



**TECHNOLOGY**  
METALS AUSTRALIA LIMITED

# Technology metals for a cleaner future



ASX:TMT

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## Competent Person's Statement

The information in this report that relates to Exploration Results are based on information compiled by Mr John McDougall. Mr McDougall is the Company's Exploration Manager and a member of the Australian Institute of Geoscientists. Mr McDougall has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this report and to the activity which they are undertaking to qualify as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' ("JORC Code"). Mr McDougall consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Mr Aaron Meakin. Mr Aaron Meakin is a Principal Consultant of CSA Global Pty Ltd and is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy. Mr Aaron Meakin has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves ("JORC Code"). Mr Aaron Meakin consent to the disclosure of the information in this announcement in the form and context in which it appears.

The information that relates to Ore Reserves is based on information compiled by Mr Daniel Grosso an employee of CSA Global Pty Ltd. Mr Grosso takes overall responsibility for the Report as Competent Person. Mr Grosso is a Member of The Australasian Institute of Mining and Metallurgy and has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Person in terms of the JORC (2012 Edition). The Competent Person, Daniel Grosso has reviewed the Ore Reserve statement and given permission for the publication of this information in the form and context within which it appears.

The information in this report that relates to the Processing and Metallurgy for the Yarrabubba and Gabanintha projects is based on and fairly represents, information and supporting documentation compiled by Mr Brett Morgan a full-time employee of Technology Metals Australia.. Mr Morgan is a Member of The Australasian Institute of Mining and Metallurgy and has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he is undertaking, to qualify as a Competent Person in terms of the JORC (2012 Edition). The Competent Person, Brett Morgan consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Pursuant to LR-5-19-1 production target and financial forecast: Refer ASX Release - 21 August 2019 for full details of the DFS: Financial Metrics at long term historical average price of US\$8.78/lb V2O5.

Pursuant to LR-5-19-2 production target and financial forecast: The material assumptions as per the ASX release on 21 August 2019 continue to apply and have not materially changed.

# Why invest in TMT?

## World class critical minerals in a Tier 1 jurisdiction



### Murchison Technology Metals Project

Large, long-life high purity vanadium production  
- lowest quartile operating costs

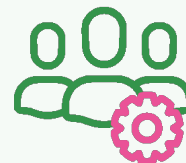
Environmental approvals – the last lap –  
Development Decision Q4 2022



### Nationally significant project

Vanadium is recognised as critical to  
storage & emissions reduction

WA Government Lead Agency status



### Part of the future energy solution

Collaboration with Japanese vanadium  
electrolyte company LE System to develop  
production capacity in Australia

### Quality management team

Experienced Board & Management team  
with expertise in financing, building and  
operating mines

# Corporate Overview



## Capital Structure

**TMT**

ASX Code

**\$21.7M**

Cash

(as at 31 December 2021)

**\$117M**

Market Cap

(As at 6 April 2022)

**204.6m**

Shares on Issue

**19.2M**

Unlisted Options<sup>1</sup>  
(Various exercise)<sup>v</sup>

**3.65m**

Performance Rights<sup>2</sup>

### Resource Capital Fund VII L.P. cornerstone shareholder

Holder Name	Holding (%)
Resource Capital Fund VII L.P.	17.7%
BNP Paribas Nominees	7.9%
Great Southern Flour Mills	6.9%
Retzos Group	4.8%
<b>TOTAL TOP 20</b>	<b>56.0%</b>
Board and Management holdings (fully diluted)	7.9%

\*Based on issued capital as at 4 April 2022



<sup>1</sup> Includes 14.35m director and employee options – 3.9m vested, balance vest on project development hurdles

<sup>2</sup> 50% vest on MTMP FID, 50% vest on first production

# Experienced Board & Management



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**Michael Fry**  
**Non-Exec Chairman**

Michael 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.



**Ian Prentice**  
**Managing Director**

Ian holds a Bachelor of Science (Geology) from the University of Western Australia and has over 30 years experience in the global mining industry, spanning exploration, development and open cut and underground mining. Ian is a Member of the Australasian Institute of Mining and Metallurgy.



**Dave English**  
**Chief Operating Officer**

David is a mining professional with over 30 years operations and project development experience working in the Western Australian resources industry.

Mr English was General Manager Operations at the Windimurra Vanadium Project from February 2008 until February 2010 involved in the process of re-developing the project.



**Sonu Cheema**  
**Non-Exec Dir/CoSec**

Sonu is a Partner at Cicero Group with 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 offers, mergers and acquisitions, management of capital raising activities and auditor liaison.



**Jacqueline Murray**  
**Non-Exec Director**

Jacqueline is a Partner at Resource Capital Funds (RCF) and has worked within the mining industry for over 20 years.

Mrs Murray joined RCF in 2012 after working in business analysis and improvement roles with BHP Billiton. Prior to this she worked in various geotechnical engineering roles in underground and open pit operations within BHP Billiton and WMC Resources.



**John McDougall**  
**Exploration Manager**

John holds a Bachelor of Science with Honours (Geology) from the University of Tasmania and has over 20 years experience in mineral exploration, with iron ore, base and precious metals experience.

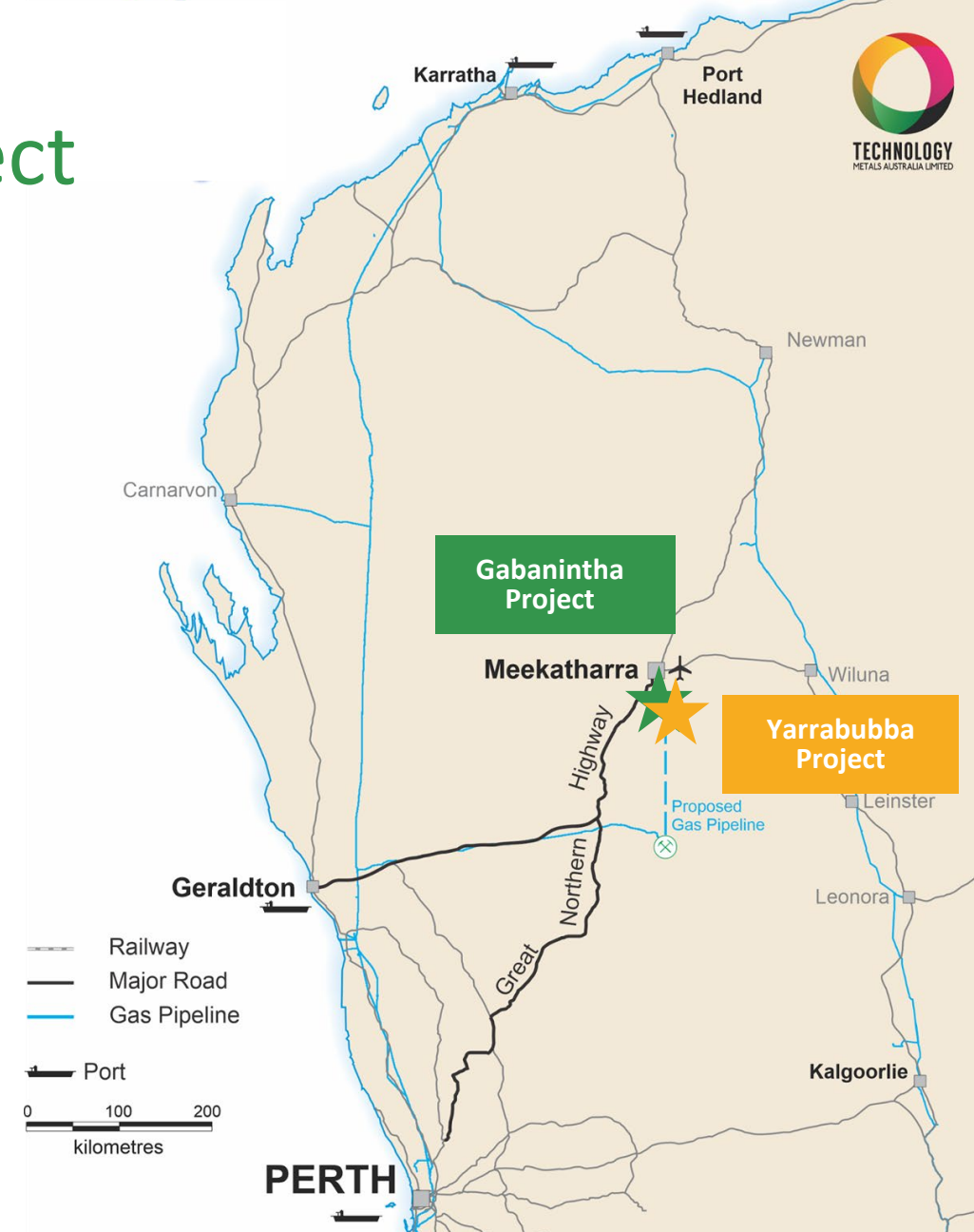
John has been managing the geological data acquisition at Gabanintha and Yarrabubba since February 2017.



# Murchison Technology Metals Project

## Significant Project Advantages

- Key environmental approvals well advanced; mining leases granted
- High-quality, high-grade resource of 79.8Mt at 1.1%  $V_2O_5$
- Lowest cost quartile – conventional salt roast water leach process
- Shallow weathering → delivers high recoveries from start
- Titanium by-product at Yarrabubba to reduce costs even further
- Domestic downstream processing opportunity alongside leading Japanese vanadium electrolyte company
- Fully funded to FID and ordering of long lead items



# Environment, Social & Governance

Building a globally relevant resources company with a focus on emissions reduction



## Environment

- Constructive consultation with WA EPA supporting progress on the GVP ERD.
- Early engagement with Traditional Owners and Pastoralists to minimise impacts.
- Promote energy efficiency and minimise water usage.
- Policy of mitigation, minimisation and rehabilitation.



## Social / Community

- Policy in place to support local procurement and employment wherever practical.
- Support community events and activities – developing a social licence to operate.
- Generate training, business and work opportunities for Traditional Owners.
- Pursue downstream processing options to ensure value add and skills development.



## Governance

- Instilling a culture of high ethical standards throughout the group and its activities.
- Aim to always operate in a safe and respectful manner.
- Focus on active risk management throughout the business.
- Develop, nurture and maintain our people.





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# Strategic plan

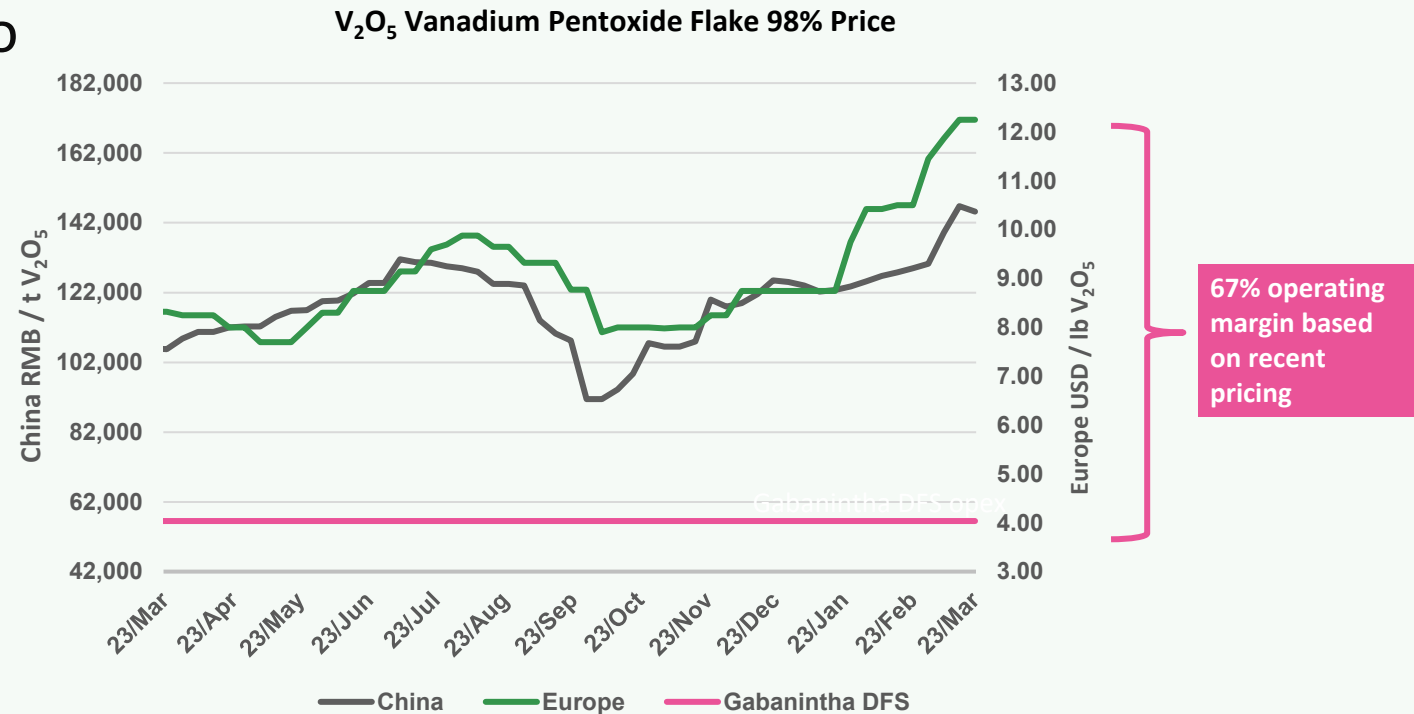
To produce strategic technology metals that reduce emissions and enable emissions free power



# Vanadium

## A critical mineral supporting net zero

- Application in large-scale batteries (VRFB) that don't degrade over time, ideal for support of renewable energy, grid stabilisation.
- Vanadium also has a role to play enabling higher quality, stronger steel, lowering emissions.
- Including vanadium in rebar represented 1.5% saving of the total 2019 CO<sub>2</sub> emissions from Chinese industrial processes<sup>1</sup>.
- Tightening market on steel consumption in China and improving demand in Europe and USA.

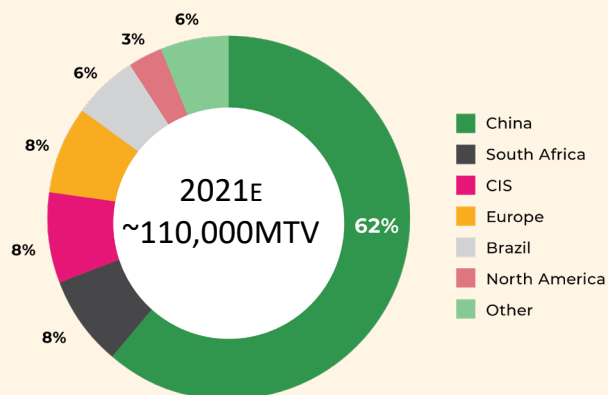


**“We see significant growth in demand for vanadium - which we foresee due to its growing use in high grade steel and flow batteries.”**

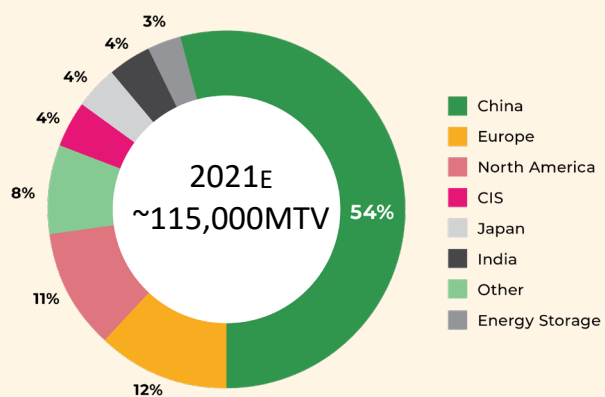
Sir Mick Davis, former Xstrata plc CEO

# A market in need of new supply

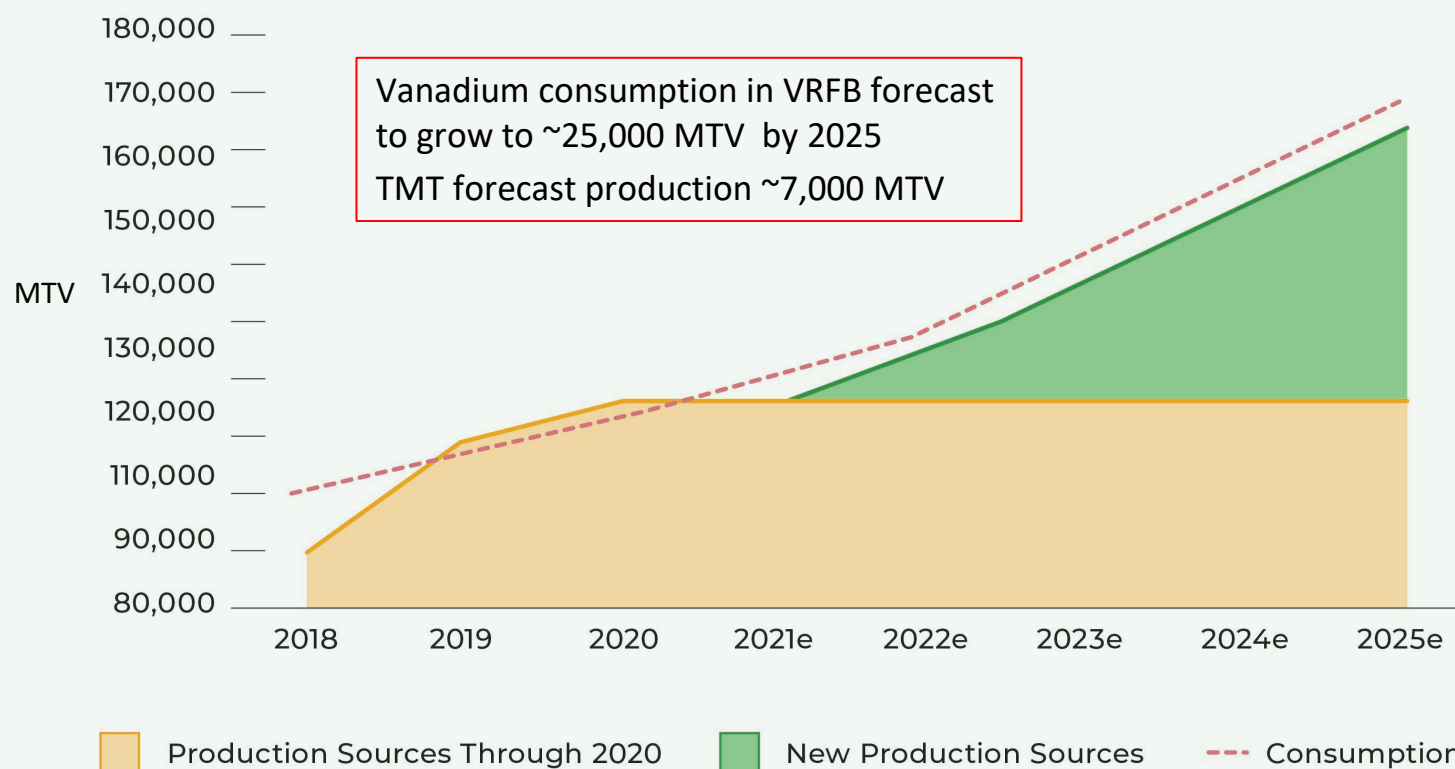
Vanadium production by region



Vanadium consumption by region



Forecast supply and demand



# Vanadium Redox Flow Batteries

Enabling the future of green energy –  
safe, stable, long duration storage



## No Degradation

Performance remains constant with excellent long term charge retention



## Low Energy Cost

Over its 20+ year lifespan, VRFB technology offers the lowest cost per kWh stored (LCOE)



## Safety

The vanadium electrolyte is water based and is totally non-flammable



## Sustainability

The vanadium is fully reusable and recyclable at end of the battery life



## Long Life

VRFB's can easily last more than 20 years with very high cycle life (up to 20,000 cycles)

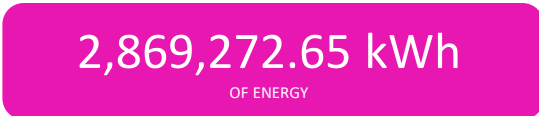
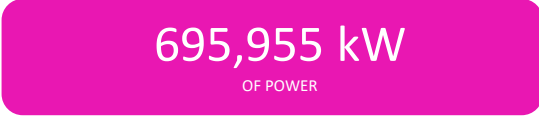
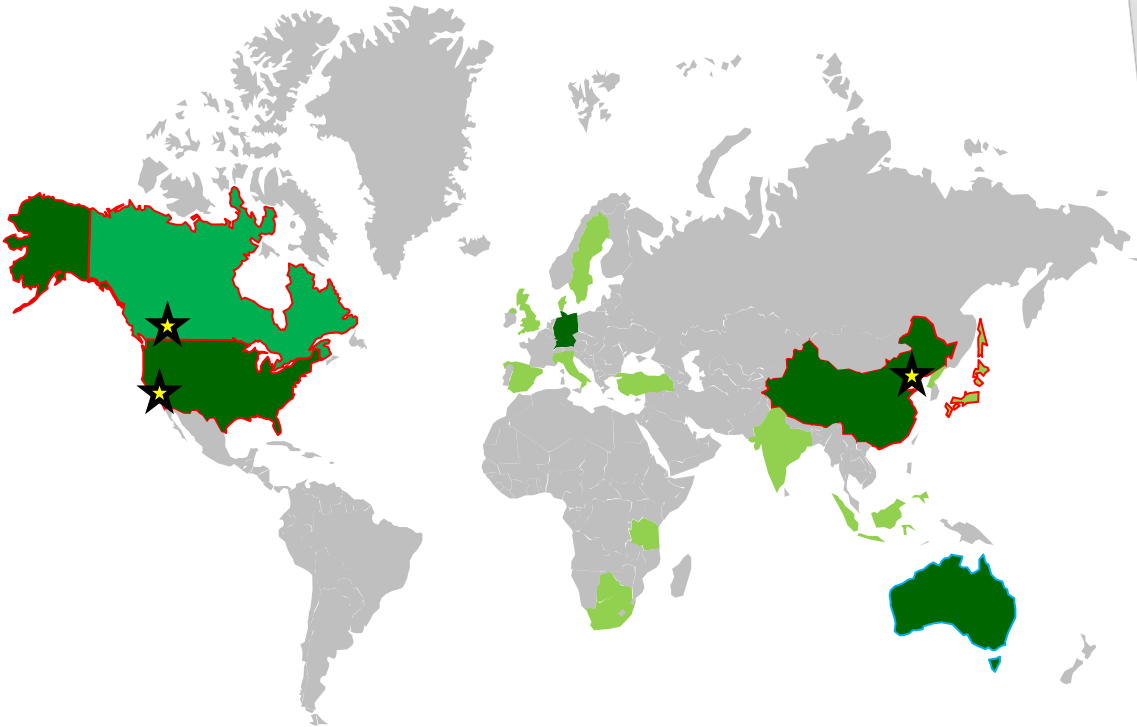
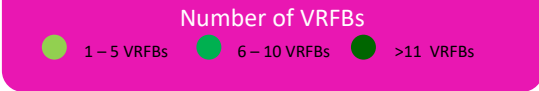


# ACCELERATING GLOBAL VRFB ROLL-OUT



Vanadium Redox Flow Battery (VRFB) technology is increasingly being deployed across the globe

	Country	VRFBs	kW	kWh
	Australia	13	1.356,50	6.333,90
	Barbuda	1	3.000,00	12.000,00
	Botswana	1	112,00	560,00
	Canada	3	2.500,00	10.000,00
	China	38	597.568,50	2.457.269,00
	Czech Republic	3	47,00	209,90
	Denmark	3	40,00	260,00
	Germany	17	1.840,00	87.310,00
	Hungary	1	10	40,00
	India	4	155,00	740,15
	Indonesia	1	400,00	500,00
	Italy	6	1.131,00	4.610,00
	Japan	6	2430,00	7.861,00
	Kenya	1	140,00	560,00
	Netherlands	1	10,00	80,00
	Portugal	1	5,00	60,00
	Singapore	1	60,00	2.000,00
	Slovakia	2	107,00	640,00
	Slovenia	1	10,00	45,00
	South Africa	2	745,00	2.950,00
	South Korea	4	1.250,00	4.900,00
	Spain	3	220,00	800,00
	Sweden	1	210,00	1.800,00
	Switzerland	2	800,00	460,00
	Taiwan	1	460,00	750,00
	Turkey	1	10,00	40,00
	UAE	1	10,00	40,00
	United Kingdom	5	805,00	5.180,00
	United States	22	80.668,00	261.373,70



**pv magazine** 3 February 2022

[Canada's largest solar-powered vanadium flow battery](#)

Canada-based VRFB manufacturer [Invinity Energy Systems](#) and Canadian renewable energy developer Elemental Energy have announced the construction of a 21 MW solar plant coupled to 8.4 MWh of VRFB capacity at Chappice Lake, in Cypress County, in Canada's Alberta province.

**搜狐** 17 February 2022

[The World's Largest 100MW VRFB Energy Storage and Peak Shaving Power Station Has Entered the Single Module Commissioning Stage](#)

The power station is the first phase of the "200MW/800MWh Dalian Flow Battery Energy Storage Peak Shaving Power Station National Demonstration Project".

**pv magazine** 31 January 2022

[Microgrid project using vanadium redox flow battery](#)

San Diego Gas & Electric (SDG&E) and Sumitomo Electric (SEI) completed a zero-emissions microgrid pilot project using a VRFB in the Bonita community in south San Diego County. The 2MW VRFB at the heart of the demonstration project can store 8MWh of energy, potentially enough to power the equivalent of about 1,000 homes for up to four hours.

# VRFB & Electrolyte Strategy

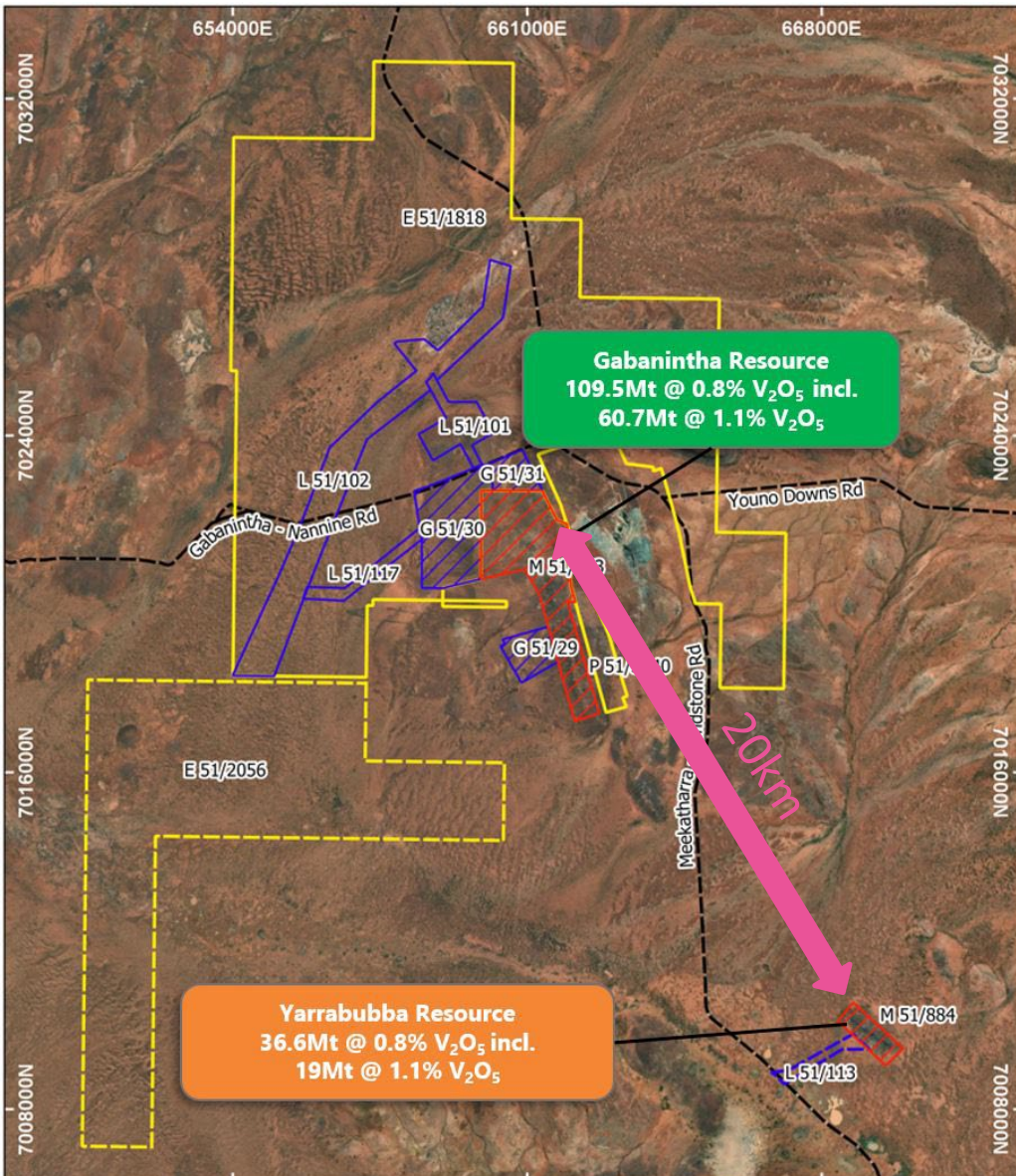
## TMT - Part of Australia's green energy solution

- Collaborating with Japanese company LE System to develop vanadium electrolyte production in Australia using TMT's high purity vanadium.
- **Vanadium electrolyte business plan being deployed:**
  - Production centres contemplated on western and eastern seaboard.
  - Competitive advantage as a very low-cost primary producer of high purity vanadium.
  - Long term – stable supplier delivering certainty for VRFB developers.
  - Significant political support for decarbonization opportunities.
- Discussions initiated with VRFB manufacturers with regards to the establishment of Australian VRFB deployment.
- Evolution of the MTMP from a high purity  $V_2O_5$  producer into downstream applications forms part of TMT's sustainability strategy.



# Murchison Technology Metals Project

Targeting +25 year life based on M&I resource of 50.2Mt at 0.9% V<sub>2</sub>O<sub>5</sub>



## Gabanintha Vanadium

- Large, long-life high purity vanadium project
- Lowest cost quartile at US\$4.04/lb V<sub>2</sub>O<sub>5</sub>
- Average annual EBITDA of A\$255 million
- Key environmental approvals well advanced
- Site of integrated processing facility

## Yarrabubba Vanadium

- High grade V<sub>2</sub>O<sub>5</sub> in magnetite concentrate
- Titanium by-product from tails stream
- Potential to materially enhance project economics
- Very shallow weathering
- Thick high grade zones at surface

## Integration Study

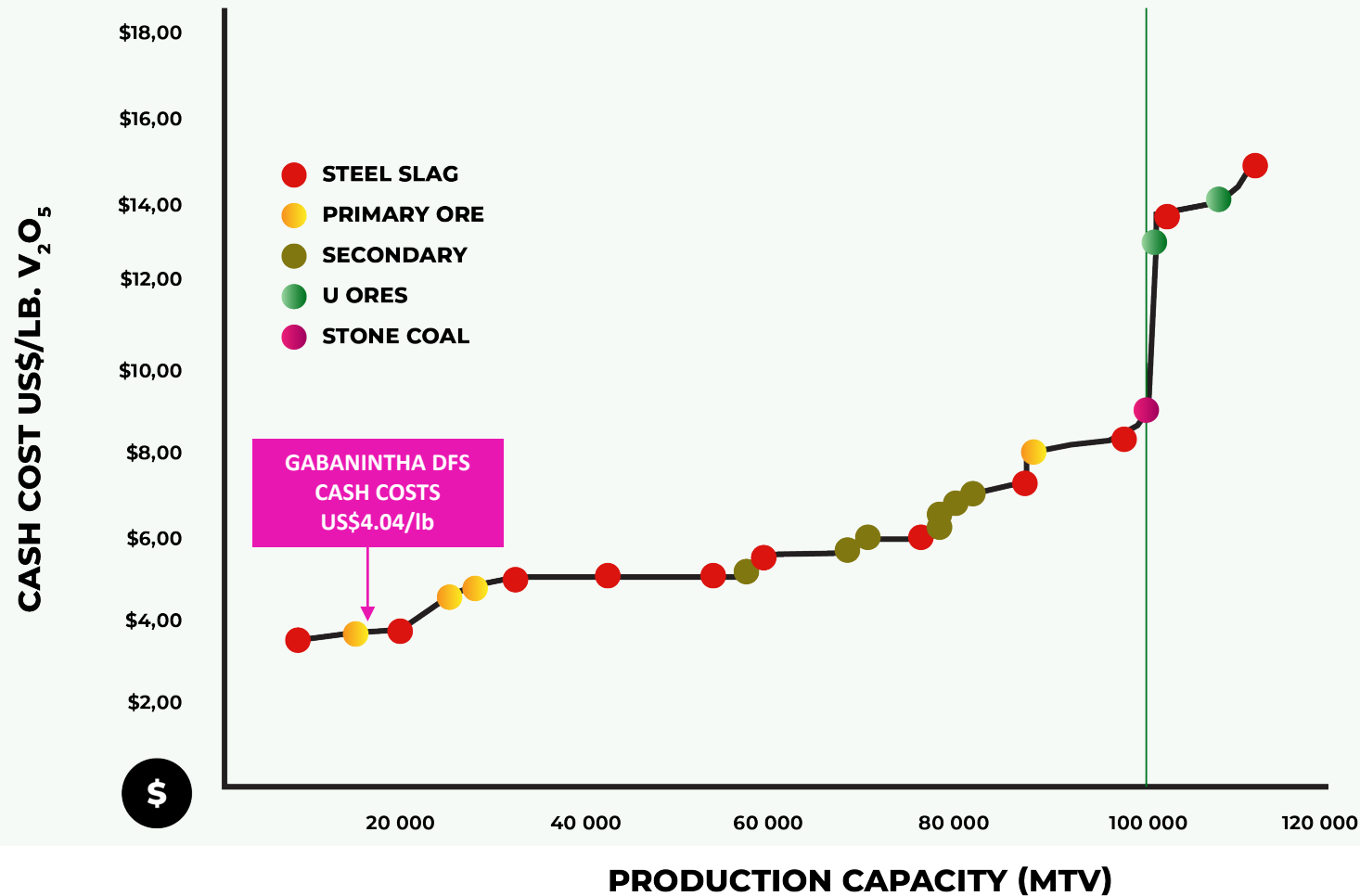
- Optimise sequencing of orebody development
- Updated MTMP Ore Reserve estimate
- Incorporation of titanium circuit for Yarrabubba ore
- Define life of mine production profile
- Study level allows direct progression to project implementation



# Lowest Quartile Cash Costs

Titanium by product credits expected to reduce costs

## 2020 $V_2O_5$ CASH COST CURVE



Source: TTP Squared, Inc

# Timetable & News



# Murchison Technology Metals Project



## Key project partners



Australian Government

### Federal Government

Northern Australia Infrastructure Facility (NAIF)  
Export Finance Australia (EFA)  
Critical Minerals Facilitation Office (CMFO)



### WA Government

Lead Agency Support  
Future Battery Industry CRC  
Supporting downstream processing.



### WA EPA

Environmental approvals  
Constructive consultation



### APA

Gas transportation agreement  
Lower gas transportation costs; access to emerging Perth Basin gas fields.



### FLSmidth

Equipment vendor engagement  
Kiln supply agreement executed.



Ongoing market engagement for product offtake / funding options  
CNMNC, LE System, Shaanxi Fengyuan, Big Power.



# A Brighter Future is Right Here



## Globally Significant

project with outstanding economics located in a Tier 1 jurisdiction

## Strategic Investor

RCF VII with long-term focus on supporting project development

## Critical Metals

to deliver critical green minerals that support a cleaner future

## Delivering

on project development underpinned by high quality technical work

## Team in place

focused on a development strategy to maximise shareholder value

## Stable

operating environment with excellent infrastructure and access



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## Come visit us at Booth 18

**Ian Prentice**  
Managing Director


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