

Rare Earth Sector Initiation

Calm before the storm

We initiate on the Rare Earth Sector with LYC our preferred producer at a BUY and PT of A\$5.0/sh. HAS is our top pick among the developers with a Speculative Buy and PT of A\$0.30/sh. We think now is a good entry point back into equities, with prices having retreated c.30% since their June frenzied highs. Near term RE price fundamentals have weakened but appear to be stabilising, but note any escalation in geopolitical tensions could well see prices spike again, key known catalysts being China 2H production quotas (due end of July), and seasonal China EV demand uplift. Long term we find sector fundamentals as increasingly attractive due to a broader electrification demand trend as well as new supply barriers to entry remaining high as well as ongoing China SOE/Environmental reforms.

Rare Earth Outlook: Good entry point

- **Attractive entry point:** We think now is a good entry point into rare earth equities, with prices retreating some c.30% since their June peaks as well as some key catalysts ahead. A frenzy broke out in May following Chinese President Xi's visit to a rare magnet factory, driving up NdPr prices and equities c.40% over 4 weeks.
- **Key Catalysts ahead (Quotas + Geopolitics):** Release of China's 2H19 production quota is due shortly, which could well exacerbate geopolitical concerns. Threats by China to weaponize (withholding) RE supply also looms large in our mind, but we query the practicality of implementation given the heavily fragmented RE supply chain.
- **Short term** – recent weakness of NdPr prices appear to be stabilising with permanent magnet exports out of China increasing to multi year highs in May, and supply from Inner Mongolia retreats due to a shortage of ore.
- **Long term - Bullish NdPr:** The broader electrification thematic remains increasingly strong and rare earths importance is under appreciated relative to other EV commodities (Li,Co,Ni,Mn etc). We expect market deficits for NdPr to compound from CY22 as demand takes off and new supply barriers to entry remain high.

Initiate coverage: Lynas Corp - Buy PT \$5.0/sh

- **In the Global Spotlight:** as the only non-Chinese producer of scale (c.15% of world supply) it could continue capturing global headlines. Ann of a separation plant in Texas further emboldens the LYC's strategic importance.
- **Political Resolution within reach:** Malaysian political uncertainty continues to weigh on the stock, but we are confident of a resolution in the coming weeks prior to the Sept 2nd license renewal deadline, we expect PDF solution (cost neutral).
- **Valuation to Rerate:** We see LYC as materially undervalued relative to its fundamentals and expect the valuation to rerate following recently ann growth plans which adds +\$1.4/sh and further potential of +60¢/sh for Texas heavy rare earth JV.

Initiate coverage: Hastings - Speculative Buy PT \$0.30/sh

- **Our top junior pick:** due to its high value orebody, low technical risk path to production, German backing, derisked ramp up and managements skin in the game.
- **Germany's RE Solution:** Similar to Japan Inc's backing of LYC in the 2000's, we see Germany backing HAS for its future RE needs, with offtake partners (Thyssenkrupp/Schaeffler) helping to secure low cost German Govt Debt (c.5%)
- **High Value Orebody:** HAS's hosts one of the worlds highest NdPr resource concentrations of 35%, boosting its basket price 2x higher than peers/ ROW producers.
- **Lower Technical Risk:** They aim to produce a mixed carbonate and not fully separate RE's, significantly reducing project technical risk and capex (A\$450m).

Lynas Corp (LYC AU)

Last Price

A\$2.55

Target Price

A\$5.00

Recommendation

Buy

Risk

Higher

Hastings Tech Metals (HAS AU)

Last Price

A\$0.13

Target Price

A\$0.30

Recommendation

Speculative Buy

Risk

Higher

Dylan Kelly

Senior Research Analyst

02 8216 6417

dkelly@ords.com.au

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Rare Earth Sector Initiation

We initiate on the Rare Earth Sector with a BUY on LYC and A\$5.0/sh target and is our preferred producer, whilst HAS is our top pick among juniors with a Speculative Buy and A\$0.30/sh target.

We think now present an attractive entry point into rare earth equities, with both stock and commodity prices retreating c.30% since their June frenzied highs. Near term RE price fundamentals have weakened but appear to be stabilising, but we note any escalation in geopolitical tensions could well see prices spike again (China 2H production quotas).

Longer term, the broader electrification thematic remains increasingly strong and rare earths importance is under appreciated relative to other EV commodities (Li,Co,Ni,Mn etc). We expect market deficits for NdPr to compound from CY22 as demand takes off and new supply barriers to entry remain high.

Attractive entry point

We think now is a good entry point back into the equities, with prices having retreated c.30% since their June peaks as well as some key catalysts ahead,. A frenzy broke out following Chinese President Xi's visit to a rare magnet factory in May, driving up NdPr prices/equities +40% over 4 weeks.

Figure 1: Price Changes since May (Indexed)



Source: IRESS, SMM, Ord Minnett Estimates (6 Juniors include HAS,ARU,ALK,GGG,NTU,PEK)

Key Catalysts

We are cautiously optimistic on the near term price outlook due to the multiple geopolitical catalysts on the horizon. Key catalysts we are looking for include:

- **China's 2H19 production quota:** typically released in late July, in our view, any material reduction from 1H19 levels (60kt mined, 57.5kt product) could be perceived negatively from geopolitical perspective.
- **Geopolitical Drama:** Threats by China to weaponize (withholding) RE supply also looms large in our mind, but we query the practicality of implementation given the heavily fragmented RE supply chain.
- **Seasonal demand tailwinds:** typically the Sep/Dec quarters are heavily skewed towards EV production (automobile/commercial vehicles).

Supply & Demand Forecast

- In CY18 we estimated the market was in a slight surplus of 0.5kt, with supply at 42.8kt and demand at 42.3kt.
- Over the past 5 years we estimate the NdPr market has grown at an 8% CAGR, with the market being relatively balanced.
 - The majority of supply growth over the past 5 years has come from LYC which has added 3.8kt (35%) with unconventional sources from Myanmar adding 2.3kt, while the restart of Mountain Pass in California added a c.2.6kt.
- Between 2019 and 2021 we expect the NdPr market to remain relatively balanced with demand growing at 8%, met by increasing recycled magnets and efficiency gains from Chinese production as well as the tail end of LYC’s project Next.
- In 2022, we expect the uptake in NdPr demand from EV production reaches an inflection point, which we expect will drive the market into deficit. We expect prices to rise until a supply response is incentivised.
 - We have become increasingly positive on the demand outlook, with key auto manufacturers bringing forward their targeted EV levels. For example Toyota has brought forward its 50% EV sales target by 5 years to 2025.

Figure 2: NdPr Oxide Supply & Demand Forecast

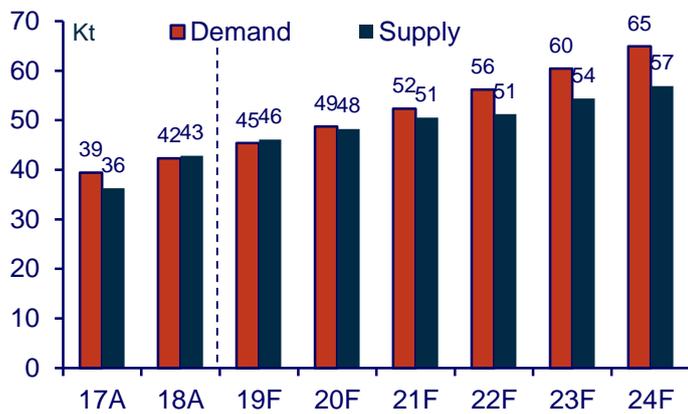
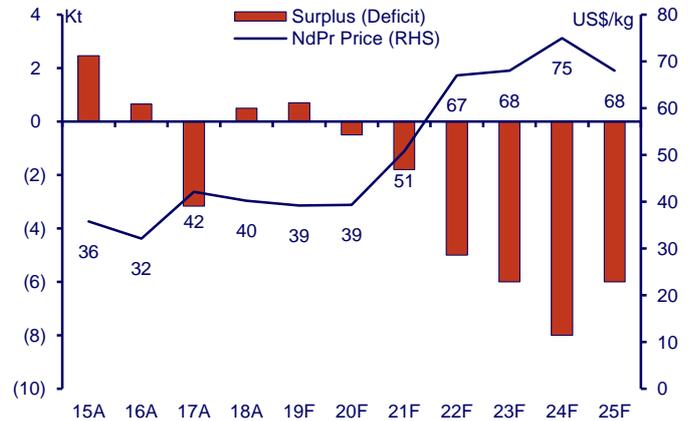


Figure 3: NdPr Market Balance & Price Forecast



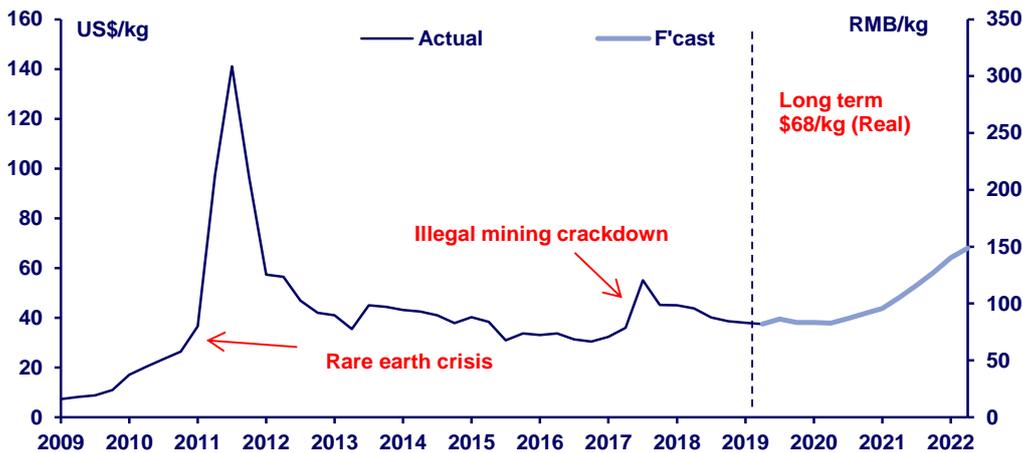
Source: Ord Minnett Estimates, SMM, Roskill, Adamas Intelligence, USGS

Price Forecast

We forecast a long term real NdPr Oxide price of US\$68/kg on an FOB China basis excluding 16% VAT. Our forecast is based on an incentive price analysis of 5 advanced NdPr rich projects to realise a 15% IRR.

- Near term we expect prices to weaken a slight -3% to from spot to c.US\$35/kg in the SepQtr before recovering in the DecQ/MarQ to \$35/39/kg and to average FY20 at \$38/kg.
- For FY21 we expect prices to lift slightly higher from FY20 level at c.US\$43/kg, before reverting to our long term number of US\$68/kg as market deficits increase.

Figure 4: Historic & Forecast NdPr Oxide Prices 2009-2022



Source: SMM, Ord Minnett Estimates

We note that incentive pricing is an ineffective predictor of future pricing. Typically we forecast prices based on the marginal cost of production, but this measure is not possible due to the 15 other rare earths that are produced alongside NdPr as either by-products or co-products. However, we have a high degree of confidence that our US\$68/kg forecast is realistic as it implies c.50% Ebitda margin for LYC, which is consistent with the long run average of 1st quartile cost producers with a high industry concentrations.

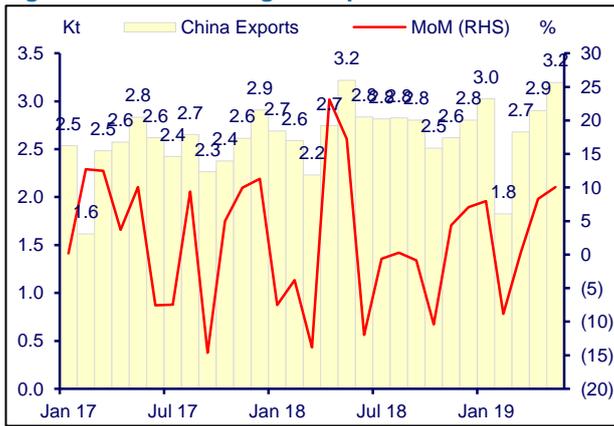
Further, visibility on NdPr market pricing is complex, opaque and highly illiquid with a very small market size of 43kt. Pricing is further complicated by reports that reported prices represent possibly as low as ~10% of trade volumes. This is worse than the Uranium spot market, which is known to represent as little as <20% of supply.

Short term outlook: Stabilising

NdPr prices have been challenged in the past several weeks since peaking in early June. Market fundamentals appear to be showing signs of normalising:

- China RE Permanent Magnet exports in May at 3.2kt hitting a new 12 month high.
- Domestic NdPr market appears have returns to relative balance with recent production and sales data even at 2.3kt per month. This is further supported by NdPr holding steady at 4kt (but still remain at 5 year highs).
- China RE separation plant utilisation rates fell by 6% in May to 58% and maintained this slightly lower level into June. This appears driven by a shortage of domestic ore from Inner Mongolian.
- Myanmar's Last Gasp: Myanmar imports were zero in June, which gives the market a potential relief that the illicit supply has come to an end. This is an important development as we previously estimated it was 2-4% of world NdPr supply (others estimated as high as 10-15%).

Figure 5: China RE Magnet Exports



Source: China Customs, Asian Metals

Figure 6: NdPr Market Balance & Price Forecast

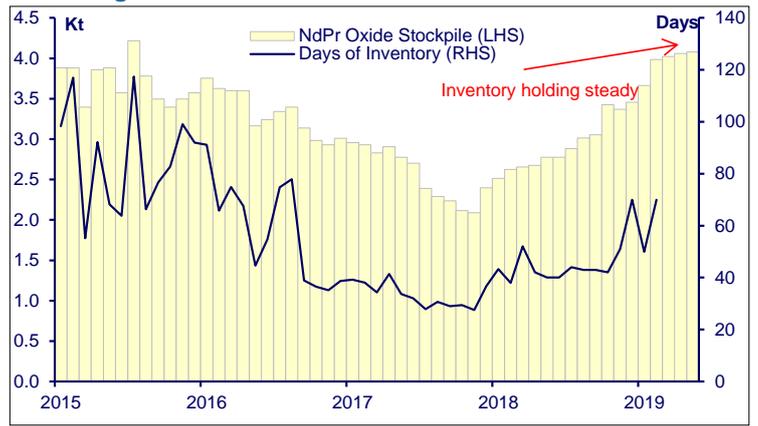
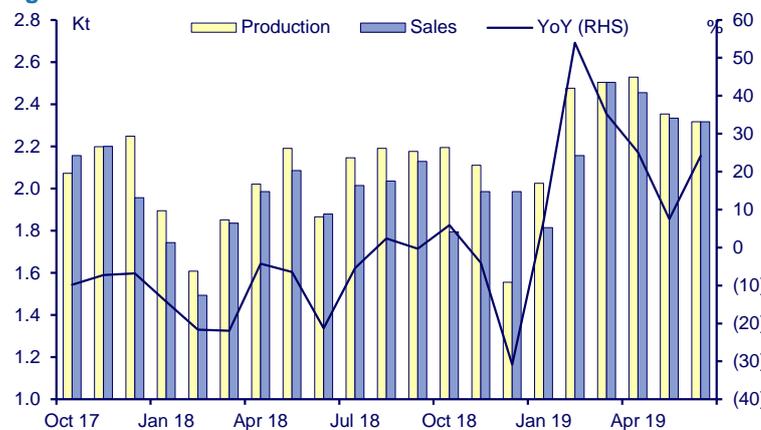


Figure 7: China NdPr Oxide Production & Sales



Source: China Customs, Asian Metals

Figure 8: China RE Separation Plant Utilisation Rates

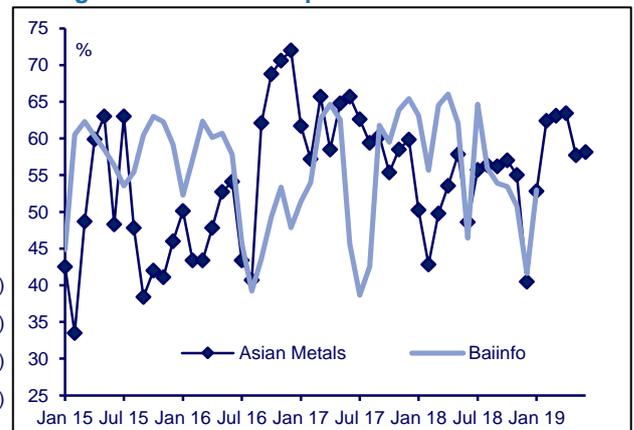
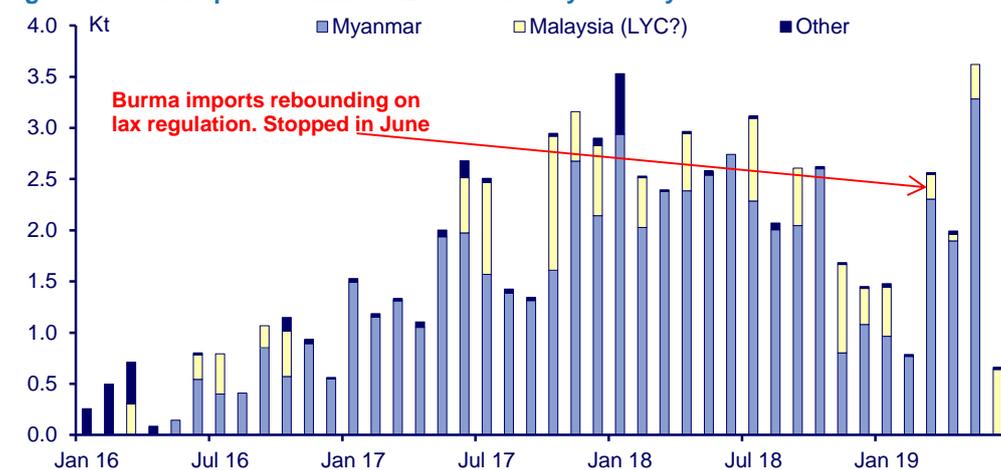


Figure 9: China Imports of Mixed RE Carbonate by Country



Source: China Customs,

Appendix A: Rare Earth Market

“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 appliance.

We are bullish on the rare earth sector and in particular NdPr seeing a combination of:

- Structural market changes curtailing supply from dominant supplier China
- Favourable demand outlook for NdPr
- Rare Earth Supply Weaponized for geopolitical reasons.

Market structure

China dominates gold 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. We focus on the upstream market, which is both complex and undergoing significant change.

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.

Industry Costs Rising

The structural cost base of Chinese rare earth producers is increasing. For decades prices have been depressed to below the cost of production due to the heavy environmental cost borne by the country side. With Beautiful China a series of Beijing and provincial-led policies is enforcement of new environmental regulations regarding the rare earths industry.

China Industry Reforms Cutting Supply

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 TREO 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, which compared to other large SOE dominated sectors like Steel, Coal, Aluminium. This reform was being achieved via:

1. Supply Side Reforms (‘SSR’): China State Owned Enterprise (SOE) forcing:
 - a. Industry Consolidation,
 - b. Closing surplus capacity
2. Removal illicit/black market rare earth supply
3. ‘Beautiful China’ and environmental reforms curtailing production and rising costs.

1. SOE Industry Consolidation

Historically, outside of Inner Mongolia the Chinese 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'.

2. Removal of surplus capacity

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 criteria 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 (ie 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 Peoples 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:

- Mining of pure monazite minerals is banned due to the high-level of radioactive elements in them and the resulting environmental damage.
- The facilities for the processing of bastnasite and mixed minerals must be installed with a complete treatment system for waste water, waste gas, and solid waste.
- Ion-adsorption deposits, ponding and heap leaching are banned due to possibility of 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.

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, particularly for the EV market which has grown to

Forecast demand growth for NdFeB varies widely between 7-25% over the next decade. China-specific 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.

Figure 10: NdFeB Magnets Consumption by segment

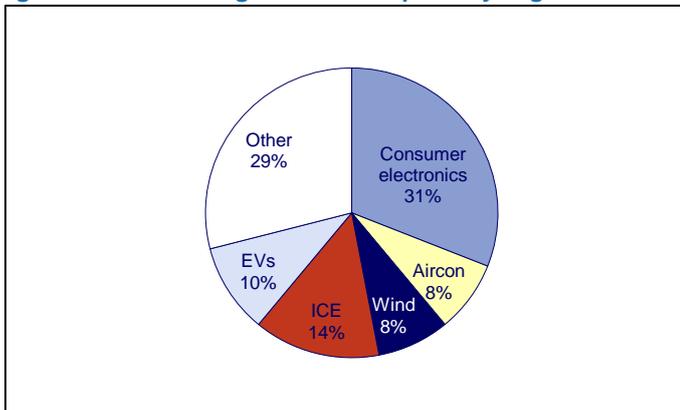
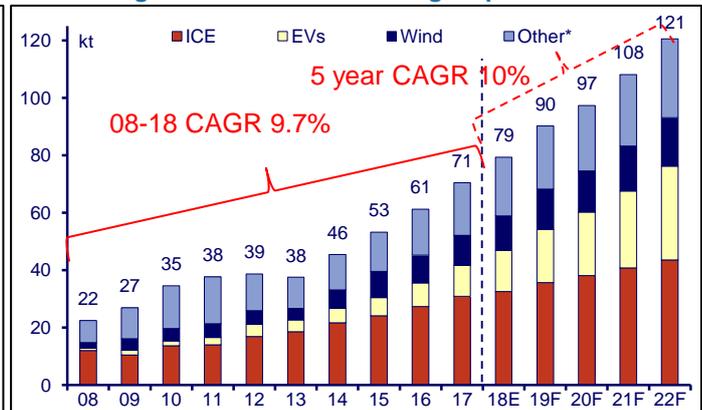


Figure 11: China NdFeB magnet production & forecast



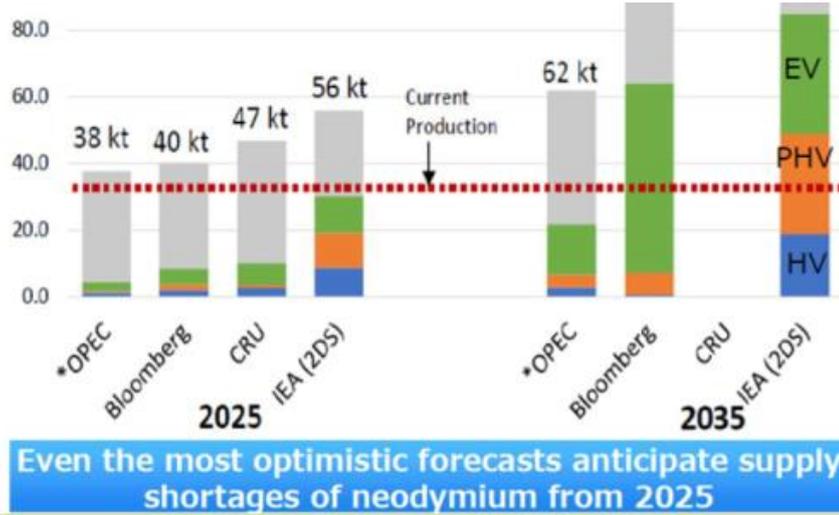
Source: SMM & Ord Minnett Forecasts

▪ 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 particular 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

Figure 12: World NdPr Demand 2025 by source vs production (from Toyota)



Source: Toyota

Lynas Corp (LYC AU)

Political resolution within reach/ Valuation rerate to follow

We initiate coverage on LYC with a BUY recommendation and A\$5.0/sh target price. We see LYC's as materially undervalued relative to its fundamentals, due to Malaysian political uncertainty, but we are confident this will be resolved by the Sep 2nd license renewal deadline. We expect the valuation to rerate soon after due to its recently ann growth plans combined with its near term cash generation potential.

Initiate with BUY rec & A\$5.0/sh target price

- Our valuation is based on a forward NPV using a 8.4% WACC (Real) and long term assumptions of US\$68/kg NdPr (ex VAT) and 0.70 AUDUSD.
- We see LYC as materially undervalued relative to its fundamentals with the market pricing in significant supply disruption.
- As the worlds largest ex China producer it's strategic importance cannot be overstated. Numerous +ive catalysts ahead (operational, growth, M&A)

Political resolution within reach

- Malaysia political uncertainty continues to weigh heavily on the share price. We remain confident that it receives its license renewal in August and the business suffers no future operational disruption.
- On May 30th the Malaysian Prime Minister explicitly stated that its license will be renewed (Due Sep 2nd 2019). In our view LYC's controversy is political (no scientific basis for concern), and the PM's support gives us confidence that a 'Win Win' deal can be struck before.
- A 'Win-Win' looks to us like a Permanent Storage Facility for the WLP (Cost Neutral) and to Crack in Leach in Aus by 2025 for "A\$500m".

Valuation to rerate

- Recent Investor Day outlined a clear 5 year growth plan to lift NdPr output +44% (+A\$1.4/sh) + a Texas JV to separate Heavy RE's (+A\$0.6/sh).
- We think they can readily self-fund growth, but they have significant flexibility from the recently renegotiated Japanese debt facility (US\$145m over 10 years at 2.5%) which also now enables dividends.

Key Financials

Year-end June (A\$)	FY17A	FY18A	FY19E	FY20E	FY21E
Revenue (\$m)	257.0	374.1	368.6	489.0	521.7
EBITDA (\$m)	31.9	127.0	121.2	209.9	240.6
EBIT (\$m)	(12.0)	86.2	79.4	168.5	199.2
Reported NPAT (\$m)	(0.5)	53.1	62.8	165.4	199.1
Reported EPS (c)	(0.0)	8.3	8.8	23.0	27.7
Normalised NPAT (\$m)	23.6	53.8	83.7	165.4	199.1
Normalised EPS (c)	0.7	11.0	12.6	24.8	29.8
EPS Growth (%)	-	1,511.2	14.3	96.6	20.4
Dividend (c)	-	-	-	-	-
Net Yield (%)	-	-	-	-	-
EV/EBITDA (X)	42.8	14.7	15.2	8.1	6.2
Normalised P/E (x)	-	23.1	20.2	10.3	8.6
Normalised ROE (%)	-	-	-	-	-

Source: OML, Iress, Lynas Corporation Limited

Last Price

A\$2.55

Target Price

A\$5.00

Recommendation

Buy

Risk

Higher

Diversified Metals and Mining

ASX Code	LYC
52 Week Range (A\$)	1.52 - 3.05
Market Cap (\$m)	1,702.9
Shares Outstanding (m)	667.8
Av Daily Turnover (\$m)	0.0
3 Month Total Return (%)	28.8
12 Month Total Return (%)	12.3
Benchmark 12 Month Return (%)	9.0
Net Debt FY19E (A\$m)	136.3

Relative Price Performance



Source: FactSet

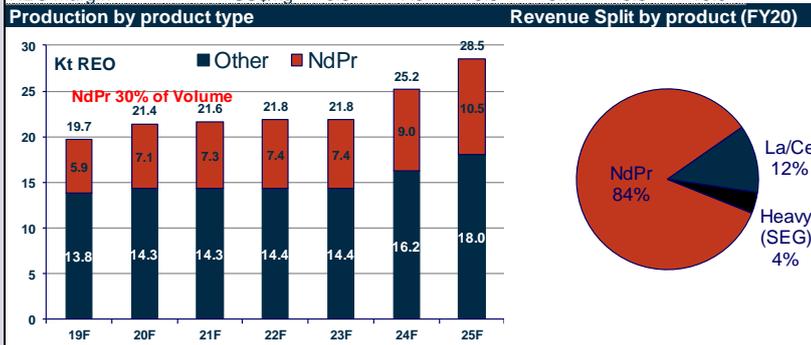
Consensus Earnings

	FY19E	FY20E
NPAT (C) (\$m)	-	-
NPAT (OM) (\$m)	83.7	165.4
EPS (C) (c)	-	-
EPS (OM) (c)	12.6	24.8

Source: OML, Iress, Lynas Corporation Limited

Production & Valuation Summary								
Assumptions (Real)		17A	18A	19F	20F	21F	22F	LT
AUD		0.75	0.78	0.71	0.66	0.68	0.70	0.70
NdPr Oxide	US\$/kg	32.5	47.4	38.5	38.4	43.4	68.0	68.0
Other REO	US\$/kg	2.8	2.8	3.3	2.5	2.5	2.5	2.5
Key financial metrics		17A	18A	19F	20F	21F	22F	
P&L								
Revenue	A\$m	257	374	369	489	522	773	
EBITDA	A\$m	32	127	121	210	241	502	
NPAT	A\$m	24	54	84	165	199	352	
EPS - (Diluted)	A¢/sh	(0.0)	8.3	8.8	23.0	27.7	49.0	
Ebitda Margin	%	12	34	33	43	46	65	
EV/Ebitda	x	25.6	13.6	15.3	8.8	6.8	2.7	
Cash flow								
Operating Cash Flow	A\$m	34	118	104	210	241	502	
Capex	A\$m	2	24	32	30	35	196	
Security Bond Deposit	A\$m	5	30	11	12			
Free Cash Flow	A\$m	34	118	104	210	241	502	
FCF Yield	%	8.8	7.6	6.1	11.3	12.9	26.9	
Balance Sheet								
Cash Balance	A\$m	64	42	90	140	241	546	
Net Debt / (Cash)	A\$m	(429)	(181)	(136)	11	222	526	
Gearing (ND/E)	%	(383)	(42)	(27)	2	26	43	
Interest Cover	x	0.16	0.22	0.07	0.02	0.01	0.01	
Debt Facilities								
Convertible Bond	US\$m	225	15	14	14	14	14	
Loan (JARE)	US\$m	200	150	145	70			
Total Debt (USD)	US\$m	425	165	159	84	14	14	
Debt converted to equity	US\$m		210	2				
Total Debt (AUD)	A\$m	493	223	226	129	20	20	
Debt Repayments	A\$m	4	66	4	114	102		

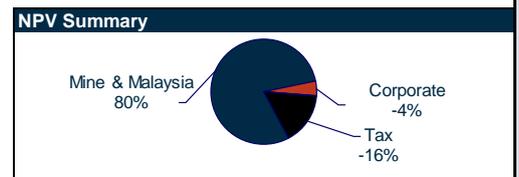
Operational Summary							
		17A	18A	19F	20F	21F	22F
Production Run Rate (Tonnes Per Month)							
NdPr	tpm	435	454	492	595	610	620
Other REO	tpm	898	1,026	1,153	1,191	1,191	1,200
Production							
NdPr	kt	5.2	5.4	5.9	7.1	7.3	7.4
Other REO	kt	10.8	12.3	13.8	14.3	14.3	14.4
Total REO Produced	kt	16.0	17.8	19.7	21.4	21.6	21.8
Sales							
NdPr	kt	5.2	5.5	5.7	7.5	7.3	7.4
Other REO	kt	9.6	12.2	13.4	14.0	14.0	14.1
Total Sales	kt	14.8	17.7	19.2	21.5	21.3	21.6
NdPr % of sales	%	35.2	31.1	29.9	34.8	34.3	34.5
Mt Weld Mining							
Ore Mined	kt	240	590	400	400	400	343
Grade Mined	% REO	17.8	16.5	14.0	14.0	14.0	13.0
Mt Weld Concentrator							
ROM Feed	kt	255	299	323	329	385	395
Headgrade	%	18.0	16.5	16.5	16.5	14.0	13.0
Recovery Rate	%	70	70	70	72	73	75
Concentrate Shipped	kt (wet)	99	106	125	121	120	118
Cash COGS							
Mt Weld	A\$m	49	56	67	77	88	90
LAMP	A\$m	115	131	157	176	173	168
Staff Costs	A\$m	19	22	38	38	33	33
Royalties (2.5%)	A\$m	6	8	9	12	13	19
Total Cash Cogs	A\$m	188	217	272	304	307	310
Unit Margin (REO)							
Unit Costs	US\$/kg	9.6	9.5	10.1	9.3	9.7	10.1
Average Sale Price	US\$/kg	13.4	16.8	13.9	15.0	16.5	25.1
REO Margin	US\$/kg	3.8	7.3	3.8	5.7	6.8	15.0



Base Case		
Valuation	A\$m	A\$/sh
NPV (FY20)		
Mine & Malaysia	4,836	6.73
Corporate	(274)	(0.38)
Net Debt / (Cash)	11	0.02
Tax	(962)	(1.34)
Total	3,611	5.03
Target Price		5.00
TSR (%)		79
Recommendation		Buy
FCF Yield - 20F (%)		11.3
EV/Ebitda -20F (x)		8.8

Valuation Metrics		
Price/NPV	x	0.6
NdPr Price Implied	US\$/kg	51.8

Discount Rate	
WACC (Real)	8.6%
WACC (Nominal)	11.1%

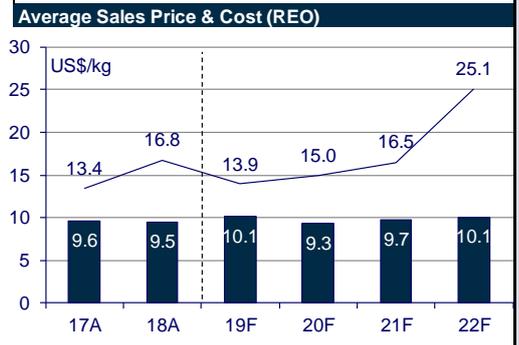
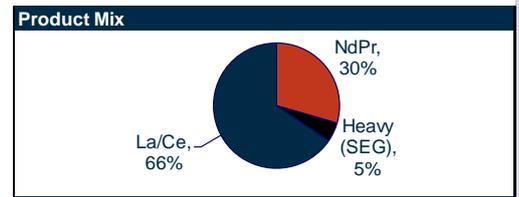


Share Register	mn	Dilution
Shares on issue	667.8	
Convertible Bonds @ 13.3¢	18.2	3%
Warrants @ 50¢	23.3	3%
Performance Rights	11.3	2%
Fully Diluted Share Count	718.3	8%

NPV Valuation Sensitivity (A\$/sh)						
AUDUSD	NdPr US\$/kg (Ex VAT)					
	45	50	60	70	80	
0.68	2.4	3.2	4.9	6.5	8.2	
0.70	2.2	3.0	4.6	6.2	7.8	
0.73	2.0	2.8	4.3	5.9	7.4	

Mineral Inventory	Volume (mt)	Grade (%)
Resource	55.4	5.4
Reserve	19.7	8.6
Mine Life	+22	
Mine Life End	2041	

Key Events	
Reserve Update	Aug 19
LAMP Licence Renewal	Sep 19



LYC Investment Thesis

We initiate research coverage on Lynas Corp with a BUY recommendation and a A\$5.0/sh target price. We view LYC as materially undervalued due to ongoing Malaysian political uncertainty which is pricing in an overly bearish production disruption outlook. We expect the valuation to rerate due to the following catalysts:

- **Operating license renewal due by Sep 2nd.** We are confident they will receive an extension, but flag potential additional conditions for residue management which are likely to be cost neutral (see Risks section below).
- **Valuation Rerate:** Recently announced expansion plans lifting their primary product NdPr by c.44% (+A\$1.4/sh) and plan to separate Heavy Rare Earths in a Texas JV (+A\$0.6/sh) (see page 19).
- **Trade Tensions Beneficiary:** any escalation in the China/US trade tensions shines an international spotlight of the strategic importance of the business as they are the worlds only Ex China producer.
- **M&A target:** in our view WES has not lost interest in pursuing LYC since its highly conditional March 2019 takeover offer. In our view the offer appears to force negotiations back behind closed doors. Watch this space.

Company Overview

Lynas is a vertically integrated producer of Rare Earth Oxides ('REO') and is the world's largest outside of China. The company owns and operates 100% of a mine and concentrator at Mt Weld in Western Australia which ships material for processing to a purpose built facility in Malaysia known as the Lynas Advanced Materials Plant ('LAMP').

Valuation

We value LYC on a sum of the parts one year forward DCF of ~A\$3,611mn (A\$5.0/sh), which is based on a real WACC of 8.4% which assuming a Cost of Equity of 9.3% and a Cost of Debt of 2.5% (pre tax) based on a risk free rate of 4.5%, Equity Beta of 1.2 and Equity Risk Premium of 4%.

Figure 13: LYC Valuation

Valuation	A\$m	A\$/sh
NPV (FY20)		
Mine & Malaysia	4,836	6.73
Corporate	(274)	(0.38)
Net Debt / (Cash)	11	0.02
Tax	(962)	(1.34)
Total	3,611	5.03
Target Price		5.00
TSR (%)		79
Recommendation		Buy
FCF Yield - 20F (%)		11.3
EV/Ebitda - 20F (x)		8.8

Source: Ord Minnett Limited estimates

We value the Mine and Malaysia processing assets at a combined pre tax basis of A\$4,836mn (A\$6.73/sh). We forecast a mine life of 22 years ending in 2041 which is based on exhaustion of existing reserves only, but we expect that recent exploration activity may substantially extend the current mine life. The key forecast assumptions are our long term NdPr Price of US\$68/kg (ex VAT) and AUDUSD of 0.70.

Tax we model as a separate DCF line item worth -A\$961mn (-A\$1.34/sh) and we note that due to its Malaysian tax holiday and substantial existing deferred tax losses, means the business will not pay cash tax until FY26.

We include a provision for corporate items including overheads, admin, closure/rehab costs at -US\$274m (-A\$0.38/sh). We also include a forward Net Cash position of A\$27m (A\$0.03/sh).

Our valuation is most sensitive to the NdPr price and AUD with a $\pm 1\%$ change in our forecasts adjusting our NPV by $\pm 3\%$ and our FY20CL Ebitda by $\pm 2\%$.

Figure 14: LYC NPV Valuation Sensitivity (A\$/sh)

AUDUSD	NdPr US\$/kg (Ex VAT)				
	45	50	60	70	80
0.68	2.4	3.2	4.9	6.5	8.2
0.70	2.2	3.0	4.6	6.2	7.8
0.73	2.0	2.8	4.3	5.9	7.4

Source: Ord Minnett Limited estimates

We estimate that the stock is pricing in an NdPr price of c.US\$51/kg, while at spot commodity prices and AUD, it's trading at relatively attractive FY20 EV/Ebitda of 9x with a FCF yield of 11%.

Earnings remains highly sensitive to the prevailing commodity price and currency forecasts. A $\pm 20\%$ move in the NdPr price adjusts our FY20 Ebitda of \$200m by \pm A\$87m, while a ± 0.02 shift in in the AUD moves it by \pm A\$12m.

Figure 15: Ebitda Sensitivity

	NdPr US\$/kg (Ex VAT)			
	Spot	+20%	-20%	2x
	40	48	32	80
0.675	208	298	119	657
0.700	197	283	110	629
0.725	186	269	102	604

Source: Ord Minnett Limited estimates

Risks

Political uncertainty in Malaysia continues to weigh heavily on the stock and it remains highly susceptible local news flow. Following the shock Malaysian election on May 9th 2018, the share price fell 45% over six months. In our view, the controversy is largely political despite strong scientific evidence and countless studies indicating the project is “inherently low risk”. Uncertainty over the renewal of its existing license (Due Sep 2nd 2019) looms large, but we remain confident LYC will negotiate a mutually agreeable outcome with the government with no operational disruption, but at a high, but not insurmountable cost.

Figure 16: LYC Share Price History



Source: IRESS, Company, Ord Minnett Limited estimates

What's the problem? License expires Sep 2nd / New conditions

LYC's current Malaysian Operating License is due for renewal on September 2nd 2019. On the 4th of December 2018, the Malaysian Minister for the Environment made a statement ([here](#)) issuing several pre conditions required for LYC's license renewal. Principally this involved the removal of 1.5mt of solid processing residue known as 'WLP' and 'NUF' by the license expiry date. LYC has been steadfast in removing its critically that removal of 1.5mt of residue could not practically be completed in the time required.

Legality in question / Negotiating an outcome

Multiple complications arise from these preconditions, but in our view it would appear that:

1. **Legality in Question:** The legality of the minister's preconditions is questionable as it appeared to:
 - a. Reflect the personal views of the minister, and;
 - b. Was contrary to expert advise and
 - c. Was not approved by parliamentary cabinet or Prime Minister.
2. **Preconditions appear negotiable:** on the 14th February 2019 when LYC announced ([here](#)) that they had reached an agreement regarding the disposal of 1.1mt of NUF, with effectively no change to the business. We believe this indicates that the ministers preconditions appear negotiable, and only the conditions of the WLP remain in question.

■ Prime Minister gave green light / Resolved by August

We are confident LYC will receive its license renewal, based on the explicit statement by the Malaysian Prime Minister on May 30th 2019 ([here](#)) that the current operating license will be renewed. On July 10th 2019 it was reported ([here](#)) in Malaysian parliament question time by deputy minister of environment that a decision on the licensing conditions will be made by August this year.

What's the 'Win – Win' solution? = PDF + C&L in Aus

In our view LYC is negotiating with the government for a mutually agreeable 'win win' outcome. In our view a solution looks like:

Short term: Transferring 450kt of WLP currently stockpiled (plus future production of c.600kt) to a permanent storage facility ('PDF') at one of the multiple nearby pre-approved locations. We roughly estimate the cost to be c.A\$5m (c.A\$10/t), but we note that the financial impact is neutral as they can utilise their US\$50mn environmental rehab bond to pay for it.

Long Term: Cracking and Leach in Australia, no WLP sent to Malaysia. We think this can absolve the issue as it puts the final point of contention for opposition to rest.

The government seals a win, as it appears tough but fair on big business and appease local opposition. For LYC optically a 'win' in the eyes of the voting public to remain in business. But obviously they planned to do this anyway, and it removes a key thorn of contention and ensures ongoing social license to operate.

Worst Case Scenario: Mt Weld still worth A\$2/sh

We remind investors that even in a worse-case scenario (Malaysian plant being closed) LYC does not cease to exist. Their Mt Weld mine produces a high grade rare earth concentrate which it currently ships to Malaysia, which could be sent to separation plants in China, Thailand, Vietnam, particularly China. On a stand alone basis we estimate Mt Weld's value to be c.A\$2.0/sh and generate c.A\$150m in Ebitda per year. The key consideration are the variables of the final product payabilities and separation cost.

Figure 17: LYC Mt Weld Valuation (A\$/sh) and

Separation Cost (\$/kg)	NPV \$/sh	Payability (%)		
		30%	40%	50%
1.5	1.5	2.0	3.2	4.3
2.0	2.0	1.5	2.7	3.8
3.0	3.0	1.0	2.2	3.3

Figure 18: Mt Weld Ebitda Sensitivity (A\$m)

Separation Cost (\$/kg)	Ebitda	Payability (%)		
		30%	40%	50%
1.5	1.5	128	202	276
2.0	2.0	64	138	212
3.0	3.0	(0)	74	149

Source: Ords Estimates

Problem background:

LYC's Malaysian operations faced a difficult start to life due (in our view) to a failure of local stakeholder engagement and an unrelated incident at a nearby plant in the 80's. In the intervening years LYC has successfully overcome initial localised opposition via educating/informing locals of low risk posed by the plant.

Today, LYC is overwhelmingly supported by the local community, regulators, state/federal politicians as well as local royalty. However, a small number of politicians linked to local environmentalists continue to use LYC as a political football for their own means.

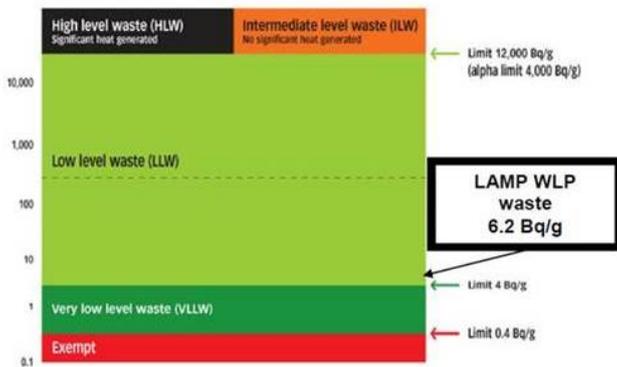
- **Initial outset:** At the initial outset, LYC's Malaysian plant generated considerable controversy due to a number of factors, which in our view the key ones were:
 1. Incident in the 1980's involving Mitsubishi Chemical recovering rare earths from tin tailings in central Malaysia at Bukit Merah (article [here](#)).
 2. Failure in initial stakeholder engagement

What’s the problem? WLP

LYC’s Malaysian plant produces a residue known as ‘Waste Leach Purification’ (‘WLP’) of which 450kt is currently stored on site. This material has slightly higher level of radioactive and is considered a ‘Naturally Occurring Radioactive Material’ (‘NORM’). There are two primary measures of radioactivity:

- **Becquerels:** (units ‘Bq/g’ per gram) is a single unit of radioactivity. WLP has ~6Bq/g, compared to background typically at 1Bq/g (but can range between 0-4). According to the UK classification systems this is deemed ‘low level waste’, just above ‘very low level waste threshold of 4Bq/g.
- **Millisievert:** (units: ‘mSV’) is the accumulated background radiation dose to an individual for 1 year:
 - Malaysian OH&S legal limit of workers is 20mSV, LYC workers are exposed to 5.61mSV
 - The Malaysian community limit is 0.5mSV, since inception LYC’s has averaged 0.15mSV.
 - Flight crew/pack a day smoker exposure is ~200mSV,

Figure 19: UK Radioactive Waste Classification system



Source: Hong (2011), Malaysian Atomic Energy Licensing Board

Figure 20: Mt Weld Ebitda Sensitivity (A\$m)



Graf 3: Perbandingan Purata Bacaan Aras Sinaran Luar (in-situ) di Lynas Advanced Materials Plant (LAMP) bagi tahun 2016 dan 2017

Science is clear: Its inherently low risk

The key point to make is that the science is clear, there is no risk posed by LYC’s operations to the environment, workforce or community. Countless studies and reviews have all reached the the same conclusion, the most recent and notable include:

- 2015 UN International Atomic Energy Agency (IAEA) independent study stated that WLP is “inherently low risk” ([here](#))
- December 2018 Malaysian Review Committee Findings report ([here](#) in Malaysian) gives a resounding positive review of the safety and handling of the WLP.

Growth plans / ‘Lynas 2025’

On the 21st May 2019 Lynas Corp hosted a well attended Investor Day which revealed its long awaited growth strategy and plans to ‘future proof’ the business from Malaysian political risk. We estimate the valuation uplift from the expansion is highly accretive with the NdPr uplift adding A\$934m (A\$1.4/sh) to our NPV. While not included in our valuation, our rough estimate for the Heavy Rare Earth JV in Texas potentially adds a further A\$400m to our NPV (A\$0.6/sh).

Overall we found the scale of the expansion to be highly value accretive, but we were underwhelmed by the lack of detail behind the A\$500m capital works program. In our view there were three key takeaways from the investor day:

- 1. NdPr production to grow +44% to 10.5ktpa by 2025
- 2. Plans to separate high value Heavy Rare Earths via a customer Joint Venture in Texas.
- 3. Plans to build a Cracking and Leaching facility in WA

Figure 21: Lynas 2025 Growth Plans



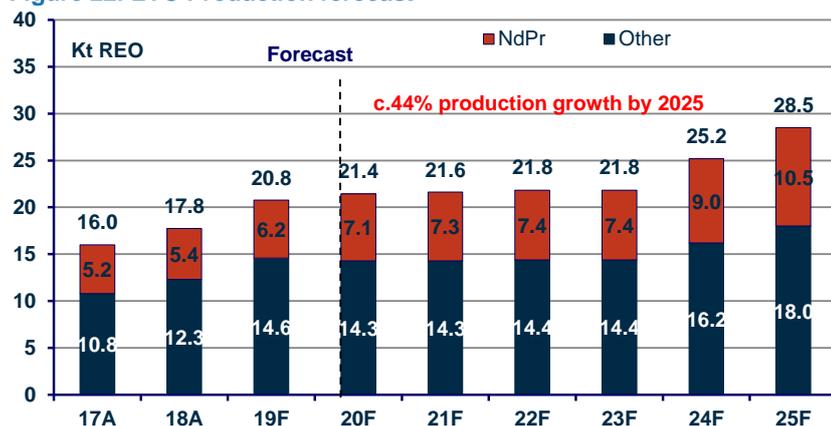
Source: Company

Key Takeaway # 1: NdPr +44% by 2025

The company plans to lift its critical NdPr production by +44% to 10.5ktpa by 2025. This could lift the current 600 tonnes per month (TPM) production run rate to 875tpm via optimising the existing Solvent Extraction (SX) and Product Finishing (PF) circuits.

We were frustrated by the lack of detail relating to how this was to be achieved, at what exact cost. But overall we find the valuation impact to be highly value accretive adding c.A\$1.4/sh to our NPV.

Figure 22: LYC Production forecast



Source: Company, Ords Estimates

Key Takeaway # 2: Heavy Rare Earth Production

We did not expect plans to enhance its Heavy Rare Earth product offering. However, after some analysis we see this strategy as logical as well as highly value accretive, potentially adding A\$430m (A\$0.6/sh) to our NPV, contributing an additional c.US\$70mn (A\$100mn) in revenue and US\$70m (A\$85m) in Ebitda. We do not currently this scenario in our valuation and await further details.

LYC's approach toward enhancing the value of its heavy RE's appears targeted across the business, with both the upstream ore feed sequence changing in addition to constructing downstream separation capacity. We have analysed the opportunity via comparing to three production scenarios:

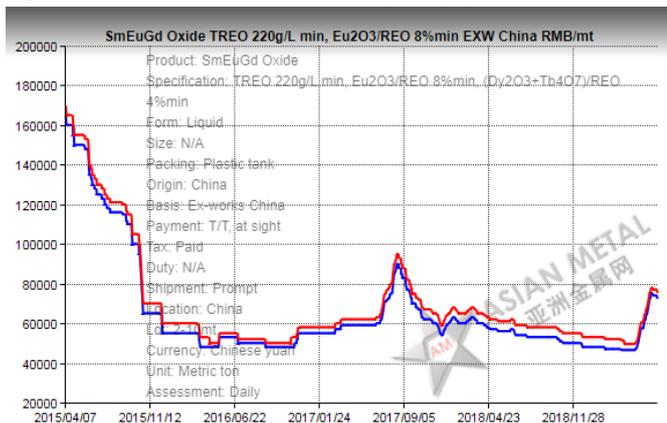
Scenario 1 (Current): selling low value SEG sporadically

Currently Lynas produces 1,200 tonnes (c.5% of output) of a product known as 'SEG' carbonate, which contains a mixture of six heavy rare earth elements; Samarium, Europium, Gadolinium, Dysprosium, Terbium.

LYC currently sells 100% of this product into the Chinese market but sales in recent years have been sporadic, due to the significant long term price decline, seeing inventory stockpiled rather than sold at a loss. We note that a domestic market price for a similar product is referenced by Asian Metals for around US\$8/kg (Ex VAT). If all 1,200 tonnes were sold at spot prices we estimate this would contribute c.US\$10m or 4% of FY19 revenue, which would be slightly loss making vs a group production cost of US\$10/kg.

We note that the SEG price has rallied in recent months following China supply constraints due to a stop to imports from nearby Myanmar.

Figure 23: SEG Price & Product Split by price



Source: Asia Metals

Scenario 2: Texas JV to separate products

On the 20th of May LYC announced a MOU to form a Joint Venture with a private US customer 'Blue Line Corp' (not rated) located in Hondo, Texas. While details were limited, it would appear that the JV plans to construct a heavy rare earth separation facility that would be designed to treat the 1,200 tonnes of Malaysian SEG Oxide.

If separated into its six individual products the realised value of the 1,200 tonnes increases almost 3 fold to c.US\$25/kg. As spot prices this implies an annual generation of US\$30m in revenue US\$18m in Ebitda and on an NPV basis A\$90mn (A\$0.13/sh) based on the following rough assumptions:

- 70% Equity Share at a 8.5% WACC (real)
- US\$30mn Capex and US\$10/kg (REO) Opex
- Spot commodity prices (ex VAT) and 0.70 AUDUSD

Scenario3: JV + High Grade Duncan

At the investor day the company made specific mention of plans to begin processing of Duncan ore from the end of 2019 through to 2022 (see Figure 8). In our view, such a strategy has the ability to dramatically increase the value of the downstream heavy rare earth product mix, as Duncan ore contains 2-4x higher concentrations of the higher value Dysprosium (c.US\$200/kg) and Terbium (US\$430/kg).

Based on the same assumptions listed in scenario 2, we roughly estimate at spot this could shift realised prices to c.US\$61/kg contributing an additional c.US\$70mn (A\$100mn) in revenue and US\$70m (A\$85m) in Ebitda and some A\$430m (A\$0.6/sh) to our NPV.

Figure 24: Heavy Rare Earth Production Scenario Analysis

Product		Production Scenario			Spot Price US\$/kg	Resource Split %	
		1: Current	2: Separated	3: Separated+Duncan		CLD	Duncan
Mixed SEG Oxide	tonnes	1,200			8.3		
Samarium (Sm)	tonnes		673	477	1.3	2.5%	2.8%
Europium (Eu)	tonnes		155	130	23.7	0.6%	0.8%
Gadolinium (Gd)	tonnes		301	335	20.4	1.10%	1.99%
Dysprosium (Dy)	tonnes		50	214	205	0.29%	1.27%
Terbium (Tb)	tonnes		20	44	432	0.11%	0.26%
Project Scenario Analysis							
Realised Price (Spot)	US\$/kg	8.3	24.6	61.0			
Revenue	US\$m	9.9	29.5	73.2			
Unit Costs (REO)	US\$/kg	9.7	10.0	10.0			
Ebitda	US\$m	(1.7)	18	61			
Initial Capex	US\$m		(30)	(30)			
NPV 70% Share*	A\$/m		90	429			
NPV 70% Share*	A\$/sh		0.13	0.60			

Source: Company, SMM, Asia Metals, Ords Estimates (*8.5% WACC and 0.7 AUDUSD)

Key Takeaway # 3: Key Crack & Leach in Australia

The investor day also provided detailed plans to build a Cracking and Leaching ('C&L') facility in Australia. This was heralded as a means to 'future proof' the business from Malaysian political risk via leaving the WLP residue in Australia.

LYC has for some time indicated that this was the preferred long term option for the business. But public release had to be brought forward, following the WES takeover announcement which coincided with the Malaysian PM stating WES assured to build facility in Kwinana WA at a cost of c.A\$375m.

We were frustrated by the lack of detail behind the headline "A\$500m" capital cost for 'Lynas 2025' and what portion would be attributable to the C&L plant. If built in Kalgoorlie, we very roughly estimate to be around half the current project headline.

A key criticism levelled at the company is that this project is duplicating existing plant capacity. We don't disagree, as when complete, certain parts of the Malaysian plant front end may be effectively redundant/impaired. However, we consider this to be prudent as it puts an end to the political uncertainty in Malaysia. We also think there is further upside from such a facility having the 'Ability to treat Alternate RE Feeds', which we understand to be treating third party concentrate.

Figure 25: Cracking & Leaching Overview + Australian Location Alignment

Step 1: Cracking & Leaching

RE Fe Phosphate + H2SO4 High temperature → RE Sulfate solution

4 rotary kilns where the reaction occurs

2 state of the art waste gas treatment units



Upstream processing expansion in WA

- Preliminary studies conducted on 5 sites
- 2 preferred sites (no fatal flaws)
- Ability to supply multiple downstream processing sites

	Mt Weld	Kalgoortie
Community Support		
Close to source / Efficient Transport		
Residue/ by product Management		
Access to Raw Materials & Energy		
Ability to flex Capacity & Opex		
Ability to treat Alternate RE Feeds		
Brownfield Opportunities		
	Best Alignment	Fatal Flaw

Source: Company

Quarterly Result Review

Overall LYC's JunQtr production on the 29th of July ([here](#)) result was mixed with production missing our estimates while cash flow beat on working capital movements. As expected there was no incremental insight on the Malaysian political front and they are waiting on cabinet decision for additional license conditions, expected mid August.

Highlights:

- Production Missed with 1,505t of NdPr Oxide (502tpm run rate)
 - Down -5% QoQ and -18% vs our bullish estimates
 - Indicated this was flagged in letter update on 21st June ([here](#))
 - We clearly missed it, suspect other may have also
- ASP of A\$18.5/kg was a 4% beat on what we suspect is higher heavy rare earth (SEG sales).
- Operating CF \$34m beat by 14% and was +31% QoQ
 - Appears to gain a \$18m working capital shift
 - Free cash flow of A\$25mn was 10% higher than our estimates,
- They paid down a touch of debt to A\$225m
- Cash at y/e was A\$89.7m with net debt now A\$136m

Figure 26: June Quarterly Production & Annual Summary

		Quarterly								Annual		
		Jun 18	Sep 18	Dec 18	Mar 19	Jun 19	A/Ords	QoQ	YoY	FY18	FY19	YoY
Production						Actual						
NdPr Run Rate	tpm	482	526	408	530	502	(15)	(5)	4	1,814	1,966	8
NdPr Production	tonnes	1,447	1,579	1,223	1,591	1,505	(18)	(5)	4	5,443	5,898	8
Other REO Produced	tonnes	3,357	3,641	3,199	3,853	3,146	(24)	(18)	(6)	12,310	13,839	12
Total Production	tonnes	4,804	5,220	4,422	5,444	4,651	(22)	(15)	(3)	17,753	19,737	11
Total Sales (REO)	tonnes	4,312	3,896	5,522	5,030	4,723	(13)	(6)	10	17,685	19,171	8
Realised Price/Costs												
NdPr (Market Price)	US\$/kg	43.7	40.8	38.6	38.5	39.1	4	2	(11)	47.6	39.2	(18)
Other REO ASP	US\$/kg	3.6	3.9	1.8	3.2	4.2	41	34	19	2.8	3.3	17
ASP (REO)	US\$/kg	16.1	19.8	10.3	14.3	13.0	4	(10)	(20)	16.8	14.0	(17)
ASP (REO)	A\$/kg	21.3	27.1	14.5	20.1	18.5	4	(8)	(13)	21.7	19.6	(9)
Unit Cost (REO Sold)	A\$/kg	(14.2)	(16.7)	(13.8)	(12.4)	(14.5)	7	17	2	12.3	14.2	16
Unit Margin	A\$/kg	7.0	10.4	0.7	7.8	4.0	(8)	(49)	(43)	9.4	5.5	(42)
Cash Flows												
Revenue (Cash)	A\$m	98.6	105.2	77.0	88.2	106.0	1	20	8	383.2	376.4	(2)
COGS	A\$m	(61.4)	(64.9)	(76.0)	(62.2)	(68.5)	(5)	10	12	216.9	271.6	25
Interest Expense	A\$m	(4.2)	(0.5)	(3.7)		(3.4)			(19)	26.7	7.3	(73)
Operating CF	A\$m	33.0	39.8	(2.7)	26.0	34.1	14	31	3	139.6	97.5	(30)
Capex	A\$m	8.9	9.5	6.1	7.6	9.0	28	18	1	21.5	32.2	50
Security Payment (AE)	A\$m	(1.9)	(0.0)	10.7						29.8	10.7	(64)
Investing CF	A\$m	(7.0)	(9.5)	(16.8)	(7.6)	(9.0)	28	18	28	(51.3)	(42.9)	(16)
Free Cash Flow	A\$m	26.0	30.3	(19.5)	18.4	25.1	10	36	(4)	88.3	54.6	(38)
Balance Sheet												
Cash	A\$m	42.3	65.8	53.7	67.1	89.7	(15)	34	112	42.3	89.7	112
Debt	A\$m	218.3	226.0	234.8	236.5	225.9	(1)	(4)	3	218.3	228.6	5
Net Debt	A\$m	(176.0)	(160.2)	(181.1)	(169.4)	(136.2)	8	(20)	(23)	(176.0)	(139.0)	(21)

Source: Company, Ords Estimates

Appendix: Company Overview & Forecasts

Production Forecast

FY18 production was 17.8kt of REO which included 5.4kt of 'NdPr' oxide which stands for combination of the chemical symbols for Neodymium ('Nd') and Praseodmium ('Pr'). Despite representing only a third of production, NdPr is considerably higher value than the other products, generating ~90% of its revenue. NdPr is a key raw ingredient for permanent magnets used in electric vehicles and other green technologies such as wind turbines, and energy efficient appliances.

Figure 27: Production & Revenue Forecast



Source: Ord Minnett Limited estimates

The LAMP production continues to expand following the low cost A\$35m 'Next' project which lifted output by:

- Gross REO output by ~60% from FY17 levels to 24.4ktpa REO by Sep18.
- NdPr output lifted incrementally from 435 tonnes per month ('tpm') in FY17 to 500tpm from April 2018 and 600tpm in September 2018.

Beyond FY19 we assume NdPr production will continue to creep over time to c.6150tpm through a combination of recovery improvements, small low cost expansions and debottlenecking projects.

The next incremental step in production is dependant upon the 'Lynas 2025' expansion plans outlined at the May 2019 Investor Day which indicated NdPr production to lift +44% to 10.5ktpa some 875tpm. We assume production comes online slightly earlier, hitting the revised run rate in FY25.

Price forecast

Between now and 2022 we forecast the NdPr market deficit to grow and expect prices to rise until a supply response is incentivised. We forecast NdPr Oxide prices on an FOB China basis excluding 16% VAT to rise from spot of c.US\$40/kg and increase to our long-term real price of US\$68/kg by June 2022 which is based on an incentive price basis for advanced NdPr rich projects.

Figure 28: Commodity Price forecast

		17A	18A	19F	20F	21F	22F	Long Term
AUDUSD	x	0.75	0.78	0.71	0.66	0.68	0.70	0.70
NdPr Oxide	US\$/kg	32.5	47.4	38.5	38.4	43.4	68.0	68.0
Other REO	US\$/kg	2.8	2.8	3.3	2.5	2.5	2.5	2.5
Average Sales Price	US\$/kg	13	17	14	15	17	25	25

Source: Ord Minnett Limited estimates

As the non NdPr production represents <15% of group revenue we have forecast an arbitrary US\$2.5/kg for the remaining 70% of REO production. This material consists of:

- 16,000 tonnes (c.66%) of production is Lanthanum and Cerium products, which are low value US\$1-2/kg, or c.10% of group revenue.
- 1,200 tonnes (c.5%) of Mixed Heavy Rare Earth 'SEG' carbonate which is worth c.US\$8/kg or c.4% of group revenue. Sales has been sporadic in recent years, with most production temporarily stockpiled rather than sold due to low prices.

Operating and capital costs Forecast

We forecast an annual operating cost base of c.A\$300m over FY20/21 which implies a cost of ~US\$10/kg REO based on the following assumptions:

- Variable Production costs of c.A\$270m pa consisting of:
 - LAMP – 70% -US\$4.0/kg of REO produced
 - Mt Weld - 30% - A\$200/t of Ore feed and A\$95/t freight
- Fixed Labour cost of A\$33mn, based on a US\$7.5mn per quarter cost base.
- Royalty of 2.5% of sales receipts (~A\$12m pa)
- Corporate/Admin costs of A\$33m pa
- Sustaining Capex we assume A\$18m annually as per guidance of A\$1.5m per month.

Mining development costs are capitalised and irregular due to the campaign style/as needed basis. We roughly estimate a mining costs of A\$12m pa and increasing after FY22 as Mt Weld grades decline, material movements increase due to higher mill throughput requirements.

We also note the company needs to make US\$7.8m (~A\$12m) security bond deposits to the Malaysian Energy Licence Agency in December 2019. Once complete they would have met their fixed US\$50m rehabilitation obligation with no further payment required. We note that this fund can be utilised to pay for remediation of the WLP residues.

Figure 5: Opex & Capex

Opex		17A	18A	19F	20F	21F	22F	23F
Production	A\$m	164	187	224	253	261	258	259
Royalties	A\$m	6	8	9	12	13	19	19
Corporate/Admin	A\$m	30	38	56	62	59	72	72
Total Opex	A\$m	188	217	272	304	307	310	311
Capex								
Mine Development	A\$m	2	13	6	12	12	12	12
PP&E (LAMP)	A\$m		19	13		5	167	167
Other / Sustaining Cost	A\$m	0	1	10	18	18	18	18
Security Bond Deposit	A\$m	5	30	11	12			
Total Capex	A\$m	7	62	40	42	35	196	196

Source: Ord Minnett Limited estimates

Capital Structure

Currently there are 668m shares on issue and 716mn on a fully diluted basis consisting of Warrants (23m), Convertible Bonds (18m). and performance rights (11m). In recent years LYC's capital structure has changed materially due to:

- In FY18 US\$205m of convertible bonds into equity which almost doubled the share count by c.280m shares.
- 10:1 stock split in 2017

Figure 29: Capital Structure

		15A	16A	17A	18A	19F	20F	21F	22F
Shares on issue	m	337	349	368	663	668	668	668	668
Convertible Bonds	m	300	300	300	20	18	18	18	18
Warrants	m		174	367	23	23	23	23	23
Performance Rights	m	29	98	95	11	9	9	9	9
Fully Diluted Shares	m	344	405	428	656	716	718	718	718

Source: Ord Minnett Limited estimates

P&L

We estimate FY20 revenue of A\$485mn, Ebitda of A\$205m and earnings of A\$161m, some 60% higher than FY19, due to a 8% lift in sales volumes, and 7% fall in the AUD with prices largely unchanged YoY. This implies a healthy Ebitda margin of 41% and +20% ROE/ROIC metrics.

Figure 30: P&L Summary

		17A	18A	19F	20F	21F	22F
Revenue	A\$m	257	374	369	489	522	773
Cost of Sales	A\$m	(242)	(253)	(237)	(283)	(289)	(390)
G&A	A\$m	(26)	(34)	(32)	(38)	(33)	(33)
Operating Profit / Ebit	A\$m	(11)	87	100	168	199	350
Net Finance Expense	A\$m	(10)	(28)	(14)	(3)	(0)	2
FX Gain/(Loss)	A\$m	(4)	(5)	1			
Profit before tax	A\$m	(24)	53	63	165	199	352
Tax expense / (Benefit)	A\$m	(24)					
Net Profit (Reported)	A\$m	(1)	53	63	165	199	352
Abnormals	A\$m	(3)	1	21			
Net Profit (Underlying)	A\$m	24	54	84	165	199	352
Underlying EBIT	A\$m	(12)	86	79	168	199	350
Depreciation	A\$m	44	41	42	41	41	151
Underlying EBITDA	A\$m	32	127	121	210	241	502
Ebitda Margin	%	12	34	33	43	46	65
EV/Ebitda	x	25.6	13.6	15.3	8.8	6.8	2.7
ROE	%	21	12	17	25	23	29
ROA	%	(1)	11	12	19	20	25
ROIC	%	(4)	8	9	23	27	45

Source: Ord Minnett Limited estimates

Balance sheet

Significant changes to the capital structure over the past 18 month has transformed the balance sheet. At the end of FY17 LYNAS had debt of US\$425mn implying a debt/equity of 3.8x. Mt Kallet Capital was the majority holder of the US\$225mn convertible bond debt, which over the course of FY18 converted 93%, which halved its debt to US\$165mn and flipped gearing (ND/E) to an investible 23%.

As at 30th March 2019, Lynas had debt of A\$227mn (US\$160mn; US\$147m from JARE and US\$13.6mn of convertibles) and cash of A\$67mn. We expect by June year end the cash balance will have increased slightly to A\$112mn implying net debt of A\$117mn and gearing (ND/E) of 23%

On July 27th LYC indicated their senior debt facility with Japan's JARE was renegotiated. Overall we were positively surprised by the details which makes for a highly flexible facility. Highlights included:

- 10 year extension from 2020 to 2030
- Interest rate reduced from 2.5%, down from 3.75%
- Removed key onerous restrictions such as the cash sweep mechanism as well as enabled dividend payments (previously not allowed).
- Reserved 7.2kt of future NdPr production (68%) exclusively for Japanese customers, up from 3.6kt previously.

Figure 31: Balance Sheet

		17A	18A	19F	20F	21F	22F
Cash	A\$m	64	42	90	140	241	546
Receivables	A\$m	5	12	13	17	19	54
Inventories	A\$m	37	52	9	12	13	39
Other	A\$m	4	2	57	57	57	57
Current assets	A\$m	110	109	169	225	330	695
Plant & Equipment	A\$m	538	594	594	582	576	621
Exploration, Evaluation	A\$m	42	19	23	23	23	23
Inventories	A\$m	1	4	6	7	8	23
AELB Deposit	A\$m	23	39	48	60	60	60
Other	A\$m	3		3	3	3	3
Non-current assets	A\$m	608	656	674	676	671	731
Total assets	A\$m	718	765	843	901	1,001	1,426
Liabilities							
Payables	A\$m	47	35	31	36	36	97
Interest bearing liabilities	A\$m	20	0	45	26	4	4
Deferred Tax Liabilities	A\$m	2	3				
Current liabilities	A\$m	69	38	76	62	39	101
Debt	A\$m	474	225	181	103	16	16
Provisions	A\$m			70	70	70	70
Other	A\$m	63	67	11	(4)	7	18
Non-current liabilities	A\$m	535	292	262	169	92	103
Total liabilities	A\$m	604	330	338	231	132	205
NET ASSETS	A\$m	114	434	505	671	870	1,221
Equity							
Contributed equity	A\$m	1,094	1,395	1,395	1,395	1,395	1,395
Reserves	A\$m	7	(25)	(17)	(17)	(17)	(17)
Retained profits	A\$m	(989)	(936)	(874)	(708)	(509)	(157)
EQUITY	A\$m	112	434	505	671	870	1,221
Gearing (ND/E)	%	(383)	(42)	(27)	2	26	43
Gearing (ND/(E+ND))	%	135	(71)	(37)	2	20	30

Source: Ord Minnett Limited estimates

Cash Flow

We estimate LYC to be highly cash generative over the next two years due to limited capex and increasing scale which enables it to pay down its current US\$145m debt facility and self fund the required A\$500m Lynas 2025 project. Over the next three years we forecast the following key changes :

- Operating Cash Flow of c.A\$200m in FY20/21, spiking to A\$500m in FY22 on higher NdPr Prices.
- Investing Cash Flow of at a relatively low c.A\$35m in FY21/21 with only sustaining/mining development capex. This jumps to c.A\$200m in FY22 of which A\$167m is for the Lynas 2025 project.
- Free Cash flow: increases from A\$157m in FY20 to A\$196m in FY21 implying a c.12% FCF Yield. Despite the \$200m jump in capex in FY22 the business is still highly cash generative at c.A\$314mn implying a 38% FCF yield.
 - We note that in FY22 at spot prices the business is still cash flow neutral in FY22 despite the \$200m capex bill.
- Financing Cash Flow: we expect LYC to rapidly pay down its existing US\$145m (A\$160m) senior facility rapidly over next two years with US\$77m (A\$110m) in FY20 and the US\$70m (A\$100m) balance in FY21. Financing costs are relatively small in terms of interest at c.A\$5m pa due to the low 2.5% interest rate.
- Cash Balance we expect to consistently build from A\$112m in FY19 to A\$153m in FY20 and roughly net cash A\$19m.

Figure 32: Cash Flow Summary

		17A	18A	19F	20F	21F	22F
Underlying EBITDA	A\$m	32	127	121	210	241	502
Other	A\$m	2	(1)	(8)			
Operating CF	A\$m	34	118	104	210	241	502
Capex	A\$m	2	24	32	30	35	196
Security Bond	A\$m	5	30	11	12		
Investing CF	A\$m	(7)	(55)	(43)	(42)	(35)	(196)
Interest Received	A\$m	0	1	1	1	2	2
Interest Cost	A\$m	(5)	(28)	(9)	(5)	(4)	(3)
New Equity	A\$m	6	7				
Debt Repayment	A\$m	(4)	(66)	(4)	(114)	(102)	
Financing CF	A\$m	(3)	(86)	(15)	(118)	(104)	(1)
Net CF	A\$m	24	(22)	47	50	102	304
FX Impact	A\$m	(4)	0	1			
Cash at End Period	A\$m	64	42	90	140	241	546
Net Cash/(Debt)	A\$m	(429)	(181)	(136)	11	222	526
Free Cash Flow	A\$m	27	64	61	168	206	305
FCF Yield	A\$m	9	8	6	11	13	27

Source: Ord Minnett Limited estimates

Lynas Corporation Limited

PROFIT & LOSS (A\$m)	2017A	2018A	2019E	2020E	2021E
Revenue	257.0	374.1	368.6	489.0	521.7
Operating EBITDA	31.9	127.0	121.2	209.9	240.6
EBIT	(12.0)	86.2	79.4	168.5	199.2
Net interest	(9.8)	(27.6)	(13.9)	(3.1)	(0.1)
Pre-tax profit	(24.3)	53.4	62.9	165.4	199.1
Net tax (expense) / benefit	23.7	(0.3)	(0.1)	-	-
Significant items/Adj.	(2.6)	0.7	20.9	-	-
Associate NPAT	23.6	53.8	83.7	165.4	199.1
Normalised NPAT	23.6	53.8	83.7	165.4	199.1
Reported NPAT	(0.5)	53.1	62.8	165.4	199.1
Normalised dil. EPS (cps)	0.7	11.0	12.6	24.8	29.8
Reported EPS (cps)	(0.0)	8.3	8.8	23.0	27.7
DPS (cps)	-	-	-	-	-
DPS (cps)	-	-	-	-	-
Dividend yield (%)	-	-	-	-	-
Payout ratio (%)	-	-	-	-	-
Diluted # of shares (m)	428.0	655.5	715.7	718.3	718.3

CASH FLOW (A\$m)	2017A	2018A	2019E	2020E	2021E
EBITDA incl. adjustments	31.9	127.0	121.2	209.9	240.6
Income tax paid	(0.1)	0.1	(0.1)	-	-
Other operating items	2.2	(8.7)	(17.0)	-	-
Operating Cash Flow	34.0	118.5	104.1	209.9	240.6
Other investing items	(4.6)	(30.4)	(10.5)	(11.8)	-
Investing Cash Flow	(6.9)	(54.7)	(42.7)	(41.9)	(35.0)
Other financing items	(5.0)	(26.6)	(10.5)	(4.1)	(1.8)
Financing Cash Flow	(3.0)	(85.6)	(14.8)	(117.9)	(104.0)
FX adjustment	(3.5)	0.2	0.8	-	-
Net Inc/(Dec) in Cash	24.1	(21.8)	46.6	50.1	101.6

BALANCE SHEET (A\$m)	2017A	2018A	2019E	2020E	2021E
Cash	63.9	42.3	89.7	139.8	241.4
Receivables	4.5	12.4	13.2	16.6	18.9
Inventory	37.4	51.7	9.4	11.9	13.5
PP & E	580.4	613.1	617.0	605.6	599.3
Other non-current assets	3.7	4.1	9.0	10.5	11.5
Total Assets	717.7	764.6	843.4	901.2	1,001.3
Short term debt	19.5	0.5	45.2	25.7	3.9
Payables	47.1	35.0	30.9	35.8	35.5
Long term debt	473.8	225.1	180.7	103.0	15.6
Other non-current liabilities	61.4	67.0	11.5	(3.7)	6.7
Total Liabilities	604.2	330.2	338.2	230.7	131.6
Total Equity	112.2	434.5	505.2	670.5	869.7
Net debt (cash)	429.4	180.8	136.3	(11.1)	(221.9)

Buy

DIVISIONS	2017A	2018A	2019E	2020E	2021E
KEY METRICS (%)	2017A	2018A	2019E	2020E	2021E
Revenue growth	34.6	45.6	(1.5)	32.7	6.7
EBITDA growth	-	298.0	(4.6)	73.2	14.6
EBIT growth	-	-	(7.8)	112.2	18.2
Normalised EPS growth	-	1,511.2	14.3	96.6	20.4
EBITDA margin	12.4	34.0	32.9	42.9	46.1
EBIT margin	-	23.0	21.5	34.5	38.2

VALUATION RATIOS (x)	2017A	2018A	2019E	2020E	2021E
Reported P/E	-	30.7	29.1	11.1	9.2
Normalised P/E	-	23.1	20.2	10.3	8.6
Price To Free Cash Flow	40.3	26.2	29.7	10.9	8.9
EV / EBITDA	42.8	14.7	15.2	8.1	6.2
EV / EBIT	-	21.7	23.2	10.0	7.4

VALUATION RATIOS (x)	2017A	2018A	2019E	2020E	2021E
Reported P/E	-	31.5	28.4	11.7	9.4
Normalised P/E	-	23.8	20.0	10.9	8.8
Price To Free Cash Flow	41.4	26.9	25.9	11.5	9.2
EV / EBITDA	43.6	15.1	15.0	8.4	6.3
EV / EBIT	-	22.2	22.5	10.6	7.6

LEVERAGE	2017A	2018A	2019E	2020E	2021E
ND / (ND + Equity) (%)	79.3	29.4	21.2	(1.7)	(34.3)
Net Debt / EBITDA (%)	1,345.6	142.3	112.4	(5.3)	(92.2)
EBIT Interest Cover (x)	-	3.1	5.7	53.8	1,633.6
EBITDA Interest Cover (x)	3.3	4.6	8.7	67.0	1,973.1

SUBSTANTIAL HOLDERS	m	%
Greencape	61.9	9.3%
Ausbil	44.9	6.7%
FIL	41.7	6.3%

VALUATION	
Cost of Equity (%)	9.3
Cost of debt (after tax) (%)	2.5
WACC (%)	8.6
Forecast cash flow (\$m)	3,611.4
Terminal value (\$m)	13,365.0
Equity NPV (\$m)	3,611.4
Equity NPV Per Share (\$)	5.03

Target Price Method	NPV
Target Price (\$)	5.00
Valuation disc. / (prem.) to share price (%)	96.1

Hastings Tech Metals (HAS AU)

Germany's rare earth solution

We initiate research coverage on HAS with a Speculative BUY and A\$0.30/sh target price. HAS is our top pick among rare earth developers due to its high value orebody and the low technical risk path to production. Similar to Japan Inc's backing of LYC in the 2000's, we see Germany backing HAS for its future RE needs, with offtake partners (Thyssenkrupp/Schaeffler) helping to secure low cost German G'ovt loans. Key risks include project financing, ramp up and NdPr prices. We value HAS on a sum of the parts DCF using a 9.5% WACC (real) and LT NdPr Price of US\$68/kg & 0.70 AUD.

Investment Thesis: Our top project pick

- **High Value Orebody:** high NdPr endowment of 35% enables a US\$20/kg basket price (key project economic determinate) almost double its peers/existing world producers.
- **German Backed:** Similar to Japan inc backing of Lynas in the 2000's, we see Germany supporting HAS for its future RE needs. Signed 2x 10 year offtake MOU's with German industrial stalwarts Thyssenkrupp and Schaeffler AG (auto manufacturer). Their support helped secure US\$140m (A\$200m) of low cost German G'ovt Debt.
- **Shortcut to market:** aims to produce a mixed carbonate and not fully separate RE's, significantly reducing project technical risk and capex.
- **Skin in the game:** added certainty of seeing project through to completion is Exec Chairman Charles Lew, who owns 11.5% and has self-funded most development to date.

Company Overview

- Hastings Technology Metals ('HAS') is a rare earth development company that owns 100% of the Yangibana project in the Gascoyne Region of WA.
- The ~A\$450m project is expects commercial production to commence by mid-2021 and quickly ramp-up to a nameplate of 15kt of Mixed Rare Earth Carbonate ('MREC') containing ~3.5kt of 'NdPr' (some 90% of revenue).
- Key risks for developing projects apply (permitting, funding, project execution/construction) as well as our NdPr, AUD forecasts.

Key Financials

Year-end June (A\$)	FY17A	FY18A	FY19E	FY20E	FY21E
Revenue (\$m)	-	-	-	-	-
EBITDA (\$m)	(1.7)	(3.2)	(3.2)	(3.0)	(3.0)
EBIT (\$m)	(1.7)	(3.2)	(3.2)	(3.0)	(3.0)
Reported NPAT (\$m)	(1.5)	(2.9)	(2.9)	(7.6)	(13.8)
Reported EPS (c)	(0.3)	(0.4)	(0.3)	(0.6)	(1.0)
Normalised NPAT (\$m)	(1.4)	(2.5)	(2.9)	(7.6)	(13.8)
Normalised EPS (c)	(0.3)	(0.4)	(0.3)	(0.7)	(1.1)
Dividend (c)	-	-	-	-	-
Net Yield (%)	-	-	-	-	-
Normalised ROE (%)	-	-	-	-	-

Source: OML, Iress, Hastings Technology Metals Limited

Last Price

A\$0.13

Target Price

A\$0.30

Recommendation

Speculative Buy

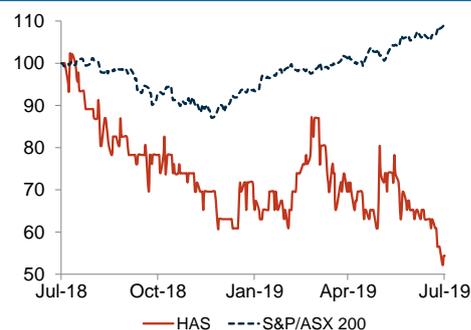
Risk

Higher

Metals and Mining

ASX Code	HAS
52 Week Range (A\$)	0.12 - 0.24
Market Cap (\$m)	114.6
Shares Outstanding (m)	916.9
Av Daily Turnover (\$m)	0.0
3 Month Total Return (%)	-24.2
12 Month Total Return (%)	-45.7
Benchmark 12 Month Return (%)	9.0
Net Cash FY19E (A\$m)	18.0

Relative Price Performance



Source: FactSet

Consensus Earnings

	FY19E	FY20E
NPAT (C) (\$m)	-	-
NPAT (OM) (\$m)	(2.9)	(7.6)
EPS (C) (c)	-	-
EPS (OM) (c)	(0.3)	(0.7)

Source: OML, Iress, Hastings Technology Metals Limited

Dylan Kelly

Senior Research Analyst

02 8216 6417

dkelly@ords.com.au

Production & Valuation Summary							
Key financial metrics		18A	19A	20F	21F	22F	23F
P&L							
Revenue	A\$m					164	274
EBITDA	A\$m	(3)	(3)	(3)	(3)	49	128
NPAT	A\$m	(3)	(3)	(8)	(14)	(8)	53
EPS - (Diluted)	A¢/sh	(0.4)	(0.3)	(0.7)	(1.0)	(0.6)	4.1
Ebitda Margin	%					30	47
Cash flow							
Operating CF	A\$m	(3)	(3)	(12)	(25)	22	119
Capex	A\$m	(14)	(38)	(74)	(252)	(108)	(1)
Free CF	A\$m	(15)	(41)	(86)	(227)	(86)	117
Financing CF	A\$m						
Balance Sheet							
Cash Balance	A\$m	21	18	48	35	30	48
Net Debt / (Cash)	A\$m	(21)	(18)	43	243	320	202
Gearing (ND/E)	%	(30)	(20)	41	209	295	125
Interest Cover	x						0.11
Debt Facility Draw							
German Govt (US\$140m)	US\$m			60	100	140	140
German C'mrcl (US\$35m)	US\$m				35	35	35
NAIF (A\$150mn)	A\$m				53	70	
Total Debt Drawn	A\$m			91	278	350	250
Debt Repayments	A\$m			5	11	14	14
Capital Structure							
Shares on issue	m	532	712	917	1,117	1,317	1,317
Options	m	18		69	69	69	69
Performance Rights	m	18	15	20	20	20	20
New Equity	m	58	179	116	200	200	
Fully Diluted Shares	m	568	727	1,006	1,206	1,406	1,406
Assumptions (Real)							
AUD			0.70	0.70	0.70	0.70	0.70
NdPr	US\$/kg		61	68	68	68	68
Basket Value	US\$/kg		22.6	27.6	27.1	26.3	26.6
Mining							
Ore Mined	Mt	0.01	0.9	1.6	0.7	0.8	0.9
NdPr Grade	%		0.41	0.35	0.39	0.52	0.45
Other REO Grade	%		0.77	0.66	0.73	0.96	0.84
Total Grade	%		1.18	1.01	1.12	1.48	1.29
Processing							
Ore Milled	Mt		0.6	1.0	1.0	1.0	1.0
NdPr Recovery	%		75.6	75.6	75.6	75.6	75.6
Total REO Recovery	%		75.7	75.7	75.7	75.7	75.7
Concentrate Produced (MREC)	kt		9.3	13.2	14.6	19.2	16.8
Production/Sales							
NdPr	kt		1.9	2.7	3.0	3.9	3.4
Other REO	kt		3.5	5.0	5.5	7.3	6.3
REO In Concentrate	kt		5.4	7.7	8.5	11.2	9.7
NdPr % of Production	%		35	35	35	35	38
Revenue							
NdPr	US\$m		114	182	202	265	231
Other REO	US\$m		14	29	28	29	31
Separation Fee \$2.5/kg	US\$m		(13)	(19)	(21)	(28)	(22)
Total Revenue	A\$m		164	274	298	380	305
Cash COGS							
Fixed Costs	A\$m		42	42	42	42	42
Variable Costs	A\$m		64	92	102	134	117
Royalties (3.2%)	A\$m		5	9	10	12	11
Total Cash COGS	A\$m		112	143	153	188	170
Unit Margin (REO)							
Unit Costs	US\$/kg		17	16	15	14	15
Average Sale Price	US\$/kg		23	28	27	26	27
REO Margin	US\$/kg		5.5	12.0	12	12	11.6
Production by product type							
Revenue Split by product (LOM)							
Valuation							
		A\$m		A\$/sh		Base Case	
NPV (FY20)							
Yangibana		492		0.49			
Corporate		(16)		(0.02)			
Net Debt		(43)		(0.04)			
Tax		(137)		(0.14)			
Total		296		0.29			
Target Price A\$/sh				0.30			
TSR (%)				140%			
Recommendation				Speculative Buy			
WACC							
Cost Of Equity				12.8%			
Cost Of Debt (pre tax)				5.0%			
WACC (Real)				9.3%			
Share Register							
		mn		% Dilltuion			
Shares on issue		916.9					
Options		69.2		7%			
Performance Rights		19.5		2%			
Fully Diluted Share Count		1,006					
NPV Summary							
Sensitivity ±1%							
		NPV					
NdPr		5.7					
AUDUSD		5.7					
Opex		3.3					
Recovery		5.7					
Headgrade		5.7					
NPV A\$/sh Valuation Sensitivity							
		NdPr US\$/kg (Ex VAT)					
AUDUSD		60	70	80	90		
0.675		0.19	0.41	0.64	0.86		
0.700		0.15	0.36	0.57	0.79		
0.725		0.10	0.31	0.51	0.72		
Mineral Inventory							
		Volume		REO		NdPr	
		(mt)		%		%	
Resource		21.7		1.10		0.39	
Reserve		10.4		1.22		0.43	
Mine Life		+11 years					
Key Events							
WA Government Approval				Aug 19			
NAIF - Debt Funding				Oct 19			
German Debt Facility Financial Clos				Nov 19			
Product Mix (LOM)							
Average Sales Price & Cost (REO)							

HAS Investment Thesis

We initiate research coverage on Hastings Technology Metals ('HAS') with a SPECULATIVE BUY recommendation and a A\$0.30/sh target price. We value HAS on a sum of the parts DCF using a 9.5% WACC (real) and LT NdPr Price of US\$68/kg & 0.70 AUD. We view HAS as having the most attractive rare earth project in development with the following key attributes to be successfully developed:

1. **High value orebody:** project hosts highest NdPr concentrations, which enables sector leading basket price (highest value material).
2. **Shortcut to market:** aims to produce a mixed carbonate and not fully separate rare earths, significantly reducing project technical risk and costs.
3. **German Backed:** Similar to Japan's backing of Lynas, we see Germany backing HAS for its future Automotive/Industrial needs.
4. **Skin in the game:** added certainty of seeing project through to completion is Exec Chairman Charles Lew, who owns 11.5% and has self-funded most development to date.

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 for HAS span across three key categories of project development, commodity price/exchange rate and operational.

Company Overview

Hastings Technology Metals ('HAS') is a rare earth development company that owns 100% of the Yangibana project, located in the Upper Gascoyne Region of Western Australia. Yangibana hosts the one of the world's highest concentrations of the highly strategic rare earth 'NdPr' and is the worlds most advanced project (studies, permitting, offtake, EPC).

The A\$450m project is expects commercial production to commence by mid-2021 and quickly ramp-up to a nameplate of 15kt of Mixed Rare Earth Carbonate ('MREC') containing c.3.5kt of 'NdPr' oxide that generates c.90% of its revenue.

Valuation

We value HAS on a sum of the parts one year forward DCF of ~A\$298m (A\$0.30/sh), which is based on a WACC of 9.5% real assuming a Cost of Equity of 12.8%, based on a risk free rate of 4.5%, Equity Beta of 1.5 and Equity Risk Premium of 10% and a Cost of Debt of 4.8% (pre tax).

Figure 1: HAS Valuation

Valuation	A\$m	A\$/sh
NPV (FY20)		
Yangibana	492	0.49
Corporate	(16)	(0.02)
Net Debt	(43)	(0.04)
Tax	(137)	(0.14)
Total	296	0.29
Target Price A\$/sh		0.30
TSR (%)		140%
Recommendation		Speculative Buy

Source: Ord Minnett Limited estimates

We value Yangibana on a pre tax basis of A\$492mn (A\$0.49/sh). The key forecast assumptions are our long term NdPr Price of US\$68/kg (ex VAT) and AUDUSD of 0.70. We forecast a mine life of 11 years commencing FY22 ending in FY32 which is based on the existing reserves at Yangibana of 10.4mt at 1.2% TREO containing 0.43% NdPr. With a resource of 21.7mt we expect the mine life can be substantially extended, which is highly value accretive to the valuation. We do not ascribe any value to their Brockman resource.

We include a provision for corporate items including overheads, admin, closure/rehab costs at A\$16m (A\$0.02/sh). We also include a forward Net Debt position of A\$43m (A\$0.04/sh). Tax we model as a separate DCF line item worth - A\$135mn (-A\$0.13/sh).

Figure 2: HAS NPV Valuation Sensitivity (A\$/sh)

AUDUSD	NdPr US\$/kg (Ex VAT)			
	60	70	80	90
0.675	0.19	0.41	0.64	0.86
0.700	0.15	0.36	0.57	0.79
0.725	0.10	0.31	0.51	0.72

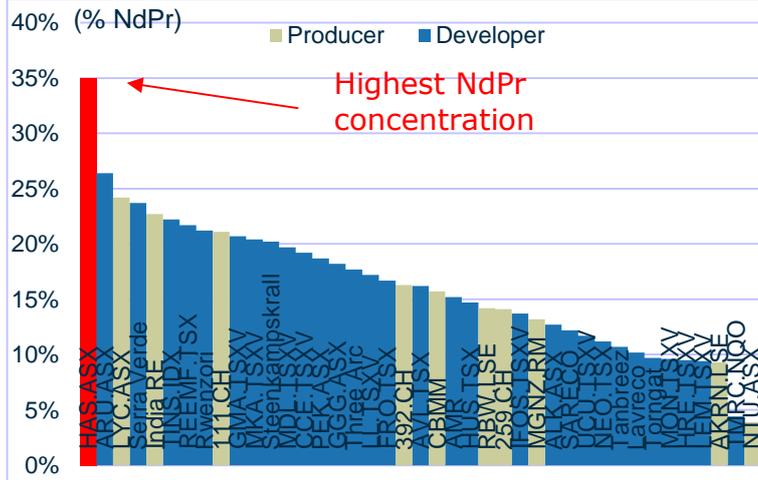
Source: Ord Minnett Limited estimates

Thesis Key Point 1: High value orebody

Yangibana hosts a resource of 21.7mt at 1.1% REO and Reserve of 1.4mt at 1.2% REO. On a grade basis, this doesn't compare favourably to the other rare earth deposits in the world which typically average c.1% TREO. However, what sets this project apart is that it contains one of the highest value rare earth product mixes.

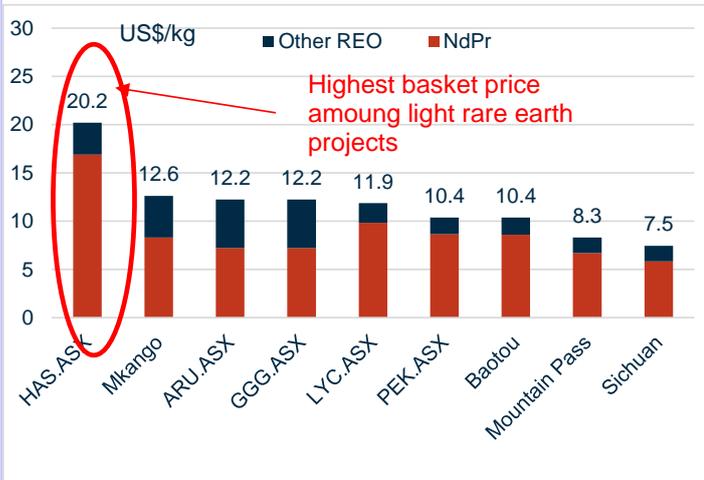
Yangibana contains one of the world's highest concentrations of the highly sought rare earth 'NdPr' which represents around 35% of the resource and ultimately 40% of its future production, generating c.90% of its revenue.

Figure 3: RE Project NdPr concentration by resource (%)



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

Figure 4: RE Project Basket price comparison (US\$/kg Ex VAT)



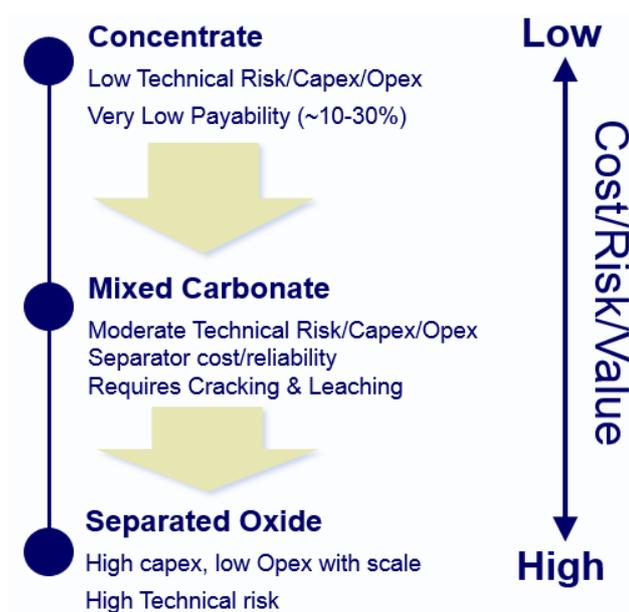
Along with other high value heavy rare earths (Dy/Tb), this enables the project to have an extremely high 'basket price' of some US\$20/kg at spot (21st July 2019), which is almost double existing producers at \$9.5/kg and its developer peers group at \$12/kg. Basket prices are a critical economic consideration for project development.

Thesis Key Point 2: Shortcut to market:

Barriers to entry for new rare earth producers remains very high. Broadly speaking there are three stages of processing in the initial rare earth supply chain of Concentrate, Mixed Carbonate, Separated Oxides. In our view, each stage down the supply chain increases a project technical risk as well as capital cost while also targeting significant value upside.

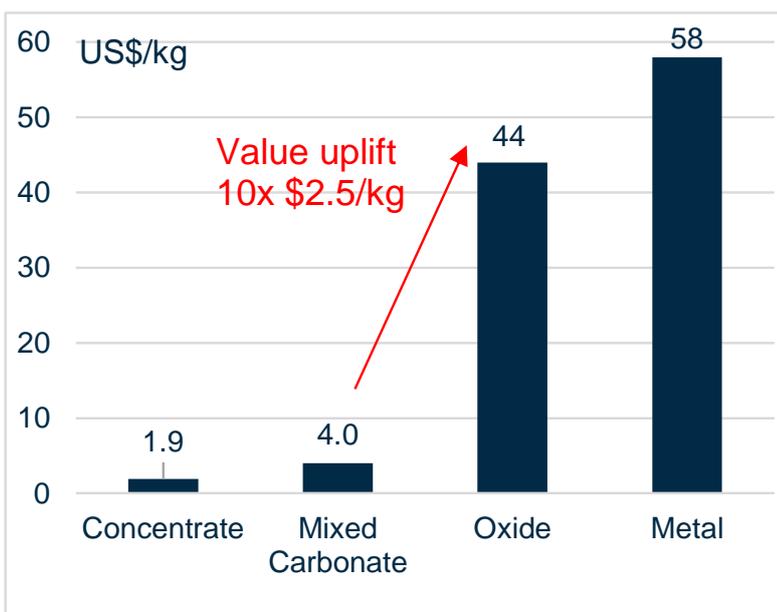
Historically new rare earth projects have had a chequered history, particularly for vertically integrated producers (eg mine to separated RE products). Typically capital costs exceed US\$1bn and take lengthy periods to commission (LYC took 6 years). There have also been spectacular failures when economic 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.

Figure 5: Rare Earth Value Chain



Source: Ord Minnett Limited, SMM, Rainbow Rare Earth

Figure 6: Rare Earth Value Chain by product price



Aversion to such risk is why we like the Yangibana project and HAS approach to development. HAS plans to only progress partially down the value chain to the second stage of producing a mixed intermediary product. This product is then sent from the mine to the customers designated separation facilities in either China, Thailand and Vietnam which have tremendous surplus separation capacity.

We note that Since 2014, China has curtailed or removed around 70% of its rare earth separation capacity from c.450ktpa to c.250ktpa by 2017. With official production quotas currently running at c.120ktpa and current utilisation rates of c.60% or there is ample outright idle or simply closed capacity due to a complete elimination of upstream raw material feedstocks. Further China separation plants can legal process raw carbonate material as it circumvents their strict production quota system.

The offsetting factor is the separation cost of US\$2.5-3/kg of REO contained which effectively adds a material 20-25% to unit cost of the business (US\$12.5/kg LOM).

Thesis Key Point 3: 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 7: 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		

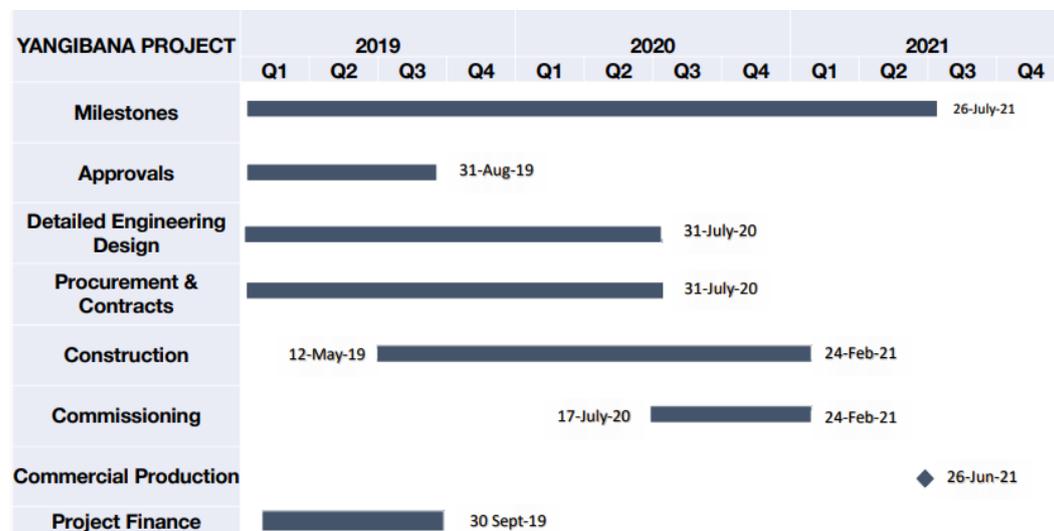
Source: Company, Ord Minnett Limited

Risks

Key risks for HAS span three key categories of project development, commodity price/exchange rate and operational.

- **Project Development Risk:**
 - Project financing hurdle of A\$450m capex,
 - Offtake – 83% of capacity under MOU, need to convert to contract.
 - WA regulatory permitting (no objections, due August 2019)
 - Construction/commissioning execution risk.
- **Commodity/FX Price risk:** The other key risk relates to the prevailing NdPr price and AUD USD. $\pm 10\%$ change in our forecasts impacts our NPV by $\sim 15\text{¢/sh}$ each. We note that the project requires a US\$52/kg NdPr price to generate an IRR of 15%, which is some 20% above spot levels.
- **Operational:** Valuation is highly sensitive to ramp up assumptions as well as metallurgical recovery rates ($\sim 76\%$) and headgrade (1.2% TREO). A $\pm 10\%$ change in either variable of or head grade of moves our NPV by $\sim 14\text{¢/sh}$.

Figure 8: Project Timeline



Source: Company

Key Risk 1: Capital Hurdle ~A\$450mn

The current preproduction capital cost for Yangibana is ~A\$450mn including contingency, with an additional A\$50m for working capital and finance charges over the initial mine life. To date around A\$32mn has been spent, slightly reducing the capex spend profile over the next three years to A\$74m in FY20, A\$252m in FY21 and A\$108m in FY22.

The key risk in any development project is the potential for project delays and capital cost blowouts. We're comfortable with the current capex estimate as it has recently been adjusted by the German debt facility requirements:

1. >90% of the capex has been fixed with EPCM project contractors
2. Higher Contingency of A\$60m (15%)
3. Additional contract cost for OEM's signing equipment performance warranties, adding A\$40m.

Figure 9: Yangibana Project Capex

Capex	A\$m
Mining	10
Process plant	220
Infas/TSF	60
Indirect costs	100
Contingency	60
Pre production Capex	450
Financing/Working Capital	50
Less: capex to date	(32)
Initial Capex Remaining	468

Source: Company, Ord Minnett Limited

Key Risk 2: Project Funding

The project will principally rely on German and Australian government debt to deliver the bulk of the (A\$400m) of the capex required. Impressively their German offtake partners have been actively assisting HAS securing German Federal Government funding, which has a mechanism to fund "eligible projects that contribute supply 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%.

Currently technical due diligence is being undertaken, with final documentation and ministerial decision completed by December 2019. Details ([here](#)).

'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 (Dampier-Bunbury gas pipeline access, access roads etc).

We expect a further A\$50mn to be funded from new equity raises and \$50mn from customer prepayments.

Figure 10: Debt Facility Summary

	Source	Facility Size A\$m	Status	Due by mmm yy	Interest rate %	Duration Years
Facility 1	German United Loan Guarantee Scheme	200	Technical due diligence	Nov 19'	US Libor + 2.75%	10
Facility 2	KfW IPEX Bank	50	" "	" "	US Libor + 4.25%	7
Facility 3	NAIF	150	Feasibility study	Oct 19'	RBA Cash + 2.5%	10
Total Debt		400				
New Equity		50				
Customer Prepayments		50				
Total		450				

Source: Company, UKF, KfW, NAIF, Ord Minnett Limited

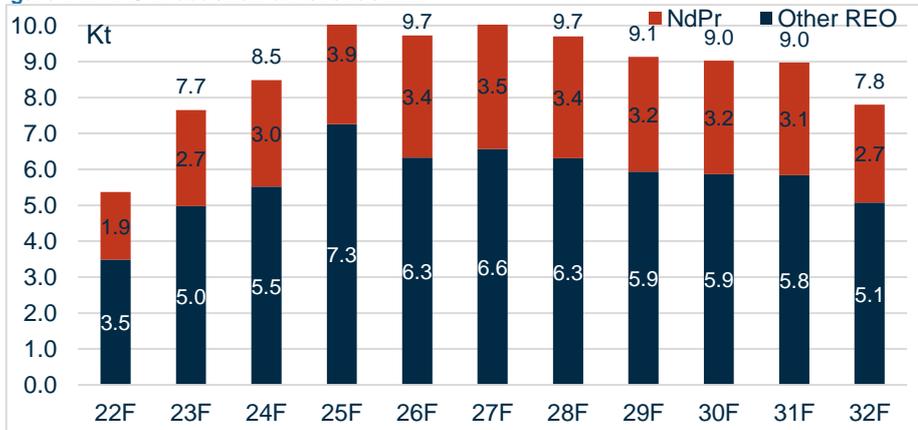
Appendix: Company Summary & Forecasts

Production Forecast

We expect Yangibana’s commercial production to commence FY22 and quickly ramp-up to a nameplate capacity of 15kt of Mixed Rare Earth Carbonate (‘MREC’). This is expected to contain 8.5ktpa of total Rare Earth Oxide (‘REO’) of which 40% or c.3.5kt of ‘NdPr’ oxide, which generates ~90% of its revenue.

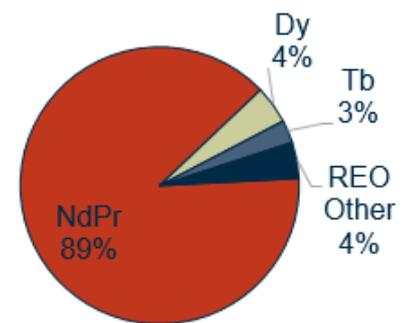
Yangibana has an unusual but highly advantageous plans to rapidly ramp up production within 6 months of commissioning. We note that its German lenders have stipulated that equipment providers sign ‘performance warranty’.

Figure 11: HAS Production & Revenue Mix



Source: Ord Minnett Limited estimates

Revenue Split by product (LOM)



Price forecast

Between now and 2022 we forecast the NdPr market deficit to grow and expect prices to rise until a supply response is incentivised in 2023. We forecast NdPr Oxide prices on an FOB China basis excluding 16% VAT to rise from spot of c.US\$40/kg and increase to our long-term real price of US\$68/kg.

As the non NdPr production represents <10% of group revenue we have forecast spot prices for its key products. The combination of the two product prices implies a basket price of c.US\$28/kg over the life of mine.

Figure 12: Commodity Price forecast

Assumptions (Real)		21F	22F	23F	24F	25F	26F	LOM
AUD		0.70	0.70	0.70	0.70	0.70	0.70	0.70
NdPr	US\$/kg	61	68	68	68	68	68	68
Basket Value	US\$/kg	22.6	27.6	27.1	26.3	26.9	26.9	26.6

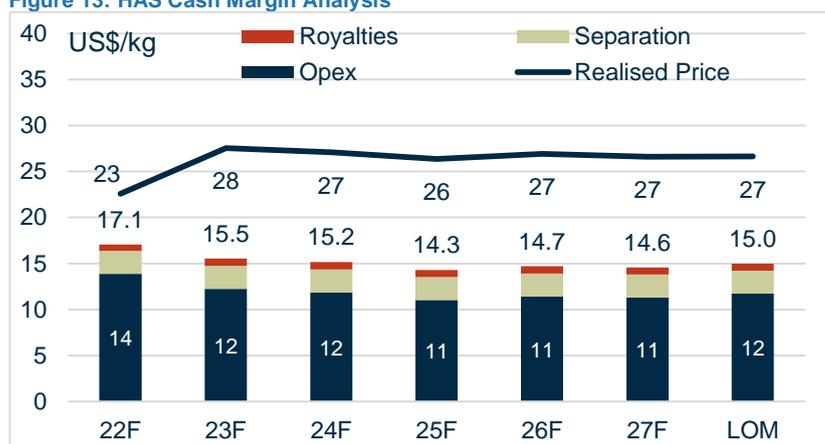
Source: Ord Minnett Limited estimates

Cost Forecast

We forecast an annual operating cost base of c.A\$150m over the life of mine or ~US\$15/kg REO based on the following assumptions:

- Variable Production costs of c.A\$12/kg or some A\$100m pa.
- Fixed cost A\$42mn annually
- Royalty of 3.2% from a State Royalty of 2.5% and 0.7% for a native title royalty (~A\$10m pa)
- Corporate/Admin costs of A\$3m pa
- Separation cost of US\$2.5/kg for REO sold or some A\$20m pa (at AUD of 0.7) we treat this as a treatment cost for accounting purposes which reduces the realised revenue rather than costs.
- Sustaining Capex we assume A\$1.3m annually

Figure 13: HAS Cash Margin Analysis



Source: Ord Minnett Limited estimates

Capital Structure

Currently there are 916.9mn shares on issue and 1,005.6mn on a fully diluted basis, consisting of 69.2mn Options and 19.5mn performance rights. Over the next 2 years we expect two further capital raising for c.A\$50mn which increases the share count by 357mn shares (35%).

Executive Chairman Charles Lew owns 11.5% of the register along with his Singapore/Malaysian business associates Mark Chang at 6.5%.

Figure 14 Capital Structure

Key financial metrics		18A	19A	20F	21F	22F	23F
Shares on issue	m	532	712	917	1,117	1,317	1,317
Options	m	18	69	69	69	69	69
Performance Rights	m	18	15	20	20	20	20
New Equity	m	58	179	116	200	200	
Fully Diluted Shares	m	568	727	1,006	1,206	1,406	1,406

Source: Ord Minnett Limited estimates

Hastings Technology Metals Limited

PROFIT & LOSS (A\$m)	2017A	2018A	2019E	2020E	2021E
Revenue	-	-	-	-	-
Operating EBITDA	(1.7)	(3.2)	(3.2)	(3.0)	(3.0)
EBIT	(1.7)	(3.2)	(3.2)	(3.0)	(3.0)
Net interest	0.2	0.3	0.3	(4.6)	(10.8)
Pre-tax profit	(1.4)	(2.6)	(2.9)	(7.6)	(13.8)
Net tax (expense) / benefit	-	-	-	-	-
Significant items/Adj.	0.2	0.4	-	-	-
Associate NPAT	(1.4)	(2.5)	(2.9)	(7.6)	(13.8)
Normalised NPAT	(1.4)	(2.5)	(2.9)	(7.6)	(13.8)
Reported NPAT	(1.5)	(2.9)	(2.9)	(7.6)	(13.8)
Normalised dil. EPS (cps)	(0.3)	(0.4)	(0.3)	(0.7)	(1.1)
Reported EPS (cps)	(0.3)	(0.4)	(0.3)	(0.6)	(1.0)
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)	567.8	727.0	1,005.7	1,184.3	1,362.9

CASH FLOW (A\$m)	2017A	2018A	2019E	2020E	2021E
EBITDA incl. adjustments	(1.7)	(3.2)	(3.2)	(3.0)	(3.0)
Change in working capital	-	-	-	-	-
Net Interest (paid)/received	0.2	0.3	0.3	(9.4)	(22.1)
Income tax paid	-	-	-	-	-
Other operating items	0.4	0.2	-	-	-
Operating Cash Flow	(1.0)	(2.7)	(2.9)	(12.4)	(25.1)
Other investing items	10.8	1.7	-	-	50.0
Investing Cash Flow	(1.3)	(12.5)	(38.0)	(74.0)	(202.0)
Other financing items	(0.1)	(1.5)	-	-	-
Financing Cash Flow	4.6	31.6	22.4	116.3	213.9
FX adjustment	-	-	-	-	-
Net Inc/(Dec) in Cash	2.3	16.4	(18.5)	29.9	(13.2)

BALANCE SHEET (A\$m)	2017A	2018A	2019E	2020E	2021E
Cash	4.3	20.7	18.0	47.9	34.7
Receivables	0.4	0.6	-	-	-
Inventory	-	-	-	-	-
PP & E	37.3	54.5	92.5	166.5	418.5
Other non-current assets	-	-	-	-	-
Total Assets	42.0	75.9	110.5	214.4	453.2
Short term debt	-	-	-	18.3	55.6
Payables	3.3	7.2	-	-	-
Long term debt	-	-	-	73.0	222.2
Other non-current liabilities	-	-	-	(73.0)	(222.2)
Total Liabilities	3.3	7.3	-	18.3	55.6
Total Equity	38.7	68.5	88.0	105.4	116.6
Net debt (cash)	(4.3)	(20.7)	(18.0)	43.4	243.1

Speculative Buy

DIVISIONS	2017A	2018A	2019E	2020E	2021E
KEY METRICS (%)	2017A	2018A	2019E	2020E	2021E
EBITDA growth	-	-	-	-	-
EBIT growth	-	-	-	-	-

VALUATION RATIOS (x)	2017A	2018A	2019E	2020E	2021E
Reported P/E	-	-	-	-	-
Price To Free Cash Flow	-	-	-	-	-
EV / EBIT	-	-	-	-	-

LEVERAGE	2017A	2018A	2019E	2020E	2021E
ND / (ND + Equity) (%)	(12.5)	(43.3)	(25.7)	29.2	67.6
Net Debt / EBITDA (%)	248.8	646.0	558.5	(1,446.7)	(8,103.8)
EBIT Interest Cover (x)	8.8	11.4	11.1	-	-
EBITDA Interest Cover (x)	8.8	11.4	11.1	-	-

SUBSTANTIAL HOLDERS	m	%
Charles Lew	103.3	11.5%
Mun Kee Chang	60.2	6.6%

VALUATION	
Cost of Equity (%)	12.8
Cost of debt (after tax) (%)	5.0
WACC (%)	9.5
Forecast cash flow (\$m)	298.1
Terminal value (\$m)	1,439.5
Equity NPV (\$m)	298.1
Equity NPV Per Share (\$)	0.30

Target Price Method	NPV
Target Price (\$)	0.30
Valuation disc. / (prem.) to share price (%)	140.0

Institutional Research

Nicholas McGarrigle	Head of Institutional Research	+61 2 8216 6345	nmcgarrigle@ords.com.au
Dylan Kelly	Senior Research Analyst	+61 2 8216 6417	dkelly@ords.com.au
Jules Cooper	Senior Research Analyst	+61 3 9608 4117	julescooper@ords.com.au
John O'Shea	Senior Research Analyst	+61 3 9608 4146	joshea@ords.com.au
Phillip Chippindale	Senior Research Analyst	+61 2 8216 6346	pchippindale@ords.com.au
William MacDiarmid	Research Analyst	+61 2 8216 6514	wmacdiarmid@ords.com.au
Jason Korchinski	Research Associate	+61 2 8216 6348	jkorchinski@ords.com.au
Joshua Goodwill	Research Associate	+61 3 9608 4121	jgoodwill@ords.com.au

Institutional Sales (Australia)

Nick Burmester	Head of Institutional Equities	+61 2 8216 6363	nburmester@ords.com.au
Chris McDermott	Institutional Equities Sales	+61 2 8216 6335	cmdermott@ords.com.au
Frida Bohlenius	Institutional Equities Sales	+61 2 8216 6365	fbohlenius@ords.com.au
Jim Bromley	Institutional Equities Sales	+61 2 8216 6343	jbromley@ords.com.au
Matt White	Institutional Equities Sales	+61 3 9608 4133	mwhite@ords.com.au
Richard Wolff	Institutional Equities Sales	+61 2 8216 6429	rwolff@ords.com.au
Stephen Jolly	Institutional Equities Sales	+61 2 8216 6424	sjolly@ords.com.au
Zac Whitehead	Institutional Equities Sales Support	+61 2 8216 6350	zwhitehead@ords.com.au
Brendan Sweeney	Operator	+61 2 8216 6781	bsweeney@ords.com.au

Institutional Sales (Hong Kong)

Timothy Last	Institutional Equities Sales	+852 2912 8988 +61 8 8203 2526	tlast@ords.com.hk
Chris Moore	Institutional Equities Sales	+61 2 8216 6362	cmoore@ords.com.hk

Ord Minnett Offices

Adelaide
Level 5
100 Pirie Street
Adelaide SA 5000
Tel: (08) 8203 2500
Fax: (08) 8203 2525

Buderim
Sunshine Coast
1/99 Burnett Street
Buderim QLD 4556
Tel: (07) 5430 4444
Fax: (07) 5430 4400

Gold Coast
Level 7
50 Appel Street Surfers
Paradise QLD 4217
Tel: (07) 5557 3333
Fax: (07) 5557 3377

Melbourne
Level 7
161 Collins Street
Melbourne VIC 3000
Tel: (03) 9608 4111
Fax: (03) 9608 4142

**Head Office
Sydney**
Level 8, NAB House
255 George Street
Sydney NSW 2000
Tel: (02) 8216 6300
Fax: (02) 8216 6311
www.ords.com.au

Brisbane
Level 31
10 Eagle St
Brisbane QLD 4000
Tel: (07) 3214 5555
Fax: (07) 3214 5550

Canberra
101 Northbourne Avenue
Canberra ACT 2600
Tel: (02) 6206 1700
Fax: (02) 6206 1720

Mackay
45 Gordon Street
Mackay QLD 4740
Tel: (07) 4969 4888
Fax: (07) 4969 4800

Newcastle
426 King Street
Newcastle NSW 2300
Tel: (02) 4910 2400
Fax: (02) 4910 2424

**International
Hong Kong**
1801 Ruttonjee House
11 Duddell Street
Central, Hong Kong
Tel: +852 2912 8980
Fax: +852 2813 7212
www.ords.com.hk

Guide to Ord Minnett Recommendations

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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