life magnets and the production of a high-quality separated magnet rare earths oxide (REO) product. IXR expects to complete a Feasibility Study (FS) in 3QCY24 and aims for first commercial production and cashflow in CY2026.

Makuutu produces first MREC and Expands Resource: IXR reached a major milestone in March, with first mixed rare earth carbonate (MREC) from its demonstration plant at Makuutu. The plant will validate the mine plan, and sample MREC has been sent to customers and strategic partners to evaluate. Makuutu has targeted FID later in CY2024 and commercial production in CY2026. IXR also expanded the Mineral Resource by 16%.

A\$5.5m cap raising to advance projects: IXR raised A\$5.5m to fund several activities including advancing partnership negotiations, magnet recycling demonstration plant enhancements and the FS at Belfast.

JV to Advance Rare Earth Separation Business in Brazil: IXR and Viridis are to form JV to advance a rare earth separation business in Brazil, one of the world's fastest developing rare earth regions.

Investment Thesis

Downstream magnet recycling a competitive edge: IXR has developed proprietary technology to separate and recover REEs from recycled permanent magnets and scrap, contributing to the production of high-performance magnets. The plant is low capex, and provides a potential for rapid commercialisation, near term cashflow and future expansion.

Makuutu Rare Earths Project Producing High Value REEs: The Makuutu Project in Uganda will be a long-life, low operating cost asset producing high-value heavy REEs generating EBITDA margins of ~40%.

Long-term supply chain partnerships: With western world magnet producers seeking ex China suppliers, IXR is poised to develop new unique Western supply chains, integrating mining, refining, and recycling.

Valuation: \$0.10/Share (Unchanged)

Our IXR valuation is A\$0.10/share, fully diluted, based on IXR's Makuutu Project and Belfast Recycling Plant. We have applied a 75% risk probability weighting and incorporated both the recent capital raising and an assumed capital raising to construct the Belfast plant.

Risks

Key risks include an increase in development capital costs, technological risks with processing REEs, and country risks with operating in Uganda.

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Materials

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ionic rare earths

IXR is leading the secure supply of magnet rare earths, leveraging their sustainable technology, pioneering magnet recycling to drive the next generation of wind turbines, electronic vehicles, defence, and advanced manufacturing.

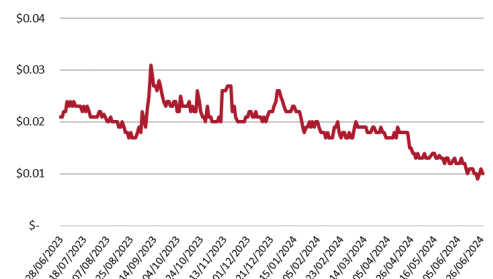
www.ionice.com.au

Valuation	A\$0.10 (unchanged)
Current price	A\$0.01
Market cap	A\$48m
Cash on hand	A\$1.84m (31 Mar 2024) Pre A\$5.5m raise

Upcoming Catalysts / Next News

Period	
3QCY24	Belfast Feasibility Study
CY2024	Belfast funding for commercial plant
CY2024	Potential Belfast expansion
CY2024	Makuutu funding and FID

Share Price (A\$)



Source: FactSet, MST Access.

Figure 1: Financial summary, IXR (June year-end)

IONIC RARE EARTHS LIMITED							IXR.AX
Year end June 30							
MARKET DATA							
Share Price	A\$/sh					0.01	
52 Week Low	A\$/sh					0.01	
52 Week High	A\$/sh					0.03	
Market Cap (A\$m)	A\$m					48	
Net Debt / (Cash) (A\$m)	A\$m					(5)	
Enterprise Value (A\$m)	A\$m					43	
Shares on Issue	m					4,831	
Options/Performance shares	m					191	
Other Equity	m					5,473	
Potential Shares on Issue (Diluted)	m					10,495	
INVESTMENT FUNDAMENTALS		FY22A	FY23A	FY24E	FY25E	FY26E	
Reported NPAT	A\$m	(5)	(1)	(15)	(12)	(20)	
Underlying NPAT	A\$m	(5)	(1)	(15)	(12)	(20)	
EPS Reported (undiluted)	¢ps	(0.1)	(0.2)	(0.5)	(0.1)	(0.2)	
EPS Underlying (undiluted)	¢ps	(0.1)	(0.0)	(0.3)	(0.1)	(0.2)	
P/E Reported (undiluted)	x	n/m	n/m	n/m	n/m	n/m	
P/E Underlying (undiluted)	x	n/m	n/m	n/m	n/m	n/m	
Operating Cash Flow / Share	A\$	(0.001)	(0.003)	(0.004)	(0.001)	(0.002)	
Price / Operating Cash Flow	x	n/m	n/m	n/m	n/m	n/m	
Free Cash Flow / Share	A\$	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	
Price / Free Cash Flow	x	n/m	n/m	n/m	n/m	n/m	
Book Value / Share	A\$	0.01	0.01	0.01	0.02	0.01	
Price / Book	x	0.80	0.90	1.13	0.62	0.71	
NTA / Share	A\$	0.01	0.01	0.01	0.02	0.01	
Price / NTA	x	0.80	0.90	1.13	0.62	0.71	
Year End Shares	m	3,873	3,946	4,831	10,495	10,495	
Market Cap (spot)	A\$m	39	39	48	105	105	
Net Cash / (Debt)	A\$m	27	11	4	36	(194)	
Enterprise Value	A\$m	12	28	44	68	299	
EV / EBITDA	x	n/m	n/m	n/m	n/m	n/m	
Net Debt / Enterprise Value		(0.6)	(0.3)	(0.1)	(0.8)	4.5	
Dividend per share	¢ps	0	0	0	0	0	
PRODUCTION AND PRICING		Jun-22	Jun-23	Jun-24e	Jun-25e	Jun-26e	
CAPEX	\$AUD	(0)	-	-	(90)	(210)	
IXR REO Basket Price (excl. payability)	\$US/kg	77	88	96	101	100	
AUDUSD	:	0.73	0.70	0.67	0.67	0.67	

12-Month Relative Performance vs S&P/ASX Metals & Mining					
Profit & Loss (A\$m)	FY22A	FY23A	FY24E	FY25E	FY26E
Revenue	-	-	-	-	-
Expenses	(5)	-	(22)	(10)	(10)
EBITDA	(5)	-	(22)	(10)	(10)
D&A	(0)	(1)	(0)	(0)	(0)
EBIT	(5)	(1)	(22)	(10)	(10)
Interest	0	-	0	(6)	(18)
Tax	-	-	7	5	8
Underlying NPAT	(5)	(1)	(15)	(12)	(20)
Exceptionals	-	-	-	-	-
Reported Profit	(5)	(1)	(15)	(12)	(20)
Net profit before tax	(5)	(1)	(22)	(17)	(28)
Balance Sheet (A\$m)	FY22A	FY23A	FY24E	FY25E	FY26E
Cash	27	11	4	252	22
Receivables	1	1	1	1	-
Inventory	-	1	1	1	-
PP&E	0	2	2	91	302
Exploration	12	2	2	2	2
Other	9	28	28	28	28
Assets	49	45	37	374	353
Creditors	1	1	1	1	-
Debt	-	-	-	215	215
Other	0	0	(7)	(10)	(11)
Liabilities	1	1	(6)	206	204
Shareholder's Equity	48	44	43	168	148
Cashflow (A\$m)	FY22A	FY23A	FY24E	FY25E	FY26E
Net Cash From Operations	(4)	(12)	(22)	(15)	(210)
Capex	(0)	-	-	(90)	(210)
Exploration	(9)	-	-	-	-
Other	(2)	-	-	-	-
Net Investing Cashflow	(11)	-	-	(90)	(210)
Equity	30	1	15	137	-
Borrowings	-	-	-	215	-
Dividend	-	-	-	-	-
Net Financing Cashflow	30	1	15	352	-
Effects of FX	(0)	0	-	-	-
Net Increase / (Decrease) in Cash	16	(10)	(7)	248	(230)

Source: IXR, MST estimates.

IXR's 3-Pillar Strategy – Magnet Recycling Moves Rapidly

Momentum is building for Ionic Rare Earths (IXR) to deliver its 3-pillar strategy (see Figure 2), which aims to supply a circular economy of sustainable and traceable magnet and heavy rare earth element (REE) products for electric vehicles (EVs), offshore wind turbines, communication, and key defence initiatives. The company has defined the key elements of its strategy as follows:

- **Pillar 1: to develop its existing IAC project**, the Makuutu Rare Earths Project in Uganda, to be a long-term, low-capital supplier of high-value magnet and heavy rare earth oxides (REOs)
- **Pillar 2: to develop a potential Brazilian magnet and heavy rare earth refinery** via JV with Viridis Mining & Minerals Ltd (ASX: VMM) to produce value-added, separated REOs and compounds and cement the company's place in new, ex-China rare earths supply chains
- **Pillar 3: to develop a downstream magnet recycling business.**

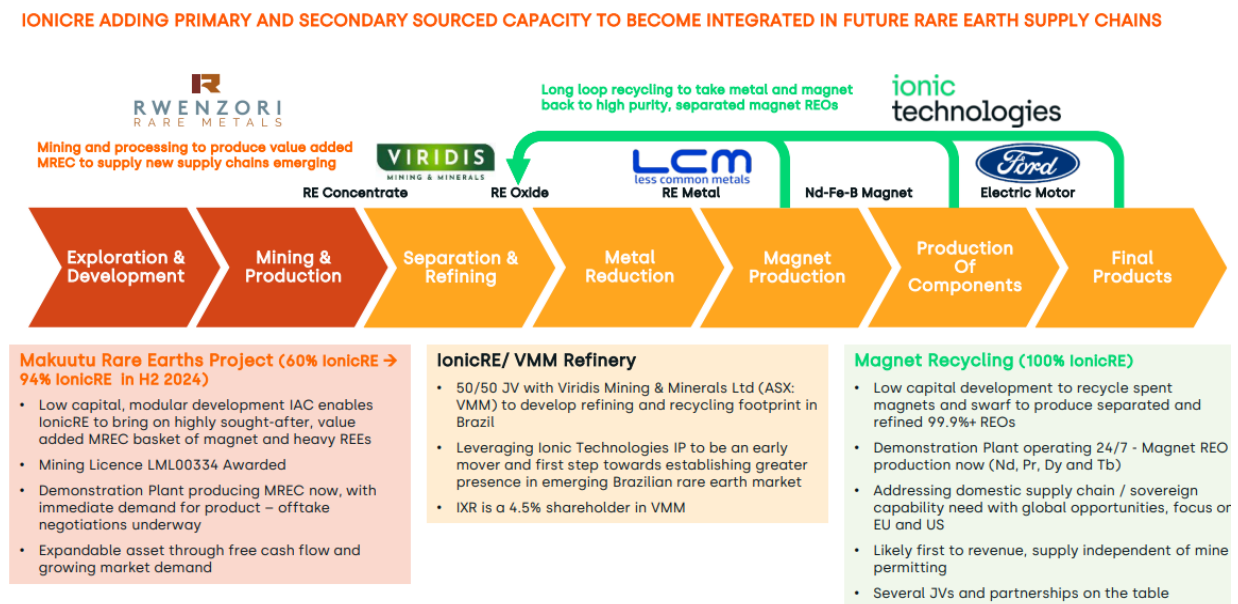
Belfast recycling (Pillar 3) accelerating – nearer-term cashflow profile

The key long-term pillar of IXR's strategy is the development of the Makuutu Rare Earths Project in Uganda. However, recent developments around the magnet recycling plant in Belfast have accelerated its potential to be a key cash-generating business in the nearer term.

Recent developments have shown there is strong interest in IXR's magnet recycling technology and the importance of both the processing of the spent magnets and the production of a high-quality REO product.

In the next section, we review the development of the Belfast recycling centre and the importance of its development to IXR.

Figure 2: IXR's 3-pillar strategy and role in establishing a new Western supply chain



Source: IXR.

Belfast Recycling Plant Bounds Ahead

Significant Customer Interest in Technology

A brief history of the Belfast Rare Earths Recycling Plant

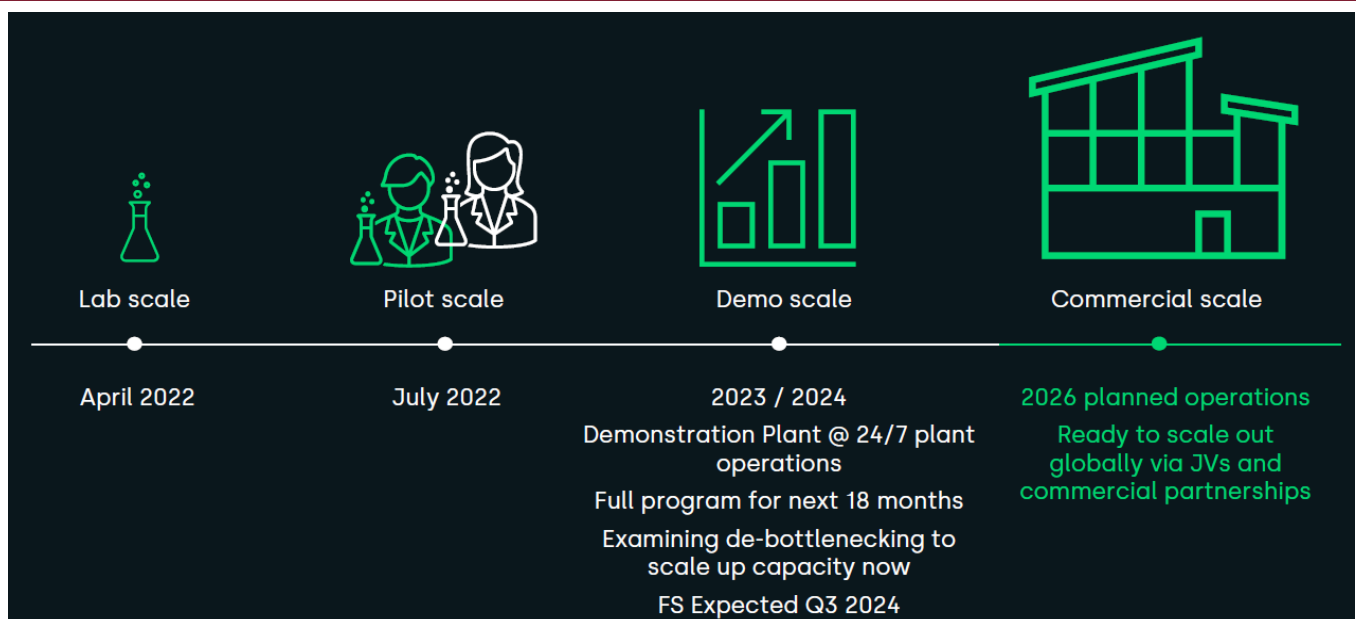
In early 2022, IXR acquired SerenTech (now known as Ionic Technologies) for US\$1m in cash plus scrip valued at US\$1.5m and a milestone fee on the commercialisation of the technology, worth up to US\$1.5m. The acquisition gave IXR access to a proven team, established intellectual property (IP) and specialised knowledge.

Ionic Technologies has developed IP and processes for separating and recovering REEs from mining ore concentrates, swarf (cuttings and shavings) and recycled permanent magnets. This proprietary technology provides a flexible solution for extracting high-grade REEs from varying magnet grades. It has the potential to provide magnet REOs for the production of modern high-performance magnets, which are integral to sectors such as EVs and wind turbines.

The hydrometallurgical process is able to deliver high-purity separated magnet REOs, independent of variability in composition of magnet feedstock, enabling the creation of sustainable, traceable, and sovereign rare earth supply chains.

An initial pilot plant campaign successfully produced ~5kg of separated magnet REOs – Nd₂O₃ and Dy₂O₃ – at high purity.

Figure 3: IXR recycling – path to commercialisation



Source: IXR.

The rationale: why IXR went down the recycling route

European Critical Raw Materials Act – €300 bn initiative

The European Commission's Critical Raw Materials Act (CRMA) is a €300bn action aimed at countering the Chinese Belt and Road Initiative.

The CRMA identifies a list of strategic raw materials which are:

- crucial to Europe's green and digital ambitions and for defence and aerospace applications
- subject to potential supply risks in the future.

The CRMA sets clear benchmarks for domestic capacities along the strategic raw material supply chain with the goal of diversifying EU supply by 2030 (see Figure 4).

Figure 4: CRMA strategic material supply chain regulations



Source: IXR.

Potentially IXR's first source of revenue

The recycling plant has the potential to provide magnet REOs for the production of modern high-performance magnets, which are integral to sectors such as electric vehicles (EVs) and wind turbines.

The recycling business is the third pillar of IXR's 3-pillar strategy, and potentially the first to generate revenue. It can be seen as 'priming the pump' on the supply chain.

The establishment of the demonstration plant positions IXR as a leader in the industry, allowing it to quickly begin producing magnet REOs which can be used in collaborative partnerships to demonstrate new supply chain possibilities.

The ability to recycle magnets gives IXR a solid foundation for creating new supply chains in Western markets.

Why Belfast? A strategic location with good infrastructure and market access

Ionic Technologies is located within the Belfast Harbour Estate, which is the UK's largest single port estate comprising 2,000 acres.

Belfast Harbour has world-class infrastructure, including the UK's first offshore wind terminal (see Figures 5–6).

Dual market access

Belfast is strategically located to take full advantage of both the UK and European markets for rare earths. Both the UK and the European Union (EU) have critical minerals strategies in place:

- UK – trading arrangements are in place with Northern Ireland that make this location attractive and the Critical Minerals Strategy and
- EU – the CRMA

Potential US funding – Atlantic Declaration

In mid-2023, the UK and the USA backed a new Atlantic Declaration for greater cooperation on pressing economic challenges in areas such as clean energy, critical minerals and artificial intelligence.

The joint declaration described the partnership as the "first of its kind" in covering the broad spectrum of the two countries' economic, technological, commercial and trade relations.

Under the plan, the UK and the USA will strengthen their supply chains, develop technologies of the future and invest in one another's industries. From this agreement there is a potential £5bn in US funding.

Figure 5: Belfast Port – unique infrastructure



Source: IXR

Figure 6: IXR location – Belfast Port



Source: IXR

Funding for Belfast demonstration plant provided by UK Government grant

In September 2022, Ionic Technologies received a £1.72m (~A\$2.9m) grant from the UK Government to build a demonstration-scale magnet recycling plant in Belfast.

The plant was constructed and commissioned during CY2023.

The first batch of REOs from the process commissioning of high-grade magnet REOs included:

- 2 kg of Nd_2O_3 , grading at 99.7% and ~0.3% Dy_2O_3 (cumulative REO content of 99.99%)
- 0.6 kg of Dy_2O_3 , graded at 99.8% (total REO content of 99.9%).

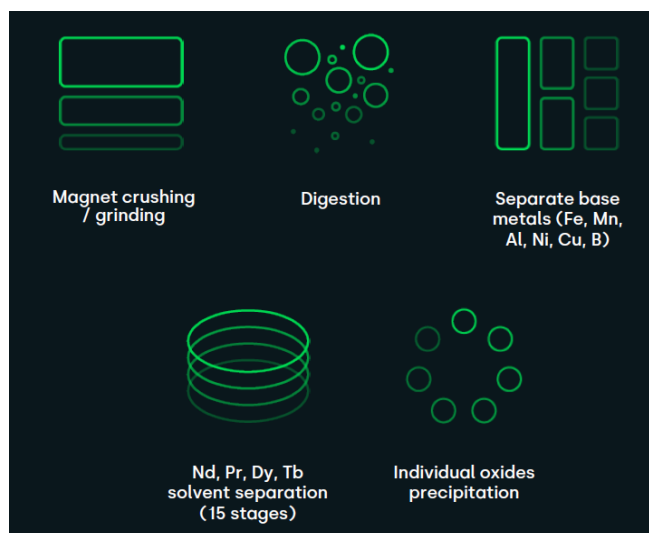
IXR expects the demonstration plant will have production capacity of 10 tonnes per annum (tpa) from a 30 tpa feed rate of end-of-life permanent magnets or production swarf.

How the technology works

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.

Unlike other recycling processes, IXR's technology can recycle any form of mixed waste magnets and production swarf, regardless of type, age or coatings, and is not reliant on a single feedstock stream.

Figure 7: The IXR recycling process



Source: IXR.

Landmark agreement – Ford gets involved; UK Government chips in

In September 2023, Ionic Technologies secured a collaboration partnership with Ford and Less Common Metals (LCM) to develop a UK supply chain for recycled magnet rare earths to magnets.

Final aim of agreement – IXR's recycling technology to contribute to magnets that satisfy Ford's standards

The majority of Ford's EU production will come from its UK-based Halewood facility, which Ford plans will produce close to half a million units per annum by 2026.

The aim of the agreement is to ensure that IXR's rare earths recycling technology, once implemented into the rare earths production chain, will lead to a sufficiently high-quality permanent magnet product to satisfy Ford's needs for its EV-producing plants in Europe.

Each stage of the process, from magnet recycling to EV testing, will generate waste (magnets and swarf), including the magnets used in Ford's EV motors. IXR will recycle this material, thus completing a totally circular rare earth supply chain within the UK.

The verification by Ford of the quality of the magnets produced from IXR's recycled materials would be a significant validation of IXR's recycling strategy.

Agreement with LCM Further Expanded

IXR has signed a further Memorandum of Understanding with LCM in May 2024, focused on:

- Expanding recycling opportunities from magnet manufacturing across the UK and the USA
- Engagement with both UK and international governments to support and expand a resilient, Western capability for recycling as an integral piece of the rare earth permanent magnet supply chain
- Collaboration on the production of other alloys, including samarium-cobalt (SmCo) and Scandium (Sc), integrating Ionic Technologies' recycling technology to supply high purity oxides;

The MOU expands upon existing joint collaboration mentioned above in partnership with Ford.

More UK Government grants accelerate the process

IXR will receive approximately £750k in direct cash funding as a result of grants from the UK Government. The grants represent a strong commitment by the government to IXR's recycling facility and, along with the agreement signed with LCM and Ford, will accelerate the development path of the company's recycling strategy.

£1m towards the IXR-LCM-Ford partnership: The UK Government will support the partnership between Ionic Technologies, Ford and LCM via a £1m grant, with Ionic Technologies announced as the major beneficiary and lead collaborator in the focus on delivering the UK's first domestic sourcing of separated high-purity magnet REOs.

A further £1m for recycling feasibility study: The UK Government is providing an additional £1m grant in funding a feasibility study into the construction and supply-side dynamics of a magnet rare earth recycling plant in the UK in collaboration with the British Geological Survey (BGS).

What's next – the path to first cash flow

Demonstration plant – full program for next 18 months

In January 2024, 24/7 operations commenced at the Belfast Recycling Demonstration Plant. The plant's production schedule is now full through to 3Q2025.

IXR continues to receive numerous requests from various magnet REO supply chain participants and potential strategic partners to run both end-of-life (EOL) magnet material and swarf and magnet production waste streams trials through the rare earth recycling plant.

IXR has now filled the plant's capacity for the next 18 months to run several campaigns as part of demonstrator programs to progress enquiries towards commercial partnerships. Multiple discussions are advancing regarding potential commercial partnerships which would utilise IXR's technology to produce REOs by recycling.

IXR examining options for expansion

Due to this high demand, IXR is now exploring options to increase capacity at the Belfast demonstration plant, together with potential new capacity with partners in other jurisdictions. This comes amid significant demand for the production of REOs from magnet recycling, which is currently essentially non-existent in the Western world.

The company is also looking to increase capacity nearer term and is currently working on de-bottlenecking the plant in order to achieve this.

Feasibility Study (FS) in progress – completion expected 3QCY24;

commercial production and first cashflow CY2026

IXR expects to complete an FS into the commercialisation of the plant with completion targeted for 3QCY24. Upon completion of the FS, IXR will progress potential funding of the plant with the aim of first commercial production and cashflow in CY2026.

A\$5.5m Capital Raise to Advance Projects

IXR has raised A\$5.5m at A\$0.013 per share, including participation of A\$0.5m from Executive Chairman Brett Lynch (adding to his recent \$1.5m investment on joining the company in January 2024). 423,076,923 fully paid ordinary shares were issued, with the issue price representing a 25.3% discount to the 10 day VWAP immediately preceding the raising.

Participants in the raising will receive 3 attaching unlisted options for every 4 shares issued. The options will have an exercise price of A\$0.02 (a 54% premium to the issue price of shares under the placement) and a 4-year term, with a total of 317,307,690 unlisted options issued.

JV to Advance Rare Earth Separation Business in Brazil

IXR and Viridis Mining and Minerals Ltd (ASX: VMM) have agreed to form a 50:50 joint venture (JV) to advance a rare earth separation business in Brazil, one of the world's fastest developing rare earth regions.

The JV aims to construct a refinery and magnet recycling facility in Brazil utilising IXR's separation technology, demonstrated at the Belfast Demonstration Plant.

Viridis' Colossus Rare Earth Project, located in Poços de Caldas, Brazil, is potentially a major high-grade IAC deposit.

Viridis has agreed to supply MREC processed from the Colossus Project on standard market terms. IXR will supply separation technology expertise to ensure successful commercial operation for the JV, ensuring a closed-loop process for the production and supply of rare earths product to the market.

A Scoping Study for the refinery and recycling project is targeted for completion by the end of 2024.

Makuutu RE Project: – Mining Licence Approved; First MREC Produced on Site; Mineral Resource Expanded; FID in CY24

In a major milestone for the company, the Large-Scale Mining Licence for the Makuutu Project was approved by the Ugandan Government on 17 January 2024. The approval, which represents the first large-scale mining licence to be issued in Uganda under the Mining Act of 2022, adds to the flagship project status awarded to Makuutu in 2022 and reflects the strong support received from the government.












On 25 March 2024, IXR announced a major milestone: maiden MREC production from the Makuutu Demonstration Plant. The company will now use these MREC products for advanced offtake and strategic partner negotiations.

IXR is aiming for final investment decision (FID) late 2024, and first product to customers in 2026.

Makuutu the most advanced IAC project in the world

Makuutu is the most advanced new ionic adsorption clay (IAC) project globally which has product available for Western customers. Figure 8 shows the advanced status of Makuutu compared to the other global IAC projects.

Figure 8: Status of the Makuutu Project compared with comparable IAC projects globally

Project (Owner) (Ticker)	Location	Mineral Resource Estimate	Scoping Studying / PEA	Pre-Feasibility Study	Ore Reserve Estimate	Definitive Feasibility Study	Demo Plan	Env Permits	Mining License	Offtake	Final Investment Decision	Target First Production
Pela Ema Mineracao Serra Verde (Private)		✓	-	✓	✓	✓	✓	✓	✓			✓
Makuutu Ionic Rare Earths Ltd (ASX: IXR)		✓	✓	-	✓	✓	Q1 2024	✓	✓		H2 2024	2026
Penco Module Aclara Resources Inc (TSX: ARA)		✓	-	✓	✓	-	✓	✗				
Carina Module Aclara Resources Inc (TSX: ARA)		✓	✓									
Koppamurra Australian Rare Earths (ASX: AR3)		✓										
Caldeira Meteoric Resources Ltd (ASX: MEI)		✓							✓			
Colossus Viridis Mining & Minerals Ltd (ASX: VMM)												
Bluebush Alvo Minerals Ltd (ASX: ALV)												
Brazilian Rare Earths Ltd (ASX: BRE)		✓										
Harena Resources Pty Ltd/Citius Resources Plc (Private)		✓										

Source: IXR.

Makuutu Demonstration Plant produces first MREC

The Makuutu Demonstration Plant technical facility aims to further optimise metallurgical test work and provide further technical validation basis for grade control, mine design, material handling, metallurgical reconciliation and construction activity, whilst also supporting project financing and further assessment by potential strategic partners.

In March 2024, the newly commissioned Demonstration Plant on site at Makuutu achieved first production of MREC. This MREC is rich in both magnet and heavy REEs, and presents a key alternative, strategic future source for supply-constrained Dysprosium (Dy) and Terbium (Tb).

The demonstration plant is essential for validating the mine development plan. The MREC production advances further supply chain and off-taker engagement, providing sample product for customers and strategic partners to evaluate, and positions Makuutu for targeted FID later in 2024 and planned full commercial production in 2026.

Figure 9: Makuutu Demonstration Plant on site in Uganda



Source: IXR

Figure 10: First mixed rare earth carbonate (MREC) produced from the Makuutu plant



Source: IXR.

Mineral Resource Increased 16%

The MRE has been updated with results from the 2023 Phase 5 infill and extension drilling results which targeted MRE areas A and B. The previous Makuutu Project MRE reported in May 2022 contained Inferred Resources only for Areas A and B, with the Phase 5 drilling program increasing resource confidence and extending the defined mineralisation in these areas by approximately 85 million tonnes.

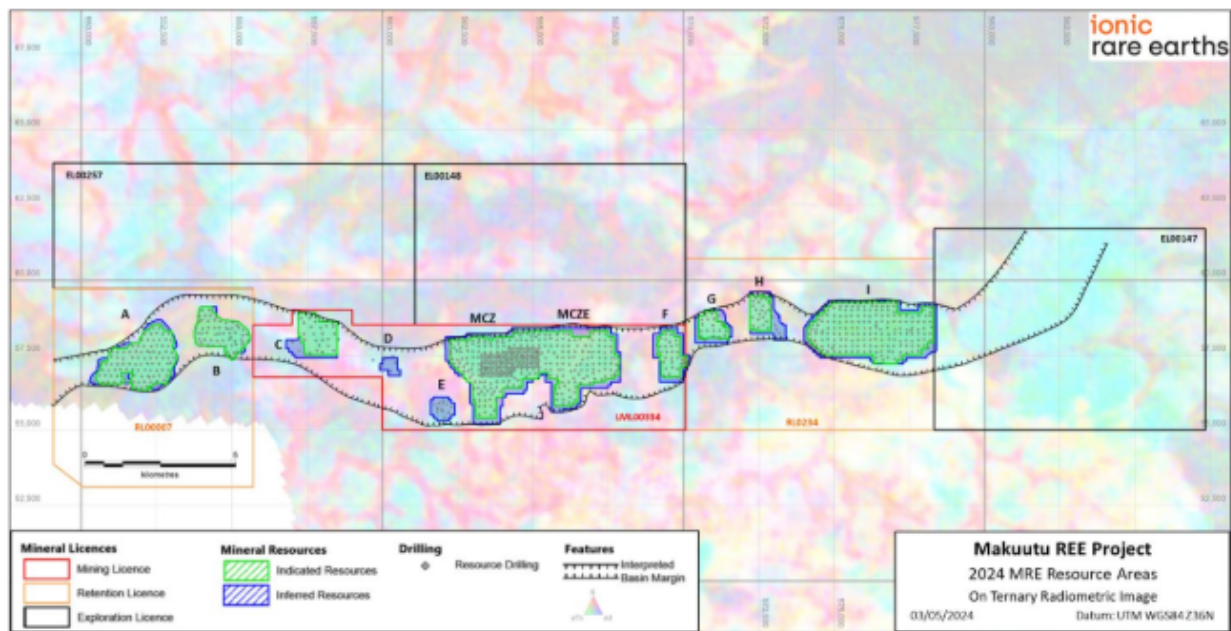
Based on the Phase 5 drilling assays, the mineral resource estimates have been updated in Areas A and B only.

Drilling infilled the previous Inferred resource areas on a 200-metre spaced pattern and extended the drilling coverage of both areas beyond previous limits. Figure 11 shows the infill drilling locations on Areas A and B, and the updated Indicated and Inferred resource areas compared to the previous 2022 resource boundaries.

The extension drilling was particularly significant on Area A, defining mineralisation up to 1.5 kilometres west of the previous drilling limit. This extension to Area A has increased the total resources for that area from an Inferred only status of 13 million tonnes at 580ppm TREO in May 2022, to a revised resource of 85 million tonnes at 530ppm TREO including 79 million tonnes at 540ppm of Indicated resource.

Area B was extended to the southeast with the infill drilling also providing higher TREO grade than the 2022 Inferred resource. Consequently, the Area B resource has grown from 26 million tonnes at 410ppm TREO Inferred resource to a total resource of 39 million tonnes at 530ppm TREO including 38 million tonnes at Indicated status.

Figure 11: Plan view of MRE areas by classification. Green shading Indicated resource and blue Inferred resource areas



Source: IXR

Figure 12 shows the updated MRE while figure 11 shows the previous MRE

Figure 12: Updated and Expanded MRE for Makuutu

Resource Classification	Tonnes (Millions)	TREO (ppm)	TREO-CEO ₂	LREO (ppm)	HREO (ppm)	CREO (ppm)	S ₂ O ₂ (ppm)
Indicated	517	650	440	470	170	220	30
Inferred	99	560	380	420	140	190	30
Total	616	630	430	460	160	210	30

Source: IXR

Figure 13: Previous MRE for Makuutu

Resource Classification	Tonnes (Millions)	TREO (ppm)	TREO-CEO ₂	LREO (ppm)	HREO (ppm)	CREO (ppm)	S ₂ O ₂ (ppm)
Indicated	404	670	450	500	170	230	30
Inferred	127	540	360	400	140	180	30
Total	532	640	430	480	160	220	30

Source: IXR

Key Outcomes of the Expanded MRE

The key outcomes of the MRE update were:

- Significant increase in Makuutu Mineral Resource Estimate (MRE)
 - Total MRE tonnage increasing by 16%;
 - Indicated Resource tonnage growing 28%
- Updated Makuutu MRE contains
 - approximately 126,000 tonnes of magnet Rare Earth Oxides including;
 - 99,000 tonnes of heavy REOs²
 - 86,000 tonnes of NdPr oxide;
 - 7,400 tonnes of DyTb oxide

What the New Resource Means for IXR

The updated MRE means that IXR can progress with planning on the next mining licence application and can also provide context on the growth opportunity of the Project to the west.

It is important to note that the increase in the overall magnet and heavy REOs reaffirms the positioning of Makuutu as a development ready, long-life alternative supply source away from China, and positions IXR with a unique offering from both recycling and near-term mined and processed MREC.

Footnote:

1 Magnet REOs = Nd₂O₃ + Pr₆O₁₁ + Tb₄O₇ + Dy₂O₃ + Sm₂O₃ + Gd₂O₃ + Ho₂O₃

2 Heavy REOs = Sm₂O₃ + Eu₂O₃ + Gd₂O₃ + Tb₄O₇ + Dy₂O₃ + Ho₂O₃ + Er₂O₃ + Tm₂O₃

Valuation A\$0.10/Share (Previous A\$0.10); Initial Valuation for Belfast Recycling Plant

We have reviewed our valuation to take into consideration the increased share capital from the recent capital raising as well as the options attached to the raising. Our valuation now also includes our initial estimate for the Belfast Recycling Plant. We note that this is an initial valuation and that IXR is currently in the process of a Feasibility Study. We will update our valuation of the Belfast plant on the release of that study.

Our valuation has remained at A\$0.10, and includes the recent equity raise and associated options. We have also decreased the price at which equity is raised to fund both the Makuutu Project and the Belfast Recycling Project.

Valuation summary

Our valuation is derived from our discounted cash flow (DCF) analysis of the Makuutu Project and the Belfast Recycling Plant, both of which we assign a 75% probability risk weighting.

Figure 14 summarises our valuation, using a discount rate of 12% for Makuutu and 10% for the Belfast operation. Our valuation assumes a A\$137m capital raise (60/40 debt to equity for IXR's share of capex for both the Makuutu and Belfast Recycling Plant) at A\$0.025/share. Our fully diluted share count is 10.5 bn.

Figure 14: IXR valuation summary including Belfast plant

Ionic Rare Earths Valuation				
	Discount rate	Risk weighting	AUD\$m	AUD\$/sh
Makuutu (94%)	12.0%	75.0%	937	0.09
Belfast recycling	10.0%	75.0%	74	0.01
Total operating assets			1,012	0.10
Corporate/SG&A	12.0%		(30)	(0.00)
Net cash/(debt) (\$AUD)			91	0.01
Net Asset Value			1,073	0.10
Current Share Price				0.010
Upside				922%

Source: MST estimates.

Figure 15: Summary of debt and equity financing

Financing - 60/40 Debt to Equity	
Capex IXR 94% Ownership - First Module (\$Am)	252.5
Capex Belfast Recycling	89.6
Debt Arrangement (60%)	
Debt (\$Am)	205.3
Interest Rate	12%
Equity Raise (40%)	
Equity Raised (\$Am)	136.8
Issued Price assumption	0.025
Shares Issued (m)	5,473
Options/Performance Rights (m) (including Makuutu Consideration and Bonus Rights)	191

Source: MST estimates.

Key valuation assumptions

Key assumptions for Makuutu

Our critical valuation assumptions for Makuutu are shown in Figure 16.

We believe our pricing assumptions are conservative, given the critical status of the Makuutu product basket. We also assume a conservative head grade in the later years of the project.

Our base-case NPV valuation is based on a mine plan consistent with the Stage 1 DFS, but it assumes a final plant capacity of 15 Mtpa ROM throughput instead of the DFS's 5 Mtpa. We consider this a reasonable assumption given the resource size (currently: 532 Mt @ 640ppm) and anticipated demand.

IXR must fund its 94% share of the project, requiring US\$169m under our capex assumptions (we assume 20% higher than IXR). We assume a 60/40 debt-to-equity split (per company guidance) and an equity raising at a price of A\$0.025/share. The remaining three modules (2.5 Mtpa of additional processing capacity) will be self-funded through Makuutu's free cashflow.

Figure 16: Makuutu – our key valuation assumptions

Assumptions (LOM)	MSTe
PROJECT ASSUMPTIONS (Real FY23)	
Project Ownership (%)	94%
Strip Ratio (waste : ore)	0.57
Mixed Rare Earth Carbonate (% REO)	>90%
TREO Average Recovery (%)	35.0%
Average REO Produced - ex Scandium (tpa)	3,312
Mine Life (years)	35
Capex - first module (US\$m) - for 100% (Real)	180
COST & FINANCING ASSUMPTIONS	
Discount Rate - Nominal (%)	12%
Inflation Rate (%)	2%
Capital Raised - IXR 94% Share (A\$m)	101
Debt to Equity Split of Capital Raised (%)	60:40
Debt interest rate	12%
Issued Price for Equity raising (A\$/share)	0.025
PRICING & EXCHANGE RATE ASSUMPTIONS	
USD/AUD	0.67
Average REO Price LOM (Real) (US\$/kg) - incl. Payability factor	86
Royalty Rate (%)	5%
Corporate Tax Rate (%)	30%

Source: MST estimates.

Key assumptions for Belfast Recycling Plant

Unrisked NPV US\$66m / A\$98m

We have included the Belfast Recycling Plant in our valuation for the first time. We consider that, given the achievements of the plant in the recent past, it warrants inclusion on a stand-alone basis. Our critical valuation assumptions for Belfast are shown in Figure 17.

We emphasise that our valuation and the assumptions that it contains are preliminary in nature, and will be firmed up once the Feasibility Study for the plant is released to the market.

Our base-case NPV valuation is based on an operating life of 15 years. We have assumed a plant capacity of 350 tonnes pa of total REOs produced.

Initial capex is US\$60m and on our assumption of a 25% margin, the plant generates US\$9m EBITDA pa.

Our initial preliminary NPV (pre tax) on an unrisks basis is US\$66m.

We have assumed IXR funds its 100% share of the project, requiring US\$60m. We assume a 60/40 debt-to-equity split and an equity raising at a price of A\$0.025/share.

Figure 17: Belfast recycling plant – our key valuation assumptions

Recycling Valuation	Unit	LOM
Operating Life	Years	15
Product capacity	tpa TREO	350
Capex	US\$m, real	60
Recycling margin	US\$/t	25
EBITDA	US\$m	9
IRR	%	28
NPV10 (pre-tax)	US\$m	66

Source: MST estimates.

Positive catalysts for the share price

Belfast Recycling Plant - Advancement with customers and partners and PFS

The Belfast recycling plant is a priority for IXR with significant interest in the product and from strategic partners. The upcoming PFS will be a key catalyst for the market to understand the economics of the project. Advancement with customers with product will also be key to the project as will the strategic relationship with Ford

FID Makuutu

IXR's key REE project is producing MREC from its on site demonstration plant for customer acceptance. The FID for the project is due in 2024 and will be a major milestone for IXR.

Further Government Incentives

With Western governments looking for alternative supply chains for critical minerals, IXR has potential to benefit further from grants and low interest loans.

Other potential share price catalysts

- **Resource growth:** Drilling at Makuutu is being undertaken with a plant to grow the resource further. An increase in the resource will be positive.
- **REO price increase:** The valuation and share price sentiment is highly sensitive to REO prices. Increases in the price of REO would positively affect the valuation.

Risks to the share price and valuation

Company- and project-specific risks

- **Access to funding:** The availability of funding for the project is not guaranteed. A lack of sufficient funding could have a negative impact on the stock.
- **Delays to development:** Any delays in moving into construction would be a negative for the stock. This includes delays in approval of the mining licence.
- **Cost inflation:** Inflation is becoming a global theme and is particularly concerning in the mining industry. If operational or capital costs increase without a corresponding increase in the commodity price, the project's margins will be reduced, which could impact the economics and viability.

Macro risks

- Rare earth oxide price – this is the key valuation sensitivity
- Foreign exchange rates
- Increasing interest rates and the potential impact on the cost of debt finance

Country-specific risks

The Makuutu project, operating in Uganda, may face several country-specific risks. For example, changes in government policies or regulations could significantly affect the project's success.

- **Political instability:** Any government policies or leadership changes could impact the Makuutu project, as it may cause adverse changes in laws, taxes, or other regulations that could increase costs or decrease revenues.
- **Regulatory environment:** With any adverse changes in regulations or laws potentially impacting the project's success.

Personal disclosures

Michael Bentley received assistance from the subject company or companies in preparing this research report. The company provided them with communication with senior management and information on the company and industry. As part of due diligence, they have independently and critically reviewed the assistance and information provided by the company to form the opinions expressed in this report. They have taken care to maintain honest and fair objectivity in writing this report and making the recommendation. Where MST Financial Services or its affiliates has been commissioned to prepare content and receives fees for its preparation, please note that NO part of the fee, compensation or employee remuneration paid has, or will, directly or indirectly impact the content provided in this report.

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Ionic Rare Earths (IXR.AX) | Price A\$0.01 | Target price A\$0.10

Price, target price and rating as at 01 July 2024 (not covered)*

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