

NGUALLA RARE EARTH PROJECT

# ANNUAL GENERAL MEETING

29 NOVEMBER 2013, PERTH



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## Competent Person Statement

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The information in this presentation relates to Exploration Results based on information reviewed by David Hammond who is a Member of the Australasian Institute of Mining and Metallurgy, is also a Director and full time employee of the Company. He has sufficient experience which is relevant to the 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. David Hammond consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The information in this presentation that relates to Metallurgical Test Work Results based on information compiled and / or reviewed by Gavin Beer who is a Member of The Australasian Institute of Mining and Metallurgy. Gavin Beer is a Consulting Metallurgist with sufficient experience relevant to the activity which he is undertaking to be recognized as competent to compile and report such information. Gavin Beer consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

# Company Snapshot



100% ownership of the world's highest quality, lowest cost rare earth development project.

## Board and Management

<b>Alastair Hunter</b>	Executive Chairman
<b>Dave Hammond</b>	Technical Director
<b>Jonathan Murray</b>	Non- Executive Director
<b>Jeff Dawkins</b>	CFO / Company Secretary
<b>Lucas Stanfield</b>	Chief Development Officer

## Corporate Snapshot

**ASX:** PEK At 30 September 2013  
**Ordinary Shares on Issue:** 275.6m  
**Cash:** \$910k (prior to \$1.69m R&D rebate)  
**1 year range:** 10.5c to 22.5c  
**Market Cap at 9.5c:** \$26m  
**Listed Options:** 51.7m



MID+HEAVY



NEODYMIUM –  
PRASEODYMIUM



LANTHANUM



CERIUM

# OUTLINE

1. Investment Highlights
2. Rejuvenation of Rare Earth Markets
3. Ngualla's Value Drivers
4. The Resource Asset
5. Metallurgical Process
6. Economic Assessment
7. Outlook and next steps



# Investment Highlights

## Strategic Materials

- Magnet and Critical Rare Earths
- High Value Growth Markets



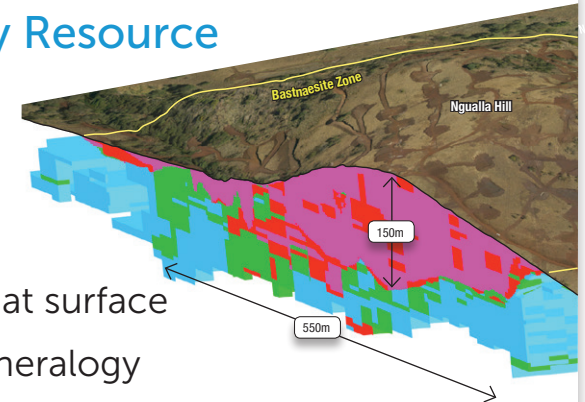
**86%**  
OF ANNUAL  
REVENUE



## Large Quality Resource

- High Grade
- Mineralisation at surface
- Favourable Mineralogy
- Very low U and Th

REO %:  
 >4%  
 3 to 4%  
 2 to 3%  
 1 to 2%



## Robust Project Economics

- Low OPEX US\$10.18/kg
- Low CAPEX US\$373 M (including SX Plant)
- Average Annual Revenue US\$378 M
- Payback in 2nd year
- >50 year mine life

## Metallurgical Process

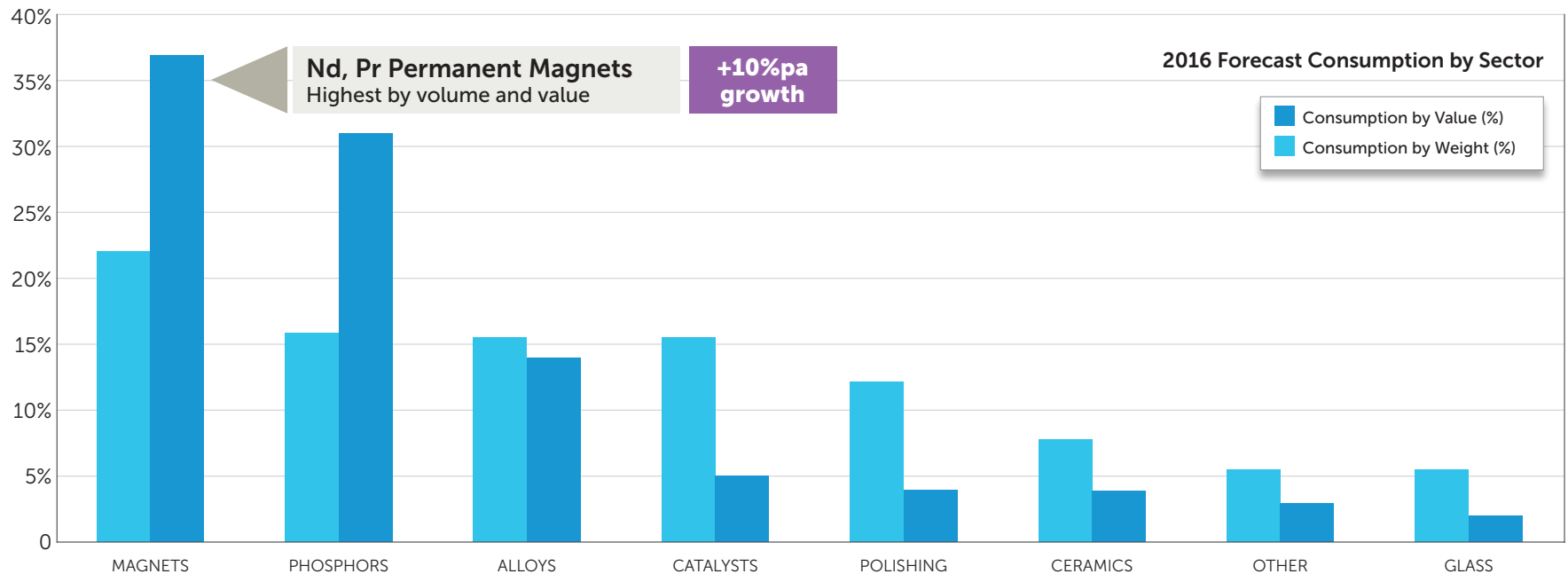
- Demonstrated low cost processing route from mineralisation to high purity separated rare earth oxides





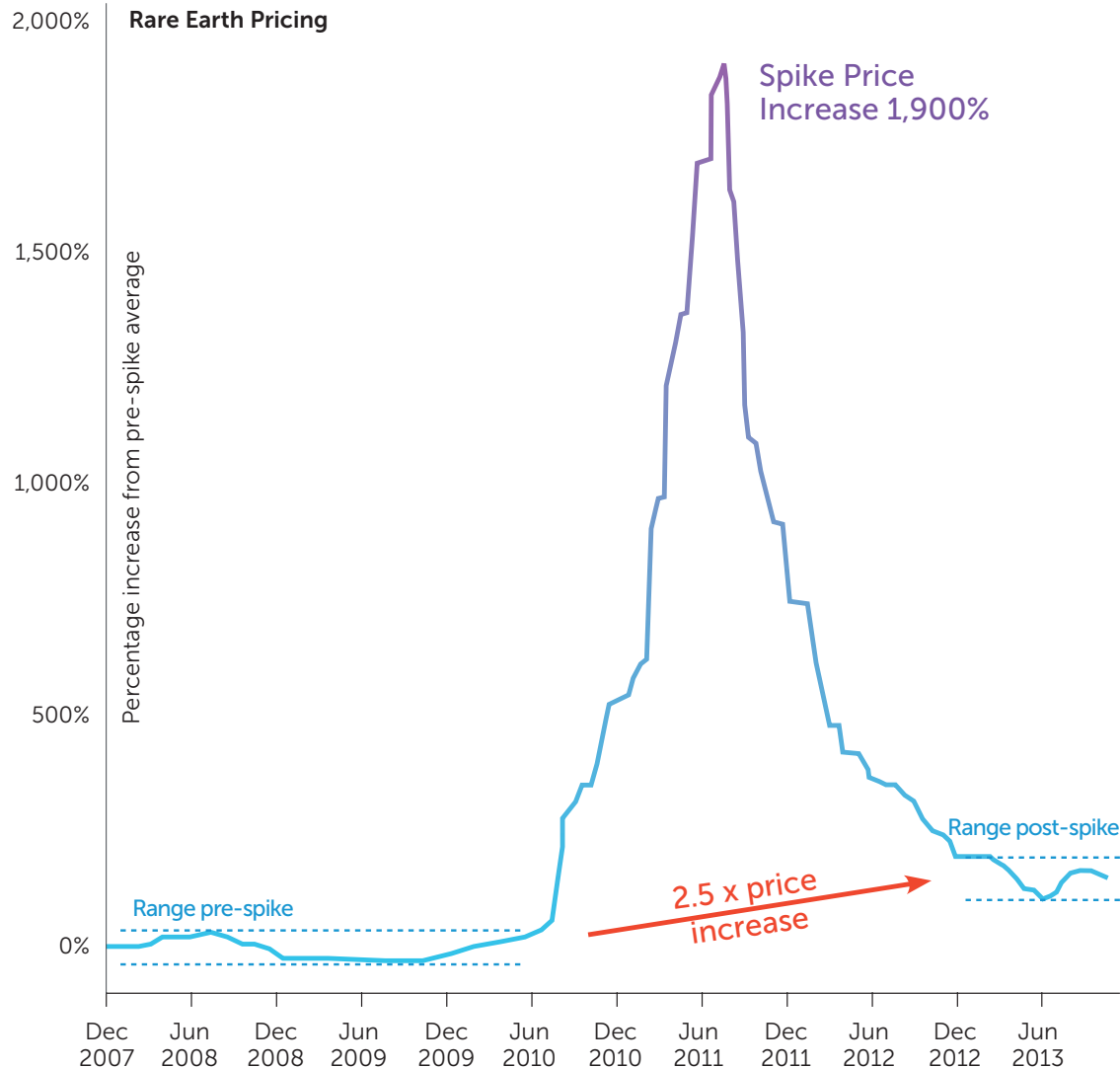
# Rare Earth Applications

- Rare earths have a range of applications including emerging 'green technologies' and consumer electronics industries
- 2013: \$3-5B market, ~125,000tpa REO (2013, IMCOA)
- The magnet industry (Nd-Pr) is the largest consumer of rare earths and is forecast to show the highest growth at 10%pa driven by increasing demand from the wind turbine, automobile and personal electronics sectors



Source: IMCOA, November 2012

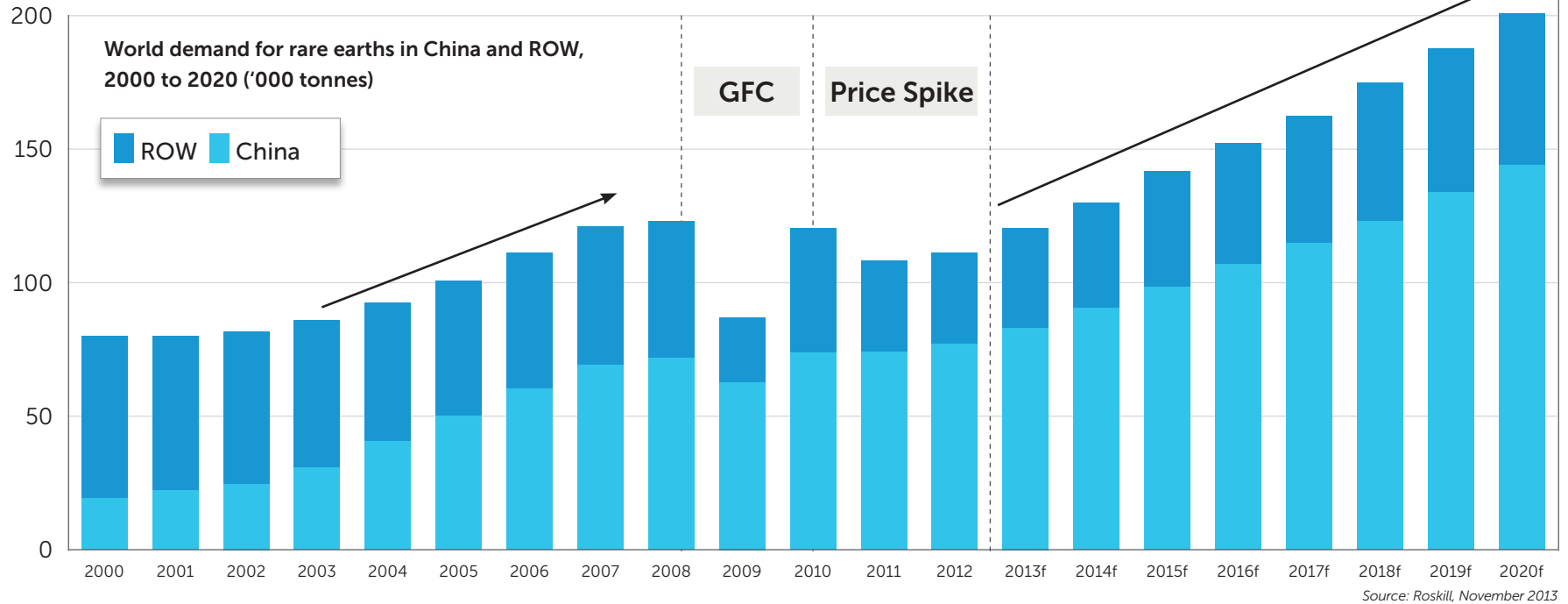
# Stability After the Price Spike



- The GFC and the price spike of 2011 temporarily halted growth in the RE market
- Some permanent Ce and La market lost due to RE recycling in the glass polishing industries
- Encouraged a host of high cost, high Capex new development projects
- RE prices are now stabilizing to industry acceptable levels
- Magnet metals re-establishing their dominance in market value and growth

# Rare Earth Industry Rejuvenated







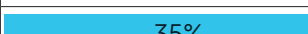
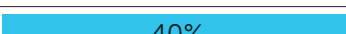










- Growth is set to resume
- New suppliers add confidence to supply
- Lower prices encourage use
- Stockpiles depleted
- ROW push to develop alternative supply chain
- Will high cost new projects fail (>US\$1b Capex and/or Opex >\$15/kg)?



Return to normal business fundamentals:  
Low cost projects producing high quality, high demand products will prevail.



# Rare Earths Are Not Equal


	REO	2012 demand (tonnes)	"Price US\$/kg (MP - 19/11/13)"	World Market Value (US\$M)	2012 World Market Value	2016 World Market Value
Light Rare Earths	Lanthanum	29,325	\$6	182	 5%	 4%
	Cerium	48,825	\$6	273	 7%	 7%
	Praseodymium	4,900	\$118	576	 15%	 16%
	Neodymium •	18,575	\$73	1,347	 35%	 40%
	Samarium	755	\$9	7	0%	0%
Heavy Rare Earths	Europium •	430	\$975	419	 11%	 9%
	Gadolinium	1,435	\$47	67	 2%	 2%
	Terbium •	305	\$825	252	 7%	 8%
	Dysprosium •	980	\$520	510	 13%	 9%
	Erbium	780	-	-	-	-
	Yttrium •	8,560	\$22	184	 5%	 5%
	Ho-Tm-Yb-Lu	130	-	-	-	-
<b>Total</b>		<b>115,000</b>		<b>3,816</b>	<b>100%</b>	<b>100%</b>

\* Metal Pages, 19 November 2013. # Values for 2012 and 2016 calculated using Metal Pages REO FOB Prices, 19 November 2013. ^ IMCOA, February 2013 (+/- 20%). • Critical Rare Earth, US DoE 'Critical Materials Strategy report, December 2011'


- Light RE: \$2.4billion or 62% annual market value. Heavy RE: 38%
- Magnet metals: Nd-Pr are 50% of 2012 world market value
- Growing to 56% in 2016 (even at 2013 prices - Nd-Pr prices are predicted to increase with respect to others due to higher demand)

# Rare Earth Magnets

- Neodymium-praseodymium demand from the magnet industry set for strong growth at 10-12% pa
- Growth driven by automotive industry, wind farms and hybrid and electric vehicles
- NdFeB magnets the largest market for REs at 23,000t in 2012
- Hybrid and electric vehicles: 15-20% growth 2012-20
- Direct drive technologies for large new offshore wind turbines rely on NdFeB magnets



The current generation of hybrid cars each require over 10 kg of rare earth metals



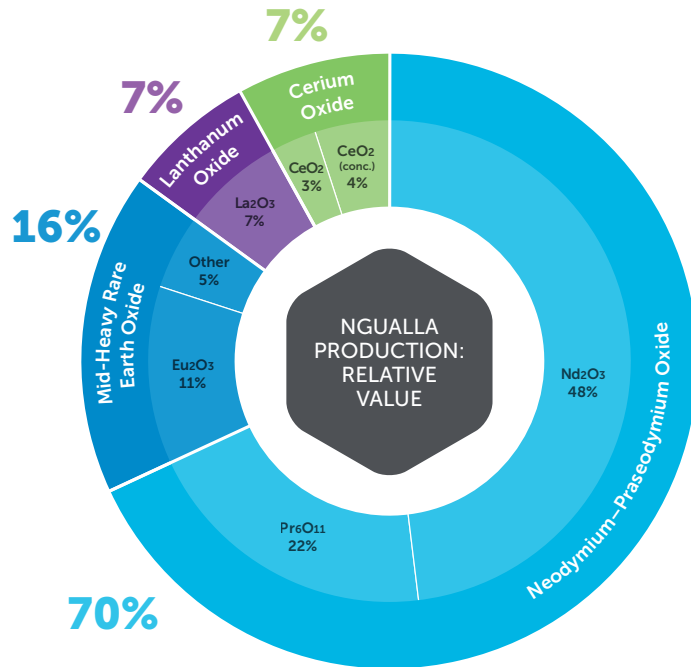
Production of EV/HEV predicted to reach 6.6 million by 2020

A modern 3MW wind turbine uses about 600kg of neodymium and praseodymium

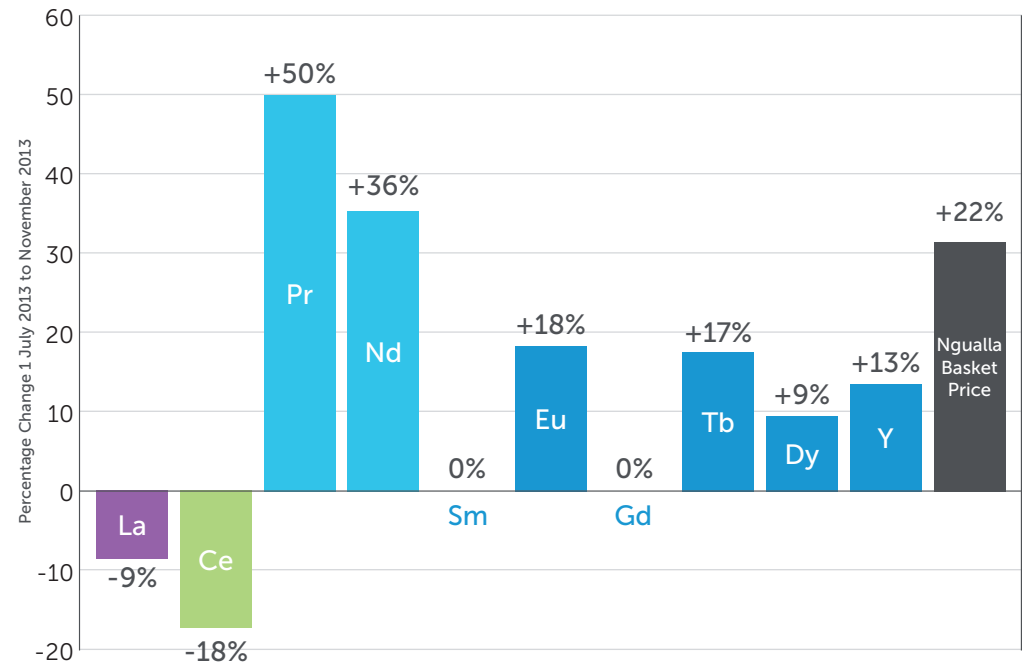
Source: Roskill November 2013

# Ngualla's Value Drivers – Nd, Pr, Eu

Predicted revenue



Recent price increases

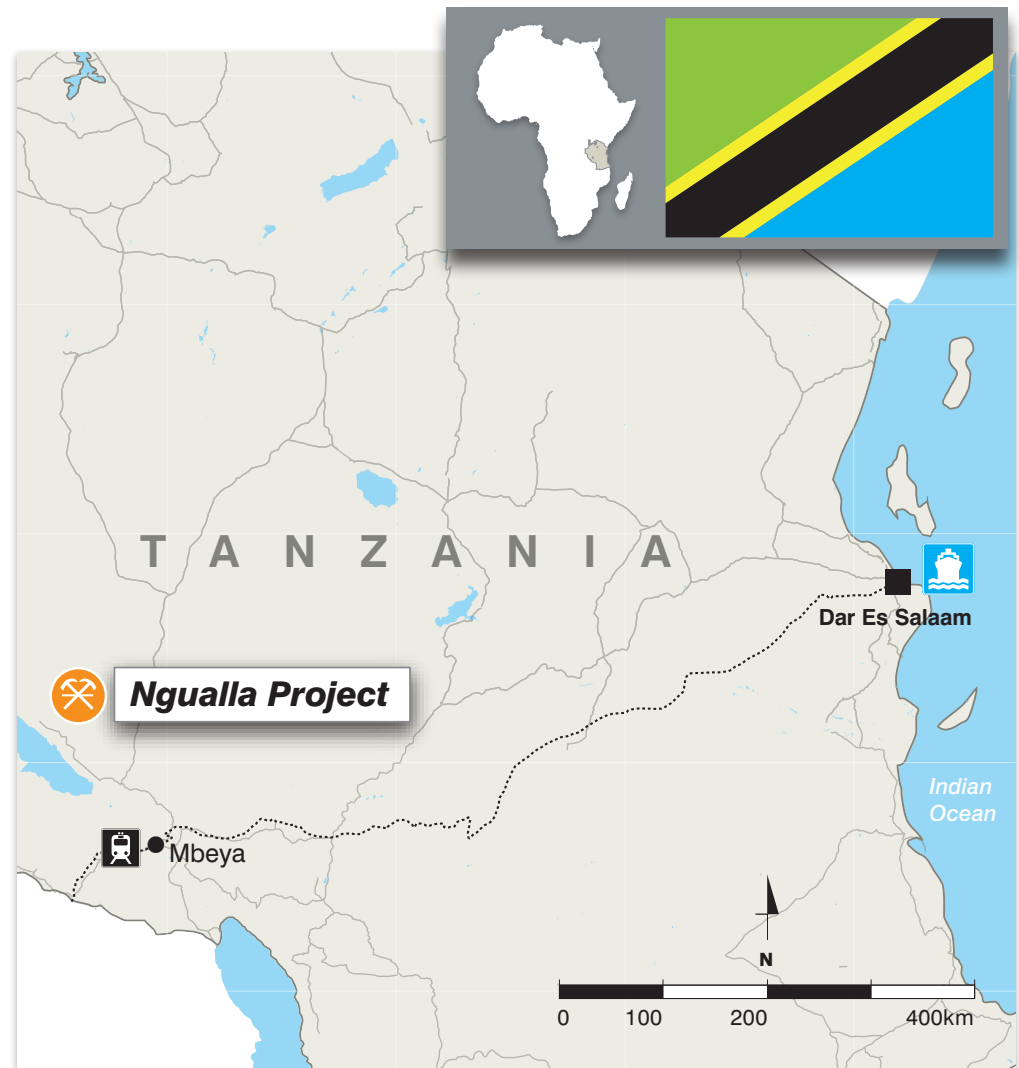


- Aligned with RE market value, demand and growth
- 86% revenue underpinned by high value Magnet and Critical rare earths
- Increasing demand will support prices

- Rare earth price movements since 1 July 2013
- Ngualla's main value drivers show large price increases

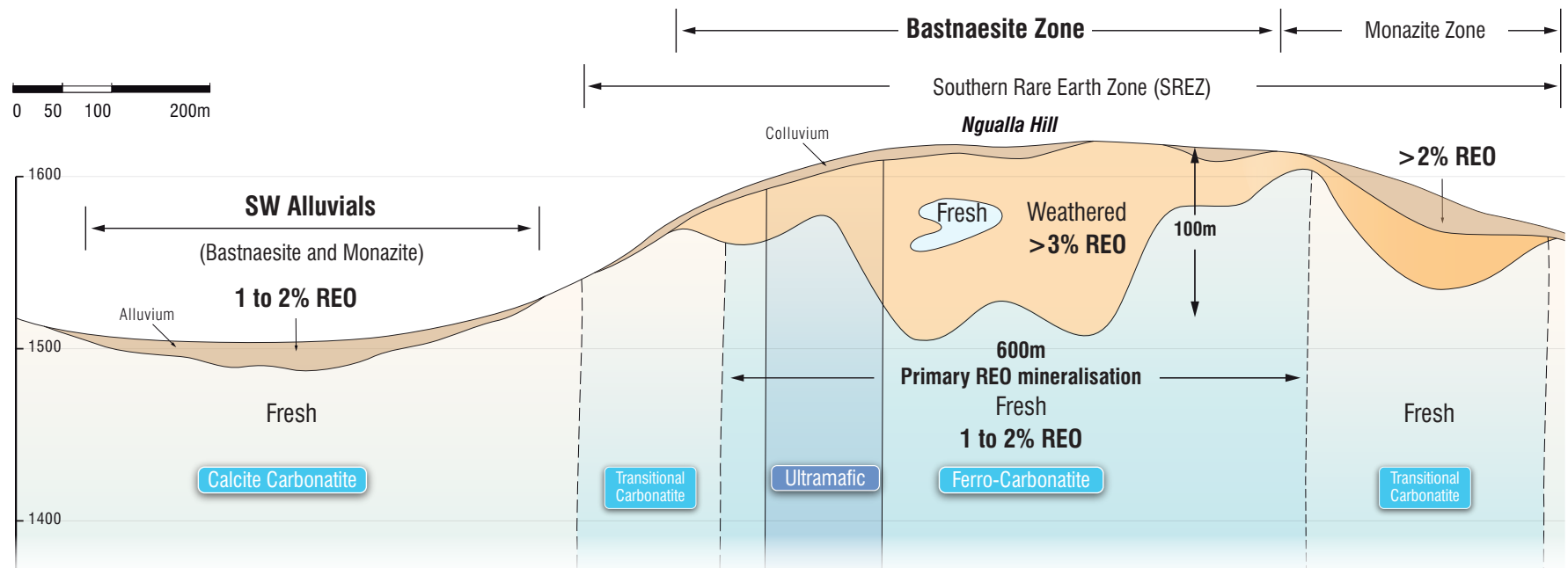
# Ngualla Project location and infrastructure

- Established mining culture
- Fourth largest gold producer in Africa
- Politically stable
- Government investment incentives and guarantees
- Transportation infrastructure
- Logistics - low tonnage high value product
- Independent, on-site power as bi-product of acid plant



## A Quality Asset – 100% owned

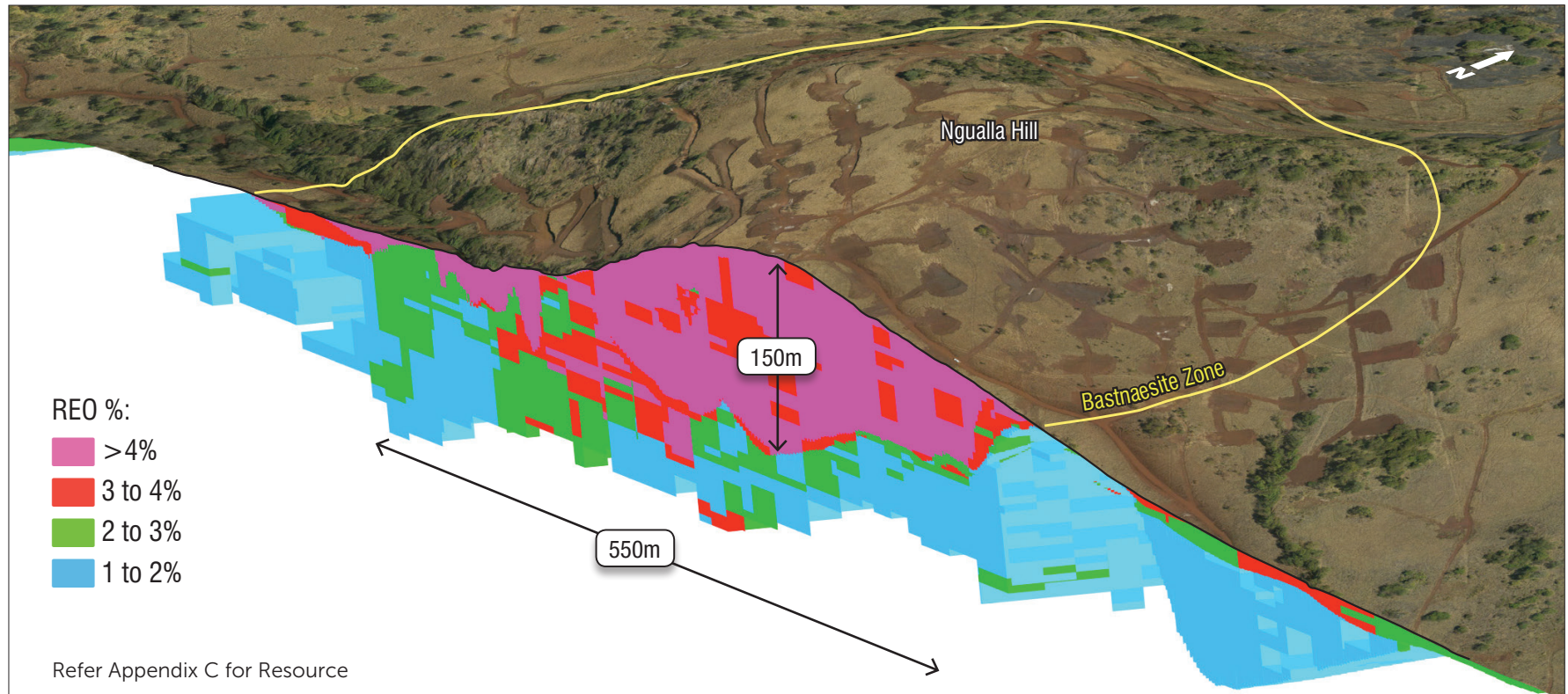
- Thick zone of high grade >5% REO at surface
- Globally significant Resource – grade and tonnes
- A virgin discovery – First drill hole August 2010
- 40,400m in 781 drill holes for April 2013 Resource
- Well defined, 85% is Measured JORC category





# The Resource

- 195Mt at 2.26% REO containing 4.4Mt REO including:  
Bastnaesite Zone weathered: 21.6Mt at 4.54% REO for 982,000t contained REO
- Open pit mining, low strip First 25 years 5.35% REO
- >50 year mine life in Bastnaesite Zone alone





# Mineralogy – key to low risk and costs

## Mineralogy distinguishes a quality deposit

- Weathered Bastnaesite Zone – simple mineralogy
- Host rock leached of carbonates
- No phosphate or monazite
- Non radioactive – U 14ppm, Th 42ppm

## Enables simple 3 stage metallurgical process



### Diamond core NDD006:

Weathered iron oxide- barite carbonatite containing high grade mineralisation, **3 to 8 % REO**.

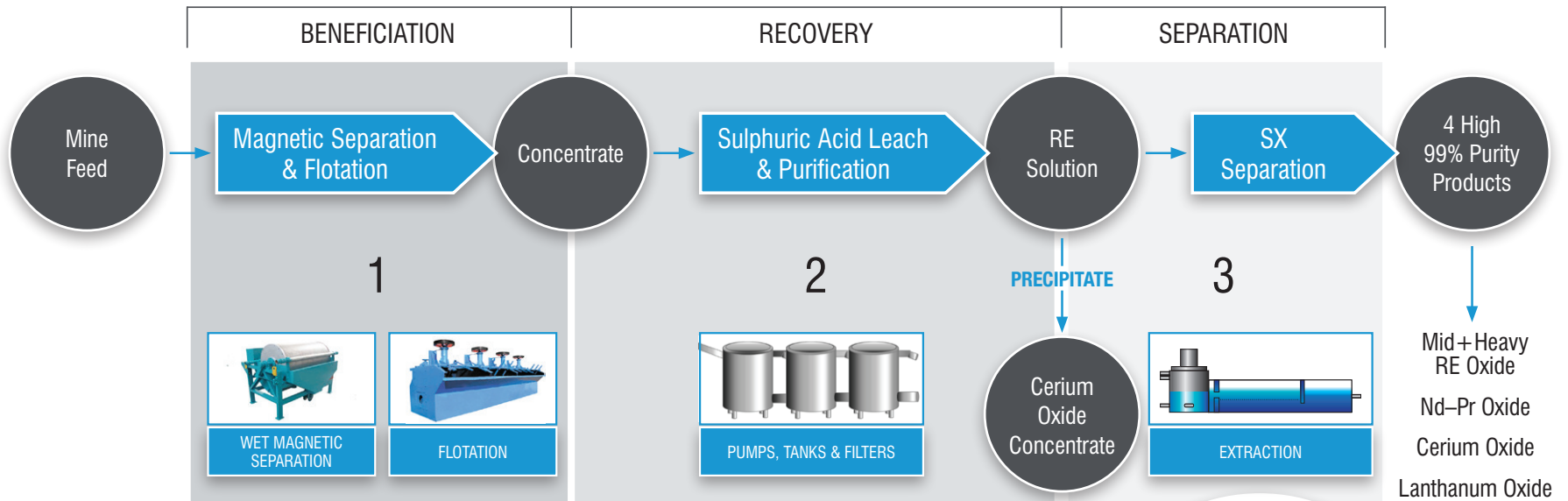
Amenable to simple sulphuric acid leach as majority of carbonate minerals removed through weathering.

Sharp karstic surface contact between weathered and fresh carbonatite.

Fresh carbonatite rock containing primary mineralisation **1 to 2.5% REO**.

# Metallurgy - Overview

- Simple three stage process



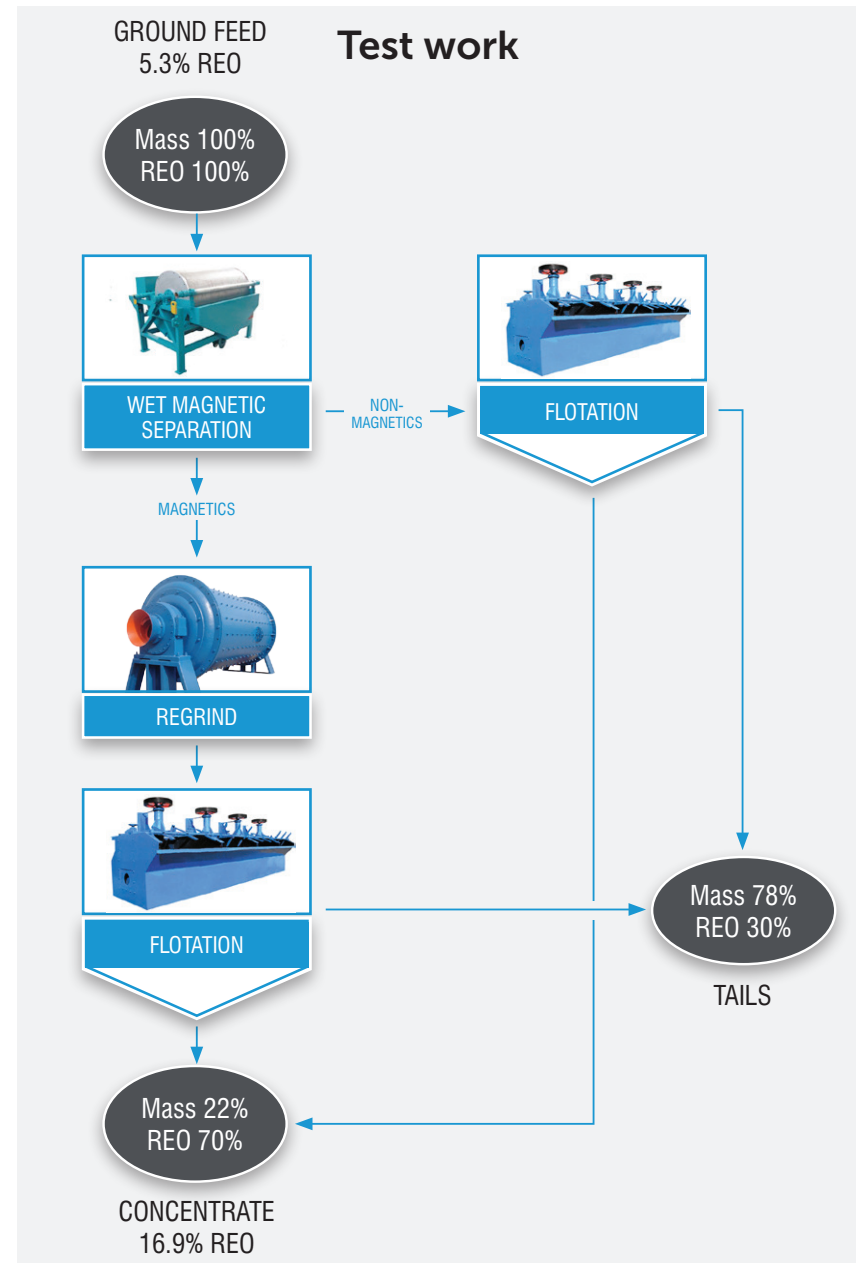
- Demonstrated, proven metallurgical process from mineralisation to high purity separated products
- Low operating and capital costs



▲ Nd-Pr Oxide

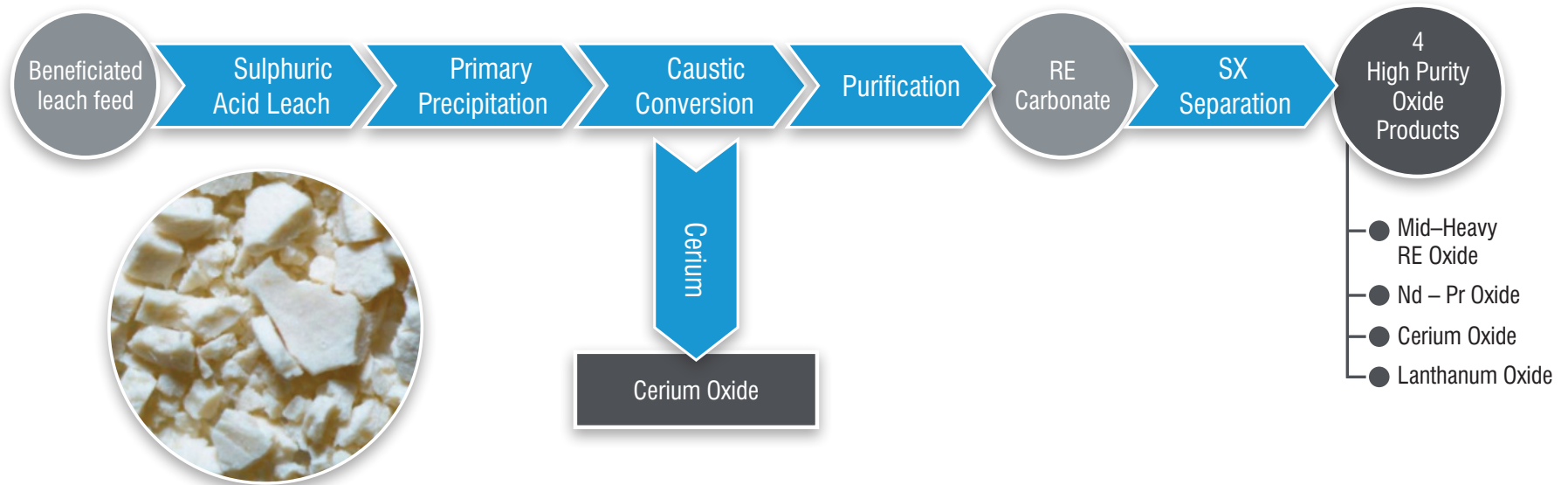
# Metallurgy 1 - Beneficiation

- Key to lower operating and capital costs
- Reduced down stream leach recovery plant, acid plant, reagents, tailings
- Established technology
- 78% mass rejection for 70% REO recovery achieved in initial test work
- Optimisation test work planned to increase concentrate grade above 20% REO



## Metallurgy 2 - Recovery

- Proven sulphuric acid leach process – 83% REO recovery
- Tanks, pumps and filters: simple proven technology, low cost, low risk process
- No baking and expensive, difficult to operate kilns
- Sulphuric acid generated on site
- Early removal of cerium

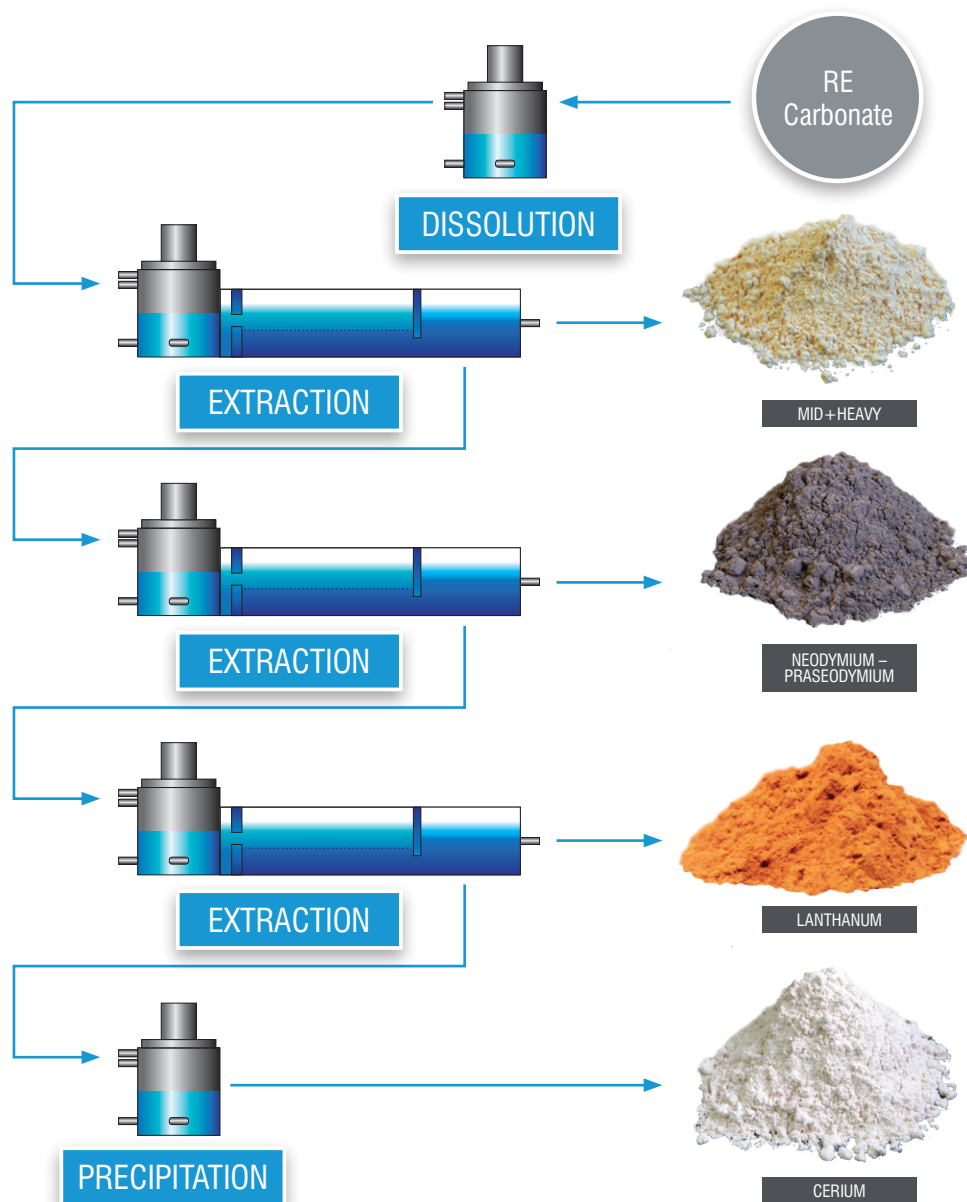


▲ 56% REO high grade rare earth carbonate produced in test work.

▲ Simplified flow sheet of sulphuric acid leach process to solvent extraction for Ngualla bastnaesite mineralisation into four product streams.

## Metallurgy 3 - Separation

- Adding value and accessing wider markets
- Distinguishes Ngualla from other projects
- Four high purity (>99%) separated products:
  - Mid+Heavy RE Oxide
  - Nd–Pr Oxide
  - Ce Oxide
  - La Oxide
- Completed in Pilot Plant in October 2013 from bulk sample Ngualla mineralisation at



# Economic Assessment – Financial Highlights

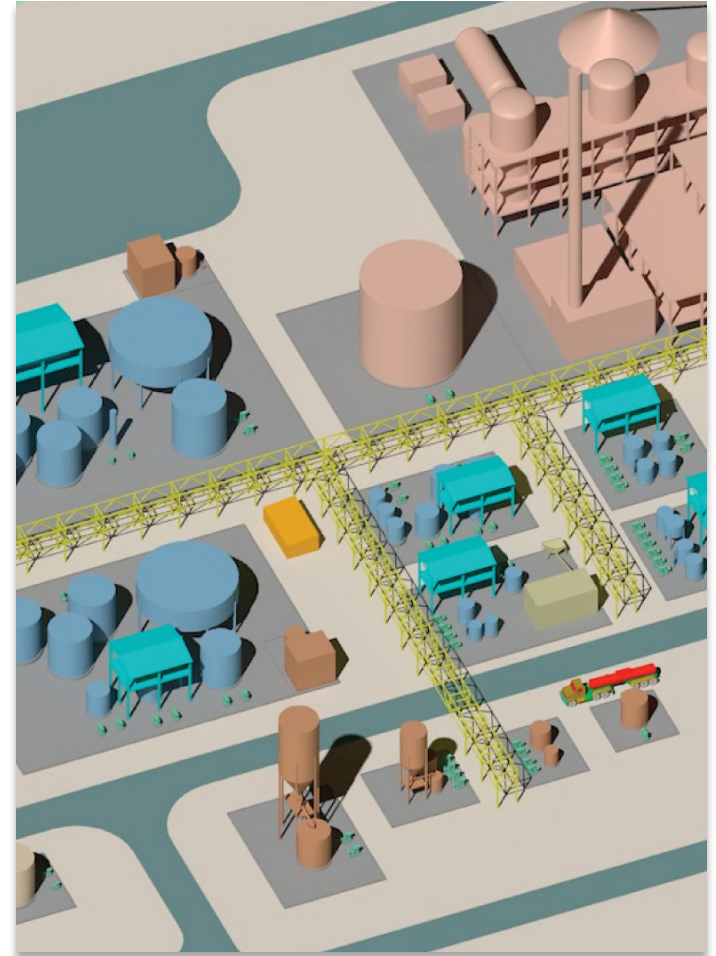
NPV & IRR	NPV @ 10% discount rate (Pre-tax and Royalties)	US\$ 1.768 billion
	IRR (Pre-tax and Royalties)	60%
Capital Expenditure	Capital Cost (excluding contingency)	US\$ 373 million
	Pay back from production start up	In 2nd Year
Cash Cost	Average (LoM) Cash Cost (FOB) (excluding amortisation, depreciation and royalties)	US\$ 10.18 / kg
Revenue	Average Annual Revenue (after Ramp Up)	US\$ 378 million
	In-Ground Basket Price (FOB)	US\$ 38.84 / kg
	Average Annual TREO Production	10,409 tonnes

The Economic Assessment assumptions are contained within the 'Revised Scoping Study' ASX announcement of 29 May 2013.  
Please refer to safe-harbour statement at beginning of this presentation.



# Outlook and News Flow

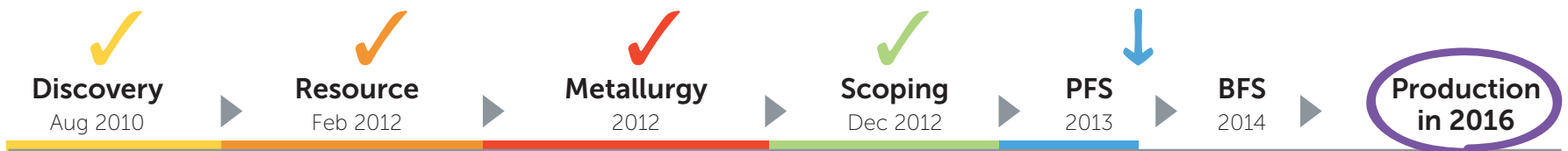
- Rare earth prices stabilising at sustainable levels
- Growth forecast for Ngualla's value drivers
- Strong interest from consumers for low cost, reliable, non-China RE supply from Ngualla
- Preliminary Feasibility Study (Q1 2014)
  - Low cost cerium production options
  - SX Pilot Plant data and new Resource
  - Location of processing plants option study
  - Revised economic assessment
- Maiden Reserve statement (Q1 2014)



▲ 3D plant layout of Ngualla processing plant facility (detail)

# Development Pathway

- **Strategic investor, technical and off take partners**  
Discussions with several parties currently in progress
- **Evaluation of additional phased development options**  
*Potential to reduce initial capex even further and fast track to production*  
Markets for concentrates and / or mixed carbonate  
Toll treating for separation  
Phased start up production levels
- **Metallurgical process optimisation**  
Optimisation of beneficiation  
Acid leach optimisation  
Acid recycling  
Beneficiation and acid leach pilot plants
- **Definitive Feasibility Study**



# Developing a low cost rare earth project

# Thank you

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## Appendix A – Product and value splits

**The value drivers for Ngualla are the Nd - Pr and Mid+HRE >99% purity products**

These include the higher value 'Critical RE's' forecast to be in undersupply.

86% of the annual revenue (December 2012 Scoping Study) is from the high purity Nd – Pr and Heavy Rare Earth products.

The lower value Ce and La are relative by-products at only 14% of the total revenue.

Product	Status of production of high purity REO products	Total Equivalent REO Production t/y*	Relative Value Contribution
Nd–Pr Oxide	✓ Completed	2,216	70%
Mid+Heavy Oxide	✓ Completed	300	16%
La Oxide	✓ Completed	2,875	7%
Ce Oxide	✓ Completed	1,256	3%
Ce Oxide (concentrate)*	✓ Completed	3,762	4%
<b>Total</b>		<b>10,409</b>	<b>100%</b>

\* Rare earth distribution derived from April 2013 Mineral Resource estimate for Bastnaesite Zone weathered mineralisation +3% REO. #Concentrate discounted to 53% of oxide price. Rare earth prices for relative value from Metal Pages, 19 November 2013.

# Appendix B

## List of specialist consultants behind the Peak team

Company	Responsibility
ANSTO	SX pilot plant
Amdel B.V.	Comminution test work
P.D.C	Scoping study project management, infrastructure, tailings, services, environmental, civil engineering, logistics and independent technical report preparation
Hatch	Mineral Process engineering, including sulphuric acid plant, comminution and beneficiation circuits, rare earth recovery and solvent extraction plants
H&S Consulting Pty Ltd	Independent specialists for Mineral Resource model and estimation
Independent Metallurgical Operations Pty Ltd (IMO)	Beneficiation process design and test work
Met-Chem Consulting Pty Ltd	Beneficiation and hydrometallurgical process flow sheet studies and development
Nagrom	Beneficiation and metallurgical test work
Orelogy	Mine engineering, geotechnical, pit optimisation and scheduling
Radiation Advice & Solutions Pty Ltd	Assessment of radiation levels in the mineralisation and process
Roger Townend	Mineralogy
SGS Australia Laboratories	Analytical laboratory for drill samples
Dr Wally Witt	Geological specialist consultant

## Appendix C – JORC Resource estimates

### Classification of Mineral Resources for the Bastnaesite Zone weathered mineralisation at a 3.0% cut-off grade

Lower cut – off grade	Resource Category	Tonnage (Mt)	REO (%)*	Contained REO tonnes
<b>3.0% REO</b>	Measured	19	4.53	840,000
	Indicated	2.9	4.62	140,000
	Inferred	0.11	4.10	4,000
	<b>TOTAL</b>	<b>21.6</b>	<b>4.54</b>	<b>982,000</b>

### Classification of Mineral Resources for the Total Ngualla Project at a 1.0% REO cut off grade

Lower cut – off grade	JORC Resource Category	Tonnage (Mt)	REO (%)*	Contained REO tonnes
<b>1.0% REO</b>	Measured	81	2.66	2,100,000
	Indicated	94	2.02	1,900,000
	Inferred	20	1.83	380,000
	<b>TOTAL</b>	<b>195</b>	<b>2.26</b>	<b>4,400,000</b>

\*REO (%) includes all the lanthanide elements plus yttrium oxides. Figures above may not sum precisely due to rounding. The number of significant figures does not imply an added level of precision.

The information in this report that relates to Mineral Resources is based on information compiled by Rob Spiers, who is a member of The Australasian Institute of Geoscientists. Rob Spiers is an employee of geological consultants H&S Consultants Pty Ltd. Rob Spiers 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Rob Spiers consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



## Appendix D – In-ground rare earth distribution of major deposits

	OXIDE	Ngualla Bastnaesite Zone %	Mountain Pass %	Bayan Obo %	Mt Weld %
Light Rare Earths	Lanthanum	27.6	33.2	27.1	23.9
	Cerium	48.2	49.1	49.9	47.5
	Praseodymium	4.73	4.30	5.15	5.16
	• Neodymium	16.6	12.0	15.4	18.1
	Samarium	1.60	0.80	1.15	2.40
Heavy Rare Earths	• Europium	0.30	0.10	0.19	0.53
	Gadolinium	0.61	0.20	0.40	1.09
	• Terbium	0.05	0.06	-	0.09
	• Dysprosium	0.08	0.05	0.30	0.25
	Other	0.05	0.09	0.03	0.13
Other	• Yttrium	0.20	0.10	0.20	0.76
		<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

The blue markers (•) denote the five “critical rare earths”, which are predicted to be in undersupply in the years ahead and predicted to command significantly higher value than other rare earths. (US DoE, ‘Critical Materials Strategy’ report, December 2011). Source: TMR & Arafura website.