#### **ASX ANNOUNCEMENT**

#### **21 NOVEMBER 2024**

### ANNUAL GENERAL MEETING CHAIR ADDRESS

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to provide the Chair's Address to be read at the Company's Annual General Meeting today.

Good afternoon and welcome to Australian Vanadium Limited's 2024 Annual General Meeting.

Firstly, I would like to acknowledge the Traditional Custodians of the land we are meeting on today, the Whadjuk People of the Noongar nation. We acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region. We also acknowledge the Yugunga-Nya People, the Traditional Owners of the land where our planned mine site will be located, and the Mullewa Wadjari People of the Yamatji Nation, the Traditional Owners of the land where our proposed processing plant will be located.

FY2024 saw AVL make considerable progress across our strategy of progressing our Australian Vanadium Project (Project) towards production and expanding our downstream VSUN Energy battery business activities.

#### Unlocking value via the merger with TMT

A pivotal moment in FY2024 was our successful merger with Technology Metals Australia Limited (TMT), which resulted in the consolidation of two adjoining projects across one orebody to unlock material benefits for all shareholders. This has accelerated our journey to become a global leader in the vanadium supply chain. We welcomed Jo Gaines onto our Board from TMT, expanding the skillset of the Board with her valuable contributions, particularly in relation to our work with government and obtaining approvals for the Project.

Our priority after the merger was to consolidate AVL and TMT's adjoining project with an Optimised Feasibility Study (OFS). We have made substantial progress with this work and the first phase delivered significant outcomes. We are excited to progress into the next phase.

### A renewables based energy transition requires both electricity generation and matched energy storage

As the global energy transition towards decarbonisation and electrification accelerates, AVL is in an exciting and unique position to generate significant shareholder value via our exposure across all facets of the vanadium value chain.



The increasing adoption of renewable energy is reducing the historic reliance on coal and gas for base load power generation during daylight hours. However, due to the intermittent nature of renewables, ensuring a continuous supply of clean energy remains a challenge. As renewable generation expands, the demand for utility-scale, long-duration energy storage solutions will only continue to grow.

Vanadium flow batteries (VFBs) are a proven technology providing energy storage over a 4 to 12+ hour time frame, with minimal degradation in performance over an asset life of more than 30 years. China is already driving a move to VFB energy storage, with over 20GWh of VFB projects approved or under construction. By the end of 2025, VFBs are forecast to account for 15-20% of China's installed battery storage capacity.

In Australia, the National Battery Strategy that was recently announced by the Federal Government recognises the critical importance of energy storage to Australia's energy transition. The strategy highlights that over 43GW of energy storage will be required in the Australian grid by 2040 and VFBs are expected to contribute meaningfully to that capacity.

The National Battery Strategy also provides access to funding to help accelerate the rollout of battery storage, and AVL is actively pursuing strategies to access that funding.

#### AVL's multi-pronged strategy

As a business, we have developed strategies to generate value across the vanadium supply chain. Our 100% owned subsidiary, VSUN Energy, has the capabilities and relationships with battery and equipment partners to deliver total energy storage solutions. VSUN Energy continues to expand its profile in the domestic market with several VFB deployments. The Company remains in ongoing discussions regarding several partnering opportunities with energy offtakers, technology providers and financial partners for VSUN Energy to develop and deploy a range of VFB storage solutions.

During the year, we completed the construction of Western Australia's first vanadium electrolyte manufacturing facility, which is a significant achievement for the Company, facilitating its 'pit to battery' strategy. Construction and subsequent operation of the facility demonstrates AVL's technical capabilities and ensures that the Company remains engaged with downstream aspects of the vanadium and VFB markets.

AVL's ability to compete in the downstream sector of the VFB value chain is underpinned by the quality of AVL's 100% owned Australian Vanadium Project in Western Australia. The Project's scale and its location in a stable jurisdiction ensure that it is uniquely positioned to satisfy the growing demand for vanadium both domestically and internationally. It is one of the most advanced vanadium development projects globally, and it is expected to be construction ready at the right time to match the surging demand for vanadium in VFBs.



With a large global and domestic opportunity for long duration energy storage, AVL's multi-pronged strategic focus allows us to capture value across the vanadium supply chain, creating clear value opportunities for our shareholders.

#### Our People

The success of the AVL business includes the health, safety and well-being of all team members. AVL continues to develop its processes and culture to ensure a safe, diverse and inclusive workplace.

AVL continues to build a team with world leading expertise across the full vanadium value chain, from mining through processing, electrolyte production, battery systems and into energy markets.

We have built an exceptional team at AVL, led by our CEO Graham Arvidson, and I am proud to Chair such a talented and dedicated group of people. I would like to take this opportunity to thank all our staff and contractors for their dedication and commitment to safety during the year.

#### **Sustainability**

The Board, management and staff of AVL remain committed to the principle of sustainable development. We will continue to develop our environmental, social and governance (ESG) policies, procedures and goals and ensure that our reporting framework aligns with global industry best practice.

AVL is committed to working ethically and with respect for the environment and society to create sustainable results for all our stakeholders. Embedding ESG philosophies into the Company's approach to the design, construction and operation of the Australian Vanadium Project and VSUN Energy's battery projects is paramount to its success.

The Company strives to deliver tangible outcomes and to genuinely live its values of Safety, Integrity, Excellence, Respect, Collaboration and Honesty.

#### Outlook

With the growing opportunity for vanadium flow batteries generated by the need for long duration energy storage, AVL is uniquely positioned as a vertically integrated business to generate value across the vanadium supply chain.

I would like to thank all of our stakeholders, including the TMT shareholders who joined us this year, for your continued support of our Company and I look forward to updating all of you as we continue to progress the Project to production and expand our presence in the downstream VFB sector.

#### **Cliff Lawrenson**

**Chair of the Board** 



This announcement has been approved in accordance with the Company's published continuous disclosure policy and has been approved by the Board.

#### ABOUT AUSTRALIAN VANADIUM LTD

AVL is a resource company focused on vanadium, seeking to offer investors a unique exposure to all aspects of the vanadium value chain – from resource through to steel and energy storage opportunities. AVL is advancing the development of its world-class Australian Vanadium Project at Gabanintha. The Australian Vanadium Project is one of the most advanced vanadium projects being developed globally, with 395.4Mt at 0.77% vanadium pentoxide ( $V_2O_5$ ), containing a high-grade zone of 173.2Mt at 1.09%  $V_2O_5$ , reported in compliance with the JORC Code 2012 (see ASX announcement dated 7 May 2024 '39% Increase in High Grade Measured and Indicated Mineral Resource').

VSUN Energy is AVL's 100% owned renewable energy and energy storage subsidiary which is focused on developing the Australian market for vanadium flow batteries for long duration energy storage. VSUN Energy was set up in 2016 and is widely respected for its VFB expertise. AVL's vertical integration strategy incorporates processing vanadium to high purity, manufacturing vanadium electrolyte and working with VSUN Energy as it develops projects based on renewable energy generation and VFB energy storage.



#### **MINERAL RESOURCE ESTIMATE**

The Australian Vanadium Project – Mineral Resource estimate by domain and resource classification using a nominal  $0.4\% V_2O_5$  wireframed cut-off for low-grade and nominal  $0.7\% V_2O_5$  wireframed cut-off for high-grade (total numbers may not add up due to rounding).

Zone	Category	Mt	V <sub>2</sub> O <sub>5</sub> %	Fe %	TiO <sub>2</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %
	Measured	30.6	1.14	46.3	12.9	7.4	6.2
HG	Indicated	74.8	1.11	47.5	12.6	7.0	5.7
	Inferred	67.9	1.06	45.3	12.1	9.0	6.6
	Subtotal	173.2	1.09	46.5	12.5	7.8	6.1
IG	Indicated	61.8	0.55	26.1	7.1	26.6	16.3
LG	Inferred	142.5	0.48	24.9	6.6	28.9	15.2
	Subtotal	204.3	0.50	25.3	6.8	28.2	15.5
Transported	Inferred	17.9	0.65	31.0	7.3	24.1	14.4
	Subtotal	17.9	0.65	31.0	7.3	24.1	14.4
	Measured	30.6	1.13	46.3	12.9	7.4	6.2
Total	Indicated	136.6	0.85	37.8	10.1	15.8	10.5
	Inferred	228.2	0.66	31.4	8.3	22.6	12.6
	Subtotal	395.4	0.77	34.8	9.3	19.1	11.4

Note: Totals may not add up due to rounding



### ASX CHAPTER 5 COMPLIANCE AND CAUTIONARY AND FORWARD-LOOKING STATEMENTS

#### ASX Listing Rule 5.23

The information in this announcement relating to mineral resource estimates for the Australian Vanadium Project is extracted from the announcement entitled '39% Increase in High Grade Measured and Indicated Mineral Resource' released to the ASX on 7 May 2024. The relevant announcement is available on the Company's website <u>www.avl.au</u>.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements, 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 announcements.

#### **Forward-Looking Statements**

This release 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 reflect the view of AVL only as of the date of this release.

The forward-looking statements made in this announcement relate only to events as of the date on which the statements are made.

AVL will not undertake any obligation to release publicly any revisions or updates to these forwardlooking statements to reflect events, circumstances or unanticipated events occurring after the date of this announcement except as required by law or by any appropriate regulatory authority.



## **Annual General Meeting**

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November 2024

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### **Compliance & Cautionary Forward-looking Statements**

The views expressed in this Presentation contain information derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information.

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### FY24 in review



FY24 saw AVL make considerable progress across our dual strategy of progressing the Australian Vanadium Project towards production and expanding our downstream VSUN Energy VFB battery business



#### Upstream

#### **Completed TMT Merger**

**Commenced Optimised Feasibility** Study Delivered updated Mineral Resource<sup>1</sup> of 395.4Mt at 0.77%  $V_2O_5$ , with a high-grade domain of 173.2Mt at  $1.09\% V_2O_5$ 

Decision to locate processing plant near Geraldton

Continued to access Federal Government Grant with second progress payment of \$14.7m received in June 2024



### **Midstream**

- Completed construction of Western  $| \sqrt{|}$ Australia's first vanadium electrolyte manufacturing facility
- First commercial production of  $\square$ vanadium electrolyte
- $\square$ AVL electrolyte utilised in Invinity Energy Systems VFB for Horizon Power
- $\overline{\mathbf{N}}$ Electrolyte plant demonstrates AVL's technical capabilities and engages AVL with downstream aspects of VFB markets



**Downstream** 

- Commissioning of vanadium flow  $|\sqrt{|}$ battery (VFB) with ASX-100-listed miner IGO Limited's Nova Nickel operation
- Site commissioning of VFB in  $\square$ Kununurra with utility Horizon Power
- Announcement of Project Lumina,  $\square$ VSUN Energy's large scale battery strategy

1. See ASX announcement dated 7 May 2024 '39% Increase in HG Measured and Indicated Mineral Resource

## Unlocking competitive advantage: AVL's energy storage investment platform

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# A renewables-based energy transition requires both electricity generation AND matched energy storage

- There is enormous effort and spend on electricity generation – too little on energy storage despite ambitious decarbonisation targets from State and Federal Governments
- Vanadium flow batteries provide a proven, economic solution for utility scale energy storage
- The value of vanadium in a flow battery provides AVL with an **unparalleled** opportunity for value creation



#### Metal contribution to supply chain value

Indicative only. Based on installed capex of total battery deployment Source: FBICRC Li-ion battery cathode manufacturing in Australia: A Scene Setting Project and AVL analysis





### Utility scale energy storage required – Victoria case study

8.6GW

Victoria recently set a new peak power demand record of Brown coal and wind provided the majority of supply

Victoria needs long duration energy storage to reduce the reliance on brown coal and achieve emission reduction targets

#### Winter operational demand – Victoria 15 July 2024



Source: Australian Energy Market Operator (AEMO)



### The VFB is a proven and commercialised technology at scale

VFBs are operational across 20+ countries



#### Sumitomo Electric Industries

15MW x 4 hour and 17MW x 3 hour VFB in Hokkaido, Japan

First operational since 2015, second since 2022

Services: frequency regulation, renewable generation smoothing

#### **Rongke Power**

100MW x 4 hour VFB in Dalian, China

Operational since 2022

Services: support grid stability, peak shaving, frequency regulation, renewable integration, black start, auxiliary power supply

#### **Sumitomo Electric Industries**

2MW x 4 hour VFB in San Diego, USA

Operational since 2017

Services: microgrid operation, peak shaving, renewable firming, market participation in energy and ancillary services

### VFB adoption in China is already at GWh scale Australia has all the right ingredients to be a fast follower





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### Project Lumina<sup>1</sup> – modular, turnkey, utility scale VFB

#### **Project Lumina - targeting deployment ready energy storage solution for utility scale long duration storage**

- Project Lumina is the detailed design of a modular, scalable, turnkey, utility-scale 100MW battery energy storage system using a vanadium flow battery (VFB BESS) on a 4-hour (100MW/400MWh) or 8-hour (100MW/800MWh) duration
- Potential to achieve a levelised cost of storage (LCOS) for a 4-hour 100MW VFB BESS of A\$274/MWh (± 30%) which is anticipated to be competitive with the LCOS of a similar lithium-ion BESS
- The intention of Phase 2 is for the Company and potential third-party investors to be able to make a final investment decision on utility scale VFB BESS solutions by VSUN Energy by Q3 CY2025
- Project Lumina will utilise well-established vanadium flow battery technology, optimised for local conditions, to de-risk the energy storage system
- AVL is considering a range of funding options, which are expected to include debt supported by strategic equity or cornerstone equity funding, including from Australian Government agencies

<sup>1</sup>Refer ASX announcement 'Realising AVL's utility scale vanadium flow battery strategy' dated 6 November 2024



Opportunity for vertical integration of AVL's business to capture margin across the supply chain



Align with proven VFB OEMs to reduce technical risk



Ability to scale business model in a market with growing demand for long duration energy storage



Potential to deploy in Build Own Operate business model

### **Project Lumina - Leveraging proven technology and specialist EPC and OEM partners to minimise technical risk**





#### Site Innastructure

Utilise local specialist EPC partners



### **Project Lumina – competitive LCOS unlocks benefits of VFB**

### Levelised Cost of Storage (LCOS)



#### **Benefits of Vanadium Flow Batteries**

With a competitive LCOS, the focus should shift to the competitive advantages of VFBs which include:

- $\checkmark$  Proven technology with a history of nearly 20 years of grid-connection
- $\checkmark$  Ability for multiple discharge cycles per day
- $\checkmark$  Operating life of a conventional VFB is estimated at 30+ years
- $\checkmark$  Ability to expand discharge duration to meet growing market requirements
- $\checkmark$  Non-degrading, ensuring installed capacity is available over the life of the BESS
- ✓ Non-flammable technology
- ✓ Capability for positive end of life environmental impact with over 99% of commercial end-of-life reuse and recyclability

1) See ASX announcement 'Realising AVL's utility scale vanadium flow battery strategy' dated 6 November 2024

2) Based on utility-scale battery without subsidies (100MW, 4-hour / 400MWh and 100MW, 8-hour / 800MWh compared to a 100MW, 4-hour / 400MWh lithium-ion battery).



### Positive outlook for longer duration energy storage



The Australian Energy Market Operator (AEMO) projects medium to long-duration energy storage capacity (excluding pumped hydro) to grow to 120 GWh by 2040

Annual increase of around 7 GWh over the next ~25 years



Implied average duration for AEMO's forecast storage capacity, excluding pumped hydro, is approximately 11 hours.



Vanadium flow batteries are a proven solution to address this growing demand

## NEM and WEM Deep and Medium Storage Forecasts 2024 to 2042



See ASX announcement 'Realising AVL's utility scale vanadium flow battery strategy' dated 6 November 2024



### **VSUN Energy - leveraging partners to accelerate deployment**



Clear and focussed strategy allows for rapid deployment of VFBs to meet demand



### Vertically integrated to generate value across the supply chain

	Upstream	Midstream	Downstream		
	Vanadium Mining and Processing	Electrolyte Manufacture	Utility scale BESS Solutions		
Asset	Australian Vanadium Project	Electrolyte manufacturing facility	VSUN Energy		
AVL advantage	High-grade project in Tier-1 jurisdiction	Established facility	Vertically integrated to deliver cost competitive VFB storage solutions		
	Optimised Feasibility Study	Producing battery grade	Project Lumina Targeting Deployment Readiness Q3 CY2025		
Status	progressing	vanadium electrolyte	Establishing key partnerships for accelerated growth		
	Australian		VSUN energy		



### **UPSTREAM** The world class Australian Vanadium Project unlocks our vertically integrated strategy



A world class asset located in Western Australia, a Tier-1 mining jurisdiction



Simple open pit mining with standard magnetite concentrator process



Proven processing technology that reduces project risk



Optimised Feasibility Study (OFS) underway, aimed at creating project with superior economics



Current focus on finalising remaining approvals, while securing offtake and funding





### MIDSTREAM Proven vanadium electrolyte manufacturing capacity

### AVL built, owns and operates a manufacturing facility in Perth, Western Australia, capable of commercial vanadium electrolyte production

- 33MWh per annum energy storage equivalent of vanadium electrolyte production
- First production completed in 2024
- First use of AVL's vanadium electrolyte in an Invinity Energy Systems battery for WA utility Horizon Power
- Qualification of electrolyte well advanced with VFB industry leaders
- Ability to scale and replicate facility to meet growing demand
- Ability to process 3<sup>rd</sup> party vanadium oxides to supply high quality electrolyte prior to AVL oxide production



### **DOWNSTREAM** VSUN Energy – engaging with mining and utility customers





#### Nova Nickel Operation (Western Australia)

Installation of a VFB to provide storage capacity to allow for carbon free electricity to be used 24/7 at the Nova Nickel operation, reducing their  $CO_2$  emissions as part of IGO's broader net-zero strategy.

*Status: Battery operational, standalone power system under final stages of commissioning* 

### **Horizon Power**



Australia

#### Kununurra (Western Australia)

Horizon Power, a utility owned by the Western Australia government, purchased a vanadium flow battery (VFB) to be installed at Kununurra as part of a long-duration energy storage project.

Status: Commissioned and operational



### **Progressing the project to production**



- Delivered
  - BFS completed (pre-merger basis)
  - Mining Leases approved
- $\square$  $\overline{\checkmark}$  $| \checkmark |$  $| \sqrt{|}$
- Completion of large-scale process plant pilot programs
- Australian Government grant agreement for up to \$49 million executed
- Merger to deliver project synergies
- **Combined Mineral Resource** Estimate update
- Project development strategy update
- Electrolyte production brought online

### **Next steps**

#### **AVL Project**

- Publish integrated Optimised Feasibility Study (OFS)
- Progress approvals including EPA and Traditional Owner agreement
- Finalise permitting of proposed Tenindewa processing hub site
- Progress discussions with Government debt and export finance agencies
- Secure bankable vanadium offtake including option for project finance
- Deliver final investment decision

#### **Downstream strategy**

- Secure VFB technology partners
- Secure priority locations for VFB deployment
- Engage EPC/EPCM partners for battery deployment
- Progress funding discussions with potential strategic partners for rapid deployment of VSUN Energy strategy
- Secure energy offtake partners



### **Investment thesis**

	VFB rapid uptake into GWh scale energy storage systems	F 23 V High metal content of VFBs	World class Australian Vanadium Project	Ability to capture downstream value	Platform solution to long duration energy storage
) ) ) ) )	<ul> <li>Led by China with over 20GWh of announced VFB projects</li> <li>Australia can be a fast follower given high level of renewable energy capacity</li> </ul>	<ul> <li>Access to quality and quantity of vanadium oxides critical to supply chain scalability</li> </ul>	<ul> <li>Project provides supply chain scalability and security for VFBs</li> <li>Advancing toward FID - permitting, offtake, financing</li> </ul>	<ul> <li>Competitive LCOS of VFB as solution to high growth long duration energy storage market</li> <li>VFBs display operational advantages vs lithium-ion BESS</li> </ul>	<ul> <li>Whole of supply chain solution creates scalable LDES platform</li> </ul>



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