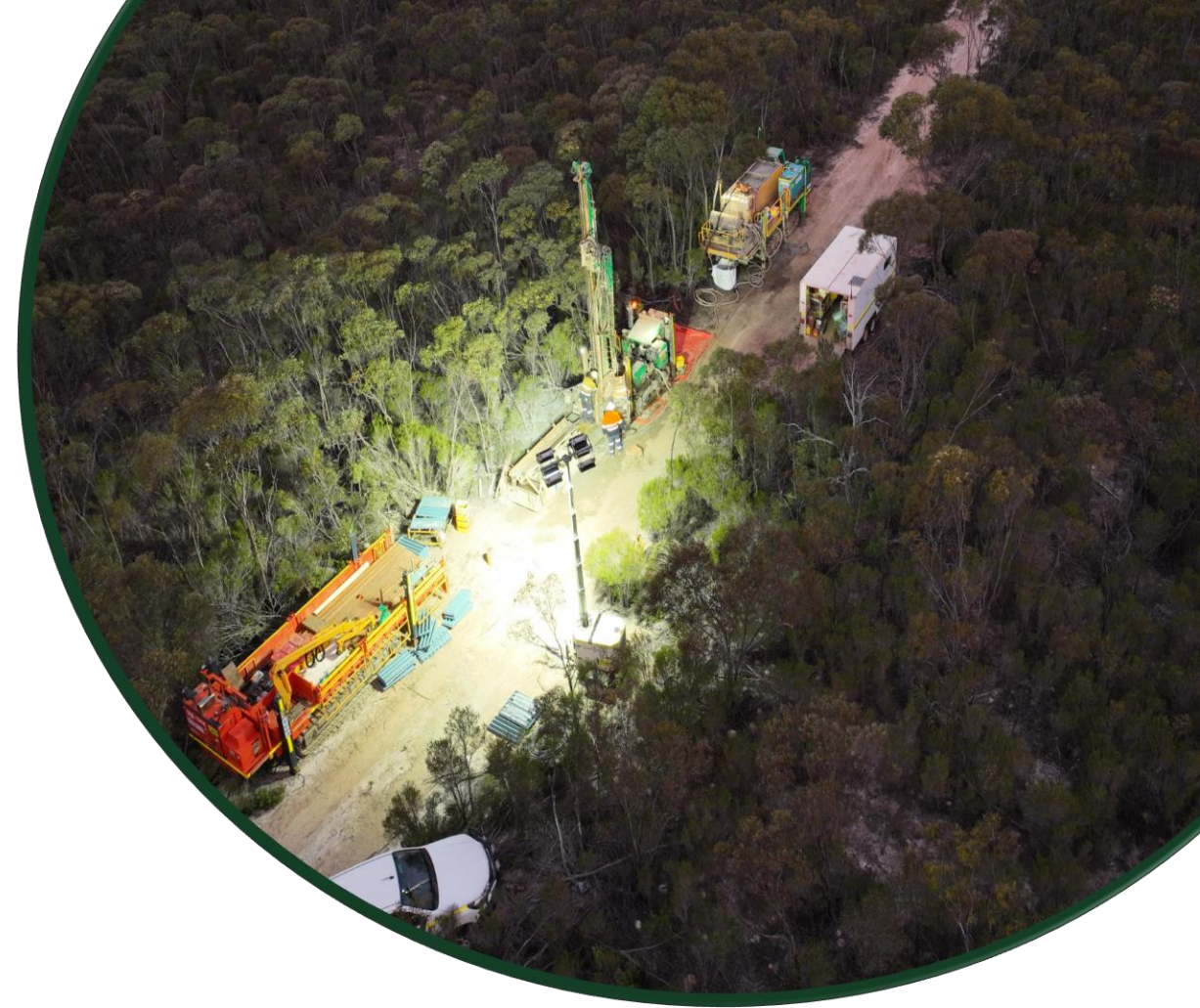




# **Uncovering a Domestic Rare Earths Province**



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## Competent Person Statement:

The information contained in this presentation that relates to exploration strategy or to exploration results is based on information generated by Mount Ridley, and compiled by, or reviewed by, Mr David Crook who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Crook has sufficient experience which is relevant to the activities reported herein to qualify as a Competent Person as defined in the 2012 edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves. Mr Crook consents to the inclusion in the presentation the matters based on his information in the form and context in which it appears

## No New Information:

This document contains information extracted from ASX market announcements reported in accordance with the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (2012 JORC Code) and available for viewing at <https://mtridleymines.com.au/announcements/>. MRD confirms that it is not aware of any new information or data that materially affects the information included in any original ASX market announcement.



*“Our mission is to delineate a globally significant source of **CRITICAL RARE EARTHS** to transform supply chain security”*

Peter Christie, Chairman – December 2022

# INVESTMENT HIGHLIGHTS



## Esperance – Southern Ocean District: a new rare earth elements province

### PROVINCE SCALE



- Peer group has collectively identified a 250 km (East-West) by 60 km (North-South) clay-hosted REE mineralisation footprint
- To date, MRD has identified a 40 km by 30 km (**1,200 km<sup>2</sup>**) mineralised footprint within a 3,400 km<sup>2</sup> tenement package
- Excellent infrastructure (highway, deep-water port, gas, renewable energy)
- Entry level junior valuation at \$39m market capitalisation

### RARE EARTHS MARKET



- China accounts for **60% of REE mining** and 87% of processing
- Chinese clay-hosted production has **plateaued**
- **8% CAGR** forecasted for NdPr growth until 2030
- Ex-China supply is **required**, not just desired, to meet demand

### EXCELLENT RESULTS



- 768 drillholes completed for **32,600m**
- Average grade of **1,062 ppm TREO** (500 ppm cut-off), with a high-grade **1,836 ppm TREO** component (1,000 ppm cut-off)
- REO assemblage biased towards **CREO (44%)**
- NdPr accounts for 42% of basket value, Tb<sub>4</sub>O<sub>7</sub> accounts for 18%
- **A\$79/kg** basket value at current prices, **A\$121/kg** at March prices

### WORK PROGRAM



- On-going aircore drilling, with **100,000m** scheduled for 2023 to define REE resources
- **1,000m** diamond drilling completed, provides samples for ore characterisation, beneficiation and extractive metallurgy
- **Maiden Mineral Resource** targeted for 2H 2023
- **Collaborative research programs** with commercial and academic institutions to provide innovative treatment solutions.

March 2022 prices (US\$/kg): please refer to slide 13.  
December 2022 prices (US\$/kg): please refer to slide 13.  
USD/AUD: 0.67.

Source: ASX Announcements, Argus Rare Earths, UBS (2022). European Call for Action (2022)

# CORPORATE OVERVIEW

Opportunity for significant shareholder returns



Share Price

**0.5c**

Shares on Issue

**7,785m**

## Board



**Peter Christie**  
*Chairman*

Accountant &  
Governance



**Simon Mitchell**  
*Non-Executive Director*

Geologist & Corporate



**Guy Le Page**  
*Non-Executive Director*

Geologist & Corporate

Market Capitalisation

**\$38.9m**

Options<sup>1</sup>

**1,061m**

## Consultants



**David Crook**  
*Technical Manager*

Geologist & Corporate



**Jonathan Busing**  
*Company Secretary/CFO*

Accountant &  
Governance

Cash (12/12/2022)<sup>2</sup>

**\$5.7m**

Performance Rights<sup>3</sup>

**120m**

<sup>1</sup> MRDAA: 436m Options (exp. 31-Dec-25, ex. 0.5c); MRDAB: 635m Options (exp. 31-Dec-25, ex. 0.3c)

<sup>2</sup> Excludes \$1.305m in investments

<sup>3</sup> Held by the Board of Directors, Management, Staff and Consultants

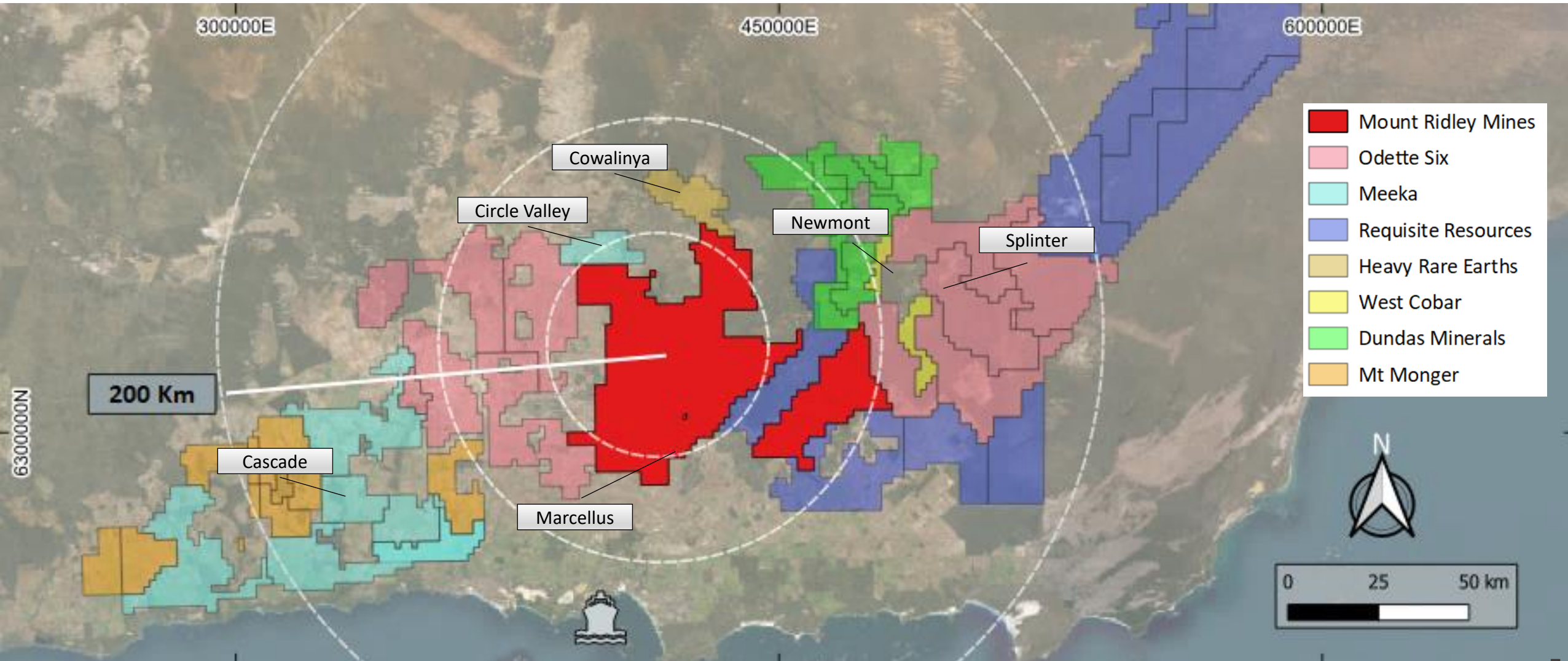
# MINING AND PROCESSING: CLAY vs HARDROCK



CLAY-HOSTED REE	STAGE	HARD ROCK-HOSTED REE
<ul style="list-style-type: none"> <li>- Near surface mining &amp; relatively lower operating costs</li> </ul>	Mining	<ul style="list-style-type: none"> <li>- Requires blasting-higher mining costs</li> <li>- Potentially higher strip ratios</li> </ul>
<ul style="list-style-type: none"> <li>- HREO dominant</li> <li>- Lower TREO grade</li> <li>- Soft material</li> </ul>	Mineralisation	<ul style="list-style-type: none"> <li>- Bastnaesite &amp; Monazite, LREO dominant</li> <li>- Xenotime, HREO dominant with higher TREO grade</li> </ul>
<ul style="list-style-type: none"> <li>- Potential for beneficiation with limited/no crushing</li> <li>- Preference for simple acid leach flow sheet</li> </ul>	On-Site Processing	<ul style="list-style-type: none"> <li>- Comminution, followed by beneficiation</li> <li>- Process requires extensive flotation to produce mineral concentrate</li> </ul>
<ul style="list-style-type: none"> <li>- Mixed high-grade REE precipitate with low La-Ce content</li> <li>- Typically 60 - 70% payability</li> </ul>	Mine Product	<ul style="list-style-type: none"> <li>- Mixed REE mineral concentrate (typically 20-40% TREO grade)</li> <li>- Low LaCe Content</li> <li>- Typically 30-35% payability</li> </ul>
<ul style="list-style-type: none"> <li>- Non-radioactive tailings</li> </ul>	Environmental	<ul style="list-style-type: none"> <li>- Tailings often radioactive</li> </ul>
<ul style="list-style-type: none"> <li>- Acid solubilisation followed by conventional REE separation</li> </ul>	Processing - Refinery	<ul style="list-style-type: none"> <li>- High temperature mineral cracking using strong reagents to solubilise refractory REE minerals</li> <li>- Complex capital-intensive plant required for radioactive issues</li> </ul>

# SIGNIFICANT POSITION IN EMERGING RARE EARTHS PROVINCE

Mineralisation in drilling > 250 km E-W (Cascade to Splinter) and 60 km N-S (Cowalinya to Marcellus)



# THE MOUNT RIDLEY PROJECT

Located in a Tier 1 mining jurisdiction



Located predominantly on crown land



Southern tenements 35km north-east of the deep-water port of Esperance



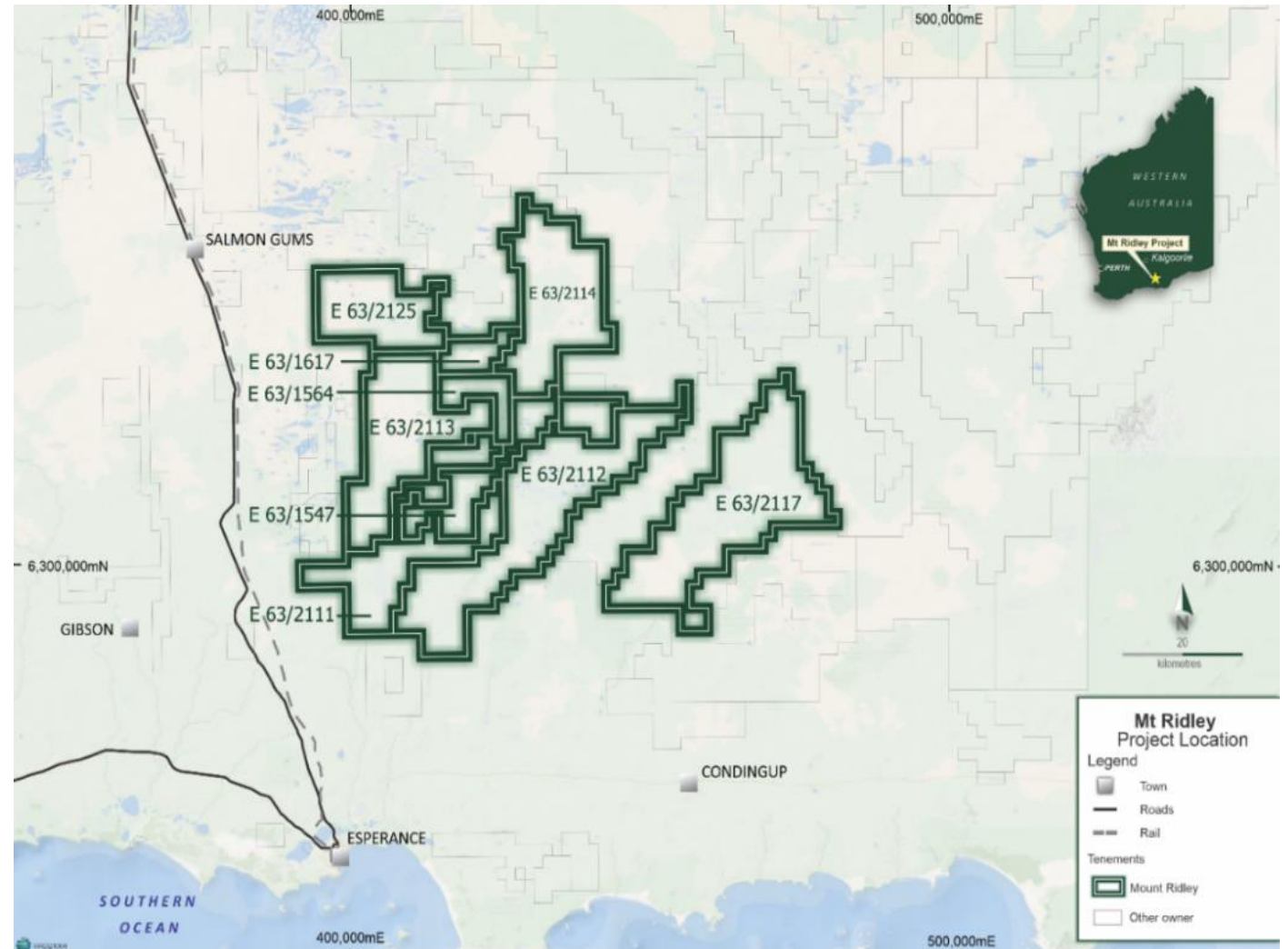
Adjacent to Goldfields-Esperance Highway, railway and gas pipelines



20 km from Esperance Airport



Renewable wind and solar energy available nearby





# GREEN PRODUCTION POTENTIAL

## Green metals produced responsibly



### Esperance's Current Mix



Following the opening of the Shark Lake Renewables Hub in May 2022, Esperance is currently powered by nearly 50% renewable energy



New integrated system combines a 4MW solar farm and two 4.5MW wind turbines with a 3MW battery energy storage system and a 22MW high-efficiency gas station



### Western Green Energy Hub (WGH)



Proposed 50GW, A\$100bn renewable energy hub



International consortium of InterContinental Energy, CWP Global and Mirning Green Energy Limited



Planned production of 3.5 Mt of green hydrogen and 20 Mt of green ammonia per year, exported via the port of Esperance

- Equivalent to Australia's entire current energy capacity

### Fortescue Future Industries (FFI)



Fortescue Future Industries (FFI) is assessing Southeast Western Australia as a priority location for development of a major green hydrogen hub.



Feasibility study due in 2023

Source: Horizon Power (2022), Intercontinental Energy (2022), ABC News (2022)

# EXCELLENT DRILLING RESULTS THROUGHOUT PROJECT

High grades and thick near surface intersections within an area of 1,200 km<sup>2</sup>



768 drillholes completed for 32,600m



Mineralisation encountered over a 40km x 30km (1,200 km<sup>2</sup>) footprint and remains open in all directions



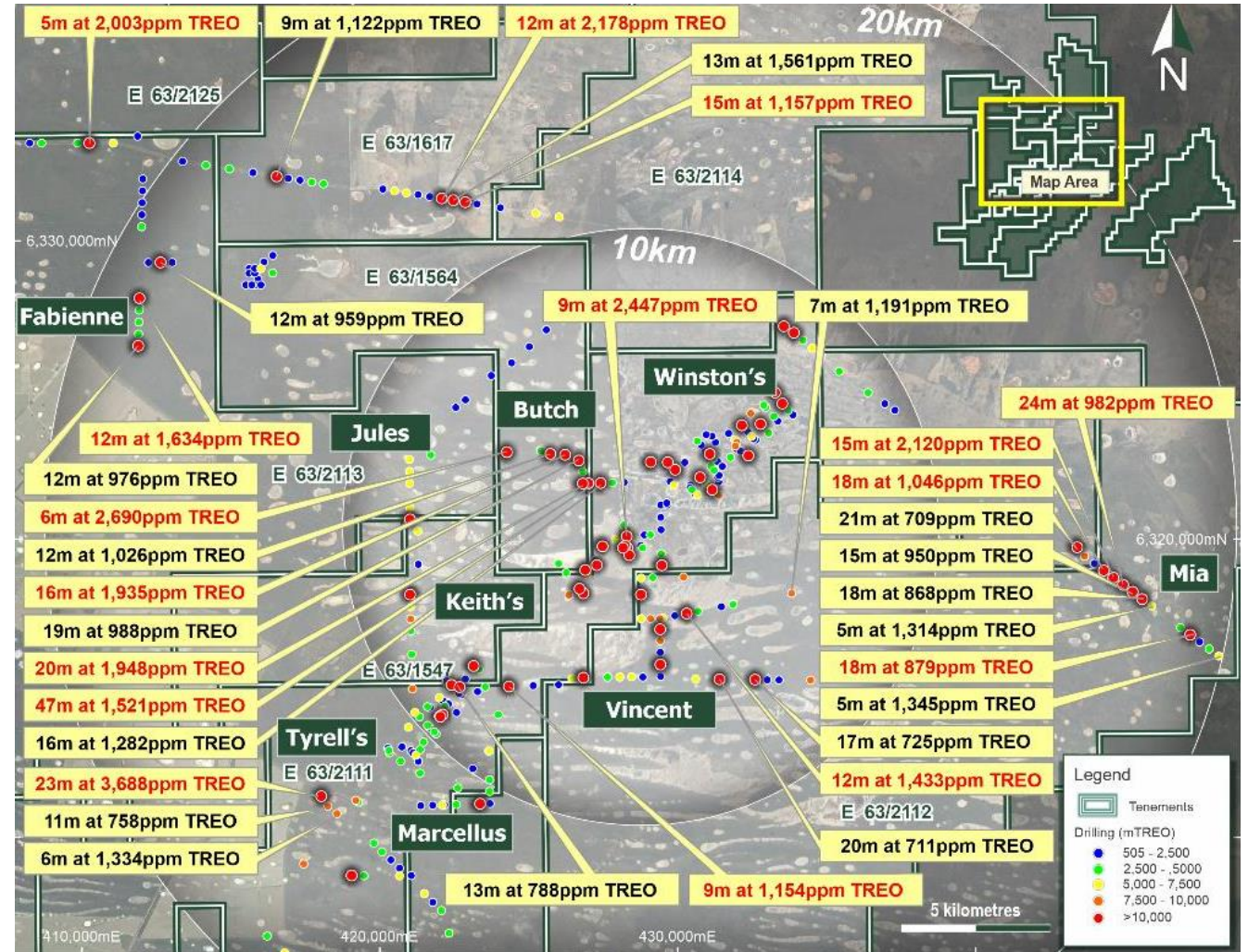
Average grades of 1,062 ppm at 500 ppm cut-off and 1,862 ppm at 1,000 ppm cut-off



44% CREO driving A\$79/kg basket value at current prices (~50% lower than 9 months ago)<sup>1</sup>



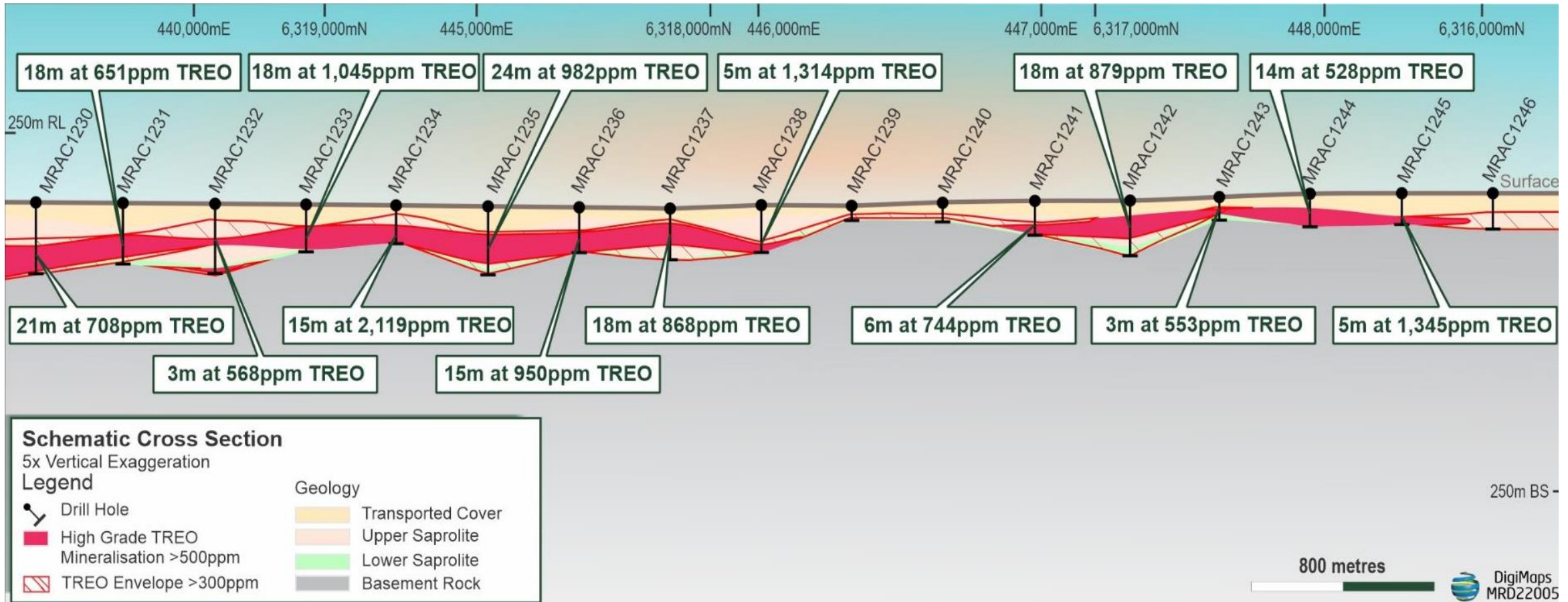
Maiden Mineral Resource planned for 2H CY2023



March 2022 prices (US\$/kg): please refer to slide 13.  
 December 2022 prices (US\$/kg): please refer to slide 23.  
 USD/AUD: 0.67.  
 Source: ASX Announcements, Argus Rare Earths.

# SECTION THROUGH THE MIA PROSPECT

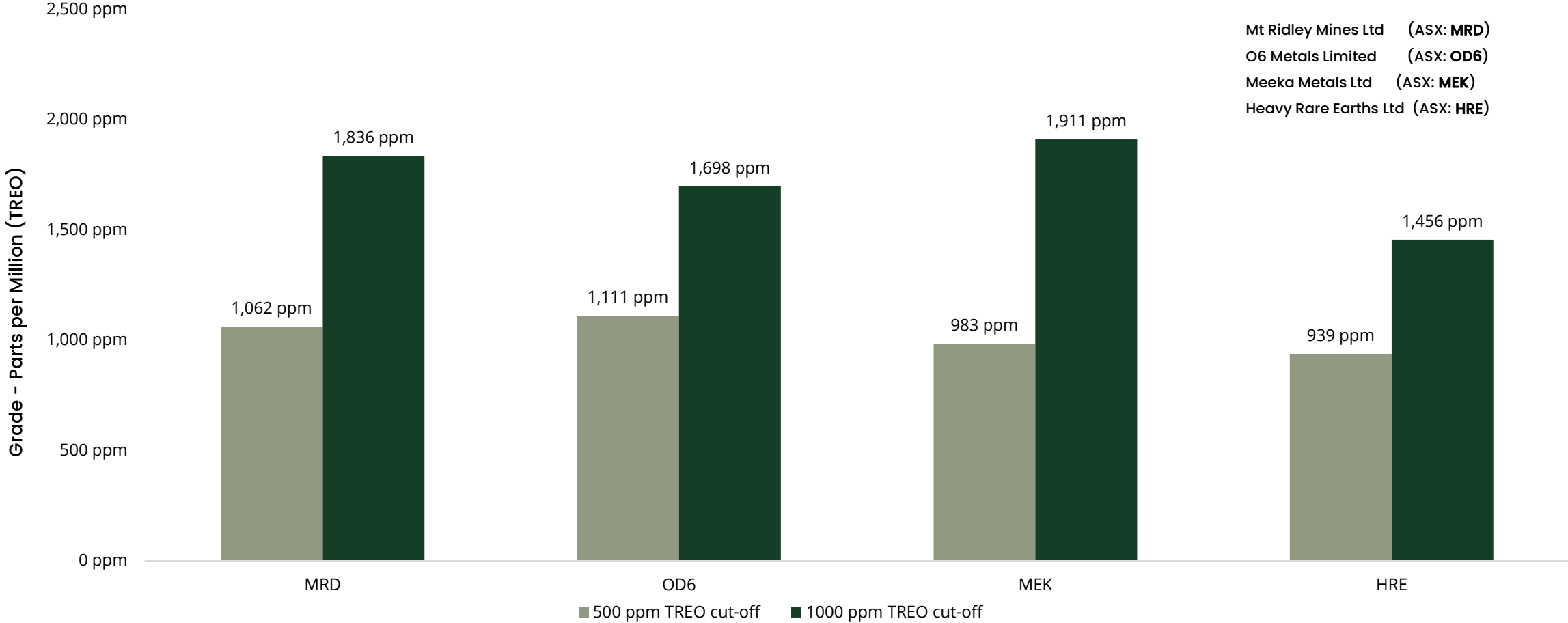
Section is 6.4 km wide with holes 400m apart



# SOUTH WEST REE PROJECTS DELIVER OUTSTANDING GRADES



Average TREO (ppm) at select cut-off grades across District

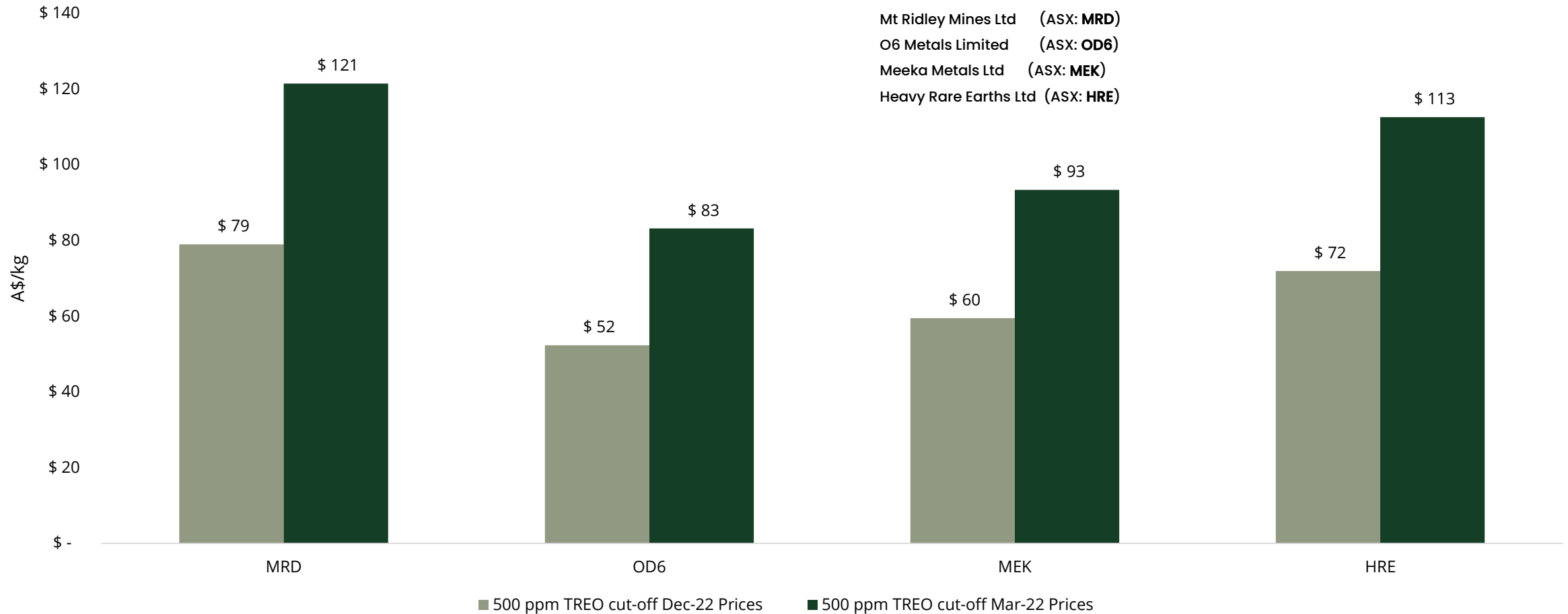


Mt Ridley Mines Ltd (ASX: **MRD**)  
 O6 Metals Limited (ASX: **OD6**)  
 Meeka Metals Ltd (ASX: **MEK**)  
 Heavy Rare Earths Ltd (ASX: **HRE**)

Note: some drilling data is excluded (e.g., 1m auger drilling and incomplete REE assaying).  
 Source: ASX Announcements.

# HIGH-VALUE RARE EARTHS BASKETS ACROSS DISTRICT

Basket value (A\$/kg) at spot & historical REO prices



Note: some drilling data is excluded (e.g., 1m auger drilling and incomplete REE assaying).

March 2022 prices (US\$/kg): La<sub>2</sub>O<sub>3</sub>: \$1.52, CeO<sub>2</sub>: \$1.58, Pr<sub>6</sub>O<sub>11</sub>: \$169, Nd<sub>2</sub>O<sub>3</sub>: \$182.50, Sm<sub>2</sub>O<sub>3</sub>: \$5.20, Eu<sub>2</sub>O<sub>3</sub>: \$31.50, Gd<sub>2</sub>O<sub>3</sub>: \$112.50, Tb<sub>4</sub>O<sub>7</sub>: \$2,340, Dy<sub>2</sub>O<sub>3</sub>: \$480, Ho<sub>2</sub>O<sub>3</sub>: \$305, Er<sub>2</sub>O<sub>3</sub>: \$69, Tm<sub>2</sub>O<sub>3</sub>: \$850, Yb<sub>2</sub>O<sub>3</sub>: \$13.50, Lu<sub>2</sub>O<sub>3</sub>: \$805, Y<sub>2</sub>O<sub>3</sub>: \$16.10.

December 2022 prices (US\$/kg): La<sub>2</sub>O<sub>3</sub>: \$1.35, CeO<sub>2</sub>: \$1.40, Pr<sub>6</sub>O<sub>11</sub>: \$104.50, Nd<sub>2</sub>O<sub>3</sub>: \$106, Sm<sub>2</sub>O<sub>3</sub>: \$2.55, Eu<sub>2</sub>O<sub>3</sub>: \$28.50, Gd<sub>2</sub>O<sub>3</sub>: \$58.50, Tb<sub>4</sub>O<sub>7</sub>: \$1,830, Dy<sub>2</sub>O<sub>3</sub>: \$323, Ho<sub>2</sub>O<sub>3</sub>: \$102, Er<sub>2</sub>O<sub>3</sub>: \$55, Tm<sub>2</sub>O<sub>3</sub>: \$850, Yb<sub>2</sub>O<sub>3</sub>: \$13.50, Lu<sub>2</sub>O<sub>3</sub>: \$805, Y<sub>2</sub>O<sub>3</sub>: \$9.20.

USD/AUD: 0.67.

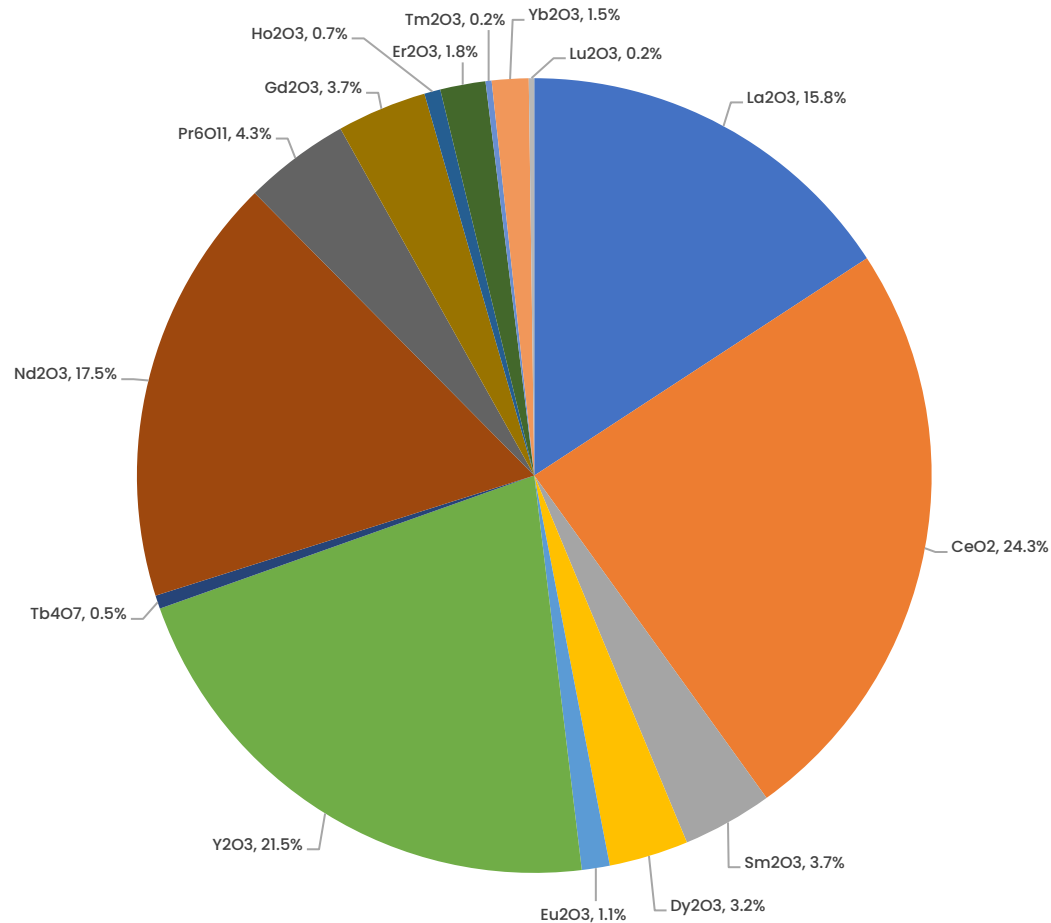
Source: ASX Announcements, Argus Rare Earths.

# REO BASKET DISTRIBUTION

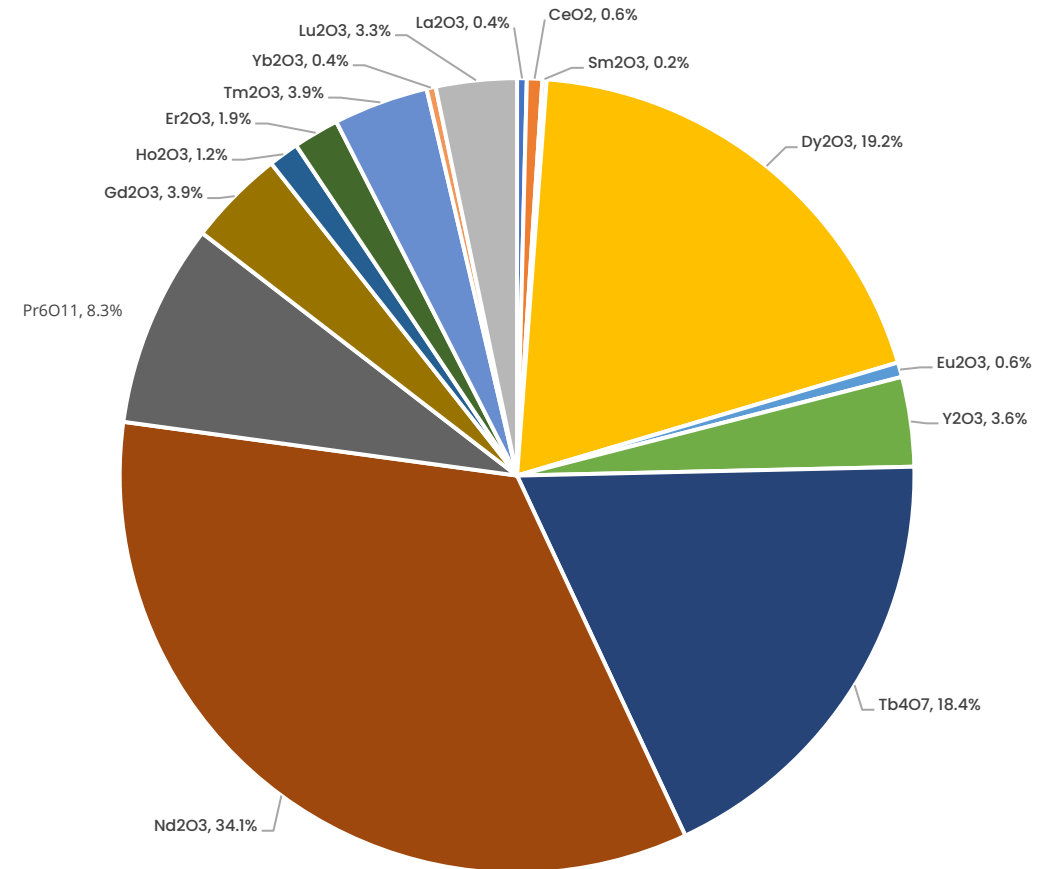
Mt Ridley Mines: The right mix



Rare Earths Basket Distribution (by Grade)



Rare Earths Basket Distribution (By Value)



Note: 500 ppm TREO cut-off grade.

December 2022 prices (US\$/kg): La<sub>2</sub>O<sub>3</sub>: \$1.35, CeO<sub>2</sub>: \$1.40, Pr<sub>6</sub>O<sub>11</sub>: \$104.50, Nd<sub>2</sub>O<sub>3</sub>: \$106, Sm<sub>2</sub>O<sub>3</sub>: \$2.55, Eu<sub>2</sub>O<sub>3</sub>: \$28.50, Gd<sub>2</sub>O<sub>3</sub>: \$58.50, Tb<sub>4</sub>O<sub>7</sub>: \$1,830, Dy<sub>2</sub>O<sub>3</sub>: \$323, Ho<sub>2</sub>O<sub>3</sub>: \$102, Er<sub>2</sub>O<sub>3</sub>: \$55, Tm<sub>2</sub>O<sub>3</sub>: \$850, Yb<sub>2</sub>O<sub>3</sub>: \$13.50, Lu<sub>2</sub>O<sub>3</sub>: \$805, Y<sub>2</sub>O<sub>3</sub>: \$9.20.

Source: ASX Announcements, Argus Rare Earths.

# PROCESSING

Committed to identifying metallurgical solutions



## Mineralisation is Soluble

- Partial digest weak aqua regia took 80% LREO, 76% HREO and 80% CREO into solution
- Indicative of readily-soluble REE mineralisation



## Beneficiation

- Beneficiation studies are underway with ANSTO
- Meeka Metals (ASX: MEK) achieved grade increases of up to 91% with up to 90.4% recoveries in the -20  $\mu\text{m}$  size fraction
- Beneficiation to drive capex and opex savings in later stages of flowsheets



## Longer-Term Met Work

- Diamond drilling for metallurgical samples, mineralogy and beneficiation testing
- Consulting metallurgists and laboratory appointed
- Part of consortium with local peers to determine underlying metallurgical characteristics of regional mineralisation

# PLANNED WORK PROGRAM

Aggressive exploration program planned



	CY22Q4	CY23Q1	CY23Q2	CY23Q3	CY23Q4
1,000m Diamond Drilling					
50,000m Regional Aircore Drilling					
50,000m Primary Target Expansion Aircore Drilling					
Metallurgical Studies					
Environmental Studies					
Maiden JORC Resource					

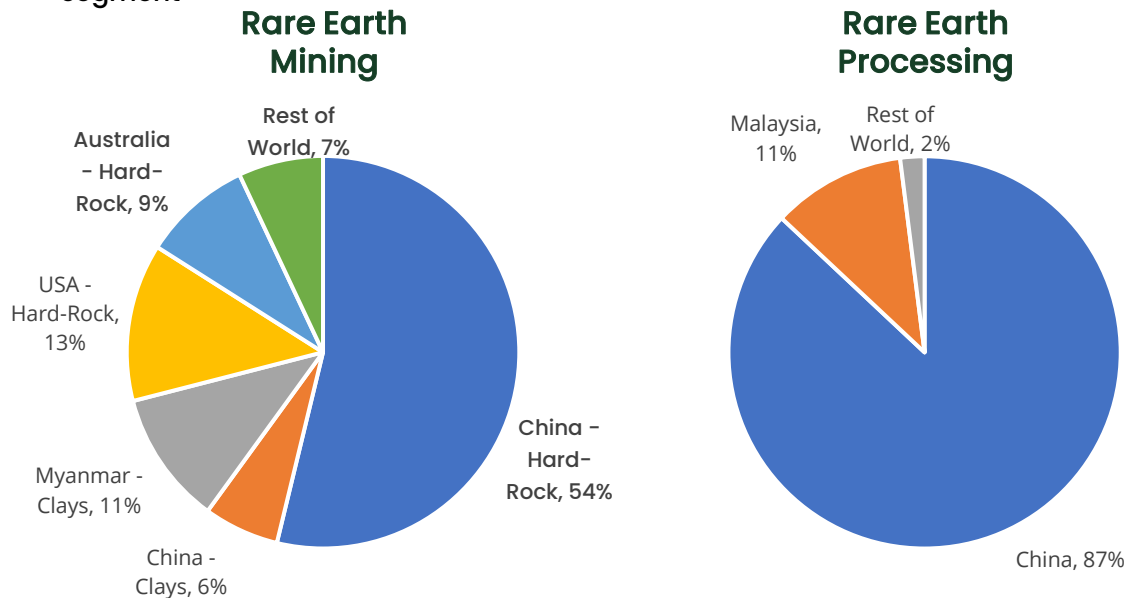


# CHINESE RARE EARTHS

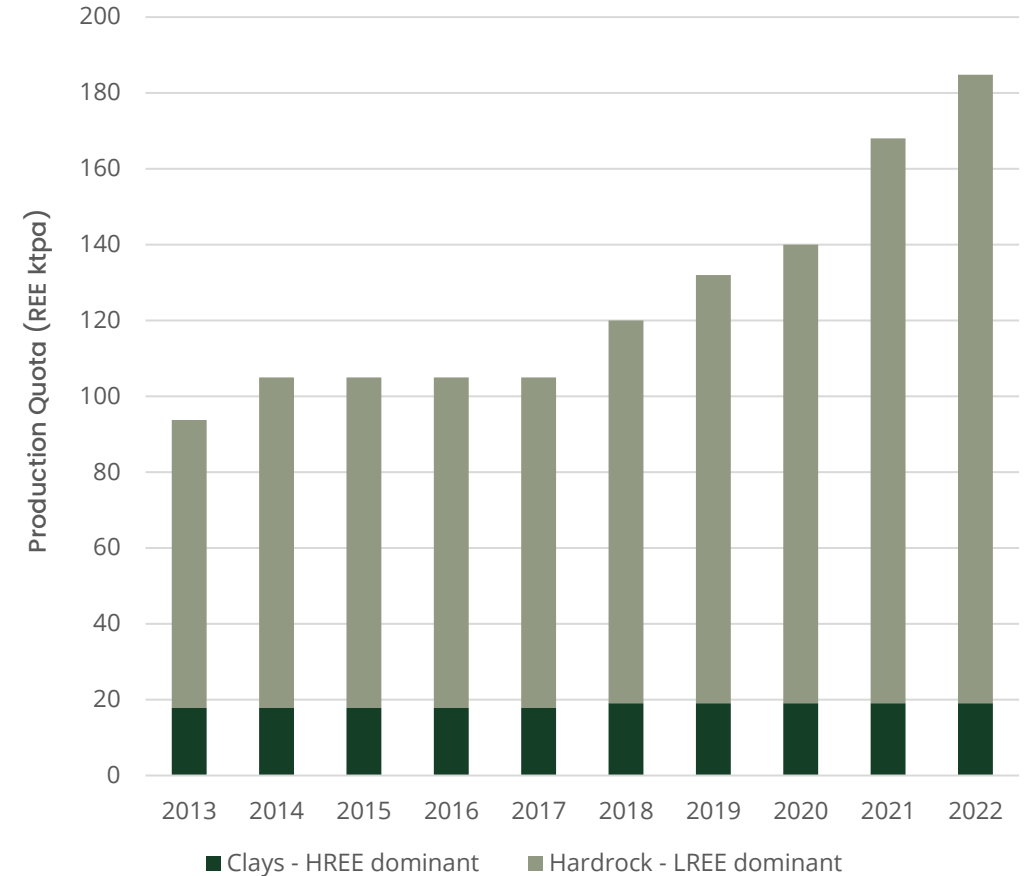


## Dependency on politically insecure and zero-growth Chinese HREE production

- China currently accounts for 60% of REE mining and 87% of processing
- REE product supply is vulnerable to Chinese policy/export restrictions (e.g. Japan 2010 embargo)
- Chinese clay-hosted REE production has plateaued due to environmental concerns
  - Water pollution, ecological loss and desertification issues stemming from in-situ leaching
- China's HREE imports from Myanmar exceeded China's quota for HREE mining in 2021
- Supply disruptions in Myanmar & restrictions on China's mines could inhibit global HREE supply
- Ex-China supply necessary to support further demand growth, especially in HREE segment



**Chinese Rare Earth Production Quotas by Hardrock and Clays**



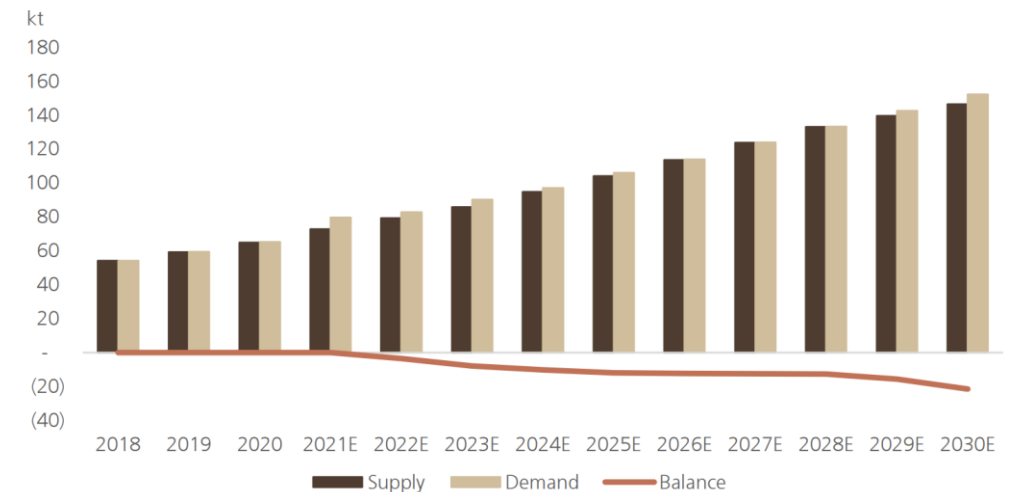
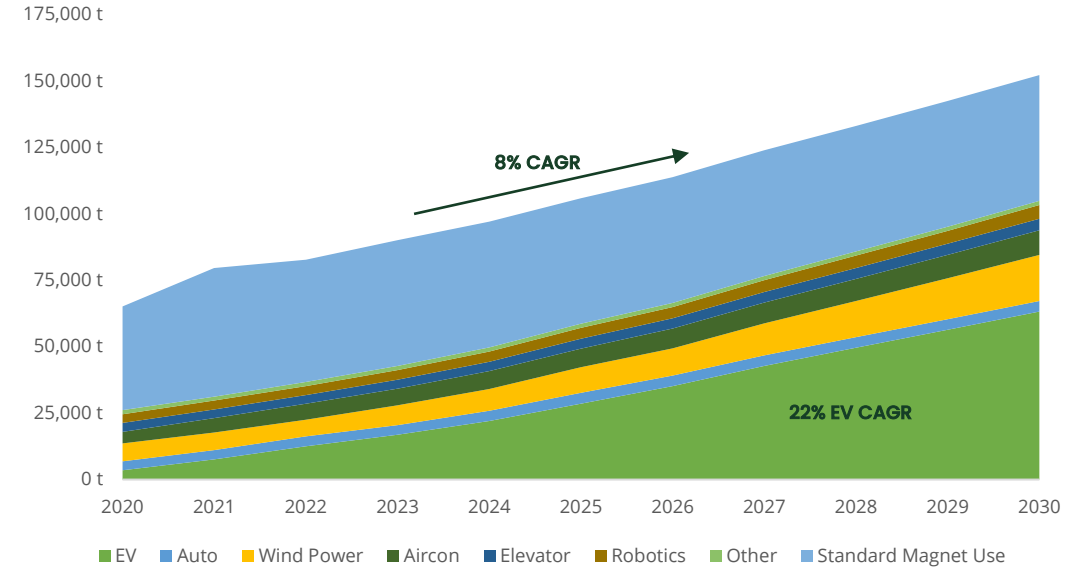
March 2022 prices (US\$/kg): please refer to slide 16.  
 December 2022 prices (US\$/kg): please refer to slide 16.  
 USD/AUD: 0.67.  
 Source: ASX Announcements, Argus Rare Earths, UBS (2022). European Call for Action (2022)

# RARE EARTHS DEMAND – SUPPLY

Rare earths are required for green transition



- NdPr is required for permanent magnets in EVs and wind turbines
- Each EV contains approx. 1.2 kg NdPr, onshore wind turbines contain approx. 200 kg and offshore turbines contain up to 2t
- Forecasts of 45m new EV sales by 2030 up from 7.8m in 2021
- NdPr demand from EVs and wind turbines forecasted to grow at 22% and 13% CAGR, respectively, to 2030
- Total NdPr forecasted demand growth of 8% CAGR to 150 kt by 2030
- NdPr shortage emerging due to slower forecasted supply growth
- No new western mines in construction now. Development pipeline is currently biased towards hard-rock sources



Source: UBS (2022), Rare Earth Magnets and Motors: A European Call for Action (2021)

# GOVERNMENT INCENTIVES

## Governments becoming stakeholders in ex-China REE projects

ABC NEWS

### Government commits **\$240 million** to critical minerals projects in mission to end Australia's reliance on China

By political reporter [Henry Belot](#)  
Posted Wed 16 Mar 2022 at 2:59am



Australia is reliant on China for critical minerals used in phones, renewables technologies and even fighter jet batteries. (ABC News: Emma Machan)

### Lynas wins US backing for Texas rare earths plant

[Alex Gluyas](#) and [Peter Ker](#)

Jun 14, 2022 - 10.49am

The US government has pumped more money into Australia's critical minerals industry under an agreement to fully fund Lynas' plans to build a rare earths refinery in the southern states of the US.

Lynas said it had signed "a follow-on contract" for about **\$US120 million (\$173 million)** with the US Department of Defence (DoD) to establish the refinery, which will produce separated heavy rare earths like terbium and dysprosium.

The refinery would process the ore that Lynas mines at Mt Weld in Western Australia, but Lynas said it may also process ore mined by other companies.

12 May, 2022

### Pentagon asks US Congress to allow funding of mining projects in Australia, UK



Author [Karl Decena](#)  
Theme [Metals](#)



ASX Announcement  
2 February 2022

NAIF approves **\$140m loan** for Yangibana Rare Earths Project

### Why Iluka can afford to hold fire on rare earth offtake deals

[Brad Thompson](#) Reporter



Aug 24, 2022 - 2.52pm

Iluka Resources is eyeing a premium for non-China supply of rare earths oxides as it prepares to start construction of Australia's first fully integrated refinery, thanks to a **\$1.25 billion** non-recourse loan from taxpayers.

RELEASE  
IMMEDIATE RELEASE

### DoD Awards **\$35 Million** to MP Materials to Build U.S. Heavy Rare Earth Separation Capacity

Feb. 22, 2022 | [f](#) [t](#) [r](#)

The Department of Defense (DoD) awarded a \$35 million contract to MP Materials Corp. (MP) of Las Vegas, Nevada to design and build a facility to process heavy rare earth elements (HREE) at the company's Mountain Pass, California production site. This project will establish the first processing and separation facility of its kind for HREEs in support of both defense and commercial applications in the United States.

# INVESTMENT SUMMARY

Positioned to advance new rare earths frontier



## Drilling Highlights



**Average TREO grade** of 1,062 ppm (500 ppm TREO cut-off)

**44% CREO** and 21.8% NdPr

**A\$79/kg basket value** with 42% NdPr and 18% Tb<sub>4</sub>O<sub>7</sub>

**A\$84–235/t in-situ value** (500–1000 ppm TREO cut-off)

## Location



**Proximate** to deep-water port, highway, rail, gas pipeline, renewable energy and airport

**3,400km<sup>2</sup> tenements** with 32,600m drilling confirming widespread mineralisation

Predominantly located on **Crown land**

## Catalysts



**100,000m** aircore drilling program to commence

**Beneficiation & metallurgy** works underway

**Maiden Mineral Resource** targeted for 2H 2023

## Outlook



**Increase in demand** for CREO presents need for supply outside China

Chinese clay-hosted REE production plateaued

**\$39m market cap** provides leverage for success

# CONTACT INFORMATION

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