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RESEARCH
INDEPENDENT INVESTMENT RESEARCH

Technology Metals Australia Limited (ASX:TMT)

October 2018

INDEPENDENT
INVESTMENT RESEARCH

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Contents

Technology Metals Australia Limited (ASX: TMT)

October 2018

Note: This report is based on information as at 18 October 2018

Investment Profile	
Share Price - 18 October 2018	A$0.49
12 month L/H	A$0.185/$0.855
Issued Capital:	
Ordinary Shares (Inc Escrowed)	70.02 m
Listed Options	6.13 m
Unlisted Options (Inc Escrowed)	20.62 m
Fully Diluted	96.77 m
In Money Options (Inc. Escrowed)	26.76 m
Market Capitalisation UD	A$34.31 m
Market Cap Diluted for In-Money Options	A$47.42 m
Cash 30 June, 2018	A$2.71 m
October 2018 Placement	A$6.0 m
Cash on Option Conversion	A$8.37 m

Board and Management
Mr Michael Fry: Non-Executive Chairman
Mr Ian Prentice: Managing Director
Mr Sonu Cheema: Non-Executive Director and Company Secretary

Major Shareholders*	
Twentieth Century Motor Company	23.8%
Station Nominees Pty Ltd	8.0%
Top 20	50.3%

Share Price Performance

Senior Analyst – Mark Gordon

SIGNIFICANT PROGRESS AT GABANINTHA

Following the completion of a positive Pre-feasibility Study ("PFS") on its 100% held Gabanintha Vanadium Project ("the Project"), Technology Metals Australia ("the Company") has now commenced a Definitive Feasibility Study ("DFS"), which is targeted for completion in mid-2019.

Since listing in late 2016, Technology Metals has made considerable progress at Gabanintha in the Yilgarn Craton of Western Australia which has a Mineral Resource Estimate ("MRE") of 119.9Mt @ 0.8% V_2O_5, including a high grade massive magnetite basal zone of 55.0Mt @ 1.10% V_2O_5, one of the highest grade undeveloped primary vanadium resources globally. Eighteen percent of the total and 26% of the high grade mineralisation is in the Indicated Resource category, with 77% of Indicated Resources being converted to Probable Reserves.

The results of recently completed drilling will be used in a Resource upgrade and expansion, expected in early 2019, from which increased Reserves will be used for the DFS - this has the potential to result in a significantly larger scale operation than the 13 year, up to 13,000tpa V_2O_5 scenario as presented in the PFS, which returned a headline post-tax NPV_{10} of A$850 million for an up-front capital cost of A$380 million, and competitive operating costs of US$4.27/lb V_2O_5.

Metallurgical test work to date has also been very positive, highlighting the potential to produce a premium, +99.5% V_2O_5 product through standard processing by virtue of a high grade, clean vanadiferous titano-magnetite concentrate. These results included vanadium recoveries of up to 97.8% to a concentrate grade of over 1.3% V_2O_5.

Subject to permitting and financing (and a positive DFS), there could be the potential for first production in 2021, with the timing right to take advantage of forecast increases in demand for vanadium.

KEY POINTS

Forecast growth in demand and decreasing supply: Forecast global growth in electrical storage systems, including grid scale storage, should help drive vanadium demand over coming years in combination with increased demand for steel, particularly with new Chinese rebar regulations set to be enforced by November, with some seeing a need for an additional 170,000t of vanadium metal (~300,000t of V_2O_5) over the next 10 to 15 years. This is expected to exacerbate the current supply deficits (with stockpiles decreasing since 2010), caused partly by cuts in production due to the closure of a number of Chinese operations due to industry rationalisation and environmental issues. This has led to recent +500% increases in V_2O_5 prices to close to US$30/lb, from early 2016 lows of under US$5/lb

The development precedent is set: Although, due to low prices, the sector has been embattled until recently, Largo Resources' (TSX.LGO, "Largo") successful development and operation of the Maracás Menchen Mine in Brazil demonstrates that the right projects can get off the ground - Maracás Menchen is hosted in a layered gabbroic intrusion similar to that at Gabanintha, with both deposits having similar vanadium grades.

World class vanadium deposit: With Gabanintha, Technology Metals has a world class project and one of the highest grade undeveloped vanadium deposits globally; work to date has confirmed the potential for excellent metallurgical characteristics, a key factor in the development of this style of deposit.

Active work programmes: The Company has made considerable progress to date, meeting deadlines, and has active work programmes related to the DFS going forward, which should result in steady news flow.

Leveraged to project progress: With an enterprise value diluted for in-money options of ~ A$27 million and at a multiple below that of peers, the Company could be considered undervalued and is well leveraged to success in advancing Gabanintha and improving vanadium markets, as well as to any other opportunities that may be taken advantage of.

VALUATION

Using a V_2O_5 price of US$13/lb (as compared to the current price of close to US$30/lb) we have an after tax, unrisked valuation of A$793 million for Gabanintha with an IRR of 43%. The Project is most sensitive, as expected, to changes in revenue inputs, including metal prices. Our inputs were similar to those used by the Company in the PFS; our view is that these are reasonable.

We have also completed an indicative risked, after tax valuation for the Company with a share price target range of A$1.13 to A$1.84 based on share structures diluted for a number of conceptual funding scenarios - given the range of possible funding paths this needs to be treated with caution and used as a guide only. We would also expect this to increase with de-risking with in particular a positive DFS.

SWOT ANALYSIS

Strengths

- **Positive PFS:** The recently completed PFS highlights a robust operation based on a world class deposit, which has been the catalyst for the Company to proceed to the DFS.
- **Simple geology:** The style of mineralisation is characterised by reasonably simple geology and continuous high grade mineralisation, making for relatively simple low strip open cut mining.
- **Shallow oxidation:** The northern part of the resource has only a shallow (5m to 10m) depth to the base of complete oxidation; this is important as it reduces the amount of time and cost of pre-stripping on any start up of operations to get to the readily treatable transition and fresh mineralisation.
- **Positive metallurgy**: Work to date indicates that the project will have good metallurgical characteristics, with premium grade V_2O_5 being produced in bench scale testwork. This is by virtue of the mineralisation being able to be concentrated into a high grade, clean feed for the planned roast/leach processing.
- **Mining friendly jurisdiction:** Gabanintha is located in Western Australia, a mining-friendly jurisdiction which in 2017 ranked 5th globally and 1st in Australia in the Fraser Institute Survey of Mining Companies.
- **Cashed up:** Having just raised A$6 million, the Company has sufficient cash to fund activities for the foreseeable future - in addition in the money options have the potential to provide an additional A$8.4 million upon conversion.
- **Experienced people with shareholdings:** Company personnel have significant experience in the resources game, as well as shareholdings in the Company which align their interests with those of other holders.

Weaknesses

- **Development funding:** Given the "spike-collapse" nature of the price history of vanadium, traditional project financing may be difficult to obtain with price forecasts being unreliable, even with the potential for a structural change in the industry. However, on the other side, there may be a number of financing options open, including offtake pre-payments, vendor financing and a partner taking an equity stake in the Project.

Opportunities

- **Growing vanadium demand:** This is largely tied into the forecast growth in the storage and rebar markets, and with Gabanintha, the Company has a project that is well placed to take advantage of improving markets.
- **Gabanintha development options:** There is, should the Company wish, the potential for different development options, including the possibility to value add by installing a vanadium nitride or electrolyte plant.
- **Gabanintha co-products, alternative metallurgical process routes:** Although not being actively pursued, there could be the opportunity to extract high quality titanium and iron products through additional processing of the Gabanintha mineralisation – TNG Limited (ASX: TNG) is planning such an operation at Mt Peake in the Northern Territory using the licenced TIVAN process, however such projects will require significant additional capital than that required for a vanadium only operation. Neometals (ASX: NMT) is also developing a multi-metal leach process for use on their Barrambie deposit, targeting titanium production. There is also the possibility to extract base metals through the additional flotation of the minor amounts of sulphide that are present in the concentrator tails.

Threats

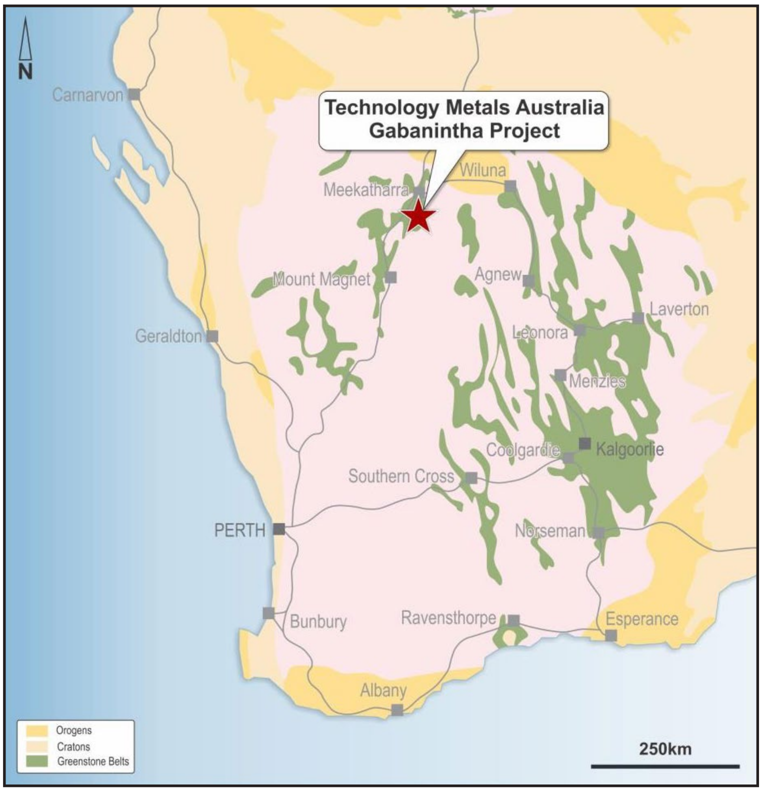
- **Markets**: Although junior resources markets are strong at the moment, they can turn on a dime; junior resource stocks are very susceptible to falls in the overall stock markets, which will affect the capacity to raise capital should the markets turn.
- **Vanadium Prices:** Vanadium prices have seen a resurgence lately, interpreted as largely being on restriction on exports out of China; however, the metal has shown in the past that it can move without logic; a potential game changer however is the forecast growth in VRFBs, which require a consistent supply of high quality flake product for the electrolyte, something which is not readily sourced from the slag producers.
- **Vanadium and battery demand not being as forecast**: This goes without saying in that it will affect demand and prices.

OVERVIEW

STRATEGY AND PROJECT OVERVIEW

- Technology Metals, following completion of a positive PFS, is looking towards the 2Q19 completion of a DFS on the 100% owned Gabanintha Vanadium Project, located some 40km south-east of Meekatharra in Western Australia (Figure 1).
- The Company listed in late 2016 on the back of Gabanintha, which was held by KOP Ventures Pty Ltd ("KOP"), an unlisted Company, and which was subsequently acquired by TMT as part of the IPO.
- The ultimate strategy is to develop Gabanintha, one of the world's highest grade undeveloped vanadium deposits which is contiguous with and located over the same layered gabbroic intrusive that hosts Australian Vanadium's Gabanintha Vanadium Project.
- The Company has made rapid progress subsequent to listing, as demonstrated by the completion of a PFS well within two years; this study highlights the potential of Gabanintha to be a technically and financially viable operation; this has also shown that the Project has the capacity to produce premium, high quality products.
- The aim of the DFS is to optimise and build on the PFS, and to present a longer term operation, that will take advantage of the forecast strong vanadium markets going forward.

Figure 1: Gabanintha location plan



Source: Technology Metals

FINANCIAL POSITION

- The Company listed in December 2016, and raised A$4 million before costs through the issue of 20 million shares at A$0.20 as part of the listing.
- TMT has subsequently (in October 2018) raised A$6 million before costs (6% brokerage fee in cash) through the placement of 12 million shares at A$0.50/share; this followed a placement in March 2018 that raised A$3 million at A$0.30/share before costs.
- As of June 30, 2018 the Company had A$2.710 million in cash and no debt.
- Since listing and until June 30, 2018 the Company has spent A$2.646 million on exploration and evaluation and A$1.653 on administration and staff.
- There are currently 26.76 million in the money options (at various expiry dates and strike prices, (with 14.62 million being escrowed until December 21, 2018); these have the potential to bring in A$8.373 million upon exercise.
- Given the recent raise and potential cash from options, the Company is well funded for the foreseeable future.

RECENT ACTIVITIES

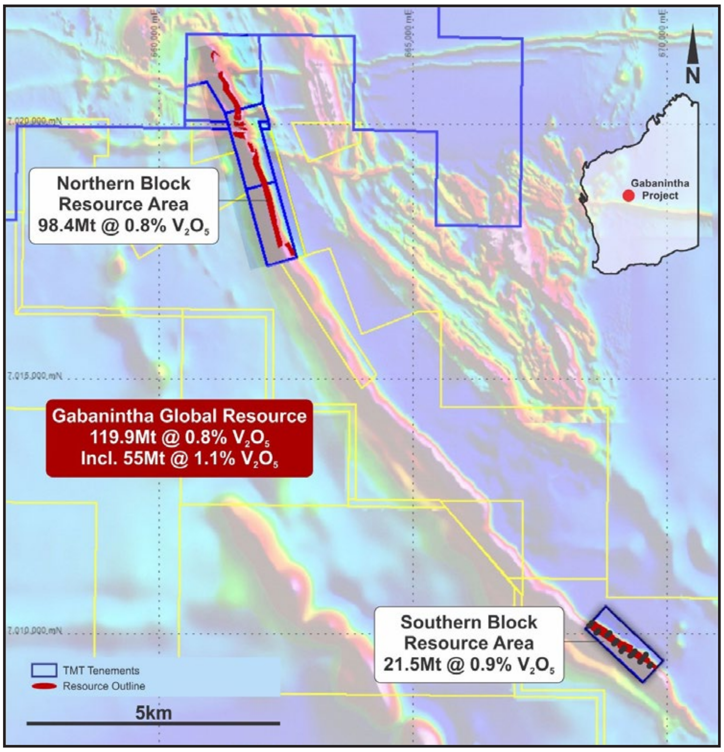
- Subsequent to our March, 2018 Initiation Report, activities by Technology Metals have largely concentrated on the now completed PFS, and the recently commenced DFS; these have included amongst others:
  - Completion of the PFS, with the positive results released to the market on June 21, 2018,
  - Ongoing metallurgical test work, including successful bench scale production of high purity (+99.5%) V_2O_5 flake from Gabanintha mineralisation,
  - Stage 1 DFS drilling (45 RC and diamond holes for 6,730m), to be used for Resource extensions and upgrades, metallurgical test work and geotechnical studies; and,
  - Ongoing large diameter metallurgical drilling to provide bulk samples for process plant equipment vendors and large scale metallurgical test work.
- Permitting activities include applications for Mining Leases, the acquisition of an addition licence adjacent to the Central Pit, that will allow for more flexibility in planning the site layout. The consideration for P51/2930 was A$40,000 cash, 200,000 TMT shares, a 2% NSR on commercial production of gold and a 1% NSR on commercial production of V_2O_5 from P51/2930 only.
- Environmental work is ongoing, with base line studies close to completion; in addition dialogue with the local Traditional Owner claimant groups is progressing.
- On the marketing front the Company continues to engage with producers and potential offtake partners.
- TMT has also raised an addition A$6 million through a placement to sophisticated and high net worth investors.

GABANINTHA VANADIUM PROJECT

TENURE AND PERMITTING

- The Project is situated within a 100% held package that includes two granted exploration licences ("EL") and five granted prospecting licences ("PL"); in addition there are two Mining Lease Applications ("MLA").
- Six granted tenements form a contiguous block in the north of the Project, with one, P51/2942 termed the "Southern Tenement", being enclosed within a tenement held by Australian Vanadium towards the southern end of the intrusive (Figure 2).

Figure 2: Gabanintha Vanadium Project tenements and resources



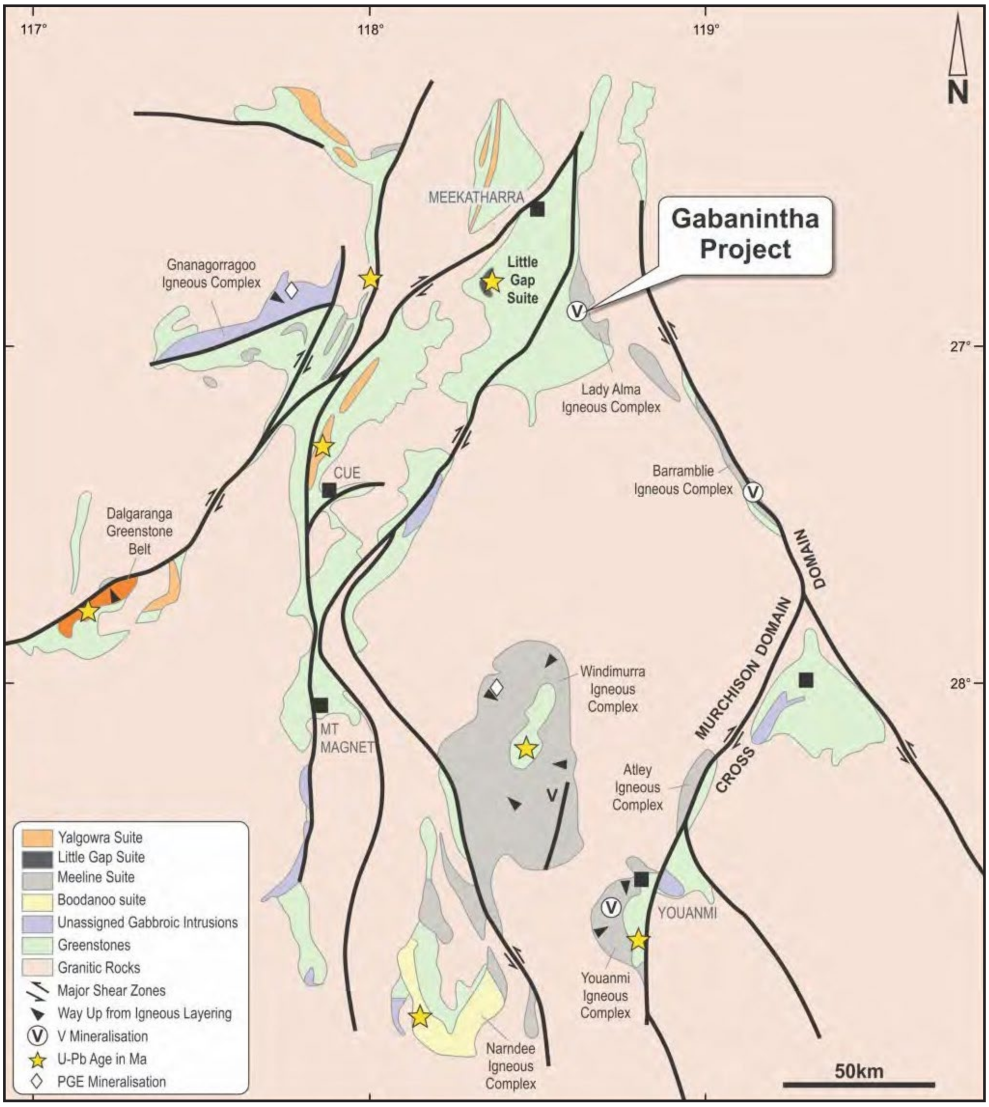
Source: Technology Metals

- The granted tenements, all held by KOP Ventures Pty Ltd ("KOP"), a wholly owned subsidiary of Technology Metals, cover an area of ~132 km^2, and are all in good standing.
- The Project is located approximately 40 km southeast, along the gazetted all-weather Meekatharra-Sandstone Road, from the mining and pastoral town of Meekatharra; the nearest port is Geraldton, some 600km away.

GEOLOGY AND MINERALISATION

- The Project is located over units of the Meekatharra-Wydgee Greenstone Belt within the Archaean Yilgarn Craton, a key mineralised terrane in Western Australia.
- More specifically, it is located over the Archaean Gabanintha Gabbro (part of the Lady Anna Igneous Complex), one of a number of mafic/ultramafic intrusive complexes in the region as shown in Figure 3; other significant igneous complexes include Windimurra, site of the now closed Windimurra Vanadium Mine and Barrambie, the site of Neometals' Barrambie Titanium Project.
- The Gabanintha Gabbro, which has a strike length of some 19 km (including ~6 km within TMT's tenements) and which has a consistent 45°-55° south-westerly dip, has been dated at around 2.81 Ga.
- Gabanintha is a layered intrusive, with a total true thickness of up to 180 m, with the basal, high grade mineralisation being associated with a titano-magnetite cumulate phase.
- The gabbro intrudes units of the Yaloginda Formation, the basal unit within the Norie Group, which is within the Northern Murchison Domain of the Murchison Supergroup.
- The gabbro has been cut by a number of generally SW-NE striking faults, however there has only been minor displacement along these.

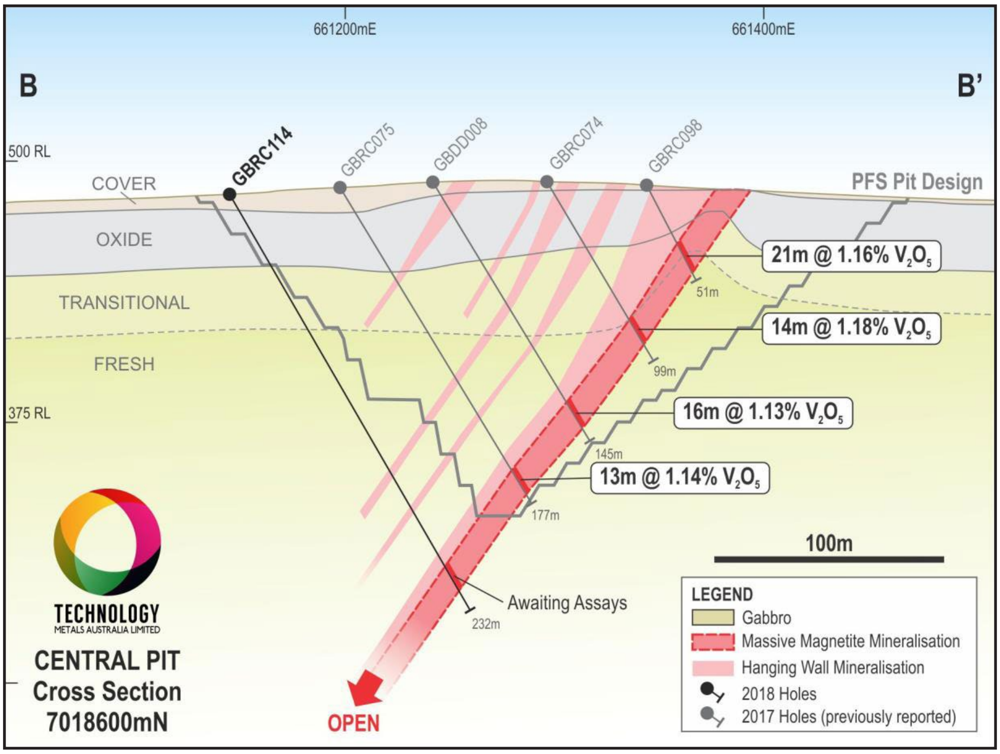
Figure 3: Gabanintha regional geology



Source: Technology Metals

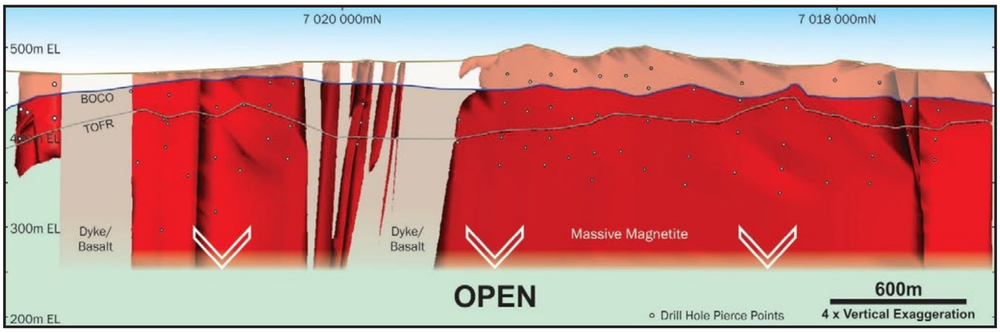
- This basal unit has a true thickness of between 10-30m (Figure 4), with work by both Technology Metals and Australian Vanadium highlighting the consistent widths of this unit along the entire drilled strike length of the intrusion.
- This basal unit is comprised almost entirely of vanadiferous titano-magnetite, with accessory ilmenite and silicate minerals, including anorthosite; hanging wall units include both banded and disseminated mineralisation, with some bands of massive mineralisation being seen in the immediate hanging wall to the massive mineralisation, as well as some in the footwall.
- The Yaloginda Formation is comprised largely of felsic volcaniclastics and banded iron formation ("BIF"), with some sedimentary schists.
- Upper units within the intrusive are dominated by gabbro-norites and anorthosites - gabbroic rocks which are largely composed of plagioclase and pyroxene; these units also contain appreciable disseminated vanadium bearing titano-magnetite in a series of sub-parallel zones, albeit of lower overall grade than the basal cumulate, however potentially economically recoverable (discussed later).
- The project area has been strongly weathered to depths of between 10m and 50m; however the vanadium is not removed by weathering, although the magnetic properties are lost due to the weathering to more oxidised species such as martite, a pseudomorph of haematite formed by the weathering of magnetite.
- Figure 4 shows a typical cross section of the mineralisation, highlighting grades and thicknesses in the massive basal zone, and mineralised lenses in the upper disseminated and banded zones - this is from the planned Central Pit in the northern block of mineralisation.
- One aspect of the deposit is that the morphology is ideally suited to open pit mining; the immediate footwall to the mineralisation would possibly approximate the final pit wall (this is expected to steepen from that shown in Figure 4 with the final DFS pit design following additional geotechnical drilling into the footwall), and there is the possibility to treat the overlying disseminated mineralisation, which, as it has to be dug up to access the massive mineralisation, should help the economics of any future development.
- The potential for a relatively short lead time to production due to reduced pre-stripping requirements is shown by the shallow oxidation (5m to 10m) in the north of the deposit (Figures 4 and 5); drilling on the southern block has highlighted a similar situation.

Figure 4: Cross section 718600N, showing typical intersections and very shallow oxidation - this is Section B-B' on Figure 9.



Source: Technology Metals

Figure 5: Northern long section (looking NE), highlighting shallow oxidation in the north

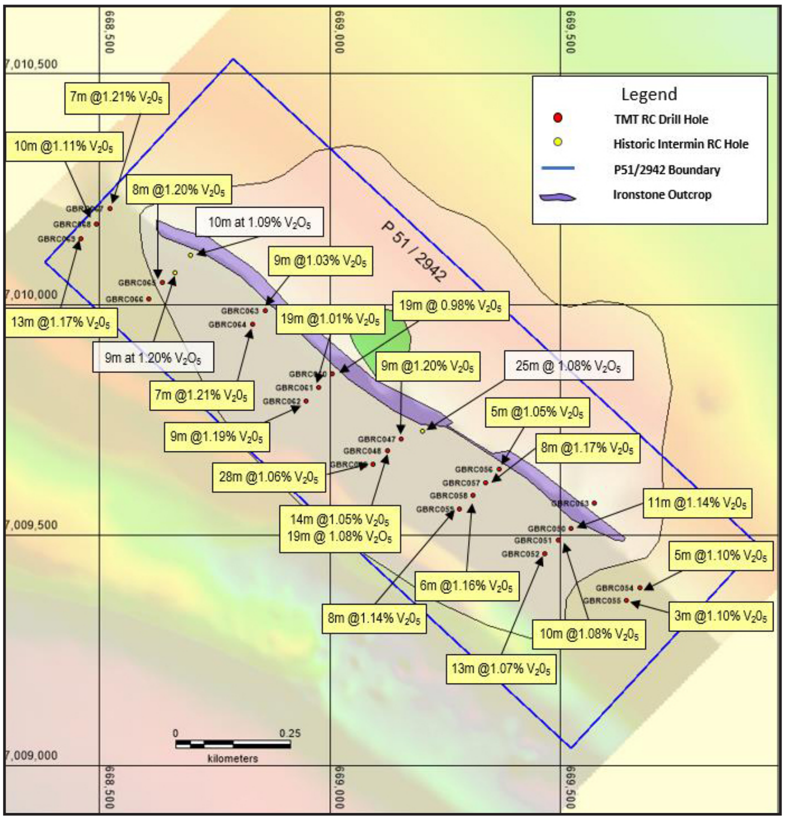


Source: Technology Metals

DRILLING, RESOURCES AND RESERVES

- Since listing, TMT has carried out significant drilling at Gabanintha, which has resulted in the MRE - drill targeting was partially based on the results of a detailed airborne magnetics survey completed by the Company - the basal massive mineralisation has a strong, distinctive magnetic signature.
- The drilling has included both diamond and reverse circulation ("RC"), generally drilled at 40 m hole spacings on lines spaced at either 200 m or 100 m apart - pre-PFS drilling tested 1,500 m of strike within the southern tenement and 5 km of strike in the north down to depths of ~200 m below surface.
- This pre-PFS drilling included 108 RC holes for 10,619 m (including 23 holes for 2,233 m on the southern block) and 13 diamond core holes for 1,235 m, all on the northern block, with the work on the northern block including the infill drilling to 100 m line spacing; this allowed the upgrading of a proportion of the Inferred Resources to Indicated.
- This work has shown consistent results, particularly in the basal massive mineralisation; results from the southern block are shown in Figure 6 and an example from the northern block in Figure 4; the resource model for the northern block is shown in Figure 7.

Figure 6: Southern block drill plan and results

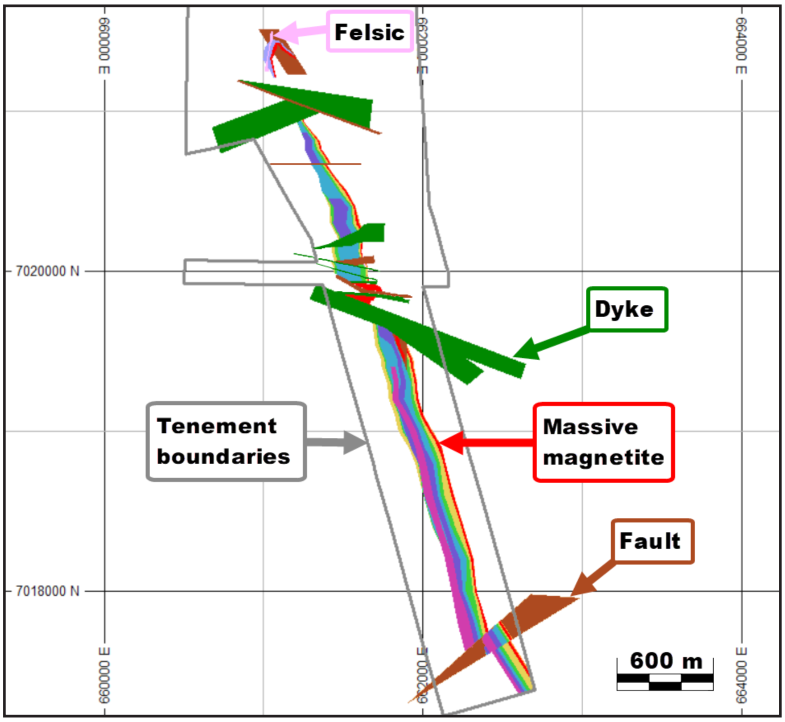


Source: Technology Metals

- Given the relative orientations of the drillholes and dip of the mineralisation, all intercepts are close to true width.

- This has also intersected the full thickness of the intrusion, allowing for full geological interpretations.
- Subsequent to the PFS Technology Metals has carried out further drilling (45 RC and diamond holes for 6,730m), with this for Resource upgrade, metallurgical test work and geotechnical purposes on both the northern and southern blocks, with large diameter metallurgical drilling currently drilling under way.
- Assay results from this drilling are expected later in the year, with the drill core currently being subject to metallurgical and geotechnical assessment; following receipt the assay results will be sent to the resource geologist, with an upgrade expected in 1Q19 for both Resource blocks.

Figure 7: Northern block resource plan



Source: Technology Metals

- The current JORC-2012 compliant MRE of 119.9Mt @ 0.8% V_2O_5 is presented in Table 1 - this includes high grade, massive magnetite mineralisation of 55.5Mt @ 1.10% V_2O_5 - 18% of the total, including 26% of the massive mineralisation is in the Indicated category, all included in the northern block.

Table 1: Gabanintha JORC-2012 Compliant MRE

Mineralised Zone	Classification	Million Tonnes	V_2O_5%	Fe%	Al_2O_3 %	SiO_2 %	TiO_2 %	LOI %
Northern Zone								
Massive Magnetite	Indicated	14.5	1.1	49.2	5.1	5.8	12.8	-0.2
	Inferred	30.1	1.1	48.0	5.7	6.7	12.7	0.2
	Ind + Inf	44.6	1.1	48.4	5.5	6.4	12.4	0.1
Disseminated	Indicated	7.1	0.6	29.9	12.6	24.4	7.8	2.9
	Inferred	46.6	0.5	26.5	14.1	27.4	7.0	4.4
	Ind + Inf	53.7	0.5	27.0	13.9	27.0	7.1	4.2
Total Northern Zone	**Indicated**	**21.6**	**0.9**	**42.8**	**7.6**	**12.0**	**11.2**	**0.9**
	Inferred	**76.8**	**0.8**	**34.9**	**10.8**	**19.3**	**9.2**	**2.8**
	Ind + Inf	**98.4**	**0.8**	**36.7**	**10.1**	**17.7**	**9.7**	**2.4**
Southern Zone								
Massive magnetite	Inferred	10.4	1.1	49.1	4.9	5.9	12.6	-0.4
Disseminated	Inferred	11.1	0.6	30.2	11.9	23.4	7.7	2.4
Total Southern Zone	**Inferred**	**21.5**	**0.9**	**39.3**	**8.5**	**14.9**	**10.1**	**1**

Gabanintha JORC-2012 Compliant MRE									
Mineralised Zone	**Classification**	**Million Tonnes**	**V_2O_5%**	**Fe%**	**Al_2O_3 %**	**SiO_2 %**	**TiO_2 %**	**LOI %**
Combined Zones								
Massive Magnetite	Indicated	14.5	1.1	49.2	5.1	5.8	12.8	-0.2
	Inferred	40.5	1.1	48.3	5.5	6.5	12.7	0.2
	Ind + Inf	55.0	1.1	48.5	5.4	6.3	12.7	0.1
Disseminated Magnetite	Indicated	7.1	0.6	29.9	12.6	24.4	7.8	2.9
	Inferred	57.7	0.6	27.2	13.7	26.7	7.2	4.0
	Ind + Inf	64.9	0.6	27.5	13.5	26.4	7.2	3.9
Total Resources	**Ind + Inf**	**119.9**	**0.8**	**37.1**	**9.8**	**17.2**	**9.7**	**2.1**

Source: Technology Metals

- The resources are based on a nominal 0.9% V_2O_5 bottom cut for the basal zone and 0.4% for the disseminated zones; bulk dry densities are shown in Table 2.

Table 2: Gabanintha density vales - t/m³

Gabanintha density values - t/m³			
Weathering state	**Waste**	**Disseminated/ banded**	**Massive**
Oxide	1.8	2.0	3.0
Transition	2.7	3.2	3.8
Fresh	3.2	3.4	4.3

Source: Technology Metals

- Reserves were estimated as part of the PFS, with these shown in Table 3 - it is noted that there is a high (77%) conversion of Indicated Resources to Probable Reserves.

Table 3: Gabanintha Ore Reserves

Gabanintha Ore Reserves			
Reserve Category	**Tonnes (Mt)**	**Grade V2O5%**	**Contained V2O5 (Mt)**
Proven	-	-	-
Probable	16.7	0.96	0.16
Total	16.7	0.96	0.16

Source: Technology Metals

- The Reserves were included in the 19.2Mt @ 0.96% V_2O_5 Mining Inventory, with 2.5 Mt of Inferred Resources also being used - the Mining Inventory is shown in Table 4.
- We have added an extra column here to summarise the results of the metallurgical recoveries of various types of material to the magnetic concentrate, and then calculated a weighted average that shows that the overall recoveries to concentrate may be in the order of 85% using the material mix in the inventory.
- It would be expected that oxidised and lower grade material will be stockpiled, and treated later in the mine life to maximise returns up front to pay back capital.

Table 4: Gabanintha PFS Mining Inventory

Gabanintha PFS Mining Inventory							
North Pit	**Indicated**		**Inferred**		**Total**		**V_2O_5 Recovery to Con**
Mineralisation Type	**kt**	**% V_2O_5**	**kt**	**% V_2O_5**	**kt**	**% V_2O_5**	**%**
Banded/Disseminated transitional and oxide	540	0.73	42	0.73	581	0.73	22%
Banded/Disseminated fresh	741	0.62	652	0.62	1,393	0.62	76%
Massive magnetite Oxide	-	-	52	0.85	52	0.85	28%
Massive magnetite transitional	651	0.85	41	0.95	692	0.94	77%
Massive magnetite fresh	3,805	0.94	142	0.95	3,947	0.94	98%
Total ROM feed (inc. mine recovery and dilution)	**5,737**	**0.87**	**929**	**0.7**	**6,666**	**0.84**	**84%**
Waste	-	-	-	-	31,485	-	

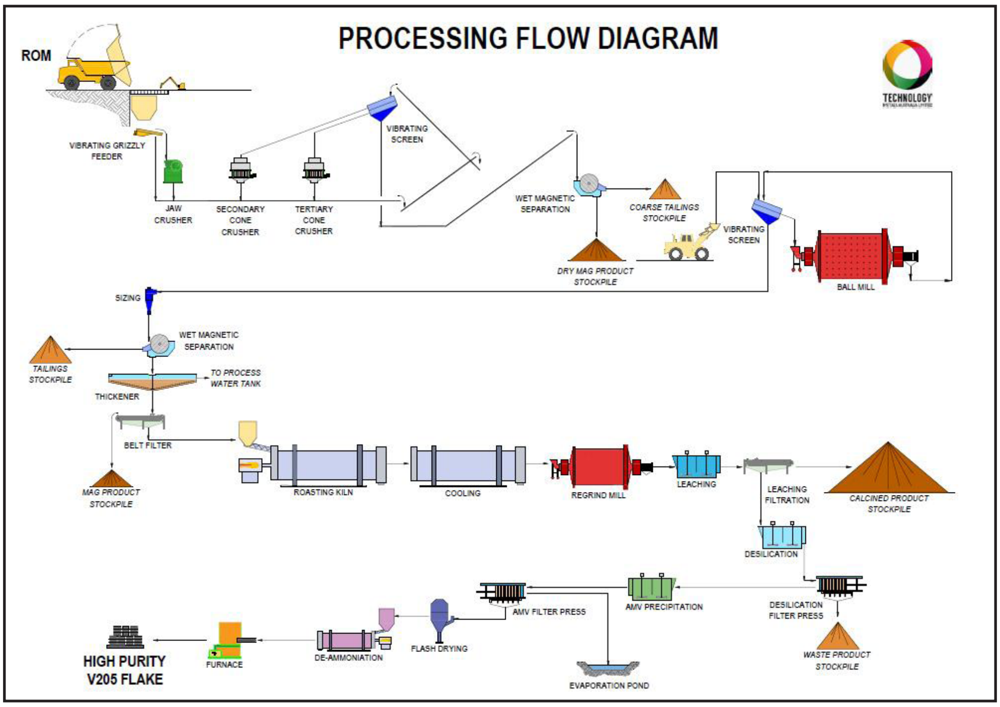
Gabanintha PFS Mining Inventory							
Central Pit	**Indicated**		**Inferred**		**Total**		**V_2O_5 Recovery to Con**
Mineralisation Type	**kt**	**% V_2O_5**	**kt**	**% V_2O_5**	**kt**	**% V_2O_5**	**%**
Banded/Disseminated transitional and oxide	80	0.66	9	0.65	88	0.66	22%
Banded/Disseminated fresh	919	0.62	133	0.6	1,052	0.62	76%
Massive magnetite oxide	-	-	1,121	1.08	1,121	1.08	28%
Massive magnetite transitional	2,297	1.07	172	1.06	2,469	1.05	77%
Massive magnetite fresh	7,690	1.05	141	1.06	7,830	1.05	98%
Total ROM feed (inc. mine recovery and dilution)	**10,986**	**1.02**	**1,575**	**1.03**	**12,561**	**1.02**	**85%**
Waste	-	-	-	-	75,125	-	

Source: Technology Metals, IIR analysis

METALLURGY

- A key factor to the success of any future operation is the metallurgical performance, particularly of the basal massive zone - the aim here is to achieve a high recovery to a high grade vanadiferous magnetite concentrate, which will lower downstream processing costs, and optimise the value of the concentrate if there is the intention to sell concentrate.
- The planned process route is well proven and typical for these styles of deposits, with the main steps including the following and shown in Figure 8:
  - Crushing and milling of the RoM ore to P80 -250µm,
  - Low intensity magnetic separation ("LIMS") to a magnetic concentrate,
  - Oxidation of the concentrate through roasting with sodium salt in a rotary kiln at ~1200° C which produces water soluble vanadium salts,
  - Water leaching of vanadium salts followed by precipitation of ammonium metavanadate ("AMV", NH_4VO_3); and,
  - Calcining of the AMV to produce vanadium pentoxide (V_2O_5).
- The Company has used an overall vanadium metallurgical recovery of 70% to finished V_2O_5.

Figure 8: Processing flow sheet



Source: Technology Metals

- Factors that affect the metallurgical performance include amongst others (which are discussed in more detail in the case of Gabanintha below):
  - The grade and mineralogy of the RoM material,
  - The mass pull and recovery of vanadium to the concentrate - a lower mass pull for the same recovery will result in a higher grade concentrate, less material and hence potentially lower downstream operating and capital costs (the equation relating these factors is - feed grade % x metal recovery % = mass pull % x concentrate grade %),
  - Oxidation state of the RoM feed (which affects recoveries and mass pulls); and,
  - Deleterious elements, particularly silica, in the feed.
- The results of work to date by Technology Metals have been very positive, with high purity, +99.5% V_2O_5 being produced at a bench scale - one important feature is that high purity flake can command a premium price, although the market size is as such that production would not be all high purity material.
- As an example, in 1H18 Largo Resources produced some 4,770t of V_2O_5 at the Maracás Menchen Mine in Brazil, of which 820t, or 17% was high purity material.

Concentration Testwork

- The key concentration method, given the mineralogy, is magnetic separation, with the effectiveness affected by the weathering state of the mineralisation.
- A consideration is the performance of the more disseminated mineralisation - although not the primary target, given that this material will need to be mined to access the basal massive mineralisation being able to achieve some economic benefit from this will help project economics by increasing the revenue and decreasing the effective strip ratio.
- Initial metallurgical work concentrated largely on the massive mineralisation, however some disseminated material was included in the composites - this included Davis Tube ("DTR") testwork at a 45µm grind, and DTW (similar, but using specified size fractions) at 75µm, 106µm and 210µm grind sizes.
- The results of this were positive, and was followed up by detailed low intensity magnetic separation ("LIMS", 1,200 gauss) work on fresh, transitional and oxide material for both the massive and banded/disseminated mineralisation; this produced excellent results, as shown in Tables 5 (valuable metals) and 6 (gangue minerals).
- The head grade of the three massive ore samples ranged from 1.22% to 1.27% V_2O_5, with that for the disseminated mineralisation ranging from 0.52% to 0.60% V_2O_5.
- Key outcomes of this work included:
  - High vanadium recoveries of up to 97.8%, with mass recoveries of up to 85.6%,
  - Concentrate vanadium oxide grades of over 1.3% for the transitional and fresh massive mineralisation; this also returned concentrate grades of 1.27% V_2O_5 for the fresh disseminated mineralisation albeit at a lower mass pull,
  - Concentrate grade and recovery is not sensitive to grind size, with the resultant potential operating efficiencies, and,
  - High rejection of the deleterious minerals silica and alumina highlights the potential to produce a high quality concentrate.
- The lower silica grade in the concentrate is important, in that it results in lower salt consumption in the roast/leach processing, with salt being the second highest cost (behind power) in this stage of the operation; in addition high SiO_2 levels can lead to the formation of glassy silicates in the kiln, which trap vanadium and hence lower recoveries to the leach solution.
- The results also highlight potential operational benefits, in that being able to treat hanging wall disseminated mineralisation returns some value from what otherwise may have been considered as waste, and the positive results from transitional material will mean less pre-strip and a shorter time to production.
- Comminution test work (to a finer 80µm grind than the mid-point 106µm grind as used in the concentration test work) has resulted in bond work indices ("BWI") of 19.9kWh/t for the fresh massive material and 20.4kWh/t for the disseminated material; these are typical for this style of mineralisation.

Table 5: Gabanintha detailed metallurgical test work results - valuable metals

Gabanintha metallurgical test work results - valuable metals									
			Fe		TiO_2		V		
Composite	Screen Size	Mass Pull %	Grade %	Rec %	Grade %	Rec %	V%	V_2O_5 %	Rec %
Massive Fresh	P80 250	85.4	57.4	94.5	13.80	87.9	0.73	1.30	96.8
	P80 106	85.6	57.9	95.4	13.70	87.2	0.73	1.30	97.8
	P80 45	85.9	58.8	95.5	13.60	86.8	0.74	1.32	97.9
Massive Transition	P80 250	68.4	55.1	72.6	14.40	69.1	0.74	1.32	75.8
	P80 106	68.8	55.6	73.5	14.30	69.1	0.75	1.34	77.0
	P80 45	64.2	56.0	69.2	14.10	64.3	0.76	1.36	73.1
Massive Oxide	P80 250	36.9	54.1	40.8	14.5	37.0	0.75	1.14	40.8
	P80 106	25.2	54.7	28.2	14.4	25.2	0.75	1.14	28.0
	P80 45	7.9	55.5	9.0	13.8	7.5	0.74	1.13	8.5
Disseminated Fresh	P80 250	34.8	53.4	66.2	14.30	66.9	0.68	1.21	76.4
	P80 106	33.0	55.5	64.9	14.30	63.7	0.71	1.27	75.9
	P80 45	32.0	56.9	64.1	14.00	60.4	0.72	1.29	75.1
Disseminated Transition	P80 250	19.1	49.5	33.1	14.80	38.8	0.59	1.05	39.3
	P80 106	17.3	52.6	32.7	15.00	37.4	0.63	1.12	39.4
	P80 45	16.0	54.5	31.3	14.40	33.3	0.64	1.14	36.9
Disseminated Oxide	P80 250	2.3	53.5	5.3	17.20	5.0	0.68	1.21	5.11
	P80 106	1.9	53.1	4.5	17.00	4.3	0.67	1.20	4.29
	P80 45	1.0	54.0	2.4	16.30	2.1	0.66	1.18	2.21

Source: Technology Metals

Table 6: Gabanintha metallurgical test work results - gangue materials

Gabanintha metallurgical test work results - gangue minerals							
			SiO_2		Al_2O_3		LOI
Composite	Screen Size	Mass Pull %	Grade %	Rec %	Grade %	Rec %	Grade %
Massive Fresh	P80 250	85.4	0.55	13.6	2.75	49.2	-2.73
	P80 106	85.6	0.46	11.5	2.55	45.9	-3.00
	P80 45	85.9	0.32	8.8	2.36	44.2	-3.21
Massive Transition	P80 250	68.4	0.82	21.7	2.73	46.4	0.42
	P80 106	68.8	0.65	17.8	2.50	43.1	0.29
	P80 45	64.2	0.47	11.9	2.30	36.3	-0.10
Massive Oxide	P80 250	36.9	1.3	10.8	2.9	21.1	0.9
	P80 106	25.2	1.0	5.7	2.7	13.2	0.6
	P80 45	7.9	0.7	1.3	2.5	4.0	-0.6
Disseminated Fresh	P80 250	34.8	3.95	5.3	3.47	9.1	-2.13
	P80 106	33.0	2.62	3.3	2.80	7.0	-2.70
	P80 45	32.0	1.96	2.5	2.45	5.9	-3.31
Disseminated Transition	P80 250	19.1	6.82	5.2	3.31	5.6	-1.19
	P80 106	17.3	4.49	3.0	2.51	3.7	-1.82
	P80 45	16.0	3.54	2.2	2.11	2.9	-2.55
Disseminated Oxide	P80 250	2.3	2.07	0.2	1.73	0.2	0.33
	P80 106	1.9	2.78	0.2	1.92	0.2	0.10
	P80 45	1.0	2.22	0.1	2.10	0.1	-1.05

Source: Technology Metals

Downstream Processing

- The Company has completed bench scale salt roast/water leach test work on a composite made up of 85% of the fresh massive concentrate and 15% of the transitional massive concentrate, which reflects the long term feed composition for the proposed operation.

- Desilification and AMV precipitation test work was carried out in conjunction with the roast/leach work, with this highlighting the potential to produce a high purity AMV product; a 99.4% product (based on the sum of impurities, which were mainly below the limit of detection) was then calcined to V_2O_5.
- Subsequent to the completion of the PFS the Company has completed further work on a 60 kg sample of high grade basal mineralisation, with high purity V_2O_5, with a grade of 99.53% being produced; analysing the sample with a lower limit of detection may change this figure.
- The reported grade, as a number of impurities were below the limit of detection for the assay method, was calculated from the sum of impurities, with those below the limit of detection being treated as half the limit of detection.

Ongoing Test Work

- There is significant ongoing test work that is a major part of the DFS, with this planned to include pilot scale kiln test work amongst other activities.

PRE-FEASIBILITY STUDY

- In June 2018, the Company released the results of the PFS for Gabanintha, with the study incorporating the factors discussed above.
- The Study was predicated on a 13 year operation, producing some 13,000tpa of V_2O_5 through treating 1.6 Mtpa to 1.9 Mtpa of RoM ore - key inputs and results from the Study are presented in Table 7

Table 7: Gabanintha PFS inputs and results

Gabanintha PFS inputs and results		
Parameter	**Units**	**Amount**
Targeted V_2O_5 Production Rate	Tonnes Per Annum	13,000
Targeted Production Commencement	Year	2021
Estimated Mine / Processing Life	Years	13
Life of Mine Production	Tonnes V_2O_5	129,000
Processing Rate	Mtpa	1.6 - 1.9
Estimated mineralisation to be mined	Mt	19.2
Average Diluted Mining Grade	% V_2O_5	0.96
RoM Contained V_2O_5	Tonnes V_2O_5	184,320
Overall Metallurgical Recovery	%	70%
Average Strip Ratio	Waste:Ore	5.6 : 1
Commodity Price Forecast	US$/lb V_2O_5	13
Exchange Rate Assumption	A$: US$	0.75
Total Revenue	A$m	4,935
Total EBITDA	A$m	3,070
Total Capital Expenditure	A$m	380
Total Operating Expenditure	A$m	1,600
Average Operating Costs	US$/lb V_2O_5	4.27
Discount Rate Assumption	%	10
Net Present Value (pre-tax)	A$m	1,277
Internal Rate of Return (pre-tax)	%	55
Net Present Value (post-tax)	A$m	850
Internal Rate of Return (post-tax)	%	43
Anticipated Payback on Capital	Years	3.4

Source: Technology Metals

Costs

- Estimated capital costs are shown in Table 8, with operating costs in Table 9.
- The most relevant comparison for costs is Largo's Maracás Menchen Mine in Bahia State, with current annual production of 9,600t V_2O_5 from ~1.2 Mtpa RoM.

- Although at an early stage, our view is that Technology Metals' costs are reasonable, and broadly in line with those of Maracás Menchen and the figures from Australian Vanadium's interim PFS.
- Australian Vanadium's capex is US$360 million (~A$500 million), some 30% higher than Technology Metals'; this however includes an allowance for an investment in a gas pipeline that is not included in Technology Metals' estimate.
- The final capex for Largo's operation (which uses the same flow sheet as that planned for Gabanintha) was US$250 million (A$360 million now, ~A$280 million at the time of construction in 2014), with 1H18 direct site operating costs of C$3.82/lb V_2O_5 with total operating cash costs of C$4.97/lb.
- It is hard to directly compare Gabanintha and Maracás Menchen without drilling deeply into the detail, however the higher estimated site costs for Gabanintha, at A$5.69/lb (C$5.26/lb) may be due to a number of factors including the following:
  - A more remote location for Gabanintha,
  - Lower labour costs in Brazil,
  - The concentrate grade at Menchen, at +3%, is significantly higher than that for Gabanintha, with this resulting in lower downstream processing costs; and,
  - Power costs in Brazil are lower than those expected for WA, however Largo reportedly requires ~25% more salt in the roasting process.
- Similar factors will dictate the capex - Gabanintha may require the construction of a gas pipeline (with the extra capex, but lower gas delivery costs), and by virtue of the higher concentrate grade and lower production, Maracás Menchen requires a smaller back-end than Gabanintha.

Table 8: Gabanintha PFS estimated capital costs

Gabanintha PFS estimated capital costs	
Cost Centre	**Amount (A$ million)**
Direct Costs	242.8
Indirect Costs	72
Subtotal	314.8
Contingency	59.8
Mining CAPEX	4.8
Total Expected Cost	379.4

Source: Technology Metals

Table 9: Gabanintha PFS estimated operating costs

Gabanintha PFS estimated operating costs					
Cost Centre	**Average Annual Opex (A$m)**	**LoM Costs (A$m)[1]**	**LoM Costs (A$/ RoM Tonne)[1]**	**LoM Costs (A$/ lb V_2O_5)[1]**	**% of Total Costs**
Mining	38.2	496.6	25.9	1.75	31
Labour - Admin and Management	2.7	35.1	1.8	0.12	2
Labour - Processing	14.8	192.4	10.0	0.68	12
Flights, Messing and Accommodation	5.9	76.7	4.0	0.27	5
Reagents	16.4	213.2	11.1	0.75	13
Energy Utilities	27.2	353.6	18.4	1.24	22
Utilities - Water	0.2	2.2	0.1	0.01	0
Road Maintenance	3.0	39.0	2.0	0.14	2
Tailings Management	4.1	52.7	2.7	0.19	3
Equipment Hire	2.5	32.5	1.7	0.11	2
Equipment Maintenance	5.6	72.2	3.8	0.25	4
Contract/General Expenses	3.1	39.9	2.1	0.14	2
Packaging and Handling	0.9	11.1	0.6	0.04	1
Total Operating Costs AUD	124.5	1,618.5	84.3	5.69	100

Source: Technology Metals, (1) - IIR analysis

Pricing

- Product pricing forecasting is difficult for vanadium, given the historic "spike-collapse" nature of vanadium pricing (which however now may change with structural changes in the industry), with this exacerbated by the Project being sensitive to changes in price.
- The Company's price of US$13/lb V_2O_5 is based on forecasts from UK based Merchant Research and Consulting, a specialist market research company in the chemicals sector; this however is less than half of the current spot price of ~US$28/lb.
- Technology Metals has included a price sensitivity analysis, with this presented as Table 10 - we discuss this further in our valuation.

Table 10: Gabanintha PFS price sensitivity

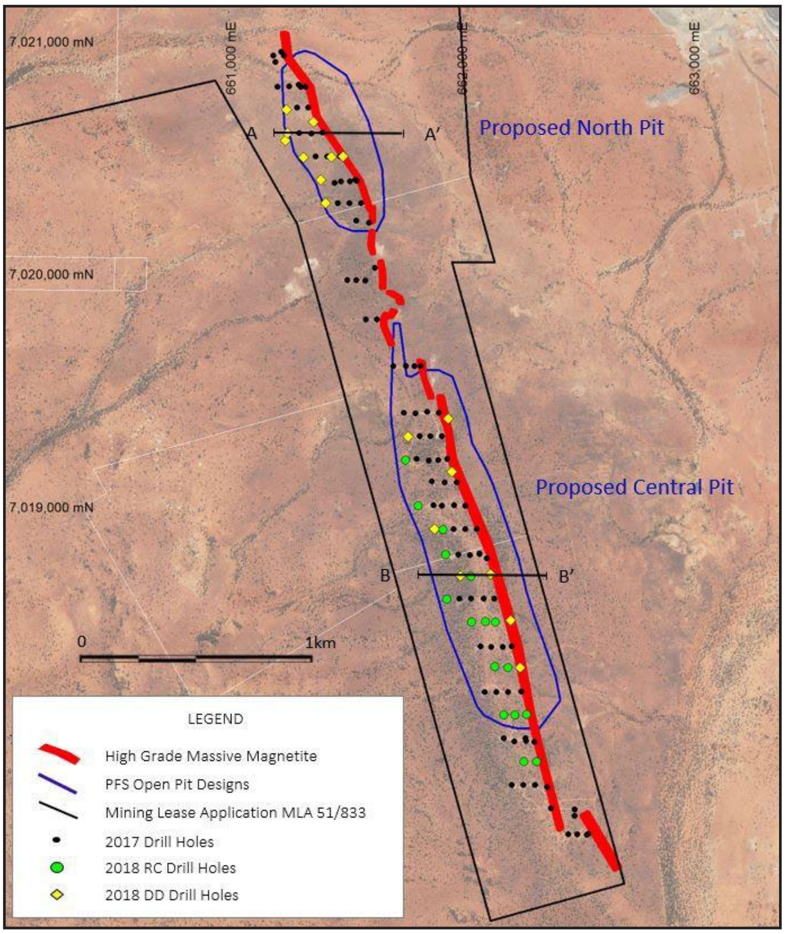
Gabanintha PFS price sensitivity					
Impact of Change in Price	**-20.00%**	**-10.00%**	**Base Case**	**10.00%**	**20.00%**
Revenue (A$)	3,948.10	4,441.60	4,935.10	5,428.60	5,922.10
EBITDA (A$)	2,132.80	2,601.60	3,070.40	3,539.30	4,008.10
NPV 10% Post Tax (A$)	499	673.9	848.8	1,023.70	1,200.40
IRR Post Tax (A$)	31.30%	37.40%	43.20%	48.80%	54.20%

Source: Technology Metals

Mining

- The Study is based on a conventional drill and blast contractor operated open pit mining.
- Two pits have been included in the Study, the Central (formerly the Southern) and North Pits (Figure 9); both are in the northern block, with the North Pit reaching a depth of 150m and the Central 155m.
- Scheduling will be planned to mine the areas with shallower oxide first, with oxide and disseminated material stockpiled for treatment later in the mine life.

Figure 9: PFS pit outlines - refer Figure 4 for Section B-B'



Source: Technology Metals

Processing and Product Transport

- As discussed earlier, processing will be a standard route resulting in the production of both standard and high purity V_2O_5 products, with a schematic view of the plant presented in Figure 10.
- Tailings, calcine waste and mine waste will be stored in conventional facilities - the tailings storage facility will have an estimated area of 20 ha, with the HDPE lined calcine waste storage facility being ~30 ha is size for the 13 year operation.
- Product will be bagged on site, and transported by truck to a suitable export port - the nearest port is Geraldton (600 km), with Fremantle being ~800 km from site; given the estimated product tonnages of 13,000 tpa, logistics is not a major issue, and given the high value product FOB transport costs likewise will be relatively minor; assuming cartage of A$160/tonne and a product price of ~A$30,000/tonne (US$10/lb, AUSUSD of 0.75, 2205 lb to a tonne) transport comprises 0.67% of the revenue.

Figure 10: Gabanintha processing plant schematic

Source: Technology Metals

Utilities and Infrastructure

- The Project is readily accessible by 2.3km of access road from the gazetted Meekatharra - Sandstone Road, with Meekatharra, on the Great Northern Highway, 40km from site.
- One of the largest single cost centres is energy, required for electricity generation and kiln heating - energy requirements are estimated at ~2,913 TJ/annum, including ~950 TJ/annum for the power plant and 1,962 TJ/Annum for heating in the processing facilities.
- Fuel options for the former include gas and/or diesel, and for the latter gas and/or heavy fuel oil.
- The Company is investigating supply options for gas, which include trucked liquid or compressed natural gas, and pipeline delivered gas - the nearest pipelines are both ~170km away, being the Goldfields Gas Pipeline at Wiluna and the Central West Gas Pipeline at Mt Magnet.
- As an example, Sheffield Resources (ASX:SFX) plan to truck LNG 932 km from Karratha to their Thunderbird Mineral Sands Project in the Canning Basin.
- Water will need to be provided by bores - there are a number of water bores on Technology Metals' tenure that were used for Dominion's Gabanintha Gold Mine in the 1980s to 1990s that the Company is planning to purge and pump test; in addition an EM surveying will be carried out over what may be a significant paleaochannel

CURRENT AND UPCOMING ACTIVITIES

- The majority of current activities are related to technical inputs for the DFS, with these covering metallurgical, geotechnical, mining and resource aspects amongst others - TMT is looking to complete the DFS by mid-2019.
- Assay results from the upcoming drilling will be incorporated into an MRE expansion/upgrade, with this expected in 1Q19 - it is expected that this will significantly expand the total Resources, including Indicated Resources, as well as deliver some Measured Resources, thus allowing for a significant expansion in Reserves which will feed into an expanded proposed operation.

- Further metallurgical test work is now underway, with this including amongst others:
  - A planned pilot scale kiln test, which will require some 8-10 tonnes of concentrate - the Company is close to choosing a facility (which will be overseas) to undertake this work,
  - Ongoing upstream and downstream optimisation work,
  - Equipment vendor targeted test work, to aid in the selection of metallurgical plant; and,
  - Downstream processing test work, with a focus on the "traditional" salt roast/leach processing of concentrate,
- Following on from the recent drilling, detailed geotechnical work is underway, with this expected to result in positive changes in pit design including steepening up the pit footwall leading to a decrease in the strip ratio.
- Key activities will include those required for permitting, including environmental studies and negotiating a "Mining Agreement" with the Traditional Owner claimant groups (with discussions under way, however with native title still to be determined) which are required for the grant of the MLs.
- Marketing and financing discussions are also underway.

VALUATION

- We have completed two valuations - an un-funded, un-risked valuation for Gabanintha, and a risked, funded Company valuation, assuming a number of funding options - these are discussed below - the latter includes a range of per share valuations.

GABANINTHA UN-FUNDED PROJECT VALUATION

- We have completed an un-risked NPV_{10} valuation for Gabanintha, based on the PFS - this is unfunded, and as such should not be converted to a per shale valuation.
- We have largely used parameters as used in the Company's PFS, with key inputs and results presented in Table 11

Table 11: Gabanintha unfunded project valuation key inputs and results

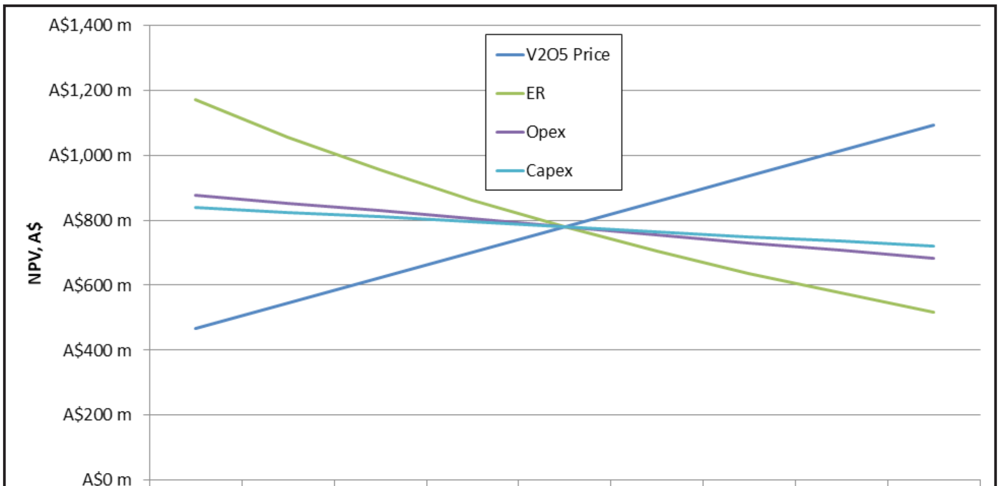
Gabanintha unfunded project valuation key inputs and results		
Parameter	**Result**	**Notes**
Production Parameters		
Total Mined and Treated	19.23mt	As per PFS
LOM	13 years	
Average Mining Rate	1.48 mtpa	
LOM Head Grade	0.96%	
Concentrator V_2O_5 Recovery	90%	
Mass Yield to Mag Con	73%	
Magnetic Concentrate to Roaster	13.96mt	
V_2O_5 in Mag Con	165,597t	
Downstream Metallurgical Recovery	78%	
Overall Metallurgical Recovery	70%	
LOM V_2O_5 Production	128,798t	
LOM Concentrate Production	130,759t	98.5% V_2O_5 concentrate
Base Case V_2O_5 Prices	$13.00/lb	Forecast long term prices
Strip Ratio	5.55:1	
Overall Financials – Ungeared, After Tax 100% Basis – $A		
LOM Net Smelter Return	$5,128 m	
Peak EBITDA	$259 m	
Total Free Operating Cf	$2,484 m	After initial capex
Initial Capex	$380 m	
Pre tax NPV @ 10% DR	$1,150 m	10% DR
Pre Tax IRR	51%	
Post tax NPV @ 10% DR	$793 m	10% DR
Post Tax IRR	44%	

Gabanintha unfunded project valuation key inputs and results		
Parameter	**Result**	**Notes**
	Unit Financials - A$	
Opex/lb payable V_2O_5	$5.32	$4.00/tonne ore mining, $3.00/tonne waste mining, $2.00/ROM tonne G & A, $75/LOM ROM tonne roasting/refining, $160/tonne concentrate transport
Royalties and Taxes/lb payable V_2O_5	$1.08	5% NSR government royalty, 30% corporate tax
Initial Capex/lb payable V_2O_5	$1.34	Based on estimate of $A380m initial capex
Sustaining Capex/lb payable V_2O_5	$0.35	2% of initial capex per annum, part of opex in PFS
Total Cost/lb payable V_2O_5	$8.09	
Revenue/lb payable V_2O_5	$18.06	
Margin/lb payable V_2O_5	$9.97	

Source: IIR analysis

- As part of our analysis we have completed a sensitivity analysis, with results presented in Figures 11 and 12 and Tables 12 to 14 - note that all sensitivities are based on the unrisked valuations - as mentioned above we would apply a risk factor of 30% to these to reflect the stage of Gabanintha.
- In Figure 10, changes in the V_2O_5 price can be considered as a proxy for other revenue side parameters, including grade and metallurgical recovery.

Figure 11: Gabanintha post tax NPV sensitivity



	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
V2O5 Price	A$466 m	A$545 m	A$623 m	A$702 m	A$780 m	A$858 m	A$937 m	A$1,015 m	A$1,093 m
ER	A$1,172 m	A$1,057 m	A$954 m	A$863 m	A$780 m	A$705 m	A$637 m	A$575 m	A$519 m
Opex	A$877 m	A$853 m	A$829 m	A$804 m	A$780 m	A$756 m	A$731 m	A$707 m	A$682 m
Capex	A$840 m	A$825 m	A$810 m	A$795 m	A$780 m	A$765 m	A$750 m	A$735 m	A$720 m

Source: Technology Metals

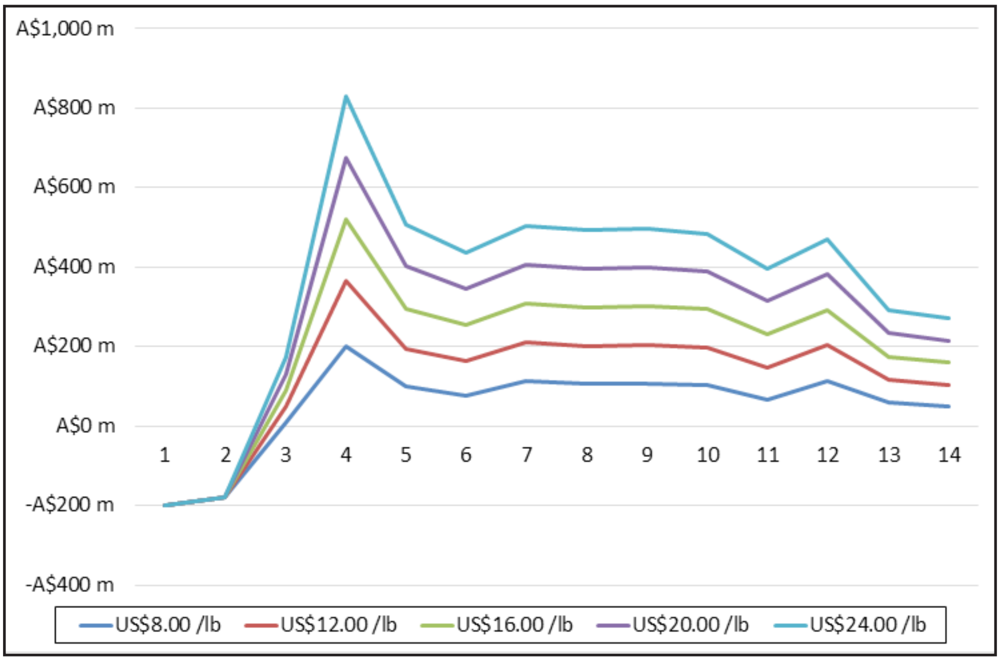
- One of the critical inputs is vanadium price, with significant uncertainty in any forecasts; as such we have presented the sensitivity of key outputs to the vanadium price in Table 12;
- This highlights the sensitivity, however shows that the Project can still generate reasonable cash flows - this is highlighted in Figure 11 which presents the after tax free cash flows at various V_2O_5 prices.

Table 12: Sensitivity to vanadium price

Sensitivity to vanadium price						
V2O5 Price	**Pre Tax NPV**	**Pre Tax IIR**	**Post Tax NPV**	**Post Tax IIR**	**Average FCF Post Tax**	**Average EBITDA**
US$8.00 /lb	A$313 m	25%	A$182 m	20%	A$90 m	A$114 m
US$12.00 /lb	A$983 m	46%	A$670 m	39%	A$171 m	A$230 m
US$16.00 /lb	A$1,652 m	63%	A$1,159 m	55%	A$252 m	A$345 m
US$20.00 /lb	A$2,322 m	77%	A$1,647 m	68%	A$333 m	A$460 m
US$24.00 /lb	A$2,992 m	89%	A$2,135 m	80%	A$414 m	A$576 m

Source: IIR analysis

Figure 12: After tax, unfunded cash flows at various V_2O_5 prices



Source: Technology Metals

- Table 13 presents the project sensitivity to changes in both prices and opex.

Table 13: Sensitivity to changes in price and opex

Pre-tax NPV sensitivity to changes in price and opex					
V2O5 Price/ Change in opex	**-20%**	**-10%**	**0%**	**10%**	**20%**
US$8.00 /lb	A$280 m	A$231 m	A$182 m	A$132 m	A$83 m
US$12.00 /lb	A$768 m	A$719 m	A$670 m	A$621 m	A$572 m
US$16.00 /lb	A$1,257 m	A$1,208 m	A$1,159 m	A$1,110 m	A$1,061 m
US$20.00 /lb	A$1,745 m	A$1,696 m	A$1,647 m	A$1,598 m	A$1,549 m
US$24.00 /lb	A$2,233 m	A$2,184 m	A$2,135 m	A$2,086 m	A$2,037 m

Source: IIR analysis

FUNDED COMPANY VALUATION

- Our funded company valuation has used the base case parameters as presented in the unfunded case above.
- There are a number of options that can be included in funding the project, including traditional debt equity, offtake prepayments, selling an equity stake at the Project level and vendor finance.
- In our valuation, we have considered traditional debt equity only, to give an indicative valuation - this should be treated as a guide only, given the number of potential options available and the Company's current share price in comparison to the expected capital requirements amongst others.
- We have used the following parameters in the debt funding:
  - Total capital raised of A$420 million - estimated capex of A$380 million plus ~10% for working capital, debt facilitation fees, interest payments during construction etc, and,
  - Interest rate of 7.5% and a repayment term of eight years, commencing with production.
- We have included a range of debt/equity mixes and capital raising prices to present a range of values for Gabanintha, as shown in Table 14 - this should be considered a proxy for the Company valuation, given that our NPV of our estimated head office costs (A$1.4 million pa during the life of mine) and current cash (which includes potential cash from in the money options) have a combined value of A$6 million, which is not material when compared with the overall value.
- The share structure has been diluted for current in the money options, and we have used a risk multiplier of 40% in calculation the per share value - the funded diluted shares on issue ranges from 162 million to 498 milion.

- As presented below, we have a preferred range of A$1.13/share to A$1.84/share, equating to 50% or 60% debt, and capital raisings at between A$0.75/share and A$1.25/share - we note that although currently trading at A$0.485/share, the Company has traded at up to A$0.855/share in recent months.

Table 14: Unrisked, funded Technology Metals valuation

Unrisked Funded Technology Metals valuation			
Debt % (top)/ Equity Price	**50%**	**60%**	**70%**
A$0.50	A$1,008 m	A$979 m	A$949 m
A$0.75	A$1,008 m	A$979 m	A$949 m
A$1.00	A$1,008 m	A$979 m	A$949 m
A$1.25	A$1,008 m	A$979 m	A$949 m
A$1.50	A$1,008 m	A$979 m	A$949 m

Source: IIR analysis

Table 15: Risked (40%), funded per share valuation

Risked (40%), funded per share valuation			
Debt % (top)/ Equity Price	**50%**	**60%**	**70%**
A$0.50	A$0.81	A$0.94	A$1.15
A$0.75	A$1.13	A$1.29	A$1.54
A$1.00	A$1.40	A$1.59	A$1.86
A$1.25	A$1.64	A$1.84	A$2.12
A$1.50	A$1.85	A$2.06	A$2.34

Source: IIR analysis

PEER GROUP ANALYSIS

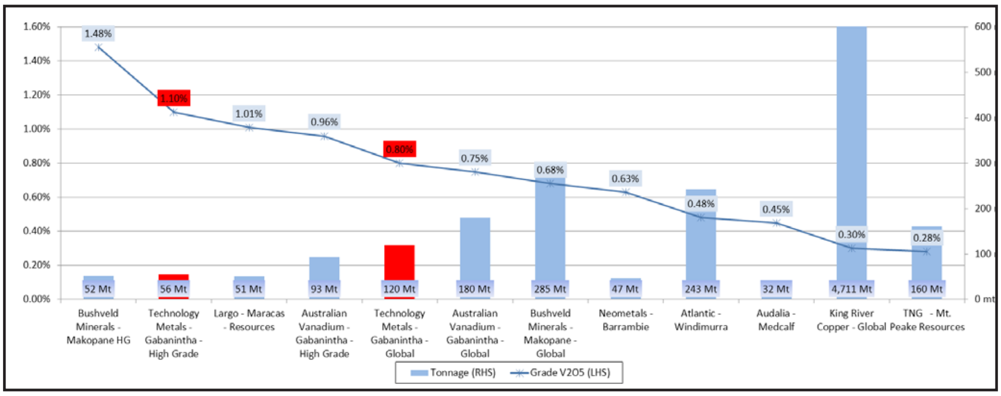
- Table 16 presents a list of who we consider to be peers of Technology Metals, which includes developers and producers - this is sorted by enterprise value, which has been converted to Australian dollars for those companies listed overseas; Figure 13 presents Resource tonnages and grades.
- Our view that the closest producing analogy to Technology Metals is Largo Resources, which commenced production in 2015 from its Maracás Menchen Mine in Brazil, and is treating ~ 1.1 mtpa of ore per annum to produce, depending on head grade up to 9,600tpa of V_2O_5 flake (with this currently being exceeded) – this is of a similar quantum to what may be a reasonable size operation at Gabanintha.
- Largo, with an EV of ~A$2,200 million highlights the upside potential should a project be taken through to production, and is the only standalone vanadium mine to be funded and developed in recent times.
- We have quoted the global resource for Largo for comparison purposes below - current reserves are 18Mt @ 1.18% V_2O_5.
- In Australia the obvious peer is Australian Vanadium (which enjoys an EV which is ~twice that for Technology Metal as shown in Table 5), who hold the along strike portion of the Gabanintha resource.
- Neometals Limited is currently looking to produce Ti, V and Fe products from its Barrambie Project, which is located within 50km of Gabanintha, and hosted in a similar style of intrusion, however their main focus is on the producing Mt. Marion lithium mine.
- Also in Australia TNG Limited is looking to develop their Mt. Peake V-Ti-Fe Project in the Northern Territory; the plans are to treat this using the proprietary TIVAN® process, to produce high quality vanadium, titanium and iron oxide products. TNG is currently talking to potential finance and development partners having recently completed a positive BFS.

Table 16: Technology Metals peers

Technology Metals peers						
Company and Project	**Tonnage**	**Grade V_2O_5**	**Contained V_2O_5 - Mt**	**Enterprise Value (UD, A$)**	**Stage**	**Notes**
Largo - Maracás - Global	51 mt	1.01%	0.51 mt	$2,218	Production	Q2 2018 production of 2,458t V2O5 produced from the Menchen Mine at the Maracás Project. Initial estimated capex was US$250m for a planned production of 9,200t V2O5
Bushveld Minerals - Global	440 mt	0.64%	2.82 mt	$545.1	PFS	
Neometals - Barrambie - Global	280 mt	0.44%	1.23 mt	$102.7	PFS	Largely a titanium project
TNG - Mt. Peake Resources	160 mt	0.28%	0.45 mt	$86.8	DFS Completed	Ti and Fe co-products in proposed TIVAN hydrometallurgical plant
Australian Vanadium - Gabanintha - Global	176 mt	0.77%	1.35 mt	$59.2	Engineering Concept Study completed	Has other projects, and is in the VRFB supply, installation and maintenance market
King River Copper - Global	4,711 mt	0.30%	14.13 mt	$63.5	Scoping	Activities focussed on other assets
Technology Metals - Gabanintha - Global	120 mt	0.80%	0.96 mt	$25.6	PFS Completed	
Vanadium Corp - Global	114 mt	0.43%	0.49 mt	$21.8	Resource	
Audalia - Medcalf	32 mt	0.45%	0.14 mt	$6.61	PFS completed	
Atlantic - Windimurra	243 mt	0.48%	1.16 mt	N/A	C & M	Private company

Source: IRESS, IIR analysis

Figure 13: Technology Metals peers



Source: IRESS, IIR analysis

- Presenting the V_2O_5 grade only for TNG and Neometals is misleading since they are both looking at producing TiO_2, and in the case of TNG, iron products - we cover TNG and our modelling indicates that vanadium products make up some 20% of the projected revenue from Mt Peake - this would suggest a V_2O_5 equivalent grade in the order of 1.4% for the deposit.
- What Table 14 and Figure 13 highlight is the relatively high grade of Technology Metals' resources, (particularly the high grade massive magnetite), as well as the low enterprise value - this points to the Company being undervalued and gives significant potential for value uplift and we would expect to see this rise as activities progress and the Project is de-risked.
- Another factor that needs to be considered is the concentrate grade, with this affecting the economics of the downstream processing (whereas the ore grade determines the concentration economics) - TMT's concentrate grade from work to date of over 1.30% V_2O_5 (from relatively high grade mineralisation) is broadly typical of most of the Australian deposits, however Largo's Maracás operation has a significantly higher grade of ~3.4%

V_2O_5 from a reserve grade of 1.18% V_2O_5. King River Copper has achieved a concentrate grade of 2.15% V_2O_5 - however this was from a composite sample of mineralisation with a grade of 0.37% V_2O_5.

CAPITAL STRUCTURE

- Technology Metals currently has 70.03 million shares on issue (of which 22.51 million are escrowed until December 31, 2018) and 26.76 million options, all of which are in the money and detailed in Table 17.
- The Board and Management currently hold ~8.2% on a fully diluted basis.
- The Company has over 1,200 shareholders, with the top 20 holding 50.3%.
- The largest shareholder is Twentieth Century Motor Company, with 23.8% of TMT, with the second being Station Nominees at 8.0% - both of these holdings are escrowed to December 21, 2018.

Table 17: Options

Unlisted options			
Expiry Date	**Number**	**Exercise Price**	**Cash on Exercise**
31/12/2019 - Listed	6,133,333	A$0.40	$2,453,333
31/12/2019 - Unlisted, escrow until 31/12/18	14,615,000	A$0.25	$3,653,750
12/01/2021 - Unlisted	2,750,000	A$0.35	962,500
24/05/2020 - Unlisted	3,258,334	A$0.40	1,303,334
Total/Average	**26,756,667**	**A$0.313**	**$8,372,917**

Source: TMT

RISKS

- **Exploration and Resource** – Given the style of mineralisation and the results of work completed to date this is not a risk for Technology Metals - the current MRE has the potential to support a long term operation.
- **Metallurgy** – This is one of the key technical risks, however the results of the concentration and downstream test work (including producing V_2O_5) with a grade of 99.53% have proved very positive, somewhat mitigating this risk.
- **Development Funding:** Although down the track, the ability to raise project development funding will depend upon markets at that time, as well as the market capitalisation of the Company.
- **Metal Prices and Exchange Rates** – These are key for the success (and a decision to go ahead) of any potential resource project, and a factor in which the operators have no control. After seeing a nadir in early 2016 and relatively flat prices following, the last 12 months, and particularly the last 6 months have seen significant rises in vanadium prices, pointing towards a possible longer term recovery in the metal.
- **Permitting and Sovereign Risk** – Given that Western Australia is a relatively friendly mining jurisdiction, we do not see this as a key risk. This is also mitigated by Gabanintha being located in a historical mining district.

BOARD AND MANAGEMENT

- **Mr Michael Fry – Non-Executive Chairman:** Michael Fry holds a Bachelor of Commerce degree from the University of Western Australia, is a Fellow of the Financial Services Institute of Australasia, and is a past member of the Australian Stock Exchange.Mr Fry has extensive corporate and commercial experience, financial and capital market knowledge and a background in corporate treasury management. Mr Fry is currently Non-Executive Chairman of ASX listed Brookside Energy Limited with a focus on oil and gas exploration and production onshore mid-continent region of USA, Non-Executive Chairman of Challenger Energy Limited that is focussing on oil and gas exploration opportunities in South Africa and Non-Executive Chairman of ASX listed Norwest Energy NL that has assets in Australia and the United Kingdom with an operational focus on the northern Perth Basin.

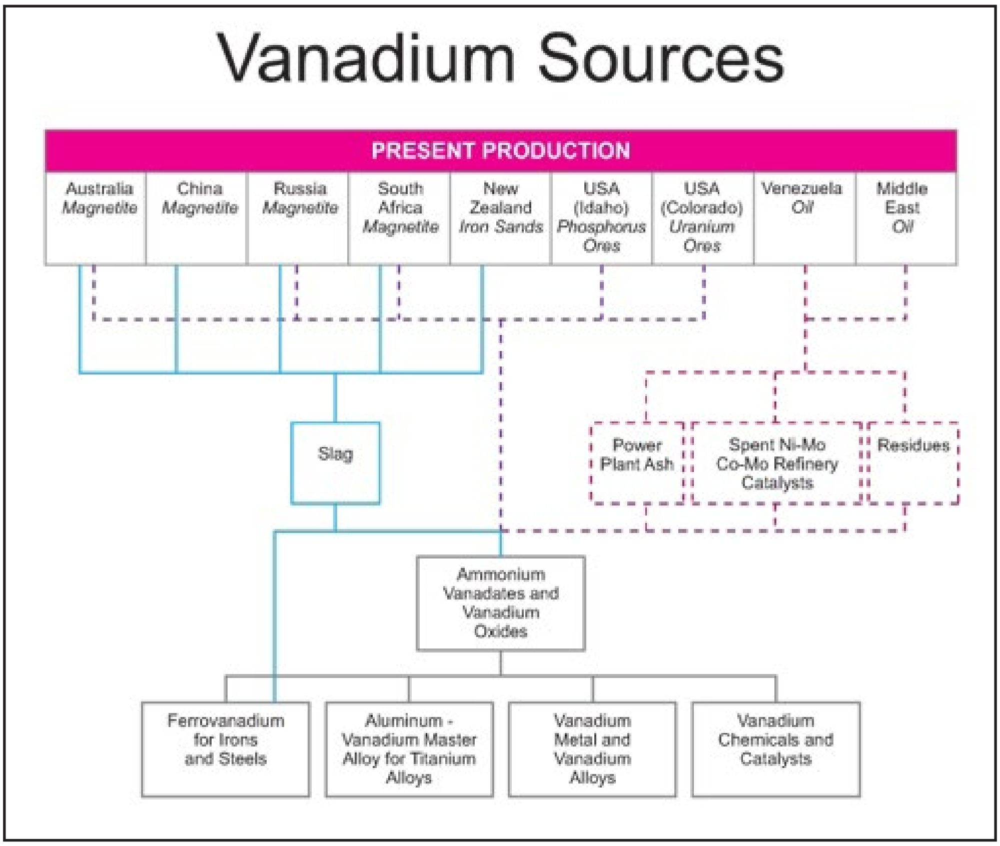
- **Mr Ian Prentice – Managing Director:** Mr Prentice has extensive global resource industry and equity capital markets experience, with a proven track record of high quality corporate management and technical excellence. His broad ranging 25 year-plus career extends from exploration and operational roles across a variety of commodities to the listing and management of ASX-listed resource companies. Mr Prentice has served as a Director for a number of ASX-listed resource companies, with activities ranging from exploration and project acquisition in Asia and Africa through to gold production in Australia. He has broad experience in identifying and reviewing resource projects for potential acquisition. Mr Prentice is a Member of the Australasian Institute of Mining and Metallurgy and holds a Bachelor of Science (Geology) from the University of Western Australia.
- **Mr Sonu Cheema – Non-Executive Director and Company Secretary:** Mr Cheema holds the position of Accountant and Company Secretary for Cicero Corporate and has over 10 years' experience working with public and private companies in Australia and abroad. Roles and responsibilities held by Mr Cheema include completion and preparation of management and ASX financial reports, investor relations, initial public offer, mergers and acquisitions, management of capital raising activities and auditor liaison. Currently Mr Cheema is Company Secretary for Corizon Limited (ASX: CIZ), Intiger Group Limited (ASX: IAM), Yojee Limited (ASX: YOJ) and the Company. Mr Cheema has completed a Bachelor of Commerce majoring in Accounting at Curtin University and is a CPA member. Having completed the CPA Program, the core competencies and key areas of focus by Mr Cheema include Financial Reporting, Taxation, Management Accounting and Ethics & Governance. Mr Cheema's core strengths include the ability to communicate and complete regulatory reporting requirements, assist company board and management personnel with implementing strong business structures and controls, sound governance and compliance with reporting requirements.

VANADIUM AND VRFBs

INTRODUCTION

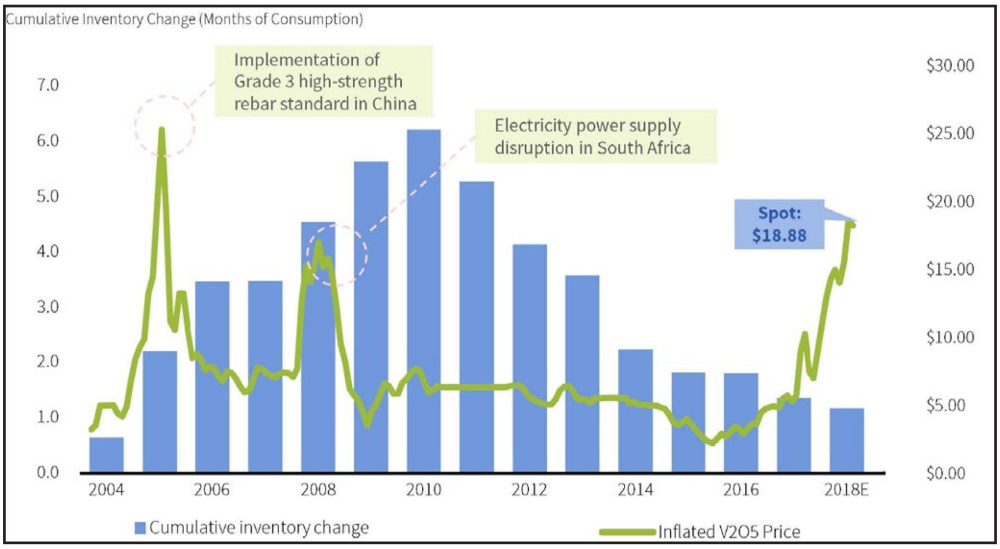
- The main use of vanadium is as a steel additive in high-strength steel, which accounts for about 92% of the current global demand of ~100,000t of vanadium metal (equivalent to ~180,000t V_2O_5, with the oxide containing 56% V).
- Other uses include chemicals, catalysts and in batteries - vanadium is produced as two main products – FeV for steel-making and V_2O_5 for chemical and battery applications.
- Just for clarity, throughout this document vanadium has been quoted in terms of vanadium metal (V) and vanadium pentoxide (V_2O_5) - the latter contains ~56% V, therefore 1.78 t of V_2O_5 contains one tonne of V metal; ferrovanadium (FeV) contains anywhere from 35% to 85% V.
- We also use the term "mtV" - this is shorthand for metric tonnes of vanadium.
- Global production was reportedly ~83,181 mtV in 2017, with the largest source being as a by-product from slag produced from the smelting of titaniferous magnetite ores for steelmaking (Figure 14) – it is estimated that this accounts for ~73% of total supply, with 17% being derived from mining as a primary product and the remainder from secondary sources, including oil residues and fly ash.
- However estimated consumption in 2017 was over 100,000t, of which ~9,000t was high purity material, used in aerospace, chemical catalyst and battery electrode applications.
- Supply is concentrated, with over 80% of vanadium products produced in South Africa, China, Russia and Brazil.
- The only recent development is Largo Resources Maracás Project in Brazil, which is now in full production, and exceeding the planned output of 9,200t of V_2O_5 per year, with a planned FeV plant to be added at a later date.
- Demand has outstripped supply since 2010, with successive draw downs on inventory; part of this has been due to industry rationalisation and environmental constraints in China, with this now resulting in the inventories being depleted and hence a recent increase in prices after falling for over 10 years (Figures 15 and 19).
- In addition mine closures in South Africa have severely impacted on supply.

Figure 14: Vanadium sources



Source: Vanitec

Figure 15: Vanadium Inventory change



Source: Protean

- Another reason behind the spike and collapse in 2008 has been mooted as the rapid increase in Chinese iron ore production, with, as the source is largely magnetite ores, resulting in the addition of considerable vanadium supply - given the more recent clean up of the Chinese iron ore industry it is unlikely that this supply will return to the market.
- This is pointing towards a major structural change in the industry, with the potential to result in a significantly higher price floor in the longer term.

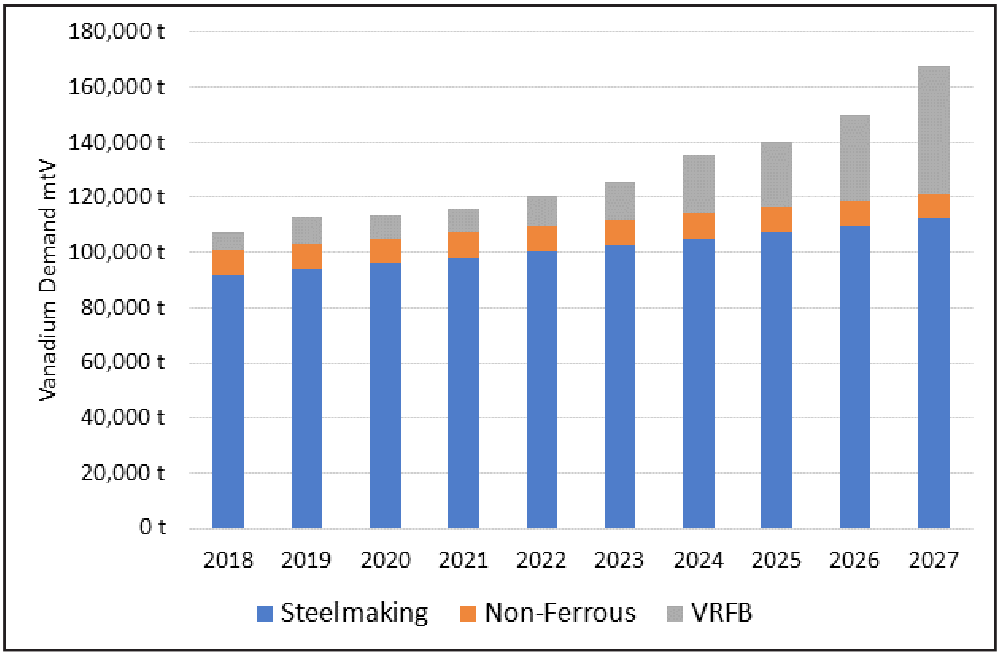
DEMAND DRIVERS

Introduction

- As mentioned earlier, the base demand is in steel, with this making up ~90% of current demand of ~100,000 mtV - batteries currently make up ~2% of this; China is the largest consumer, accounting for ~44% of global demand.

- However, as a base case we may expect to see steel demand grow by 33,000t, or 37% over the next 10 years, due both to increased steel making, and increased V intensity in steel.
- Over the same period we could also see the use in batteries grow from negligible amounts currently to close to 50,000 mtV in 2027, leading to a 60% increase in total V demand over that period (Figure 16).

Figure 16: Forecast vanadium demand

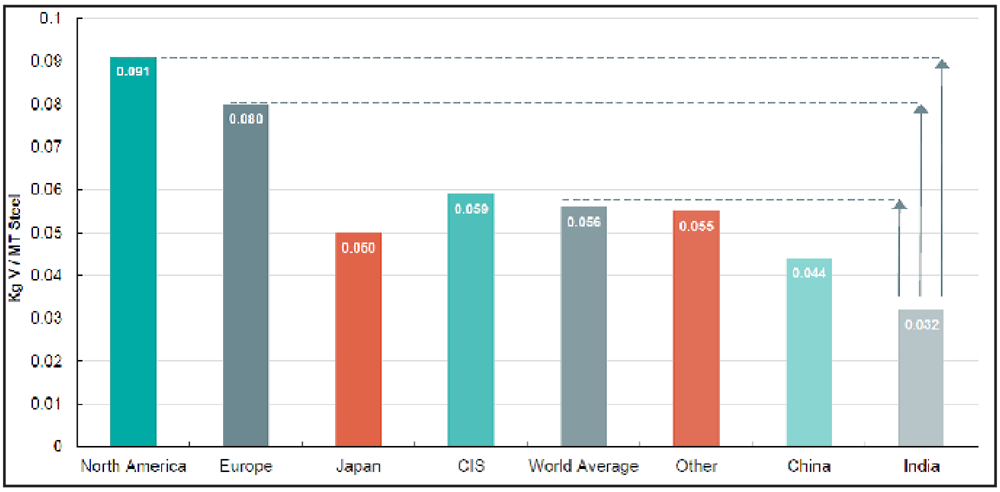


Source: Roskill in Highveld "Vanadium 101 presentation", IIR analysis

Steelmaking

- The current key demand driver is as an additive in steel – demand for vanadium closely follows the production of steel. This includes two factors – firstly the natural organic growth in steel production and secondly increasing vanadium intensity in steel with the move to lighter weight and higher strength steels – the addition of just 0.02% vanadium to steel increases steel strength by up to 100% and reduces the weight of steel required in relevant applications by up to 30%.
- This second factor is particularly relevant in China, where there is increasing vanadium intensity in rebar due to changes in building standards (with new regulations set to become effective in November 2018), partly following on from the 2008 earthquake - there is still a fair way to go with this and thus significant potential growth in use in this application, however this has the potential to increase Chinese vanadium consumption by up to 24,000tpa.
- Roskill estimate that, although steel production will only grow at 1.76% CAGR over coming years, the increasing intensity of vanadium in steel along with other end uses will result in a long term demand growth for vanadium in steel of 3.24% CAGR from ~90,000tpa V in 2017 to~123,000tpa contained V in 2027, with the forecast supply deficits now being seen.
- Figure 17 shows the relative vanadium intensities in rebar between various jurisdictions.

Figure 17: Vanadium steelmaking intensity

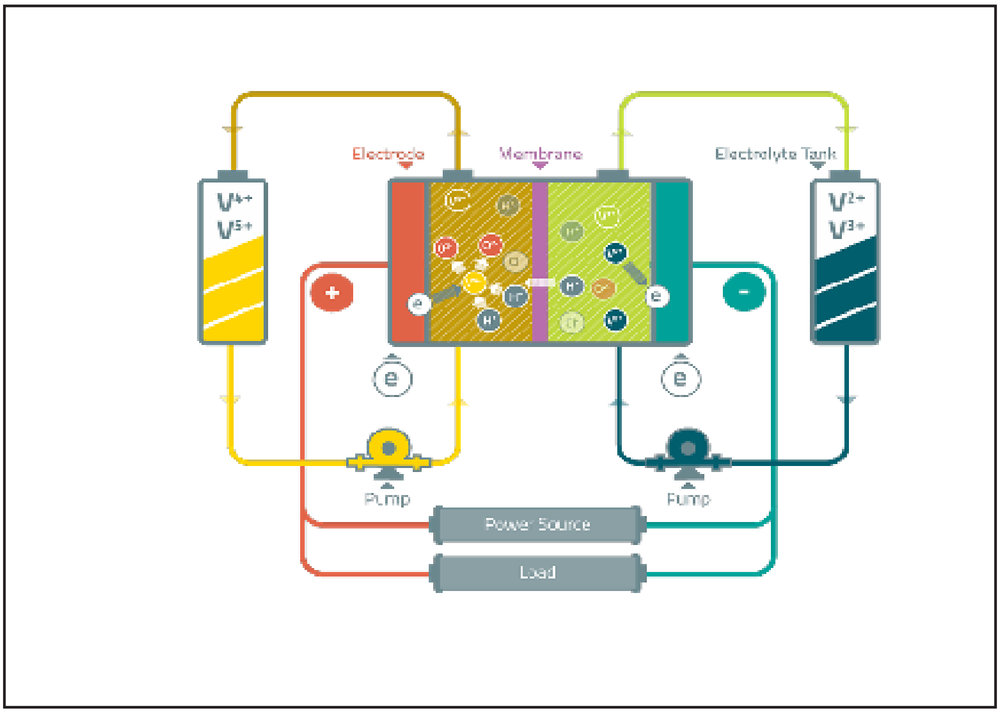


Source: Australian Vanadium

Energy Storage – VRFB's and Li-Ion Batteries

- The blue sky in demand, and the potentially disruptive technology is in grid scale battery usage - the key here will be the adoption of VRFB's that have the capacity for multi-megawatt scale storage - this makes them useful for grid scale applications, including grid balancing and storing energy from variable output sources, including wind turbines and solar cells.
- The batteries are inherently simple, relying on the changing redox state of vanadium to store and then supply power (Figure 18).

Figure 18: VRFB schematic



Source: Australian Vanadium

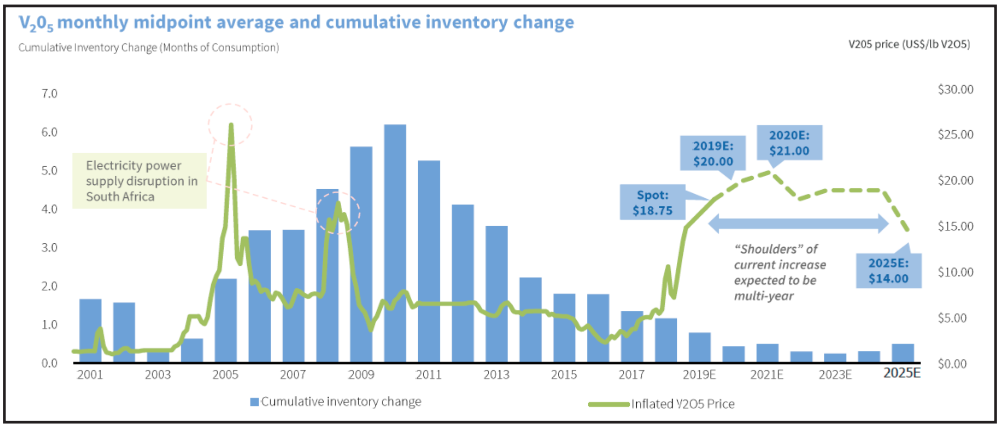
- Other attributes of these batteries include:
  - Scalability
  - Long lifespan – up to 20 years
  - Up to a 1 year charge retention
  - 100% discharge without damage, and,
  - Only one element – V in various oxidation states – in electrolyte.
- There are a number of active VRFB developments globally at the moment, reportedly with the largest being the development of a 200MW/800MWh battery in Dalian, China, which reportedly uses 6,950 tonnes of V_2O_5, at an intensity of 8.7 t/MWh (4 mtV/MWh).

- Other recent developments include a US$200 million, 15MW/60MWh facility by Sumitomo on the Japanese island of Hokkaido.
- Development of VRFBs has been partly hamstrung by the lack of a suitable battery grade V_2O_5 supply – batteries require a higher purity product than that used in steelmaking, and hence arises the opportunity for manufacturers of high purity material.
- There are widely differing forecasts on the growth in VRFB's, however some commentators see the potential for VRFBs to provide up to 30% of the growing energy storage market, with forecasters estimating that the stationary energy storage deployment to reach between 20GWh and 40GWh by 2025, with a minimum cumulative forecast of 88GWh.
- Taking the base case of 20GWh deployment in 2025 with 25% provided by VRFBs, and a V usage intensity of 5t/MWh, results in an additional annual demand of 25,000t of V (44,500t of V_2O_5) in that year alone.
- Some forecasts see the Australian energy storage market reaching 3,000MWh by 2030 – should the VRFB penetration reach an estimated 25% of the market this will result in the requirement of 750MWh of VRFB capacity over the same period.
- Australia is an ideal market for fringe-of-grid and off-grid storage facilities given the extended power networks and large off-grid areas, thus potentially providing a domestic market for any V_2O_5 producers.
- Assuming a capital intensity of A$2,000,000/MWh, this equates to a A$1,500 million market, and using a V_2O_5 intensity of 8.9t/MWh, this results in a potential domestic demand for an additional 8,000t of V_2O_5 by 2030 in Australia.
- There is also forecast demand (~1/3 of that for VRFB's) for vanadium in Li-ion batteries.

PRICING

- Figure 14 above highlights the recent price recovery to over US$30/kg (US$14 - US$14.50/lb) largely due to de-stocking of inventories over recent years and supply constraints due to rationalisation of the iron ore industry in China (with vanadium being a major by-product) along with environmental constraints leading to a sharp decline in production
- Figure 19 presents a longer term chart of real V_2O_5 prices adjusted to November 2016, and shows the commencement of the recent recovery, which has followed a period of sustained falls in prices, largely post the GFC.

Figure 19: FeV price and stocks chart



Source: Largo presentation

- The 30 year average price has been US$11/kg V_2O_5, with the inflation adjusted mean since 2014 being ~US$16/kg as shown in Figure 14 (note that Figure 14 is in US$/pound, with one kg = 2.205 pounds).
- It is expected that pricing may remain reasonably strong, although as shown in Figure 11 vanadium pricing has a history of volatility.
- The market is not particularly transparent, and also prices do not correlate with steel production even though this is the key demand driver.
- As mentioned earlier wide acceptance of VRFBs (as well as a broader supply restructure) may go some way to breaking the price "spike-collapse" pattern over recent times, due to the requirement for a consistent supply of high purity V_2O_5 for the electrolyte.

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