



**NORTHERN  
MINERALS**

Powering Technology.



**Dysprosium** > Permanent Magnets > Electric Motors > Electric Cars

# Disclaimer

This presentation has been prepared by Northern Minerals Limited ("Northern Minerals" or the "Company"). It should not be considered as an offer or invitation to subscribe for or purchase any securities in the Company or as an inducement to make an offer or invitation with respect to those securities. No agreement to subscribe for securities in the Company will be entered into on the basis of this presentation.

This presentation contains forecasts and forward looking information. Such forecasts and information are not a guarantee of future performance, involve unknown risks and uncertainties. Actual results and developments will almost certainly differ materially from those expressed or implied. Northern Minerals has not audited or investigated the accuracy or completeness of the information, statements and opinions contained in this presentation. Accordingly, to the maximum extent permitted by applicable laws, Northern Minerals makes no representation and can give no assurance, guarantee or warranty, express or implied, as to, and take no responsibility and assume no liability for, the authenticity, validity, accuracy, suitability or completeness of, or any errors in or omission, from any information, statement or opinion contained in this presentation.

You should not act or refrain from acting in reliance on this presentation material. This overview of Northern Minerals does not purport to be all inclusive or to contain all information which its recipients may require in order to make an informed assessment of the Company's prospects. You should conduct your own investigation and perform your own analysis in order to satisfy yourself as to the accuracy and completeness of the information, statements and opinions contained in this presentation and making any investment decision.

## Compliance Statement

The information in this presentation that relates to the Mineral Resource Estimates of the Wolverine deposit is extracted from the report entitled "Increased Mineral Resource delivers more good news" dated 23 February 2015 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. 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.

The information in the announcement that relates to the Mineral Resource Estimates of the Cyclops and Banshee deposits is extracted from the report entitled "Further Increase in Browns Range Mineral Resource" dated 15 October 2014 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. 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.

The information in the announcement that relates to the Mineral Resource Estimates of the Gambit, Gambit West and Area 5 deposits is extracted from the report entitled "Wolverine Total Resource Doubled in a Major Upgrade of Browns Range HRE Mineral Resource Estimate" dated 26 February 2014 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. 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.

The information in the announcement that relates to Ore Reserves is extracted from the report entitled Increased Ore Reserve for Browns Range created on 2 March 2015 and is available to view on the Company's website ([northernminerals.com.au](http://northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. 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.

The information in this report that relates to Exploration Results or Exploration Targets is based on information compiled by Mr Robin Wilson, a full-time employee of Northern Minerals, a Competent Person, who is a member of the Australasian Institute of Mining and Metallurgy. Robin Wilson has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Wilson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The potential quantity and grade of the Exploration Target is conceptual in nature. There has been insufficient exploration completed in the areas of the Exploration Target and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

The information in the announcement that relates to production targets is extracted from the report entitled "DFS positions Browns Range Project as next dysprosium supplier" dated 2 March 2015 and is available to view on the Company's website ([northernminerals.com.au](http://northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the production targets in the relevant market announcement continue to apply and have not materially changed.

TREO = Total Rare Earth Oxides –  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Pr}_6\text{O}_{11}$ ,  $\text{Nd}_2\text{O}_3$ ,  $\text{Sm}_2\text{O}_3$ ,  $\text{Eu}_2\text{O}_3$ ,  $\text{Gd}_2\text{O}_3$ ,  $\text{Tb}_4\text{O}_7$ ,  $\text{Dy}_2\text{O}_3$ ,  $\text{Ho}_2\text{O}_3$ ,  $\text{Er}_2\text{O}_3$ ,  $\text{Tm}_2\text{O}_3$ ,  $\text{Yb}_2\text{O}_3$ ,  $\text{Lu}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$

HREO = Heavy Rare Earth Oxides – Total of  $\text{Sm}_2\text{O}_3$ ,  $\text{Eu}_2\text{O}_3$ ,  $\text{Gd}_2\text{O}_3$ ,  $\text{Tb}_4\text{O}_7$ ,  $\text{Dy}_2\text{O}_3$ ,  $\text{Ho}_2\text{O}_3$ ,  $\text{Er}_2\text{O}_3$ ,  $\text{Tm}_2\text{O}_3$ ,  $\text{Yb}_2\text{O}_3$ ,  $\text{Lu}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$

Heavy  
Rare  
Earths  
**ASX:NTU**



**Powering Technology**

[northernminerals.com.au](http://northernminerals.com.au)



# Rare Earths 2.0 – Strategically and Politically Critical

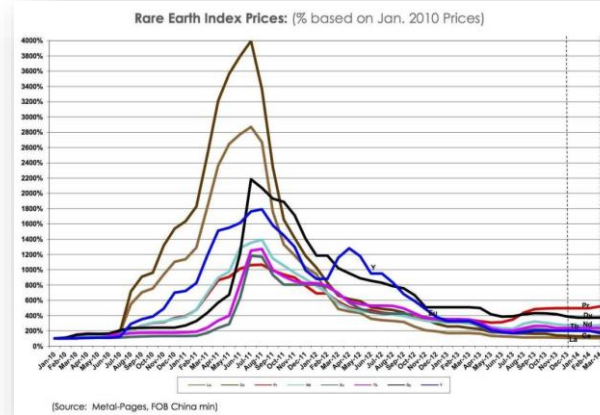
1992



*“Saudi Arabia has oil, but China has rare earths”*

Chinese Premier, Deng Xiaoping

2011



*China cuts rare earths exports on South China Sea issues, prices skyrocket*

RARE EARTHS 1.0

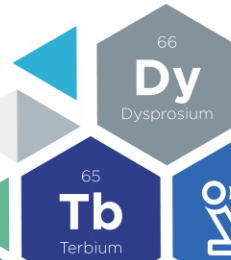
2018



*“This executive order will prioritize reducing the nation’s vulnerability to disruptions in our supply of critical minerals safely and responsibly for the benefit of the American people,”*

US President Donald Trump

Heavy  
Rare  
Earths  
ASX:NTU



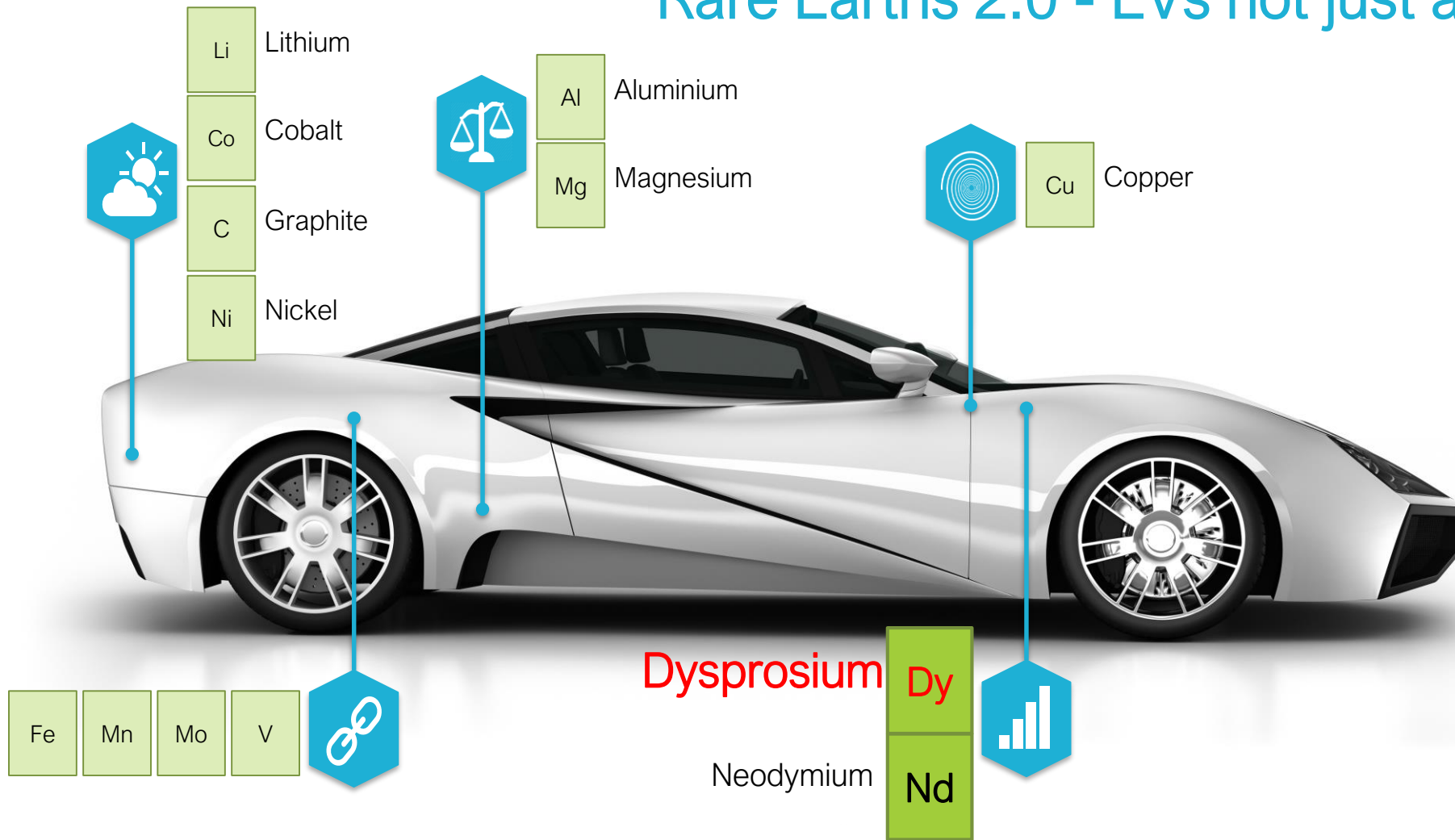
*Demand from EV's is the difference*



Powering Technology

[northernminerals.com.au](http://northernminerals.com.au)

# Rare Earths 2.0 - EVs not just a lithium story!



Heavy  
Rare  
Earths  
**ASX:NTU**



  
**NORTHERN  
MINERALS**

Powering Technology

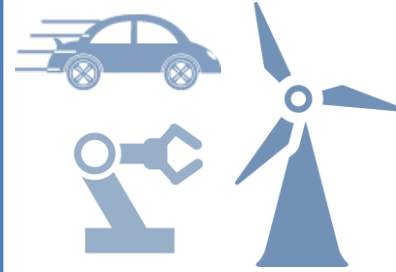
[northernminerals.com.au](http://northernminerals.com.au)

# Dysprosium

66  
**Dy**  
162.5

**99%**

Production from  
China



**Lighter &  
More Efficient**

**20m**

Forecast EV  
sales by 2025

**100g**

Dysprosium per  
electric vehicle

**2,000tpa**

EV demand for  
Dy by 2025



**Government  
mandated change**

Heavy  
Rare  
Earths  
**ASX:NTU**

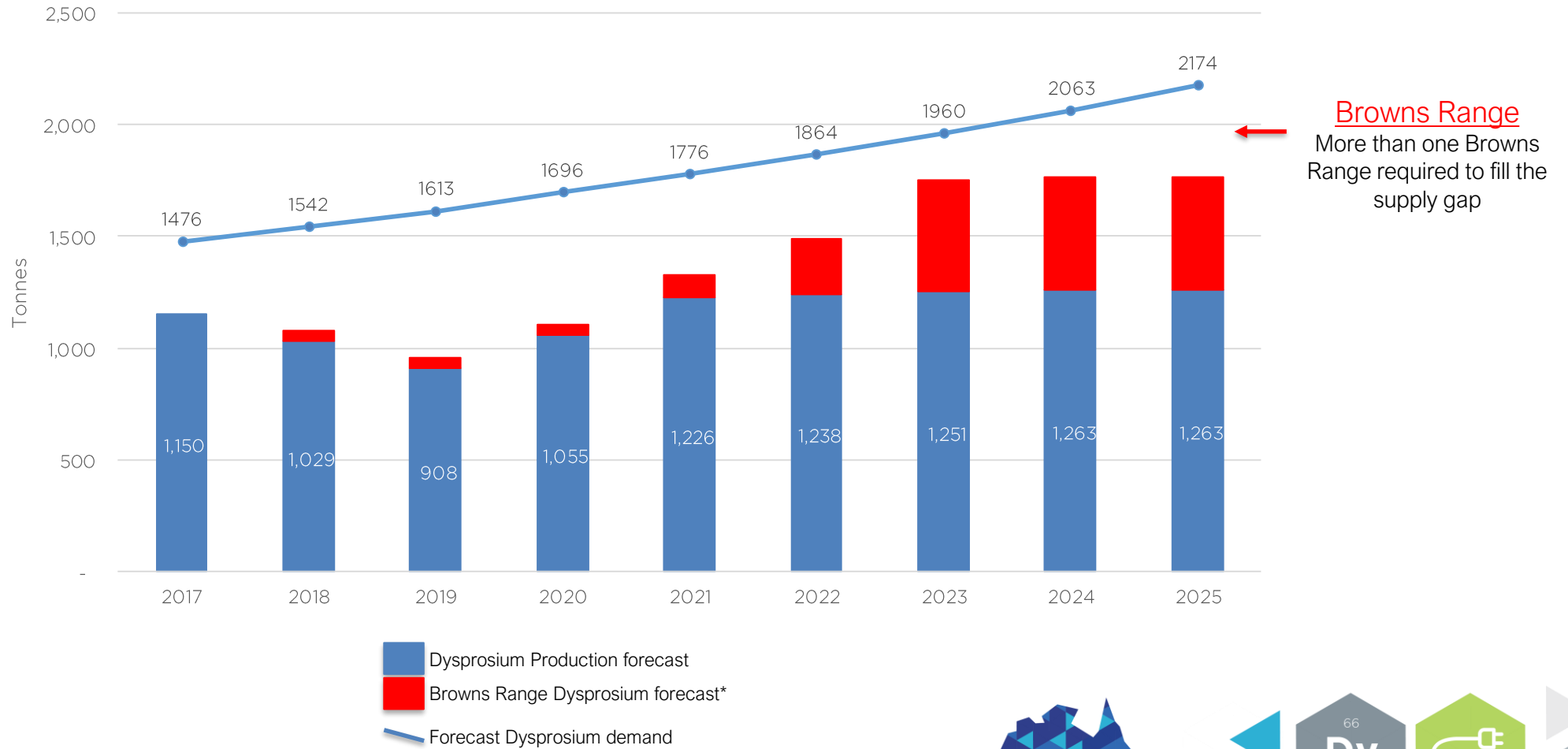


  
**NORTHERN  
MINERALS**

**Powering Technology**

[northernminerals.com.au](http://northernminerals.com.au)

# Browns Range - Filling the Dysprosium supply gap



Powering Technology

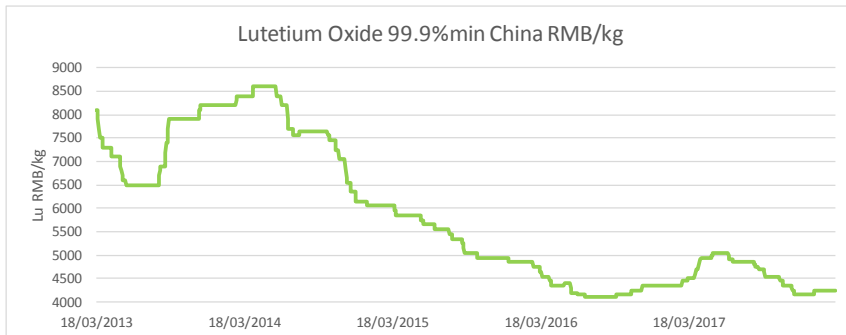
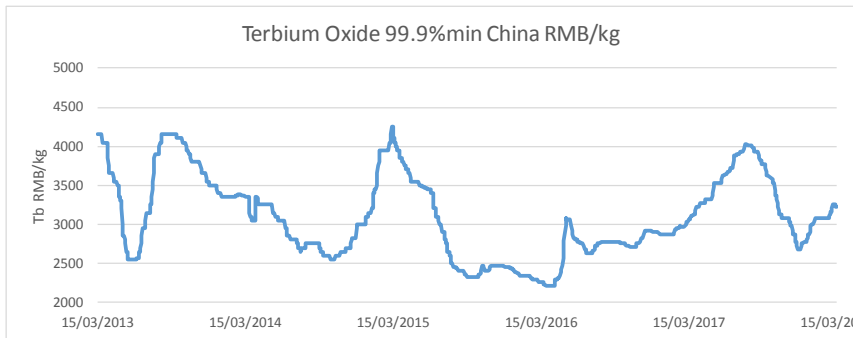
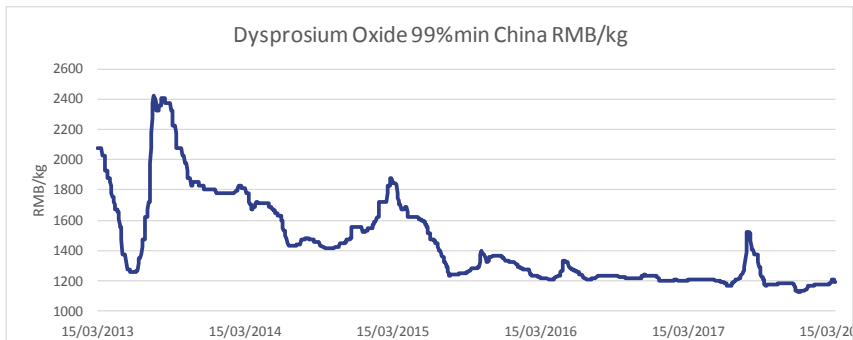
Heavy Rare Earths **ASX:NTU**

Source: Adamus Intelligence, Northern Minerals



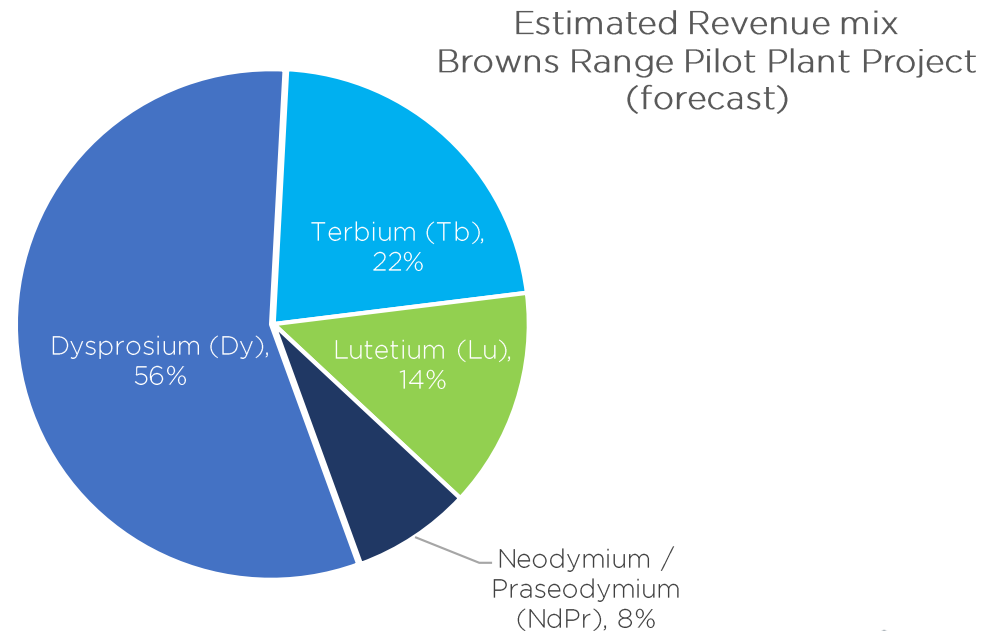
# HRE – sustainable pricing

Increased demand from new EV sales coupled with crackdown on illegal mining in China will positively impact prices

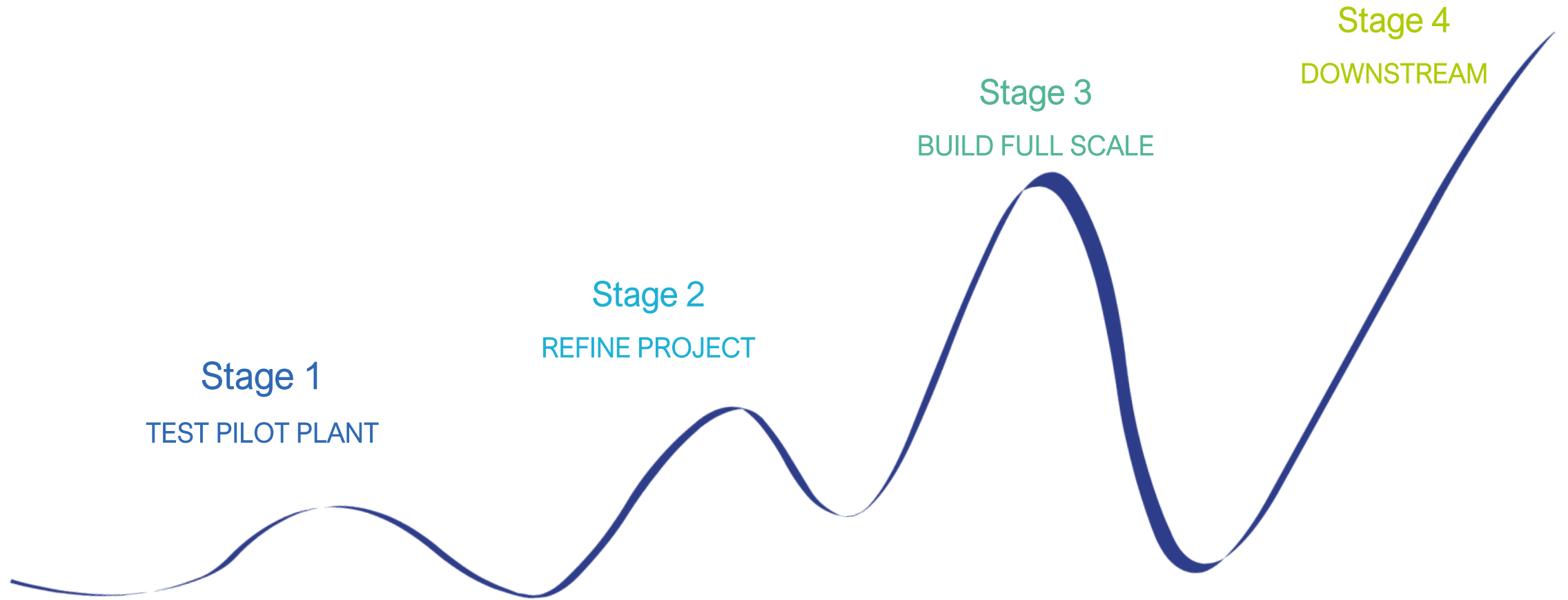


Powering Technology

Heavy Rare Earths **ASX:NTU**



# Our Strategy – Building waves of momentum



**Powering Technology**

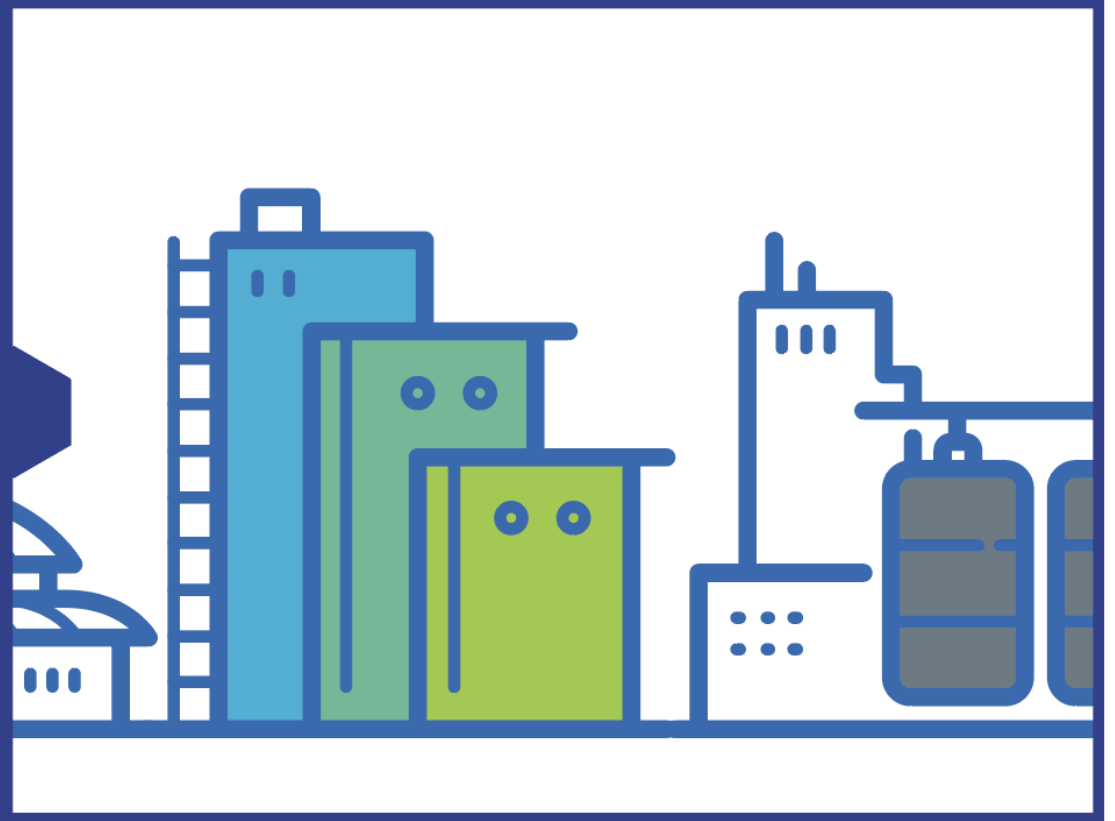
Heavy Rare Earths **ASX:NTU**

Ongoing  
PROJECT GROWTH  
THROUGH EXPLORATION





- 10% of full scale capacity
- Production – from July 2018
- Develop, mining, processing & offtake experience
- 573tpa contained TREO
- 72ktpa capacity beneficiation plant
- 3,840tpa capacity hydrometallurgical plant





# Three year pilot plant project



Pilot  
Plant  
Site

May 2017



# Three year pilot plant project



June 2017



# Three year pilot plant project



September 2017





December 2017



In 2017, Northern Minerals completed stacking of raw product ready for processing



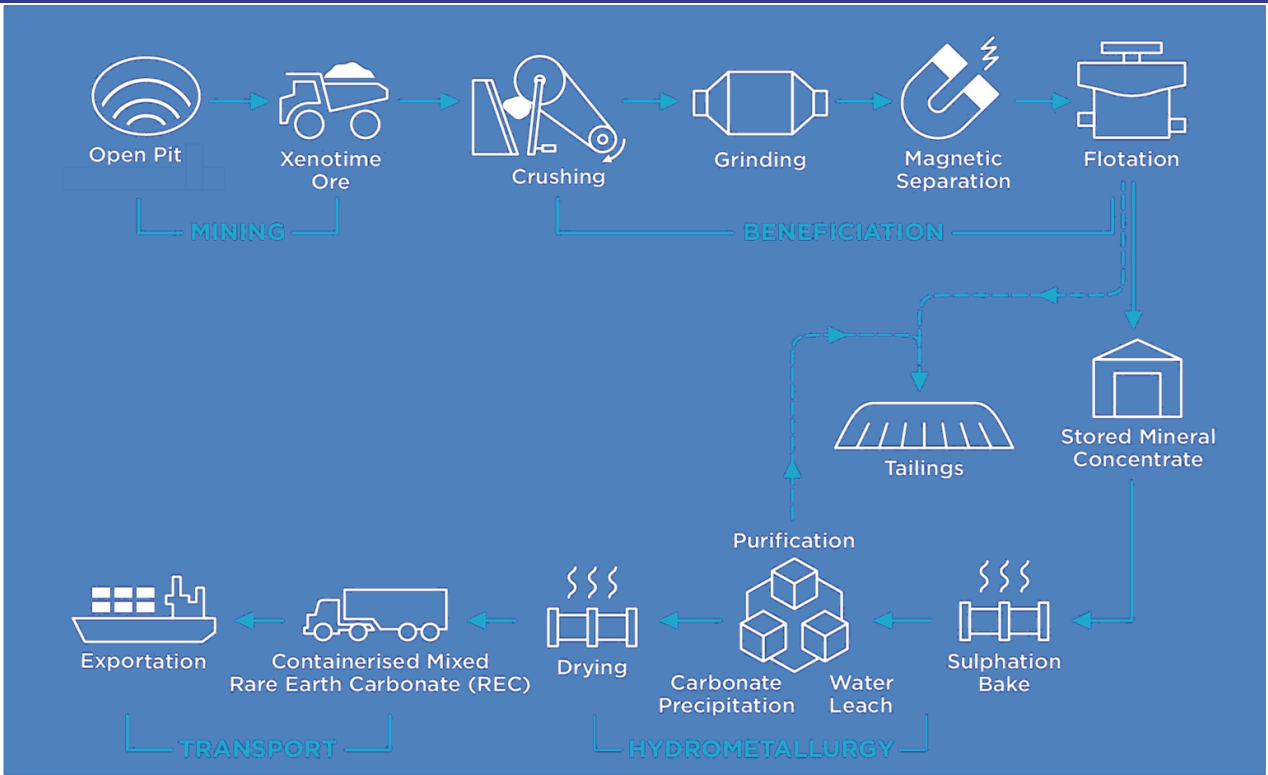
NORTHERN  
MINERALS



In 2018, we will commence a new supply of heavy rare earths to the global market



- Processing Plant
- Schedule
- Financing
- Sales Agreement
- Community



Project Component:  
Modular processing plant

Contractor:  
Sinosteel MECC

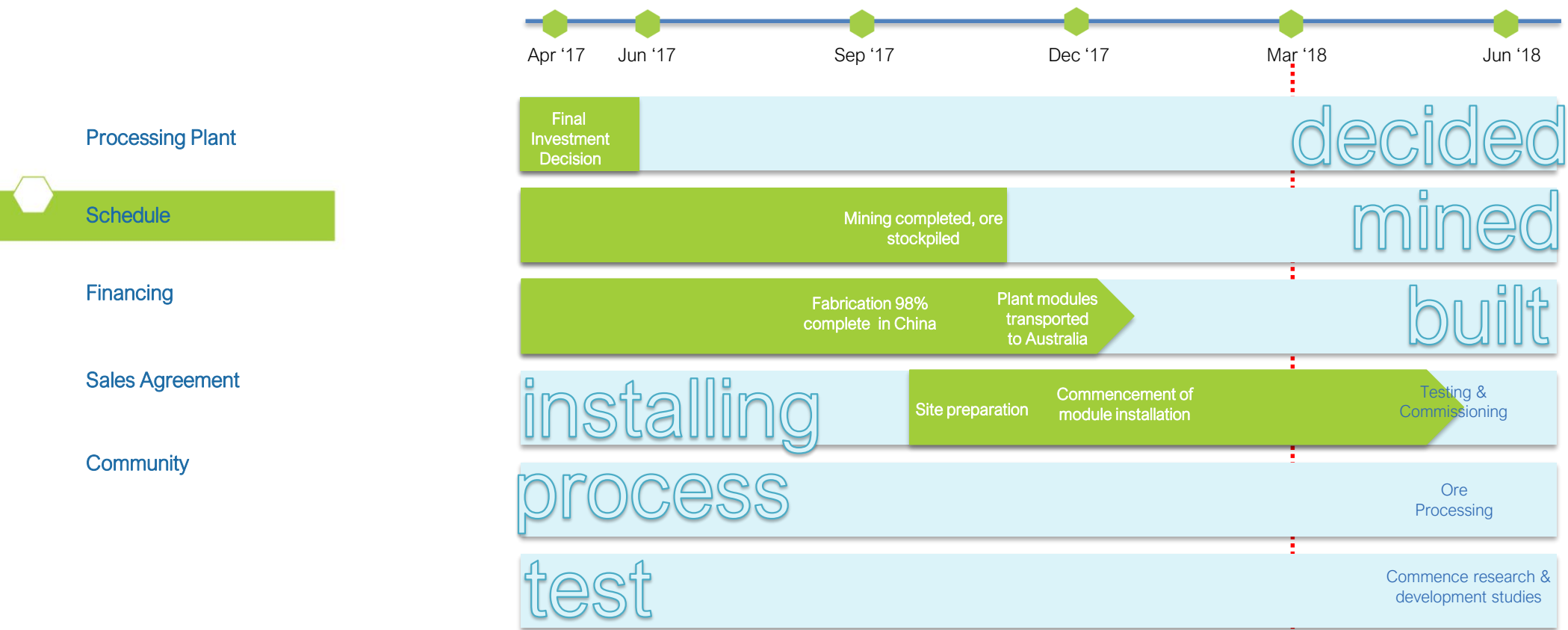
Annual Production:  
60,000tpa (based on 10  
operating months per year)

Capital Cost:  
A\$39 million

Status:  
99% completed in China  
& delivered to site



# Project Development Schedule



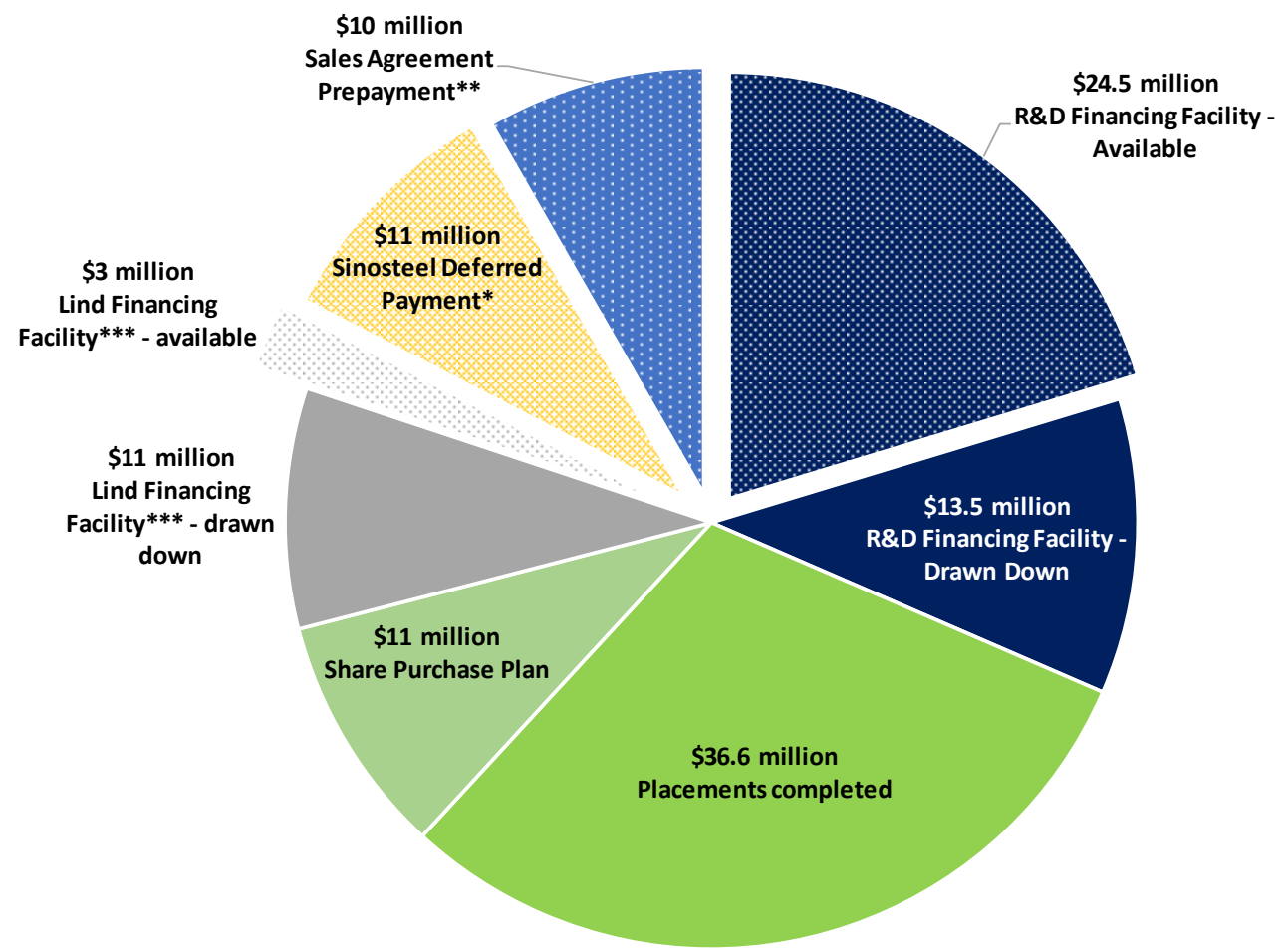
Processing Plant

Schedule

Financing

Sales Agreement

Community



Powering Technology

Heavy Rare Earths **ASX:NTU**

\* Sinosteel MECC has agreed to defer 20% of its contract amount for 24 months, with the ability to convert into Northern Minerals' shares at a conversion price of the lessor of \$0.15 per share or 20 day VWAP prior to conversion notice

\*\* JFMAG has agreed to prepay \$10m (expected payment Q1 2018). JFMAG will be issued 40m unlisted options upon receipt of the loan advance with a \$0.25 exercise price.

\*\*\* Northern Minerals has drawn down \$11m of a \$14m financing facility.



# Secure Sales Agreement

Processing Plant

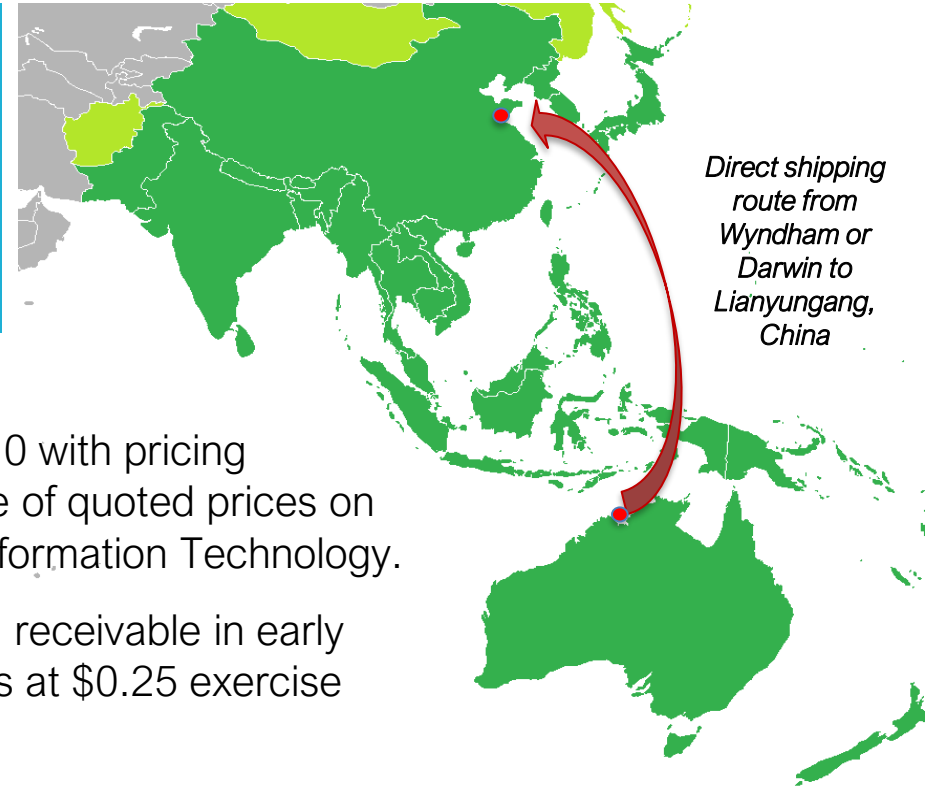
Schedule

Financing

Sales Agreement

Community

100% of Browns Range Pilot Plant production to be purchased by Lianyungang Zeyu New Materials Sales Co Ltd (JFMAG), a 51% owned subsidiary of Guangdong Rare Earths Group.



- Terms based off CIF Incoterms 2010 with pricing referenced from a 2-month average of quoted prices on Asian Metals and Beijing Ruidow Information Technology.
- Includes A\$10 million pre-payment, receivable in early 2018 and 40 million unlisted options at \$0.25 exercise price.
- Representative to join Northern Minerals' Board upon receipt of funds.

**Powering Technology**

Heavy Rare Earths **ASX:NTU**





Processing Plant

Schedule

Financing

Sales Agreement

Community



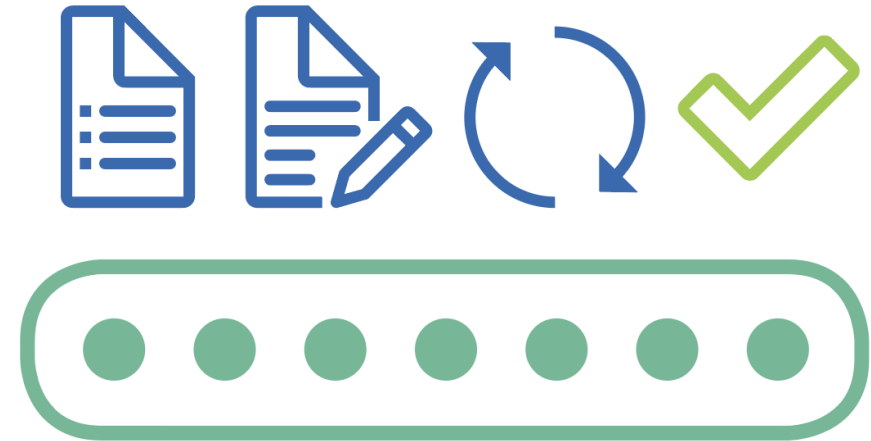
- Northern Minerals has partnered with The Wunan Foundation for the establishment of an \$8.1 million indigenous training-to-work facility at Browns Range.
- The Federal Government, under the Building Better Regions Fund (BBRF) has provided funding of \$4.8 million towards the programme.
- Construction of the facility will commence soon, \$1.3 million received.

**Powering Technology**

Heavy Rare Earths **ASX:NTU**



- Reduce mining cost - modify mining method
- Boost production – increase head grade
- Develop premium product – yttrium rejection
- Funding plan for progressing initiatives







205,000t ore mined at Wolverine and Gambit West;  
Steeper walls employed, resulting in more ore and less waste;

Funding secured to investigate this and other project enhancement initiatives for potential larger scale project.

Opportunity to increase grade

**Powering Technology**

Heavy Rare Earths **ASX:NTU**

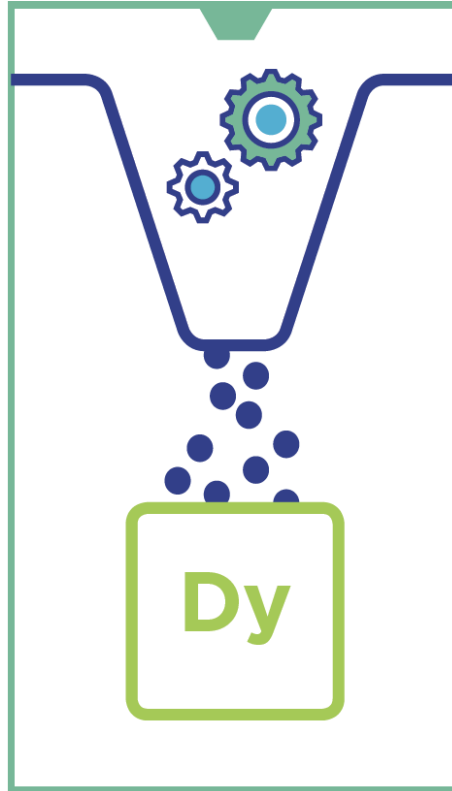


66  
**Dy**  
Dysprosium



65  
**Tb**  
Terbium





- 300,000kg Dysprosium production per annum
- 3,000,000kg TREO per annum
- Significant dysprosium supplier
- Initial 11 year life with significant upside through exploration



Mining

Processing Plant

Schedule

Financing

Sales Agreement

Community

Feasibility

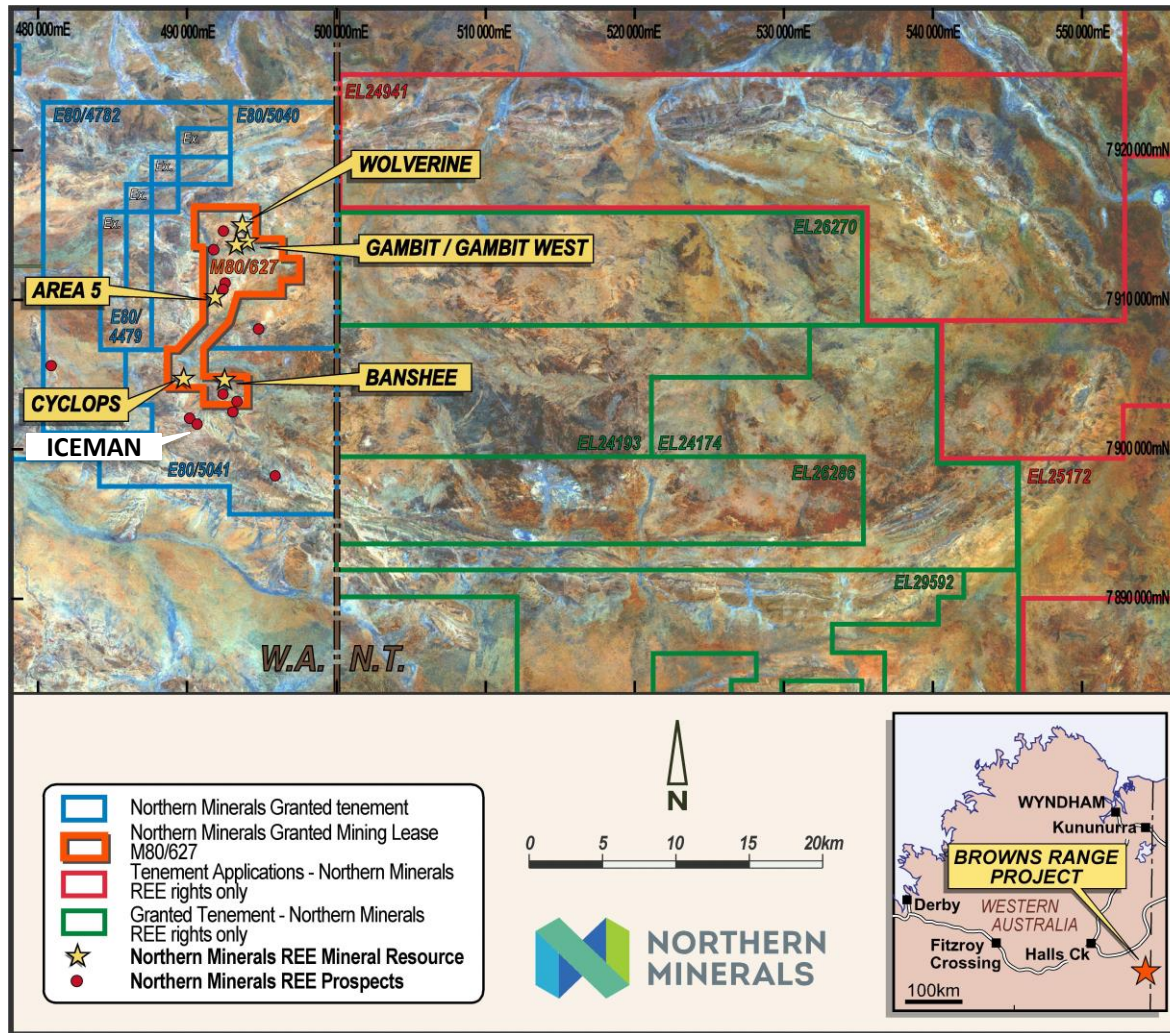
- The three-year pilot project has been designed to assess the technical and economic feasibility of the proposed full-scale development.
- Key aspects of assessment during the Pilot Plant phase:
  - Mining and ore variability;
  - Flowsheet and recovery optimisation;
  - Water and environmental considerations;
  - Transport and shipping logistics;
  - End user product specifications; and
  - Long term dysprosium market dynamics.
- These determining factors will be incorporated into an updated feasibility study for the proposed full-scale operation.
- Funded development plan of project enhancement initiatives, including downstream processing, mining optimisation and exploration.

**Powering Technology**

Heavy Rare Earths **ASX:NTU**







The Browns Range dome is a massive geological feature covering 1,500km<sup>2</sup> and stretching 60km x 30km most of which hasn't been effectively explored

- ◆ JORC Resource supporting an 11 year full scale operation
- ◆ Exploration target to add additional 9 years of JORC Resources (under review)
- ◆ 170 defined targets yet to be drilled
- ◆ High priority target at Iceman
- ◆ John Galt and Boulder Ridge – Additional HRE projects with upside potential
- ◆ Funding in place - exploration ramp up in June quarter

## Powering Technology

Heavy Rare Earths **ASX:NTU**

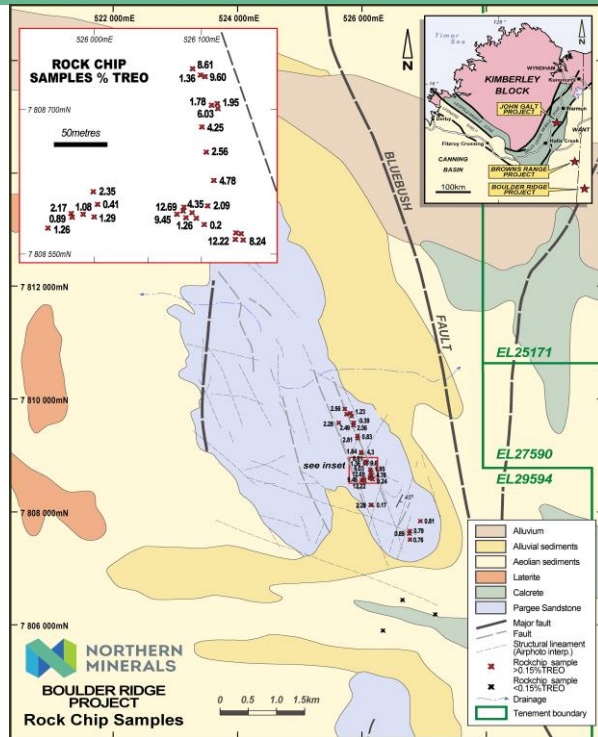


66  
**Dy**  
Dysprosium

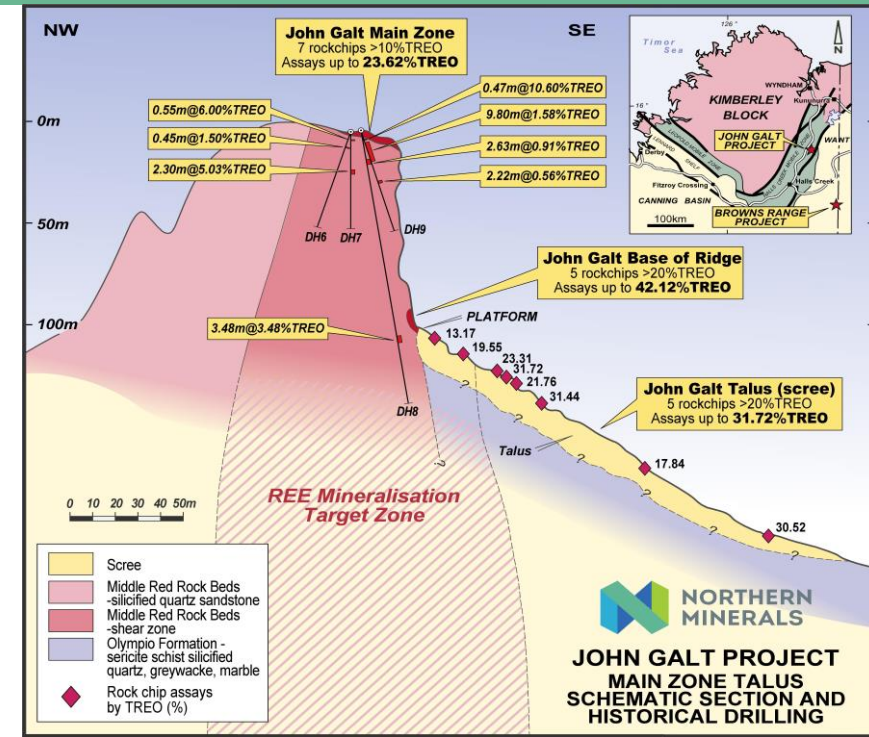


65  
**Tb**  
Terbium





- Rock chip samples from the Boulder Ridge project confirm high-grade Heavy Rare Earths (HRE)
- Best results exceed 12% TREO, including up to 1.15% Dysprosium, with a dominance of HRE – up to 99%.
- Reinforces significant growth potential in Browns Range and Tanami regions.



- Rock chip samples up to 42% TREO with approximately 95% Heavy REO
- Preliminary metallurgical tests indicate excellent recovery rates (>90%)
- Potential for concentrate grades >40%
- High grade mineralisation in talus (scree) material
- Hard-rock source of scree is the primary target

## Powering Technology

Heavy Rare Earths **ASX:NTU**



**Dy**  
Dysprosium



**Tb**  
Terbium



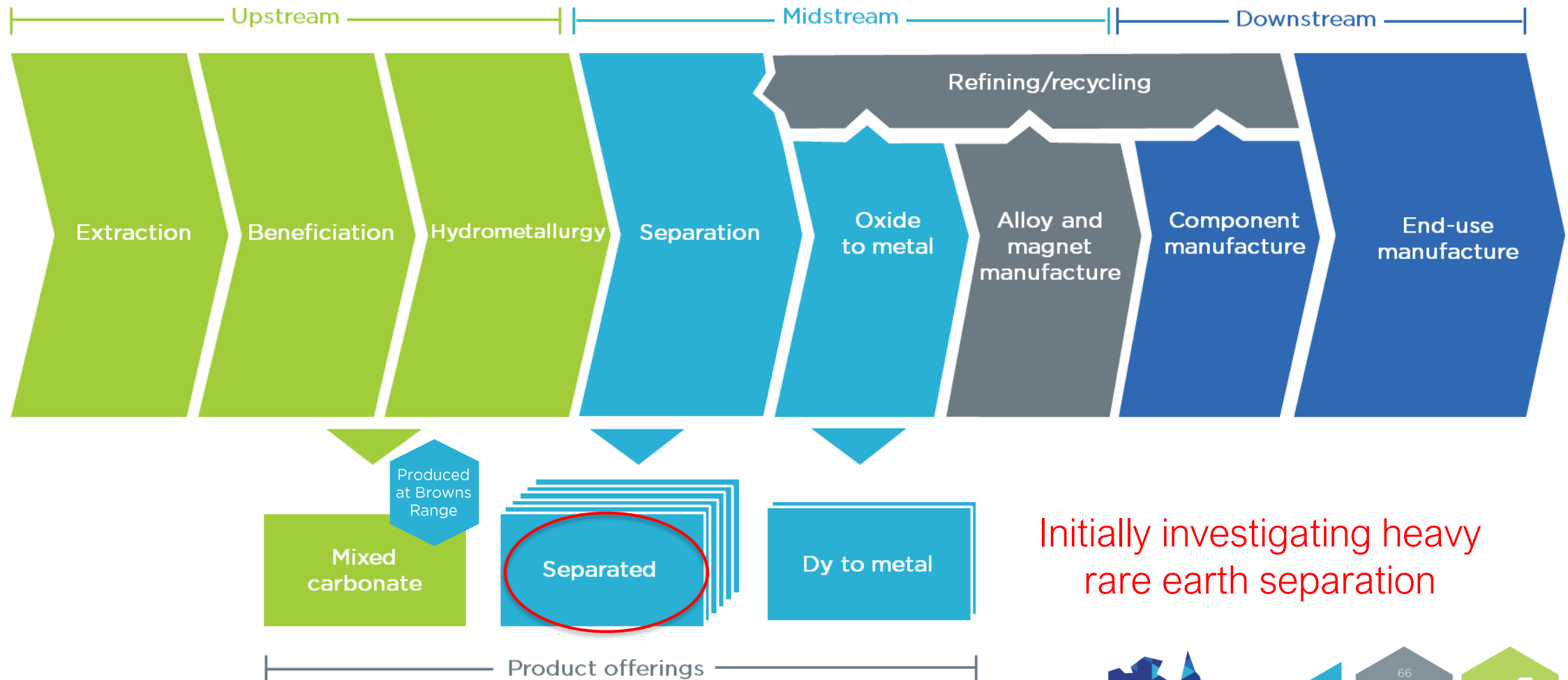
# Downstream Opportunities



- Downstream separation of heavy rare earth elements
- Production of dysprosium oxide and terbium oxide
- Wider potential customer base
- Additional value capture
- Funded plan to investigate downstream opportunities







Initially investigating heavy rare earth separation

**Powering Technology**

Heavy Rare Earths **ASX:NTU**



# 2018 PLANS




**TRAIN & LEARN**  
Implementation of  
Training-to-Work Program




**PRACTICAL COMPLETION**  
Commence research &  
Development studies

**EXPLORE**  
Continue  
exploration on  
multiple HRE  
opportunities



**FIRST PRODUCT  
DELIVERY**  
Mixed rare earth carbonates



**RESEARCH &  
DEVELOPMENT**  
Assess the technical and  
economic feasibility of the  
larger scale operation



**BONUS OPTION ISSUE**  
Planned listed 12c options for all  
shareholders as at Record Date  
following General Meeting

**1-for-5**



**CASHFLOW**  
Commence product sales from  
Browns Range

Powering Technology

Heavy Rare Earths **ASX:NTU**







Key Site Personnel:  
Eben Van Rooyen – Resident Manager  
Tony Hadley – General Manager



BREVET CAPITAL MANAGEMENT



Powering Technology

Heavy Rare Earths **ASX:NTU**



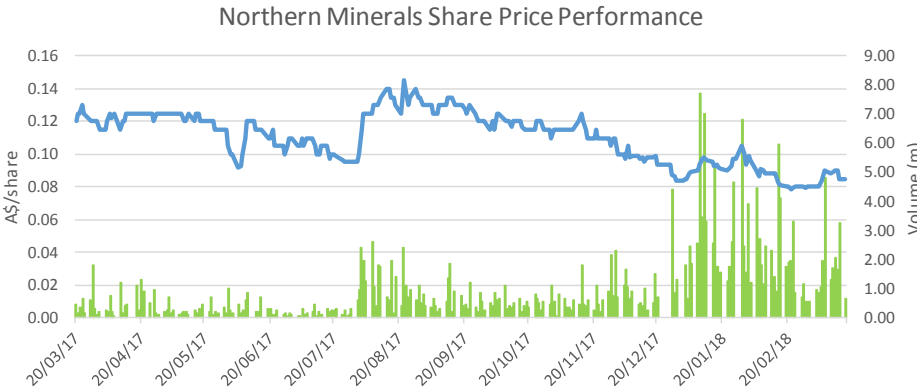


Major shareholders	19 March 2018
ACIIG	18.4%
Huatai Mining	15.0%
Citicorp Nominees	3.3%
Board & Management	2.3%
Remaining Top 20	19.3%
Other	41.7%

## Market capitalisation \$92M

(at 19 March 2018 @ \$0.085)

Ordinary Shares	1,079M
Options and Performance Rights	103M
Cash (28 February 2018)	\$14.9M
12 month low - high	\$0.081 - \$0.15
Average daily volume (12 month avg)	902,000
Average daily volume (3 month avg)	2,035,000



## Powering Technology

Heavy Rare Earths [ASX:NTU](#)



- Pilot plant production to commence in July 2018
- Three year project to demonstrate and assess economic and technical feasibility of full scale operation
- Browns Range on track to be a globally significant supplier of dysprosium
- Quality management and operations team focussed on delivery
- An essential part of the EV evolution







# NORTHERN MINERALS

## Delivering critical technology metals to the EV evolution



ASX:NTU

Powering Technology.



# APPENDICES

Heavy  
Rare  
Earths  
**ASX:NTU**



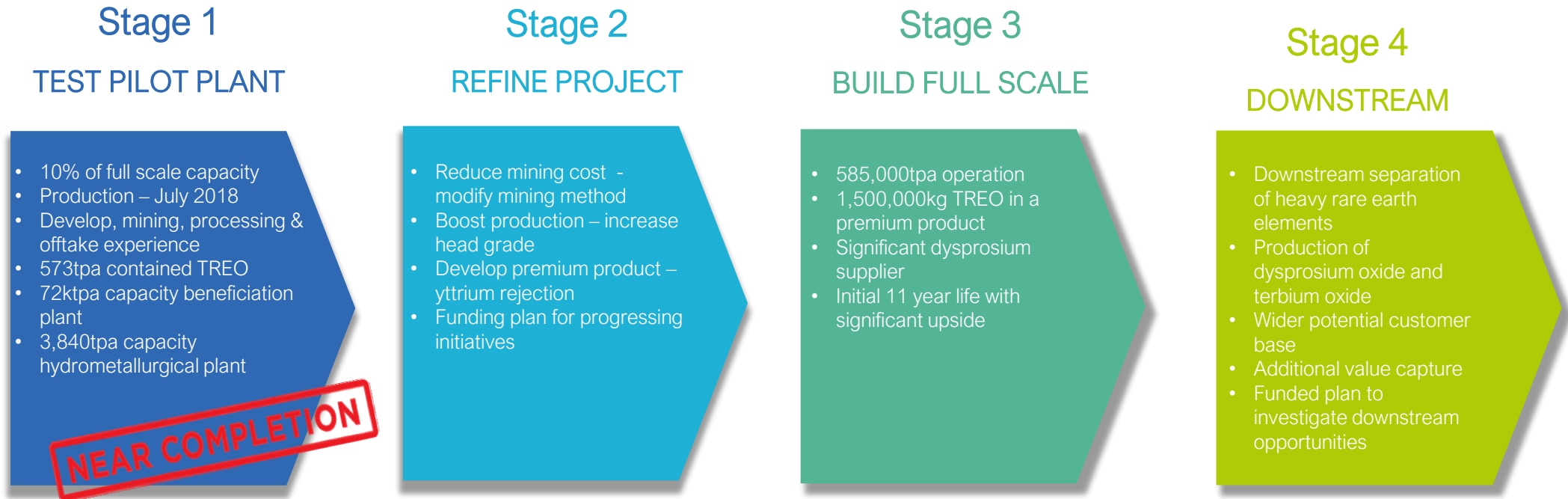
**NORTHERN  
MINERALS**

**Powering Technology**

[northernminerals.com.au](http://northernminerals.com.au)



# Four stage approach to full value capture



## MINERAL RESOURCES

Extend existing resources at Browns Range  
Explore opportunities at Boulder Ridge and John Galt  
Looking for new LRE projects

measured . sustainable . achievable

# Heavy rare earths crucial to growth of electric vehicle sector



- ◆ NdDyFeB permanent magnets used by major electric vehicle (EV) manufacturers require Dysprosium and Terbium as key additives for high performance
- ◆ Changing policy settings by European governments and future development plans by global carmakers have resulted in demand for EVs reaching an inflection point
- ◆ Permanent magnets account for 25% of rare earth demand in tonnes and 80% in value and the increasing rate of market acceptance has translated into significantly higher prices for heavy rare earth elements specifically
- ◆ UBS has increased forecasts on EV production as a consequence of earlier than expected EV cost parity, with EV sales expected to grow from 1.2 million in 2015 to >20 million by 2025
- ◆ Each electric vehicle contains approximately 100g of Dysprosium

**Powering Technology**

Heavy Rare Earths **ASX:NTU**

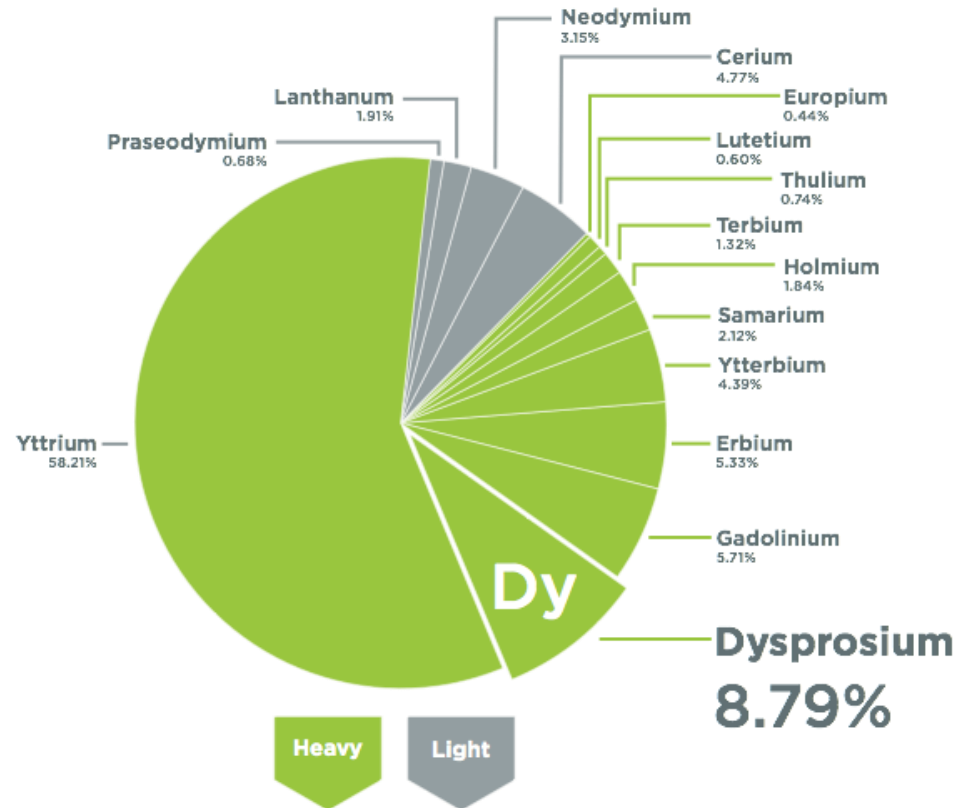




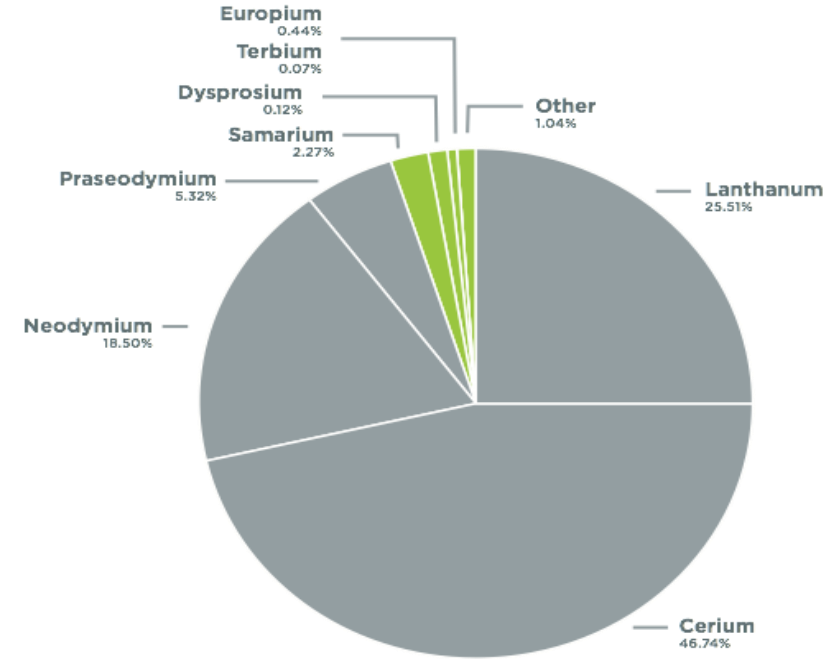
# Northern Minerals Browns Range

# Lynas Mt Weld

Rare earth distribution <sup>1</sup>



Rare earth oxide composition <sup>2</sup>



## Powering Technology

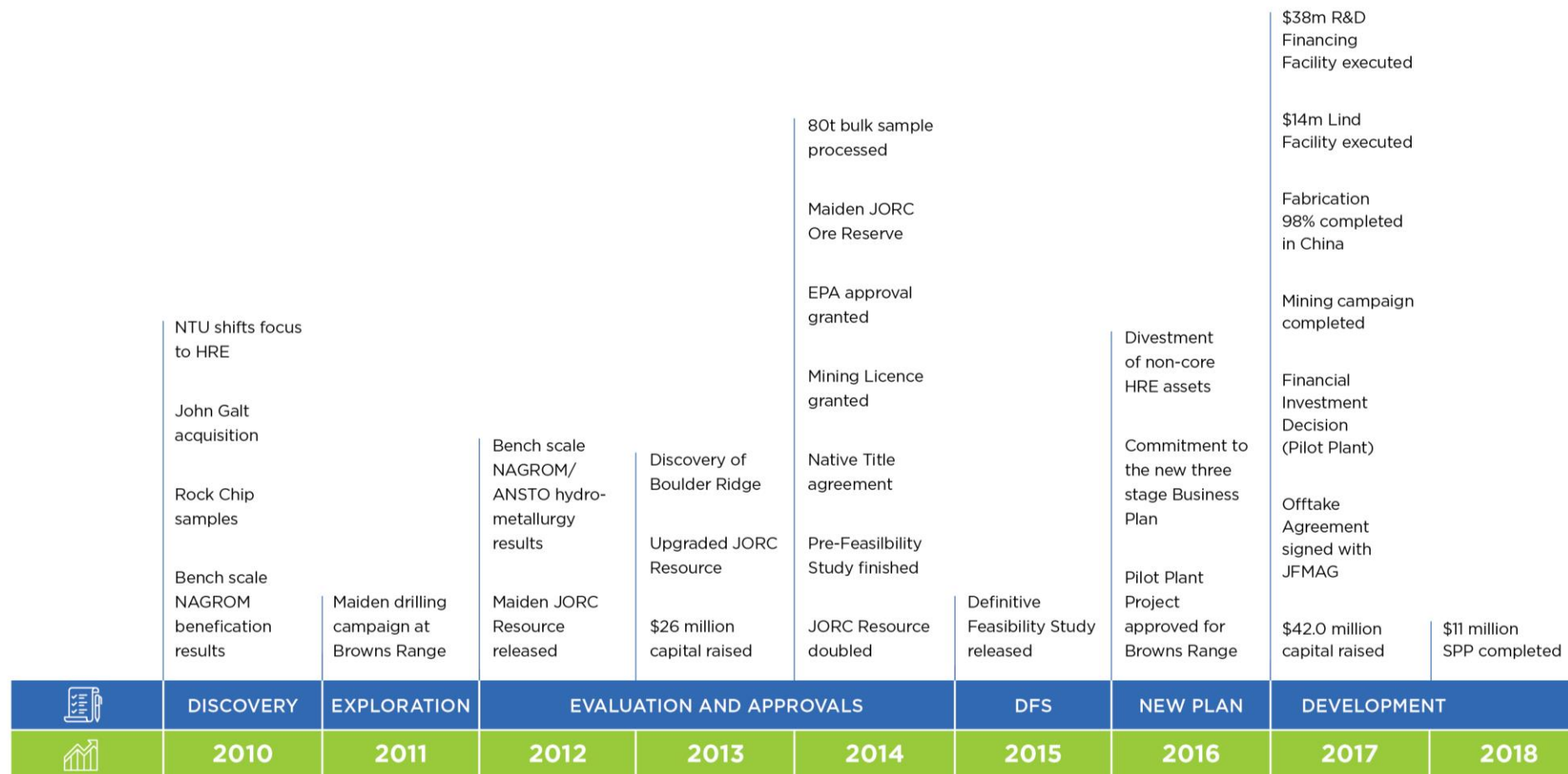
Heavy Rare Earths [ASX:NTU](#)

<sup>1</sup> Based on Wolverine Mineral Resource

<sup>2</sup> Source: Lynas Corporation website



# Browns Range – An Eight Year Journey



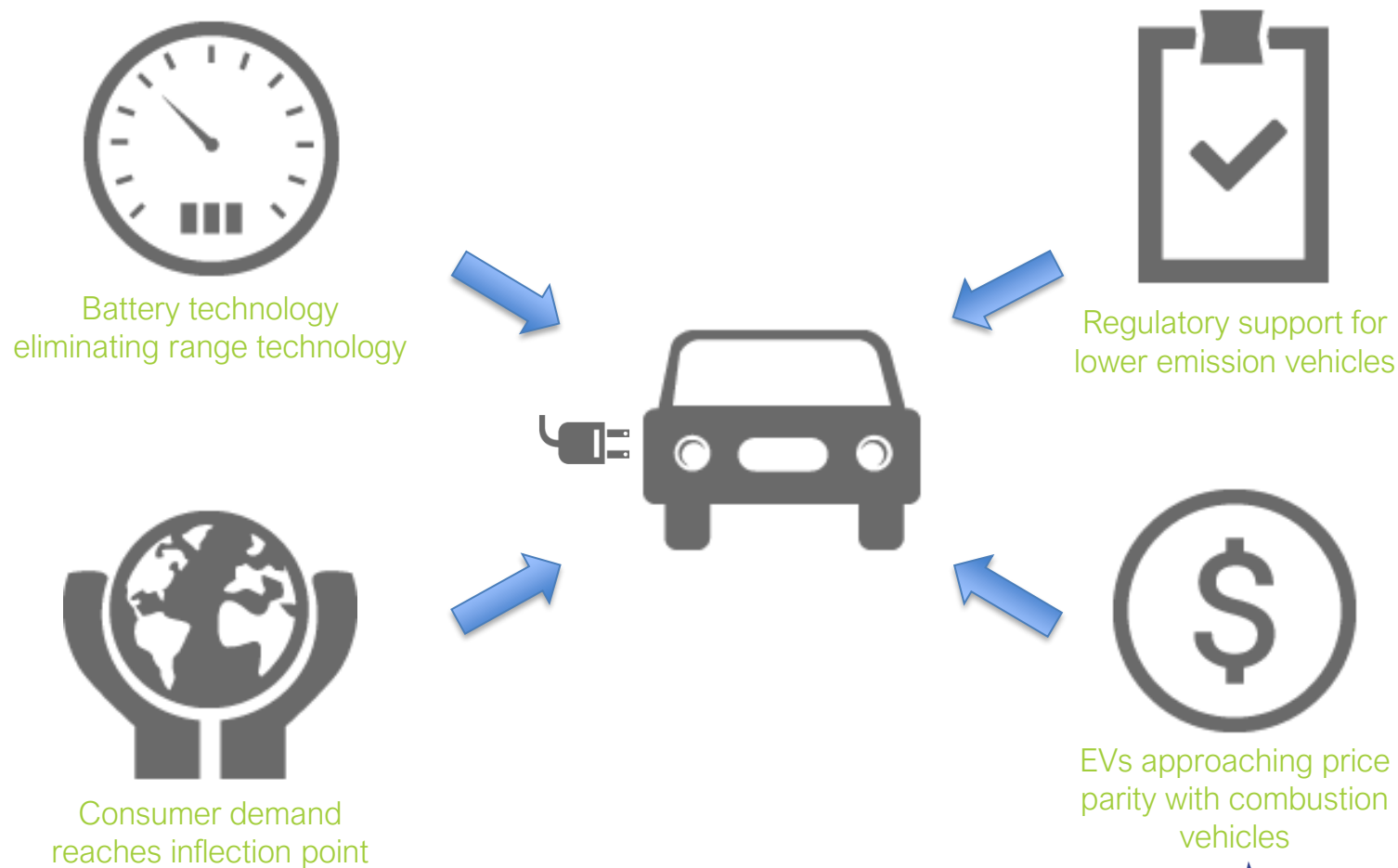
Powering Technology

Heavy Rare Earths **ASX:NTU**





# Global EV growth drivers



**Powering Technology**

Heavy Rare Earths **ASX:NTU**



# EV acceptance reached inflection point in 2017

## THE AUSTRALIAN



Donald Trump and Malcolm Turnbull at the White House

### Trump woos Turnbull for rare earths alliance

ROBERT GOTTLIEBSEN



It's taken a long time but suddenly the US under Donald Trump has realised that it has a potential "rare earths" crisis and is calling on Australia to help. Indeed, one of the most dramatic features of the

nations for oil and gas in the 1970s. America has no stockpiles and is in the hands of China. And Americans also believe that in rare earths they were "taken to the cleaners" by China. Back in 2010, after a dispute with Japan, China restricted its exports of rare earths and the price skyrocketed. That led to a boom in rare earths exploration and development. At one point Australia had 500 companies listed as having an interest in rare earths. In the US MolyCorp spent some \$US1.5 billion developing the giant Mountain Pass mine, which was the only rare earths

## THE AUSTRALIAN

TECHNOLOGY

July 5 2017

### Volvo to phase out conventional engine

## FINANCIAL REVIEW

France to end petrol car sales by 2040 as it embraces electric vehicles July 7 2017

## Examiner

Trump: Break Chinese, Russian stranglehold over mineral supplies  
by John Siciliano | Dec 20, 2017, 9:13 PM

## Forbes

Shift to Electric Vehicle Demand Accelerates  
July 14 2017

## CEFC

CLEAN ENERGY FINANCE CORP

Where we invest

Case studies

About us

Publications

Media

Submit proposal

Media

Macquarie leasing drives electric vehicle and energy efficiency push with \$100M in CEFC finance

## Powering Technology

Heavy Rare Earths **ASX:NTU**



66  
**Dy**  
Dysprosium



65  
**Tb**  
Terbium







NATHAN EDWARDS

Donald Trump and Malcolm Turnbull at the White House

## Trump woos Turnbull for rare earths alliance

ROBERT GOTTLIEBSEN



It's taken a long time but suddenly the US under Donald Trump has realised that it has a potential "rare earths" crisis and is calling on Australia to help.

Indeed, one of the most dramatic features of the

nations for oil and gas in the 1970s. America has no stockpiles and is in the hands of China.

And Americans also believe that in rare earths they were "taken to the cleaners" by China.

Back in 2010, after a dispute with Japan, China restricted its exports of rare earths and the price skyrocketed. That led to a boom in rare earths exploration and development. At one point Australia had 500 companies listed as having an interest in rare earths.

In the US Molycorp spent some \$US15 billion developing the giant Mountain Pass mine, which was the only rare earths

## Powering Technology

Heavy Rare Earths **ASX:NTU**

# US recognises rare earths as critical

- In December 2017, President Trump signed a '[Presidential Executive Order on a Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals](#)'
- In February 2018, the [US Department of the Interior](#) released a draft list of 35 minerals deemed 'critical' to US national security
- Also in February 2018, [US President Trump](#) and Australian PM Malcolm Turnbull agreed to work together on strategic minerals exploration, extraction, processing and research and development of rare earths and high performance metals

**Northern Minerals has the most advanced heavy rare earths project outside China, with production to commence from July 2018**



66  
**Dy**  
Dysprosium



65  
**Tb**  
Terbium



# Chinese carmakers to dominate EV production



## Powering Technology

Heavy Rare Earths [ASX:NTU](#)





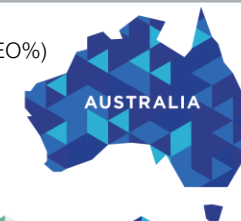
# Mineral Resources

Deposit	Category	Mt	TREO	Dy <sub>2</sub> O <sub>3</sub>	Y <sub>2</sub> O <sub>3</sub>	Tb <sub>4</sub> O <sub>7</sub>	HREO	TREO
			%	Kg/t	Kg/t	Kg/t	%	Kg
<b>Wolverine</b>	Indicated	2.99	0.83	0.73	4.86	0.11	89	24,952,000
	Inferred	1.97	0.89	0.76	5.13	0.11	88	17,609,000
	<b>Total<sup>1</sup></b>	<b>4.97</b>	<b>0.86</b>	<b>0.74</b>	<b>4.97</b>	<b>0.11</b>	<b>89</b>	<b>42,560,000</b>
<b>Gambit West</b>	Indicated	0.27	1.26	1.07	7.06	0.14	90	3,424,000
	Inferred	0.12	0.64	0.54	3.67	0.07	85	753,000
	<b>Total<sup>1</sup></b>	<b>0.39</b>	<b>1.07</b>	<b>0.91</b>	<b>6.04</b>	<b>0.12</b>	<b>89</b>	<b>4,177,000</b>
<b>Gambit</b>	Indicated	0.05	1.06	0.92	6.62	0.12	97	533,000
	Inferred	0.06	1.2	1.01	6.8	0.15	95	671,000
	<b>Total<sup>1</sup></b>	<b>0.11</b>	<b>1.13</b>	<b>0.97</b>	<b>6.72</b>	<b>0.13</b>	<b>96</b>	<b>1,204,000</b>
<b>Area 5</b>	Indicated	1.38	0.29	0.18	1.27	0.03	69	3,953,000
	Inferred	0.14	0.27	0.17	1.17	0.03	70	394,000
	<b>Total<sup>1</sup></b>	<b>1.52</b>	<b>0.29</b>	<b>0.18</b>	<b>1.26</b>	<b>0.03</b>	<b>69</b>	<b>4,347,000</b>
<b>Cyclops</b>	Indicated	-	-	-	-	-	-	-
	Inferred	0.33	0.27	0.18	1.24	0.03	70	891,000
	<b>Total<sup>1</sup></b>	<b>0.33</b>	<b>0.27</b>	<b>0.18</b>	<b>1.24</b>	<b>0.03</b>	<b>70</b>	<b>891,000</b>
<b>Banshee</b>	Indicated	-	-	-	-	-	-	-
	Inferred	1.66	0.21	0.16	1.17	0.02	87	3,484,000
	<b>Total<sup>1</sup></b>	<b>1.66</b>	<b>0.21</b>	<b>0.16</b>	<b>1.17</b>	<b>0.02</b>	<b>87</b>	<b>3,484,000</b>
<b>Total<sup>1</sup></b>	Indicated	4.69	0.70	0.59	3.95	0.09	87	32,862,000
	Inferred	4.28	0.56	0.46	3.15	0.07	87	23,802,000
	<b>Total<sup>1</sup></b>	<b>8.98</b>	<b>0.63</b>	<b>0.53</b>	<b>3.56</b>	<b>0.08</b>	<b>87</b>	<b>56,663,000</b>

<sup>1</sup> – Rounding may cause some computational discrepancies (TREO (metal) tonnes estimated from Mt x TREO%)  
Mineral resources as per NTU announcement 2 March 2015 in relation to increased reserves.

**Powering Technology**

Heavy Rare Earths **ASX:NTU**



# Ore Reserves

Deposit	Classification	Ore Tonnes	TREO		Dy <sub>2</sub> O <sub>3</sub>		Tb <sub>4</sub> O <sub>7</sub>		Y <sub>2</sub> O <sub>3</sub>	
			kg/t	kg Contained	kg/t	kg Contained	kg/t	kg Contained	kg/t	kg Contained
OPEN PIT										
Wolverine	Probable	833,000	6.15	5,124,000	0.55	460,000	0.08	66,000	3.59	2,989,000
Gambit West	Probable	219,000	10.10	2,212,000	0.83	182,000	0.11	25,000	5.52	1,209,000
Gambit	Probable	37,000	8.05	298,000	0.68	25,000	0.09	3,000	4.74	176,000
Area 5	Probable	467,000	2.24	1,048,000	0.14	65,000	0.02	10,000	0.99	463,000
UNDERGROUND										
Wolverine	Probable	2,104,000	8.00	16,833,000	0.70	1,483,000	0.10	221,000	4.71	9,908,000
Gambit West	Probable	90,000	9.54	860,000	0.88	79,000	0.11	10,000	5.78	521,000
RESERVE										
Total	Probable <sup>1</sup>	3,750,000	7.03	26,375,000	0.61	2,294,000	0.09	335,000	4.07	15,266,000

<sup>1</sup> Rounding may cause some computational discrepancies

Ore reserves as per NTU announcement 2 March 2015 in relation to increased reserves.

## Powering Technology

Heavy Rare Earths **ASX:NTU**





# Pilot plant: targeted production

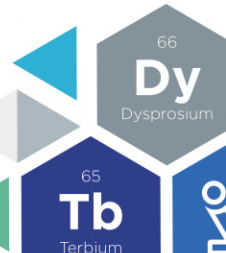
- Mixed RE carbonate (REC) produced
- Product specification available for REC
- REC samples validated by several downstream separators
- REC suitable for solvent extraction separation
- Low thorium and uranium levels
- First shipment planned for September quarter

REO contained in mixed RE carbonate	Annual production (000s kg)
Lanthanum	5.8
Cerium	15.2
Praseodymium	2.8
Neodymium	10.6
Samarium	11.4
Europium	2.4
Gadolinium	34.8
Terbium	6.7
Dysprosium	49.4
Holmium	13.5
Erbium	39.3
Thulium	5.6
Ytterbium	33.1
Lutetium	4.5
Yttrium	337.6
<b>Total TREO produced</b>	<b>573</b>
<b>Total carbonate produced</b>	<b>1,100</b>

Figures may not add due to rounding  
 TREO = Total Rare Earth Oxides- Total of Dy<sub>2</sub>O<sub>3</sub>, La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Pr<sub>6</sub>O<sub>11</sub>, Nd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>

Production table from NTU announcements dated 4 February 2016 in relation to new business plan for Browns Range and presentation of the business plan

Heavy  
Rare  
Earths  
**ASX:NTU**



**Powering Technology**

[northernminerals.com.au](http://northernminerals.com.au)

# NTU Board



Nan  
Yang

Colin  
McCavana

Adrian  
Griffin

George  
Bauk

Bin  
Cai

**Powering Technology**

Heavy Rare Earths **ASX:NTU**

## Colin McCavana - Non-executive Chairman (appointed 2006)

Mr McCavana has more than 35 years of management experience worldwide in the earthworks, construction and mining industries.

## George Bauk - Managing Director / CEO (appointed 2010)

George is an experienced executive, with over 25 years' experience in the resources industry. Prior to Northern Minerals, George held global operational and corporate roles with WMC Resources, Arafura Resources and Indago Resources. Mr Bauk is Vice President of the Chamber of Minerals and Energy, WA and Chairman of Lithium Australia.

## Adrian Griffin - Non-executive Director (appointed 2006)

An Australian trained mining professional with exposure to metal mining and processing throughout the world, Mr Griffin has been involved in the development of extraction technology for platinum group metals and agricultural commodities.

## Nan Yang - Non-executive Director (appointed 2017)

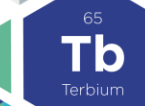
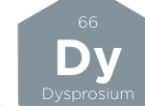
Mr Yang is an Australian mining engineer with more than 10 years' experience in mine planning, design, and mergers and acquisitions.

## Yanchung Wang - Non-executive Director (not in photo) (appointed 2013)

Ms Wang acts as a strategic investor for a number of Chinese based companies. Ms Wang is Vice Chairman of Conglin Baoyuan International Investment Group and also a Director of Huachen.

## Bin Cai - Non-executive Director (alternate) (appointed 2013)

Bin is the MD of Conglin International Investment Group Pty Ltd based in Brisbane. He has a record of successful strategic investments in emerging Australian resources companies.



# Executive Team



5 years

**Mark Tory**  
**Chief Financial Officer**  
Mark is a Chartered Accountant with 25 years of professional experience in the mining industry and accounting professions. Prior to Northern Minerals, Mark held senior positions at Crescent Gold Limited, Anglo American Exploration and Homestake Gold (now Barrick Gold).



5 years

**Robin Jones**  
**Chief Operating Officer**  
Robin has more than 20 years experience in the mining industry, the majority of which has been in the assessment and development of resource projects from scoping study level through to operation. Robin has held senior management positions in PGM, nickel, copper, gold and uranium projects in Australia, RSA and China.



12 years

**Robin Wilson**  
**Exploration Manager**  
Robin has held senior exploration positions in several exploration and mining companies, including Polaris Metals, Tanganyika Gold, Troy Resources and CRA Exploration. In addition, he spent 5 years working in oil and gas exploration for Woodside Energy.  
  
Robin was instrumental in the discovery of the Browns Range Project, including Wolverine and Gambit West.



1 year

**Eben Van Rooyen**  
**Resident Manager**  
Mr Van Rooyen is a Project Manager with an electrical and mechanical engineering background with more than 35 years experience in the mining industry. Eben has significant gold industry experience in brownfields projects from concept and feasibility through to commissioning.



2 months

**Tony Hadley**  
**General Manager**  
Mr Hadley is a metallurgist with 26 years' experience in the management of rare earths, base metals, vanadium and gold projects globally. His experience includes 10 years' with Lynas Corporation, where he was the Operations Manager for the Mount Weld Rare Earth mine and the manager of process flowsheet development.

## Powering Technology

Heavy Rare Earths **ASX:NTU**





# The Northern Minerals SPIRIT



**Powering Technology**

Heavy Rare Earths **ASX:NTU**

