

7 February 2024

Shenghe Signs Binding Offtake

NEED TO KNOW

- Binding offtake for 60% of capacity over 3 years
- Approvals process takes a big step
- New resource at Nowie Project

Offtake with strategic partner: Shenghe, a leading rare earths industry player, has converted an offtake MOU into a binding agreement with VHM. Shenghe has agreed to purchase 6,400 tonnes per annum (tpa) of rare earth mineral concentrate (REMC) and 100,000 tpa of heavy mineral concentrate (HMC) for 3 years, representing ~60% of Goschen's expected production capacity.

Approvals process takes a big step: The all-important approvals process to obtain the Environment Effects Statement (EES) for VHM's Goschen Project has concluded a 40-business-day period of public exhibition. An independent Inquiry and Advisory Committee (IAC) that is appointed by the Minister for Planning will then hold a public hearing on the environmental effects of the project.

A new resource at Nowie: VHM confirmed a new Inferred Mineral Resource of 16.4Mt @ 3.8% total heavy mineral (THM) grade for its Nowie Project, located just 22 km north of Goschen.

Investment Thesis

100%-owned long-life project with potential for life extension and strategic partner option: The current focus is on 98.8Mt of the 210.2Mt Ore Reserves in Areas 1 and 3, and an initial mine life of 20 years. The Total Ore Reserve provides potential for material production scale up and mine life extension beyond 40 years. The 100% ownership provides strategic flexibility, including enhancing funding options via the partial sale of the project to a strategic partner.

DFS demonstrates high-value project: The project's DFS estimates A\$1.5bn pre-tax NPV₁₀, 44% pre-tax IRR and annual pre-tax cash flow of A\$270m.

Risk reduction from dual product stream and staged construction approach: The diversified product stream reduces revenue risks, and VHM's 3-stage approach to developing Goschen lessens up-front capital spend and capital risk. Phase 1 involves producing REMC and zircon-titania HMC, while Phase 1A adds a hydromet circuit to refine REMC to a higher-value mixed rare earth carbonate (MREC). Phase 2, if pursued, includes constructing a mineral separation plant for further added value to the zircon-titania product.

Exposure to future-facing commodities – current prices not reflecting likely shortages: VHM's products are key inputs into decarbonisation and electrification, especially EVs and wind farms. Market analysts estimate an undersupply of 90kt of rare earth oxide by 2040, with the magnet rare earth oxide market predicted to grow 5X by 2040, driving price rises and volume growth that will increase the market value from US\$10.8bn now to US\$56.7bn in 2040.

Valuation: A\$1.67/Share Blended Valuation, 3x Upside

We have used a blended valuation of A\$1.67/share based on (1) a **60% probability of a sell-down to a strategic partner** in Goschen – in this scenario, we assume VHM realises 70% of our NPV for Goschen in the sale, funding the remainder through equity and debt (50:50); and (2) a **40% probability of VHM fully funding the project independently** through equity and debt (50:50).

We apply risk weightings to both scenarios to account for project risks. Our un-risked, pre-funding valuation is A\$3.10 per share.

Risks

Key risks include offtake finalisation, funding for the project, delay in approvals, delays in construction, capital cost inflation and commodity price weakness.

Equities Research Australia

Mining and Energy

Michael Bentley, CFA, Senior Analyst
michael.bentley@mstaccess.com.au



VHM Limited (VHM) is an Australian owned and operated, listed public mineral sands and rare earth company. VHM is proposing to develop the Goschen Mineral Sands and Rare Earths Project in the Loddon Mallee Region of Victoria, approximately 35 km south of Swan Hill in the Gannawarra Shire and 275 km north of Melbourne.

<https://www.vhmltd.com.au/>

Valuation	A\$1.67 (unchanged)
Current price	A\$0.60
Market cap	A\$130m
Cash on hand	A\$13.9m (31 December 2023)

Upcoming Catalysts / Newsflow

Period	
1HCY24	Approvals for project; funding of project
1HCY24	Further commercial offtake
1HCY24	Detailed Design Engineering completed – Goschen, Phase 1

Share Price (A\$)



Source: FactSet, MST Access.

Financial Summary: VHM Limited

VHM Limited						VHM.AX
Year end 30 June						
MARKET DATA						
Share Price	A\$/sh	0.60				
52 Week Low	A\$/sh	0.42				
52 Week High	A\$/sh	1.01				
Market Cap (A\$m)	A\$m	122				
Net Debt / (Cash) (A\$m)	A\$m	(14)				
Enterprise Value (A\$m)	A\$m	108				
Shares on Issue	m	203				
Performance rights and options	m	10				
Shares Issued during Capital Raise	m	551				
Potential Diluted Shares on Issue	m	754				
INVESTMENT FUNDAMENTALS						
Reported NPAT	A\$m	(9)	(16)	(9)	3	73
Underlying NPAT	A\$m	(9)	(16)	(9)	3	73
EPS Reported (undiluted)	¢ps	(7.0¢)	(0.1¢)	(4.6¢)	0.4¢	9.6¢
EPS Underlying (undiluted)	¢ps	(0.1¢)	(0.1¢)	(2.0¢)	0.4¢	9.6¢
P/E Reported (undiluted)	x	n/m	n/m	n/m	169.6	6.2
P/E Underlying (undiluted)	x	n/m	n/m	n/m	169.6	6.2
Operating Cash Flow / Share	A\$	(0.03)	(0.05)	(0.01)	0.00	0.20
Price / Operating Cash Flow	x	n/m	n/m	n/m	150.2	3.0
Free Cash Flow / Share	A\$	(0.10)	(0.15)	(0.01)	(0.76)	0.00
Price / Free Cash Flow	x	(5.8)	(4.0)	(44.3)	(0.8)	223.0
Free Cash Flow Yield	%	n/m	n/m	n/m	n/m	0.4%
Book Value / Share	A\$	0.13	0.32	0.56	0.56	0.66
Price / Book	x	4.72	1.88	1.08	1.07	0.91
NTA / Share	A\$	0.13	0.32	0.56	0.56	0.66
Price / NTA	x	4.72	1.88	1.08	1.07	0.91
Year End Shares	m	139	203	754	754	754
Market Cap (spot)	A\$m	83	122	453	453	453
Net Cash / (Debt)	A\$m	24	21	373	(202)	(200)
Enterprise Value	A\$m	59	101	79	655	653
EV / EBITDA	x	n/m	n/m	n/m	n/m	0.5x
Net Debt / Enterprise Value		(0.2)	(0.2)	(3.4)	1.9	1.8
PRODUCTION AND PRICING						
Ore Mined (Kt)		-	-	-	-	4.94
Total Mill Feed (Kt)		-	-	-	-	4.94
HMC production (Kt)		-	-	-	-	168
Realised Z-Ti price (US\$/t)		-	-	-	-	530
REMC production (Kt)		-	-	-	-	11.73
MREC production (Kt)		-	-	-	-	-
NdPr Price (US\$/kg)		-	-	-	-	176
Realised REE Basket Price (US\$/kg)		-	-	-	-	16.49
Source: VHM; MST Estimates						
12-Month Relative Performance vs S&P/ASX Metals & Mining						
Profit & Loss (A\$m)						
Revenue		-	-	-	-	404
Expenses		(6)	(11)	(9)	(9)	(198)
EBITDA		(6)	(11)	(9)	(9)	205
D&A		(1)	(0)	(0)	(0)	(60)
EBIT		(7)	(11)	(9)	(9)	145
Interest		(2)	(4)	(1)	11	(41)
Tax		-	-	-	1	(31)
Underlying NPAT		(9)	(16)	(9)	3	73
Exceptionals						
Reported Profit		(9)	(16)	(9)	3	73
Balance Sheet (A\$m)						
Cash		24	21	737	162	164
Receivables		1	1	-	-	33
Inventory		-	-	-	-	11
PP&E		11	16	16	594	683
Exploration		27	39	39	39	39
Other		0	1	1	1	1
Assets		63	79	794	797	931
Creditors		4	3	-	-	62
Debt		-	-	364	364	364
Other		42	11	10	10	10
Liabilities		46	14	374	374	436
Shareholder's Equity		18	65	420	422	495
Cashflow (A\$m)						
Receipts from Customers		-	-	1	-	359
Payments to suppliers and employees		(4)	(11)	(12)	(9)	(136)
Interest Received / Paid		0	0	0	12	(41)
Tax Paid						(31)
Net Cash From Operations		(4)	(10)	(10)	3	151
Capex		(0)	(3)	-	(578)	(149)
Exploration		(12)	(20)	-	-	-
Other		2	2	-	-	-
Net Cash From Investing		(10)	(20)	-	(578)	(149)
Equity		-	29	364	-	-
Borrowings		(2)	(2)	364	-	-
Borrowing Costs		30	(0)	(1)	(1)	-
Net Cash From Financing		28	27	727	(1)	-
Effects of FX		-	-	-	-	-
Net Increase / (Decrease) in Cash		13	(4)	717	(576)	2

Shenghe Signs on the Dotted Line – Takes 60% of Goschen’s First 3 Years of Production

VHM and Shenghe have finalised offtake negotiations for Goschen Project’s Phase 1 products. The binding offtake agreement with Shenghe is for 6,400 tpa of REMC and 100,000 tpa of zircon-titania HMC products (each approximately 60% of forecast production per annum) for an initial 3-year term.

Figure 1: Shenghe offtake details

Products	HMC: 60% of production up to 100,000 tpa REMC: 60% of production up to 6,400 tpa
Take or pay	Shenghe obligated to purchase 100% of product tonnage Commences when VHM achieves 90% of plant nameplate capacity
Pricing	HMC: floating price based on publicly available zircon index (Ruidow’s CIF China Iluka Premium Zircon Price) REMC: floating price based on publicly available monazite pricing (FerroAlloyNet’s published average China spot monazite price)
Term	3 years from the completion of the ramp-up period
Termination	By agreement or due to material breach by either party
Conditions precedent	In favour of VHM covering: <ul style="list-style-type: none"> • Goschen Project Phase 1 – Final Investment Decision • Ministerial and regulatory approvals

Source: VHM.

Who is Shenghe?

Shenghe is a China-based, globally recognised rare earths and mineral sands processor, listed in Shanghai with a market cap of US\$3.1bn.

Shenghe is a key consumer of rare earth raw materials and is China's leading importer of rare earth concentrate. Shenghe has operations covering mining, beneficiation, refining, trading, alloy and metal production and a large, integrated titanium business. Its rare earth portfolio includes rare earth oxides, rare earth salts, rare earth metals, metal catalysts and molecular sieves.

Why is Goschen important to Shenghe?

Shenghe has a long-term strategic issue in sourcing rare earth and heavy minerals for its processing facilities in China, which it has managed to date through its relationship with MP Materials.

MP Materials operates the Mountain Pass mine in California – the second-largest rare earth mine globally. MP sells bastnaesite mineral concentrate, exporting approximately 40ktpa total rare earth oxide (TREO) to Shenghe. Shenghe has a 7.75% interest in MP, and has consistently supported MP through offtake agreements, technical collaborations, and funding.

However, as part of a strategic expansion, MP is transitioning downstream to produce NdPr oxide and magnets. This strategic integration downstream will effectively remove approximately 15% of the global rare earth concentrate supply, thereby creating a supply gap in Shenghe’s procurement.

Agreement for 60% of offtake shows the quality of Goschen

The agreement highlights the quality of the Goschen Project and the value in the initial products (a REMC containing greater than 58% TREO and a zircon-titania HMC comprising high-grade zircon, rutile, leucoxene, and ilmenite). The agreement is a strong endorsement of Goschen as a world-class rare earths and mineral sands resource with significant value.

Significant de-risking signal for potential partners and capital providers

The binding agreement also significantly de-risks Goschen by providing a vote of confidence on the bankability of the project from the perspective of potential commercial and government debt providers, strategic partners and equity capital providers.

A high-quality product with enhanced market value

In Phase 1A of the project, VHM expects to produce approximately 8.5ktpa mixed rare earth carbonate (MREC) for the first 10 years. A MREC product is an upgraded carbonate form of rare earth mineral concentrate (REMC), obtained by leaching the REMC which dissolves REEs into a solution. After further purification steps (e.g. solvent extraction), the rare earth solution is combined with a carbonate source, leading to the formation of MREC – a more refined solid composed of REEs in their respective carbonate forms. Metallurgical testing shows that impurities in the MREC product are low, at 2.5–3.0% total impurities. Measurements of the final content of uranium and thorium were also considered exceptionally low. The additional steps raise costs but produce a product closer to individual REEs, thereby enhancing the product's market value. The MREC will bring further capability to Australia's downstream rare earths processing capabilities.

This offtake agreement between VHM and Shenghe may include, but does not require, inclusion of the Goschen MREC product (Phase 1A). MREC offtake negotiations are subject to a separate process.

What will happen to the remaining 40% of Goschen's product?

The remaining 40% of product during the first 3 years will be sold through further offtakes and spot sales. This offtake strategy looks to balance the needs of satisfying debt and equity providers with maximising the value of the resource and to globally diversify sources of rare earths and mineral sands feedstock.

Approvals Process Takes a Big Step

The approvals process for the Goschen Project is considered by the equity market as the project’s highest risk. The approvals process for mining projects in Victoria is widely seen as difficult. However, it should be noted that the approvals process is prescriptive and relatively simple to understand.

We consider the risk of not obtaining the approvals as relatively low, but see the timing of receiving those approvals as a risk.

The end game – a mining licence

VHM placed the Goschen Project’s mining licence application on public notice on 9 January 2024. The review and issue of a mining licence by the Earth Resources Regulator (ERR) is dependent on the outcome of the Environment Effects Statement (EES) approvals process, with the statutory advertising for the mining licence application running concurrently with the EES Public Exhibition stage. VHM submitted the mining licence application to the ERR on 30 March 2023.

Significant step completed with EES public exhibition closed

The EES was placed on public exhibition for 40 business days (20 November 2023–17 January 2024).

Throughout the public exhibition period, members of the public were invited to access the Goschen EES and related documentation and make public comment submissions to Planning Panel Victoria (PPV) regarding the EES. Public exhibition of the EES marks a significant milestone in the Goschen approvals process.

Next step – public hearings

The next stage in the EES process is the independent Inquiry and Advisory Committee (IAC) hearing. This involves a Directions Hearing and a Public Hearing, and is managed by the appointed IAC.

A Directions Hearing will be held on 13 February 2024 and will confirm dates and venue for the Public Hearing and make directions about the conduct of the Public Hearing.

The Public Hearing is expected to begin the week commencing 25 March 2024. At this hearing, VHM will make submissions and call evidence in support of the EES and in response to matters raised in the EES submissions and respond to any questions or requests for information from the IAC. The public will also have an opportunity to present.

Upon completion of the Public Hearing process, the IAC have six weeks to prepare a recommendation report to the State Planning Minister.

Subject to satisfactory completion of that review in the near term, VHM anticipates that the regulatory approvals and permits will be awarded in 1H2024.

Figure 2: Permitting – countdown to production



Source: VHM.

Figure 3: Goschen permitting pathway – the Environmental Effects Statement approvals process



Source: VHM.

Nowie: A Nice Start – Maiden Resource

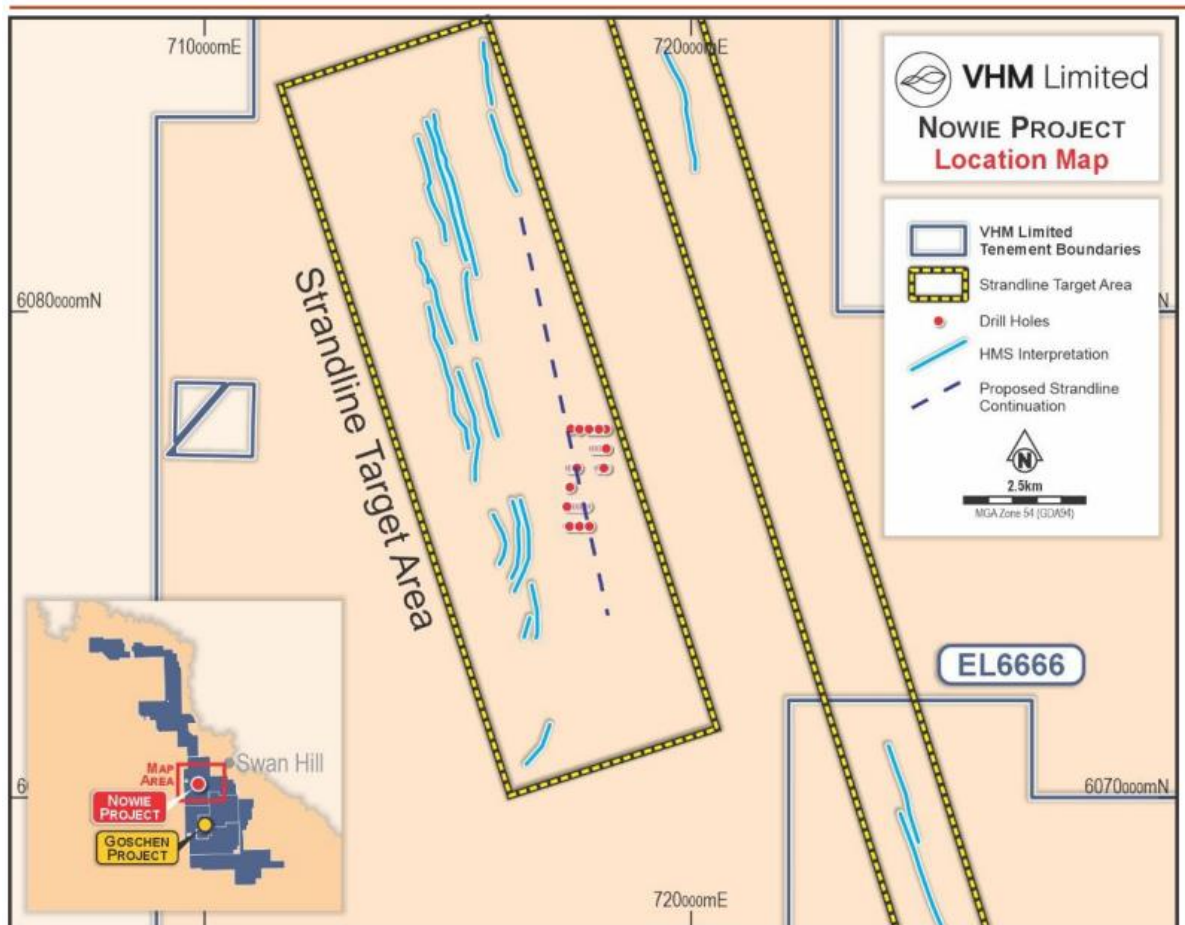
The Nowie Project is located 22km north of the Goschen Project. VHM commenced drilling in January 2023 and has completed a 50-hole drilling program. Geological interpretation concludes that the Nowie deposit is formed from multiple high-grade strandline systems which occur above a thick sequence of moderate total heavy minerals (THM) grade sheet-style mineralisation up to 20m thick. Significantly, these strandline deposits occur close to surface and provide selective high-grade mining opportunities.

The Inferred Maiden Mineral Resource estimate (MRE) is 16.4Mt @ 3.8% total heavy minerals (THM) and includes 6.4Mt @ 6.1% THM contained in high-grade strandline deposits which remain open along and across strike.

The mineral assemblage contains:

- 16% zircon
- 16% rutile
- 24% leucoxene
- 2.1% monazite
- 0.5% xenotime.

Figure 4: The Nowie Project



Source: VHM.

Investment Thesis: High-Value Rare Earth Product; Dual Revenue Stream + Offtake Partner

High-quality long-life asset; 100% ownership gives strategic options

VHM is on the path to emerge as a major producer of critical and strategic rare earth elements (REEs), complemented by a second revenue stream from heavy mineral sands. VHM holds 100% ownership of the Goschen Project, an advanced pre-production venture in Australia's foremost mineral sands region. This scalable initiative boasts a substantial mineral inventory with room for reserve expansion, positioning Goschen to potentially become a leading rare earth producer.

Full ownership provides funding flexibility and options

The 100% ownership provides strong flexibility, including the possibility of a partial sale of the project to a strategic partner. This enhances VHM's funding options via the injection of cash and reduced capital and equity-raising requirements.

Definitive Feasibility Study underscores strong project economics

An updated Definitive Feasibility Study (the 'DFS Refresh'), released in March 2023, underscores the strong economics of the Goschen Project. The inclusion of the nearby Cannie and Nowie Projects, especially with Cannie's significant total rare earth oxide (TREO) Mineral Resource, enhances VHM's attractiveness for potential partners. Coupled with the added contributions of zircon, rutile, and leucoxene, VHM has solidified its position in Victoria's Critical Minerals Province along the Lake Boga granite, amplifying its global standing.

Binding agreement with Shenghe, strong cash position set up VHM for success

Building on this momentum, VHM has signed a binding offtake agreement with Shenghe Resources, signalling a commitment to off-take 60% of Goschen's production for the initial 3 years. With a healthy cash reserve of A\$14m, VHM is well-equipped to advance the Goschen Project, with the aim of commencing production in 2025. Goschen is emerging as a strategic and financially attractive investment in the rare earth sector.

Market context: rare earths not yet fully appreciated by the market

Goschen's rare earth minerals, crucial for electric vehicles, predominantly consist of elements such as dysprosium, neodymium, praseodymium, and terbium, making up 87% of its basket value. By 2040, a projected undersupply of 90,000 tonnes of NdPr oxide is anticipated, mainly due to scarce new sources post-2023. The magnet rare earth oxide market is set to expand five-fold by 2040, with consumption growing at a 5.2% CAGR, and prices increasing by 3.3–5.2% per annum. Adamas Intelligence forecasts the market value to jump from US\$10.8 bn currently to US\$56.7 bn by 2040.

China monopolises every step of the rare earth value chain – a fact that is of great concern to Western economies as rare earth minerals are critical for the transition to the new 'green' economy as well as to government-critical sectors such as defence. In 2011 a trade dispute with the US, Japan and Europe and one side and China on the other, and the subsequent hyper-inflated rare earth oxide prices, is a warning of what may lie ahead. Such a situation today, however, would be much more serious, with the value of rare earths to the global economy today much greater than in 2011.

In our view, this political reality will result in significant flows of capital into the rare earths sector. The \$1.25bn loan provided by the Australian Government to Iluka for the development of its rare earths refinery is a very positive read through, as it suggests that governments realise the importance of an ex-China supply chain in transitioning to the new 'green' economy.

Asset overview

The Goschen Project: VHM's flagship development

The Goschen Project has an extensive and very high-grade Mineral Resource and Reserve. The Resource comprises 629Mt of ore with a total heavy mineral (THM) and TREO grade of 2.95% and 2.43%, respectively, and a Reserve total of 98.8Mt with THM grade of 4.0%.

The Goschen Project aims to produce rare earth intermediate products and zircon-titania heavy mineral concentrate (HMC). It is designed to have a processing capacity of 5 million tonnes per annum (Mtpa) and a projected mine life of 20.5 years. The dual product stream is extremely attractive from an investing point of view as it provides some downside protection compared to a single commodity exposed company.

The Goschen high-grade deposit will produce ~9.4ktpa of REMC and ~134.5ktpa of zircon-titania HMC over the first 10 years of mine life. However, the REMC is planned to be converted to a mixed rare earth carbonate (MREC) through the introduction of a hydrometallurgical circuit (Phase 1A) in the first six months of operations. This will result in the production of a higher-quality and beneficiated product that only requires a relatively small incremental capex outlay. The project will produce ~8.6ktpa of MREC over the first 10 years of production. Phase 2, if pursued, includes constructing a mineral separation plant for further processing of the zircon-titania product.

Approximately 87% of Goschen's rare earth basket value comes from premium dysprosium, neodymium, praseodymium, and terbium oxides, accounting for nearly 70% of the project's revenue. In addition, mineral sands containing zircon and titanium (rutile, ilmenite, leucoxene) offer an alternative revenue source, further enhancing the project's financial stability.

Cannie and Nowie: additional assets helping to attract key partners

Scale and associated pricing power are a significant issue for ex-China rare earth producers as China monopolises the market. VHM has an attractive opportunity in the future to establish itself as a major rare earth player through unlocking the potential of its additional and adjacent projects, Cannie and Nowie.

Drilling and exploration to date has uncovered extremely high-grade ore bodies at Cannie and Nowie. Cannie's Maiden Mineral Resource released by VHM in May 2023 revealed exceptional grades of TREO and zircon-titania minerals. Furthermore, the recent drilling program at Nowie also confirmed areas up to two times higher than the highest-grade areas of the Goschen Ore Reserve.

Upcoming catalysts

- 1HCY24 – Further offtakes, strategic partner, funding advancement
- 1HCY24 – EES approval
- 1HCY24 – Completion of Detailed Design Engineering for Goschen Phase 1
- 1HCY24 – Resource update – Cannie Project

Recent milestones

- January 2023 – VHM listed on the Australian Stock Exchange
- March 2023 – VHM releases an Updated DFS (the 'DFS Refresh') for the Goschen Project
- April 2023 – New discovery of high-grade rare earth, titania, and rutile ore body at Cannie Project
- May 2023 – Maiden Resource announced for Cannie Project
- August 2023 – Strong drill results at Nowie
- September 2023 – Experienced resources executive Ian Smith appointed Chairman and Ron Douglas as CEO
- November 2023 – Public exhibition of EES open
- January 2024 – Binding offtake agreement with Shenghe
- January 2024 – Maiden Resource at Nowie

Financing Strategy: Multiple Sources Needed

Current status of funding discussions

VHM's DFS estimates a capital cost of ~A\$607m to build the Goschen Project's Phases 1 and 1A (we estimate A\$729m). We forecast capital will be secured through a combination of 50% debt and 50% equity.

As of 31 December 2023, VHM had cash reserves of A\$13.9m. With a current burn of approximately A\$1.5m/month, VHM is well funded to move forward with its CY24 strategy.

VHM will progress discussions with prospective Australian and international commercial lenders over the over the first few months of CY2024, with the objective of securing a substantial project debt facility with financial completion achieved on receipt of all regulatory approvals. At the same time, VHM will progress opportunities for available government supported grant and debt funding and export credit funding support.

Subject to a potential sale or farm-out of a partial interest in the Goschen project (as noted above), VHM will seek to raise the remaining capital through an equity raise at or close to the project FID and finalisation of a committed debt facility.

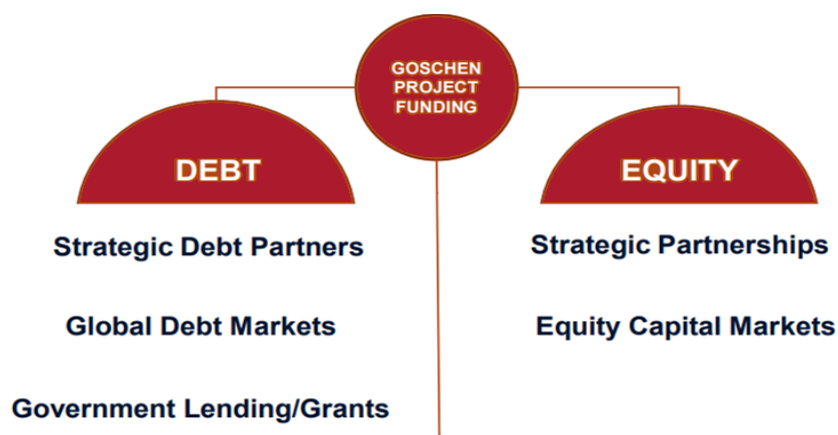
Seeking the best funding mix

VHM is actively exploring a variety of options to secure financing with the goal of achieving the best outcome for shareholders. The options being considered include traditional debt and equity financing, as well as alternative options such as divesting a stake at the project level.

High-risk projects of this nature usually raise more capital through equity, however, the ESG importance of Goschen's products could potentially allow the project access to cheaper funding, which in turn would lower the project's cost of capital and improve its attractiveness from investors' point of view.

We expect the project to attract interest from domestic and international managers of globally substantial volumes of ESG capital, given that the rare earths to be produced by the project are the fundamental building blocks for renewables (particularly electric vehicles and wind farms), as well as the fact that the project has sound financial metrics.

Figure 5: Options for funding the Goschen Project – seeking the best mix



Source: VHM.

Governments increasingly interested in critical minerals supply chain investments

Recent news flow highlights governments' growing appetite to invest in critical minerals supply chains:

- April 2022: Iluka receives a \$1.05bn debt facility from the Australian Government to build the country's first fully integrated rare earths separation facility. Under the 16-year loan agreement, Iluka will pay interest rates of 3% above the BBSY, with the loan being non-recourse to Iluka.
- May 2023: The new Climate, Critical Minerals and Clean Energy Transformation Compact was announced by Australian Prime Minister Anthony Albanese and US President Joe Biden at the G7 meeting in Japan. President Biden offered to give Australian resources companies 'domestic supplier' status under the US\$369 bn (A\$555 bn) Inflation Reduction Act (IRA). The potential inclusion of Australian resources companies in the IRA could give local projects that wish to join the US supply chain access to more than US\$40 bn in cheap loan programs run by the US Department of Energy.

Valuation: A\$1.67/Share Blended Valuation – 60% Probability of Strategic Partner and 40% Probability of Funding All of Project

Our base-case risked NPV-based valuation for VHM is A\$1.67/share on a fully diluted basis.

Blended risked valuation offers ~3x potential upside

We have arrived at a blended valuation of A\$1.67 per share, based on two potential project funding scenarios:

- a 60% probability of a sale of a stake in the Goschen Project to a strategic partner
- a 40% probability of VHM having to fund the project on its own.

We have attributed a net asset value (NAV) of A\$646m compared with the current market value of ~A\$100m.

Our un-risked, pre-funding valuation based on the current capital base implies A\$3.10/share.

Our valuation scenarios exclude any potential upside from exploration and do not consider potential upside from building Phase 2 of the project, with our modelling and forecasts only taking Phases 1 and 1A into consideration. We believe rare earths are under-appreciated with strong structural tailwinds, and we see the potential for tight medium-term fundamentals in the rare earth market.

Scenario 1: Strategic partner buys in (60% weighting in our base case)

Our valuation of VHM based on a strategic partner buying in to the project is A\$2.06 per share (see Figure 6). We assume under this scenario that VHM sells 40% of the project (retaining 60% and control) and achieves 70% of NPV for the share. VHM's share of the project capital is funded 50% debt and 50% equity and we assume that only ~A\$37m of equity is raised at a 10% premium to the current share price (assuming that progressing project approvals, confirming a strategic partner, and progressing debt financing will de-risk development of the project and drive an increase to the share price). We have probability risk-weighted our project valuation in this scenario at 85%.

Figure 6: Valuation assuming a sell-down of 40% of project (forming 60% of our blended valuation)

VHM		Jun-24		Financing		
	Discount rate	Risk weighting	AUD\$m	AUD\$/sh		
Sell-down valuation						
Goschen (60%)	10.0%	85.0%	329	1.28	Capex Phase 1/1a (70%)	436.3
Total operating assets			329	1.28	Debt	50%
Corporate/SG&A			(30)	(0.12)	Total Debt	218.2
Net cash/(debt) (\$AUD)			47	0.18	I/R	12.0%
Goschen sale proceeds			181	0.71	Equity	50%
Net Asset Value			527	2.06	Equity Raised	37.4
Current Share Price				0.64	Issue Price (10% premium)	0.704
Upside				221%	Shares Issued	53.1

Source: MST estimates.

Scenario 2: VHM funds project on its own (40% weighting in our base case)

Our valuation in the event of VHM fully funding the project on its own is A\$1.10 per share (see Figure 7). Under this scenario the full cost of the project is funded 50% debt and 50% equity, and we assume that A\$363m of equity is raised at a 25% premium to the current share price (again, assuming that progressing project approvals and progressing debt financing will drive an increase to the share price). We have probability risk-weighted this valuation at 70% to reflect the increased risk of financing and executing the project independently.

Figure 7: Valuation assuming Goschen Project is fully funded by VHM (forming 40% of our blended valuation)

VHM				Jun-24		Financing	
Diluted post-funding valuation	Discount rate	Risk weighting	AUD\$m	AUD\$/sh			
Goschen (100%)	10.0%	70.0%	452	0.63	Capex Phase 1/1a		727.2
Total operating assets			452	0.63	Debt		50%
Corporate/SG&A			(30)	(0.04)	Total Debt		363.6
Net cash/(debt) (\$AUD)			373	0.52	I/R		12.0%
Net Asset Value			795	1.10	Equity		50%
Current Share Price				0.64	Equity Raised		363.6
Upside				73%	Issue Price (10% premium)		0.704
					Shares Issued		516.5

Source: MST estimates.

Un-risked pre-funding valuation of A\$3.10/share

Our valuation of the project on an un-risked, pre-funding basis is A\$646m (A\$630m post corporate outflows and cash) equating to A\$3.10/share based on VHM's current capital base (see Figure 8). This includes our more conservative forecasts around capex and opex. The pre-funding valuation demonstrates a standalone value that any potential strategic partner may consider in its assessment of the project.

Figure 8: Un-risked pre-funding valuation summary

	Pre-construction undiluted unrisked valuation A\$m	A\$/sh
Goschen (100%)	646	3.18
Corporate/SG&A	-30	(0.15)
Net cash/(debt) (\$AUD)	14	0.07
Total Valuation	630	\$3.10

Source: MST estimates.

Key assumptions

Our base-case NPV valuation is built upon a mine plan which largely aligns with the March 2023 DFS Refresh. Our capital cost and operating cost assumptions are ~20% higher than those presented in the DFS. Critical assumptions are shown in Figure 9.

We have used a 10% discount rate (real) and assumed A\$727m for Phases 1 and 1A (versus A\$607m in the DFS) in initial development capital. Our received basket price (avg. initial 10 years) of US\$30.5/kg is post payability assumptions from the REMC and MREC, and reflective of improving underlying separated rare earth oxide pricing as per market expert analysis. We assume project construction commences in mid-CY2024, with first production for Phase 1 in mid-CY2025 after a ~12-month construction period. We assume a further ~12 months of construction for Phase 1A first production.

We assume the project will be funded by 50%/50% debt/equity (at a 70c issue price). Importantly, our valuation does not incorporate the benefit of any additional potential project expansions.

Figure 9: Our base-case valuation assumptions

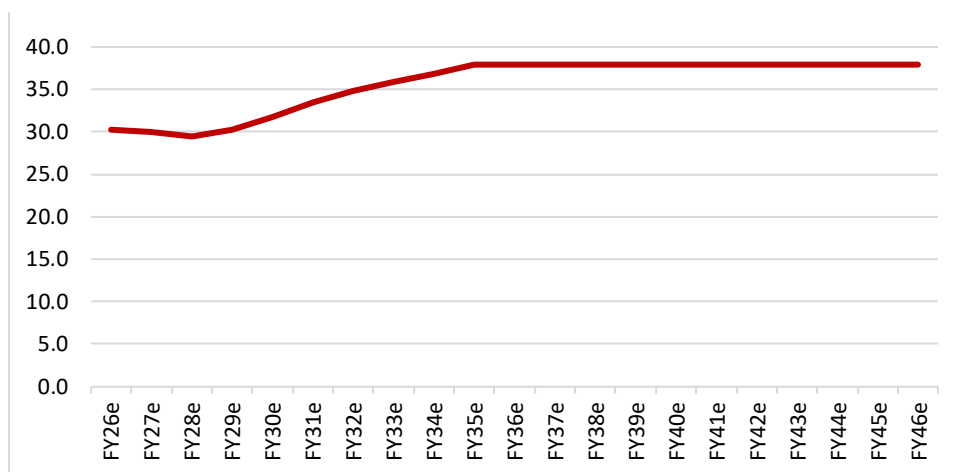
PROJECT ASSUMPTIONS	
Project Ownership (%)	100%
Strip Ratio (waste : ore)	2.6
Ore Reserve Grade (% THM)	3.70%
Ore Reserve Grade (% TREO)	2.45%
Average Material Mined (Mtpa)	12.4
Average Ore Mined (Mtpa)	4.7
Mine Life (years)	20.5
Development Capex (A\$m) (Real 2023 \$)	727
Debt to equity	50:50
Ore Reserve (kt)	7,352
COST & FINANCING ASSUMPTIONS	
Discount Rate Real (%)	10.0%
Inflation Rate (%)	2.5%
Debt interest rate	12.0%
Share price for Equity raising (A\$/share)	0.58
PRICING & EXCHANGE RATE ASSUMPTIONS	
AUDUSD	0.70
LT NdPr Price (Real) (US\$/kg) - from 2035	247
Received Basket Price (US\$/kg) - Average first 10 years	30.5
Royalty Rate (%)	2.75%
Corporate Tax Rate (%)	30%

Source: MST estimates.

Pricing forecasts

Our pricing assumptions for VHM's received price for MREC sales from the Goschen Project are shown in Figure 10. The increase in basket price value over the time is driven in turn by forecast increases in the underlying valuable REEs (particularly NdPr, Dy, Tb). We use a flat price of US\$530/t achieved for the HMC. VHM could see significant upside from higher RE and HM prices than those that underpin our assumptions.

Figure 10: Forecasted basket price for MREC (post-payability) – real 2023 \$

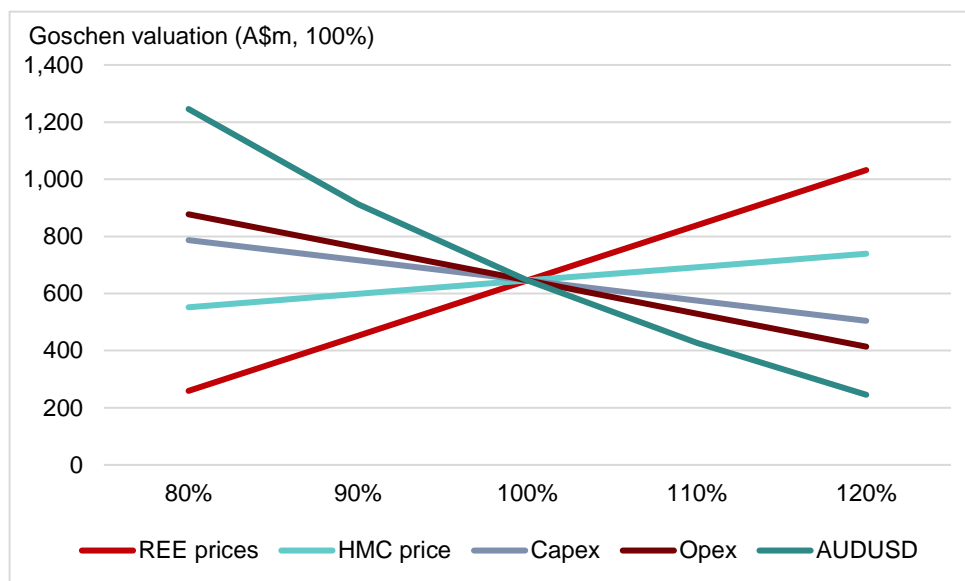


Source: MST estimates.

Key sensitivities

As shown in Figure 11, our valuation is most sensitive to assumptions on the REE price and, to a lesser extent, the AUD/USD exchange rate.

Figure 11: Key project sensitivities



Source: MST.

Capex (MST estimates vs. VHM)

We have taken a conservative approach in forecasting pre-development capital costs. While VHM's DFS anticipates a figure of A\$607m, we have projected an increase of 20% in capital costs given the extremely tight conditions in the Australian mining industry and global equipment inflation, therefore estimating a cost for Phases 1 and 1A of A\$727m (see Figure 12).

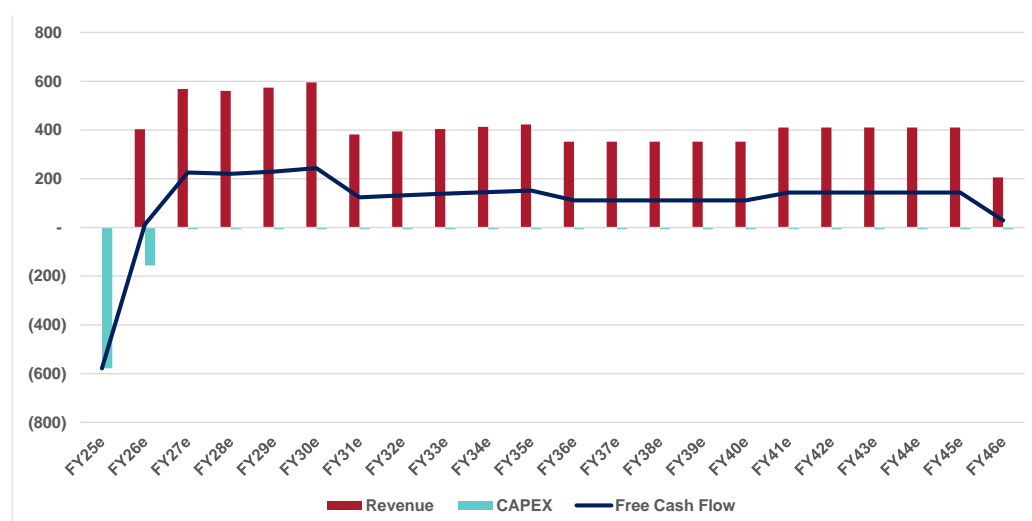
Figure 12: MST vs VHM's estimated project pre-development capex for Goschen Project

Description	Total (A\$m)	Total (A\$m)
	VHM	MST
Directs	234.3	281.2
Earthworks	65.1	78.1
Civil/concrete	12.2	14.6
Buildings and NPI	8.4	10.1
Structural steel	22.2	26.6
Platework	7.8	9.4
Process and mechanical equipment	43.5	52.2
Piping and valves	48.9	58.7
Electrical, controls and instrumentation	20.9	25.1
Spares and first fills	2.6	3.1
Mobile equipment	2.5	3.0
Indirect	77.6	93.1
Engineering Services, Contractors & Expenses	72.9	87.5
Owner's Costs (labour, expenses & insurances)	4.6	5.5
Total capex (excluding line item contingency)	407.9	489.5
Value of line item contingency	47.0	56.4
Total capex (including line item contingency)	455.0	546.0
Value of Project contingency	28.0	33.6
Total capex Phase 1 (including Project contingency)	483.1	579.7
Capex Phase 1A	124.0	147.5
Total Capex Phase 1 and 1A	607.1	727.2

Source: VHM, MST.

Capex and free cash flow (MST estimates)

Figure 13: MST forecast revenue, capex and free cash flow (100% basis)



Source: MST.

Positive catalysts for share price and valuation

Finalisation of approvals: Approvals are required prior to any construction going ahead. Victoria's approval system is difficult and slow, so finalisation of approvals would be a strong catalyst for the stock.

Funding of project: Securing capex for major resource developments is a challenge for small companies; thus, a competitive funding package would significantly de-risk the project.

Exploration upside: Discovering economical deposits of heavy rare earths, fluorspar, niobium, or phosphate at Goschen could greatly enhance its value. Such discoveries would diversify revenue and position the project favourably in a high-demand market, ensuring strong returns for investors.

Asset sell-down: Selling a stake in the project to finance its development would mitigate construction risks and minimise dilution.

Other potential share price catalysts:

- **Resource growth:** Drilling at Goschen is being undertaken. An increase in resource would be positive.
- **Price increases:** The valuation is highly sensitive to NdPr prices. Increases in the price of NdPr oxide would positively affect the valuation.

Risks to share price and valuation

We outline the key risks to the share price and valuation below, noting that early-stage mining projects have various critical risks.

Company-and project-specific risks:

- **Approvals:** The key short-term risk is approvals. The Victorian approval process is long and complex and there are risks that approvals will be delayed or not achieved.
- **Offtake agreements:** Delays to or cancellation of offtake agreements would put at risk sales of product and funding of the project.
- **Access to funding:** The availability of funding for the project is not guaranteed. A lack of sufficient funding could have a negative impact on the stock.
- **Delays to development:** Any delays in moving into construction, post-funding, would be a negative for the stock and would gradually make the information from the DFS less current and thus less reliable.
- **Cost inflation** is a global theme and is particularly concerning in the mining industry. If operational or capital costs increase without a corresponding increase in the commodity price, the project's margins would be reduced, which could impact the project's economics and viability.
- **Supplying to China:** Tensions between China and other countries could lead to trade embargoes or other restrictions, potentially impacting VHM's ability to sell its refined products internationally.

Macro risks:

- Rare earth oxide price – this is the key valuation sensitivity
- Foreign exchange rates
- Increasing interest rates and the potential impact on the cost of debt finance

Appendix 1: History of the REE Industry – and How China Became the Largest Producer

Up to the 1960s: discovery and the beginnings of the REE industry

The term *rare earth* was coined in 1788 when a miner unearthed an unusual black rock in Ytterby, Sweden. The ore was called 'rare' because it had never been seen before and 'earth' because that was the 18th-century geological term for rocks that could be dissolved in acid. The rare earth industry began to grow in the early 1960s, when it was discovered that the element europium (Eu) gave an intense red luminescence when excited by electrons – a discovery very quickly used in the development of colour TVs.

1980s–1990s: how China became the dominant player in rare earths

Deng Xiaoping was the architect behind China's dominance of rare earth mining and processing. In a 1992 speech, he said, 'The Middle East has oil. China has rare earth metals.'

In the 1980s, China kicked off two innovative programs in science and technology, accelerating the country's high-tech development. In March 1986, Deng Xiaoping (China's leader at the time) approved Program 863: The National High Technology Research and Development Program, which focuses on biotechnology, space technology, information technology, laser technology, automation, energy technology, and new materials. A very important researcher was Professor Xu Guangxian (1920–2015). Xu is called 'the father of rare earths in China' (*Peking University News*) and is credited with paving the way for the country to become the world's primary exporter of rare earth elements (REEs). Xu applied his previous research in extracting isotopes of uranium to rare-earth extraction and succeeded in developing cutting-edge REE extraction technologies.

As REEs were materials that could provide China with both high profits and geopolitical influence, China focused in the 1980s and 1990s on becoming a world leader in their production. China increased production of REEs by an average of 40% per year in 1978–1989, during which time Chinese companies profited from a combination of low labour costs and lax environmental regulations relative to the United States. In the 1990s, China's export of REEs grew, causing a significant world-wide drop in prices. The Mountain Pass mine (a rare earths mine in California which was the largest rare earth mine in the world) struggled to remain competitive, and slowly began to curtail production as a result.

2009–today: the REE crisis and global efforts to catch up with China

A trade war between China and the US in 2009–2013 illustrates what potentially lies ahead if the West fails to allocate capital to the REE industry. In 2007, China limited the export of rare earths in order to retain them for the domestic market. This was achieved by raising export duties, which were originally at 10%. Duties were raised to 25% in 2011 for ferro-alloys containing more than 10% REEs. Overall, this resulted in a large drop in China's rare earth exports and hence a strong rise in REE prices. For example, the price of rare earth neodymium – a necessity for a range of products including headphones and EVs – climbed from \$42/kg in 2009 to \$283/kg in 2011.

China still maintains its monopoly in the REE industry. Despite the term 'rare,' rare earths are abundant in the earth's crust – the difficult part is separating the contained elements and producing a separated oxide. China's IP in this area is extremely valuable, as other countries have not made much progress in this regard, with rare earths having contributed very little to economies outside of China for the past 30 years. However, Western economies are now desperate to establish a position in the rare earths market, as separated rare earths are critical for decarbonisation and other industries such as defence. Lynas is the most advanced rare earths player (with a separations facility in Malaysia), followed by Iluka (currently building a rare earths refining facility in Western Australia). Mountain Pass has begun producing again after being acquired by MP Materials in 2017; the mine is producing a concentrate that is then shipped to China for further processing and refining. MP Materials is developing a refining plant to produce separated rare earth oxides.

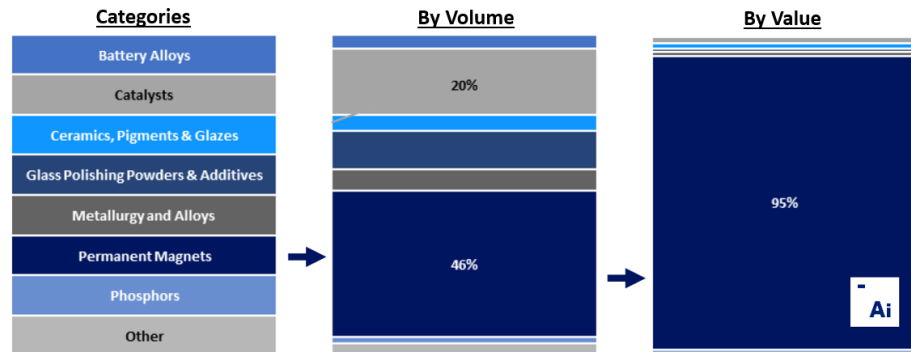
The rare earth industry requires significant capital investment in order for the West to build a commanding position in the market. Competing with China (which controls supply and prices and has limited environmental restrictions) will make it difficult for new entrants. New greenfield projects are seeing significant capex blowouts: for example, Hastings Technology Metals recently reported a +40% revision of its capex budget (A\$948m) for its Yangibana project. While raising capital from investors will remain difficult due to China's stranglehold on the market, we expect that governments will intervene and offer cheap debt to prospective projects, given the likely poor effect on global economies from the continuation of the current concentrated rare earths supply.

Appendix 2: A Closer Look at Permanent Magnets

PMs the key use of REEs – and growing

Permanent magnets (PMs) are the key end-use for REEs, with the share of PMs in this market only set to grow further (see Figure 14).

Figure 14: Permanent magnets the largest demand drivers of rare earth elements



Source: Adamas.

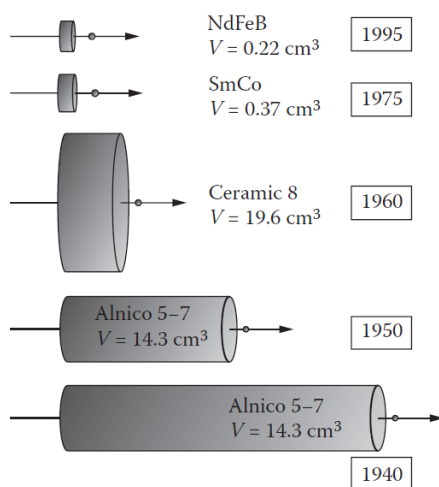
A closer look at NdFeB PMs

Neodymium-iron-boron (NdFeB) is the market leader in the PM market. NdFeB, a PM alloy that was developed and commercialised in the 1980s, has largely replaced alternative PM types including ceramic (ferrite), AlNiCo (aluminium nickel cobalt) and samarium cobalt (SmCo) magnets.

NdFeB alloy is predominately comprised of NdPr, iron and boron with minor concentrations of aluminium, niobium and dysprosium. Compared to other permanent magnets, NdFeB magnets offer substantially stronger magnetic fields per volume, which make them suitable for high-performance products with compact designs. The high strength-to-weight ratio of NdFeB magnets facilitates the miniaturisation of electric motor systems and is the preferred solution when it comes to the trade-off between weight and performance.

In the EV, two main types of motors are in commercial use today: permanent magnet motors (PMMs) and induction motors (IMs). According to Adamas Intelligence, PM traction motors are the most power-dense EV motor available today in terms of kW/kg and/or kW/cm³, and can be up to 15% more efficient. Importantly, although a PMM is more expensive than an alternative induction motor (IM), the weight and volume savings from its greater power density results in lower battery requirements that, at current prices, more than offset the motor's higher cost.

Figure 15: Relative magnet volume for the same magnet energy **Figure 16: NdFeB composition**



Source: Industry.

Main Elements within NdFeB	Weight Percentage (%)
Neodymium & Praseodymium (75%Nd 25%Pr)	29%-32%
Iron (Fe)	64.2% - 68.5%
Boron (B)	1.0% - 1.2%
Aluminium (Al)	0.2% - 0.4%
Niobium (Nb)	0.5% - 1%
Dysprosium (Dy)	0.8% - 1.2%

Source: Industry.

Methodology & Disclosures

MST Access is a registered business name of MST Financial Services Pty Ltd (ACN 617 475 180 "MST Financial") which is a limited liability company incorporated in Australia on 10 April 2017 and holds an Australian Financial Services Licence (Number: 500 557). This research is issued in Australia through MST Access which is the research division of MST Financial. The research and any access to it, is intended only for "wholesale clients" within the meaning of the Corporations Act 2001 of Australia. Any advice given by MST Access is general advice only and does not take into account your personal circumstances, needs or objectives. You should, before acting on this advice, consider the appropriateness of the advice, having regard to your objectives, financial situation and needs. If our advice relates to the acquisition, or possible acquisition, of a financial product you should read any relevant Product Disclosure Statement or like instrument.

This report has been commissioned by VHM Limited and prepared and issued by Michael Bentley of MST Access in consideration of a fee payable by VHM Limited. MST Access receives fees from the company referred to in this document, for research services and other financial services or advice we may provide to that company.

MST Financial also provides equity capital markets ("ECM") and corporate advisory services through its capital markets division, MST Capital Markets ("MST Capital"). MST Capital provides these services to a range of companies including clients of the MST Access service. As such, MST Capital may in future provide ECM and/or corporate advisory services to the company that is the subject of this research report and, accordingly, may receive fees from the company for providing such services. However, MST Financial has measures in place to ensure the independence of its research division is maintained, including information barriers between its Capital Markets and Research teams. In addition, neither MST Access, nor any of its research analysts, receive any financial benefit that is based on the revenues generated by MST Capital Markets or any other division of MST Financial.

The analyst has received assistance from the company in preparing this document. The company has provided the analyst with communication with senior management and information on the company and industry. As part of due diligence, the analyst has independently and critically reviewed the assistance and information provided by the company to form the opinions expressed in the report. Diligent care has been taken by the analyst to maintain an honest and fair objectivity in writing this report and making the recommendation. Where MST Access has been commissioned to prepare content and receives fees for its preparation, please note that NO part of the fee, compensation or employee remuneration paid will either directly or indirectly impact the content provided.

Accuracy of content: All information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable, however we do not guarantee the accuracy or completeness of this report and have not sought for this information to be independently certified. Opinions contained in this report represent those of MST Access at the time of publication. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results and estimates of amounts not yet determinable, and therefore involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of their subject matter to be materially different from current expectations.

Exclusion of liability: To the fullest extent allowed by law, MST Access shall not be liable for any direct, indirect or consequential losses, loss of profits, damages, costs or expenses incurred or suffered by you arising out of or in connection with the access to, use of or reliance on any information contained in this report. No guarantees or warranties regarding accuracy, completeness or fitness for purpose are provided by MST Access, and under no circumstances will any of MST Financials' officers, representatives, associates or agents be liable for any loss or damage, whether direct, incidental or consequential, caused by reliance on or use of the content.

General Advice Warning

MST Access Research may not be construed as personal advice or recommendation. MST encourages investors to seek independent financial advice regarding the suitability of investments for their individual circumstances and recommends that investments be independently evaluated. Investments involve risks and the value of any investment or income may go down as well as up. Investors may not get back the full amount invested. Past performance is not indicative of future performance. Estimates of future performance are based on assumptions that may not be realised. If provided, and unless otherwise stated, the closing price provided is that of the primary exchange for the issuer's securities or investments. The information contained within MST Access Research is published solely for information purposes and is not a solicitation or offer to buy or sell any financial instrument or participate in any trading or investment strategy. Analysis contained within MST Access Research publications is based upon publicly available information and may include numerous assumptions. Investors should be aware that different assumptions can and do result in materially different results.

MST Access Research is distributed only as may be permitted by law. It is not intended for distribution or use by any person or entity located in a jurisdiction where distribution, publication, availability or use would be prohibited. MST makes no claim that MST Access Research content may be lawfully viewed or accessed outside of Australia. Access to MST Access Research content may not be legal for certain persons and in certain jurisdictions. If you access this service or content from outside of Australia, you are responsible for compliance with the laws of your jurisdiction and/or the jurisdiction of the third party receiving such content. MST Access Research is provided to our clients through our proprietary research portal and distributed electronically by MST to its MST Access clients. Some MST Access Research products may also be made available to its clients via third party vendors or distributed through alternative electronic means as a convenience. Such alternative distribution methods are at MST's discretion.

Access & Use

Any access to or use of MST Access Research is subject to the [Terms and Conditions](#) of MST Access Research. By accessing or using MST Access Research you hereby agree to be bound by our Terms and Conditions and hereby consent to MST collecting and using your personal data (including cookies) in accordance with our [Privacy Policy](#), including for the purpose of a) setting your preferences and b) collecting readership data so we may deliver an improved and personalised service to you. If you do not agree to our Terms and Conditions and/or if you do not wish to consent to MST's use of your personal data, please do not access this service.

Copyright of the information contained within MST Access Research (including trademarks and service marks) are the property of their respective owners. MST Access Research, video interviews and other materials, or any portion thereof, may not be reprinted, reproduced, sold or redistributed without the prior written consent of MST.