

Hastings Tech Metals (HAS)

Thematic Firing / Upgrade to Buy

We have revised our HAS thesis and upgrade HAS to Speculative Buy after increasing our target by 14c to \$0.30/sh. The rare earth thematic is firing and HAS's strategic position warrants a rerate. Project economics have recently improved (capex) with further upside in opex and ore sorting. We see a debt funding solution is within reach to start construction by mid-2021. Risks include financial close and project execution, but we find the risk/reward attractive.

Revisiting Thesis: Next RE producer / Thematic Firing

- The rare earth thematic is firing in line with our thesis with permanent magnet raw materials prices rising 50% YTD (Fig 2).
- As we wrote in our 2019 initiation Germany's RE Solution, HAS's Yangibana project is the world's next Rare Earth producer due to high value ore (Pg9), German state debt backing (Pg10) and capital-light development strategy of partial integration (Pg11).
- We expect the \$520m construction to start mid-2021, producing 3.5ktpa of NdPr from 2024 over a +14 year life at a cost of US\$17.5/kg.

Further Optimised: Layout & Ore Sorting

- Several recent modifications have enhanced the project's economics and de-risked development. Project capex has fallen by -\$68m primarily via relocating the downstream hydromet facility closer to the coast.
- Whilst early days, we see upside in apply Ore Sorting, potentially lowering costs ~20-30% and lift our NPV by ~13-30cps.

Upgrade to Buy; TP +14c to \$0.30/sh

- We have made significant model changes: lowered WACC -2% to 12%, lowered capex, adjusted grades, increased share count to 1,204m (+16%) and updated the last cash balance of \$20m.
- HAS is now our top pick in the sector as it provides the most compelling risk reward. We note that since 1 July HAS is up +25%, underperforming peers (+135%) and NdPr (+46%) and is overdue a rerate (Fig 3).
- Next catalysts include converting offtake into contract agreements, a prerequisite for securing ECA debt facilities of ~A\$500mm.
- Risks remain around financial close and project execution, but we take comfort in the German state conservatism (contingency, warranty).

Note Ord Minnett acted as Lead Manager to a recent capital raising and receives fees for acting in this capacity

Year-end June (\$)	FY19A	FY20A	FY21E	FY22E	FY23E
Revenue (\$m)	-	-	-	-	190.7
EBITDA (\$m)	(5.5)	(4.7)	(2.6)	(2.6)	91.0
EBIT (\$m)	(5.4)	(4.5)	(2.6)	(2.6)	46.0
Reported NPAT (\$m)	(5.2)	(4.2)	(10.0)	(27.0)	21.5
Reported EPS (c)	(0.6)	(0.4)	(0.7)	(2.0)	1.6
Normalised NPAT (\$m)	(5.2)	(4.2)	(10.0)	(27.0)	21.5
Normalised EPS (c)	(0.6)	(0.4)	(0.8)	(2.2)	1.8
Dividend (c)	-	-	-	-	-
Net Yield (%)	-	-	-	-	-
EV/EBITDA (X)	-	-	-	-	7.2
Normalised P/E (x)	-	-	-	-	8.4
Normalised ROE (%)	-	-	-	-	-

Source: OML, Iress, Hastings Technology Metals Ltd

Last Price

A\$0.15

Target Price

A\$0.30 (Previously A\$0.16)

Recommendation

Speculative Buy (Previously Hold)

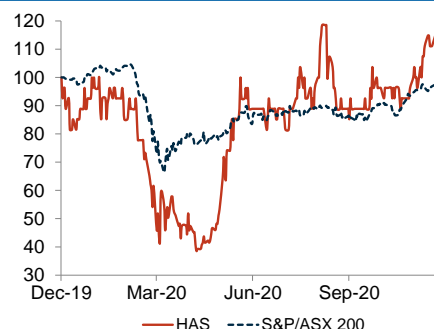
Risk

Higher

Diversified Metals and Mining

ASX Code	HAS
52 Week Range (\$)	0.05 - 0.16
Market Cap (\$m)	180.6
Shares Outstanding (m)	1,204.3
Av Daily Turnover (\$m)	0.0
3 Month Total Return (%)	25.0
12 Month Total Return (%)	3.4
Benchmark 12 Month Return (%)	-1.6
Net Debt FY21E (\$m)	79.0

Relative Price Performance



Source: FactSet

Consensus Earnings

	FY21E	FY22E
NPAT (C) (\$m)	-	-
NPAT (OM) (\$m)	(10.0)	(27.0)
EPS (C) (c)	-	-
EPS (OM) (c)	(0.8)	(2.2)

Source: OML, Iress, Hastings Technology Metals Ltd

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Production & Valuation Summary			Key financial metrics						
Valuation	A\$m	A\$/sh		19A	20A	21F	22F	23F	
NPV (FY20)			P&L						
Yangibana	565	0.41	Revenue	A\$m				191	
Corporate	(15)	(0.01)	EBITDA	A\$m	(6)	(5)	(3)	91	
Cash (Last)	20	0.01	NPAT	A\$m	(5)	(4)	(10)	22	
Tax Payable	(131)	(0.10)	EPS - (Diluted)	A\$/sh	(0.6)	(0.4)	(0.8)	(2.2)	
Total	439	0.32	Ebitda Margin	%				48	
Target Price A\$/sh		0.30	Cash flow						
TSR (%)		114%	Operating CF	A\$m	(4)	(7)	(18)	(52)	
Recommendation	Speculative Buy		Capex	A\$m	(33)	(19)	(121)	(363)	
Market Cap	A\$m	169	Free CF	A\$m	(38)	(24)	(138)	(415)	
Enterprise Value	A\$m	149	Financing CF	A\$m	36	15	193	414	
WACC			Balance Sheet						
Risk Free Rate	%	2.5%	Cash Balance	A\$m	18	9	64	63	
Equity beta	x	1.0	Net Debt / (Cash)	A\$m	(18)	(9)	79	444	
ERP	%	12.0%	Gearing (ND/E)	%	(19)	(9)	53	257	
Cost of Equity	%	12.0%	Interest Cover	x			(2.9)	(9.6)	
Cost of Debt	%	3.8%	Debt Facility Draw						
WACC (Real)		12.0%	German/Finish Facilities (US\$275m)	A\$m			143	357	
Register			NAIF (A\$150m)	A\$m			105	105	
Shares on issue	mn	1,204	Total Debt Drawn	A\$m			143	507	
Options (HASO)	mn	127	Debt Repayments	A\$m			8	25	
Performance Rights	mn	32	Capital Structure						
Diluted Share Count	mn	1,363	Shares on issue	m	798	986	1,204	1,204	
NPV A\$/sh Valuation Sensitivity			Options	m	69	120	127	127	
NdPr US\$/kg (Ex VAT)			Performance Rights	m	20	20	32	32	
AUDUSD	60	70	80	90	New Equity	m	116	187	
0.700	0.16	0.37	0.57	0.76	Fully Diluted Shares	m	887	1,035	
0.725	0.13	0.32	0.51	0.70	Price Assumptions				
0.750	0.08	0.27	0.46	0.64	AUD	0.70	0.70	0.70	
Project Funding Requirements			A\$m						
Mining		10							
Process plant		181							
Infrastructure		69							
Tailings		18							
Indirect/Other		171							
Contingency 15%		67							
Total Capex		516							
Sunk Capital		(33)							
Working Capital		27							
Financing Cost		66							
Total Project Funding		576							
Mineral Inventory			Volume	REO	NdPr				
		(mt)	%	%					
Resource		20.9	1.12	0.38					
Reserve		12.2	1.13	0.40					
Ords		14.4	1.31	0.50					
Mine Life		+13 years							
Average Sales Price & Cost (REO)			Revenue Mix (%)			Production by REO			
30 US\$/kg			Dy 4% Tb 4%			12 Kt			
28			NdPr 90%			9			
20						6			
10						3			
0						0			
23F	24F	25F	26F	LOM	23F	24F	25F	26F	27F
17	17	17	17	17	4.8	3.7	3.7	3.7	3.7
2.0	5.4	5.4	5.4	5.4	2.9	5.4	5.4	5.4	5.4

Summary of Model Changes

We have made significant model changes which results in a +\$0.14/sh increase in our target price to \$0.30/sh We upgrade to Speculative Buy (from Hold). Our valuation is based on a forward NPV assuming a WACC of 12% (real), long term NdPr price of US\$68/kg, AUD of 0.70 and spot commodity price for other RE's. Key changes include:

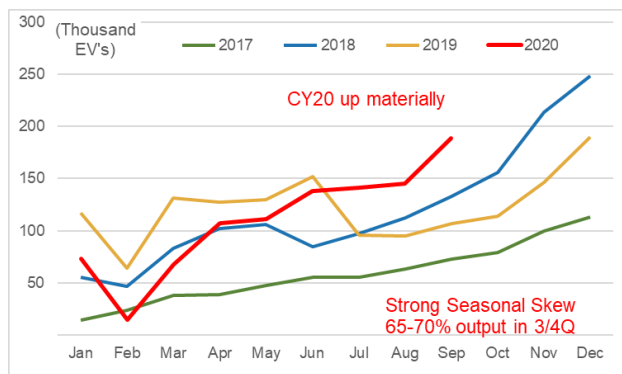
- WACC lowered by 2% to 12% (lower beta to 0.9)
- Lowered capex by \$68m in line with recent update
- Increased the diluted shares count +16% to 1363m
- Increased last cash position to \$20m
- Updated spot prices for other REO's
- Project assumptions tweaked headgrade by 5% due to ore sorting upside

Assumptions	New				Old				% Diff				Comments	
	21F	22F	23F	LT/LOM	21F	22F	23F	LT/LOM	21F	22F	23F	LT/LOM		
Production														
NdPr	kt		2.0	3.6				3.1			100	13	6 months earlier start, @ 5% higher grade	
Total REO Produced	kt		4.8	8.8				8.1			100	8	5% higher grade	
MREC Concentrate	kt		8.0	14.6				15.0			100	(3)		
P&L														
Revenue	A\$m		191	348				282			100	19	Updated Other REO prices to spot	
EBITDA	A\$m	(3)	(3)	91	165	(5)	(5)	(5)	131	(92)		105	21	
NPAT	A\$m	(10)	(28)	18		(9)	(19)	(25)		13	31	242		Rolled forward financials into FY21
Cash flow														
Operating cash flow	A\$m	(18)	(54)	34	165	(13)	(34)	(45)	78	28	37	234	53	
Capex	A\$m	(121)	(363)	(121)	(620)	(88)	(301)	(129)	(688)	27	17	(7)	(11)	Lowered capex by \$68
Free Cash Flow	A\$m	(138)	(417)	(37)	90	(101)	(335)	(124)	45	27	20	(234)	50	
Financing CF	A\$m	163	429	57		99	343	107		39	20	(88)		
Cash	A\$m	34	46	66		13	21	4		62	54	94		higher cash balance from latest raising
Valuation (NPV)														
Assets (Pre Tax)	A\$m	565	0.41			248	0.21			128				1 year longer mine life, lower capex
Tax	A\$m	(130)	(0.10)			(55)	(0.05)			137				Tax increased with higher project CF's
Corporate	A\$m	(15)	(0.01)			(21)	(0.02)			(29)				
Cash (Last)	A\$m	20	0.01			15	0.01			34				Higher last cash balance
Total NPV	A\$m	439	0.32			187	0.16			135				
Diluted Shares	m	1363				1,174				16				16% increase post last raise
WACC	%	12.0				13.8				(2)				2% reduction in WACC, due to CoE Beta
TSR (%)	%	114				33				81				
Target Price	A\$/sh	0.30				0.16				88				Doubled NPV to 30c

Thematic is Firing

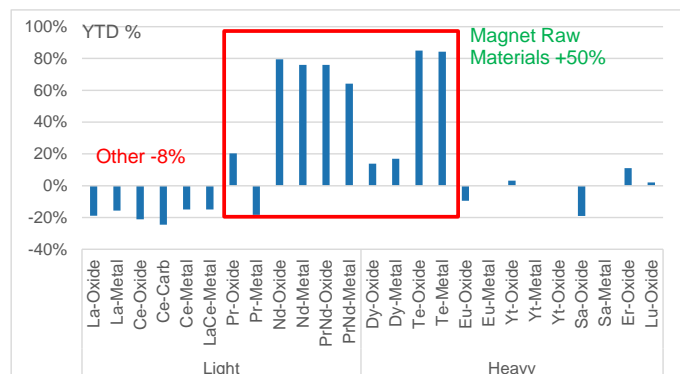
Electric vehicle demand has seen explosive growth in the 2H of 2020 and with it the demand for rare earth permanent magnets (Figure 1). We note a stark price trend has emerged across the various rare earths elements, with magnet raw material prices (Nd,Pr,Dy,Tb) seeing a +50% increase year to date, materially outperforming other RE's which are down -8% (Figure 2).

Figure 1: China EV Production by month



Source: China Automotive Association via Bloomberg with Ords Edits

Figure 2: Rare Earths Price Performance YTD (%)



Source: SMM, Baiinfo with Ords Edits

This commodity price performance strongly reaffirms our July 2019 sector initiation (Calm Before the Storm) which was bullish on the outlook for Rare Earth's. We highlight the broader electrification thematic remains increasingly strong and rare earths importance is under appreciated relative to other EV commodities (Li, Co, Ni, Mn etc). Our thesis of increasing market deficits for NdPr compound from CY22 as demand takes off and new supply barriers to entry remain high.

See Appendix B: Rare Earth 101

Overdue a re-rate

We note that since 1 July HAS rallied +25% and is yet to reflect the appreciation in the underlying commodity price (+46%) and its peer group which is up 135%. We flag that despite boasting the best rare earth project, HAS remains mis understood by the boarder market (Fig 3,4). In our view HAS warrants a material rerate in line with peers.

Rare Earth Sector Initiation
Calm before the storm

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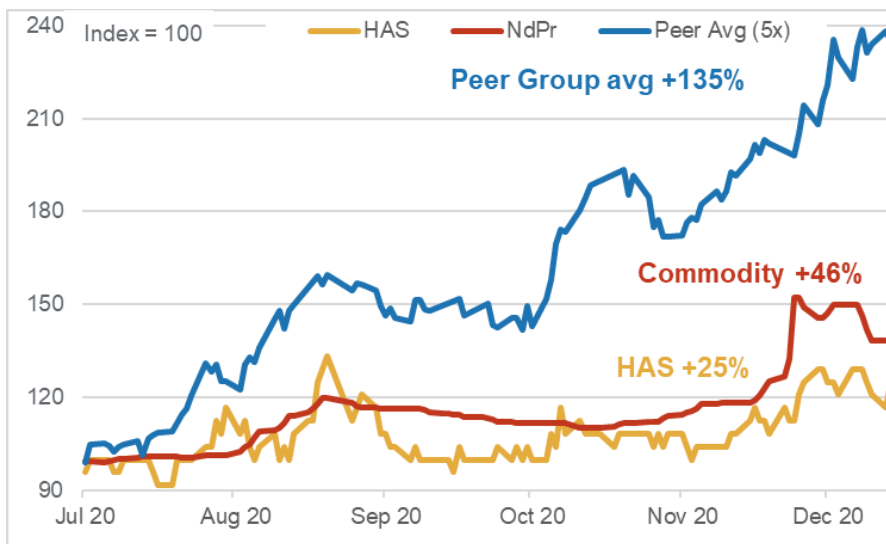
Lynas Corp (LYC AU)
Last Price: **A\$2.55**
Target Price: **A\$3.80**
Recommendation: **Buy**
Risk: **Higher**

Hastings Tech Metals (HAS AU)
Last Price: **A\$1.30**
Target Price: **A\$2.30**
Recommendation: **Speculative Buy**
Risk: **Higher**

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Figure 3: HAS Price Performance vs Peers & NdPr Index (1 July)



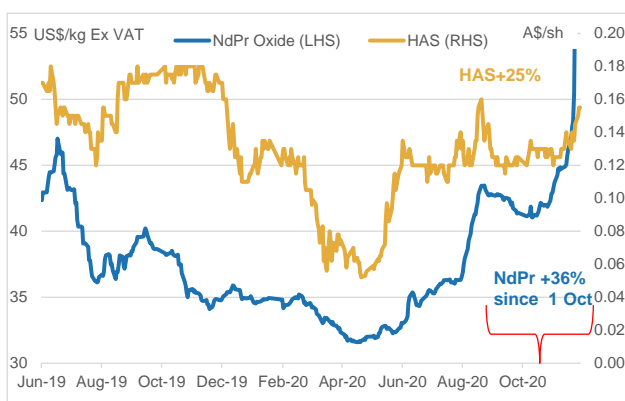
Source: IRESS, SMM via Bloomberg, Peer group includes: LYC, ASM, PEK, GGG, ARU

RE Initiation & Thesis in Appendix B

HAS underperformed peers & commodity

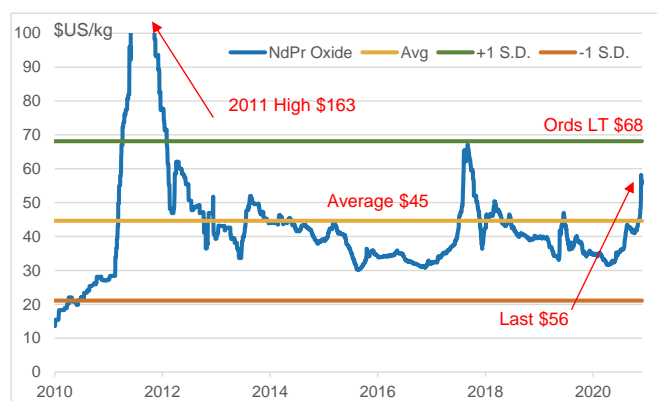
Overdue a rerate

Figure 4: NdPr Oxide & HAS Share Price



Source: SMM Via Bloomberg

Figure 5: Long term NdPr Price



Source: SMM via Bloomberg with Ords Edits

Key Changes #1: Project Optimisation

Since our last note in July there have been several important project developments that have enhanced the project economics and de-risked execution. This results in project capex being reduced -\$68m (Fig 6) to \$520m. We also see further opportunities to reduce operating costs due to the efficiency gains in being closer to a fully serviced location (logistics, reagents, gas access etc).

Optimised project layout with material cost savings of -\$68m

Relocating downstream hydromet plant closer to the coast

Key changes include:

- Relocating the downstream hydrometallurgical part of the processing plant from the remote mine site to an industrial zone closer to the coast near Onslow or Port Headland (Fig 7).
- Optimising project layout including centralising process plant, and tailings dam, camp as well as realigning haul roads

Figure 6: Project Capex Improvements

	Capex Budget 2019 (\$m)	Capex Revised 2020 (\$m)	Variance (\$m)
Mining	14	10	-3
Process Plant	167	181	14
Tailings Facility	19	18	-1
Infrastructure	77	69	-8
Services	130	50	-79
Other Items	9	9	0
Indirects	104	112	8
Totals	517	449	-68

Source: Hastings 2020 AGM

Figure 7: Downstream Plant Relocation Map



Source: Hastings 2020 AGM

Key Change #2: Ore Sorting Upside:

Yangibanana ore is a visually distinct black colour compared to the surrounding white gangue/waste material. The distinction makes the project ideally suited to ore sorting which can be purchased off the shelf and via a DIY implementation. Whilst its still early days, we see clear potential to improve project economics including higher longer mine life, lower costs higher metal output.

Project amenable to Ore Sorting technology

Test samples returned ~50% grade uplift

Ore sorting Background

The DFS Base Case currently assumes a 1mtpa ROM operation running at a 1.2% TREO grade (inc 0.4% NdPr). At a 74% recovery this equates to annual Rare Earth Oxide ('REO') production of 8.8ktpa including ~3.5ktpa NdPr.

In Nov 2019 ([here](#)) the results of a bulk trial (1.8 tonne) of Ore from Bald Hill (40% of resource) achieved:

- Mass Sample Rejection: 37% (containing 0.09% NdPr)
- Recovered 95% of the contained NdPr
- Improved NdPr grades by 52% from 0.7% to 1.08%.

Could boost grade, reserve life and lower costs by ~20-30%

If the results are uniform across the remaining geological domains there are several important implications and potential changes to the strategy from Ore Sorting including:

- **Increase reserve life:** Yangibana assumes a significant 30% mining dilution factor due to the 0.5 meter waste halo. A shift in the modifying factors could see a material boost in reserve/mine life.
- **Headgrades** would likely benefit materially, which we note a 30% uplift in (from 1.2% to 1.6% TREO) yields directly to a 30% outlift in product.
- **Potentially higher recoveries:** due to the reduction in waste impurities in the circuit
- **Lower operating costs:** haulage fewer tonnes of waste, Lower reagent use,

The strategic implications of the grade & product uplift is important when considering the potential cost savings. We flag that if grades were increased by 30% the same output level (8.8ktpa TREO) would require -22% less front-end throughput. We flag that HAS's financial model is driven by a variable rate per tonne of ROM (~A\$166/t), of which reagents is represent 26% (or A\$45/t due largely to sulphuric acid). We envisage that the business strategy could shift via:

1. **ROM 700ktpa / Costs -20%:** for the same product output of 8.8ktpa, ore sorting could lower front end throughput by 20-30% to ~700-800ktpa. This would significant reduce costs via lower reagents use (among others). We estimate the unit costs could decline -22% to A\$15/kg as well as lifting our NPV 44% to A\$596m (44cps) (See Figure 8 below).
2. **Maintain ROM / Grade +30%** conversely maintaining ROM throughput at 1mtpa at a 30% higher headgrade (1.6%) would equally lift metal output by 30% to metal to ~11.4ktpa REO. The offsetting factor would be the higher capital cost requirements of ~\$50m for a larger beneficiation equipment to handle the extremely hard ore. We roughly estimate a -18% reduction in opex vs our base case to \$17/kg and an almost doubling of our NPV to \$818m (60cps) (See Figure 8 below).

We note that further test work on the other 60% of the resource still needs to be completed (currently underway) before being incorporate the FS and financial model. We roughly assume a 1mtpa ore sorter to have a capital cost of ~A\$35m.

Figure 8: Scenario Analysis Ore Sorting

Scenario # /Desc		1: DFS	2: Ords	3: ROM -30%	4: Grade +30%
ROM	Mtpa	1.0	1.0	0.70	1.00
HeadGrade	% TREO	1.22%	1.35%	1.62%	1.62%
NPV (12%)	A\$m	481	414	596	818
IRR	\$	24%	22%	26%	29%
NdPr	ktpa	3.6	3.6	3.6	4.6
TREO	ktpa	8.8	8.8	8.8	11.4
Opex	A\$/kg	21.6	23.0	15.5	16.9
Mine Life	years	13	14	15	13

Source: Ords Edits, DFS assumptions differ to our model due to higher NPV,

Produce same amount of TREO ~9ktpa from 30% less ROM

Options for further study include lowering throughput to 700-800ktpa or maintaining 1mtpa

Material uplift in NPV of 13-30cps

Higher throughput needs +\$50m capex

Next Steps: Project Funding

The total project funding is ~A\$576mn based up of \$516m of capex (inc 15% contingency), financing cost (\$66m). We assume a more conservative 20% contingency for a total of \$600m. The key risk in any development project is the potential for project delays and capital cost increases. We remain comfortable that the capex estimate as German debt facility requirements has been rigorously reviewed and compiled to include:

- >90% of the capex has been fixed with EPCM project contractors
- Higher Contingency of A\$67m (15%)
- Additional contract cost for OEM's signing equipment performance warranties, adding A\$40m to the financing cost.

How to fund it: Export Credit Agency

The project will principally rely on Export Credit Agencies (German, Finish and Australian) to deliver the bulk of the of the capex required with up to A\$500m (US\$355m) available (Fig 10).

Impressively their German offtake partners Shaffeler have been actively assisting HAS in securing German Federal Government funding, which has a mechanism to fund "eligible projects that contribute supply of critical natural resources to Tier 1 German companies". In our view, this funding arrangement give us considerable confidence in the projects standing as:

1. German funding evaluation process is extremely rigorous.
2. It is typically very difficult to get debt financing for rare earth projects.
3. Highly attractive low-cost debt with interest of c.5% over 7-10 years, the principal facility of US\$140m (A\$200m) boasts rate of US Libor + 2.75%.

'North Australia Infrastructure Fund' ('NAIF') is also undertaking a feasibility study (due Oct 19') for funding of c. A\$150mn. This is expected to be used for site infrastructure expenditure that will more broadly assist the region. More recently the Finish credit export agency has also indicated a loan size of US\$75m.

HAS expects to secure the project financing by 1Q 2021, with the It appears the final step to secure funding is converting offtake agreements into binding supply contracts. We expect a further A\$50mn to be funded from new equity as well as \$50mn from customer prepayments.

Figure 9: Project Capex and Total funding requirement

	A\$m
Mining	10
Process plant	181
Infrastructure	69
Tailings	18
Indirect/Other	171
Contingency 15%	67
Total Capex	516
Sunk Capital	(33)
Working Capital	27
Financing Cost	66
Total Project Funding	576

Source: Company with Ords Edits

Figure 10: Indicative debt/equity structure

	A\$m	A\$m	%
Project Capex – Mine & Process Plant	449		
Contingency @ 15%	67		
Total Project Capex*		516	80%
Sunk cost up to DFS		33	5%
Working capital		27	4%
Financing costs/ interest capitalised during construction period		66	11%
Total funding for the Project		642	100%
Equity/cash raised since 2014 - capitalised		133	21%
Project Finance (NAIF, UFK, FV and Commercial Banks)**		385	60%
Balance of equity to raise		124	19%
Total sources of fund		642	100%

Source: HAS AGM 2020

Total project funding requirement of \$576m

We assume a higher contingency (20%)

Vigorous German due diligence and contingency

ECA's providing the bulk of funding

Few RE projects amenable to debt

Low cost gov't debt

Debt needs binding offtake contracts

On track for 1Q21

**We assume 80% Debt
10% Prepayment
10% New equity**

HAS Investment Thesis

We view HAS as having the most attractive rare earth project in development with the following key attributes to be successfully developed:

1. **German Backed:** Similar to Japan’s backing of Lynas, we see Germany backing HAS for its future Automotive/Industrial needs.
2. **High value orebody:** project hosts highest value rare earth ore body. This is primarily driven by the amount of NdPr of 35%, double world project average of 15%.
3. **Development Strategy:** only partial integration to produce a MREC product enables a low capital cost and significantly reducing project technical and execution risk.
4. **Skin in the game:** added certainty of seeing project through to completion is Executive Chairman Charles Lew, who owns 11.5% and has self-funded most development to date along with the directors who often appear to take shares in lieu of cash.

In our view the company appears undervalued relative to its fundamentals and we expect the valuation to rerate following a series of upcoming catalysts (debt financing) Key risks include: final permitting, project development, commodity price and exchange rates and operational factors including grade and recovery.

Thesis #1: German backed

Similar to Japan’s backing of Lynas in the 2000’s, we see Germany backing Hastings for its future rare earth needs. To date, HAS signed two separate MOU’s for 10-year offtake with German industrial stalwarts Thyssenkrupp (Raw Materials Division) and Schaeffler AG (auto component manufacturer). Their support has helped secure US\$140m (A\$200m) of low-cost German Government Debt facilities (see below). We note that in July 2017 ([here](#)) Schaeffler AG was chosen by Volkswagen Group as one of its EV technology suppliers.

Figure 11: Yangibana Project Offtake announced

Company	Country	Type	MREC (Kt)	Date Ann	Years
Thyssenkrupp	Germany	MOU	5.0	Mar 18'	10
Baotou Sky Rock RE	China	Contract	2.5	Nov 18'	5
Schaeffler AG	Germany	MOU	5.0	Jun 19'	10
Total			12.5		
MREC Capacity			15.0		

Source: Company, Ord Minnett Limited

Thesis #2: High Value Orebody

The key economic determinants for any mining project is the underlying value of the ore. For HAS we estimate a NSR value of A\$350/t which compares favourably to the DFS cost of \$166/t and our conservative estimates of \$180/t.

The high value of the ore is driven by the mix of the 17 rare earths typically found in any RE deposit. HAS project is endowed with a very rich source of ‘Nd’ & ‘Pr’ which is a key ingredient in permanent magnets (see appendix B: Rare Earth 101). For Yangibana NdPr represents:

- 35% of the contained resource, double the world average at 16%.
- At spot the value of the contained rare earths is worth US\$27/kg, also around double its peer group at US\$16/kg.

Figure 12: HAS Project Rare Earth Assembly (%) by Product

Figure 13: RE Project NdPr concentration by Resource (%)

HAS is our top rare earth pick

Attractive risk reward

German backing

High value orebody

Management has skin in the game

Appears undervalued relative to peer groups

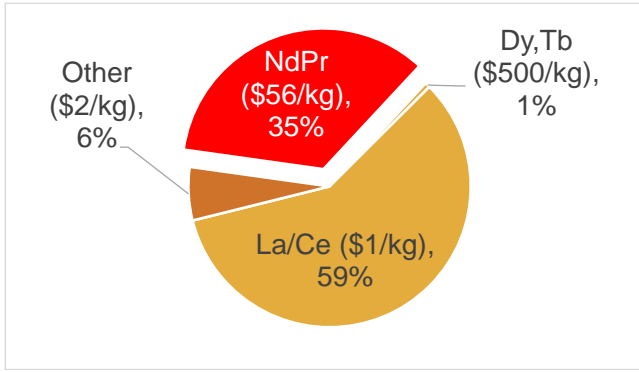
German industry is backing Hastings

Offtake with Thyssenkrupp and Schaeffler

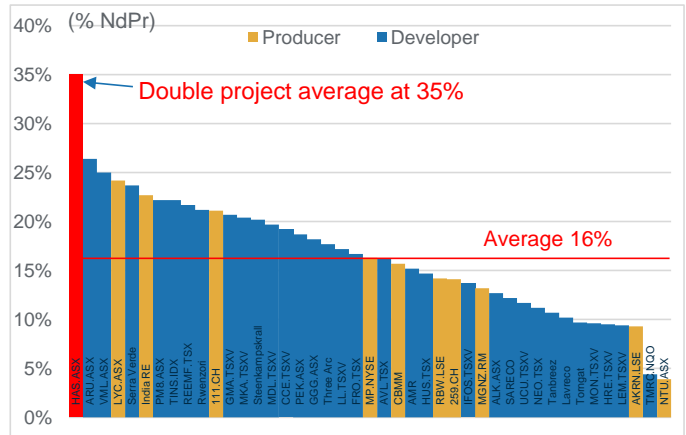
Customers assisting with State government debt

HAS’s ore value of A\$350/t driven by NdPr

Almost double its peer group

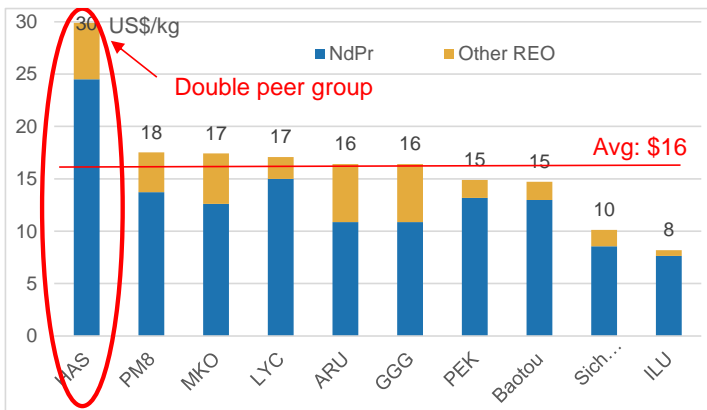


Source: Company Resource Statement 2020



Source: SMM, Asian Metals, Company Resource Statements, Extractive Metallurgy of Rare Earths 2nd Edition, Ord Minnett Limited, Roskill, Argus, Adamas Intelligence

Figure 14: Project Basket Price Comparison (US\$/kg spot)



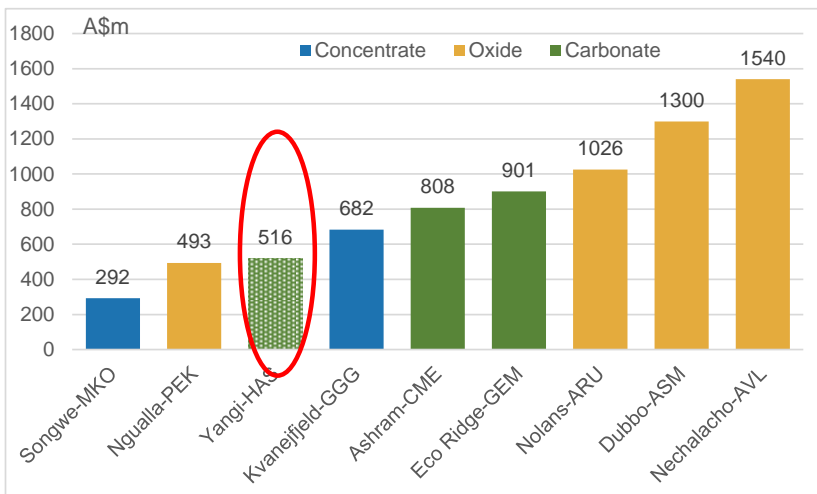
Source: Company Resource Statements, SMM as at 7th December 2020

Thesis #3: Low Capital Intensity + Shortcut

Barriers to entry for new rare earth producers is high. We like HAS's strategy of only partial integration which lowers its capital cost as well as lowering its technical/execution risk.

HAS project capital cost is ~A\$500m which pales in comparison to the worlds greenfield development projects which averages A\$1000m for vertically integrated (separated oxide) producers and A\$850m for mixed carbonate (Figure 15).

Figure 15: Rare Earth Project Capex Comparison



Source: Company Reports, Ords Estimates, assumes AUD of 0.75 and CAD of 1.27

Basket value worth double its peer group at \$30/kg

NdPr concentration >2 standard deviations above the mean

HAS strategy is of partial integration

Capital lite at \$500m

Average project cost A\$840m

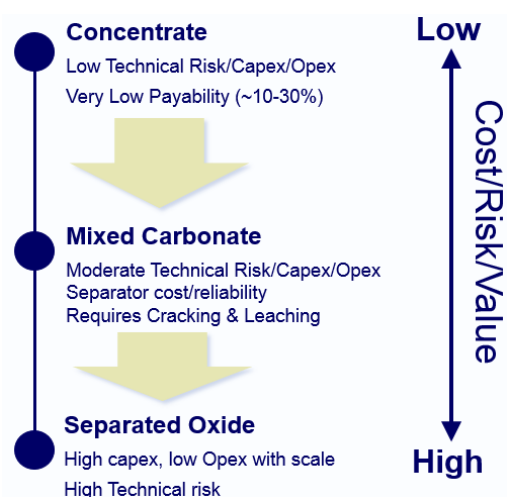
Up/down stream for different costs

Strategy: Partial integration & toll treat separation

Broadly speaking there are three stages of processing in the initial rare earth supply chain: Mixed Concentrate, Mixed Carbonate, Separated Oxides. In our view, each stage down the supply chain increases a projects technical risk along with its capital cost, offset by capturing more value (See Figure 16).

HAS strategy is to process only down to the 2nd stage of a Mixed Rare Earth Carbonate ('MREC') containing ~25% TREO. HAS plans to ship MREC to a customers designated separation facility under commercial terms similar to toll treatment. This loosely involves paying the separator a commercial treatment fee of ~US\$2.75/kg per unit of TREO, which adds 25% to the unit cost of the business (US\$15/kg). This also enables HAS to cost effectively capture the value uplift of 10-15x on the typical carbonate price (Figure 17).

Figure 16: Rare Earth Value Chain



Source: Ords Edits

We highlight that various industry analysts indicate at least a dozen underutilised rare earth separation facilities outside of China. Total TREO treatment capacity of ranges between 30-50ktpa (TREO) and is running at less than 25% utilisation producing <10ktpa (Fig 18 below). There plants are adjacent to mineral deposits that have been depleted but continue to process 3rd party ore feeds. Reliable feedstock appears difficult to procure.

We note that since 2014, China has curtailed or removed around 70% of its rare earth separation capacity from c.450ktpa to 140ktpa by 2020. With official production quotas currently running at c.120ktpa the utilisation rates of c.60% warrant further capacity cuts due to a complete elimination of upstream raw material feedstocks. Further China separation plants can legally process raw carbonate material from imported as it circumvents their strict production quota system.

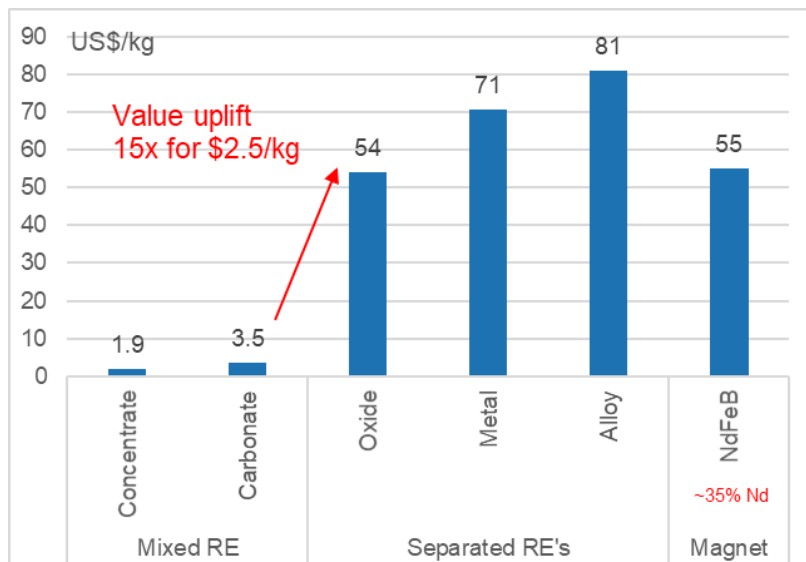
Figure 18: World Rare Earth Separation Capacity

Partial integration

Produce a mixed carbonate and toll treat separation for \$3/kg

Higher costs worth the lower capex/technical risk

Figure 17: NdPr Value Chain By Product



Source: SMM, Baiinfo, Ords Edits, Rainbow Rare Earths

>Dozen underutilised separation plants worldwide

Old mines closed, but processing plants remain in place

30-50ktpa of separation capacity worldwide

With significant global rare earth separation capacity, Vital will focus on producing a Mixed R.E. Carbonate product

Global Rare Earth Separation Capacity



COUNTRY	ESTIMATED TREQ T/YR	ESTIMATED CAPACITY UTILISATION
China	300,000	40%
Malaysia	20,000	100%
France	9,000	25%
Vietnam	7,000	50%
Russia	4,000	60%
Kazakhstan	3,500	0%
Estonia	3,000	33
Laos	3,000	0%
India	2,500	0%
Brazil	2,000	0%

10 INVESTOR PRESENTATION AUGUST 2020



Source: Vital Metals Presentation August 2020

Appendix A: HAS Overview

Hastings Technology Metals ('HAS') is a rare earth development company that owns the Yangibana project, located in the Upper Gascoyne Region of Western Australia. The project hosts one of the world's highest concentrations of the highly strategic rare earth 'NdPr' and is the world's most advanced project (studies, permitting, offtake, EPC).

The \$520m construction is expected to commence by mid-2021 and quickly ramp-up to a nameplate of 15kt of Mixed Rare Earth Carbonate ('MREC') containing 8.8ktpa of Rare Earth Oxides ('REO') including c.3.5kt of 'NdPr' oxide. Operating costs over the LOM are assumed to be \$17.5/kg.

Figure 19: Ords HAS Valuation

Valuation	A\$m	A\$/sh
NPV (FY20)		
Yangibana	565	0.41
Corporate	(15)	(0.01)
Cash (Last)	20	0.01
Tax Payable	(127)	(0.09)
Total	443	0.32
Target Price A\$/sh		0.30
TSR (%)		114%
Recommendation		Speculative Buy
Market Cap	A\$m	169
Enterprise Value	A\$m	149

Source: Ords Estimates

Figure 20: HAS NPV Valuation Sensitivity (A\$/sh)

AUDUSD	NdPr US\$/kg (Ex VAT)			
	60	70	80	90
0.700	0.16	0.37	0.57	0.76
0.725	0.13	0.32	0.51	0.70
0.750	0.08	0.27	0.46	0.64

Source: Ords Estimates

To account for the project risks, our model includes several conservative assumptions that materially differ to the company's stated forecasts including:

- Slower development timeline modelling 1st production to commence in FY24
- Higher operating costs of \$186/t vs DFS of \$166/t
- High WACC of 12% (Real) vs company at 6.7%

On the positive we assume an additional year of mine life at 14 years on expectation of a boost in the 1Q 2021 resource update a large exploration campaign over the past 18 months. We expect the 13-year mine life can be increased. We include an additional 1mt noting each additional year mine plan inventory adds 4cps to our valuation.

Figure 21: HAS Project Timeline

	2019	2020				2021				2022		
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Milestones	[Timeline bar]											
Project Finance	[Timeline bar]											
Approvals	[Timeline bar]											
Detailed Engineering Design	[Timeline bar]											
Procurement & Contracts	[Timeline bar]											
Construction	[Timeline bar]											

Source: Hastings

Appendix B: Rare Earth 101

“The middle east has oil, China has rare earths. It is of extremely important strategic significance; we must be sure to handle the rare earth issue properly and make the fullest of our country’s advantage in rare earth resources...”

- Deng Xiaoping 1992

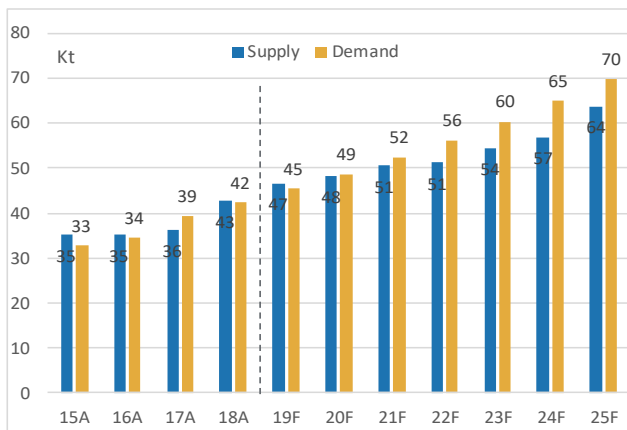
Rare earths are collection 15 metallic elements known as the lanthanide series with a range of applications (see Appendix A). We are principally interested in only two of these elements, Neodymium ('Nd') and Praseodymium ('Pr') known collectively as 'NdPr' as it represents roughly c.80% of the total value of the sector. NdPr is also a key raw ingredient for permanent magnets used in electric vehicles and other green technologies such as wind turbines, and energy efficient appliances. We are bullish on the rare earth sector and in particular NdPr seeing a combination of:

- Structural changes to China supply
- Strong demand growth for NdPr in permanent magnets
- Rare Earth deployed for geopolitical reasons.

Market Structure

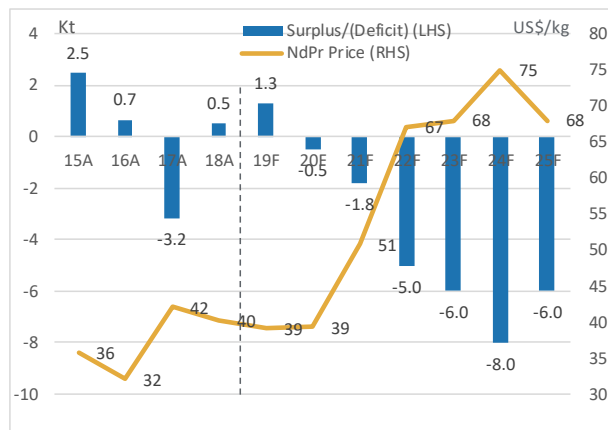
China dominates the rare earth supply chain responsible for c.80% of world production and 60% of demand. Within China, the rare earth supply chain is highly concentrated upstream (mine to separation plants) with six SOE's being the only approved producers, whilst the downstream product market (oxide to magnet makers) is highly fragmented. The Rare Earth Market is difficult to estimate due to the large volume of illicit Chinese supply. We roughly estimate the NdPr market to be ~45kt in 2019, 83% from China, 13% from Lynas.

Figure 22: NdPr Supply & Demand



Source: Ord Minnett Estimates, SMM, Roskill, Adamas Intelligence, USGS

Figure 23: NdPr Market Balance & Price Forecast



Demand Outlook

Certain Rare Earth metals are essential ingredients for high performance magnets in electric motors as they:

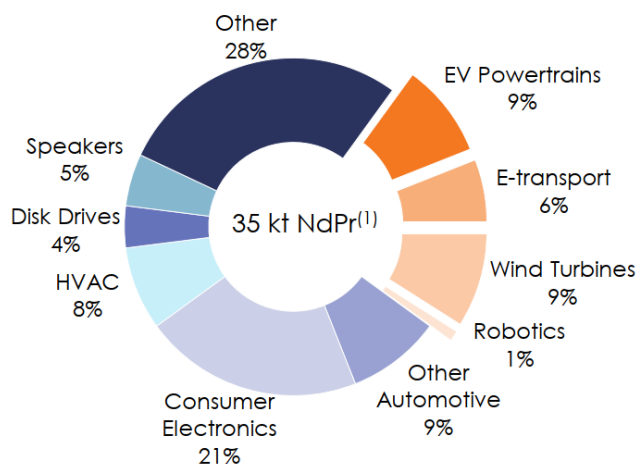
- Generate rotational force through magnetic power,
- Their size is small relative to delivering high torque/power density
- Require less maintenance

The dominant permanent magnets known as 'NdFeB' (Neodymium Iron Boron) contain c.30% NdPr Oxide and have a high intensity of use in electric motors:

- Electric Vehicles contain ~2kg of NdFeB per vehicle (Toyota Prius 1.5kg)
- Wind Turbines use 100-150kg of NdFeB per megawatt

Over the past 5 years global NdFeB demand has grown at a CAGR of 8% to reach around 171kt in 2018 and worth c.US\$12.2bn. China dominates world NdFeB supply at some 45% and its adoption rate has been far more pronounced than the ROW, particular for the EV market which has grown to 25% of the market

Figure 24: NdPr Magnet Market Segments (2019)



Source: Roskill via MP Materials Prospectus

Forecast demand growth for NdFeB varies widely between 7-25% over the next decade. China demand growth estimates are particularly bullish, at a 5-year CAGR of c.10% from 61kt in 2016 to 97kt by 2020, driven primarily by EV growth.

Supply Outlook

We see China’s historic rare earth dominance of supply undergoing a structural shift due to a combination of Beijing led industry wide reforms. We expect domestic production to continue to decline by forcing inefficient and illegal capacity to close as well as increasing costs to comply with strict new environmental regulations. We expect that ex China supply will have to dramatically increase in future years and must overcome historically high barriers to entry.

1. High Barriers to Entry

Historically new rare earth projects have had a chequered history, particularly for vertically integrated producers (e.g. mine to separated RE products). Typically, capital costs exceed US\$1bn and take lengthy periods to commission (LYC took 6 years). There have also been spectacular failures when economic design rates are not achieved. Case in point is Molycorp and its redevelopment of Mountain Pass in California, which after a 5-year restart process, failed to achieve design rates and filed for Chapter 11 bankruptcy protection in mid-2015 with debts of US\$1.7bn.

2. China SOE Reforms

Historically, China’s rare earth market was highly fragmented across southern provinces. The industry was progressively consolidated into the hands of a select group six provincial SOE’s and two smaller ‘research’ entities referred to as the ‘6+2’.

Since the 12th Five Year Plan (2011-2015) a significant reform agenda has been underway with a 2020 target of reducing rare earth capacity to c.140ktpa of TREC some 70% less than the c.450ktpa levels of 2013. China sees considerable strategic importance in its domestic rare earth industry as evidenced by it being the only commodity in China with its own five-year plan compared to other large SOE dominated sectors like Steel, Coal, Aluminium.

Since 2013, surplus capacity of rare earth separation plants has been reduced from c.450ktpa to c.250ktpa by 2017. Production has been restricted by limiting output via official 6 monthly quotas to approved entities. Whilst the quota system is likely to be strictly enforced, it bears little resemblance to reality with the 2017 quota of c.100kt of product well below the c.150kt of estimated total production.

3. Illegal/Black market crackdown

A black-market crackdown has been underway, and Beijing's actions indicate that the impact is quite pronounced. In 2010 the Ministry of Industry and Information (MIIT) tabled a strict criterion for the rare earth industry to reform and comply with strict production quotas granted to only officially sanctioned '6+2' SOE's. Any producer not certified or approved under the quota system (i.e. non '6+2') has been effectively outlawed.

The size of market is difficult to quantify ranging with estimates ranging between 30-60kt (15-40%) of domestic output, complicated by its geographic spread and fragmentation for upstream mine supply. This quota system has been strictly enforced in recent years via large province wide police led crackdowns which effectively halted supply for months at a time. Surveys of rare earth separation plants' utilisation rates indicate this trend clearly, with production rates falling to zero in effected provinces. This was particularly the case in the 6 months leading up to the China People's Congress in 2017 when nationwide utilisation rates fell to 43%. This event had a dramatic impact on oxide supply, driving prices dramatically higher. Post the CPC illegal mining resumed, and prices recovered.

4. Beautiful China/Environmental Reforms

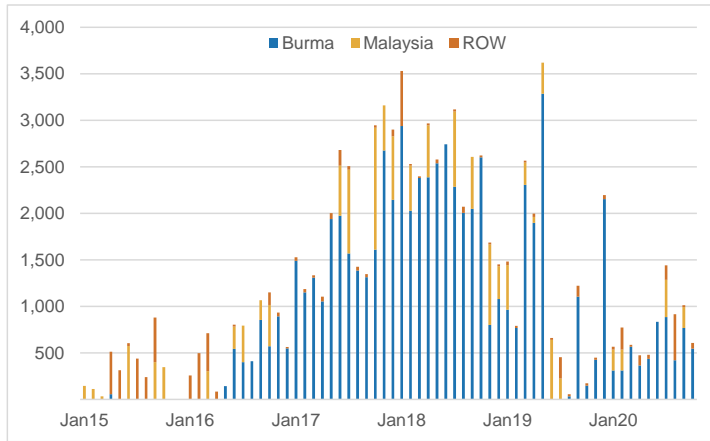
We note environmental reforms within China are playing a central role in curtailing production and increasing costs. The clean-up has been a long time coming but enforcement has been lacking until only recently begun in the last 3 years. In 2010 the Ministry of Industry and Information (MIIT) tabled production criteria for the rare earth industry, which clearly stated the grim outlook for certain producers. Key points included:

- **Banning monazite mining:** due to the high-level of radioactive elements and the resulting environmental damage due to poor waste management practices.
- **Upgraded Facilities:** processing of bastnasite & mixed minerals must be installed with a complete treatment system for wastewater, waste gas, and solid waste.
- **Banning ponding and heap leaching:** Ion-adsorption from clays in southern provinces utilised extraction methods that caused massive environmental damage.
- The rehabilitation of plants and vegetation after mining of ion-adsorption deposits should cover at least 90% of the affected area.

The impact of recent crackdowns on each of these factors has indirectly resulted in an increase in supply of rare earth feed stocks from other countries. As seen in monthly customs since industry reforms commenced in 2014, imports of raw rare earth materials from non-traditional producers such as neighbouring Myanmar skyrocketed from zero in FY14 to over 28kt in CY17. Since then Myanmar has shifted to downstream processing rather than transporting raw ore.

The combined impact of this policy is imposing a significant and structural increase in the industry cost base. For decades prices have been depressed to below the cost of production due to the heavy environmental cost borne by the countryside.

Figure 25: China RE Imports by Country



Source: China Customs with Ords Edits

China increasingly reliant on rare earth raw materials

Myanmar and US a key source of supply

Toyota backing NdFeB

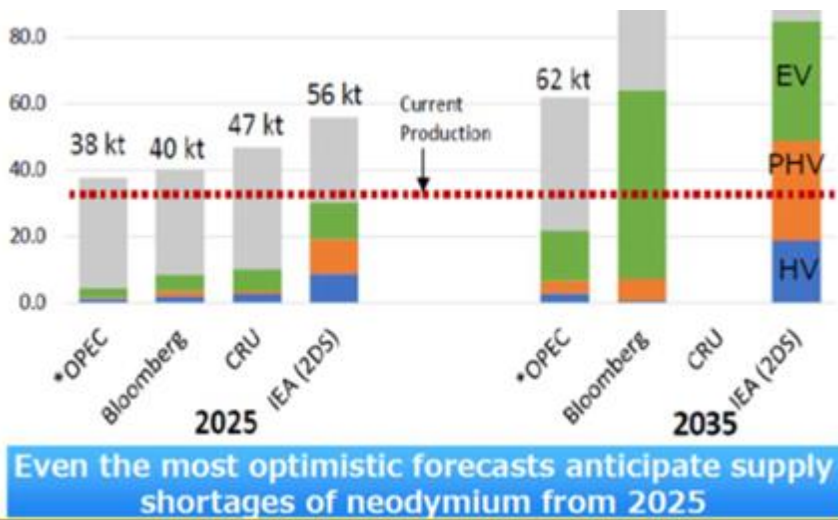
In February 2018, a Toyota investor briefing announced the release of new rare earth magnet for electric motors with largely bullish implications for the NdFeB market. Of importance was its 2025 outlook for the NdPr market “even the most optimistic forecasts...[we] anticipate supply shortages of NdPr from 2025”. Other key points:

- By 2025 Toyota is targeting production one electrified version for each conventional vehicle sold.
- Toyota R&D created a new magnet which uses lower concentrations of heavy RE’s Dy/Tb and use less NdPr and replace it with cheaper rare earth La/Ce.
- Accelerating development for mass production technologies for use in motors, inverters, and batteries but also robotics and a range of other applications

Toyota trying to use less NdPr

Also flagging the looming market deficit for NdPr

Figure 26: World NdPr Demand 2025 by source vs production



Even the most optimistic forecasts anticipate supply shortages of neodymium from 2025

Source: Toyota

Hastings Technology Metals Ltd

PROFIT & LOSS (A\$m)	2019A	2020A	2021E	2022E	2023E
Revenue	-	-	-	-	166.8
Operating EBITDA	(5.5)	(4.7)	(5.0)	(5.0)	49.7
EBIT	(5.4)	(4.5)	(5.0)	(5.0)	8.7
Net interest	0.3	0.3	(7.4)	(22.7)	(28.4)
Pre-tax profit	(5.2)	(4.2)	(12.4)	(27.7)	(19.7)
Net tax (expense) / benefit	-	-	-	-	-
Significant items/Adj.	-	-	-	-	-
Associate NPAT	(5.2)	(4.2)	(12.4)	(27.7)	(19.7)
Normalised NPAT	(5.2)	(4.2)	(12.4)	(27.7)	(19.7)
Reported NPAT	(5.2)	(4.2)	(12.4)	(27.7)	(19.7)
Normalised dil. EPS (cps)	(0.6)	(0.4)	(1.0)	(2.3)	(1.6)
Reported EPS (cps)	(0.6)	(0.4)	(0.9)	(2.0)	(1.4)
Effective tax rate (%)	30.0	30.0	30.0	30.0	30.0
DPS (cps)	-	-	-	-	-
DPS (cps)	-	-	-	-	-
Dividend yield (%)	-	-	-	-	-
Payout ratio (%)	-	-	-	-	-
Diluted # of shares (m)	887.2	1,034.6	1,362.9	1,362.9	1,362.9

CASH FLOW (A\$m)	2019A	2020A	2021E	2022E	2023E
EBITDA incl. adjustments	(5.5)	(4.7)	(2.6)	(2.6)	91.0
Change in working capital	-	-	-	-	-
Net Interest (paid)/received	0.3	0.2	(14.9)	(49.5)	(49.5)
Income tax paid	-	-	-	-	-
Other operating items	0.8	(2.0)	-	-	-
Operating Cash Flow	(4.4)	(6.5)	(17.5)	(52.1)	41.5
Other investing items	-	1.8	-	-	50.0
Investing Cash Flow	(33.3)	(17.1)	(121.0)	(362.9)	(71.0)
Other financing items	(1.3)	(0.4)	-	-	-
Financing Cash Flow	35.6	14.7	192.9	414.3	-
FX adjustment	-	-	-	-	-
Net Inc/(Dec) in Cash	(2.2)	(8.9)	54.4	(0.7)	(29.5)

BALANCE SHEET (A\$m)	2019A	2020A	2021E	2022E	2023E
Cash	18.5	9.5	63.8	63.2	33.7
Receivables	1.3	3.9	-	-	13.4
Inventory	-	-	-	-	9.5
PP & E	86.5	100.3	221.2	584.1	660.1
Other non-current assets	-	0.3	32.4	105.9	29.1
Total Assets	106.2	113.9	317.5	753.2	745.8
Short term debt	-	0.2	28.6	101.4	101.4
Payables	6.6	3.4	24.7	73.1	44.2
Long term debt	-	-	114.3	405.7	405.7
Other non-current liabilities	0.1	0.1	-	-	-
Total Liabilities	6.8	3.9	167.6	580.2	551.3
Total Equity	99.4	109.9	149.9	172.9	194.5
Net debt (cash)	(18.5)	(9.5)	79.0	444.0	473.4

Speculative Buy

DIVISIONS	2019A	2020A	2021E	2022E	2023E
KEY METRICS (%)	2019A	2020A	2021E	2022E	2023E
EBITDA growth	-	-	-	-	-
EBIT growth	-	-	-	-	-
EBITDA margin	-	-	-	-	47.7
EBIT margin	-	-	-	-	24.1

VALUATION RATIOS (x)	2019A	2020A	2021E	2022E	2023E
Reported P/E	-	-	-	-	9.5
Normalised P/E	-	-	-	-	8.4
Price To Free Cash Flow	-	-	-	-	-
EV / EBITDA	-	-	-	-	7.2
EV / EBIT	-	-	-	-	14.2

LEVERAGE	2019A	2020A	2021E	2022E	2023E
ND / (ND + Equity) (%)	(22.8)	(9.4)	34.5	72.0	70.9
Net Debt / EBITDA (%)	335.2	199.3	(3,038.9)	(17,075.2)	520.5
EBIT Interest Cover (x)	21.0	17.7	-	-	1.9
EBITDA Interest Cover (x)	21.4	18.8	-	-	3.7

SUBSTANTIAL HOLDERS	m	%
Charles Lew	120.5	11.5%
Mun Kee Chang	41.7	3.5%

VALUATION	
Cost of Equity (%)	12.0
Cost of debt (after tax) (%)	3.8
WACC (%)	12.0
Forecast cash flow (\$m)	439.0
Terminal value (\$m)	2,023.2
Equity NPV (\$m)	439.0
Equity NPV Per Share (\$)	0.32

Target Price Method	NPV
Target Price (\$)	0.30
Valuation disc. / (prem.) to share price (%)	100.0

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SPECULATIVE BUY	We expect the stock's total return (nominal yield plus capital appreciation) to exceed 20% over 12 months. The investment may have a strong capital appreciation but also has high degree of risk and there is a significant risk of capital loss.
BUY	The stock's total return (nominal dividend yield plus capital appreciation) is expected to exceed 15% over the next 12 months.
ACCUMULATE	We expect a total return of between 5% and 15%. Investors should consider adding to holdings or taking a position in the stock on share price weakness.
HOLD	We expect the stock to return between 0% and 5%, and believe the stock is fairly priced.
LIGHTEN	We expect the stock's return to be between 0% and negative 15%. Investors should consider decreasing their holdings.
SELL	We expect the total return to lose 15% or more.
RISK ASSESSMENT	Classified as Lower, Medium or Higher, the risk assessment denotes the relative assessment of an individual stock's risk based on an appraisal of its disclosed financial information, historic volatility of its share price, nature of its operations and other relevant quantitative and qualitative criteria. Risk is assessed by comparison with other Australian stocks, not across other asset classes such as Cash or Fixed Interest.

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