

# Independent and Sustainable Rare Earth Production

Establishing world class Rare Earth production from Longonjo, Angola and Saltend Chemicals Park, Humber Freeport, UK

Angola Mining Diversification Webinar  
February 2022

**PENSANA** Plc

# EV AND OFFSHORE WIND WILL DRIVE RARE EARTH DEMAND FIVE-FOLD BY 2030

NdPr oxide is key to the manufacture of permanent magnets used in Electric Vehicles and Offshore Wind turbines.

**Adamas Intelligence warns that post 2030:**



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



**NdPr OXIDE PRICE  
GROWTH TO 2030**

**5.6 - 9.9% CAGR**

# CHINA SUPPLIES 95% OF WORLD'S RARE EARTH MAGNETS

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*“China has no obligation to be the rare earth supplier to the world.”*

Lin Boqiang Director of the China Center for Energy Economics

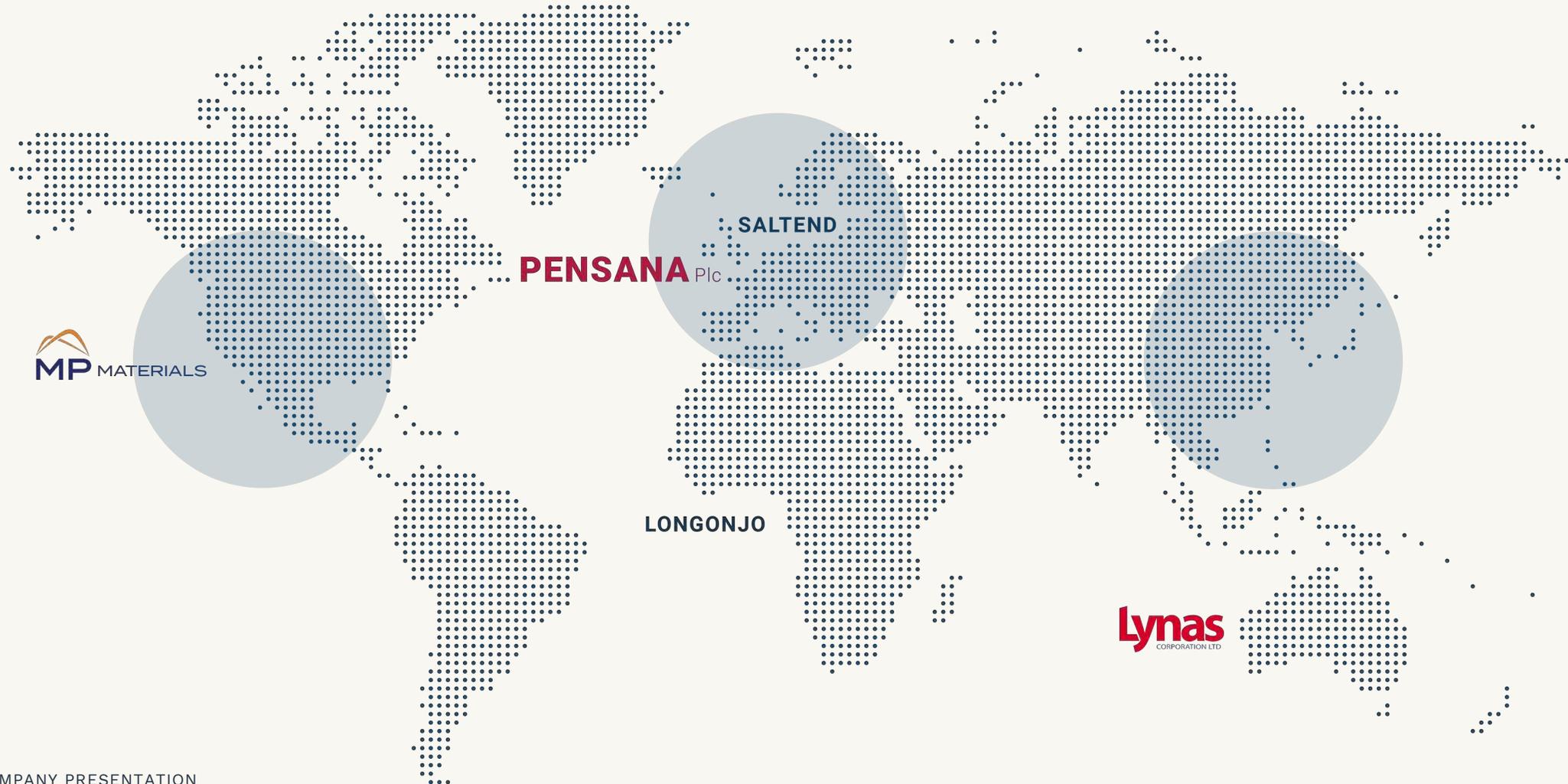


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CARBON NEUTRAL  
2060 PLAN

# LYNAS CORPORATION (LYC.ASX) CURRENTLY THE ONLY MAJOR RARE EARTH PRODUCER OUTSIDE CHINA

PENSANA Plc



# LOW CAPITAL COST STATE-OF-THE-ART MINE

Longonjo is one of the world's largest rare earth deposits with an initial 20 year mine life.

Near surface mining, 1.5 mtpa flotation concentrator, mineral sands type roaster to produce 45,000 tpa of clean, high value mixed rare earths sulphate.

Wood Group plc has designed mine to ICMM guidelines featuring solar, hydroelectric power and ~70% reagent recycling.

## LOW CAPEX DUE TO EXCELLENT INFRASTRUCTURE

Hydroelectric power and recently upgraded US\$2bn Benguela rail line provides direct link to Atlantic port of Lobito



PORTO LOBITO

LONGONJO

HYDRO POWER

# LONGONJO Project Development

Efficient regulatory process enabled rapid progress through exploration into project development phase

Mining license awarded with globally competitive fiscal terms

Angola Sovereign Wealth Fund investment into Pensana as a cornerstone

Low carbon footprint and zero discharge operations

Training for c.450 direct jobs and preparing local businesses to become service providers

# LONGONJO preparatory activities maintained through Covid



# PORT OF LOBITO HYDRO-POWER AND RAIL



# WORLD BANK GROUP

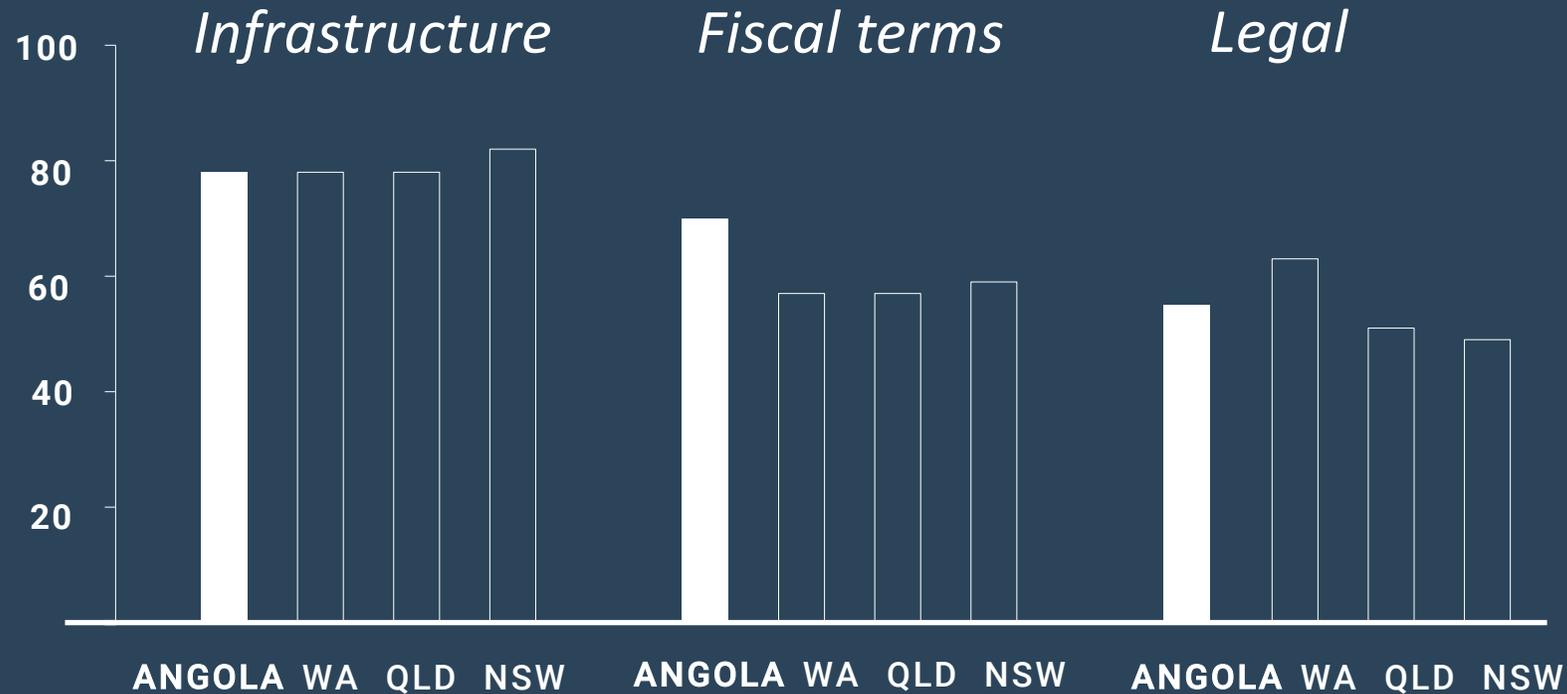
## Angola Economic Update October 2021

*Angola's economy is expected to exit a five year recession.*

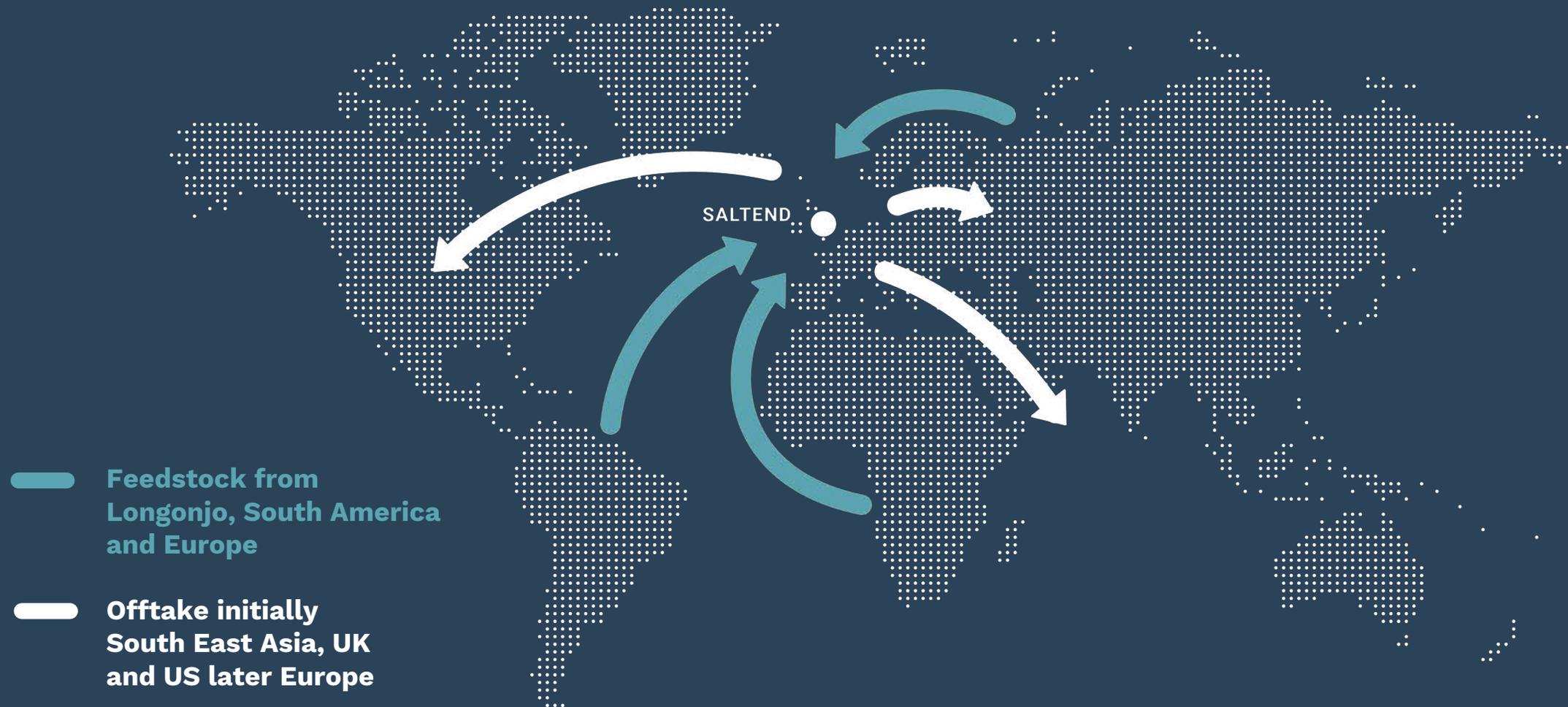
- ✓ Handled the Covid pandemic extremely well
- ✓ Fiscal Surplus (oil price rises)
- ✓ Debt to GDP ratio falling from 135% to 95% in 2021
- ✓ Moody's has upgraded credit rating to B3 with stable outlook
- ✓ Anglo American, De Beers, Rio Tinto and others now re-investing

# MINING JOURNAL WORLD RISK REPORT 2021

Angola stands tall versus the Aussie mining states of Western Australia, Queensland and New South Wales



# INDEPENDENT RARE EARTH PROCESSING HUB



# “PLUG AND PLAY” SALTEND CHEMICALS PARK

The first major rare earth separation facility to be established in over a decade.

First to be established in a Freeport - will create 450 jobs during construction and 125 high value full time jobs.

Facility will produce 12,500 tpa of TREO including 4,500 tpa of NdPr oxides ~5% of 2025 world demand.

Pensana was part of the team behind the highly successful Treasury approved Humber Freeport bid led by Associated British Ports

## METAL PRODUCTION, LINKS WITH MAGNET MANUFACTURERS, HYDROGEN TO RECYCLE OFFSHORE WIND TURBINE NACELLES

Studies are underway into private wire link to offshore wind to power conversion of NdPr oxides into metal.

Production of metal alloy provides direct link to magnet manufacturers.

Working with Equinor for the supply of Blue Hydrogen from its Hydrogen to Humber (H2H) Saltend facility to be used in the recycling of permanent magnets from end-of-life offshore wind turbines utilising hydrogen decrepitation process route.

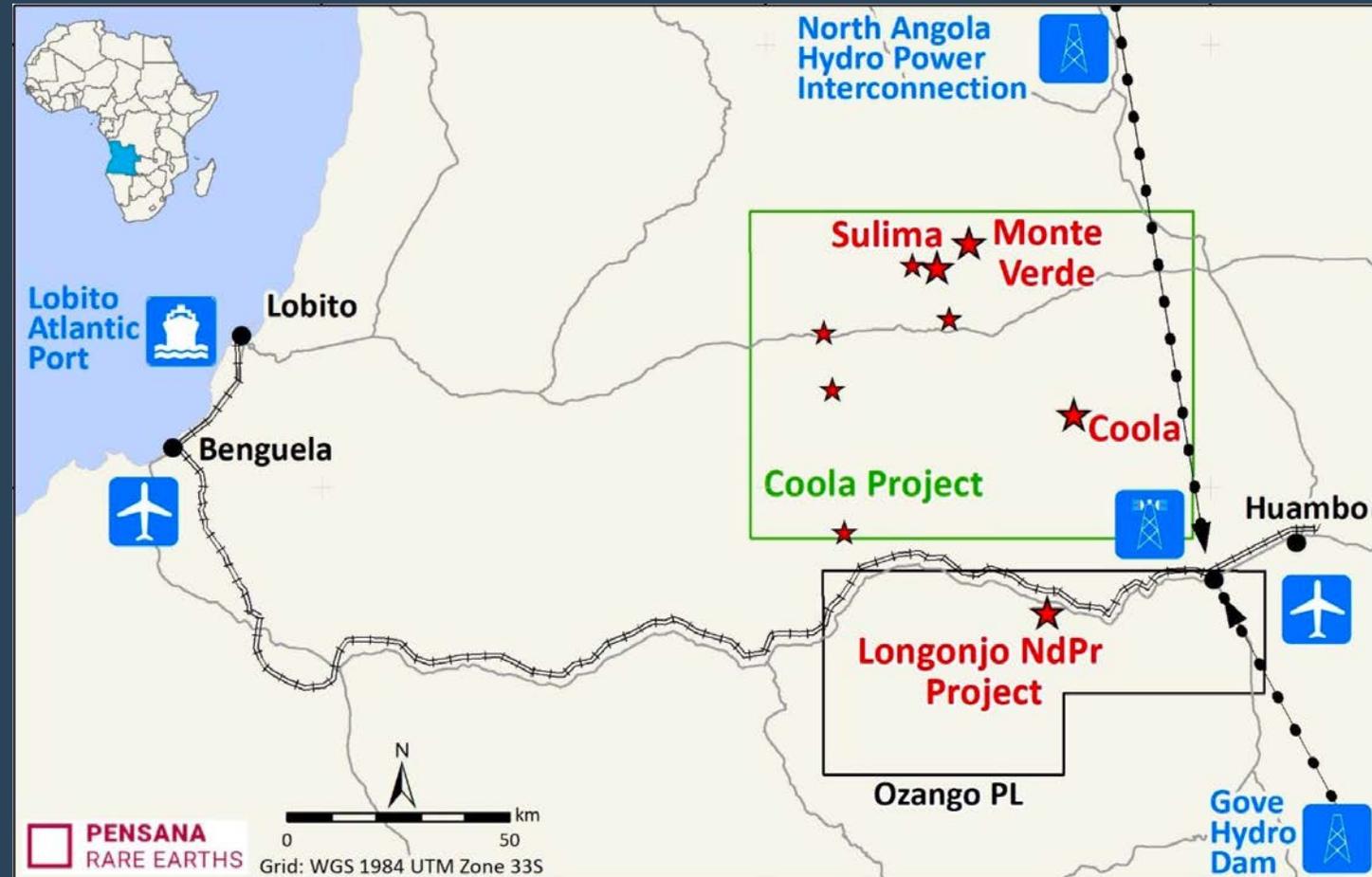
# PLANS FOR THE NEXT TWELVE MONTHS

LONGONJO	<ul style="list-style-type: none"><li>• Finalisation of FEED</li><li>• Award of 120 equipment work packages</li><li>• Commencement of construction</li></ul>
SALTEND	<ul style="list-style-type: none"><li>• Finalisation of FEED</li><li>• Award of 63 equipment work packages</li><li>• Commencement of construction</li><li>• Contract third party feedstock supplies</li><li>• Development of Rare Earth Metal Conversion Plant</li><li>• Downstream magnet metal scoping studies</li><li>• Detailed study of hydrogen based NdPr magnet recycling including Wind Turbine nacelles</li></ul>
FINANCING	<ul style="list-style-type: none"><li>• Main financing ATF, BOND, UKEF, Private Equity, bilateral and local banks, Institutional Equity</li><li>• Strategic co-operation / offtake agreements</li><li>• 3rd party feedstock partnership agreements</li><li>• Strategic JV partnership (Equinor)</li></ul>

# COOLA – Exploration to ramp-up in 2022

*“The 7,500 Km2 Coola Project contains several high quality ‘walk-up’ targets prospective for a suite of key strategic ‘new technology’ metals.*

*The early reconnaissance sampling results are a great start in confirming the Coola complex as a fertile mineralised system.”*



# WORLD CLASS MANAGEMENT TEAM



**PAUL ATHERLEY**  
CHAIRMAN

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

**TIM GEORGE**  
EXEC DIRECTOR/  
CEO

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

**ROCKY SMITH**  
COO

Mr Smith is a highly experienced Chemical Engineer with 35 years' rare earths experience. He is one of the few western mining executives with in-depth knowledge of the rare earth industry and running complex chemical processes. He was Managing Director of MP Materials Mountain Pass rare earth project in the US and was responsible for building the project and it's operational readiness.

**ROBERT KAPLAN**  
CFO

Mr Kaplan is a Chartered Accountant with over 20 years operating experience in the African mining sector. He brings a broad skill set in both the UK and sub-Saharan corporate finance together with experience in mining operations in Angola, South Africa and Tanzania.

**JEREMY BEETON**  
NON-EXEC DIRECTOR

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.

**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.

**STEVE SHARPE**  
NON-EXEC DIRECTOR

Mr Sharpe is a highly experienced natural resources financier. He is an Executive Board Member of EIT Raw Materials. Previously, he was Chair of AME Group, Managing Director at Canaccord Genuity, Managing Director at Endeavour Financial and held senior positions at Standard Bank and NM Rothschild.

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