

## Peak to increase focus on Magnet Metal rare earths for Ngualla

Peak Resources Limited ("Peak" or the "Company"; ASX Code: PEK) is pleased to provide an update on development studies and the growing importance of Ngualla's Magnet Metals to the rare earth market.

### Summary

- The Magnet Metal rare earths, particularly neodymium and praseodymium, are of increasing importance to the global rare earth market (by value), driven by growing demand from personal electronic mobile devices, hybrid and electric cars and wind energy.
- The Magnet Metals have risen sharply from 47% of the world rare earth market value in 2011 to 74% in 2014. Continued high growth rates of 7% per annum for these rare earths are forecast to 2020<sup>(1&2)</sup>.
- Peak's Ngualla Project is one of the world's highest grade neodymium-praseodymium development projects. The Company is to focus on a production profile tailored to these high value, high growth Magnet Metals by significantly reducing production of cerium. Cerium is a low value rare earth that is predicted to continue in oversupply.
- Laboratory scale testwork has demonstrated that it is possible to reject 80% of cerium early during the leach recovery stage. The anticipated advantages of this are as follows:
  - Reducing the required production capacity of the separation plant by 40%, leading to a smaller plant being required
  - Reducing hydrochloric and oxalic acid requirements (the major operating cost drivers) in the separation plant by up to 60%
  - Reducing Ngualla's estimated overall projected revenue by only 6%
  - Increasing expected operating margins
- At current prices and Ngualla's revised rare earth production profile, **81% of Ngualla's projected revenue will now be derived from neodymium and praseodymium**

1) Roskill: Market Outlook to 2020. 15th Edition 2015 and 2) Prof. Dudley Kingsnorth, Curtin-IMCOA

## Summary Details

### Magnet Metals growth

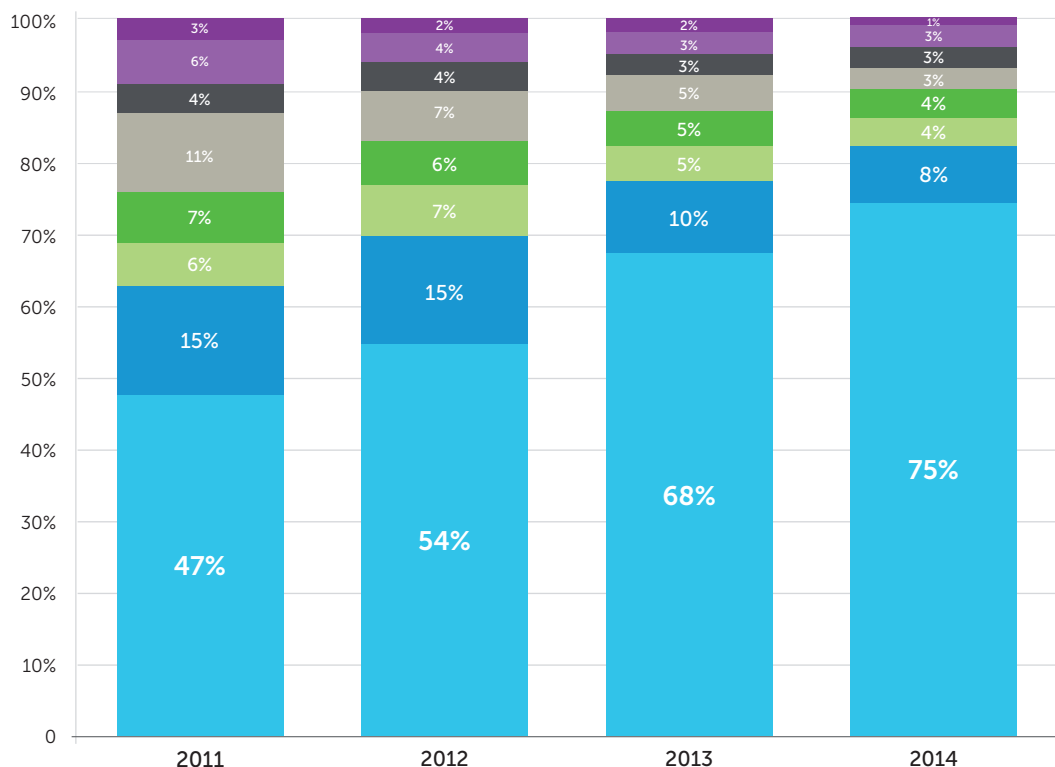
The rare earths used in the manufacture of high strength permanent magnets comprise neodymium, praseodymium, terbium, dysprosium, gadolinium and samarium (the Magnet Metals).

In recent years, the contribution of the Magnet Metals to the global rare earth market value has increased markedly - from 47% in 2011, to 74% in 2014 (Figure 1). The increase in demand for these rare earths is driven largely by growth in permanent magnet end use sectors including personal electronic mobile devices such as mobile phones, computer hard drives, audio equipment, hybrid and electric cars and wind energy turbines.

**Figure 1:** The increasing importance of the rare earth permanent magnet industry to the global rare earth market value, 2011 to 2014.

Source data - Curtin-IMCOA.

- Glass Additives
- Polishing Powders
- Other
- Catalysts
- Metal Alloys
- Ceramics
- Phosphors
- Permanent Magnets

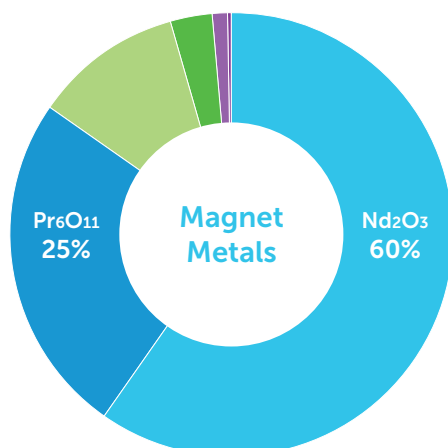


The most important of these six rare earths in terms of both value and volume are neodymium and praseodymium, which together comprised 85% of the Magnet Metals market value in 2014 (Figure 2). The importance of dysprosium continues to decline as its use has been reduced or phased out completely in many permanent magnet applications due to high cost and uncertainty of supply.

**Figure 2:** Magnet sector breakdown of individual rare earths by relative value contribution (2014).

Source data - Curtin-IMCOA.

- Neodymium 60%
- Praseodymium 25%
- Dysprosium 11%
- Terbium 3%
- Gadolinium 1%
- Samarium <1%



Continued high growth rates of 7% pa are predicted for the Magnet Metals by market forecasters Roskill and Prof. Dudley Kingsnorth, Curtin-IMCOA.

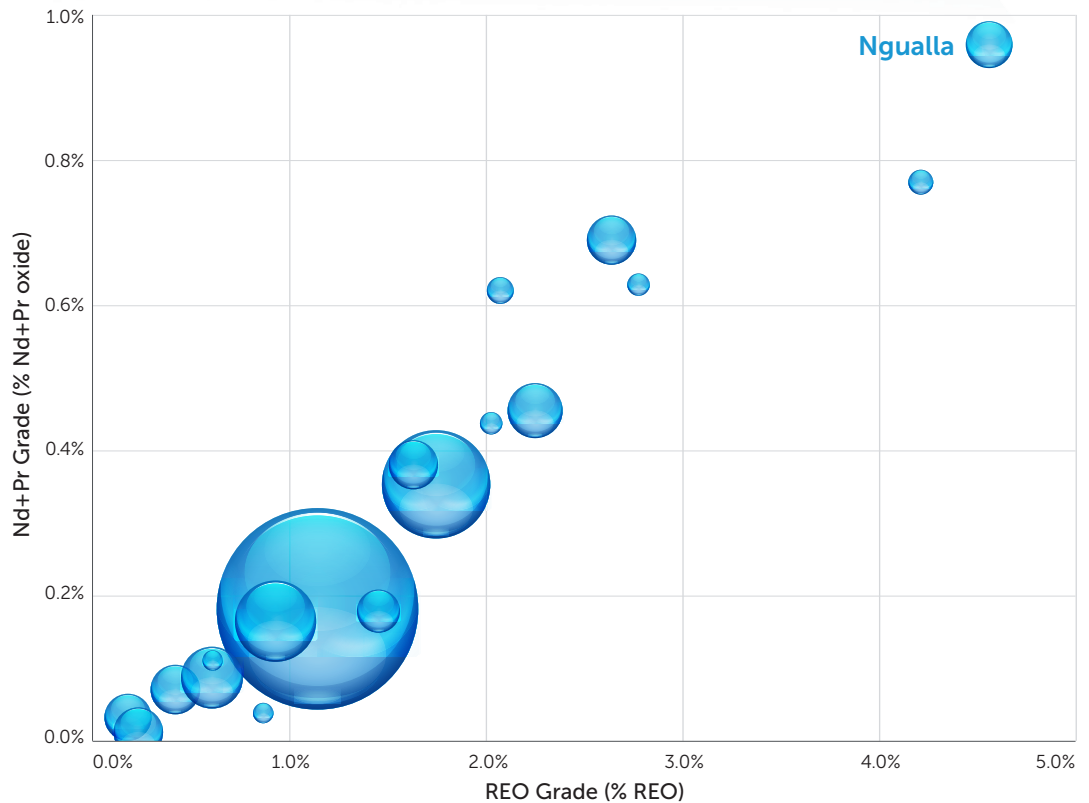
At 2014 prices, neodymium and praseodymium comprised 71% of the value of the global rare earth market, with the remaining 16 rare earths including yttrium together making up a relatively minor proportion at just 29%.

**Figure 3:**  
Neodymium+praseodymium rare earth oxide grades vs. total rare earth grades of potential rare earth development projects.

● Bubble size: Mineral Resource Tonnes.

Source: Company Reports and Technology Metals Research.

See Appendix Tables 1 and 2 for Ngualla’s Mineral Resource classification and relative breakdown of individual rare earths.



### Significance for Ngualla

The growing importance of neodymium and praseodymium in terms of relative rare earth market share and absolute value is positive for Ngualla, since the project is particularly well endowed with these rare earths and is one of the highest grade neodymium-praseodymium development projects outside of China (Figure 3).

### Cerium Rejection

Initial laboratory scale leach recovery testwork has been completed in 2015 on samples of high grade mineral concentrate produced by the improved beneficiation process (ASX announcement “Ngualla Rare Earth Project Beneficiation Breakthrough”, 7 August 2014) developed since the completion of the Preliminary Feasibility Study (PFS) in March 2014.

The testwork indicates that it is possible to efficiently reject 80% of cerium early, during the leach recovery stage and before the commencement of the separation phase of the metallurgical process.

A strategy of rejecting cerium in the process early has significant potential advantages for the Ngualla operation.

The PFS (ASX announcement “Peak Resources Delivers Robust PFS for Ngualla”, 19 March 2014) indicates that 45% of rare earths to be produced are cerium. Cerium is a low value rare earth that is in oversupply. By rejecting 80% of this low value product during the leach recovery phase, the required production capacity of the subsequent separation plant can be reduced by approximately 36%, leading to a smaller (and therefore potentially lower cost) plant.

An 80% reduction in cerium processed by the separation plant would also reduce hydrochloric acid, caustic soda and oxalic acid consumption by approximately 60% in this section of the plant. These reagents are the major contributors to operating costs in the separation plant, which constitutes 35% of the overall project operating costs in the PFS.

The cerium rejection has a relatively small impact on Project economics, reducing Ngualla’s estimated overall projected revenue by only 6% at today’s prices.

Marketing for Ngualla’s product would be improved as cerium is currently (and expected to continue) in oversupply. As a low value product, where the production cost exceeds the sale price, operating margins also would be increased.

At current prices and a revised rare earth production profile contemplating the rejection of 80% of cerium, a significant **81% of Ngualla's revenue** would be derived from neodymium and praseodymium.

Peak is pleased with the results of the initial cerium removal testwork and is continuing with the optimization of the leach recovery flowsheet and with the financial and technical support of the Appian Natural Resource Fund and IFC continues to focus on project delivery as we move into the Definitive Feasibility Study stage of development.

For and on behalf of Peak Resources Limited.



Darren Townsend, Managing Director

## Appendix 1

**Table 1: Classification of Mineral Resources for the Bastnaesite Zone weathered mineralisation at a 3.0% cut off grade.**

Lower cut – off grade	JORC Resource Category	Tonnage (Mt)	REO (%)*	Contained REO tonnes
3.0% REO	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>

\* REO (%) includes all the lanthanide elements plus yttrium oxides. See Table 2 for breakdown of individual REO's. Figures above may not sum precisely due to rounding. The number of significant figures does not imply an added level of precision. Reported according to the JORC 2004 Code of Guidelines.

**Table 2: Relative components of individual rare earth element oxides (including yttrium) as a percentage of total REO for the weathered Bastnaesite Zone +3% REO Mineral Resource.**

Oxide	Bastnaesite Zone Mineral Resource at 3.0% cut %	
Lanthanum	La <sub>2</sub> O <sub>3</sub>	27.6
Cerium	CeO <sub>2</sub>	48.2
Praseodymium	Pr <sub>6</sub> O <sub>11</sub>	4.73
Neodymium	Nd <sub>2</sub> O <sub>3</sub>	16.6
Samarium	Sm <sub>2</sub> O <sub>3</sub>	1.60
Europium	Eu <sub>2</sub> O <sub>3</sub>	0.30
Gadolinium	Gd <sub>2</sub> O <sub>3</sub>	0.61
Terbium	Tb <sub>4</sub> O <sub>7</sub>	0.05
Dysprosium	Dy <sub>2</sub> O <sub>3</sub>	0.08
Holmium	Ho <sub>2</sub> O <sub>3</sub>	0.01
Erbium	Er <sub>2</sub> O <sub>3</sub>	0.03
Thulium	Tm <sub>2</sub> O <sub>3</sub>	0.00
Ytterbium	Yb <sub>2</sub> O <sub>3</sub>	0.01
Lutetium	Lu <sub>2</sub> O <sub>3</sub>	0.00
Yttrium	Y <sub>2</sub> O <sub>3</sub>	0.20
	<b>Total %</b>	<b>100</b>

Mineral Resources are reported according to the 2004 JORC Code and Guidelines, (ASX Announcement 'Increased Resource Estimate to Improve Ngualla Project Economics', 4 April 2013). The information and material assumptions underpinning the Mineral Resource estimates continue to apply and have not materially changed.

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