

ABx Group (ABX)

Deep Leads Rare Earths MRE now over 50 million tonnes

Resource upgrade includes continued high Dysprosium & Terbium levels

ABx Group have announced another significant increase to the Mineral Resource Estimate (MRE) at the Deep Leads Ionic Adsorption Clay (IAC) Rare Earths deposit in Northern Tasmania.

The size of the deposit has increased by nearly 93% to 52 million tonnes with grade increasing slightly to 806ppm of Total Rare Earth Oxides. Since the maiden resource of 3.9 million tonnes was announced in November 2022, the Deep Leads Prospect in Northern Tasmania has swiftly developed into a Rare Earths project with commercial significance.

While we have maintained our previous target price of \$0.33/share for the company, we note that our valuation of the Deep Leads Project on its own now sits at A\$50 million or \$0.21/share.

The deposit's high ratios of Dysprosium and Terbium (Dy & Tb) set it apart from most of other the Rare Earth projects and are some of the highest Dy/Tb ratios seen globally. Figure 1 below compares the higher absolute levels of Dy and Tb of some Australian listed Clay hosted REE resources.

Project	Grade (ppm)			
	Pr	Nd	Tb	Dy
ABx - Deep Leads	36	142	5	31
Ionic Rare Earths - Makuutu	30	110	2	10
Australian Rare Earths - Koppamurra	37	139	4	21
Meteoric Resources - Caldeira	154	447	5	25
Average	64	210	4	22

Figure 1: Grades of Magnet Rare Earths in Australian listed IAC deposits.

Dysprosium and Terbium make up two of the four Permanent Magnet Rare Earth (the others being Neodymium and Praseodymium – Nd & Pr). The end uses for Dy and Tb are in the manufacturing of high-grade magnets used in Wind Turbines and Electric Vehicle motors.

Forecasts for global dysprosium and terbium markets continue to indicate significant supply shortages for the two critical Rare Earth elements as the world transitions to higher levels of renewable energy.

Deep Leads Resource upgraded to 52 million tonnes

ABx Group have reported a further substantial increase to the Deep Leads Resource. The new MRE has almost doubled to 52 million tonnes (previously 27 million tonnes) at 817 ppm Total Rare Earth Oxides (TREO). In addition, the cut-off grade has been increased since the last MRE from 250ppm TREO – CeO₂ to 350ppm TREO – CeO₂.

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Company Data

ASX code	ABX
ASX price	\$0.07
Shares on issue	242.3 mill.
Market capitalisation	\$18.4 mill.
Cash on hand	~\$6.9 mill ¹
12-month price range	\$0.07 – \$0.15

¹ As at 30/09/2023

Key Personnel

Paul Lennon	Chairman
Dr Mark Cooksey	Managing Director/CEO
Ian Levy	Executive Director
Leon Hawker	Chief Operating Officer



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Resource Category	Million Tonnes	Avg depth (m)	Avg base (m)	Avg thickness (m)	TREO ppm	TREO-CeO ₂ ppm	Perm Mag ppm	Permanent Magnet REOs				Key Ratios	
								Nd ₂ O ₃ ppm	Pr ₆ O ₁₁ ppm	Tb ₄ O ₇ ppm	Dy ₂ O ₃ ppm	PermMag TREO %	Tb+Dy TREO %
Inferred	45	4.3	12.1	7.8	806	623	211	140	36	5.1	30	26%	4.4%
Indicated	7	4.3	11.2	6.9	886	696	232	153	38	5.8	34	26%	4.5%
Totals	52	4.3	12.0	7.7	817	633	214	142	36	5.2	31	26%	4.4%

Resource Category	Other Rare Earth oxides											Low radioactivity	
	CeO ₂ ppm	Er ₂ O ₃ ppm	Eu ₂ O ₃ ppm	Gd ₂ O ₃ ppm	Ho ₂ O ₃ ppm	La ₂ O ₃ ppm	Lu ₂ O ₃ ppm	Sm ₂ O ₃ ppm	Tm ₂ O ₃ ppm	Yb ₂ O ₃ ppm	Y ₂ O ₃ ppm	U ₃ O ₈ ppm	ThO ppm
Inferred	182	17	8.8	32	6.0	121	2.2	32	2.3	14	175	1.7	6.4
Indicated	190	19	10.2	36	6.7	130	2.4	35	2.6	16	204	1.7	6.3
Totals	183	17	9.0	33	6.1	122	2.2	33	2.4	15	179	1.7	6.4

Parameters Block cut-off grade (cog) = 350ppm TREO-CeO₂ Minimum thickness = 2 metres Search ellipse = 120m (Ind), 250m (Inf) Density = 1.9 tonnes/cubic metre
 TREO = total rare earth elements as oxides. TREO-CeO₂ = TREO minus cerium oxide

Figure 2: Deep Leads Mineral Resource Estimate - November 2023

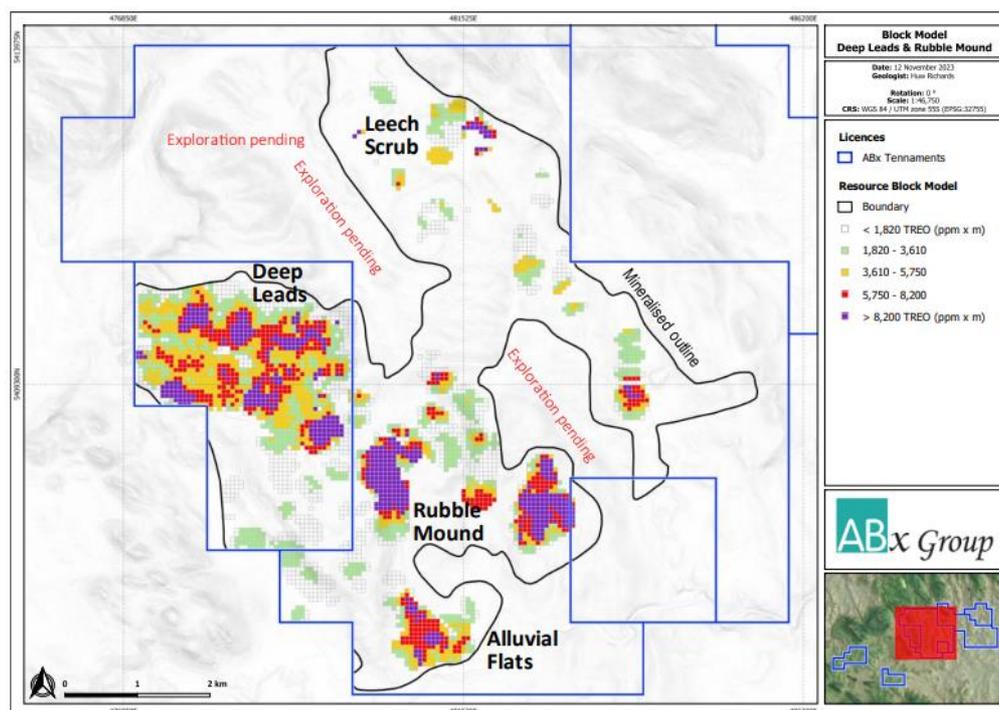


Figure 3: Deep Leads - Rubble Mound Block Modelling (Source: ABx Group)

The method of estimating the resource has now changed to the more sophisticated geostatistical Block Modelling (previously the Polygonal method). ABx have made the change in order to establish a more accurate estimation of the MRE but in addition the Block Modelling has identified additional high grade drill targets that will be targeted in 2024.

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Deep Leads – valuation uplift.

Our valuation of the Deep Leads resource now sits at \$50 million or \$0.21/share. It should be noted that this valuation is for the Deep Leads Project only and does not include Alcore or ABX’s Bauxite assets. The valuation uplift is driven by the revised MRE and the slight increase in overall grade and is considerably higher since our initiation coverage in May 2023 (\$19 million or \$0.08/share).

Deep Leads - Resource Valuation : Probabilistic		Resource (mill. Tonnes)	Resource TREO (ppm)	TREO value per tonne (A\$/t)	Total In-situ Value (A\$ million)	Implied Valuation (\$A mill.)	Weighting	Risked Value (A\$ mill.)	Risked Value (A\$/share)
% of In-Situ Value (1%)	Current MRE	50	803	76	3800	38	10%	4	
% of In-Situ Value (1%)	Future MRE (<12 months)	65	803	76	4940	49	50%	25	
% of In-Situ Value (1%)	Future MRE (<12 months)	70	803	76	5320	53	40%	21	
Deep Leads - Resource Valuation							100%	50	0.21

Figure 4: Deep Leads Ionic Adsorbed Clay Project - Valuation

The Dy and Tb grades continue to look exciting.

Rare Earths explorers and developers will often refer to Neodymium and Praseodymium as the important rare earths for permanent magnet production but fewer reference Dysprosium (Dy) and Terbium (Tb). Dysprosium and Terbium are generally considered to be the most valuable REE’s given their scarcity in most “hard rock” rare earth deposits like bastnasite and monazite - but they are found in relatively higher proportions in Ionic Adsorption Clay (IAC) rare earth deposits. Most of the world’s supply of Dy and Tb is sourced from the IAC deposits in China – exacerbating their position as strategic metals.

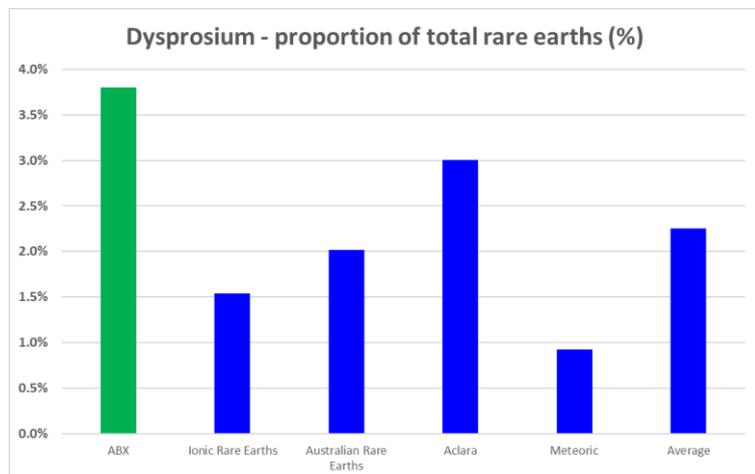


Figure 5: Proportion of Dy to other REE's in the MRE

Along with the higher grades of Dy & Tb (See Fig.1 and 2.), the ratio of Dy/Tb to other Rare Earths in the resource is unusually high – this means that a concentrate produced by Deep Leads would have a higher proportion of Dy/Tb to the less valuable Rare Earths, making the concentrate more valuable. Figures 5 & 6 highlight how high the Dy and Tb ratios are for Deep Leads.

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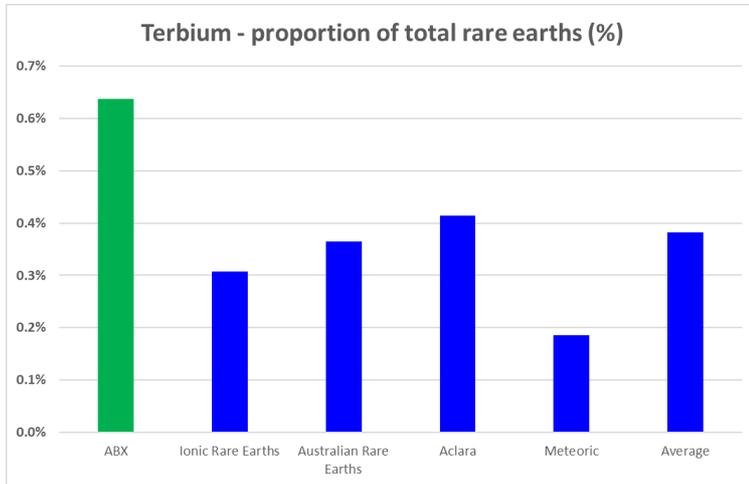


Figure 6: Proportion of Tb to other REE's in the MRE

As can be seen in Figure 7 – Dy and Tb represent some of the highest priced Rare Earths already and the Supply-Demand scenarios outlined in the next section will go a long way to at least maintaining these levels.

Earth Oxide	La ₂ O ₃	CeO ₂	Pr ₆ O ₁₁	Nd ₂ O ₃	Sm ₂ O ₃	Eu ₂ O ₃	Gd ₂ O ₃	Tb ₄ O ₇	Dy ₂ O ₃	Ho ₂ O ₃	Er ₂ O ₃	Tm ₂ O ₃	Yb ₂ O ₃	Lu ₂ O ₃	Y ₂ O ₃
Price (US\$/KG)	1	1	128	134	4	30	69	2046	382	179	54	0	17	810	12

Figure 7: Rare Earth Price Deck (Source: Iluka, Adamsas 2022)

Dy and Tb Market Outlook – summary

The US Department of Energy and the EU Joint Research Centre have both studied the Supply Demand scenarios for the Rare Earth used in high grade magnet manufacturing. While the forecasts do have significant uncertainty to them, it is plausible that 2030 demand for these REE could be more than double existing production capacity. Furthermore, the forecasts suggest that the percentage increase in demand will be greater for Tb and Dy, compared to Pr and Nd.

Both studies found that it will be difficult to supply sufficient permanent magnet REE to satisfy the likely global demand by 2030, particularly for Tb and Dy. There is a significant opportunity for new projects to supply permanent magnet REE, however the demand is not infinite, so low quality projects are unlikely to commence production.

The US Department of Energy's 2023 Critical Minerals Assessment highlighted the supply pressure that the four REE's used in magnet manufacturing as follows:

Rare earth materials (neodymium [Nd], praseodymium [Pr], dysprosium [Dy], and terbium [Tb]) used in magnets in EV motors and wind turbine generators continue to be critical. While Dy and Tb are both heavy rare earth elements that serve the same function in magnets, the criticality of Tb is slightly lower than that for Dy in the short term due to the widespread use of Dy in high-grade magnets and Tb's present role as a substitute. Similarly, Pr is critical in the medium term but only near critical in the short term because it is more substitutable in magnets than Nd.

Figure 8 & 9 highlight not only the high supply risk but also the importance of Dy and Tb to the energy transition.

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SHORT TERM 2020-2025

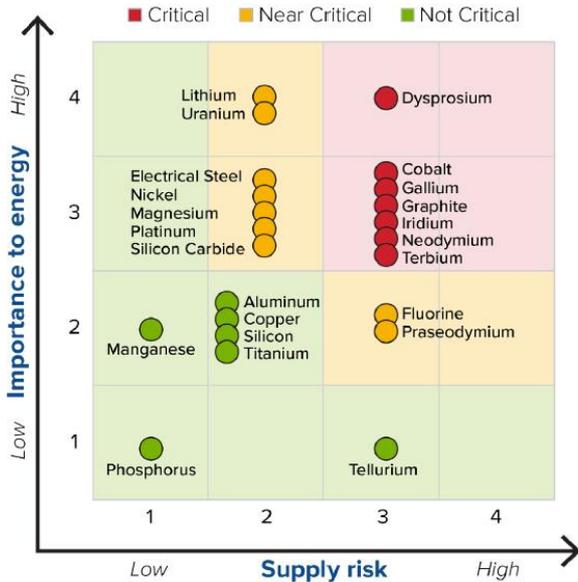


Figure 8: Short Term Criticality Matrix (Source: US DoE)

MEDIUM TERM 2025-2035

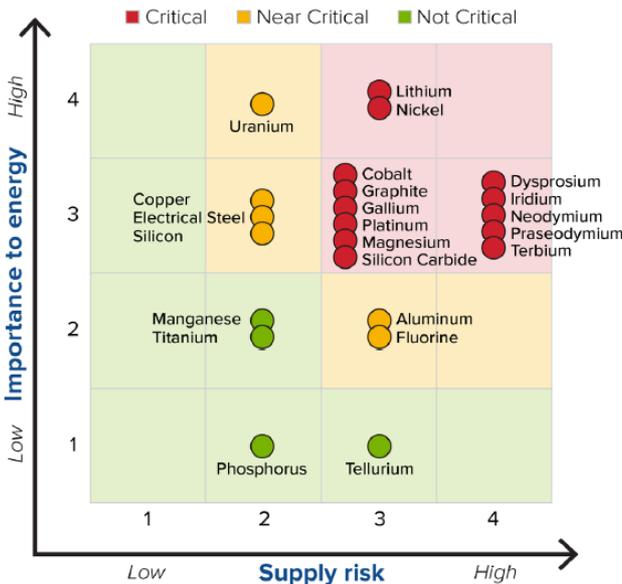


Figure 9: Medium Term Criticality Matrix (Source US DoE)

Similarly, the European Union’s Joint Centre of Research has drawn the same conclusions and have modelled high and low demand scenarios. The work shows that under a high demand scenario, Dy demand could be nearly 300% higher than production.

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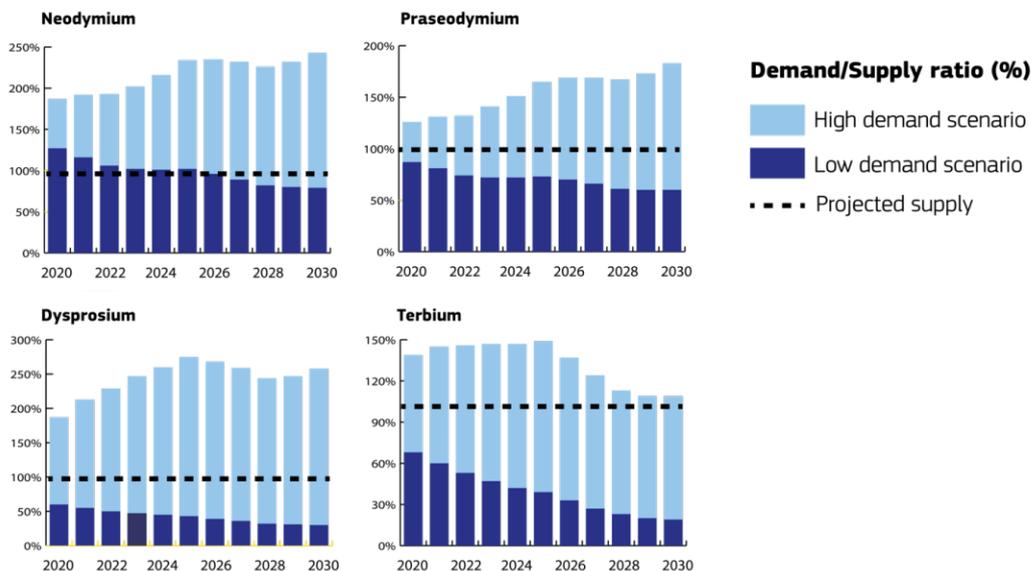


Figure 10: Demand/supply ratio for neodymium, praseodymium, dysprosium and terbium (Source: European Commission, Joint Research Centre)

All similar work we have studied draws the same conclusion – future Dy and Tb production estimates fall way short of expected demand.

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