Australian VANADIUM LIMITED

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MARCH 2023

Paydirt Battery Minerals Conference

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ASX CHAPTER 5 COMPLIANCE AND CAUTIONARY AND FORWARD-LOOKING STATEMENTS

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ASX Listing Rules 5.19 and 5.23

ASX Listing Rule 5.19

The information in this Presentation relating to production targets, or forecast financial information derived from a production target, is extracted from the announcement titled "Bankable Feasibility Study for the Australian Vanadium Project" released to the ASX on 6 April 2022 which is available on the Company's website www.australianvanadium.com.au.

The Company confirms that all material assumptions underpinning the production target, or the forecast financial information derived from a production target, in the original market announcement continue to apply and have not materially changed.

ASX Listing Rule 5.23

The information in this Presentation relating to exploration results and mineral resource and ore reserve estimates for the Australian Vanadium Project is extracted from the announcement titled "Bankable Feasibility Study for the Australian Vanadium Project" released to the ASX on 6 April 2022 which is available on the Company's website www.australianvanadium.com.au.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement, and that all material assumptions and technical parameters underpinning the estimates in the original market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the competent person's findings are presented have not been materially modified from the original market announcement.

Forward Looking Statements

This Presentation may contain certain forward-looking statements with respect to matters including but not limited to the financial condition, results of operations and business of AVL and certain of the plans and objectives of AVL with respect to these items. These forward-looking statements are not historical facts but rather are based on AVL's current expectations, estimates and projections about the industry in which AVL operates and its beliefs and assumptions.

Words such as "anticipates," "considers," "expects," "intends," "plans," "believes," "seeks," "estimates", "guidance" and similar expressions are intended to identify forward looking statements and should be considered an at-risk statement. Such statements are subject to certain risks and uncertainties, particularly those risks or uncertainties inherent in the industry in which AVL operates.

These statements are not guarantees of future performance and are subject to known and unknown risks, uncertainties, and other factors, some of which are beyond the control of AVL, are difficult to predict and could cause actual results to differ materially from those expressed or forecasted in the forward-looking statements. Such risks include, but are not limited to resource risk, metal price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks in the countries and states in which we sell our product to, and government regulation and judicial outcomes. For more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other filings.

AVL cautions shareholders and prospective shareholders not to place undue reliance on these forward-looking statements, which relate only to events as of the date on which the statements are made.

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Why Vanadium? Industrial, critical, and (battery metal)[2]

Steel Alloy: Growth Market

Industrial Metal

- Increased use of vanadium alloyed steels is a force multiplier in reducing carbon footprint
- 20 years of continuous demand growth, set to accelerate as higher specific V use continues to increase

Quality of Life: Growth Market

Critical Metal

- Vanadium contributes to sustaining and improving our quality of life. It is used extensively **in aerospace, defence and chemical catalysts**
- Over 75% of global vanadium supply currently sourced from China, Russia, and South Africa
- There is a case to diversify supply chains toward stable, ESG credentialled jurisdictions

Energy Storage: Growth Market

Battery Metal (Horizon 1 VRFBs)

- Vanadium redox flow batteries (VRFBs) are a mature and proven technology ideally positioned to meet demand for long duration storage.
- 2% of V market historically, expected to be >10% in 2023
- More VRFB capacity has been commissioned in the last 12 months than the entire prior 40 year history of VRFB technology combined

Innovation: Future Upside

Battery Metal (Horizon 2 Lithium-ion)

- Multiple advanced pre-commercialisation technologies showing significant economic and technical merits of **vanadium use in lithium-ion cathodes and anodes**
- Potential to improve Li-ion batteries including energy density, charge rate, cycling, and safety
- Vanadium use in solid state lithium metal batteries is another exciting application for vanadium under research

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Vanadium – consensus on demand growth

CRU

Vanadium demand to **double by 2032**, with more than 90% of this growth from Vanadium Redox Flow Batteries (VRFBs).

PROJECT BLUE
CRITICAL MATERIALS AND ENERGY TRANSITION INTELLIGENCE

VRFBs will **fundamentally restructure** the vanadium supply chain.

Wood Mackenzie

Massive growth in batteries will **stress supply**.

'Assuming even modest growth in vanadium consumption in energy storage applications, the industry will be **challenged to meet surging demand** in the coming decade.'
TTP Squared

eResearch

Currently, it is estimated that the VRFB market only accounts for 3%-5% of vanadium production but the continued shift to renewable energy solutions could trigger a surge in vanadium demand and account for **20% of vanadium consumption by 2030**.

Sources: Stockhead, TTP Squared, Project Blue, eResearch, Wood Mackenzie

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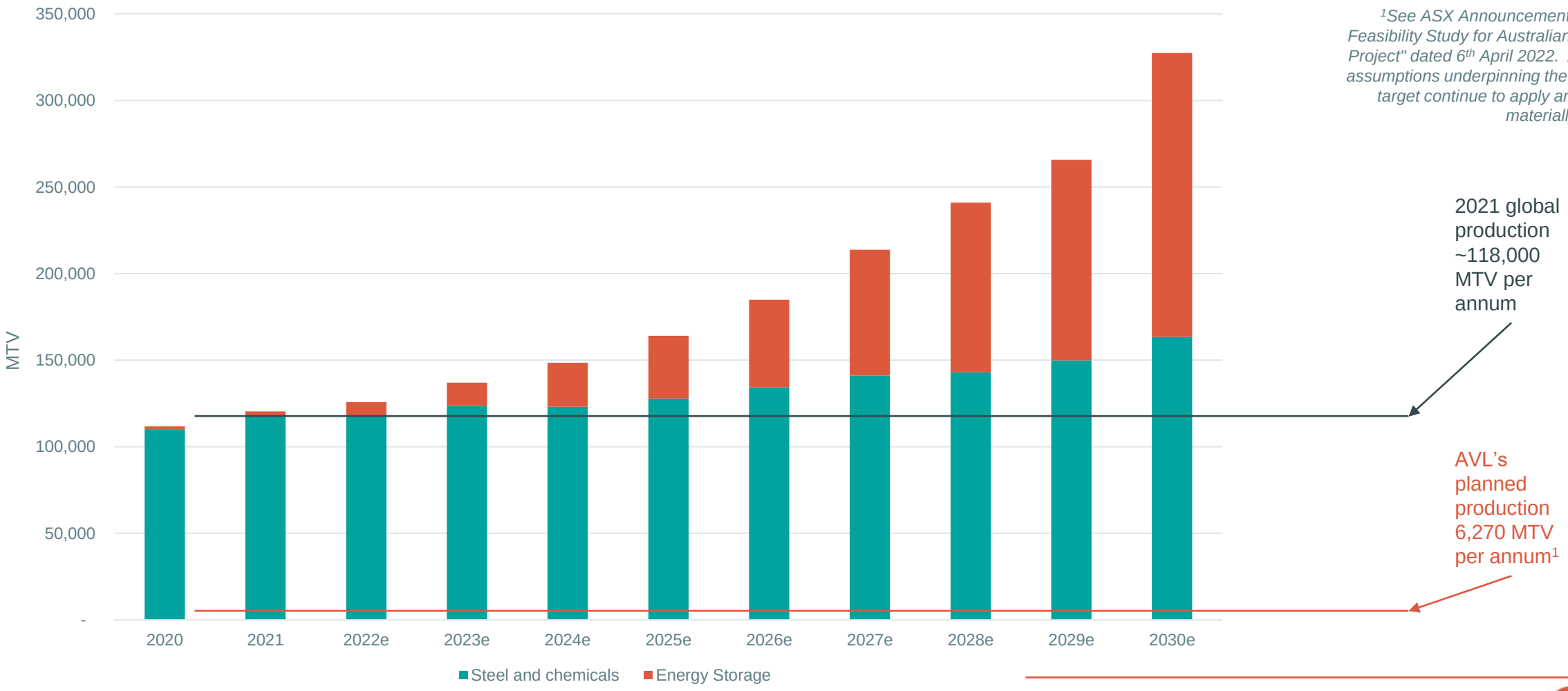
VANADIUM MARKETS

Industrial metal and battery metal demand growth



[1]See ASX Announcement "Bankable Feasibility Study for Australian Vanadium Project" dated 6th April 2022. All material assumptions underpinning the production target continue to apply and have not materially changed.

Source – US based vanadium market specialist: TTP Squared, Inc

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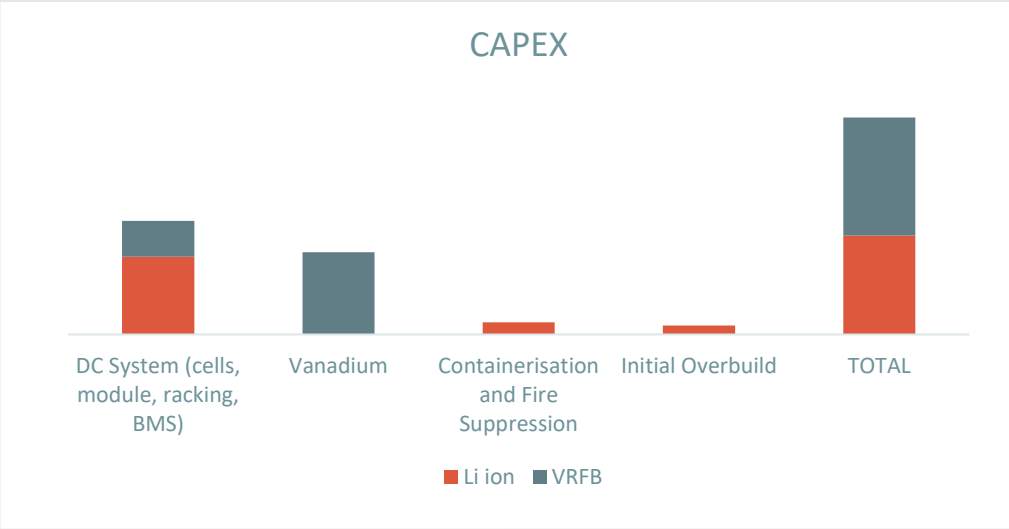
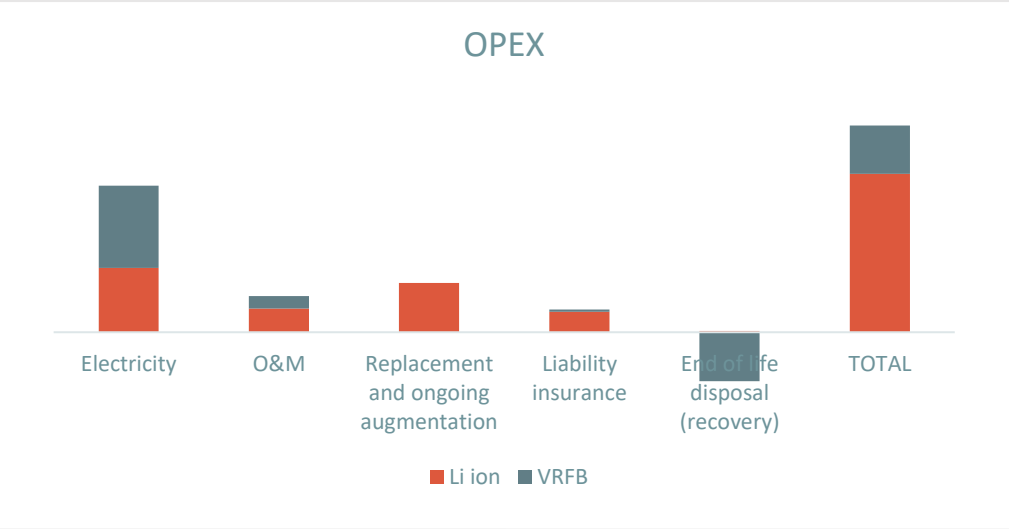
VRFB: Technical merit

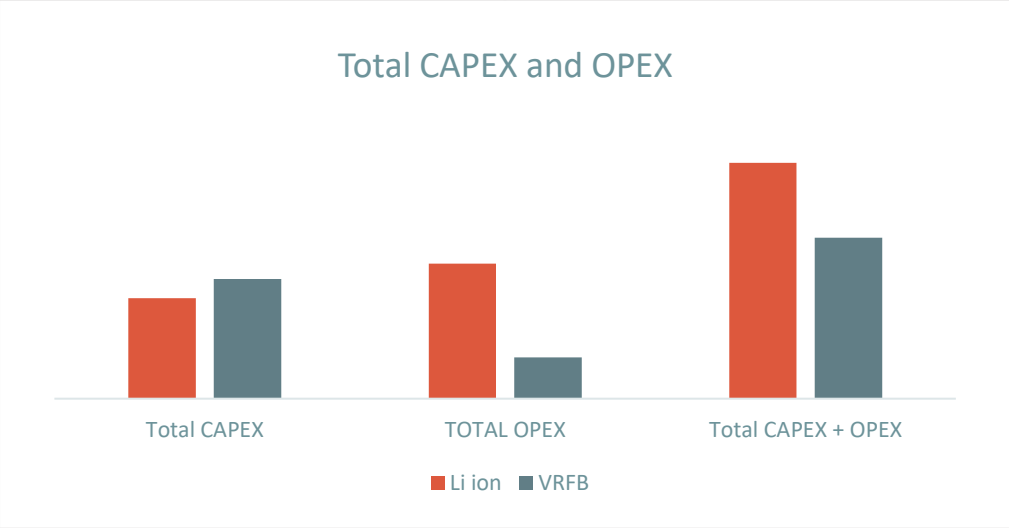
- Long duration
- **Easy to scale** power and energy separately
- Lifespan over 20 years with little to **no degradation in performance** over time
- **Non-flammable** making it one of the safest and most stable battery chemistries
- Multiple daily cycles, with **100% depth of discharge** available
- Vanadium electrolyte can be **reused indefinitely** or recycled for use in steel market

VRFB: Financial merit

Example cost comparison for VRFB vs Lithium-ion 3MW / 24MWh (8 hour) system over 20-year lifespan







Source 2023 – US based vanadium market specialist: TTP Squared, Inc

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Vanadium in lithium-ion (Energy Storage, Growth Horizon 2)

- **Vanadium is an ideal candidate for use in lithium-ion batteries due to unique properties and scalability**
- Vanadium known for decades to improve lithium-ion performance, but earlier use impacted cycle life.
- Multiple promising technologies (eg Dimien-cathode, Tyfast-anode) claim to overcome past challenges
- Opportunity to substantially reduce the cost of lithium-ion cathodes, improve energy density, charge times, cycling, safety
- Vanadium is also considered an important ingredient in lithium metal batteries (eg Pure Lithium)

	High Nickel (NMC/NMA)	Iron Phosphate (LFP)	Dimien (z-V_2O_5)
Cost/kWh	-	✓	✓
Energy Density	✓	-	✓
Safety	-	✓	✓
Cycle Life	-	✓	✓
Fast Charge	X	X	✓
Secure Supply	X	✓	✓
Future Proof	-	-	✓
Add'l cost down	X	X	✓

TYFAST Dimien BELENOS Clean Power Holding Ltd PURE LITHIUM

Sources – 'V Market Data', TTP Squared, Inc, https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/battery-2030-resilient-sustainable-and-circular, Company websites, Interview with Joe Lowry 26/2/23

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Why AVL?

Track Record

- Track record in raising capital and securing significant government grants to fund and build value in the company.

Asset & Scalability

- **25+ years mine life**, **competitive C1 OPEX**
- **Hub Processing Configuration**: built for scalability
- **Scalable Infrastructure**: gas and logistics
- **Scalable Feed**: proximal to 1B tonnes similar ore types
- **Premium mining & processing jurisdiction**: Western Australia

Vertical Integration

- Industry leading product quality, LoM
- True “Pit to Battery” integration optionality

Green Lights

- A recent, comprehensive BFS, advanced approvals status
- Strong relationships: $49M MMI-C Federal Government Grant (Multiple Grants, Major Project Status), Critical Minerals Office Austrade; State Government (Lead Agency Status)
- One of the most advanced undeveloped vanadium projects in the world
- Positioned with early mover advantage and supplier of choice status in the battery market.

Ethically Sourced

- Distinctive ability to produce an ethical, low carbon product

Collective Expertise

- Technical team in place from inception of asset development strategy
- Commodity experience in board, executive, and technical teams

Quality of Board and AVL Team

- A future-proofed board with the right skillsets to finance, build, and operate the project and grow a globally relevant company in this commodity
- A team that can deliver with proven technical and commercial track record in vanadium, project development, operations

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A TEAM THAT CAN DELIVER

International vanadium expertise
Track record in project execution and operations

Board

Cliff Lawrenson
Non-Executive Director

Experienced Chair with extensive executive career in resources, energy, infrastructure and investment banking.

Vincent Algar
Managing Director

Mining, exploration, project development, mining services and management of publicly listed companies.

Daniel Harris
Non-executive Director

Over 40 years of **vanadium experience** including executive leadership of global vanadium companies, and operations.

Miriam Stanborough
Non-Executive Director

Over 20 years of experience in mineral processing, research, operations, technology & innovation. Roles with Monadelphous, Iluka, Alcoa and WMC.

Peter Watson
Non-Executive Director

40 years of experience in senior technical, project and management roles, executive experience running ASX-listed companies.

Executive Team

Graham Arvidson
Chief Executive Officer

Mineral sector experience spans **vanadium** and lithium project development and operations.

Todd Richardson
Chief Operating Officer

Over 20 years of **experience in the vanadium sector** and an expert in vanadium process design, commissioning and operations.

Louis Mostert
Chief Legal and Commercial Officer

20 years of experience in project contracting and finance, corporate advisory, mergers and acquisitions.

Liesl Strachan
Chief Financial Officer

More than 15 years of financial experience in the resources sector, both in Australia and the UK.

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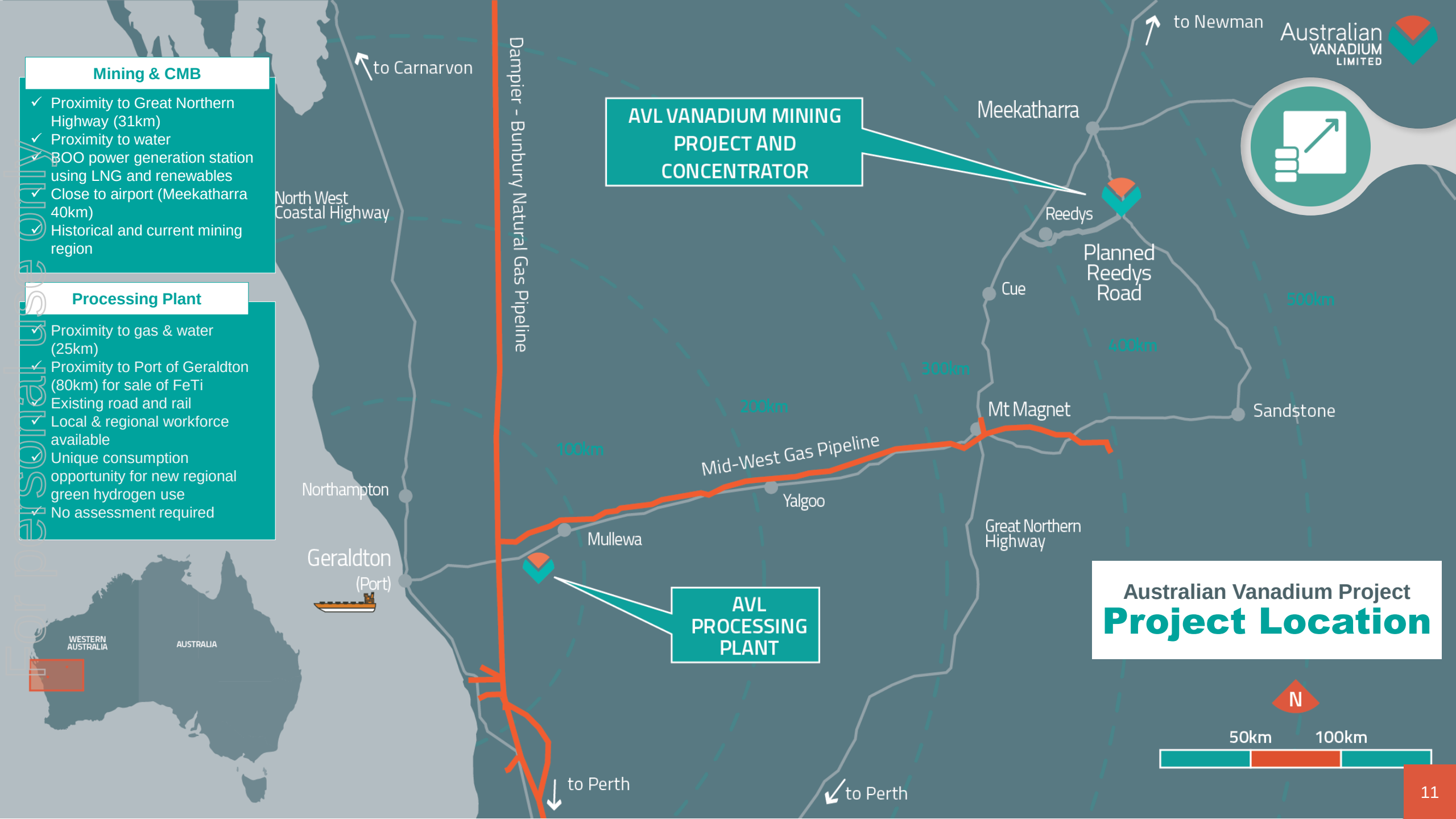
Mining & CMB

- ✓ Proximity to Great Northern Highway (31km)
- ✓ Proximity to water
- ✓ BOO power generation station using LNG and renewables
- ✓ Close to airport (Meekatharra 40km)
- ✓ Historical and current mining region

Processing Plant

- ✓ Proximity to gas & water (25km)
- ✓ Proximity to Port of Geraldton (80km) for sale of FeTi
- ✓ Existing road and rail
- ✓ Local & regional workforce available
- ✓ Unique consumption opportunity for new regional green hydrogen use
- ✓ No assessment required



Australian Vanadium Project

Project Location

Australian Vanadium Project
BFS – Robust Project Metrics

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RESOURCE

Total Resource

239Mt @ 0.73% V_2O_5

High-grade 95.6Mt @ 1.07 V_2O_5

Ore Reserve

30.9Mt @ 1.09 V_2O_5

Proved 10.5Mt @1.11% V_2O_5
Probable 20.4Mt @V_2O_5

25+ years

mine life

STRONG FINANCIAL OUTCOMES

Pre-Tax $NPV_{7.5}$

A$833M

IRR

20.6%

EBITDA Annual Average

A$175M

EBITDA Project

A$4.4B

NPAT Project

A$2.2B

OPEX, CAPEX, PRODUCTS

C1 OPEX

US$4.43/lb V_2O_5

PRE-PRODUCTION CAPEX US$435M

ANNUAL V PRODUCTION

11,200t V_2O_5 (6,270 MTV)

LoM V_2O_5 Grade 99.5%

FeTi Coproduct

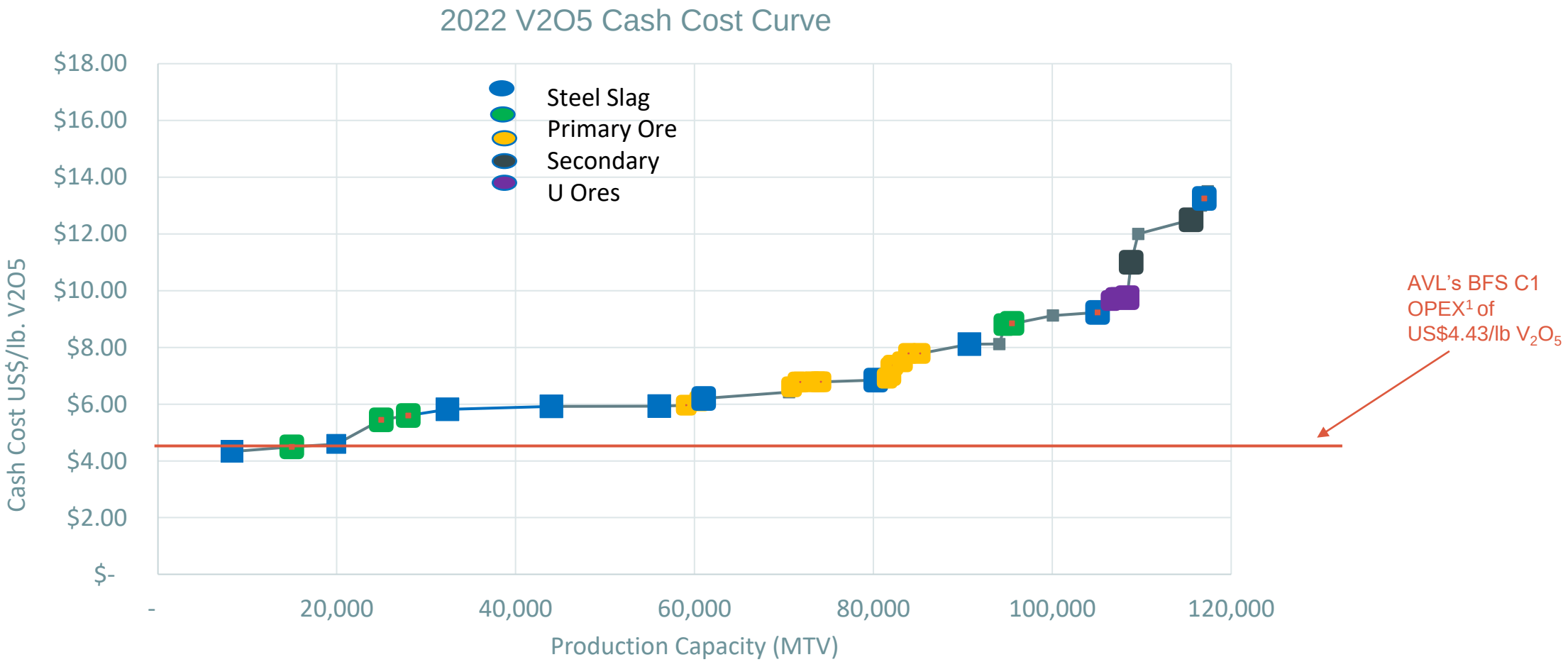
900,000tpa

Note: Information within this slide as detailed in ASX Announcement "Bankable Feasibility Study for Australian Vanadium Project" dated 6th April 2022. All material assumptions underpinning the production target and forecast financial information derived from a production target continue to apply and have not materially changed

Note: MTV = metric tonnes vanadium

Supply curve – AVL Project well positioned

"The cash cost of the last incremental units required to satiate demand in 2022 is above US$12.00/lb V_2O_5" – TTP Squared



Source: TTP Squared, inc.

[1]*See ASX Announcement "Bankable Feasibility Study for Australian Vanadium Project" dated 6th April 2022. All material assumptions underpinning continue to apply and have not materially changed.*

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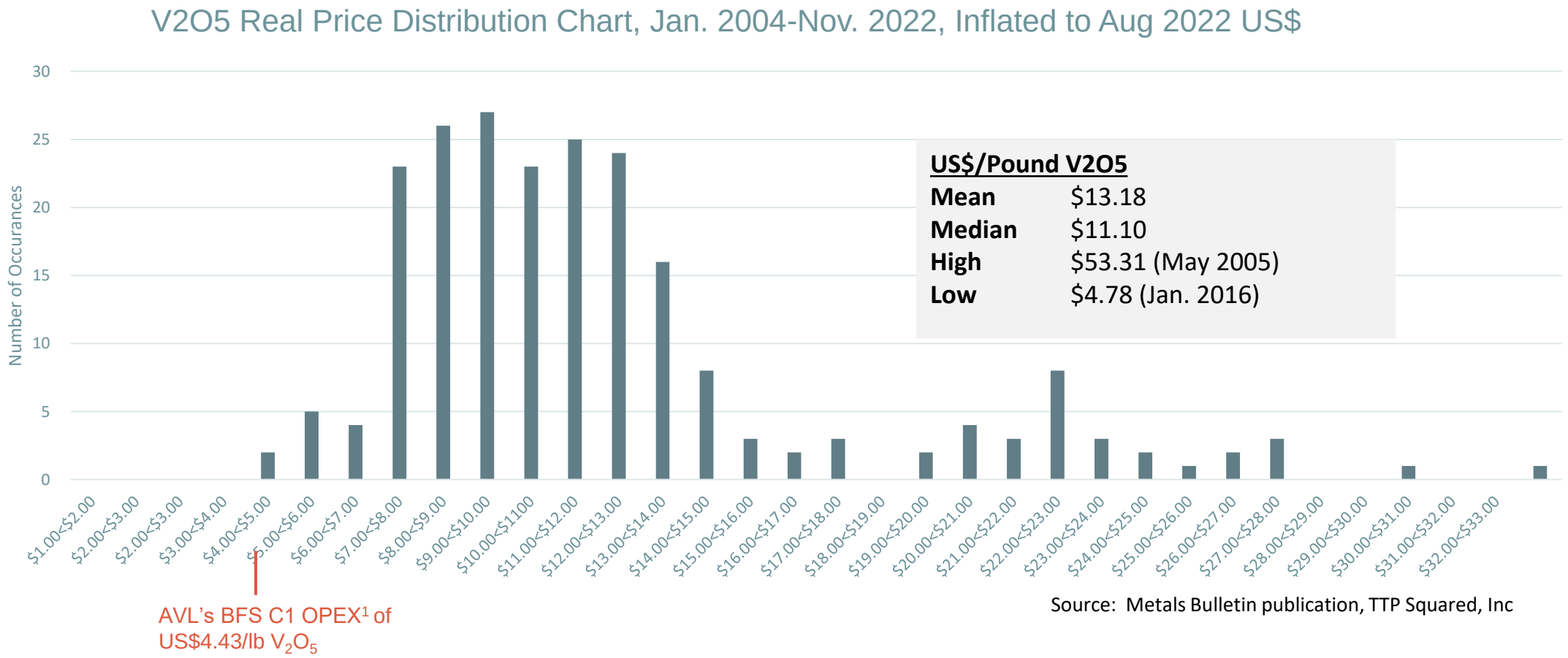
Historical pricing – AVL Project well positioned

"Long term inflated V_2O_5 historical prices are in the range of US$9.00-$12.00/lb V_2O_5" – TTP Squared



Source: Metals Bulletin publication, TTP Squared, Inc

[1]See ASX Announcement "Bankable Feasibility Study for Australian Vanadium Project" dated 6th April 2022. All material assumptions underpinning continue to apply and have not materially changed.

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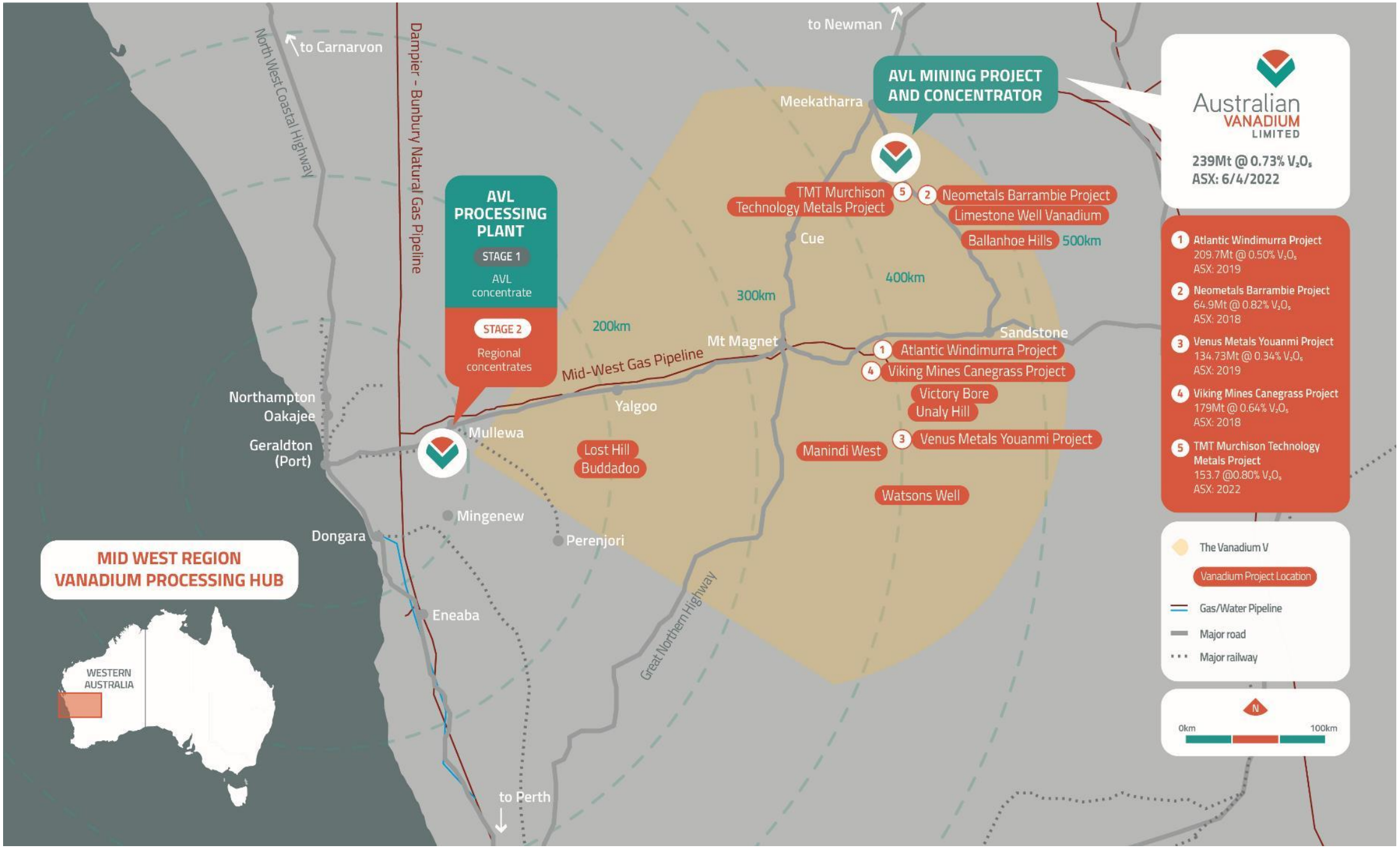

AUSTRALIAN VANADIUM PROJECT

Project Delivery Path

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01
BFS Completed

Bankable Feasibility Study undertaken at a high level of technical and financial detail to enable full scrutiny by debt and equity investors

02
Final Investment Decision

Securing debt financing from government and commercial lenders, complete binding product offtake agreements

03
EPC/EPCM Partnerships

Selection of EPC/EPCM contractors through early engagement with established Tier1 engineering and construction groups

04
Financial Close and Construction

Execute FEED, procure equipment and commence construction during 2024

05
Production

Australian Vanadium Limited's next phase of journey as the world's fourth primary vanadium producer to commence 2025

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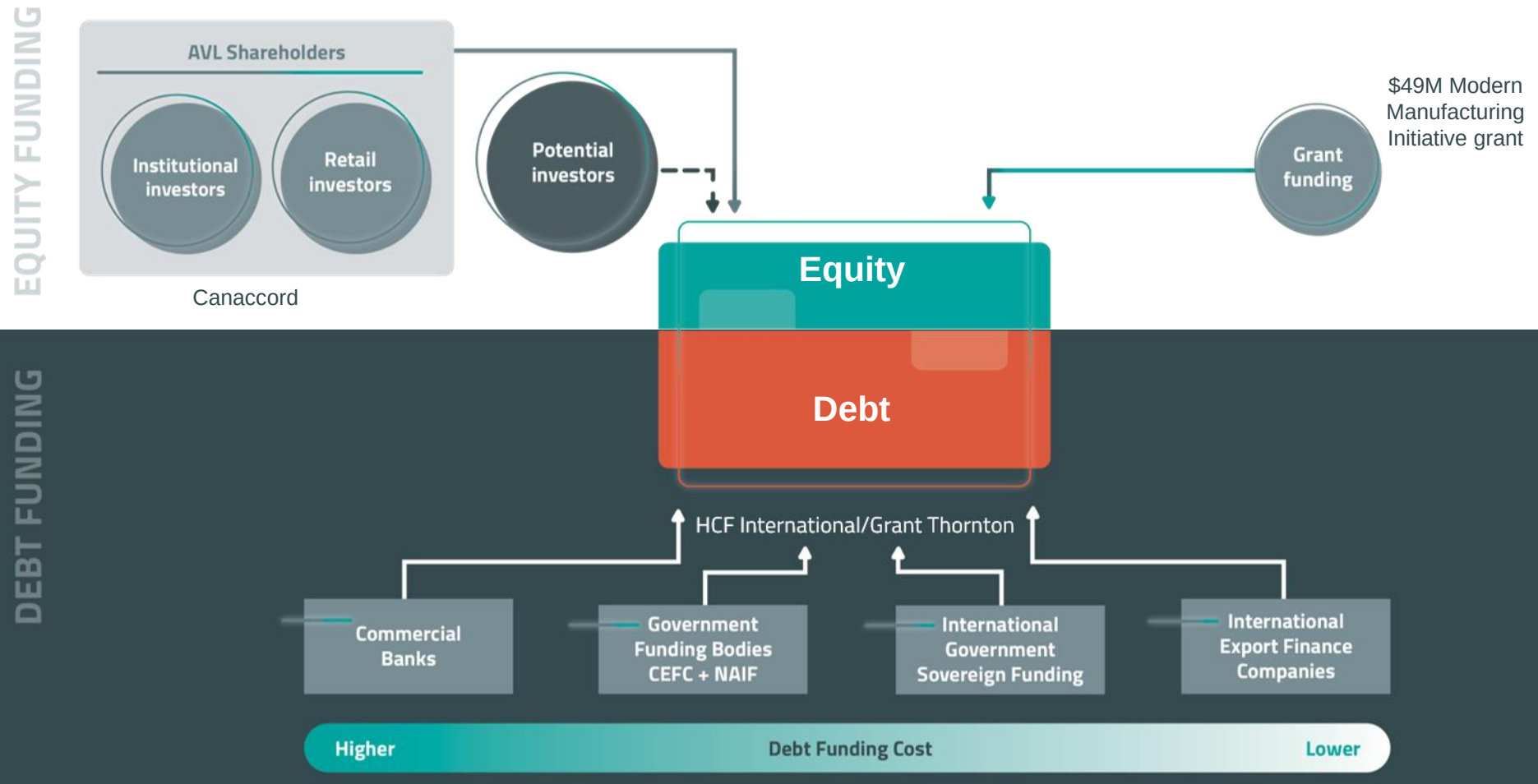
Funding model



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ESG IN ACTION

Strong ESG Focus

Renewable energy strategy

- Ability to produce ethical, low carbon vanadium product, expecting to be 50% lower carbon intensity per unit of vanadium than existing co-production vanadium producers[1]
- Use of solar and/or wind generation
- Use of VRFBs for energy storage
- Collaboration with ATCO for use of green hydrogen into the natural gas supply at the processing plant through ATCO collaboration
- Exploring use of electric or green hydrogen fuelled vehicles onsite and for haulage

Community relationships

- Workforce participation opportunities for Yugunga-Nya traditional owners
- Regional Engagement Manager based in Geraldton
- Sponsorship of awards and scholarships at Central Regional TAFE
- Mullewa community sponsorship
- Stephen Michael Foundation and Shooting Stars sponsorship

Governance

- Developing ESG reporting structure aligned to the developing ISSB framework through application of SASB, TCFD, and GRI reporting structures
- Experienced and competent Board of Directors
- Long term engagement with Environmental Protection Agency
- Organisational culture

[1]Source: AVL internal benchmarking, public information from co-producers

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Vertical Integration

Pit to Battery

Vertical integration optionality can give AVL the ability to produce the world's highest quality vanadium products tailored to our customers' needs from steel (low purity requirements) through to speciality chemicals (ultra high purity).

In addition to production, AVL will seek to participate economically in the vanadium value chain through partnerships and joint ventures

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VSUN Energy: Current Projects Overview

VSUN Energy is a 100% owned subsidiary of ASX-listed Australian Vanadium Limited (ASX: AVL)

Current Projects

- **Water Corporation** – successful completion of trial of a 5kW/30kWh vanadium redox flow battery (VRFB) to power a chlorinator.
- **IGO (ASX: IGO)** – installation of an 80kW/300kWh VRFB standalone power system (SPS) to provide power to a bore pump at the Nova Nickel Operation (pictured right, currently being tested in Perth).
- **Priest Bros Orchard**, Victoria – installation of a 20kW/80kWh VRFB.
- Consultancy work for major mining clients underway
- Tender applications underway
- Well positioned to position in a significant future pipeline

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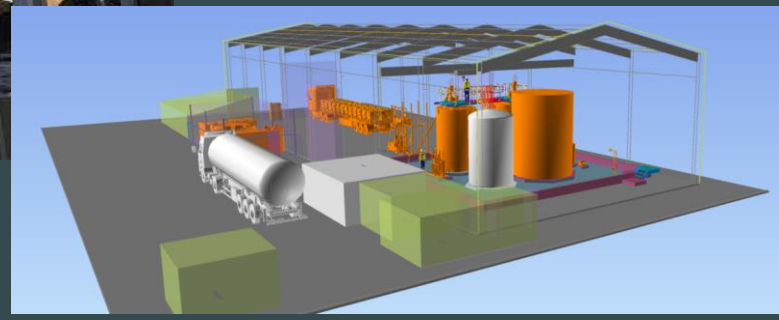
Vanadium Electrolyte Project Update

- 33MWh per annum electrolyte plant under development
- AVL to be an early mover in electrolyte manufacture in Australia
- Location secured in Perth, Western Australia
- Detailed design complete
- Long lead equipment ordered
- Utilises proven US Vanadium technology

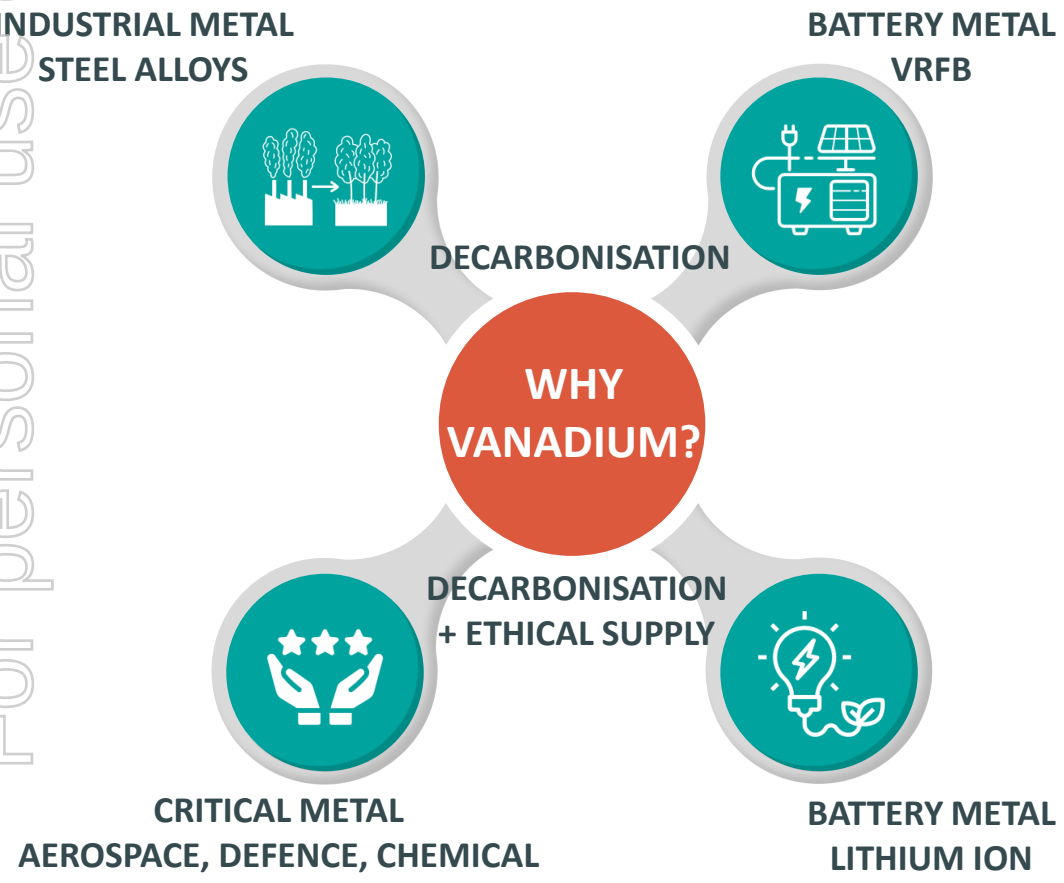
U.S. Vanadium LLC electrolyte plant in Arkansas, US

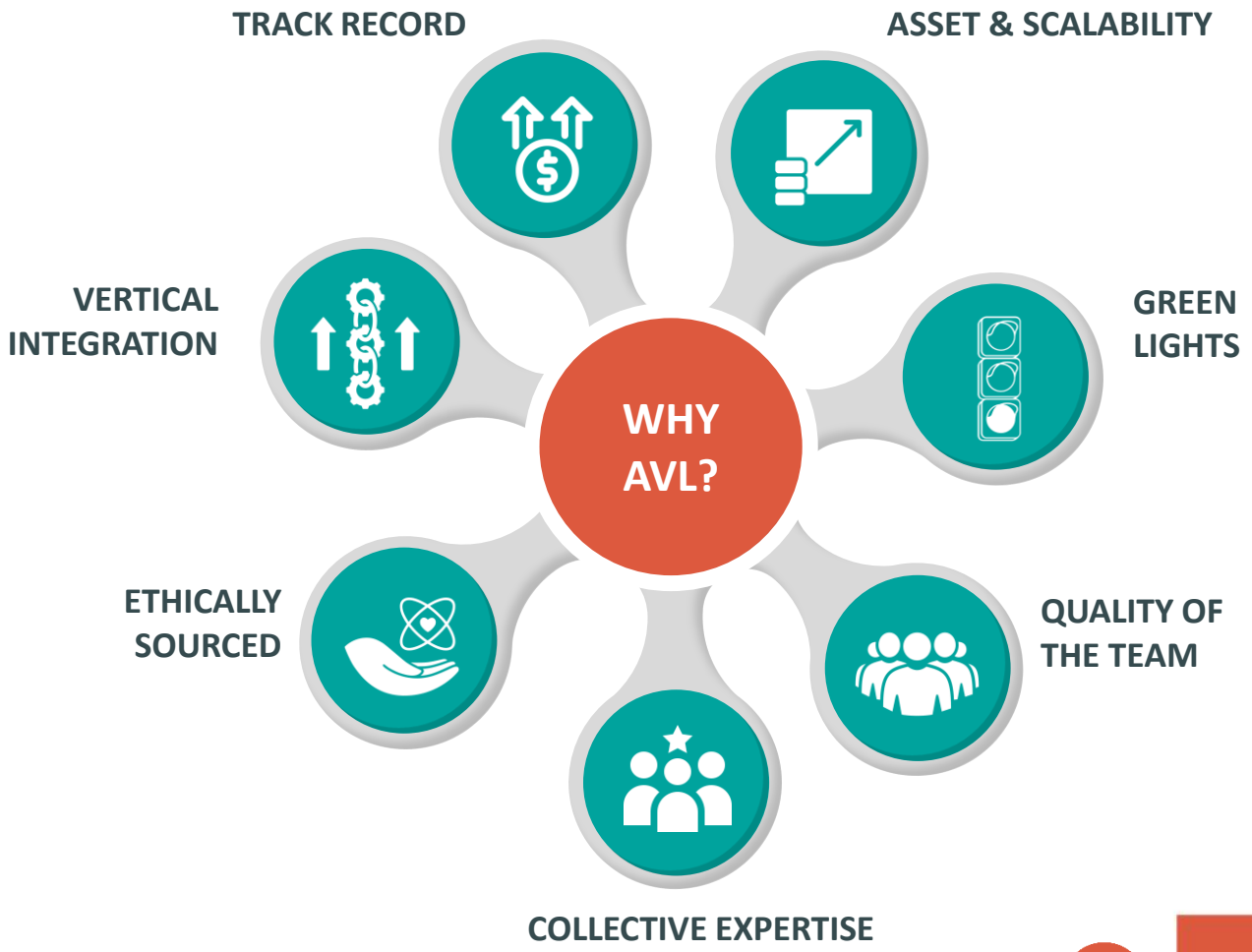


US VANADIUM

VANADIUM ELECTROLYTE MANUFACTURE

In Summary
Why Vanadium, and why AVL?





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Australian VANADIUM LIMITED

+61 (08) 9321 5594
info@australianvanadium.com.au

Level 2, 50 Kings Park Road, West Perth,
Western Australia 6005

australianvanadium.com.au