

# Nolans Project

Sydney Mining Club

16 September 2021



16/09/2021



(ASX:ARU)



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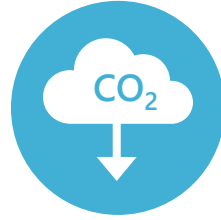
## Mineral Resources and Ore Reserves

The information in this presentation that relates to Mineral Resources is extracted from the Company's ASX announcement dated 7 June 2017 (Detailed Resource Assessment Completed) and was completed in accordance with the guidelines of the JORC Code (2012). The information in this presentation that relates to Ore Reserves is extracted from the Company's ASX announcement dated 16 March 2020 (Major Increase in Mine Life for the Nolans Project) and was completed in accordance with the guidelines of the JORC Code (2012). Arafura Resources confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the original market announcements continue to apply and have not materially changed. Arafura Resources confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

## Production Targets and Forecast Financial Information

The information in this presentation that relates to production targets and financial information is extracted from the Company's ASX announcement dated 11 May 2021 (Nolans Project Update). The production target is based on 12% Proved Reserves, 62% Probable Reserves and 26% inferred resources as reported in the Company's ASX announcement dated 11 May 2021. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised. Arafura confirms that all material assumptions underpinning the production target and forecast financial information derived from the production target set out in the Company's ASX announcement dated 11 May 2021 (including any assumptions referred to in the Company's ASX announcement dated 11 May 2021 that were used from the DFS as set out in the Company's ASX announcement dated 7 February 2019 (Nolans Project Definitive Feasibility Study) or from the Updated Mining Study as set out in the Company's ASX announcement dated 16 March 2020 (Major Increase in Mine Life for the Nolans Project)), continue to apply and have not materially changed.

# A World in Transition



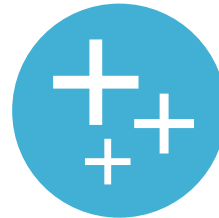
Two great revolutions are underway: **digitalisation** and **decarbonisation**



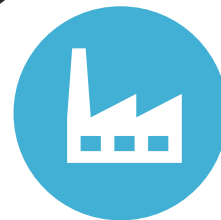
**Australia is poised to benefit:** resources, energy, expertise, proximity to markets, environmental standards



Both rely on a secure and long-term supply of **rare earths**



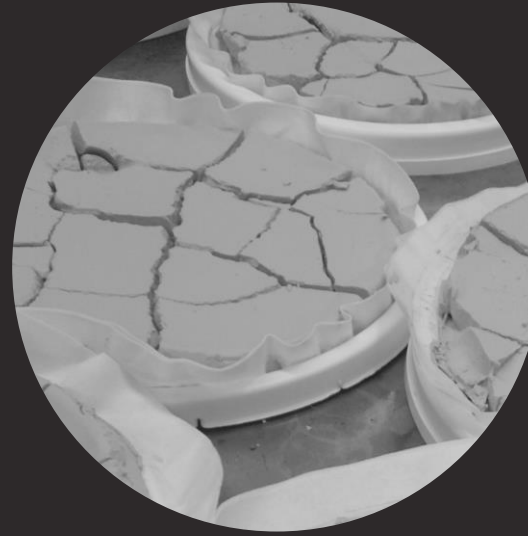
Realising its full value to Australia requires moving beyond the quarry, to **value-added processing**



Nolans is a shovel-ready, long life rare earth mine and oxide processing facility, **the first of its kind in Australia**

# Rare Earths

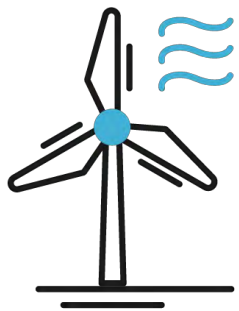
Rare Earths are essential to building a clean energy future. The transformation of the global economy relies on a secure and long-term supply



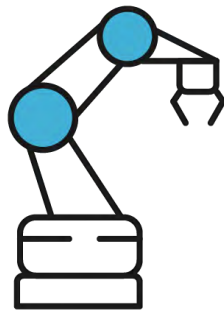
The Nolans Project contains all the Rare Earths but is particularly enriched in the 'Magnet Feed' Rare Earths NdPr



The fastest growing market for NdPr is in NdFeB Magnets. They are one of the reasons why everyday items have become smaller, lighter, mobile, more efficient and more affordable.



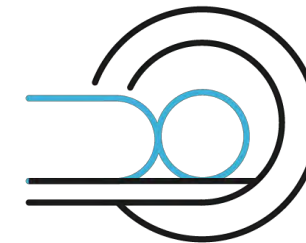
WIND  
TURBINES



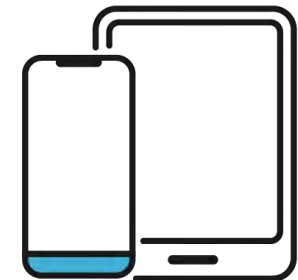
ROBOTS



ELECTRIC  
VEHICLES



MRI  
MACHINES



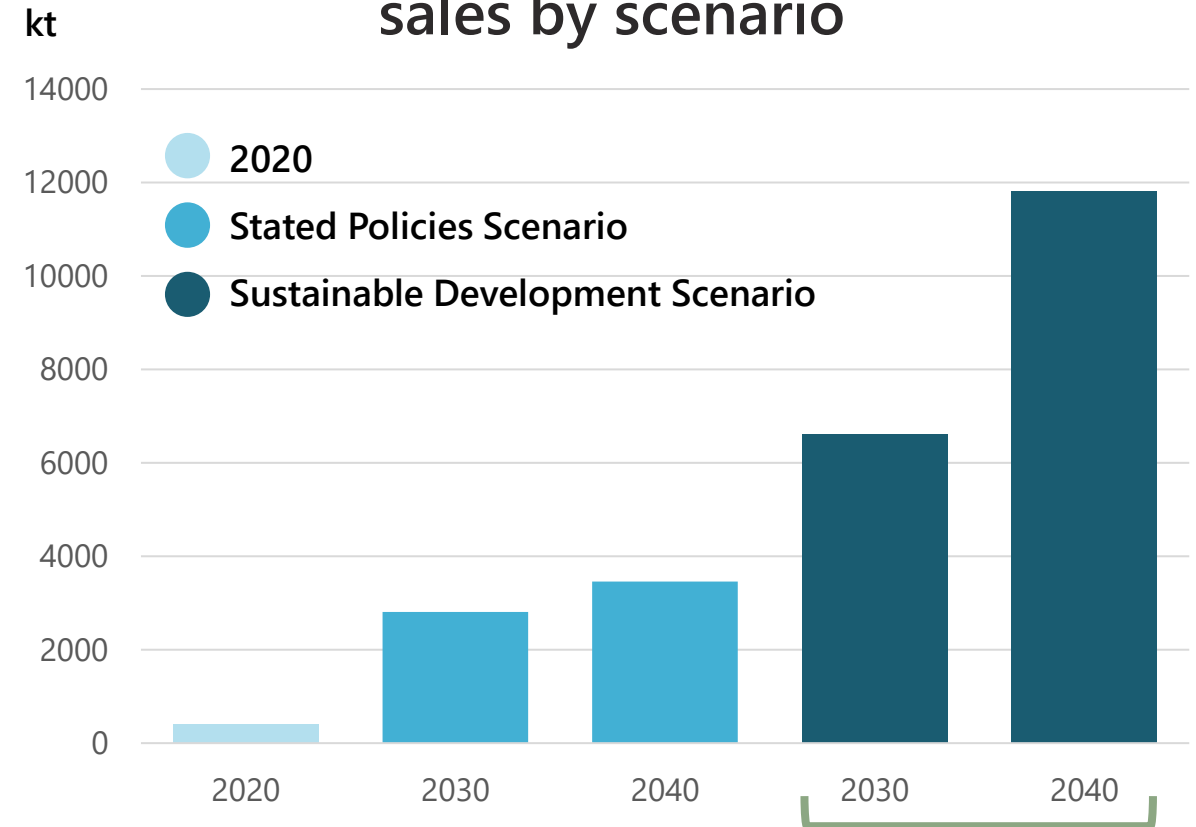
PHONES &  
TABLETS

# Rare Earths

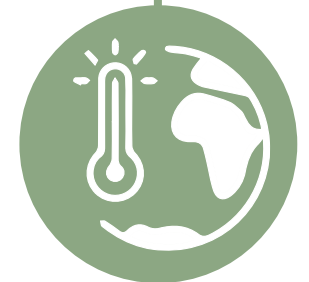
## A Vital Cog in the Electric Vehicle Revolution

- ✓ EV market growth is exponential: **10 to 40 times** in the next 20 years
- ✓ This will require **6-15 times more rare earth elements**
- ✓ Most EVs need about **1kg** of rare earths for their motor magnets
- ✓ Just 0.05% of the vehicle cost: **but it can't run without it**
- ✓ The current semiconductor shortage highlights how a **tiny cog in the supply chain can disrupt the global market**

## Total mineral demand from new EV sales by scenario

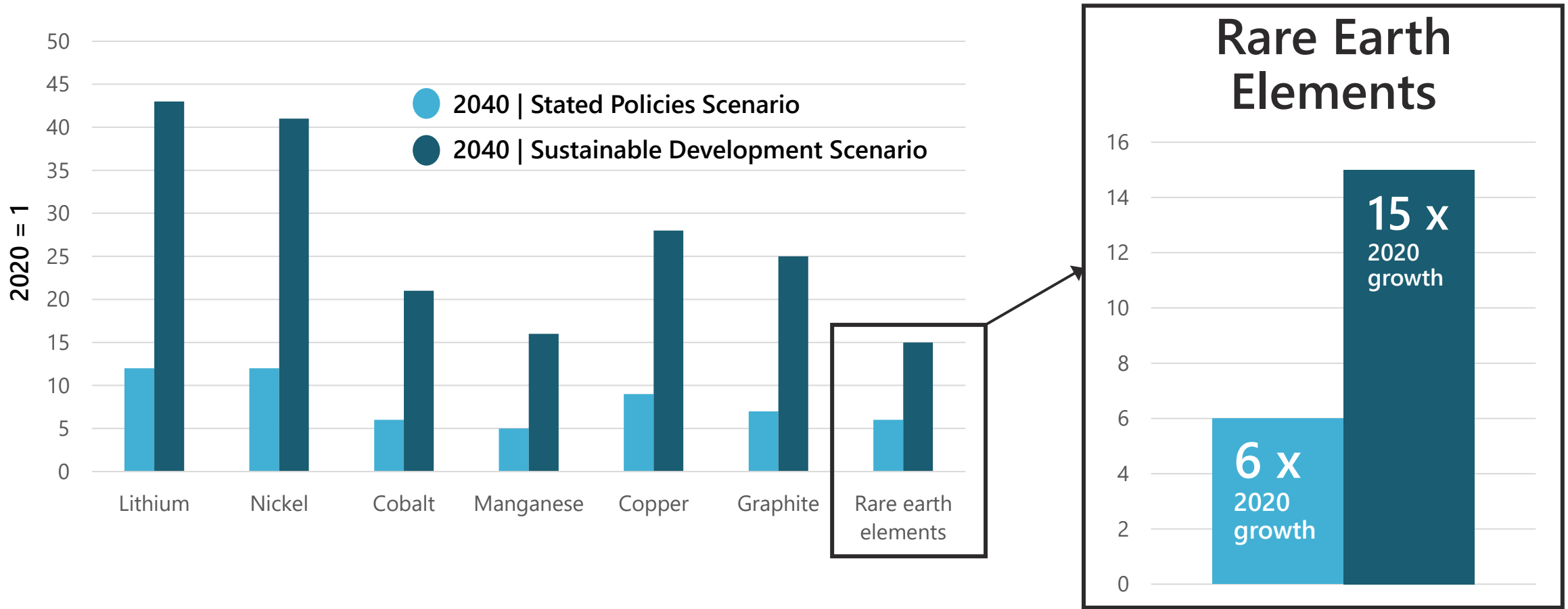


Sustainable Development Scenario is where the Paris Agreement goals on climate change are met



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# Mineral demand growth from new EV sales by scenario, 2040 compared to 2020



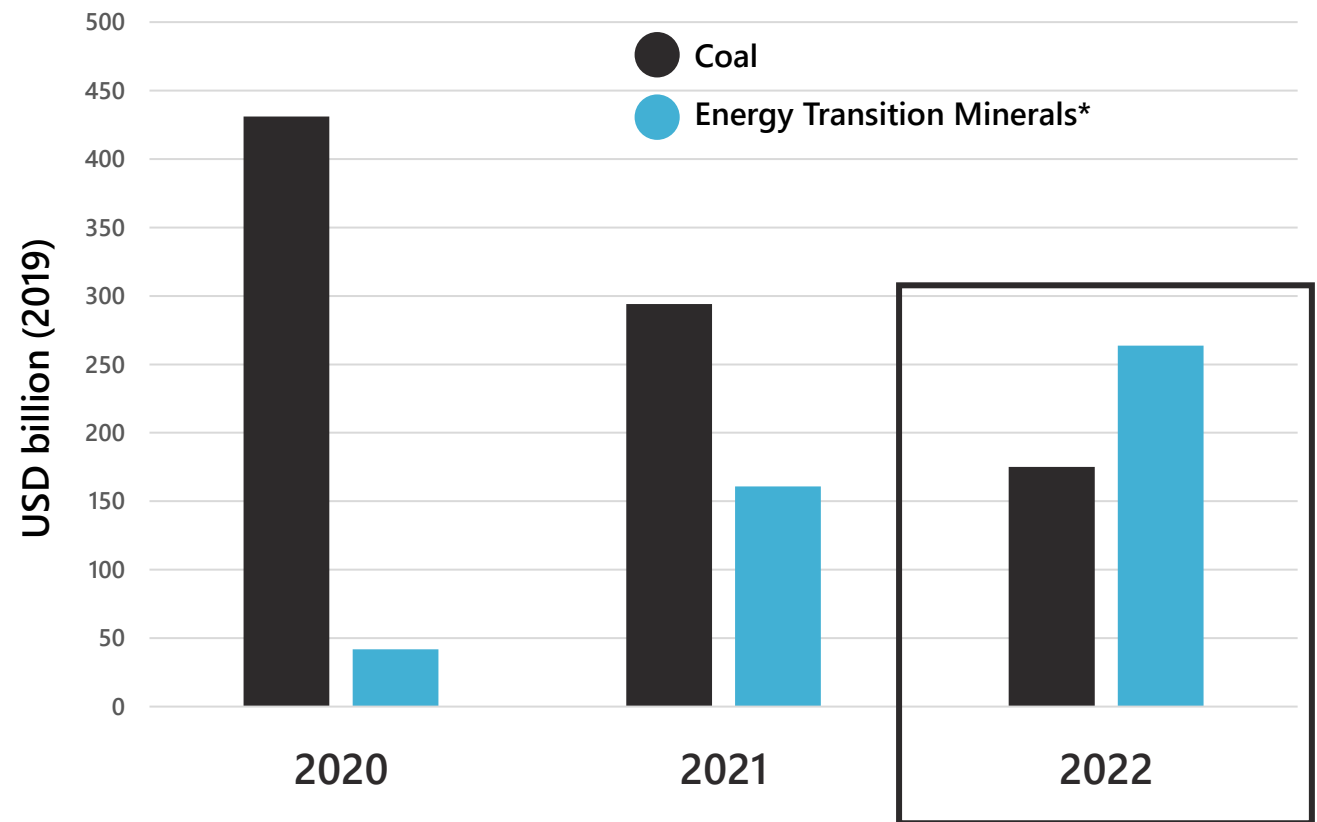
Source: IEA, Mineral demand growth from new EV sales by scenario, 2040 compared to 2020, IEA, Paris

# The Sleeping Giant

- ✓ Critical minerals are the future of Australian mining
- ✓ Will surpass coal as revenue generator in Energy Transition world
- ✓ However, much lower volume and higher value, posing different challenges for our prosperity
- ✓ To get the same multiplier job benefits for Australia as traditional mining, we need to do more of the processing and value adding here in Australia: not just dig them up...

## Changing fortunes: Coal vs energy Transition minerals

Revenue from production of coal and selected energy transition minerals in the Sustainable Development Scenario (SDS)



Source: IEA, Revenue from production of coal and selected energy transition minerals in the Sustainable Development Scenario, 2020-2040

\*Includes Rare Earth Elements, Copper, Lithium, Nickel, Cobalt, Graphite, Manganese & Silicon.

# Nolans Project Overview



# Key Facts



## Advanced manufacturing onsite

– Ore to oxide at Single Site –

First of its kind in Australia



Nolans aims to supply  
**5-10% of global demand**  
for NdPr oxide



Nolans is a shovel-ready world class NdPr project



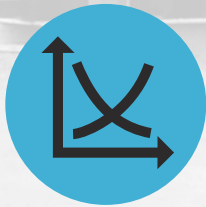
NdPr is the key input for high performance NdFeB permanent magnets



NdPr is central to many clean energy applications including EVs and wind turbines



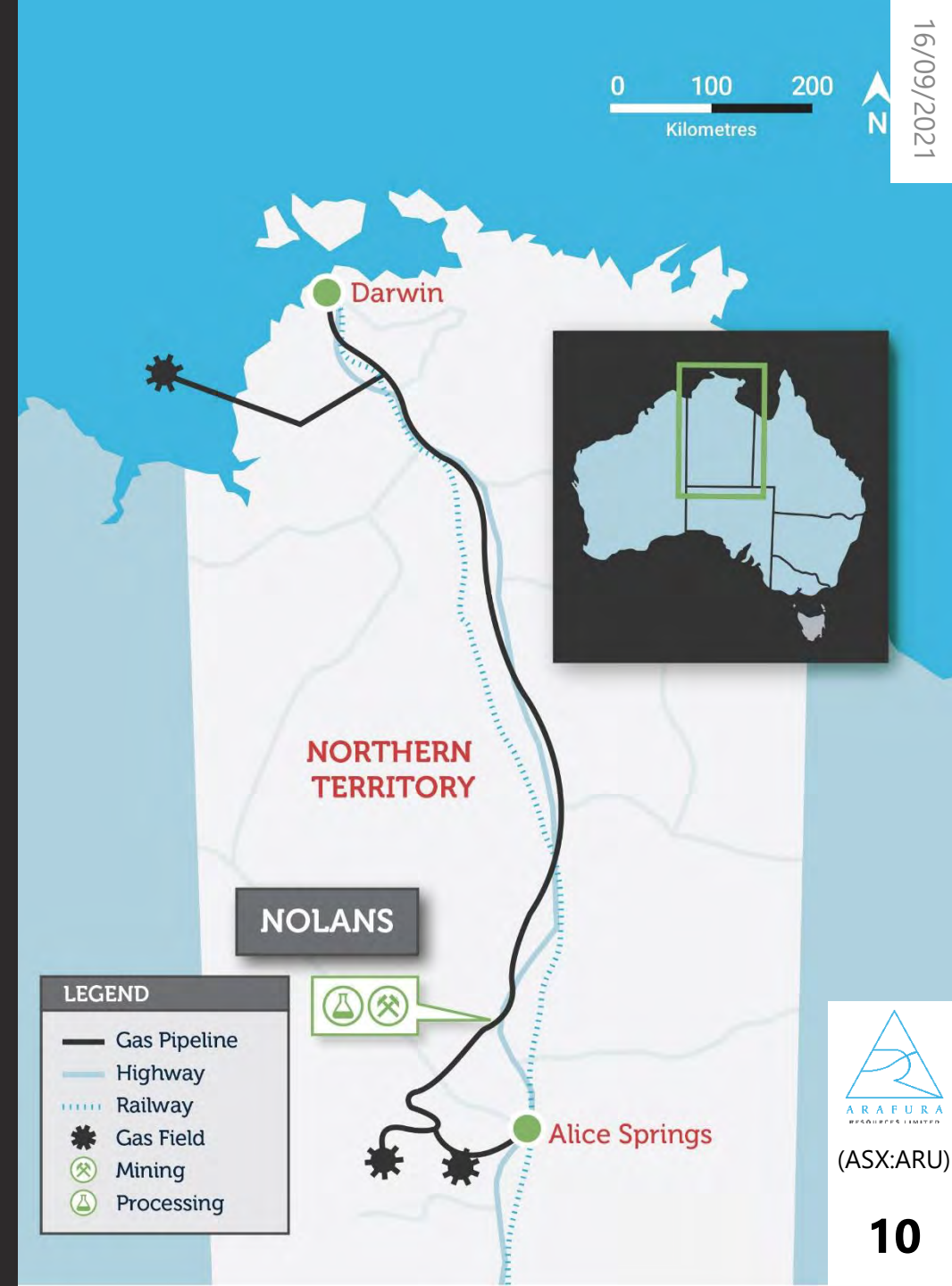
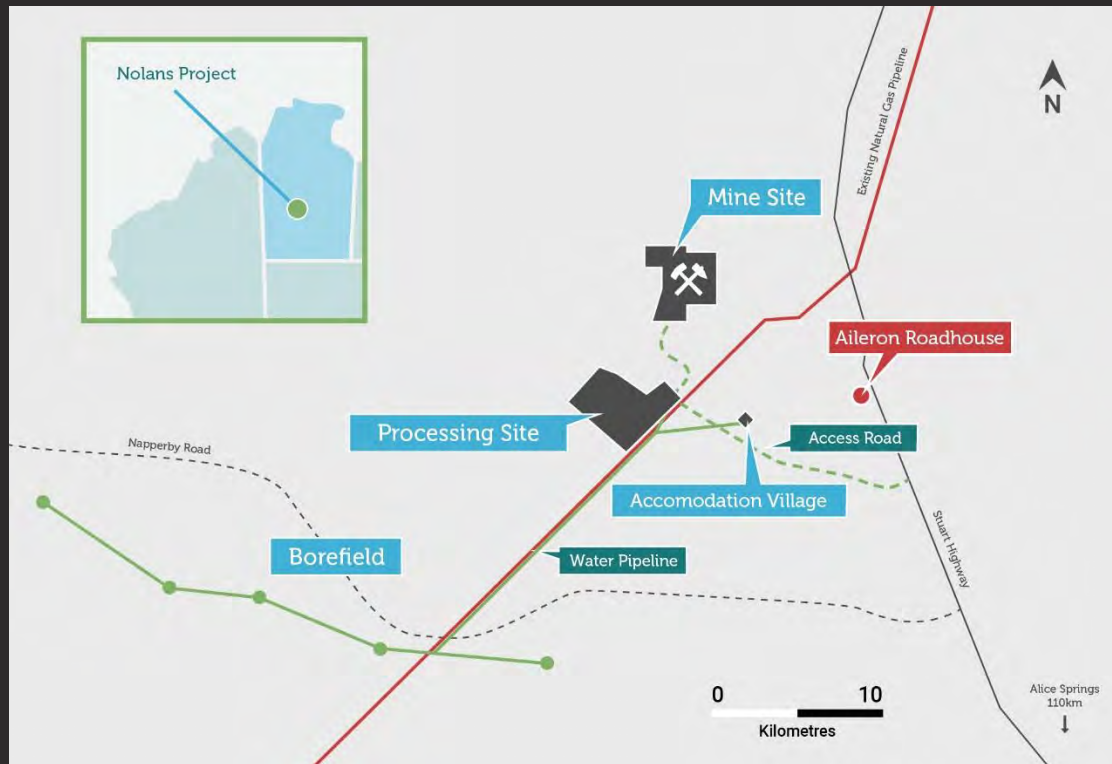
Arafura is aiming to be a trusted global leader for sustainably mined and processed rare earth products



Production is aligned with forecast supply shortage

# Close to existing key infrastructure

- ✓ Stuart Highway 10 km east
- ✓ Water supply 25km southwest
- ✓ Alice Springs railyard, airport and other services 135km south
- ✓ Amadeus natural gas pipeline- adjacent to project site
- ✓ Tailings and process wastes at site



# Nolans NdPr Shovel Ready



## Regulatory

- ✓ Federal & NT Environmental Approvals secured
- ✓ Government and Minister support for senior debt facility



## Security of Tenure & Social License to Operate

- ✓ Native Title Agreement
- ✓ Mineral License Granted
- ✓ Federal Major Project Status
- ✓ Indigenous Engagement Strategy



## Technical

- ✓ DFS and Project Update complete
- ✓ Extensive piloting of ore to oxides flowsheet
- ✓ Appointment of KBR & Wave to in-house team
- ✓ **Front End Engineering & Design (FEED) commenced**



## Commercial

- ✓ Customer verification of oxide products
- ✓ **Australian Government provide conditional letters of support for \$300M in debt**
- ✓ **\$45.5M Successful capital raising completed to begin FEED**
- Offtake engagement (advanced discussions underway)
- Project funding (commenced senior debt process)

# Shovel Ready for Rising Rare Earth Demand

## Nolans Key Development Milestones\*

*\*Milestone targets are indicative and subject to change and are contingent upon funding, offtake activities and general market conditions*

*1. FID and First Production are both subject to outcomes with offtake and financing.*

*2. Conditional letters of support are non-binding and conditional upon internal credit approval, negotiation of lender agreements and further due diligence enquiries (among other conditions).*



# Ore to Oxide at Single Site

Nolans is the **only** NdPr focused project in Australia that plans to **mine and process ore to oxide at a single site**.



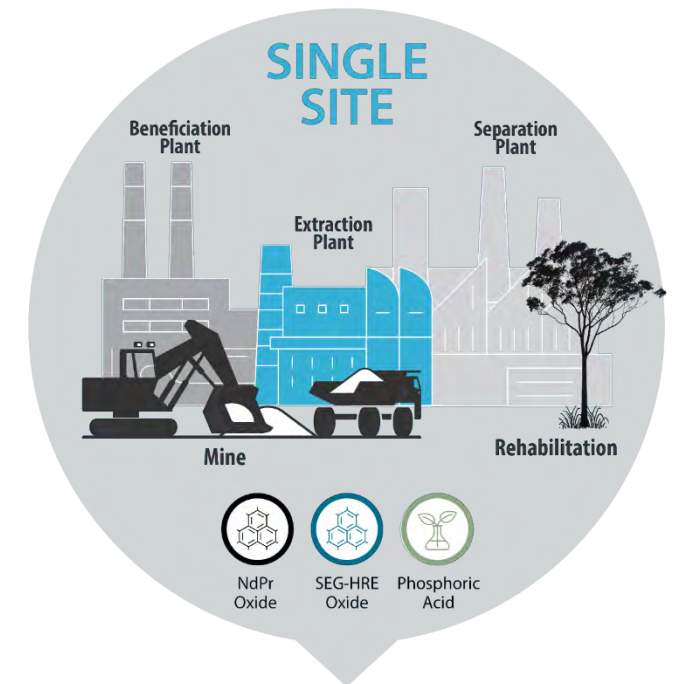
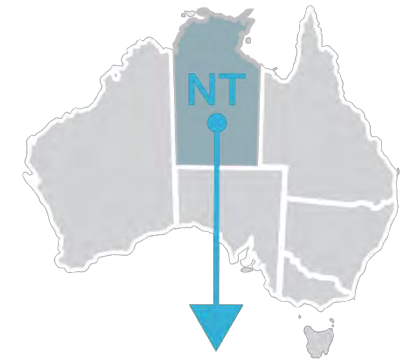
Nolans aims to be a **non-Chinese supplier of choice** for **sustainably mined NdPr oxide**.



**All environmental approvals** have been secured and waste management & site rehabilitation fully costed.



Arafura's **single site processing** provides traceable product and waste management certainty which is **aligned with customers' ESG expectations**.



**FOR EXPORT**  
To International Customers



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# ESG - Current activities and initiatives

*"Arafura's ESG commitment is to be a trusted global leader and supplier of choice for sustainably mined and processed rare earth products, helping our customers deliver clean and efficient technologies. We are committed to delivering positive intergenerational economic, environmental and social benefits to our stakeholders."*



## Prioritise GHG Emissions and Water Management

- Water reduction strategy
- GHG Emissions Audit and reduction study
- Renewable energy – Solar power initiative, Commitment to Net Zero GHG



## Finalise Update of Sustainability Report

- Signatory of the UN Global Compact
- Comprehensive report that satisfies requirements of global ESG ratings agencies and reporting standards
- Due 2H 2021



## Pending Member in IRMA

- Arafura will complete the IRMA Ready assessment standard as soon as it is launched



## Traceability – Blockchain Technology

- Aligned with customers' ESG expectations
- Will allow tracing of Nolans sustainably produced products through entire supply chain to customers



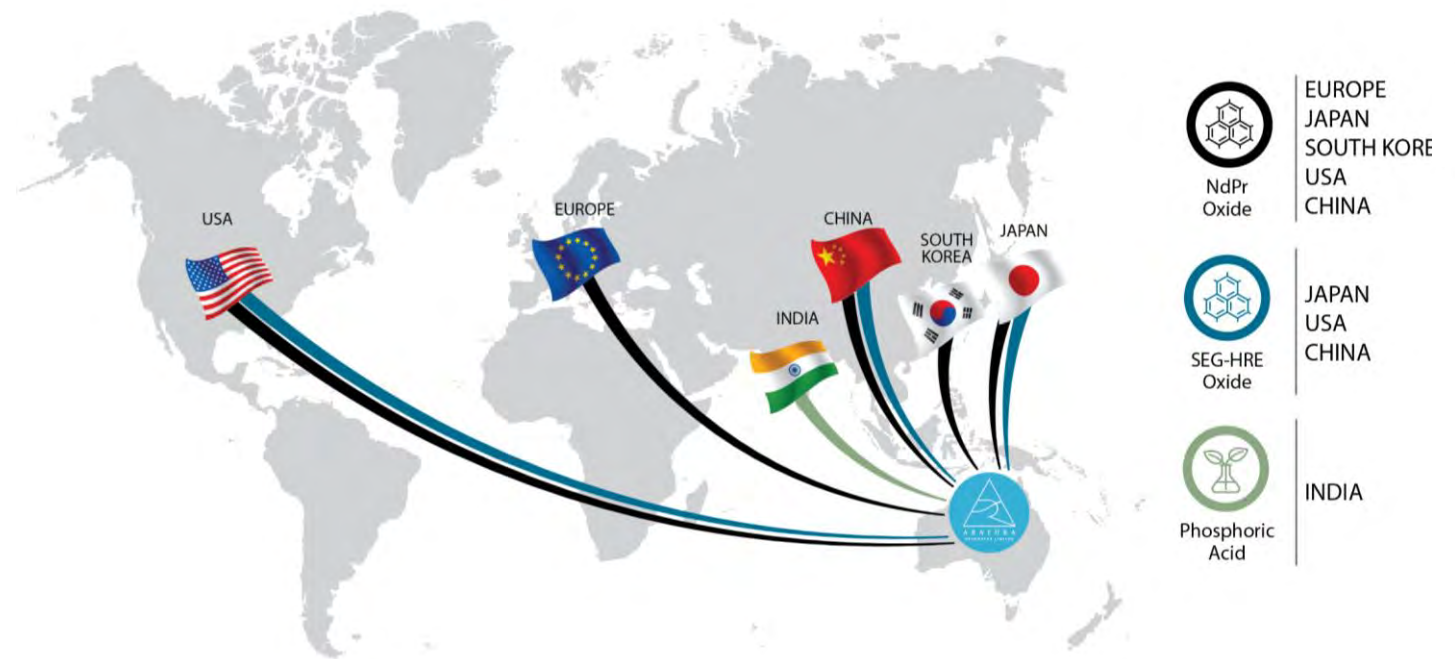
## Innovation and Technology

- Downstream value add opportunities
- Ongoing R&D, low carbon metallisation process
- Options for hydrogen or other energy storage solutions

# Offtake Strategy

Targeting NdPr users not aligned with *Made in China 2025* strategy

- ✓ Progressing Offtake agreements with customers seeking supply security with a sustainable NdPr producer
- ✓ Prices rising materially as supply tightens
- ✓ Arafura is in discussions with 9 parties for over 120% of Planned Production with a view to secure 85% as binding offtake
- ✓ Key markets for NdPr are E-Motors, Wind Turbines



Australia fuelling the **clean energy revolution**



Nolans aims to supply **5-10% of global demand** for NdPr oxide



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# Critical Minerals Supply – a Global Issue

# NdPr Market Opportunity

## DEMAND



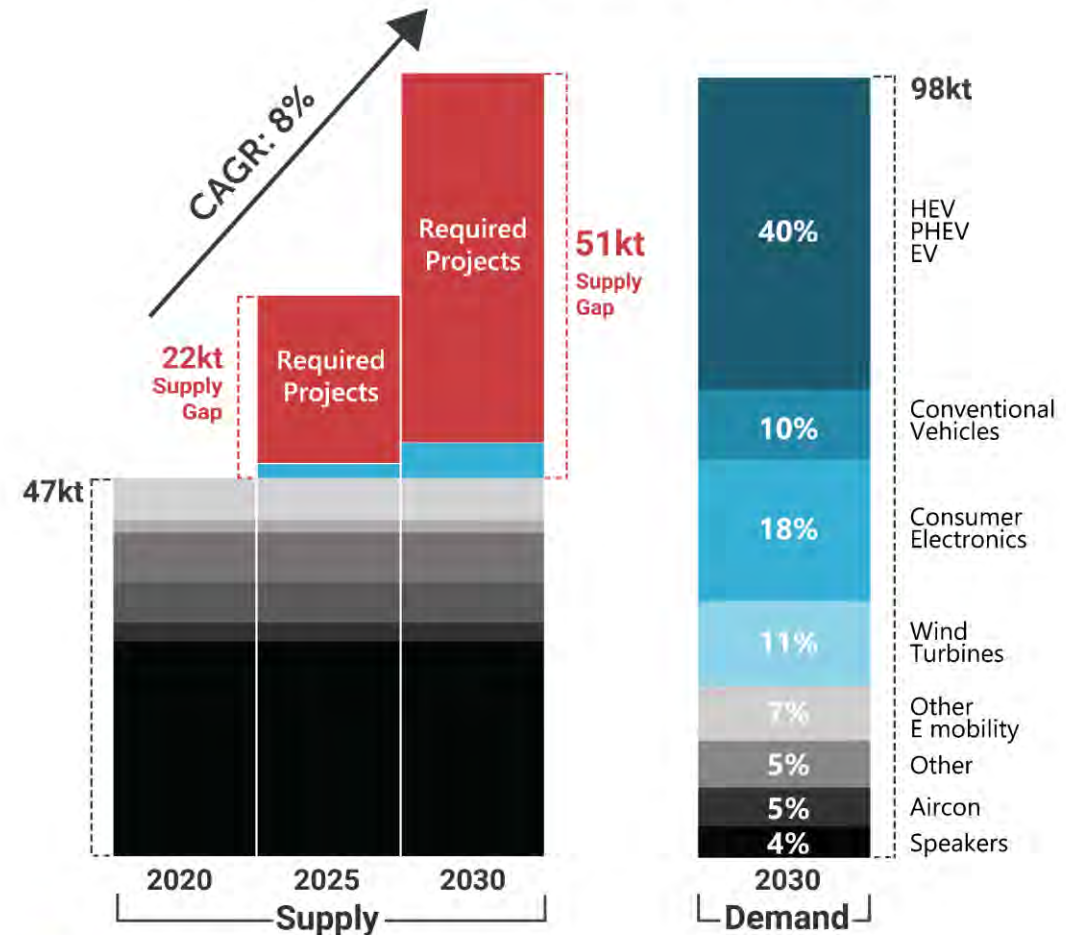
- ✓ Automotive sector is forecast to consume nearly 50% of NdFeB supply
- ✓ Supply gap is growing at a cumulative annual growth rate (CAGR) of 8%
- ✓ 2030 forecast assumes ~34 million EVs
- ✓ 2021 demand is forecast to increase by 14%

## SUPPLY



- ✓ Market analysts forecast a supply gap that represents 109% of global supply today and is in excess of 11 Nolans Projects
- ✓ NdFeB magnets will move to the best value in use
- ✓ The emerging supply gap has extra significance for companies not aligned with the China 2025 strategy
- ✓ **China's import of rare earth metal ores jumped 84.1% in June 2021.**

## NdPr Supply & Demand

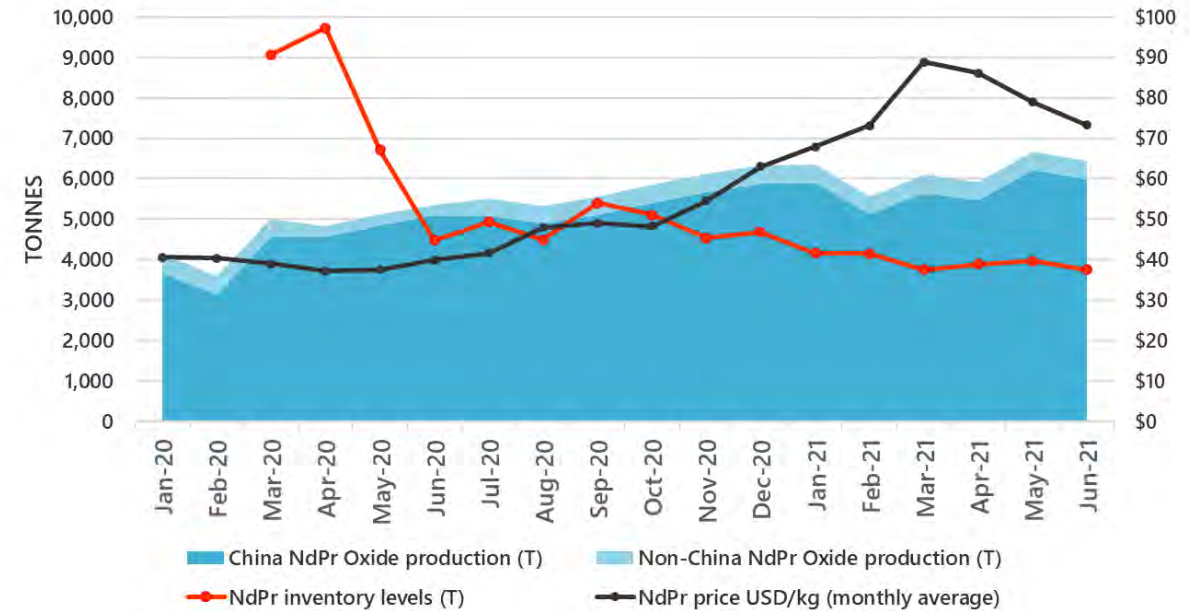


Source: Arafura internal Supply Demand forecast referencing against data from CRU, Rare Earth Market Study 2020; Roskill, Rare Earth Market Analysis 2018, Adamas Intelligence, Rare Earth Market Outlook to 2030.

# NdPr Price Rise

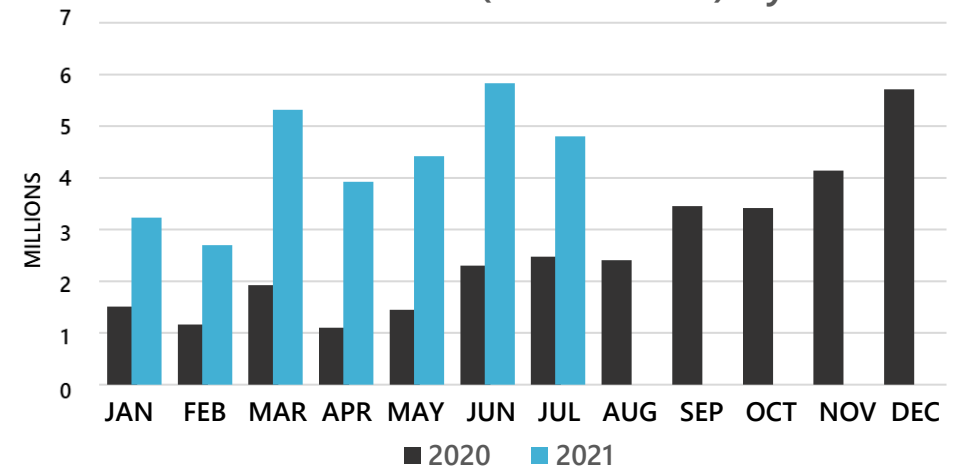
- ✓ Chinese inventory stockpiles down by ~60% since mid-2020
- ✓ Chinese producers near full capacity
- ✓ Supply chain issues highlighted by growing EV sales
- ✓ Critical Minerals Initiatives and supply chain de-risking required to facilitate government policies and targets for E-mobility and renewables

NdPr Oxide Output & Price EXW China



Source: Lynas, BAINFO, Asian Metals

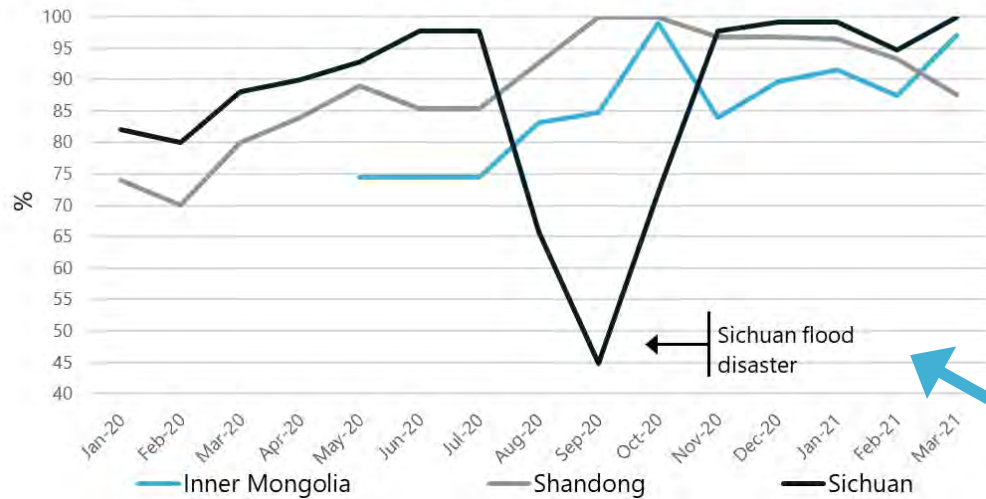
Global EV sales (BEV + PHEV) by Month



Source: EV Volumes, Inside EV

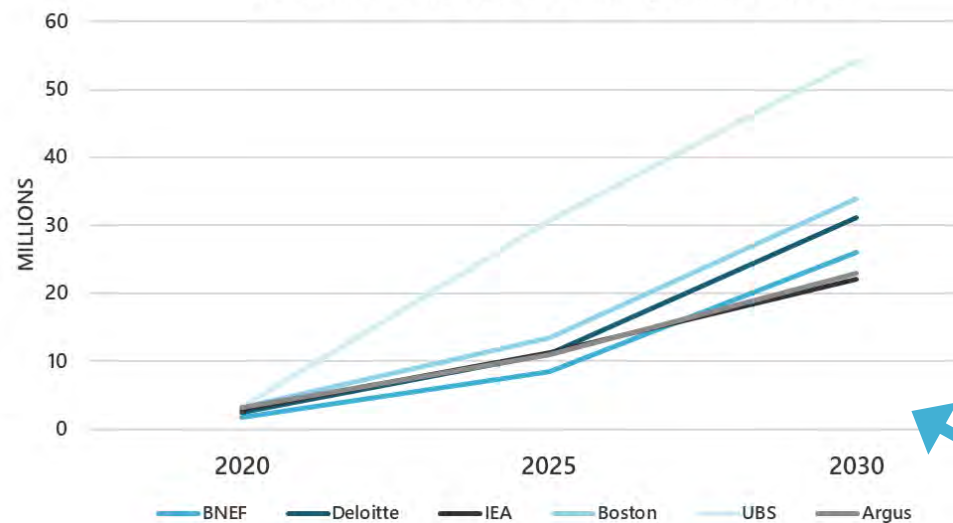
# Supply expansion challenge

LRE Separation plant utilisation rates of Chinese regions



Source: Baiinfo and Argus

Global EV sales (BEV+PHEV) 2030 forecast



Source: BNEF / Deloitte / IEA / Boston / UBS / Argus (Global EV Sales Forecast)

1

Tighter environmental and regulatory controls in China have resulted in production volumes contracting

2

China Northern Rare Earths (largest producer) will increase production but will require plant expansion to significantly improve capacity

3

New capacity will have higher capital and operating costs to meet new ESG standards

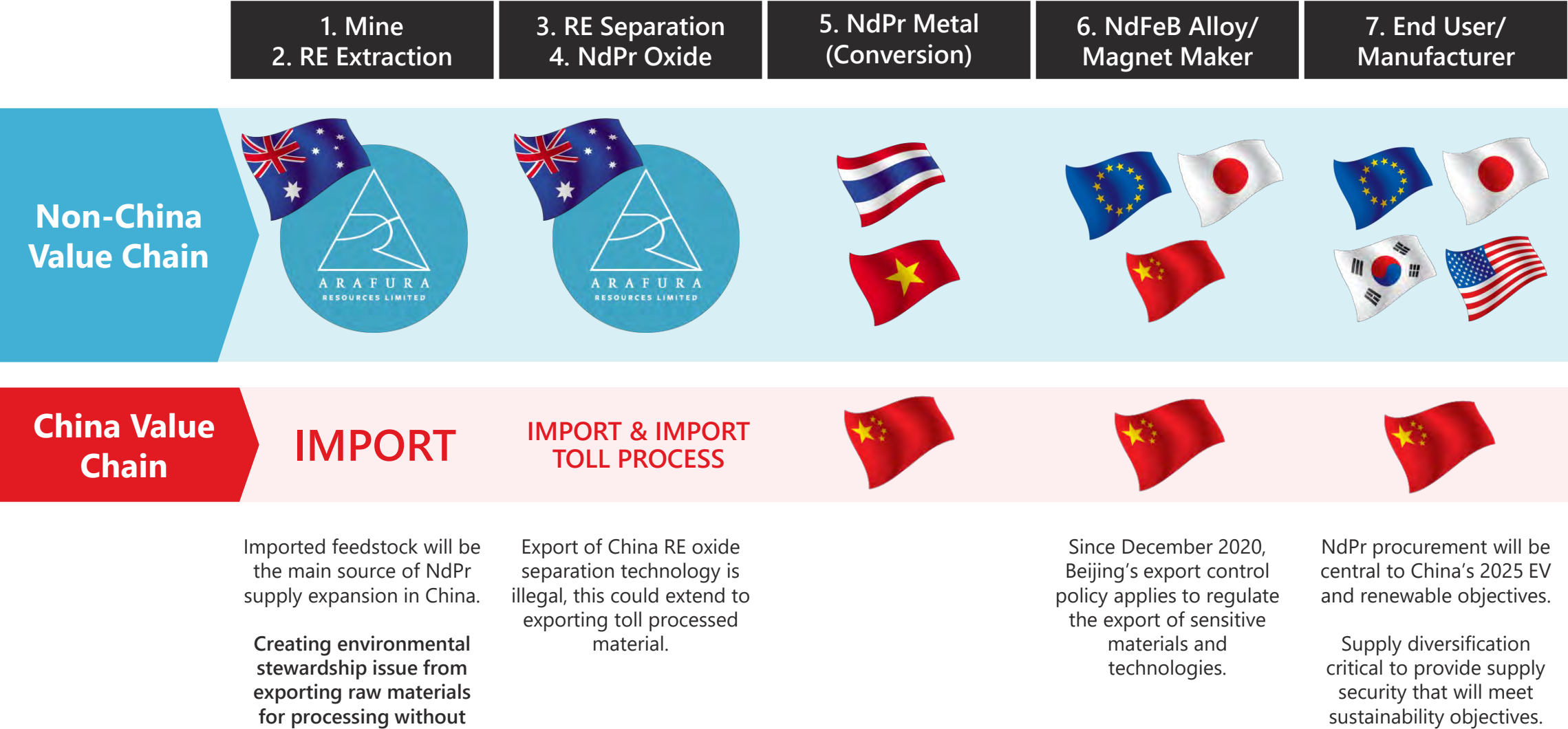
4

China production expansion and imported semi-finished materials required to meet growing domestic demand driven by EV and renewables objectives

5

Other global NdPr users will require alternative supply chain solutions to satisfy their procurement needs

# Local Processing: More Jobs, Secure Supply Chains



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# Appendices



# Arafura's Debt Funding Strategy

## Global Government Initiatives Creating Momentum

- ➔ Morrison launches the Resources Technology and Critical Minerals Processing road map
- ➔ Most countries targeting net-zero emissions
- ➔ Europe initiatives for a low carbon economy
- ➔ Made in China 2025 Strategy focused on e-mobility and renewables
- ➔ Korea to reshore production and create downstream processing
- ➔ Japan to reshore production and diversify supply chains
- ➔ Biden pledges to slash greenhouse gas emissions in half by 2030



## Strategy Leverages Global Focus on Critical Materials Supply Chains

- ✓ Conditional letters of support<sup>1</sup> for senior debt facility:
  - ✓ Export Finance Australia (EFA) for a 15-year facility for \$200m
  - ✓ Northern Australia Infrastructure Facility (NAIF) for a 15-year facility for \$100m
- ✓ Aligned with Australian Government's critical minerals strategy to create ethical value chains for critical minerals
- ✓ Foreign ECAs seeking well structured projects for the supply of critical materials for the manufacturing of EVs and renewable technologies

*1. Conditional letters of support are non-binding and conditional upon internal credit approval, negotiation of lender agreements and further due diligence enquiries (among other conditions).*

# Nolans Project Highlights



**Long life asset  
enriched in  
NdPr**



**Extensive &  
successful  
large-scale pilot  
completed**



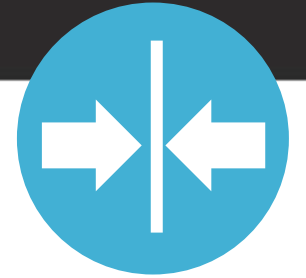
**Definitive  
Feasibility  
Study  
completed,  
fully costed  
from Ore to  
Oxide to  
Rehabilitation**



**Only single site  
Australian NdPr  
focused project  
with all  
approvals**



**Low-cost  
operation**



**Production of  
NdPr oxide  
aligned with  
Government &  
customers'  
critical raw  
material  
diversification  
plans**

# Attractive Project Economics

Mining and Production		
Mine Life (years)	38	
NdPr Oxide (tpa)	4,440	
SEG/HRE Oxide (tpa)	474	
Phosphoric Acid (tpa 54% P <sub>2</sub> O <sub>5</sub> MGA)	144,393	
Financial	US\$	A\$
Capital Cost (\$m)	768	1,056
NdPr Oxide (US\$/kg)	87	120
Rare Earth Sales Revenue (\$m/pa)	388	534
Phosphoric Acid Sales Revenue (\$m/pa)	58	79
Mining Costs (\$m/pa)	(30)	(42)
Processing Costs (\$m/pa)	(105)	(145)
General and Administration Costs (\$m/pa)	(15)	(21)
EBITDA (\$m/pa)	257	354
KPI Analysis	US\$	A\$
Operating Cost \$/kg NdPr	33.91	46.60
Operating Cost \$/kg NdPr net of P <sub>2</sub> O <sub>5</sub> credit	24.76	34.06
NPV <sub>8</sub> after tax (\$m)	1,011	1,402
IRR after tax (%)	18.1%	

Refer to ASX Announcement Nolans Project Update dated 11 May 2021 which assumes a long-term NdPr oxide price of US\$87/kg. Average production and costs are calculated as the arithmetic annual average following the anticipated two year ramp up and excluding the final years of production from low grade stockpiles.

- ✓ Definitive Feasibility Study (DFS) update released in May 2021
- ✓ **Post-tax NPV<sub>8</sub> of A\$1.4 billion** and IRR of 18.1%
- ✓ Capital cost **A\$1,056m**
- ✓ **Annual average EBITDA of A\$354m**
- ✓ Low-cost producer at **US\$24.76/kg NdPr**
- ✓ Robust economics at current NdPr oxide price **US\$88/kg\***

\* Asian Metals (1 July – 11 August 2021 average price).

# Long Life Asset

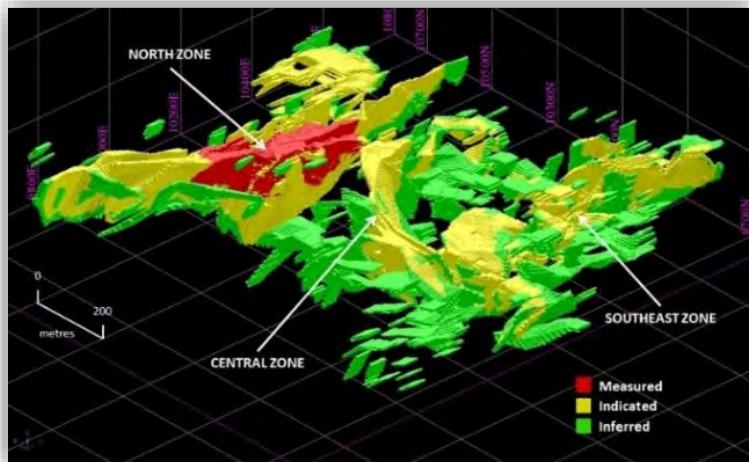
RESOURCES	TONNES (m)	RARE EARTHS TREO %	PHOSPHATE P <sub>2</sub> O <sub>5</sub> %	NdPr ENRICHMENT %
Measured	4.9	3.2	13	26.1
Indicated	30	2.7	12	26.4
Inferred	21	2.3	10	26.5
<b>TOTAL</b>	<b>56</b>	<b>2.6</b>	<b>11</b>	<b>26.4</b>

As announced on 7 June 2017. 1% TREO cut-off grade. Numbers may not compute exactly due to rounding. "NdPr enrichment" is the proportion of TREO comprising Nd<sub>2</sub>O<sub>3</sub> and Pr<sub>6</sub>O<sub>11</sub>.

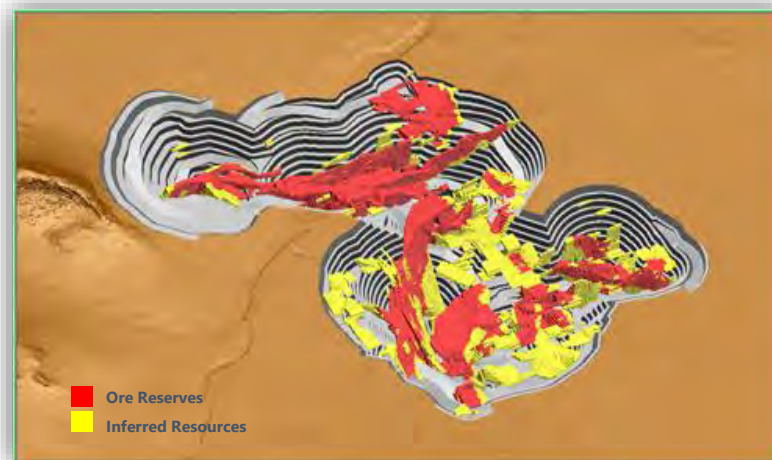
RESERVES	TONNES (m)	RARE EARTHS TREO %	PHOSPHATE P <sub>2</sub> O <sub>5</sub> %	NdPr ENRICHMENT %
Proved	5.0	3.0	13	26.2
Probable	24.6	2.8	13	26.5
<b>TOTAL</b>	<b>29.5</b>	<b>2.9</b>	<b>13</b>	<b>26.4</b>

As announced on 16 March 2020. Numbers may not compute exactly due to rounding. "NdPr enrichment" is the proportion of TREO comprising Nd<sub>2</sub>O<sub>3</sub> and Pr<sub>6</sub>O<sub>11</sub>.

## Mineral Resources



## Ore Reserves



## NdPr rich & open at depth

- ✓ Over 90km drilled to define and classify material types
- ✓ 29 year Ore Reserves
- ✓ 38 year Mining Inventory
- ✓ Single pit
- ✓ Expansion potential

# Rehabilitation & Waste Management

- ✓ Waste rock dumps designed to “encapsulate” naturally occurring radioactive materials (NORM) rock at mine site
- ✓ Mine area surface water management captures sediment
- ✓ Residue storage facility (RSF) with two cells
- ✓ Progressive rehabilitation



**Environmental Approval and Project Costing includes all costs for Waste Management System and Rehabilitation.**



# ESG/Sustainability Program Plan



## Ambition

### Arafura Sustainability Goal

*"Our goal is to be a trusted global leader and supplier of choice for sustainably mined and processed rare earth products, helping our customers deliver clean and efficient technologies. We are committed to delivering positive intergenerational economic, environmental and social benefits to our stakeholders."*



## Prioritisation

1. Mapped the Arafura stakeholder mix
2. Materiality assessment assessing ESG topics for their importance to both Arafura and our stakeholders
3. Exploration of the external environment and global landscape



## Action



Signatory of the **UN Global Compact**



Registered to complete **IRMA Ready assessment standard**



Commitment to achieve **net-zero by 2050**



Comprehensive **Sustainability Report** to be released mid-2021

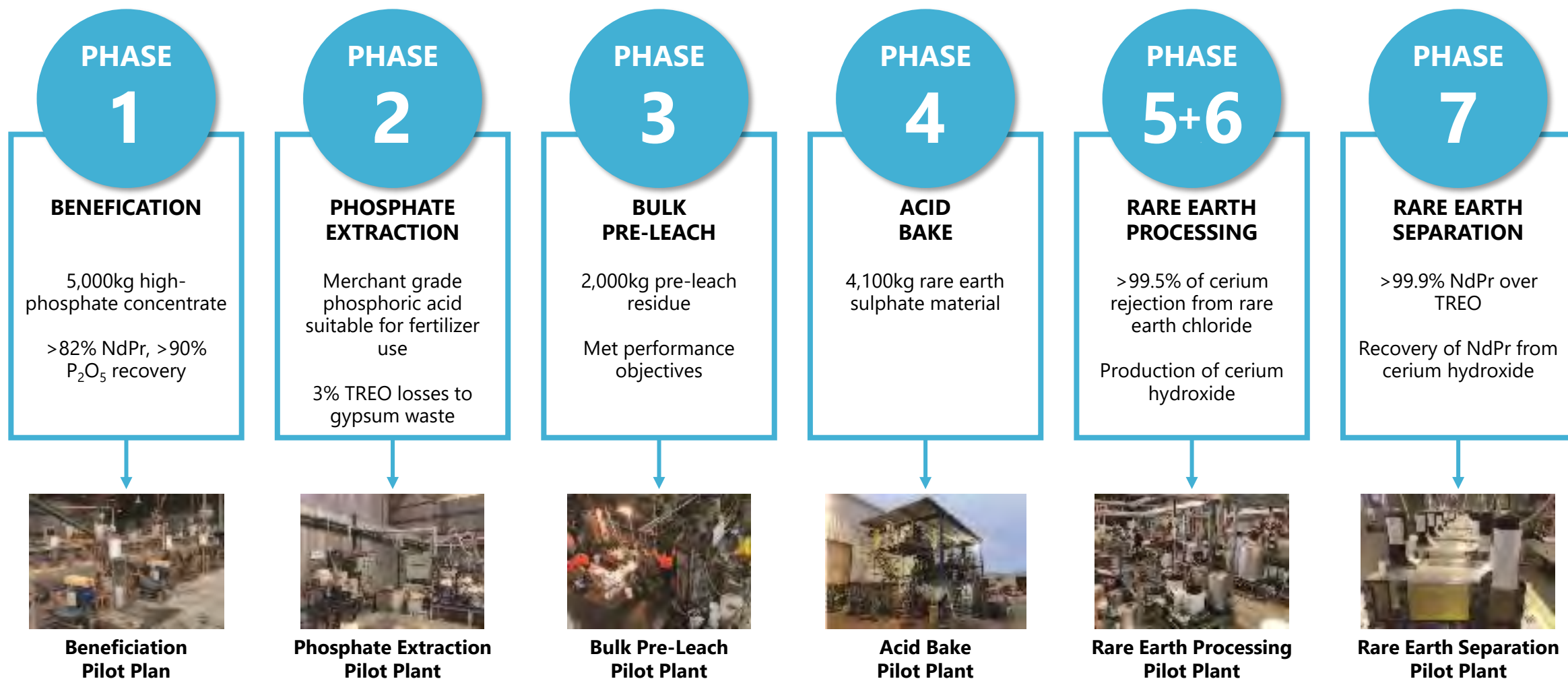


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# Technology Program Complete

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## Flowsheet Pilot



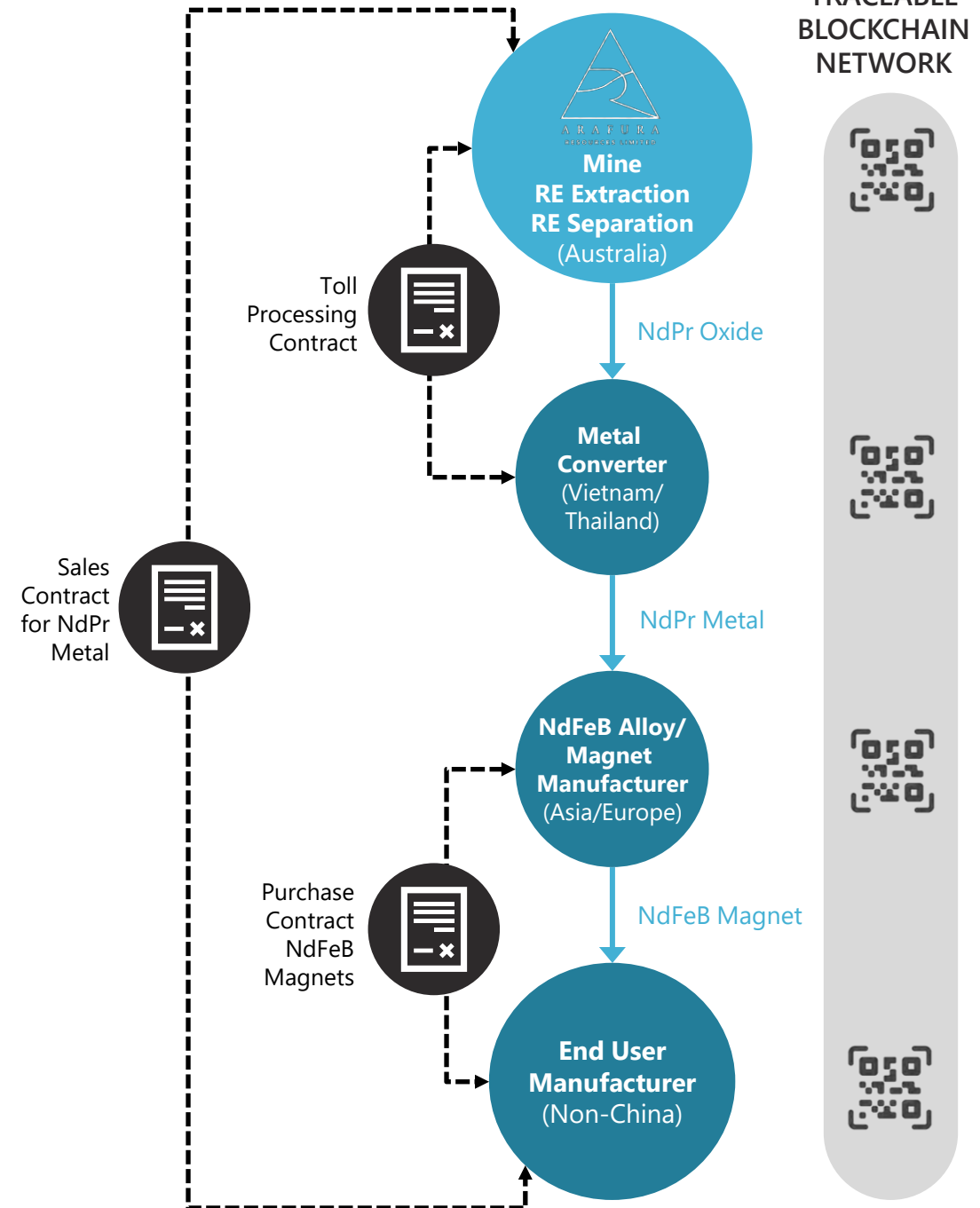
## Sustainable producer of NdPr to align to "green procurement" strategy

**1** Offtake Model proposes 'Toll Processing' of metal providing a complete traceable and verified supply chain solution to satisfy end users sustainability requirements

**2** Offtake Model proposes delivery of NdPr metal into End Users existing supply chain

**3** Provides customers with security of NdPr supply, verified traceable supply and optionality to direct material to a chosen magnet maker

ARU has an MoU with SE Asia based toll metal converter and aiming to execute a tolling agreement



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