



# PENSANA<sup>Plc</sup>

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ESTABLISHING A WORLD-CLASS  
SUSTAINABLE SUPPLY OF RARE EARTHS  
VITAL TO THE GREEN ECONOMY

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(LSE:PRE)

## DRIVEN BY DEMAND FROM EVs AND OFFSHORE WIND, THE GLOBAL RARE EARTH MARKET IS EXPECTED TO INCREASE FIVE-FOLD BY 2030

Neodymium-Praseodymium (NdPr) oxide are the key elements in the manufacture of magnet metals, crucial to the Electric Vehicle (EV) and offshore wind turbine markets.

The NdPr oxide price is expected to increase at a CAGR of 5.6 - 9.9% through 2030 due to the supply side struggling to keep up with rapidly growing demand.

Adamas Intelligence warns that post 2030: *“It is exceptionally challenging to foresee how the supply side of the rare earth industry will be able to keep up with rapidly growing demand for magnet rare earths under any realistic scenario.*

*The rapid demand growth of the 2020s will soon be dwarfed by the demand growth of the 2030s.”*

## CHINA SUPPLIES 98% OF EUROPE'S RARE EARTH MAGNETS BUT CONCERNS GROW THAT CHINA WILL NEED ALL OF THIS PRODUCTION FOR ITS US\$11 TRILLION CARBON NEUTRAL 2060 PLAN.

Europe's industries central to the Green economy are almost totally dependent on the magnets supplied from China and there are concerns that much of the supply is "unsustainably" produced.

China installed 58GW of wind capacity in 2020, exceeding the total capacity installed worldwide in the previous year.

Under the recently announced US\$11 trillion Carbon Neutral 2060 Plan, it will spend a further US\$3.8 trillion on wind and solar up to 2050, raising concern that it will need all of its current magnet production and more.





## ERMA: ESTABLISHING SUSTAINABLE RARE EARTH PRODUCTION IN EUROPE IS CRITICAL

*“We import lithium for electric cars, platinum to produce clean hydrogen, silicon metal for solar panels, 98 percent of the rare earth elements we need come from a single supplier - China - and this is not sustainable,”*

**Ursula von der Leyen EU President, February 2021**

*“It is not sufficient to have the raw materials if we do not have the processing facilities in Europe. The overall goal of the European Raw Materials Alliance is to boost EU resilience in the rare earths and permanent magnets value chain that are vital for many industrial ecosystems.”*

**Thierry Breton, EU Commissioner, September 2020**

Pensana is a founding member of the European Raw Materials Alliance (ERMA) which has stated that building sustainable rare earth oxide production and separation capacity in Europe is critical to meet the burgeoning demand from electric vehicle and offshore wind growth.

## ESTABLISHING THE WORLD'S FIRST SUSTAINABLE RARE EARTH SEPARATION FACILITY AT THE SALTEND CHEMICALS PARK IN HUMBER UK

Plans to establish the Saltend plant would see it become the world's first major separation facility to be established in over a decade and would be one of only three major producers located outside China.

Aiming to produce c. 12,500 tonnes of rare earth oxides annually, including c. 4,500 tonnes of magnet metal rare earth oxides, representing approximately 5% of 2025 projected world demand.

The US\$125 million facility plans to create over 100 direct jobs processing purified rare earth sulphates imported from the Company's state-of-the-art Longonjo mine in Angola.



## ETHICALLY SOURCED RARE EARTHS FROM STATE-OF-THE-ART LONGONJO MINE

UK Engineering experts Wood Group plc have sought to design the Longonjo mine in Angola to meet international standards which features hydro-electric power and a tailings storage facility aligning to recommendations of the Church of England Pensions Board and ICMC guidelines.

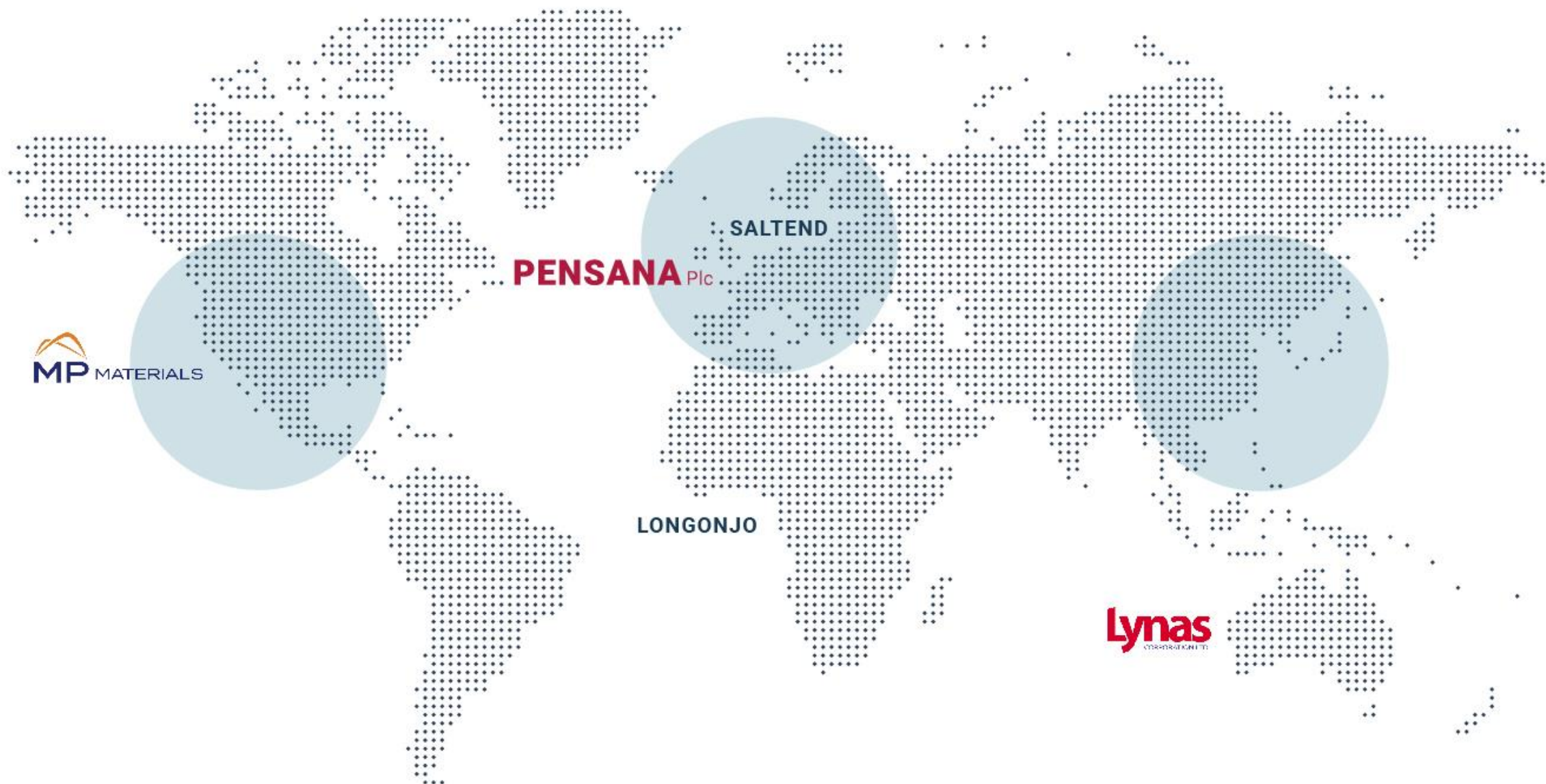
The near surface, high grade mine is linked to the Atlantic port of Lobito by the recently upgraded Benguela railway line and from the test work undertaken to date will produce a clean, high value mixed rare earth sulphate

The Angolan Government is looking to diversify the economy away from its dependence on oil, gas and diamonds towards tourism, agriculture and value-added resource development.

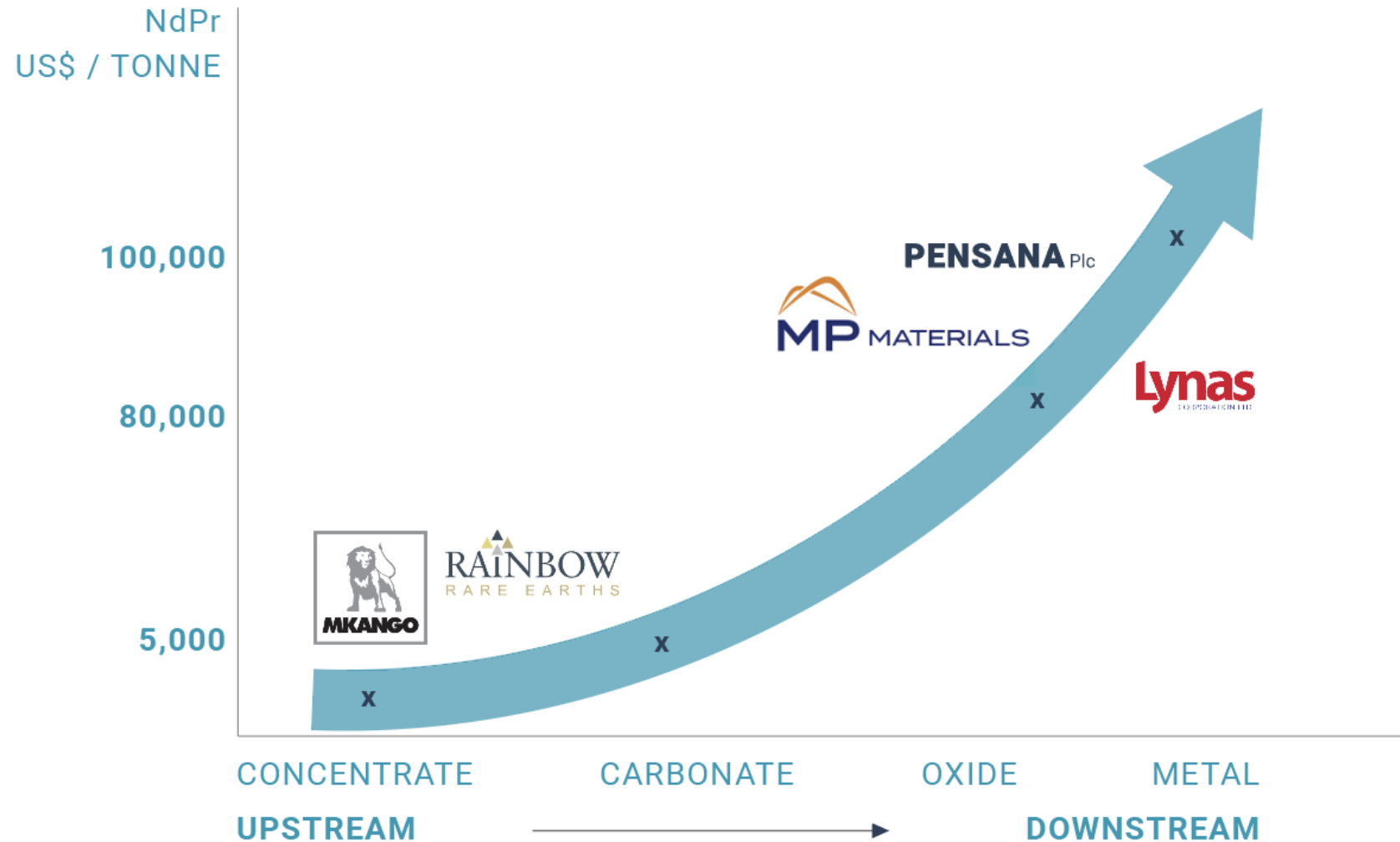
Angolan President Lourenço recently commented to international media that he has high hopes for Longonjo as the flagship achievement of his mining reforms.



# THREE MAJOR NON-CHINESE RARE EARTH OPERATIONS



# RARE EARTH VALUE CURVE





## **FREEPORT STATUS WILL HELP ESTABLISH A RARE EARTH PROCESSING HUB AT SALTEND BRINGING BACK HIGH-VALUE MANUFACTURING TO THE UK**

Recently awarded Humber Freeport status supports Pensana's ambitions for Saltend to become one of the world's largest rare earth processing hubs.

By importing sustainably sourced feedstock from around the world and processing it into high value oxides and metal products, it will have the potential to export to supply chains in Europe and beyond.

The Company is in active discussions with third parties for the additional supply of sustainably sourced rare earth carbonates in addition to plans to process Longonjo feedstock material and will look to expand production capacity once such feedstock becomes available.

## VW'S ID.3 RANGE OF EVS WILL CONSUME THE EQUIVALENT OF PENSANA'S ENTIRE RARE EARTH PRODUCTION FOR THE NEXT DECADE





A large, stylized white quotation mark icon on a teal background.

**We very much welcome the proposal to establish a fully sustainable rare earth oxide magnet metal processing facility in the Humber region. This facility is an important step in the establishment of a permanent magnet supply chain in the UK which could support a range of industries important to building back greener and our Net Zero ambitions.**

Lord Gerry Grimstone,  
UK Minister for Investment

# BUILDING A WORLD CLASS MANAGEMENT TEAM

Recent appointments have strengthened the Board and Management team



## JEREMY BEETON

NON-EXEC DIRECTOR  
*Appointed Mar 2021*

Former Director General of the 2012 London Olympic and Paralympic Games, Principal Vice President of Bechtel, Advisory Board of PWC, and Non-Exec of SSE Plc. Currently also a Non-executive Director of John Laing.

## ROCKY SMITH

COO  
*Appointed Mar 2021*

Former Managing Director of Molycorp's Mountain Pass rare earth mine in the US, now owned by NYSE listed MP Materials.

## PAUL ATHERLEY

CHAIRMAN

Mr. Atherley has extensive experience as a senior executive. Previously Executive Director of the investment banking arm of HSBC. Has completed numerous successful acquisitions and financings of resource projects in Europe, China, Australia and Asia.

## TIM GEORGE

EXEC DIRECTOR / CEO

A Minerals Engineer, Tim leverages over 30 years of experience in the mining and engineering sectors, with a broad experience in mining project development throughout Sub-Saharan Africa.

## RT HON BARONESS NORTHOVER

NON-EXEC DIRECTOR

Baroness Northover was the Prime Minister's Trade Envoy to Angola (2016- 2020), Zambia (2017-2020) and Minister in the Department for International Development ("DFID") 2011-15, including serving as Parliamentary Under Secretary and Africa Minister, 2014-15.

## SANDRA BATES

NON-EXEC DIRECTOR

Ms Bates is an international lawyer with over 20 years' experience advising listed and private companies in the natural resources sector on complex commercial negotiations and Environmental, Social and Governance (ESG) engagement.



# FINANCIAL SUMMARY\*

Saltend is targeting production of circa 12,500 annualised tonnes of rare earth oxides per annum.

*(Excluding estimates for expansion, metal / alloy production or recycling)*

ANNUAL PRODUCTION OF RARE EARTH OXIDES (REO)	C. 12,500 TPA	
ANNUAL PRODUCTION NdPr OXIDES	C. 4,500 (INCLUDED IN REO)	
OPEX	US\$ 22/KG RARE EARTH OXIDE	
CAPEX	SALTEND REFINERY	US\$ 125M
	LONGONJO MINE AND INFRASTRUCTURE	US\$ 38M
	LONGONJO CONCENTRATOR	US\$ 105M
	LONGONJO MRES REFINERY	US\$ 124M
	GROWTH ALLOWANCE AND CONTINGENCY	US\$ 31M
REVENUE (Average steady state)	US\$ 550 MILLION (Average per annum based on first five years)	
EBITDA (Average steady state)	US\$ 359 MILLION (Average per annum based on first five years)	
NPV <sub>8</sub> ** (UN-LEVERAGED, POST TAX)	US\$ 2.3 BILLION	
IRR	57%	
PAYBACK FROM FIRST PRODUCTION	2.0 YEARS	

- \* Management estimates, inclusive of Angolan and UK operations, are based on underlying independent studies undertaken by:
- SRK: Mineral resource estimates
  - Snowden: Mine plan schedule and pit optimisation
  - Wood Group: Longonjo and Saltend technical engineering and design; capex and opex estimates; supervision of metallurgical testwork and pilot plant programs
  - Paradigm Project Management: Longonjo site infrastructure and bulk services technical engineering, design and cost estimates
  - HCV Africa: ESIA
  - Adamas Intelligence: Market forecasts

\*\* NPV is calculated at an operational level pre-financing which is anticipated to be a blend of equity and long term debt financing. Revenue based on the Shanghai Metals Market spot price as at 31 March 2021 and price escalation using Adamas Intelligence market forecasts.



## POTENTIAL FINANCIAL BACKING FROM MAJOR SHAREHOLDER AND A RANGE OF FINANCIAL INSTITUTIONS

Financing is expected to be a mix of bond or similar long-dated debt finance together with institutional equity.

Saltend has received first phase progression from the UK Government's £1 billion Automotive Transformation Fund which seeks to support the national transition to electric vehicles.

Pensana has received indications of potential financial backing from its major shareholder, the Angolan Sovereign Wealth Fund, and approaches from a wide range of financial institutions to date as it seeks to review the potential funding sources and structures to deliver its plans.



## CORPORATE PROFILE

Standard listing on LSE (PRE.L) with 204 million ordinary shares on issue trading via SETS with market capitalisation of c. £350 million (c. US\$490 million).

The top 20 shareholders own over 70% of the register and include:

Angolan Sovereign Wealth Fund **23%**

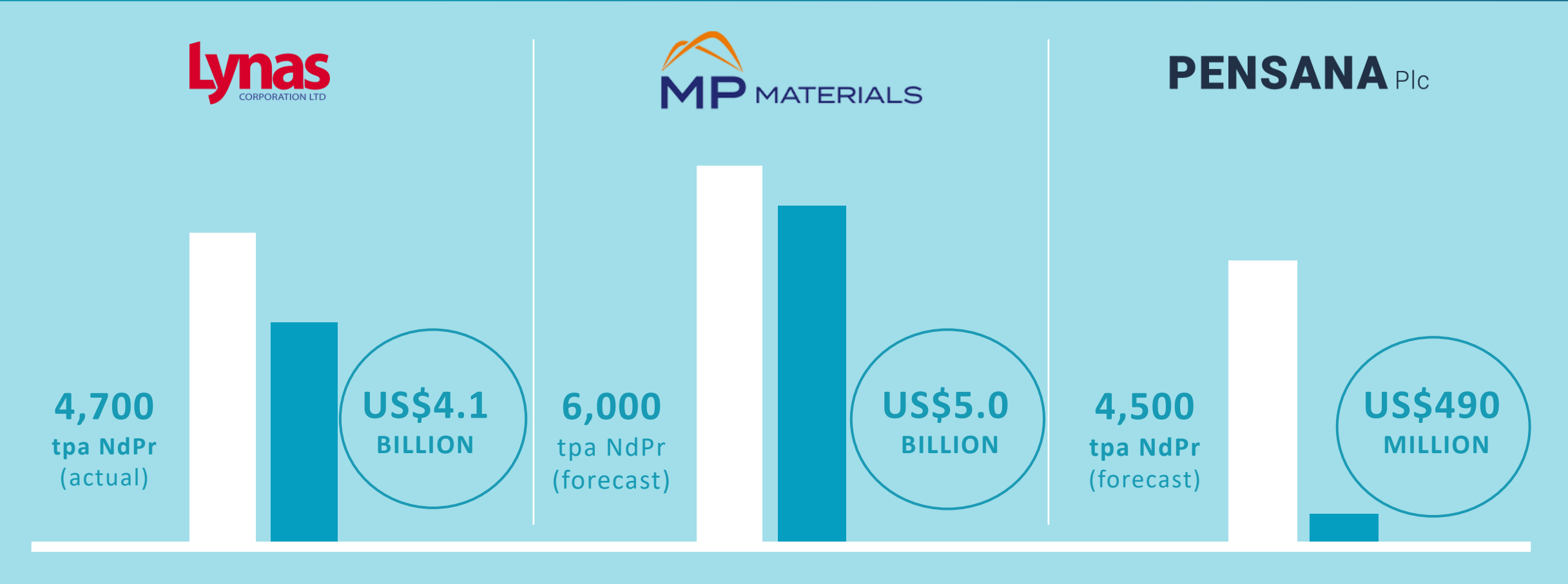
HNW and Family Offices **18%**

Management and Board of Directors **11%**

Share price since listing on LSE in July 2020:



PEER ANALYSIS  
NdPr Production vs Market Capitalisation



Source: Company disclosures, Bloomberg 20 April 2021



## ESTABLISH CERTIFIED MAGNET METAL SUPPLY CHAIN FOR WIND TURBINE, ELECTRIC VEHICLE AND OTHER STRATEGIC OEMS

By teaming up with alloy makers and magnet manufacturers, the Company is looking to establish a c. 3,000 tonne per year metal facility to supply the European automotive and wind turbine original equipment manufacturers.

The ability to provide manufacturers with proof of provenance and independently verified lifecycle certification which will become increasingly important under the EU 2023 Carbon Border Tax.

In January 2021, Pensana's Chairman led discussion with UK Treasury officials on technological applications for lifecycle analysis of raw material supporting UK decarbonisation and circular economy objectives.

## **HELP CREATE A CIRCULAR ECONOMY FOR RARE EARTH MAGNETS BY USING BLUE HYDROGEN TO RECYCLE WIND TURBINE NACELLES AT SALTEND**

Europe recycles less than 1% of magnet metals at a time when consumption is growing rapidly.

To tackle this problem, Pensana is exploring the use of blue hydrogen generated by Equinor at Saltend to recycle an addressable annual market of 4,000 tonnes of permanent magnets from end-of-life electric vehicles and wind turbine nacelles.

The Equinor-led Hydrogen 2 Humber (H2H Saltend) project plans to capture carbon and supply blue hydrogen as part of Zero Carbon Humber, a partnership to build the world's first net zero industrial cluster.



## PART OF OUR COMMITMENT TO ESG: STUDY INTO ANGOLA'S COFFEE INDUSTRY

As part of Pensana's commitment to communities in which we operate, alongside its inclusion of outsourced services and agri-business within the development plan, the Company has commissioned a detailed study involving helping to revive parts of Angola's coffee industry with enhanced certification and a fairer distribution of profits to farmers, thereby promoting inclusive growth and reducing poverty.

Previously a major coffee exporter, Angola now produces 1.5% of the tonnes of coffee it produced in the 1970s. Traditional family farmers, who make up 95% of the growers, earn just 6% of the profit with the remaining 94% going to processors and traders.

The Company has engaged international consultants and with officials in-country and the UK Embassy in Luanda to weigh opportunities to establish a centralised hub with anchor farms feeding into a roasting facility at the port of Lobito to produce coffee for export to Europe.

## PROVIDING POSITIVE OPPORTUNITIES FOR TALENTED YOUNG WOMEN TO HELP BUILD A SUSTAINABLE ECONOMY

Metals and minerals are the building blocks of the green economy. We believe that it is unacceptable to extract them unsustainably and that smart chemistry and energy transition are the keys to establishing a net zero circular economy.

Pensana is actively seeking bright and aspirational women with STEM backgrounds, particularly those who come from diverse and/or disadvantaged backgrounds and want to be part of creating solutions for a sustainable future.

In this regard, the Company is engaging with engineering centres of excellence, the University of Hull, local authorities and engagement experts to progress women in STEM across operations from the very outset of hiring and development.





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## Competent Persons Statement

The information in this statement that relates to Mineral Resource estimates is based on work done by Rodney Brown of SRK Consulting (Australasia) Pty Ltd. Rodney Brown is a member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 edition). Rodney Brown consents to the inclusion in the report of the matters based on his information in the form and contest in which it appears.

The information in this report that relates to Geology and Exploration results is based on information compiled and/or reviewed by Grant Hayward, who is a Member of The Australasian Institute of Mining and Metallurgy. Grant Hayward reports to Rocky Smith, who is the Chief Operating Officer of the Company. He has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity which he is undertaking to qualify as a Competent Person in terms of the 2012 Edition of the Australian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves. David Hammond consents to the inclusion in the report of the matters based on his information in the form and contest in which it appears.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the above original market announcements. The Company confirms that the form and context in which the Competent Person’s findings are presented have not been materially modified from the original market announcement.

This document has been prepared in compliance with English law and English Courts will have exclusive jurisdiction over any disputes arising from or connected with this presentation.

# APPENDICES

# FINANCIAL AND TECHNICAL ADVISERS

## Market Intelligence

Iconiq Innovation

Adamas Intelligence : Market forecasts

## Saltend Technical Advisory

Wood Group – technical engineering and design

pxGroup – Saltend owner operator

Oakdene Hollins – circular economy

On Line Design – planning application

SLR consulting – air quality assessments

## Longonjo Project Technical Advisory

Wood Group – technical engineering and design

Paradigm Project Management – Longonjo site infrastructure and bulk services technical engineering, design and cost estimates

Auralia Metallurgy – specialist metallurgical and processing laboratory

ALS – geochemistry testing and analysis

Eriez – pilot plant test work

HCV Africa – ESIA, EMP, RAP and hydrology

ANSTO – Australia nuclear science and technology association

Grupo Simples – Angolan ESIA

Snowden – Mine plan schedule and pit optimisation

SRK – Mineral resource estimates