

ASX Announcement

## Presentation - Mining the Territory Conference and the NT Resources Industry Environmental Management & Logistics Forum



4 September 2019

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**Arafura Resources Limited (ASX:ARU) (Arafura or the Company)** is pleased to attach a copy of the presentation for the Mining the Territory Conference in Darwin, Northern Territory.

The Mining the Territory Conference is Northern Australia's leading Mining Industry Conference and is held as part of NT Resources Week. The conference is Northern Australia's largest resources industry-based conferences and brings together key industry leadership alongside sector stakeholders, government representatives, resource experts and regional interest groups. Mr Gavin Lockyer, Arafura's Managing Director and CEO presented the Nolans project.

A similar presentation was also made at the NT Resources Industry Environmental Management & Logistics Forum in the Darwin, Northern Territory on the same day. The Forum is supported by the Northern Territory Government and brings together environmental practitioners and members of the resources industry to showcase ways to better manage environmental impact, while also supporting stakeholder engagement and regional development. Mr Brian Fowler, Arafura's General Manager NT & Sustainability presented the Nolans project to the forum.

- ENDS -

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# Arafura Resources Limited

(ASX:ARU)

*Emerging as Australia's Next NdPr Producer*

# Important Notice – Disclaimer



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## ***Mineral Resources and Ore Reserves***

The information in this presentation that relates to Mineral Resources was released in an 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 was released in an ASX announcement dated 7 February 2019 (Nolans Project Definitive Feasibility Study) 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 represented have not been materially modified from the original market announcement.

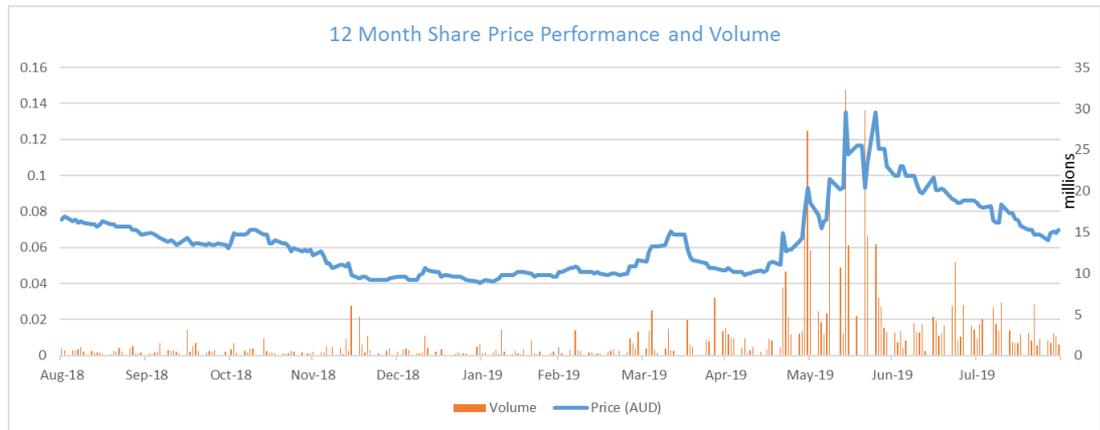
## ***Production Targets and Financial Information***

Information in relation to production targets and financial information included in this presentation is extracted from an ASX announcement dated 7 February 2019 (Nolans Project Definitive Feasibility Study). Arafura Resources confirms that all material assumptions underpinning the production target and financial information set out in the announcement released on 7 February 2019 continue to apply and have not materially changed.

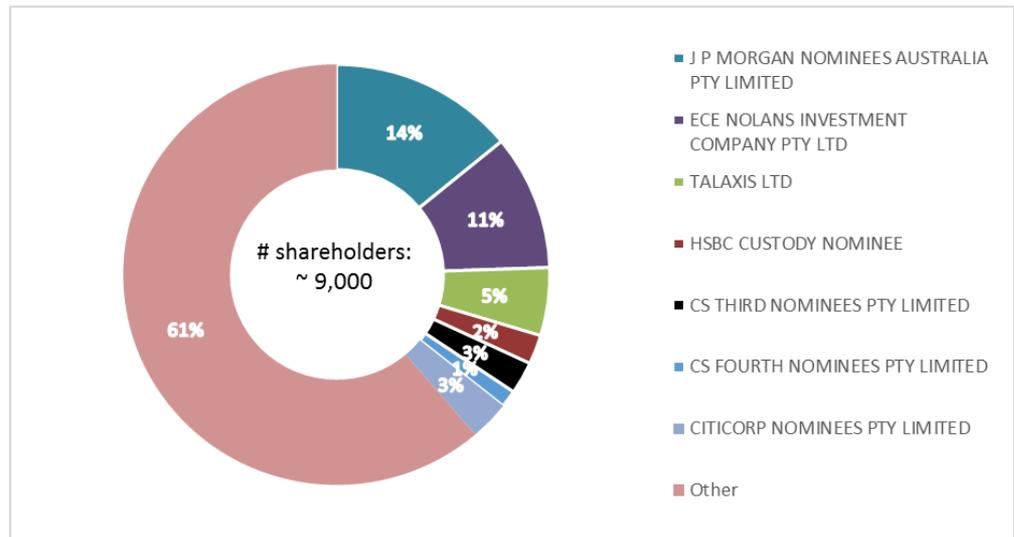
# Arafura Corporate Snapshot



Capital Structure	
ASX Code	ARU
ASX Share Price (02 Sept)	\$0.068
Shares on Issue	1,055m
Market Capitalisation (02 Sept)	\$71.7m
12 Month Liquidity	\$46.9m
Cash (30 Jun*)	\$28.6m
Debt	Nil
Enterprise Value (30 Jun)	\$76.6m



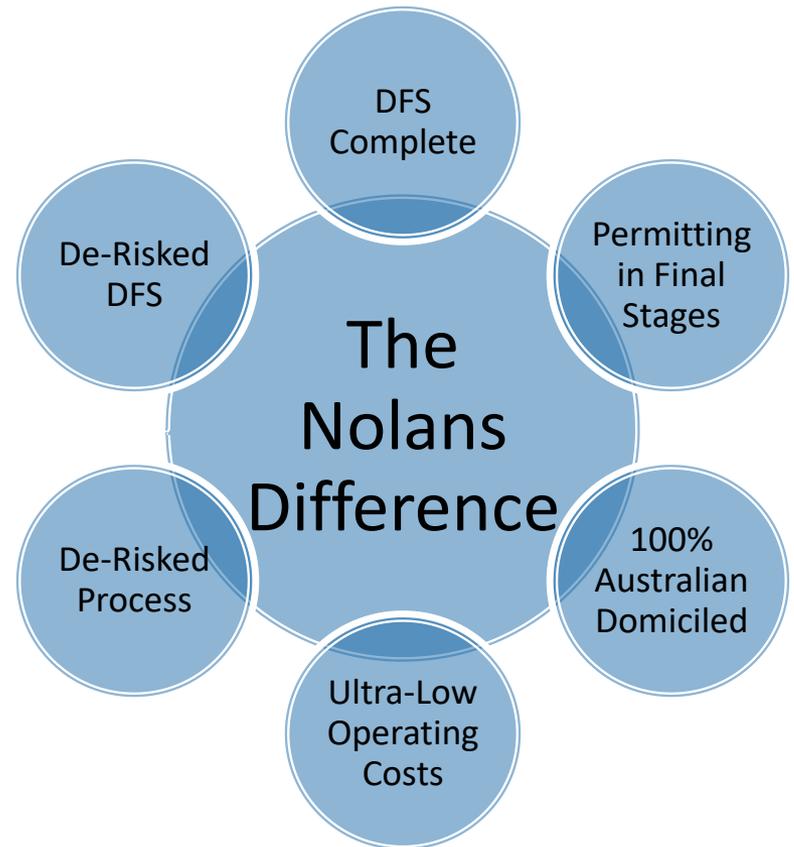
## July 2019 – investment by Talaxis Ltd, a member of the Noble Group



\* Data based on 30 June plus proceeds from entitlement offer

# Arafura's Nolans Project

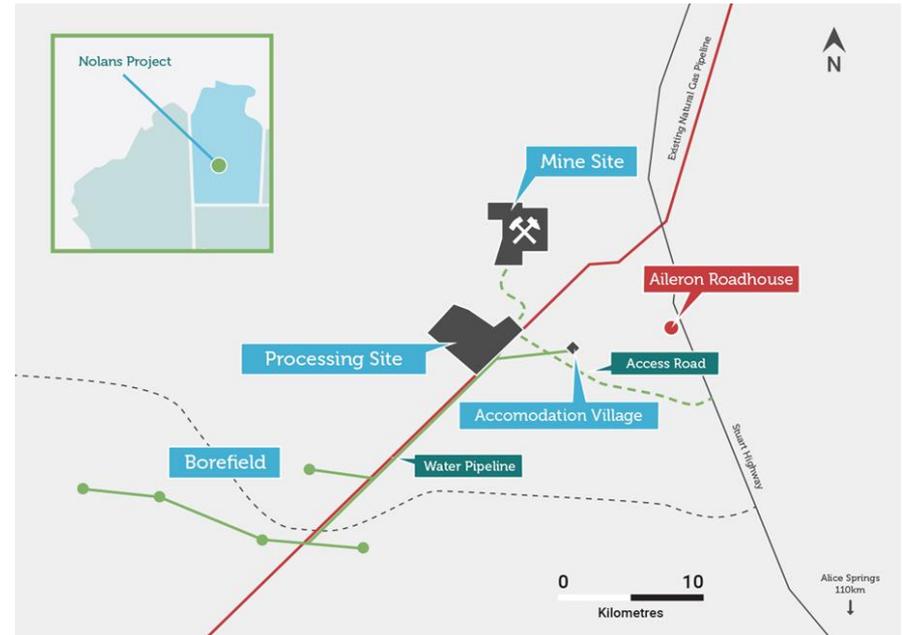
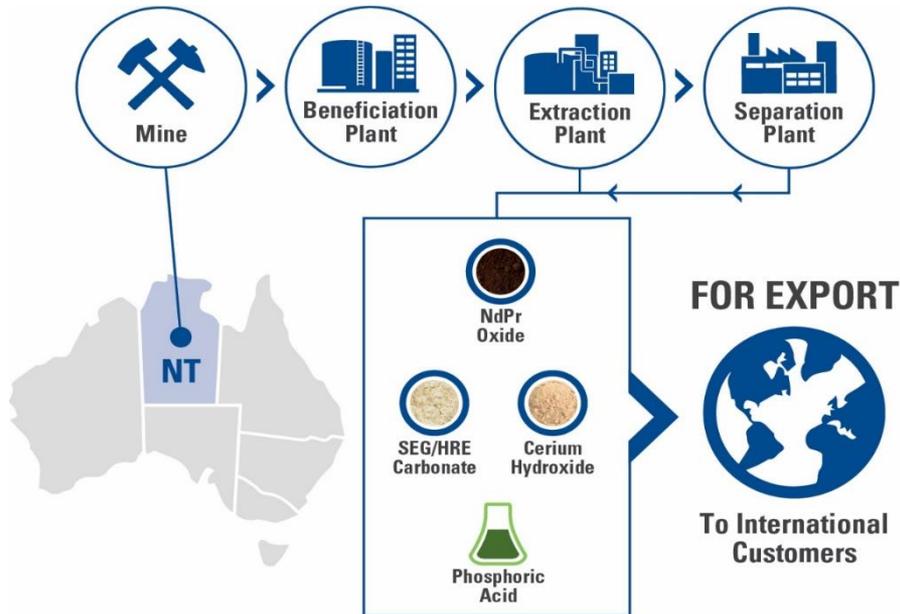
- DFS completed February 2019 confirming Nolans as a world class NdPr project
- Ultra-low cost producer at US\$25.94/kg NdPr
- Long-life asset – 23-year mine life based on Ore Reserves only with potential to extend production
- Well positioned to feed forecast NdPr supply shortfall
- Target project commissioning in 2022
- Globally strategic – 100% Australian-domiciled operation in the NT with environmental approval



*Refer ASX announcement 7 February 2019: Nolans Project Definitive Feasibility Study*

# 100% Australian Domiciled in the NT

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- DFS includes fully costed permanent disposal and rehabilitation of tailings and process residues at site
- Environmental approvals secured
- Able to provide customers with product traceability and waste management certainty
- Stuart Highway 10 km east
- Alice Springs railyard, airport and other services 135 km south
- Amadeus natural gas pipeline adjacent to project site
- Water supply 30 km south

# Sustainable Supply is Our Value

**Extensive community and stakeholder consultation**

**Waste management plan tailings and residue facility**

**Assessing impact from mining, extraction and transport corridor**

**Surface water and groundwater management plans**

**Biodiversity studies on existing flora and fauna**

**Framework for decommissioning closure and rehabilitation**

**Social License to Operate**

# Benefits for the Territory & Australia



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- Direct Capital spend >A\$730m
- Community Benefits Plan – work in progress
- Direct employment in operations  $\approx$  300
- Innovative downstream processing – not just *“dig it up and ship it out”*, we will value add in Australia
- Long mine life offers opportunities for intergenerational change
- Wider business opportunities through service providers
- Estimated Royalties and Taxes to the NT – over A\$2b over planned life of mine
- Establishes Australia as a secure and long-term supplier of strategic metals to our allies and global trading partners



Indigenous Engagement Strategy workshop Alice Springs

- Local and indigenous procurement strategy currently being developed
- Prequalification requirements will be in place for all ALL tenderers
- Prequalification requirements will be fully provided and explained well ahead of tender process
- Head contractor will have requirements to ensure local and indigenous business participation which will be included in contractual requirements
- Where practicable work packages will be broken down to allow local businesses to bid for aspects of the project
- Register with the Industry Capability Network (ICN) at [gateway.icn.org.au](http://gateway.icn.org.au)

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# Patented Process – De-risked DFS

# Technology Program – De-Risked Process



Beneficiation Pilot Plant



Phosphate Extraction Pilot Plant



Bulk Pre-Leach Pilot Plant

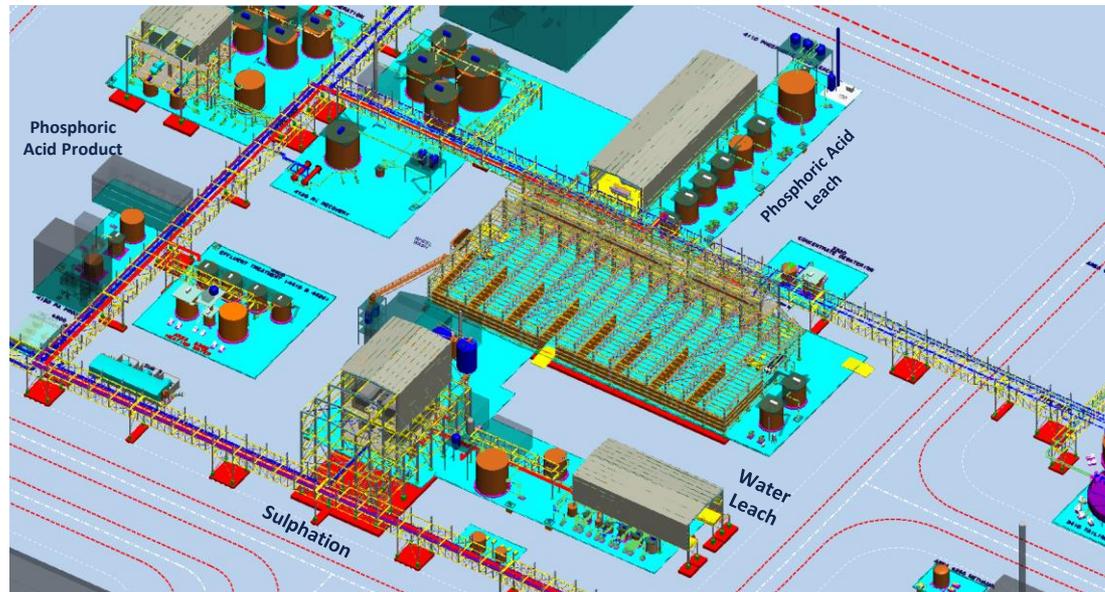


Rare Earth Processing Pilot Plant



Acid Bake Pilot Plant

- **Designed for ramp-up**
  - Surge capacities between major process stages including one week concentrate, two weeks pre-leach residue, one week rare earth chloride
  - Parallel trains of acid bake to improve availability
  - Space for expansion and modification in layout
  - Modular acid plant for staged ramp up
- **Risks costed into DFS outcomes**
  - Conservative three year ramp up schedule included (29% Y1, 62% Y2, 93% Y3)
  - Additional labour and reagents costed into ramp up operating costs
  - A\$20m included for de-bottlenecking capital
- **Nolans DFS includes learnings from other complex metallurgical projects including nickel laterites and rare earths to develop designs and costs that maximise the likelihood of delivery on the DFS promises in operation**

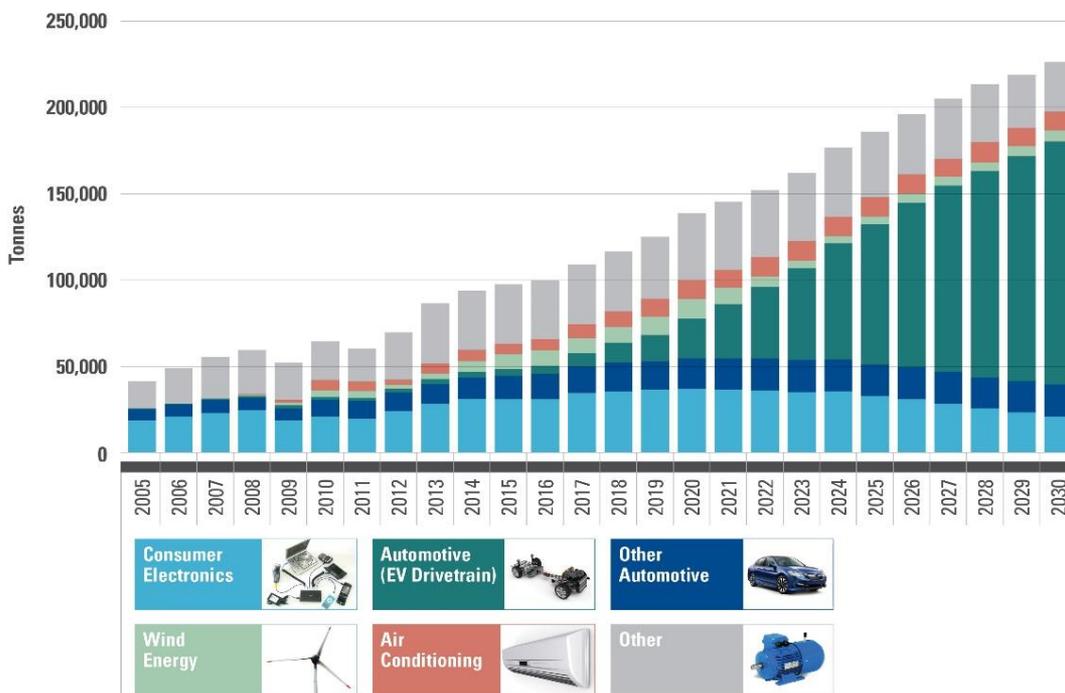


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# The Opportunity

# NdPr Market Opportunity

**NdFeB Magnet Demand by Application**



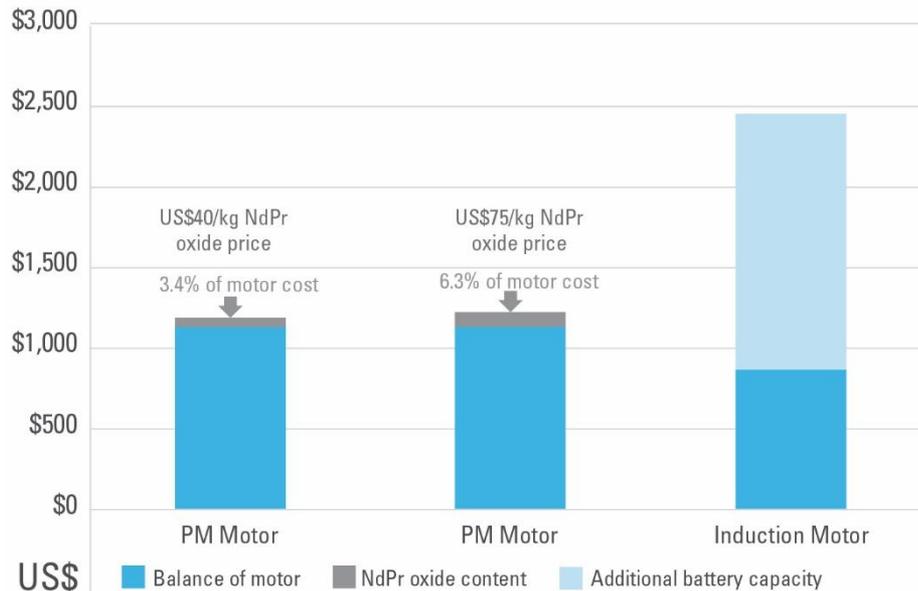
\*Other includes MRI, elevator motor, magnetic separator, robotics and industrial applications.

- Underlying demand for NdFeB magnets across all applications is forecast to grow by 6% p.a. over the period to 2030
- NdFeB demand growth for EV applications is more dramatic and forecast to grow by 24% p.a.
- Demand in applications for consumer electronics and wind turbines will reduce during the forecast period. For some applications substitution will be traded off against reduced performance and cost.
- Supply-demand balance achieved through demand destruction in lower quality applications and technology innovations that achieve better use of NdPr in magnet manufacturing
- New supply will not come on stream fast enough to meet demand from all applications – NdFeB magnets and NdPr oxide will move to the best value in use
- EV applications require high quality and efficient motors using NdFeB magnets

Source: Roskill Consulting (November 2018) – Rare Earths Market Analysis

# NdPr Magnet Substitution – EV

## Modelled effect of increase in NdPr price, NdFeB Magnet v Induction Motor and incremental Li-ion battery pack



- Chevrolet Bolt: 150 kW NdFeB magnet motor with 60 kWh lithium-ion battery pack <sup>1</sup>
- NdFeB magnet motor cost based on US\$8 per kW <sup>2</sup>
- Estimate of 1 kilogram of NdPr metal per NdFeB motor magnet <sup>2</sup>
- Induction motor cost calculated as 76% of NdFeB magnet motor <sup>3</sup>
- Efficiency of induction motor 15% less than NdFeB magnet motor.<sup>4</sup> To compensate, an extra 6 kWh of battery capacity has been allowed for.
- Lithium-ion battery pack costs of US\$176 per kWh applied <sup>5</sup>
- Demand estimates do not include analysis on the impact of drive efficiency

<sup>1</sup> [www.chevrolet.com](http://www.chevrolet.com)

<sup>2</sup> UBS, "UBS Evidence Lab Electric Car Teardown – Disruption Ahead?", [www.ubs.com/investmentresearch](http://www.ubs.com/investmentresearch), May 2017.

<sup>3</sup> Parker Hannifin, "Comparing AC Induction with Permanent Magnet motors in hybrid vehicles and the impact on the value proposition", 2013.

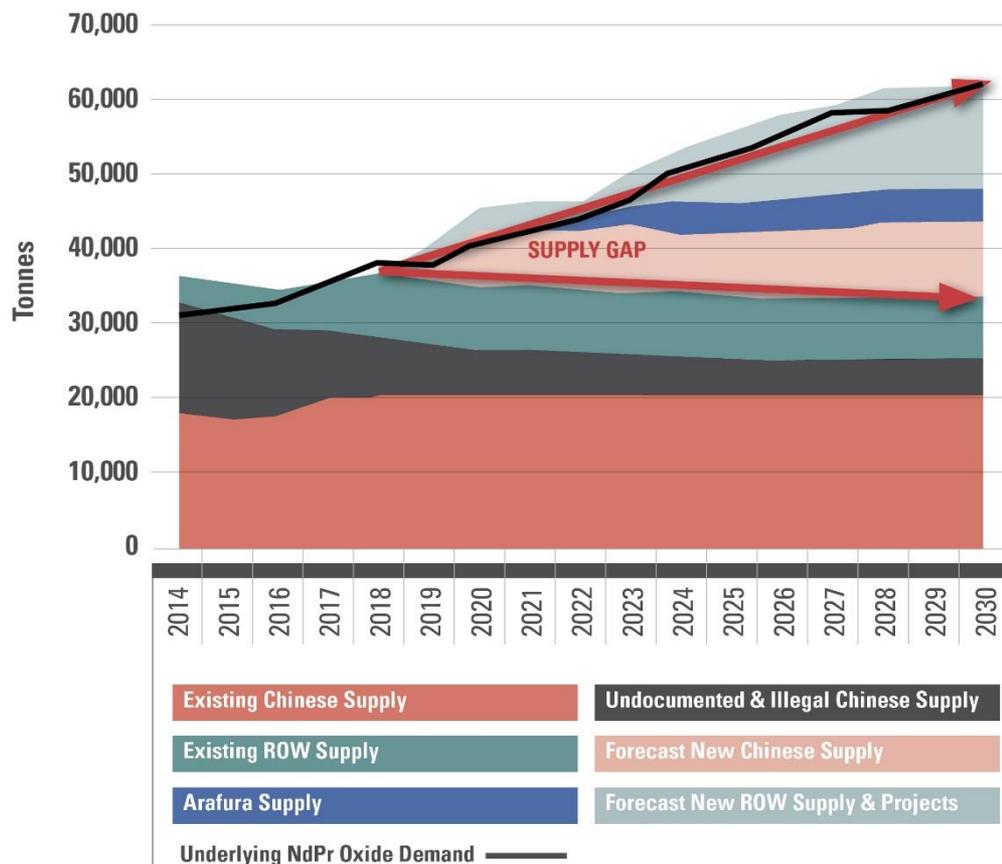
<sup>4</sup> Adamas Intelligence, "Spotlight on Dysprosium", [www.adamasintel.com/spotlight-on-dysprosium/](http://www.adamasintel.com/spotlight-on-dysprosium/), April 2018.

<sup>5</sup> Bloomberg New Energy Finance, "A Behind the Scenes Take on Lithium-ion Battery Prices", March 2019.

<sup>6</sup> Average NdPr oxide EXW China price for April 2019. [www.asianmetal.com](http://www.asianmetal.com)

# Supply & Demand Balance (1)

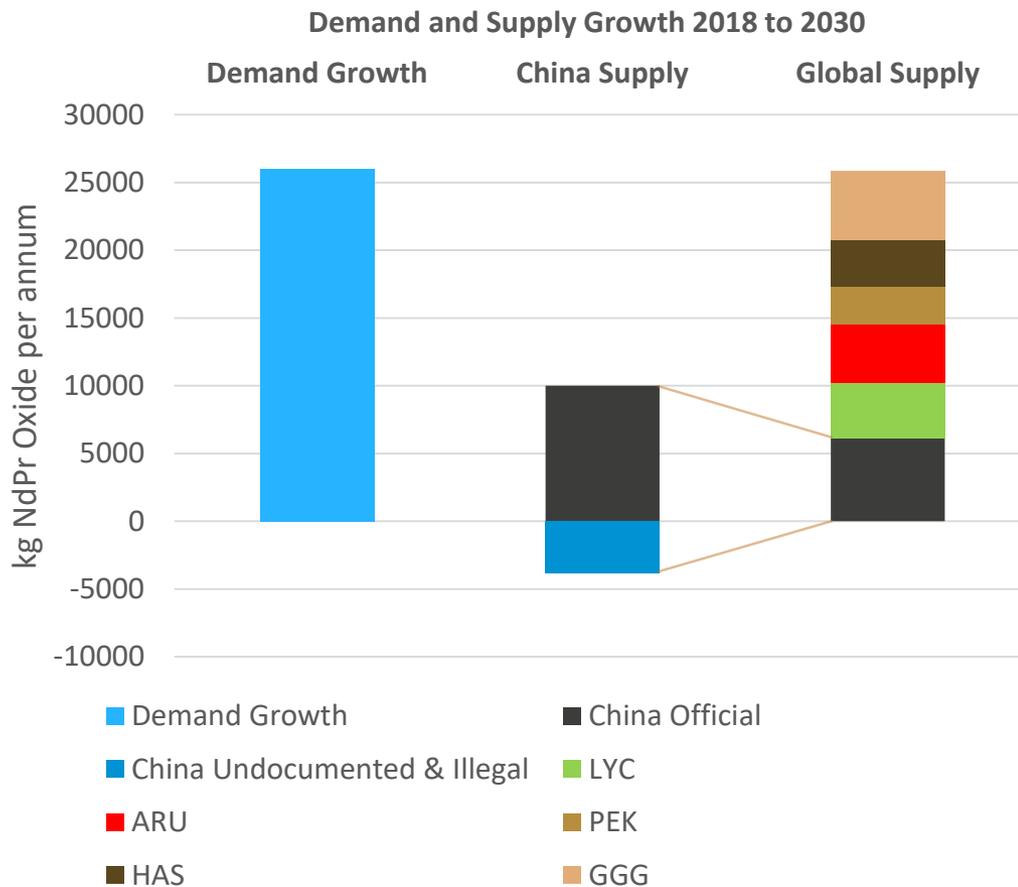
## NdPr Oxide Supply & Demand



- China continues to dominate the global supply chain being the world's largest producer accounting for about 80% of NdPr for global NdFeB magnet production
- Supply reforms, industry consolidation and higher environmental standards will constrain China's ability to rapidly increase NdPr production
- Lynas Corporation (ASX:LYC) is the only significant miner and processor of rare earth materials outside China enjoying a market capitalisation in excess of \$1b
- China remains the dominant supplier, however analysts forecast China to become a net importer by the early 2020s
- Supply growth of 20,000 tonnes of NdPr oxide required in the 2020s

Source: Roskill Consulting (November 2018) – Rare Earths Market Analysis

# Supply & Demand Balance (2)



- China will likely to experience some reduced illegal/undocumented production offsetting increased production from domestic ores and imported mineral concentrates
- Demand projections don't fully incorporate impact on efficiency when using rare earth magnets
- Demand projections also cannot incorporate the potential impact, real or reactionary, from international trade wars
- 20,000 tonnes of additional NdPr oxide in the 2020s means there is room in the market for additional China and LYC production along with all advanced stage projects including ARU, PEK, HAS and GGG

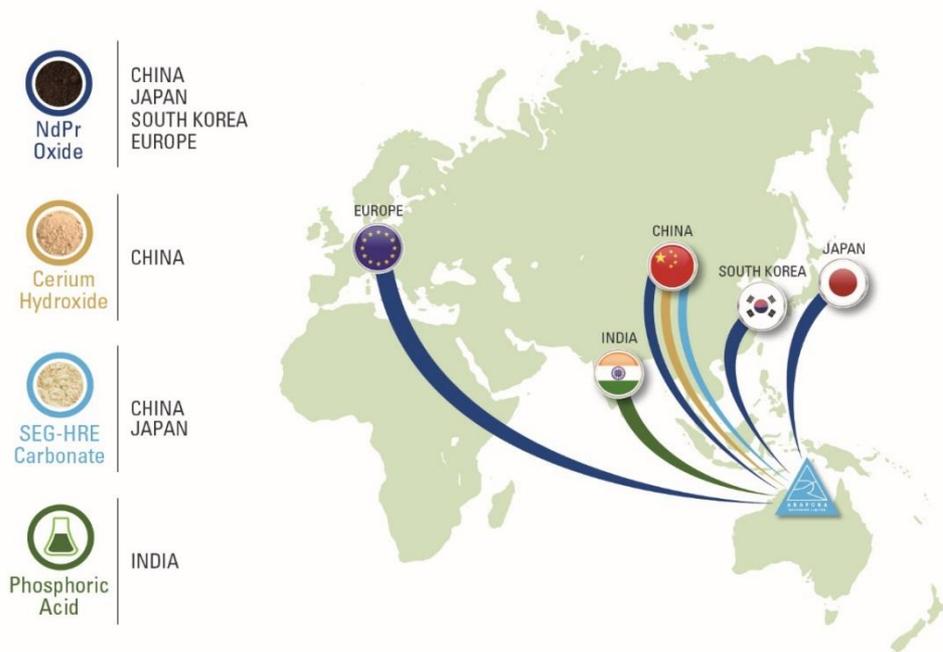
Source: Roskill Consulting (November 2018) – Rare Earths Market Analysis

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# Funding to Production

## Offtake Strategy

FOR EXPORT TO INTERNATIONAL CUSTOMERS



- Offtake agreements to underpin project funding
- Customer engagement targeted at NdPr users not aligned with China 2025 strategy
  - Japan – NdFeB magnet manufacturers
  - Europe & Korea – automotive OEMs and wind turbine makers
  - China – NdFeB magnet manufacturers with significant export markets
- India – vertically integrated fertilizer producers

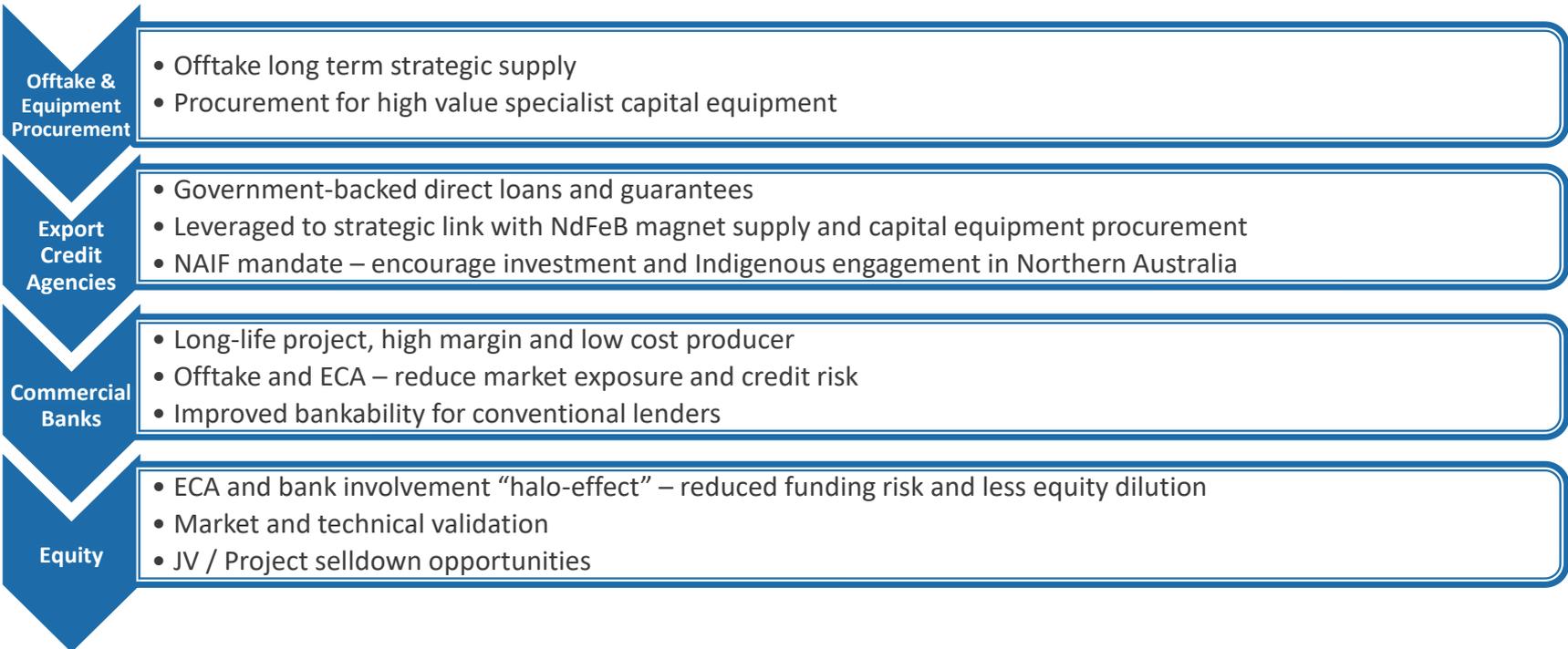
Customer / Target Region	Amount (tonnes p.a.)	Offtake Status	Proportion of Revenue <sup>1</sup>
<b>NdPr Oxide – targeting contracts with NdFeB magnet companies &amp;/or end users</b>			
JingCi Material Science Co. 	900	MOU	96%
China 	3,457	In progress	
Japan 			
South Korea 			
Europe 			
<b>SEG-HRE Carbonate – targeting contracts with rare earth processors</b>			
China 	606 (TREO equivalent)	In progress	1%
Japan 			
<b>Cerium Hydroxide – targeting contracts with rare earth processors</b>			
Baotou Xinyuan Rare Earth Hi-tech 	8,383 (TREO equivalent)	MOU	3%

*Proportion of revenue for rare earth products only*

# Project Funding Strategy

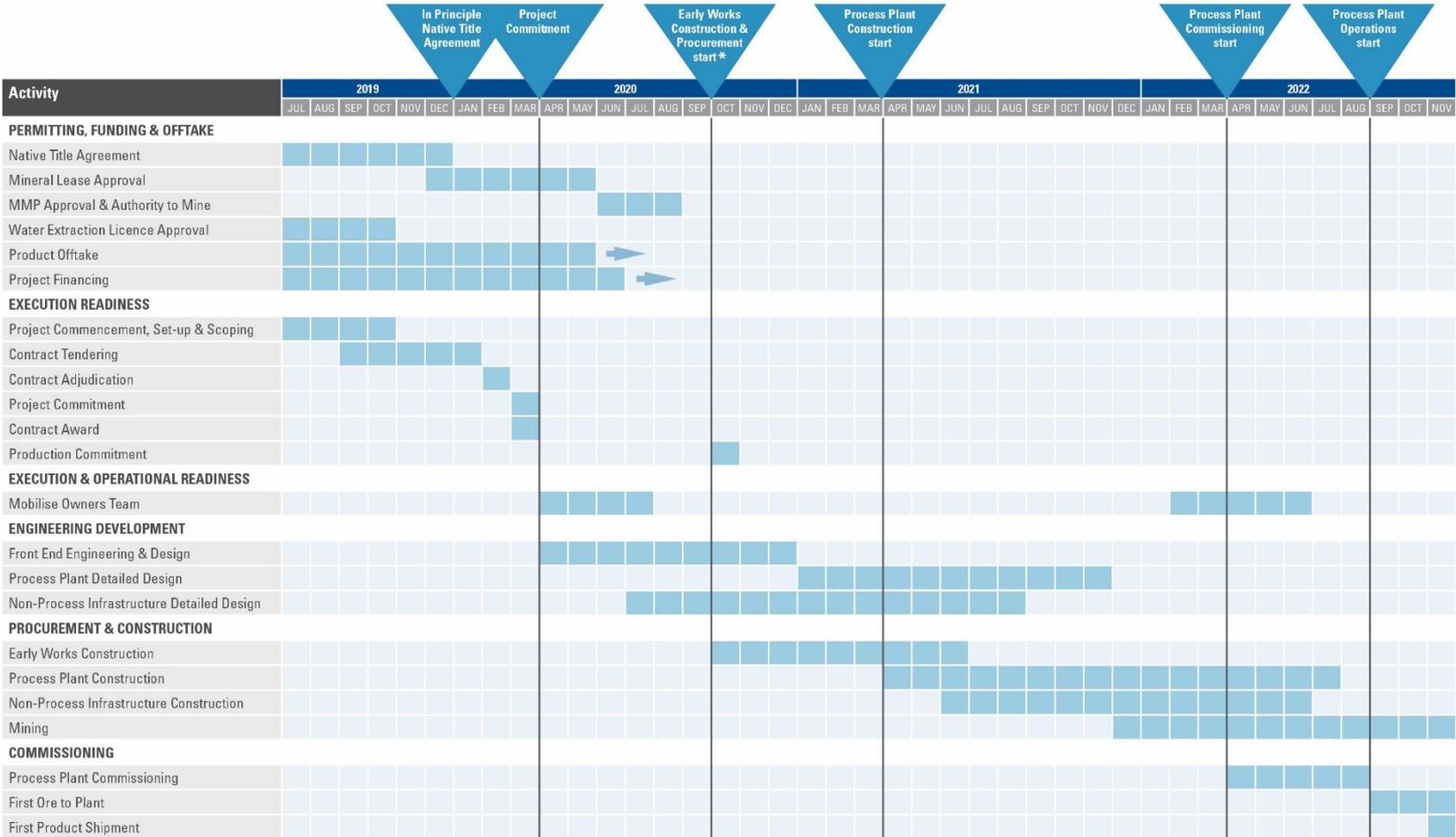
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- Arafura looking to secure a A\$1,146m<sup>(1)</sup> in new funding to execute the Nolans Project
- Potential sources of funding include equity, debt, JV and/or project selldown with a strategic investor
- DFS completion and environmental approval are critical enablers for engagement with funding partners
- Currently in due diligence by NAIF
- Recently completed \$23.2m raising to accelerate Project timeline and get “shovel ready”



*(1) Expected peak funding includes pre-production capital, sulphuric acid plant, working capital and capital escalation. Excludes financing costs.*

# Indicative Production Timeline



\*Early Works Construction & Procurement to the items that follow are subject to:  
 - Product Offtake being secured  
 - Sufficient Project Funding secured  
 - Permitting and other related activities being completed  
 - Each previous activity being completed successfully  
 Delays to commencing Early Works Construction will also impact the timing of Plant Construction and Commissioning.



*Thank You*

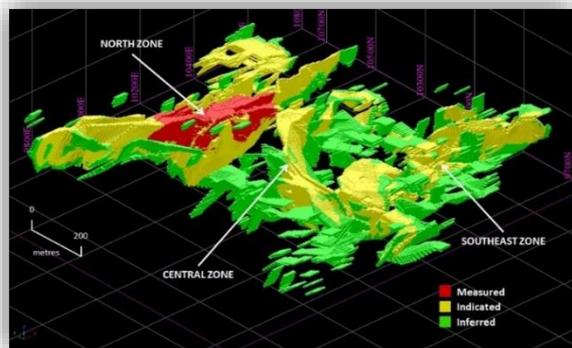
# Long Life Asset

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>

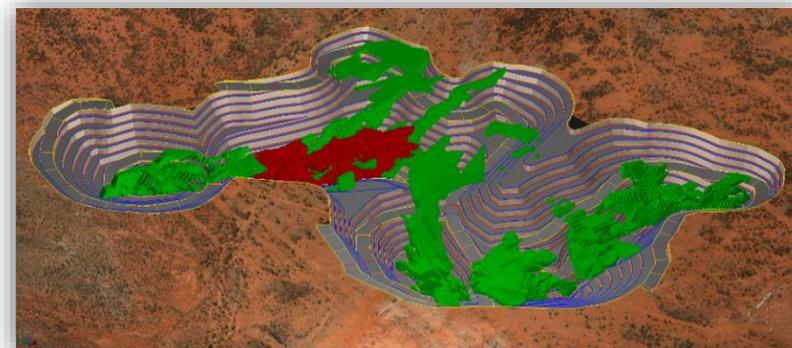
As announced on 7 June 2017. 1.0% TREO cut-off grade. Numbers may not compute exactly due to rounding. "NdPr enrichment" is the proportion of TREO comprising Nd<sub>2</sub>O<sub>3</sub> and Pr<sub>6</sub>O<sub>11</sub>.

RESERVES	TONNES (m)	RARE EARTHS TREO %	PHOSPHATE P <sub>2</sub> O <sub>5</sub> %	NdPr Enrichment %
Proved	4.3	3.1	13	26.1
Probable	14.9	2.9	13	26.5
<b>TOTAL</b>	<b>19.2</b>	<b>3.0</b>	<b>13</b>	<b>26.4</b>

As announced on 7 February 2019. 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