

2 May 2023

## Vanadium can provide cheap, large-scale grid energy storage

### NEED TO KNOW

- WA Vanadium Project: Long-Life & Near-Term
- Vanadium: Critical, Clean Metal; Strengthened by Battery Demand
- Tier 1 partnerships

**Progress building momentum:** TMT continue to advance the development of the long-life Murchison Technology Metals Project (MTMP), with significant interest from market participants in potential vanadium product offtake and support, as MTMP works toward becoming the world's next large-scale supplier of high-purity vanadium.

**Exciting Q1 2023 Milestones:** In the March 2023 Qtr., key project announcements included EKF's financing Letter of Interest, battery-grade vanadium electrolyte production, and preferred tenderers' engagement for MTMP implementation. Post-quarter, a MoU was signed to supply vanadium to an Indian battery manufacturer.

**Vanadium finds a new market in batteries:** Vanadium, whose primary use is for steel production, is now being increasingly utilised for energy storage in batteries. By 2040, it is expected that 74% of the global vanadium market will be for battery production, up from just 2.1% in 2021.

### Investment Thesis

**Progressing 100% owned Murchison Technology Metals Project (MTMP):** The MTMP offers one of the highest-grade (44.5mt Ore Reserve grading 0.89% V<sub>2</sub>O<sub>5</sub>), lowest-cost (1<sup>st</sup> quartile) vanadium projects globally, underpinned by dual revenue streams: vanadium pentoxide and an ilmenite by-product

**Prosperous 25-year lifespan:** The Integration Study for MTMP (completed August 2022) predicts strong EBITDA margins of ~46% over the mine's 25-year lifespan, with even higher margins in the first 9 years due to ilmenite production. Production is planned for CY25 pending completion of critical tasks like offtake and financing.

**Advancement of Financing Discussions:** The solid quality of MTMP sets it on track for a favourable financial solution, aiming for production start by late 2025.

### Valuation: Unchanged at A\$0.75/share

**We continue to value TMT at A\$0.75, fully diluted.** Our valuation is based on our DCF model of MTMP. We applied a conservative 60% risk weighting to account for outstanding project risks (financing, construction, commissioning), used a 10% discount rate (nominal), a vanadium price of US\$11.00/lb and an ilmenite price of US\$260/t (both long-term real).

### Risks

Key risks include inability to access funding, project delays, escalation in capital costs, a fall in the vanadium price, inability to sell large flake into the high value markets, and continuity of key persons.

### Equities Research Australia

#### Mining and Energy

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Technology Metals Australia (ASX:TMT) is an ASX-listed company focused on developing its flagship, 100%-owned Murchison Technology Metals Project (MTMP) located 50km SE of Meekatharra in the mid-west of Western Australia. The MTMP, comprising the Gabanintha and Yarrabubba vanadium deposits, is one of the world's highest-grade vanadium projects with the lowest-quartile operating costs once developed.  
<http://www.tmtlimited.com.au/>

Valuation	<b>A\$0.75</b> (unchanged)
Current price	<b>A\$0.34</b>
Market cap	<b>A\$71m</b>
Cash on hand	<b>A\$8.1m (As of March 31, 2023)</b>

### Upcoming Catalysts / Next News

Period	
Q2/Q3 2023	Completion of bankable financial model
Q2/Q3 2023	Development decision
Q3 2023	Secure project funding

### Share Price (\$A)



Source: FactSet, MST Access

# Financial Summary: Technology Metals Limited (TMT)

TECHNOLOGY METALS AUSTRALIA LIMITED

TMT.AX

Year end 30 June

## MARKET DATA

Share Price	A\$/sh		0.34
52 week low/high	A\$/sh	0.21	0.52
Valuation	A\$/sh		0.75
Market Cap (A\$m)	A\$m		71
Net Cash / (Debt) (A\$m)	A\$m		19
Enterprise Value (A\$m)	A\$m		53
Shares on Issue	m		210
Options/Performance shares	m		20
Other Equity	m		436
Potential Diluted Shares on Issue	m		666

## INVESTMENT FUNDAMENTALS

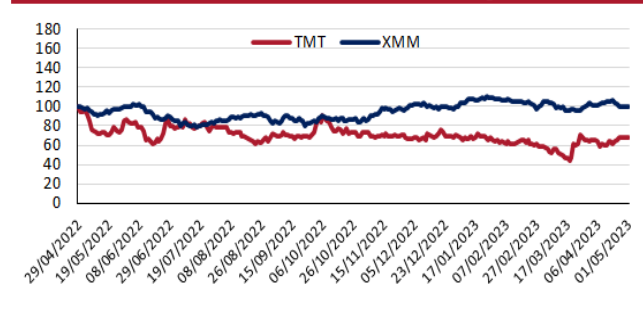
		Jun-21	Jun-22	Jun-23e	Jun-24e	Jun-25e
Reported NPAT	A\$m	(2)	(2)	(4)	(4)	104
Underlying NPAT	A\$m	(2)	(2)	(4)	(4)	104
EPS Reported (undiluted)	¢ps	n/m	n/m	n/m	n/m	15.7¢
EPS Underlying (undiluted)	¢ps	n/m	n/m	n/m	n/m	15.7¢
Underlying EPS Growth	%	-185%	-28%	107%	-49%	-1910%
P/E Reported (undiluted)	x	n/m	n/m	n/m	n/m	2.2
P/E Underlying (undiluted)	x	n/m	n/m	n/m	n/m	2.2
Operating Cash Flow / Share	A\$	(0.01)	(0.00)	(0.01)	(0.00)	0.21
Price / Operating Cash Flow	x	n/m	n/m	n/m	n/m	1.6
Free Cash Flow / Share	A\$	(0.04)	(0.04)	(0.02)	(0.99)	0.16
Price / Free Cash Flow	x	n/m	n/m	n/m	n/m	2.2
Free Cash Flow Yield	%	-12.2%	-10.6%	-5.0%	-290.6%	46.2%
Book Value / Share	A\$	0.22	0.25	0.24	0.46	0.65
Price / Book	x	1.55	1.35	1.42	0.73	0.52
NTA / Share	A\$	0.22	0.25	0.24	0.46	0.65
Price / NTA	x	1.55	1.35	1.42	0.73	0.52
Year End Shares	m	150	210	210	666	666
Market Cap (spot)	A\$m	51	71	71	226	226
Net Cash / (Debt)	A\$m	6	19	15	(381)	(277)
Enterprise Value	A\$m	45	53	56	608	503
EV / EBITDA	x	n/m	n/m	n/m	n/m	n/m
Net Debt / Enterprise Value		(0.1)	(0.4)	(0.3)	7.2	5.2

## PRODUCTION AND PRICING

		Jun-21	Jun-22	Jun-23e	Jun-24e	Jun-25e
V205 Flake Production	kt	-	-	-	-	9.5
Ilmenite Production	kt	-	-	-	-	120
Vanadium Price (US\$/lb)	US\$/lb	-	-	11.3	11.6	11.8
Ilmenite 45-50% (US\$/t)	US\$/t	-	-	266.5	273.2	280.0
AUDUSD	:	-	-	0.70	0.70	0.70

Source: Company Data, MST Access

## 12-Month Relative Performance vs S&P/ASX Metals & Mining



## Profit & Loss (A\$m)

	Jun-21	Jun-22	Jun-23e	Jun-24e	Jun-25e
Sales	-	-	-	-	402
Expenses	(2)	(2)	(4)	(4)	(208)
<b>EBITDA</b>	<b>(2)</b>	<b>(2)</b>	<b>(4)</b>	<b>(4)</b>	<b>194</b>
D&A	(0)	(0)	(0)	(0)	(33)
<b>EBIT</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(4)</b>	<b>161</b>
Interest	0	0	1	0	(11)
Tax	1	1	-	-	(45)
<b>Underlying NPAT</b>	<b>(2)</b>	<b>(2)</b>	<b>(4)</b>	<b>(4)</b>	<b>104</b>
Exceptionals	-	-	-	-	-
<b>Reported Profit</b>	<b>(2)</b>	<b>(2)</b>	<b>(4)</b>	<b>(4)</b>	<b>104</b>

## Balance Sheet (A\$m)

	Jun-21	Jun-22	Jun-23e	Jun-24e	Jun-25e
Cash	6	19	15	11	116
Receivables	0	1	1	1	33
Inventory	-	-	-	-	20
PP&E	-	-	1	656	657
Exploration	28	35	35	35	35
Other	-	-	-	-	-
<b>Assets</b>	<b>34</b>	<b>54</b>	<b>51</b>	<b>702</b>	<b>861</b>
Creditors	1	1	1	1	33
Debt	-	-	-	392	392
Other	-	-	-	-	-
<b>Liabilities</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>393</b>	<b>425</b>
<b>Net Assets</b>	<b>33</b>	<b>53</b>	<b>50</b>	<b>309</b>	<b>435</b>

## Cashflow (A\$m)

	Jun-21	Jun-22	Jun-23e	Jun-24e	Jun-25e
Cash From Operations	(1)	(1)	(3)	(3)	195
Interest	-	-	-	-	(45)
Tax	-	0	1	0	(11)
<b>Net Cash From Operations</b>	<b>(1)</b>	<b>(1)</b>	<b>(3)</b>	<b>(3)</b>	<b>139</b>
Capex	(0)	(0)	(0)	(654)	(33)
Exploration	(5)	(7)	(1)	(1)	(1)
Investments	-	-	-	-	-
<b>Free Cash Flow</b>	<b>(6)</b>	<b>(8)</b>	<b>(4)</b>	<b>(658)</b>	<b>104</b>
Equity	9	21	-	262	-
Borrowings	-	-	-	392	-
Dividend	-	-	-	-	-
<b>Net Increase / (Decrease) in Cash</b>	<b>2</b>	<b>13</b>	<b>(4)</b>	<b>(4)</b>	<b>104</b>

# Vanadium Market: a rapidly emerging battery metal supporting the drive to net zero

## What is Vanadium

Vanadium is utilised in steel and aerospace sectors due to its high melting point, conductivity, and corrosion resistance. It improves steel's strength and wear resistance, making it ideal for components like gears and axles. Vanadium also plays a vital role in energy storage through vanadium redox batteries, and its value is anticipated to increase with growing demand.

Predominantly used in ferrovanadium steel alloys (with 35-85% vanadium content), a small addition of vanadium can increase steel strength by 80% while decreasing weight by 30%.

## Global Vanadium Market Overview

Vanadium is a valuable transition metal that is seeing increasing demand in various industries, including within vanadium redox flow batteries (VRFBs). This increasing demand is shifting vanadium's use from steel production to energy storage applications.

**Market Size:** According to CRU, the global Vanadium market size was valued at ~US\$32b in 2020 and is projected to reach ~US\$62b by 2028, growing at a CAGR of 8.6% from 2021 to 2028. The Asia-Pacific region is the largest market for vanadium, followed by North America and Europe.

**Major Players in the Market:** The vanadium market includes mining companies Bushveld Minerals and Largo Resources, steel industry co-producers like EVRAZ, Panzhihua Iron and Steel Group (Pangang), and Nippon Steel, and multinational firm Glencore. Bushveld and Largo focus on steel applications and vanadium redox flow battery technology, while co-producers contribute to global vanadium supply by processing iron ore slag and fly ash. Glencore's involvement includes vanadium production at its Rhovan Mine in South Africa, providing essential components for the steel industry.

## Vanadium Demand Analysis

### Sector Demand Analysis

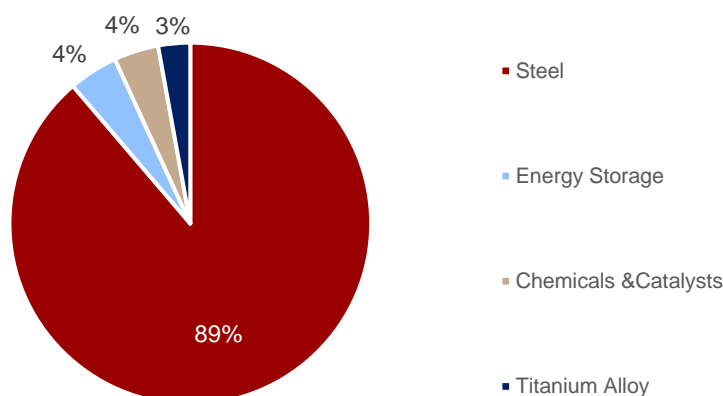
**Steel Industry:** The steel industry accounts for ~90% of global demand. Vanadium is used in producing high-strength low-alloy (HSLA) steel, which offers improved strength and corrosion resistance.

**Energy Storage:** Energy storage is an emerging growth area for vanadium, as vanadium redox flow batteries (VRFBs) gain traction for large-scale renewable energy storage (consumption grew to 4% of the global market in 2022, versus 2% in 2021).

**Titanium Alloys:** Vanadium's properties in titanium alloys drive its demand in industries like aerospace, defence, and automotive, as it offers high strength-to-weight ratio, corrosion resistance, and temperature stability.

**Chemical & Catalysts:** Other applications for vanadium include chemical production and catalysts.

Figure 1: Vanadium consumption by application (2022)



Source: TMT, Vanitec

The vanadium market, valued at ~US\$32b in 2020, expected to reach ~US\$62b by 2028, with a CAGR of 8.6%

## Regional Demand Overview

The Asia-Pacific region, led by China, is the largest consumer of vanadium, followed by Europe and Russia and then North America. A breakdown of regional demand is as follows:

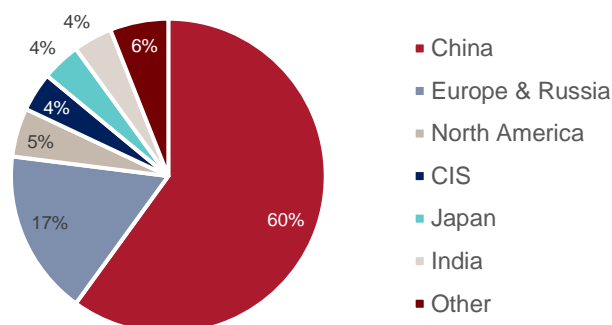
- **China** accounts for around 60% of global consumption, with the majority of the supply coming from domestic co-production sources. While consumption in the steel industry within China is expected to remain relatively stable, demand from the VRFB market is anticipated to grow rapidly.
- **Europe and Russia** combined represent approximately 17% of global consumption. These regions have been predominantly supplied by Russian feedstock. However, some changes in sourcing are expected in 2023 due to the ongoing Russia/Ukraine situation.
- **North America** constitutes about 5% of global consumption. Previously, the region relied on a mix of Russian and rest-of-world feedstock. However, sanctions imposed in 2022 have led to increased sourcing from Brazil and South Africa.
- **The rest of Asia**, including India, South Korea, and Japan, accounts for around 10% of global consumption. The primary sources of vanadium for these countries are China, Russia, and South Africa.

Figure 1: Vanadium trade flow



Source: TMT, CRU

Figure 2: Vanadium consumption by region



Source: TMT

## Demand Drivers and Restraints

There are two main demand drivers for vanadium, which are analysed below.

### 1) Higher vanadium intensity

Vanadium intensity<sup>1</sup> in steel production is increasing due to growing industrial demands for better material properties and global efforts to reduce CO<sub>2</sub> emissions. As developing nations like India expand their industries and infrastructure, the demand for high-performance, vanadium-enhanced steel is set to rise. For instance, India utilises ~39g/t of vanadium in steel, while Europe uses ~85g/t and North America ~104g/t.

Incorporating vanadium into steel production can significantly reduce CO<sub>2</sub> emissions. For example, vanadium's use in rebar production led to a 1.5% reduction in Chinese CO<sub>2</sub> emissions in 2019. As a result, vanadium-enhanced steel is expected to play a crucial role in transitioning towards greener, more efficient industries.

### 2) Vanadium Redox Flow Batteries (VRFBs)

Vanadium Redox Flow Battery (VRFB) are rechargeable energy storage systems that use vanadium ions in liquid electrolyte solutions to store and release electrical energy. VRFBs offer advantages like long cycle life, minimal capacity degradation, and suitability for large-scale storage applications, making them ideal for renewable energy integration, load levelling, and backup power supply.

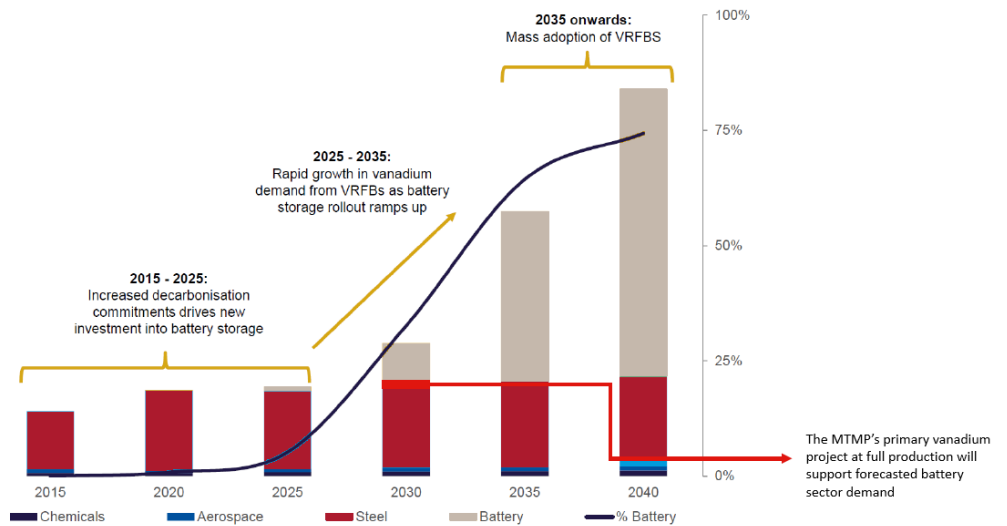
CRU forecasts that battery demand, which accounted for 2.1% of the global market in 2021, is projected to increase significantly, representing 33% of the market by 2030 and 74% by 2040 (refer to Figure 3).

India uses ~39g/t vanadium in steel, vs. North America's ~104g/t.

Battery demand forecast to rise from 2.1% in 2021 to 33% in 2030 and 74% in 2040.

<sup>1</sup> Intensity is measured in kilograms of vanadium per tonne of crude steel produced

**Figure 3: Steel and battery demand growth**



Source: TMT, CRU, January 2023

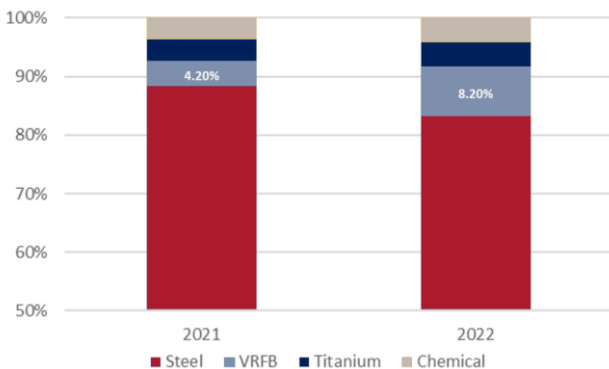
China's ban on lithium and Na-S batteries boosts VRFB adoption, increasing vanadium demand.

**China Leading the Way:** VRFBs are expected to drive vanadium demand growth in China, as the government has banned lithium and sodium-sulphur (Na-S) batteries for large energy storage projects, promoting VRFBs as a safer alternative.

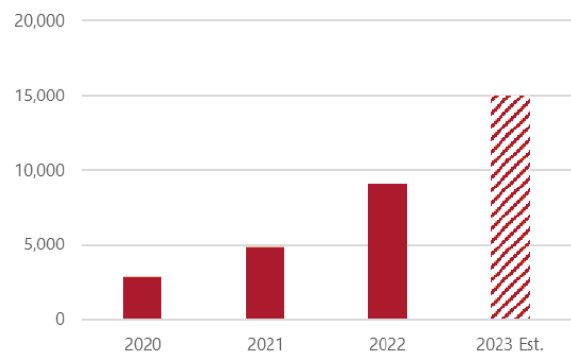
Vanadium's growing importance in energy storage is evident from the development of the world's largest VRFB in China, with plans to double its current capacity of 100MW/400MWh. The consumption of vanadium within VRFBs has increased from 4.2% in 2021 to 8.2% in 2022, underscoring its growing significance in the sector. This consumption amounted to ~9,000t of V<sub>2</sub>O<sub>5</sub> in 2022, with projections that vanadium demand for Chinese VRFB will rise to ~15,000t of V<sub>2</sub>O<sub>5</sub> in 2023.

Chinese VRFB projects continue being announced, and if all come online, they would account for the majority of demand in the medium-term forecast. The current project pipeline in China is expected to drive a near-doubling of vanadium consumption in batteries over the short term (Figure 5).

**Figure 4: China's share of vanadium consumption in end use** **Figure 5: China vanadium demand for VRFB (t V<sub>2</sub>O<sub>5</sub>)**



Source: TMT, Ferro Alloy Net, Fast Markets Ferro Alloys March 2023



Source: TMT

VRFBs offer safe, efficient energy storage with minimal wear, scalability, and suitability for large-scale use.

**Why Vanadium Redox Flow Batteries (VRFBs)**

VRFBs offer a safe, cost-effective, and scalable energy storage solution. With minimal degradation, they ensure consistent performance and efficiency over an extended life cycle. Their modular design enables capacity expansion, making them suitable for large-scale applications.

VRFBs are a sustainable energy storage option due to the recyclable electrolytes. They provide reliable performance, have an exceptionally long operational life of up to 20 years or more, and their simple system design enhances safety and reliability.

**Figure 6: At a California substation, Sumitomo Electric's vanadium batteries provide 2 MW and 8 MWh, powering 1,000 homes for up to four hours.**



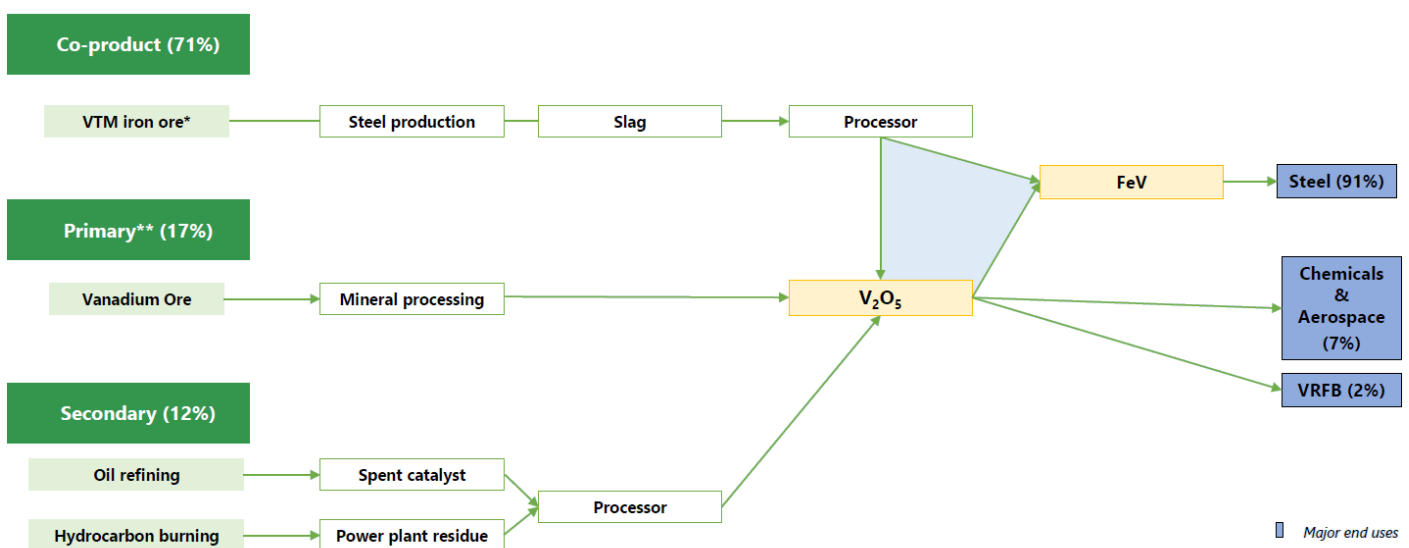
Source: TMT, The San Diego Union-Tribune, 28 January 2021

## Vanadium Supply Analysis

The supply of vanadium is known for its concentration, both in terms of production techniques and geographical distribution. Vanadium is commonly found in magnetite ore bodies alongside titanium. The extraction process for vanadium can be executed directly via primary production or indirectly by obtaining vanadium-rich slag during steelmaking or pig-iron production processes (co-production).

1. *Co-production* refers to the process of extracting vanadium from iron ore as a by-product and subsequently processing it to obtain pure vanadium. It is the most significant source of vanadium supply, accounting for an estimated 71% of production in 2021.
2. *Primary production* was estimated at 17% of global supply in 2021. Primary production refers to the process of extracting vanadium from its ores, concentrates, or other sources of raw materials through mining and processing operations.
3. *Secondary production* comprises ~12% of total vanadium supply; secondary production recovers vanadium from waste materials, including slag, fly ash, and spent catalysts. Secondary production is limited by both the availability of the necessary feedstock and the high costs of production.

**Figure 7: Three supply source types for vanadium, currently ~89% of vanadium processed into FeV for use in steel**



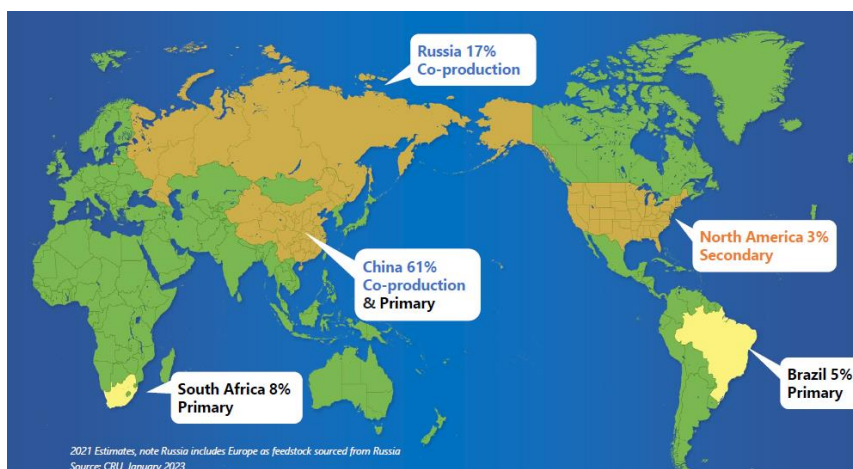
Source: TMT, CRU

China and Russia, dominating vanadium production with 61% and 17% in 2021, shape the market with geopolitical influences.

### Production by Country

The vanadium market faces geopolitical influences, with China (co-production + primary production) and Russia (co-production) dominating production, accounting for 61% and 17%, respectively, in 2021. This concentration raises concerns about supply chain disruptions and price volatility due to potential geopolitical tensions, such as the Russia-Ukraine conflict, and policy changes in China.

Figure 9: Global vanadium supply



Source: TMT, CRU

### Supply Chain Analysis

Supply disruptions stemming from China could have a potentially large effect on energy security in the West, given the concentration of battery material production in China

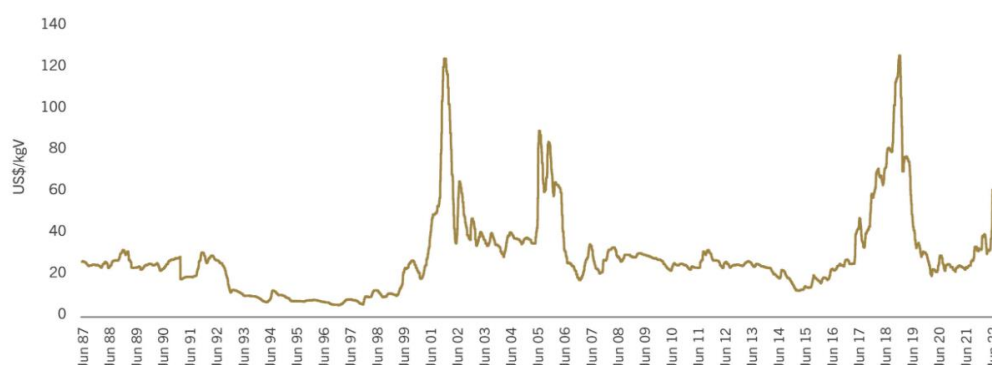
### Vanadium Price Analysis

We expect that global government policies and strategies focused on decarbonisation efforts will drive growth in the battery market, while geopolitical events will also play a role in shaping the future trajectory of the vanadium market.

### Historical Price Trends

Traditionally, vanadium prices have been closely tied to steel production, displaying long-term trends characterised by extended periods of relative price stability interspersed with episodes of extreme upward volatility.

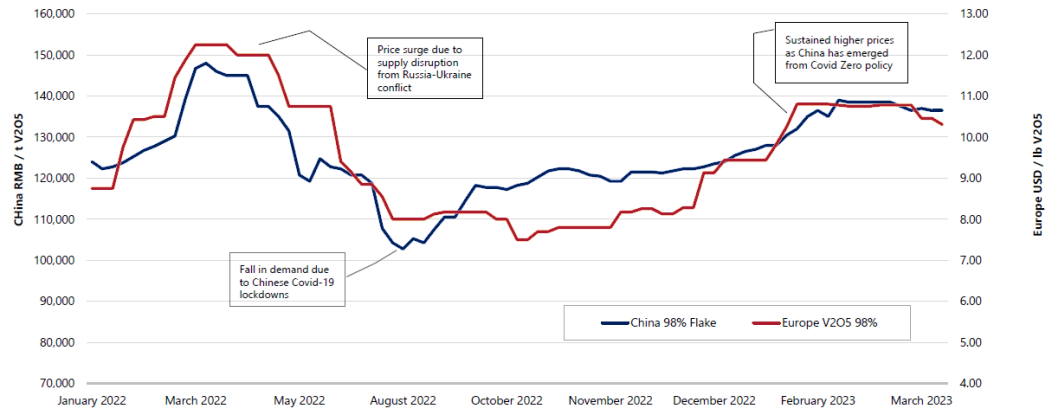
Figure 8: Ferrovandium (FeV) historical LMB price (US\$/kgV)



Source: London Metal, price as of 10 June 2022

The majority of vanadium supply is determined by steel market fundamentals, as it is primarily obtained as a by-product. As a result, vanadium markets are prone to disconnection and consolidation. Supply disruptions, such as those stemming from the ongoing Russia-Ukraine conflict, can lead to significant price fluctuations.

**Figure 9: China vs Europe relative price performance**



Source: TMT, FerroAlloy.Net

### Price Forecast

Vanadium prices are likely to see strong support as longer-term demand outweighs supply.

Vanadium demand will continue to be driven by increased steel consumption in developing countries as infrastructure spend expands and urbanisation continues. However, we see the development of VRFBs, in the transition to the new 'green economy', creating significant tailwinds for future prices.

Vanadium prices likely to see strong support as longer-term demand outweighs supply



# Investment Thesis: World-Class Vanadium Project + Tier 1 Location

TMT owns 100% of its flagship asset, the world-class Murchison Technology Metals Project (MTMP), located in the Tier 1 mining jurisdiction of Western Australia, just 50km south of the inland town of Meekatharra. The Project straddles two of the world's leading undeveloped vanadium deposits, Gabanintha and Yarrabubba. It has a high-grade vanadium resource, recoverable ilmenite credits at Yarrabubba, and first-quartile operating costs.

## Flagship Project: Murchison Technology Metals Project (MTMP), Western Australia

In August 2022, TMT published a comprehensive 'Integration Study' on the MTMP. As an extension of the prior DFS completed for Gabanintha vanadium in isolation, the Integration Study incorporated the significant value identified at Yarrabubba and the potential for significant ilmenite by-product credits. The study estimated strong life-of-mine EBITDA margins of ~46%, which are likely to be much higher over the first 9 years of the operation, given that ilmenite production is weighted towards that period. TMT expects first production at MTMP in late 2025, ramping up over the course of 2026, assuming critical tasks are completed as per the current schedule (primarily offtake and financing).

## Key operational and financial characteristics of existing project

- **Meaningful Ore Reserve:** 44.5mt Ore Reserve grading 0.89% V<sub>2</sub>O<sub>5</sub>; significant uplift in the Ore Reserve at Yarrabubba (+69%) to 15.9mt grading 0.87% V<sub>2</sub>O<sub>5</sub> and 10% TiO<sub>2</sub>.
- **Very long operation life** of 25 years (reserve life = 22.5 years), including 10.5mt of material currently classified as Inferred Resource within the Ore Reserve pit designs (we think this will be included as exploration and definition work advances).
- **Lowest-quartile operating costs** from high yielding geology enabling a simple operation and advantageous ilmenite by-product revenue.
- **Low cost, low emission power source:** TMT aims to utilise cost-effective natural gas for energy, offering cleaner fuel than competitors while integrating renewable energy to lower emissions.
- **Simple operations:** conventional mining and processing in a Tier 1 location for mining development (Western Australia); straightforward open-pit truck and excavator mining operation with a strip ratio of 5.95:1
- **Easy access to global export markets** from strong links to port export infrastructure at Fremantle (for V<sub>2</sub>O<sub>5</sub> product) and Geraldton (for TiO<sub>2</sub> product)
- **Maximised early cashflows and economic returns:** average annual vanadium production of 12.5ktpa V<sub>2</sub>O<sub>5</sub> flake and 1.1mt ilmenite (grading ~47%), expected to be predominantly in the first 9 years of operation life
- **LOM revenue >A\$13bn**, assuming of A\$11.00/lb for vanadium (conservative), US\$260/t for ilmenite concentrate

## Key opportunities for additional value capture beyond existing project definition

- conversion of the 10.5mt Inferred Resources and inclusion of these into the economic model
- pull-forward of ilmenite production profile at Yarrabubba
- moderated key cost assumptions vs. the Integration Study when the ongoing inflation outlook was uncertain
- value-adding processing options to produce and sell finished products directly to customers.

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Robust Life-of-Mine  
EBITDA Margins: ~46%

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Lowest-quartile operating  
costs from high-yielding  
geology for effortless  
operations.

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# Update from the Recent Quarter

## Corporate

TMT has announced the resignation of Jacqueline Murray, a representative from major shareholder Resource Capital Funds, as a non-executive director. The decision is attributed to her increased workload and future board roles. Resource Capital Funds, holding a 17.2% share, maintains the right to appoint a company board representative.

## Shares and Cash

As of April 18, 2023, the top 20 shareholders held 57.72% of the Company's fully paid ordinary shares. The Company had a cash balance of \$8.1 million as of March 31, 2023.

## Tier 1 Partnerships

TMT has a handful of strategic partners that provide an element of de-risking for the project. Major partners are presented in Figure 10.

Figure 10: TMT Strategic Partners



Source: TMT

## EKF Financing Letter of Interest

In January 2023, Technology Metals received a Letter of Interest (LoI) from Denmark's Export Credit Agency (EKF), outlining potential financing support for the Murchison Technology Metals Project (MTMP). The LoI, a culmination of years of positive collaboration, suggests A\$150 million in support, contingent on Danish economic interest, approvals, documentation, and due diligence. EKF's funding, backed by the Danish state and carrying a AAA rating, is a significant milestone in the Company's financing strategy, with discussions continuing across various government and commercial funding sources.

## Battery Grade Vanadium Electrolyte Produced

In February 2023, TMT and its subsidiary vLYTE announced that Japanese partner LE System successfully produced high-quality vanadium electrolyte using feedstock from TMT's MTMP in Western Australia. Developed to meet the growing demand for VRFB, MTMP is positioned to address the world's long-duration energy storage needs. LE System manufactured and tested the electrolyte at its Tsukuba Technical Centre in Ibaraki, Japan, where it met global VRFB manufacturers' specifications, showcased high power efficiency, and compared favourably to other commercial vanadium electrolytes.

## MOU with Indian VRFB Manufacturer

TMT recently announced a Memorandum of Understanding (MOU) with Delectrik Systems, a rapidly growing Indian VRFB manufacturer. Supported by the Indian Government's US\$4.3 billion investment in energy transition, Delectrik produces vanadium electrolyte and designs VRFB systems ranging from kW to MW scale. The MOU outlines the supply of vanadium products from the Murchison Technology Metals Project (MTMP) to Delectrik and vLYTE's supply of vanadium electrolyte to Delectrik within Australia, promoting the VRFB industry's growth and furthering Technology Metals' downstream strategy.

## Preferred Tenderers Engaged

During the quarter, TMT partnered with GR Engineering Services Limited (GRES) and Iron Mine Contracting (IMC) to advance the Project following a successful competitive tendering process. Working with the Company's project team and FLSmidth, a potential key equipment supplier, they will streamline construction planning, scheduling, and site establishment, as well as coordinate bulk earthworks, construction materials sourcing, and process plant construction activities. This progress lays a solid foundation for the Project and will soon provide an updated delivery schedule and pre-production capital expenditure estimate for MTMP construction activities.

Cash balance of \$8.1m as of March 31, 2023

Strategic partners help project de-risking

# Robust Valuation: Low-Risk with Solid Structural Tailwinds

Our valuation remains at A\$0.75/share, indicating a 120% upside to the current price

Our valuation remains at A\$0.75/share, indicating a 120% upside to the current price. Based on a 10% discount rate, US\$11.00/lb vanadium, and US\$260/t ilmenite prices, we project construction starting in 2023 and production in 2025. The estimated A\$654m capital expenditure is funded 60% by debt and 40% by equity. We exclude potential expansions, downstream investments, or exploration impacts.

## Valuation Summary

Figure 11: Base-case valuation summary

NPV OF PROJECTS	A\$M	EQUITY VALUE A\$/SHARE FULLY DILUTED	Valuation Methodology
MTMP	479	0.72	60% probability weighting Project NPV
Exploration and Investments	30	0.05	MST Estimate
<b>ENTERPRISE NPV</b>	<b>509</b>	<b>0.76</b>	
Add: Cash	8	0.01	As reported 30 Mar 2023
Add: Options Cash	6	0.01	MST Estimate
<b>EQUITY VALUE PRE SG&amp;A</b>	<b>522</b>	<b>0.78</b>	
SG&A	(23)	(0.03)	NPV of Corporate Costs
<b>EQUITY VALUE</b>	<b>499</b>	<b>0.75</b>	

Source: MST Access

## Base-case valuation – risked NPV of A\$0.75/share, fully diluted

MTMP has a substantial Ore Reserve of 44.5mt, which provides a very long 22.5-year operation life based on the production plan scheduled under the August 2022 Integration Study.

Exploration success would contribute most to material valuation upside if high-grade material could be added to the current operational plan. Given the long operation life, incremental years of mine life at the end of the current plan, at a lower grade, would likely provide only limited leverage to additional value creation (although it may defer rehabilitation costs which can be beneficial).

We have applied a 60% probability weighting to the Project given the advanced stage of the development pending a financing solution and FID.

Given the materiality of MTMP to TMT's overall valuation and the current strategic focus on the Project, we have not performed a detailed valuation on any of TMT's other assets but have applied a nominal value of A\$30m.

## Key assumptions to our NPV valuation

Our base-case NPV valuation is built upon a mine plan which aligns with that compiled by the technical experts under the recently published Integration Study. Figure 12 shows critical headline metrics.

We have used a 10% discount rate (nominal), a vanadium price<sup>2</sup> of US\$11.00/lb and an ilmenite price of US\$260/t (both long-term real). In addition, we assume a project timeline that commences construction in CY2023 and achieves first production in CY2025 after a construction period of approximately 18 months. We regard this timeline as reasonable given the location of the Project and our knowledge of other mining projects in development.

We assume the project capital expenditure to be A\$654m, funded by 60% debt and 40% equity (at a 50c issue price). Accordingly, our valuation does not incorporate the benefit of any additional potential project expansions, downstream investments or exploration success, which may increase the scale of such expansions or extend the operation life.

Our valuation assumes TMT will pay tax from the first year of production. However, the Company is likely to have significant capital allowances from the upfront investment, which should defer the payment of corporate cash tax for several years. Given the inherent difficulties in anticipating the potential timing of corporate tax payments (linked to the realised commodity price profile), we adopt a conservative stance.

Pre-development CAPEX of A\$654m: 60% Debt, 40% Equity.

Assumptions for Valuation: 10% Discount Rate, US\$11.00/lb Vanadium, US\$260/t Ilmenite

<sup>2</sup> Spot Price: V<sub>2</sub>O<sub>5</sub> Vanadium Pentoxide Flake 98% Price USD / lb. Europe: US\$8.50/lb, Apr 27, 2023

**Figure 12: DFS assumptions underpinning our base-case valuation**

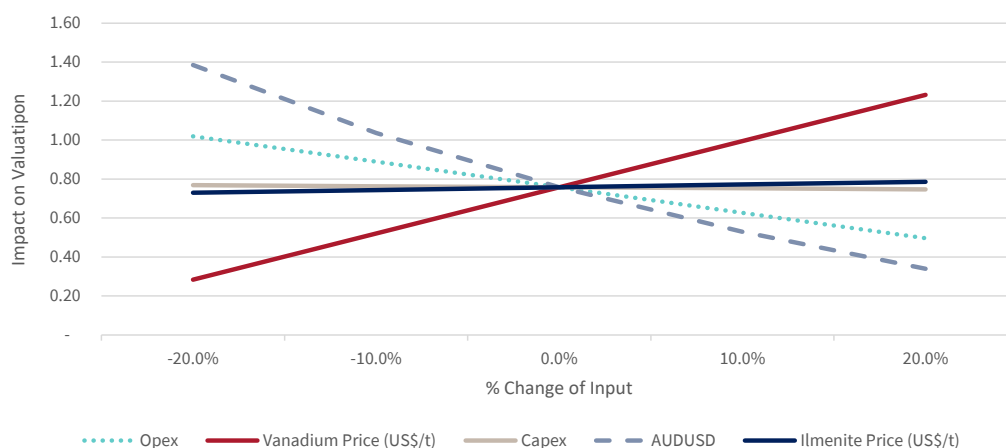
Assumptions	MST
<b>PROJECT ASSUMPTIONS</b>	
Project Ownership (%)	100%
Strip Ratio (waste : ore)	5.95
Average Diluted Mining Grade (% V2O5)	0.89%
Average V2O5 Production (ktpa)	12.5
Mine Life (years)	22.5
Capex (A\$m, real)	654
Ore Reserve (mt)	44.5
Ore Reserve Grade (% V2O5)	0.89%
<b>COST &amp; FINANCING ASSUMPTIONS</b>	
Discount Rate (%)	10.0%
Inflation Rate (%)	2.5%
AISC (US\$/lb)	5.65
Pre-Tax NPV (A\$m)	1,276
Post-Tax NPV (A\$m)	798
<b>PRICING &amp; EXCHANGE RATE ASSUMPTIONS</b>	
AUDUSD	0.70
V2O5 Flake Price (US\$/lb)	11.00
47% TiO2 Ilmenite Concentrate Price (US\$/t)	260
Royalty Rate (%)	5.0%
Corporate Tax Rate (%)	30.0%

Source: MST Access

## Key sensitivities

Our valuation is most sensitive to assumptions on the vanadium price and AUD/USD exchange rate, as well as (to a lesser extent) capital and operating costs. Figure 13 shows how our base-case valuation would change from a variation in these assumptions.

**Figure 13: Sensitivity analysis to key financial modelling assumptions**



Source: MST Access

## Positive Catalysts for the Share Price and Valuation

### Completion of the bankable financial model

The bankable financial model represents a significant step forward for the project and signifies a basis for its funding and project timing. This study is expected to be completed in mid-CY2023. The completion of this study will support the recommendation to the Board to make a Development Decision – which is targeted at enabling the Company to proceed with ordering long lead items and early works ahead of the FID.

### Funding of Project

The funding of capital expenditure relating to major resource developments for small companies is always a significant challenge. Therefore, delivering a competitive funding package for the project would be a major de-risking catalyst for the stock.

Bankable Financial Model:  
Expected Completion: Mid  
CY2023.

## Resource Upgrade

Exploration success which leads to significant upside in available tonnes of ore or significant discoveries of high-grade material capable of being processed early in the operation life would be an important positive development for the prospects of the project and the overall company valuation.

## Binding Offtake Agreement

TMT has established a non-binding MOU with Indian steel maker Tata Steel Limited, one of the world's largest steel companies. TMT is actively engaging with Tata and other partners and anticipates more updates in this field.

## Other Potential share price catalyst

- **Vanadium price increase:** The valuation and share price sentiment is highly sensitive to vanadium prices. Increases in the price of vanadium would positively affect the valuation.
- **USD depreciation:** The valuation is highly sensitive to the USD/AUD. USD depreciation would have a positive effect on the valuation.
- **Chinese post-COVID recovery:** If China relaxes its previously steadfast COVID measures, steel mills are expected to bounce back in demand. This will have a positive impact on the demand for vanadium.

## Risks to the Share Price and Valuation

We highlight the key risks to the share price and our valuation below, noting that early-stage mining projects have a number of critical risks which need careful management and consideration.

### Company-and project-specific risks

- **Access to funding:** there is no guarantee that sufficient funding will be available to advance or develop the Project. The inability to secure funding would be a major negative for the stock.
- **Offtake risks:** any binding offtake agreements with firm visibility on volumes and prices would be a significant de-risking catalyst for the project. Such agreements are critical, given that the MTMP's final product is an intermediate, so a lack of progress or failure to sign such agreements represents a major risk.
- **Delays to development:** the Integration Study is a major milestone for the Company as it demonstrates the broad economics of the project. Any delays in moving into construction would be a negative for the stock and would gradually see the information from the recent study become less current and, therefore, less reliable.
- **Commercialisation risk:** an inability to commercialise projects due to a failure to obtain final approvals, secure funding for construction or obtain access to key infrastructure would undermine the viability of the business and have a negative impact on the share price.
- **Key person dependence:** individuals, including the CEO, may have relationships and experience critical to advancing the MTMP. The loss of such personnel would significantly compromise TMT's ability to advance the project.
- **Cost inflation:** inflation is currently a significant emerging theme globally and is particularly acute within the mining industry. Any inflation in operational or capital costs without a corresponding increase in the commodity price will compress the project's margins and potentially undermine its economics and viability.

### Macro risks

Vanadium and ilmenite price decreases – this is the key valuation sensitivity

### Foreign exchange rates

Increasing interest rates and the potential impact on the cost of debt finance

### Country-specific risks

Given the project is in Western Australia, we regard these risks as low. However, ensuring that the local community and Indigenous groups support the project is essential.

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