
RAINBOW RARE EARTHS



**DRIVING
DECARBONISATION:
UNLOCKING
SECONDARY SOURCES
OF RARE EARTHS**

FEBRUARY 2023

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RAINBOW RARE EARTHS

UNIQUE INVESTMENT OPPORTUNITY



PHALABORWA BASE CASE¹

NPV₁₀
US\$627m

IRR
40%

EBITDA
US\$195m

Margin²
75%

Payback
<2 years



STRATEGIC ASSET: Near-term rare earths production from a secondary source



DE-RISKED: PEA demonstrates strong returns in all pricing scenarios and low capital intensity (US\$295.5m)



INNOVATIVE TECHNOLOGY: Unique IP developed through partnership with K-Tech, applicable at other phosphogypsum opportunities



PATHWAY TO SUPPLY GROWING DEMAND: Project pipeline of global opportunities



EXPERIENCED TEAM: Proven history of delivery

STRONG LEADERSHIP TEAM

WITH TRACK RECORD THROUGH PROJECT DEVELOPMENT TO PRODUCTION



EXPERIENCED MANAGEMENT AND TECHNICAL TEAM

- CEO, George Bennett, and Technical Director, Dave Dodd, established MDM Engineering; delivered
 - >100 feasibility studies
 - >80 mine developments
- Technical team strengthened to include Chris Le Roux and Roux Wildenboer; extensive experience in rare earth processing and project development
- Chairman, Adonis Pouroulis, is a mining entrepreneur; extensive experience across Africa and a long-term strategic vision for growth
- CFO, Pete Gardner is a Chartered Accountant with 20 years in the mining sector covering both development and producing assets



RARE EARTH ELEMENTS

ESSENTIAL FOR GLOBAL DECARBONISATION

CRITICAL BUILDING BLOCKS TO REACH NET ZERO

- Rare earths (RE) are a group of 17 elements
- Essential in permanent magnets for EVs and wind turbines, Neodymium (Nd) and Praseodymium (Pr), with Dysprosium (Dy) and Terbium (Tb) are economically important:
 - Account for 95% of global RE consumption¹
 - RE permanent magnets are the most powerful permanent magnets
 - These magnets contain c. 30% RE elements by mass
- Demand is forecast to grow strongly, driven by increased adoption of EVs and offshore wind power generation, accelerated by evolving global emissions legislation and government policy including commitments from COP27



LONG TERM SUPPLY DEFICIT EXPECTED FOR RARE EARTHS DRIVING STRENGTHENING RARE EARTH PRICES



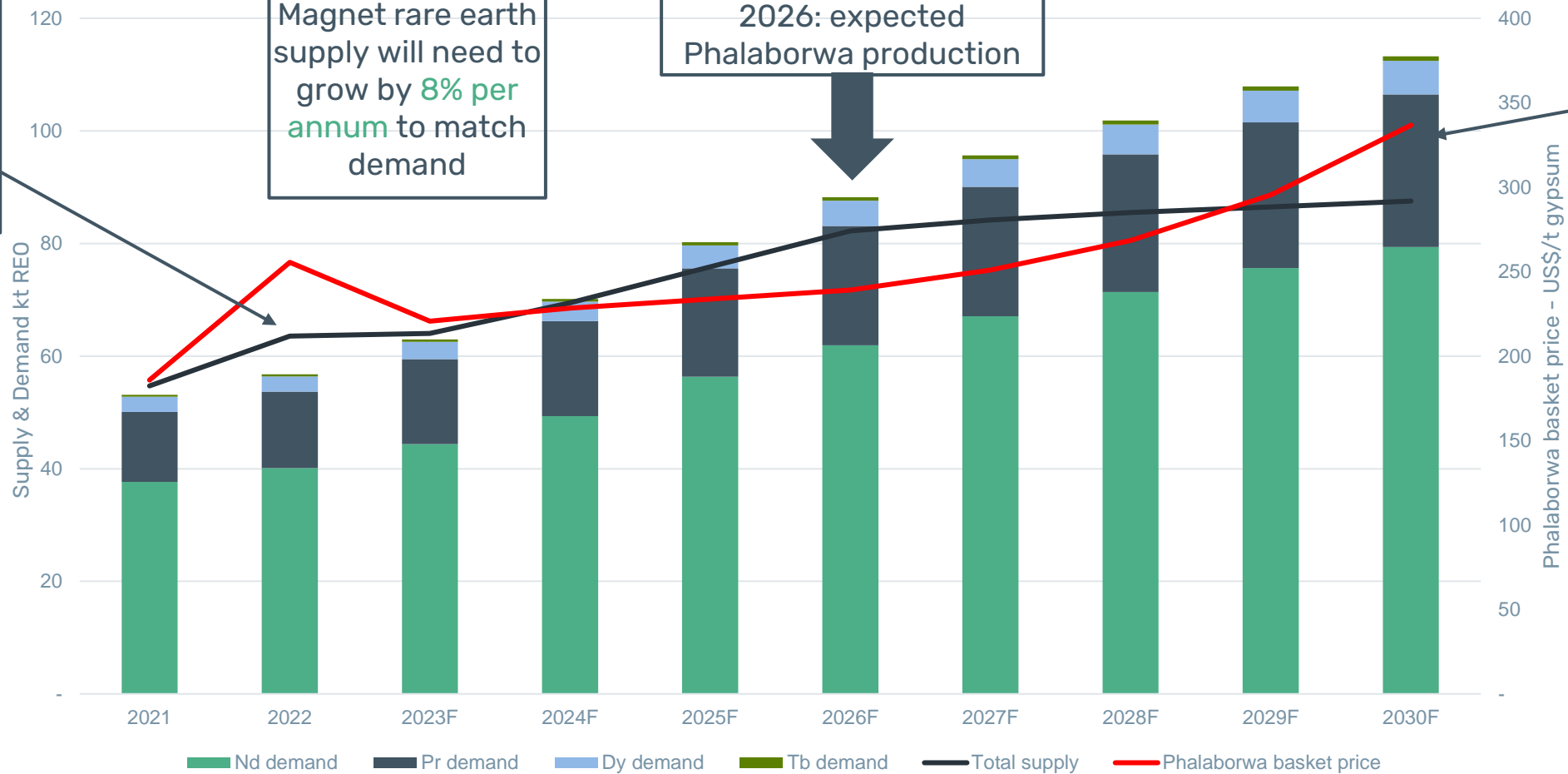
FORECAST RARE EARTH SUPPLY DEFICIT / PHALABORWA PRICE¹

Rare earth prices grew strongly in 2021 to match increased demand

Magnet rare earth supply will need to grow by 8% per annum to match demand

2026: expected Phalaborwa production

26kt supply deficit forecast by 2030



Market

CREATING A RESPONSIBLE, WESTERN, INDEPENDENT SUPPLY CHAIN

URGENCY MOUNTING TO MEET GROWING DEMAND

**“THE MIDDLE EAST HAS OIL;
CHINA HAS RARE EARTHS.”**

**Deng Xiaoping, credited as
the father of modern-day China, 1992**

- Rare earths production, separation and refinery is dominated by China – 90% market share of refining market¹
- With projected demand escalation and supply chain concerns, REEs have been designated as critical metals by many Western governments – promoting a drive toward raw materials security
- REEs are critical in defence industry – American F-35 fighter jet contains c. 420kg rare earths

SUPPLY DEFICIT IS LIKELY DUE TO TRADITIONAL RARE EARTHS MINING CHALLENGES:

- Many development projects have complex challenges to overcome including low grades, high levels of radioactivity and environmental complications
- High capex associated with complex processing
- Long lead time for mines to be brought into operation

The top billionaires are now chasing the critical magnet rare earths – Part 1 of 2

[CRITICAL MINERALS & RARE EARTHS](#) [MARKET OPINION](#)



Rinehart revs up in rare earths, gains lead in Warrego race



Brad Thompson
Reporter

Dec 5, 2022 - 12:48pm

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Gina Rinehart's Hancock Prospecting, armed with an \$18 billion investment war chest, has turned its attention to rare earths and appears to have set the scene for an intriguing battle for strategic assets with Andrew Forrest's Fortescue Metals Group.

The two Perth-based iron ore billionaires – Mrs Rinehart holds top spot on *The Australian Financial Review* Rich List and Dr Forrest is in second place – have both signalled their intentions to become major players in rare earths.

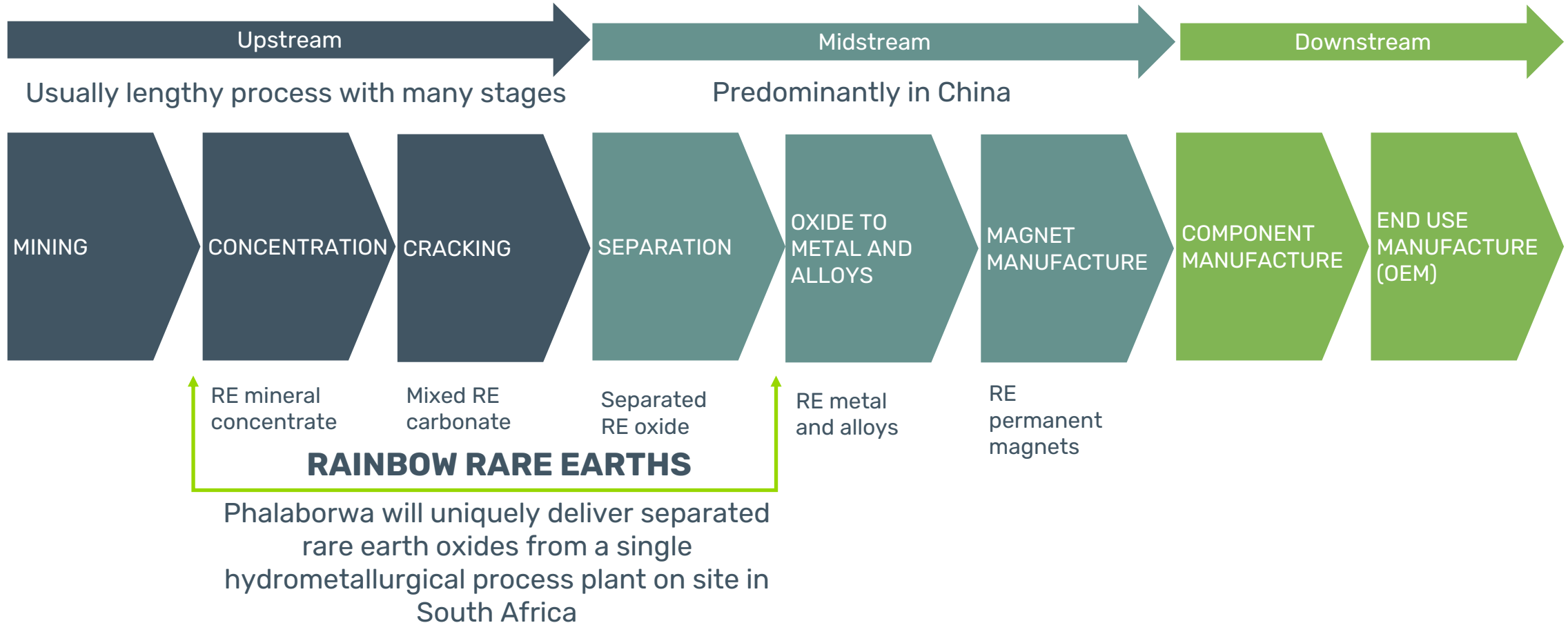
Hancock grabbed a big stake in Arafura Rare Earths on Monday amid a flurry of corporate activity that shows how serious Mrs Rinehart is about expanding her private company's footprint in green minerals as well as

RELATED QUOTES



RAINBOW'S POSITION IN THE RARE EARTH MAGNET SUPPLY CHAIN

UNDELINES PHALABORWA'S UNIQUE ADVANTAGE



Value chain

PHALABORWA: EXCITING, NEAR-TERM GROWTH OPPORTUNITY

DELIVERY OF SEPARATED MAGNET RARE EARTH OXIDES ON SINGLE SITE FROM HISTORIC GYPSUM STACKS



RAINBOW IS EARNING A 70% INTEREST IN PHALABORWA

- Project is largely permitted and positioned in an established mining town, with:
 - associated skilled labour availability
 - supporting industry (i.e., local production of sulphuric acid, a key reagent in the processing circuit)
 - existing infrastructure
- Low capital intensity: capex of **US\$295.5 MILLION** significantly below that of a traditional hard rock rare earth mining project
- Low levels of radioactive elements: typical rare earth projects require complex processing to remove these

OpEx¹
US\$/kg 33.86

Basket price²
US\$/kg 175.89

1. Operating cost per kg product
 2. Numbers based on 2022 YTD average rare earth prices at time of publication of PEA in October 2022

RESPONSIBLE PRODUCTION OF RARE EARTHS

INTEGRATING STRONG ENVIRONMENTAL AND SOCIAL PRACTICES IN PHALABORWA'S DEVELOPMENT

FOUNDED ON THE PRINCIPLES OF CIRCULARITY; RECOVERING RARE EARTHS FROM SECONDARY SOURCE

BROWNFIELD

- Phalaborwa is on an industrial site with legacy environmental issues
- Majority of environmental permits are in place and only require updating

REHABILITATION

- Rainbow will clean up legacy issues:
 - Neutralising acidic solution
 - Redepositing benign gypsum on lined stacks in accordance with IFC standards / Equator Principles

RECYCLING

- All process water needs will be met by neutralised water in ponds
- Certain key reagents¹ recovered from upfront leach process for use downstream
- Sulphuric acid from nearby plant waste stream

CLOSED-LOOP

- No water abstraction required for processing
- No discharge to the external environment

REUSE

- Existing infrastructure can be repurposed and reused
- Potential for use of reclaimed, clean phosphogypsum in building and industrial sectors

RENEWABLE

- Exploring renewable energy options at Phalaborwa, including solar

CREATING SOCIAL VALUE

COMMUNITY

- Different social context from a greenfield project in a remote location
- Transparent payment of taxes
- Commitment to prioritise local supply chain

PEOPLE

- Zero harm
- Phalaborwa expected to provide c. 275-300 direct jobs
- Commitment to prioritise local employment

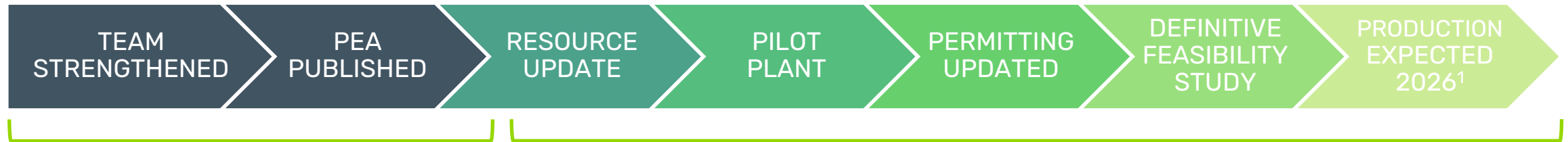
STRONG PROGRESS TO DATE

DE-RISKS PHALABORWA PROJECT; UNLOCKS VALUE



Q4 2022

Q1 2023



STRONG PROGRESS

- PEA publication – Phalaborwa expected to be lowest cost global producer of separated magnet rare earth oxides
- Technical team additions
 - unparalleled rare earths knowledge
 - technical expertise and relevant experience in uranium which is transferable to CIX technology at Phalaborwa

NEXT STEPS SUPPORTED BY POSITIVE PEA

- Phalaborwa resource update – expected Q1 2023
- Commencing workstreams to deliver:
 - continuous pilot plant operation
 - feasibility study
- Ongoing development of project pipeline across multiple jurisdictions

1. Subject to necessary permits

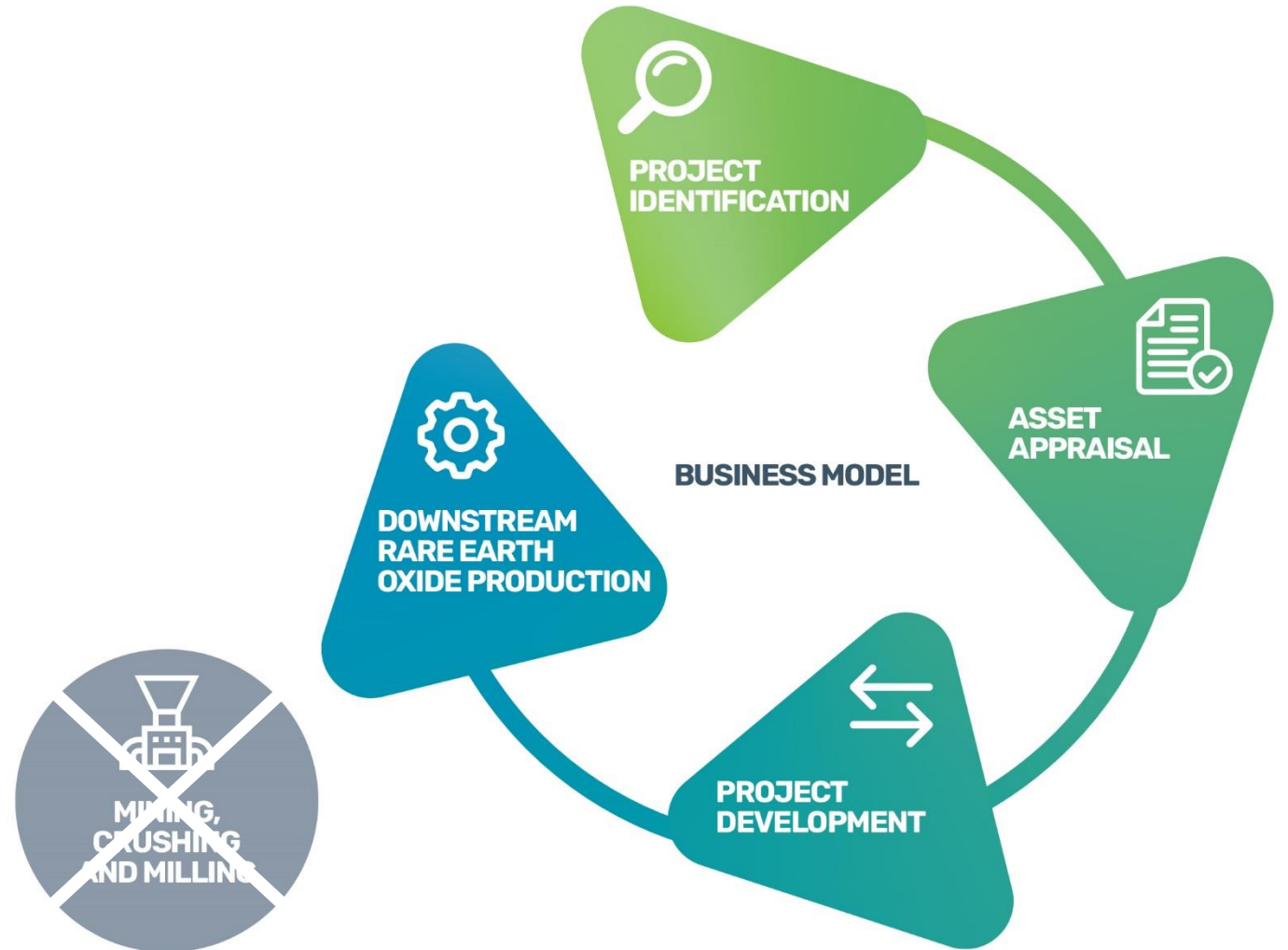
RAINBOW'S BUSINESS MODEL

DELIVERING NEAR-TERM RARE EARTHS PRODUCTION



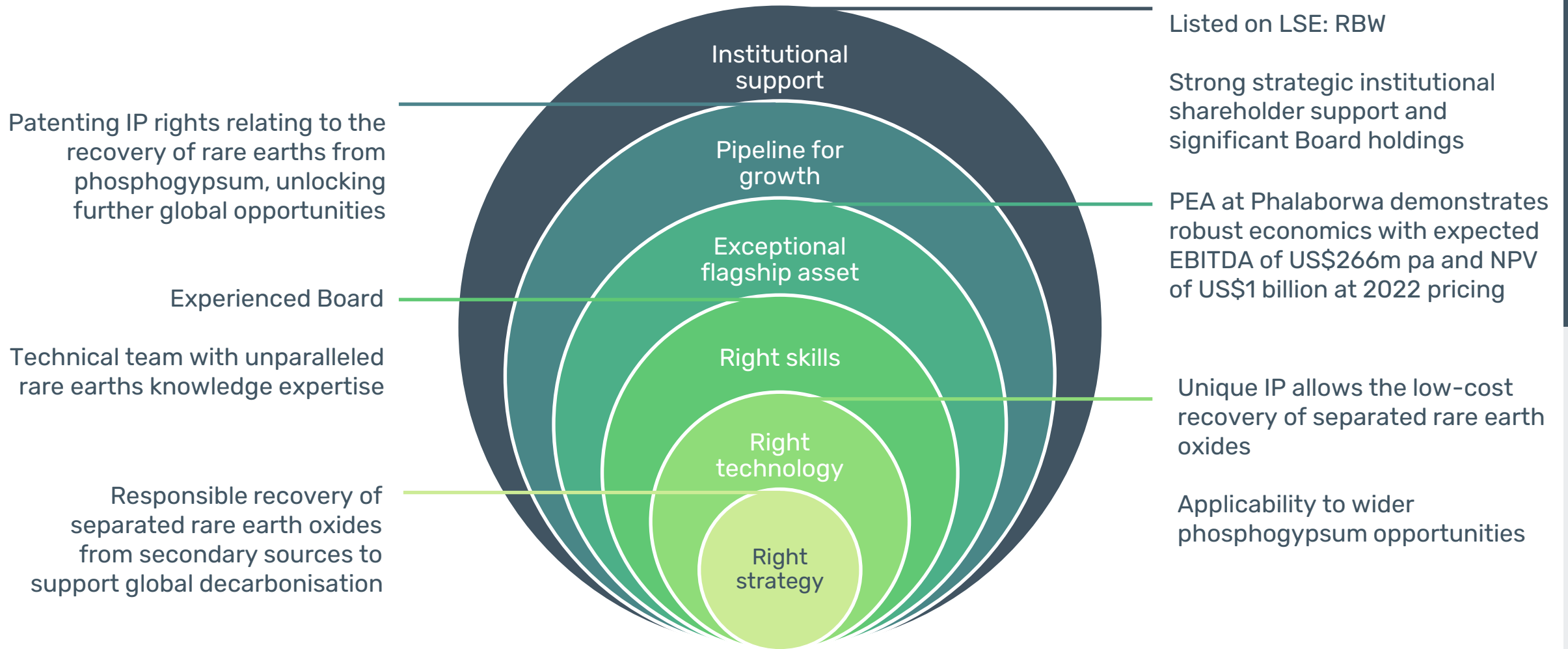
LEVERAGING IP AND PORTFOLIO FOR LONG TERM GROWTH

- Strategic focus on recovering rare earth oxides from secondary sources to support global decarbonisation
- IP and expertise in recovering rare earths from phosphogypsum unlocking additional opportunities:
 - Signed master agreement with OCP – Moroccan world-leading producer of phosphate products – and UM6P University on rare earths extraction from phosphogypsum
 - MoU with major chemicals company in SA to extract rare earths from nitro phosphate process stream
 - Investigating further global opportunities



RAINBOW RARE EARTHS

UNIQUELY POSITIONED IN A GROWING MARKET



Summary

WHY RAINBOW?

DRIVING VALUE FROM STRATEGIC SECONDARY SOURCES OF RARE EARTHS



PHALABORWA FORECAST¹

NPV₁₀

US\$1.0b

IRR

44%

EBITDA

US\$320m

Margin²

83%

1. Based on the long-term price forecasts received from Argus, with the first year of production assumed to occur in 2026 and prices assumed to remain constant from 2031 to the end of the project life
2. EBITDA operating margin

RAINBOW RARE EARTHS



THANK YOU

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EXPERIENCED BOARD AND EXECUTIVE MANAGEMENT



ADONIS POUROULIS
NON-EXECUTIVE CHAIRMAN

- Mining engineer: an entrepreneur whose expertise lies in the discovery, exploration and development of natural resources across Africa including diamonds, precious/base metals, coal and oil and gas.
- Founder of Rainbow and Petra Diamonds (LSE:PDL); Founder and Director of Chariot Oil & Gas (AIM:CHAR) and Founder of Pella Resources Limited



SHAWN MCCORMICK
NON-EXECUTIVE DIRECTOR

- International affairs specialist
- Over 25 years of political and extractive industries sector experience having served in The White House as Director for African Affairs on the National Security Council (Washington)
- Previously Political Affairs Director of BP (London) and VP of TNK-BP (Moscow)



ALEXANDER LOWRIE
NON-EXECUTIVE DIRECTOR

- Investment banker with 13 years' experience and previous director roles at Deutsche Bank and RBS
- Co-founder of Telemark Capital LLP
- Significant market experience: IPOs and primary and secondary equity offerings



J PETER PHAM
NON-EXECUTIVE DIRECTOR

- Scholar and practitioner of International Affairs; >20 years of experience in Africa
- First-ever United States Special Envoy for the Sahel Region until 2021 with the personal rank of Ambassador; previously as US Special Envoy for Great Lakes Region
- Distinguished Fellow at the Atlantic Council
- Member of the Board of the Smithsonian National Museum of African Art in Washington, DC, as well as Non-Executive Director of Africell Global Holdings



ATUL BALI
NON-EXECUTIVE DIRECTOR

- Corporate CEO and board member with extensive experience in tech, government contracting and regulated industries; Chartered Accountant
- Currently advisor to several high-growth technology companies, Chairman of the Football Pools and non-executive director of Everi Holdings Inc (NYSE:EVRI)
- Previously held divisional CEO or President positions with IGT (NYSE), Aristocrat (ASX), and Real Networks (NASDAQ), as well as a venture capital firm



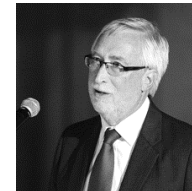
GEORGE BENNETT
CEO

- 25 years in finance and management, including as partner in stockbroking/advisory firms in SA
- Former CEO of Shanta Gold Ltd, successfully listed on LSE in 2005
- CEO and Founder of MDM Engineering, listed on LSE in 2008; responsible for building 22 process plants and completing over 80 feasibility studies. Sold after 8 years to Foster Wheeler for US\$120 million
- Seed-funded and raised initial capital for OreCorp Ltd as non-executive director, now ASX listed



PETER GARDNER
CHIEF FINANCIAL OFFICER

- Qualified Chartered Accountant; 15 years' experience in mining industry leading finance teams across Africa/developing nations
- Former CFO of Amara Mining plc (up to acquisition by Perseus Mining Ltd), Charrat Gold, Piran Resources and Alexander Mining



DAVE DODD
TECHNICAL DIRECTOR

- 45 years of extractive metallurgy experience
- Metallurgical Project Consultant
- BSc (Hons) Chemical Engineering (1974)
- Fellow of Southern Africa Institute of Mining & Metallurgy



CHARLES GRAHAM
PROJECT MANAGER - PHALABORWA

- Mechanical Engineer
- 20 years' experience in project management delivering multidisciplinary mining and infrastructure projects in remote and logistically challenging geographical regions
- Successful completion of multiple feasibility studies across Africa
- Proven track record of increasing project value by reducing capital and operating costs during project life cycle from study to execution



CHRISTOPHER ATWOOD
PROJECT MANAGER - GAKARA

- 25 years' experience in mining and extractive industries.
- Track record of driving expansion and minimising costs
- Associated with startup ventures in remote locations.
- Led operations up to 35Mtpa successfully

KEY SHAREHOLDER INFORMATION



BOARD SHAREHOLDINGS AND MAJOR SHAREHOLDERS (>3%)

Shareholder	Holding
Adonis Pouroulis	14.5%
George Bennett	6.8%
Robert Kampf	5.5%
Praesidium Capital Management	3.7%
TechMet Ireland Ltd	3.5%
UBS AG Zurich	2.8%
Shawn McCormick	1.8%
Alexander Lowrie	1.2%
Atul Bali	0.7%
J Peter Pham	0.05%
Total Board shareholding	25.0%

Ticker	Market	Market cap	Share price	Shares in issue	Brokers
RBW.L	LSE	£70m	13p	526m	SP ANGEL BERENBERG

SHARE PRICE (GBP)



RAINBOW RARE EARTHS

A STRATEGIC SOURCE OF RARE EARTHS FOR A GROWING MARKET



DRIVING VALUE THROUGH STRONG PORTFOLIO UNDERPINNED BY UNIQUE INTELLECTUAL PROPERTY

- Flagship asset at Phalaborwa, South Africa:
 - PEA substantially de-risks project
 - Exceptionally strong economics in all foreseeable pricing scenarios
 - High margins leading to strong returns in inflationary environment
- Unique rare earths separation IP
- Unlocking further global opportunities
- Gakara project, Burundi: large mineralised system - high-grade rare earth concentrate

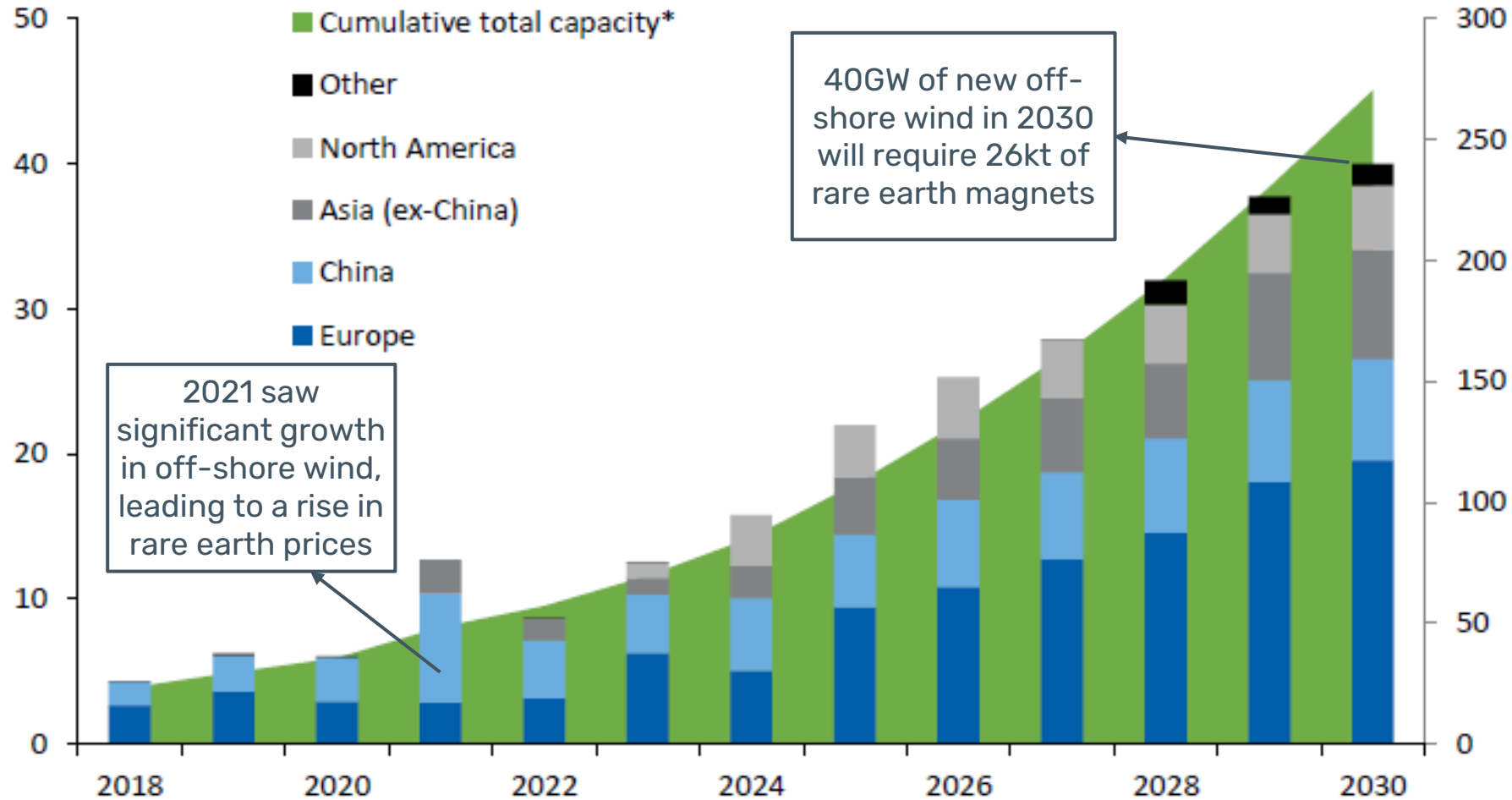


ACCELERATING GLOBAL DEMAND FOR RARE EARTHS

A 3MW OFFSHORE WIND TURBINE REQUIRES ~2T OF PERMANENT MAGNETS¹



OFFSHORE WIND POWER CAPACITY ADDITIONS (GW)



Offshore wind turbine market is forecast to grow at 25% per annum from 2020 to 2030¹

Market

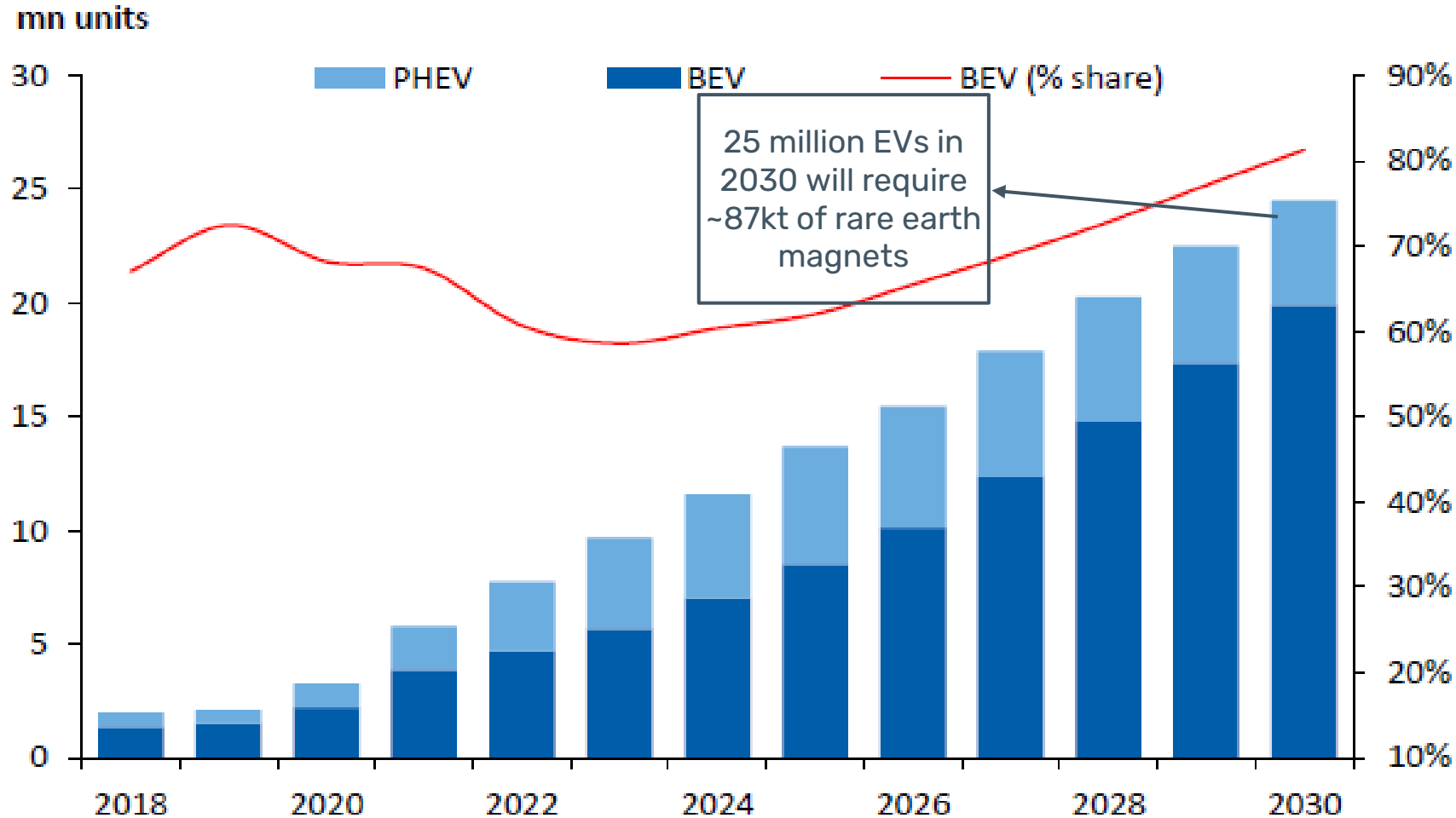
1. Reference to direct drive wind turbines. Sources: Argus Media Ltd, Global Wind Energy Council

ACCELERATING GLOBAL DEMAND FOR RARE EARTHS

THE AVERAGE HYBRID OR EV USES 2-5KG OF RARE EARTH MAGNETS¹



RISING EV SALES FORECASTS



EV market is expected to grow by 27% per annum from 2020 to 2030¹

By 2040 45% of the global vehicle fleet is forecast to be electric vehicles¹

Market

PHALABORWA PRELIMINARY ECONOMIC ASSESSMENT

EXPECTED TO BE THE LOWEST COST PRODUCER OF SEPARATED MAGNET RARE EARTH OXIDES

STRONG ECONOMIC RETURNS FROM PEA

- October 2022 PEA demonstrated the low-cost nature of the Phalaborwa development
- Base case model delivers robust economic returns with significant upside seen using YTD magnet rare earth prices
- US\$260m/annum revenue from sale of 1,870t/annum separated magnet rare earth during steady state production for base case price assumptions – rises to US\$330m/annum using 2022 YTD average prices
- Average operating costs of US\$33.86/kg separated magnet rare earth oxides expected to be the lowest of all Western rare earth projects
- US\$195m/annum EBITDA during steady state production for base case price assumptions – rises to US\$266m/annum using 2022 YTD average prices
- Capex of US\$295.5 million significantly below that of a traditional hard rock rare earth mining project

BASE CASE¹

NPV₁₀³
US\$627m

IRR
40%

Margin⁴
75%

Payback
2 years

YTD AVERAGE PRICES²

NPV₁₀
US\$934m

IRR
51%

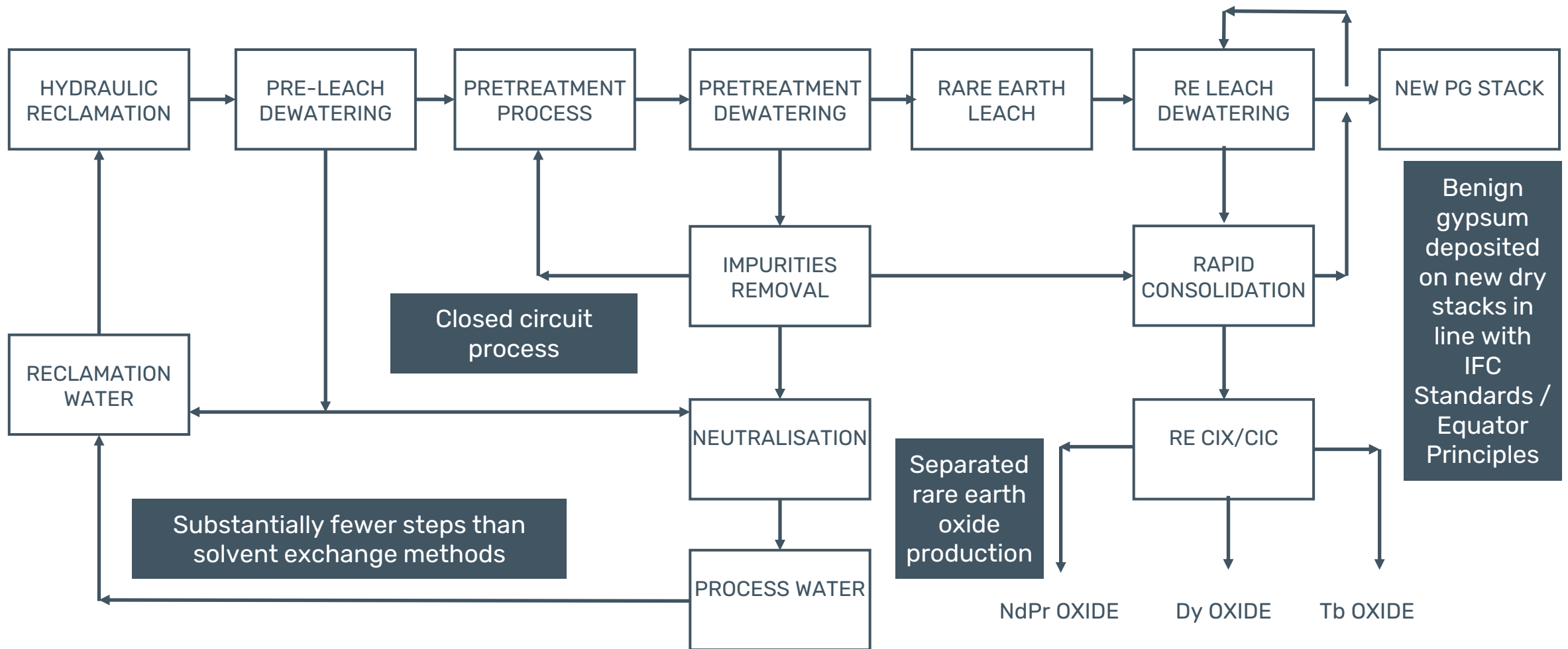
Margin
81%

Payback
1.7 years

1. The base case uses US\$110/kg Nd; US\$112.50/kg Pr; US\$340/kg Dy; US\$1,875/kg Tb
2. Prices derived from weekly data collated by Rainbow from price reporting agencies up to 23 September 2022: US\$146.36/kg Nd; US\$140.25/kg Pr; US\$403.70/kg Dy; US\$2,117.56/kg Tb
3. Net present value using a 10% forward discount rate
4. EBITDA operating margin

PHALABORWA BLOCK FLOW DIAGRAM

UNIQUE PROCESS DEVELOPED BY RAINBOW AND K-TECH



PHALBAORWA RESOURCE CONFIRMS HIGH VALUE PROJECT MUCH HIGHER GRADE THAN TYPICAL IONIC CLAY RARE EARTH PROJECTS WITH LOW LEVELS OF RADIOACTIVITY

Project	Style	Owner	TREO ³ %	NdPr ⁴ ppm	In-situ REO US\$/t ¹	U ⁵ ppm	Th ⁶ ppm
Phalaborwa ¹	Gypsum stacks	Rainbow Rare Earths	0.431%	1,257	181	2	48
La Paz ²	Ionic Clay	American rare Earths	0.04%	80	45	1	7
Round Top ²	Ionic Clay	US Rare Earths/TMRC	0.063%	39	35	45	179
Makuutu ²	Ionic Clay	Ionic Rare Earths	0.08%	232	14	10	30
Mount Weld ²	Hard rock	Lynas Rare Earths	8.20%	18,833	2,348	30	750
Ngualla ²	Hard rock	Peak Resources	4.80%	10,210	1,180	18	61
Yangibana ²	Hard rock	Hastings Tech. Metals	1.17%	4,000	1,010	300	600
Bear Lodge ²	Hard rock	Rare Element Resources	3.08%	7,059	893	113	472
Nolan's Bore ²	Hard rock	Arafura Resources	2.60%	6,859	824	191	2,700
Nechalacho ²	Hard rock	Vital Metals	1.46%	3,690	794	28	139
Longonjo ²	Hard rock	Pensana plc	1.43%	3,170	415	29	967
Songwe Hill ²	Hard rock	Mkango Resources	1.41%	2,880	403	15	386
Norra Karr ²	Hard rock	Leading Edge Materials	0.50%	701	228	8	16

GAKARA: HIGH-GRADE RARE EARTH MINERAL CONCENTRATE FROM LARGE MINERALISED SYSTEM IN BURUNDI

- 39km² mining permit hosting large scale mineralised system
- Exploration target provides opportunity for 262,000 -375,000t of high-grade vein hosted mineralisation grading 7.0% - 12.0% TREO plus 252,000 - 342,000t of breccia hosted mineralisation grading 1.0% - 1.5% TREO
- Trial mining and processing since 2017 has demonstrated amenability for simple, low-cost gravity separation from ore
- Trial mining has progressed from small-scale manual focused operations pre 2020 to bulk mechanical waste mining and selective mechanical ore mining to deliver an average mine feed grading 13.5% TREO between September 2020 and March 2021
- High value rare earth concentrate (52-56% TREO) with low levels of radioactive elements weighted towards magnet rare earths: NdPr represent ~90% of value (19.5% of mass)
- Expanded mining fleet and de-bottle necking of process plant in 2020-21 delivered growing production profile until operation placed on care and maintenance in June 2021 at request of Burundi Government
- We continue to engage with the Government to renegotiate terms of the Mining Convention and to restart operations

PRE-2020



LATEST OPERATIONS

