

ASX ANNOUNCEMENT

27<sup>TH</sup> SEPTEMBER 2021

# VANADIUM ELECTROLYTE MANUFACTURING PLANT BUILD AWARDED TO PRIMERO

*Western Australian engineering group appointed to undertake Early Contractor Involvement*

## KEY POINTS

- Western Australian engineering group Primero appointed for first stage of AVL's vanadium electrolyte manufacturing plant build.
- AVL recently awarded Australian Government grant of \$3.69M to co-fund commercial vanadium electrolyte plant development, to be located in WA.
- The AVL facility will be the first full scale vanadium electrolyte manufacturing plant in Australia.
- Vanadium electrolyte is the key component of vanadium redox flow batteries (VRFBs) which are used to store and redeploy renewable energy.
- Project will be capable of producing up to 33 MWh of VRFB energy storage annually.
- AVL has partnered with U.S. Vanadium LLC to utilise proven electrolyte manufacturing technology, simplifying design, construction, and start-up.
- Facility will support the anticipated rapid growth of the long duration, renewable energy powered VRFB market in Australia.

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to advise that prominent engineering group Primero, (a subsidiary of NRW Holdings), has been appointed to undertake the Early Contractor Involvement (ECI) for the building of AVL's vanadium electrolyte manufacturing plant. This will form stage 1 of the vanadium electrolyte manufacturing plant build process, with stage 2 being the engineering, procurement, and construction (EPC).

The ECI stage will incorporate analysis of the U.S. Vanadium LLC<sup>1</sup> plant design including alignment with Australian standards, design layouts and EPC contract preparation. Primero will also work with AVL to review potential locations for the plant. The vanadium electrolyte plant will initially be able to produce enough electrolyte per annum to fill VRFBs that can store up to 33MWh of energy. For comparison, a single Tesla Powerwall stores 13.5 kWh of energy<sup>2</sup>, with the electrolyte plant producing the equivalent energy storage capacity of 2,444 Powerwalls per year.

Managing Director, Vincent Algar commented *‘The contract award to Primero is the next step in AVL’s vertical integration strategy, cementing the Company’s goal to develop downstream processing capability in Australia. We are delighted to be working with Primero on this project, who have a proven track record for delivery of battery minerals projects in Australia and worldwide. We look forward to delivering Australia’s first vanadium electrolyte manufacturing plant, built in Western Australia by an Australian company.’*

Cameron Henry, Managing Director of Primero commented *‘Primero is excited to work with AVL to deliver high purity electrolyte production capability for use in VRFBs here in Western Australia. This will provide a critical link in the supply chain for VRFBs, a growing energy storage solution, and continues the ‘new energy’ and battery materials theme that Primero is well known for.’*

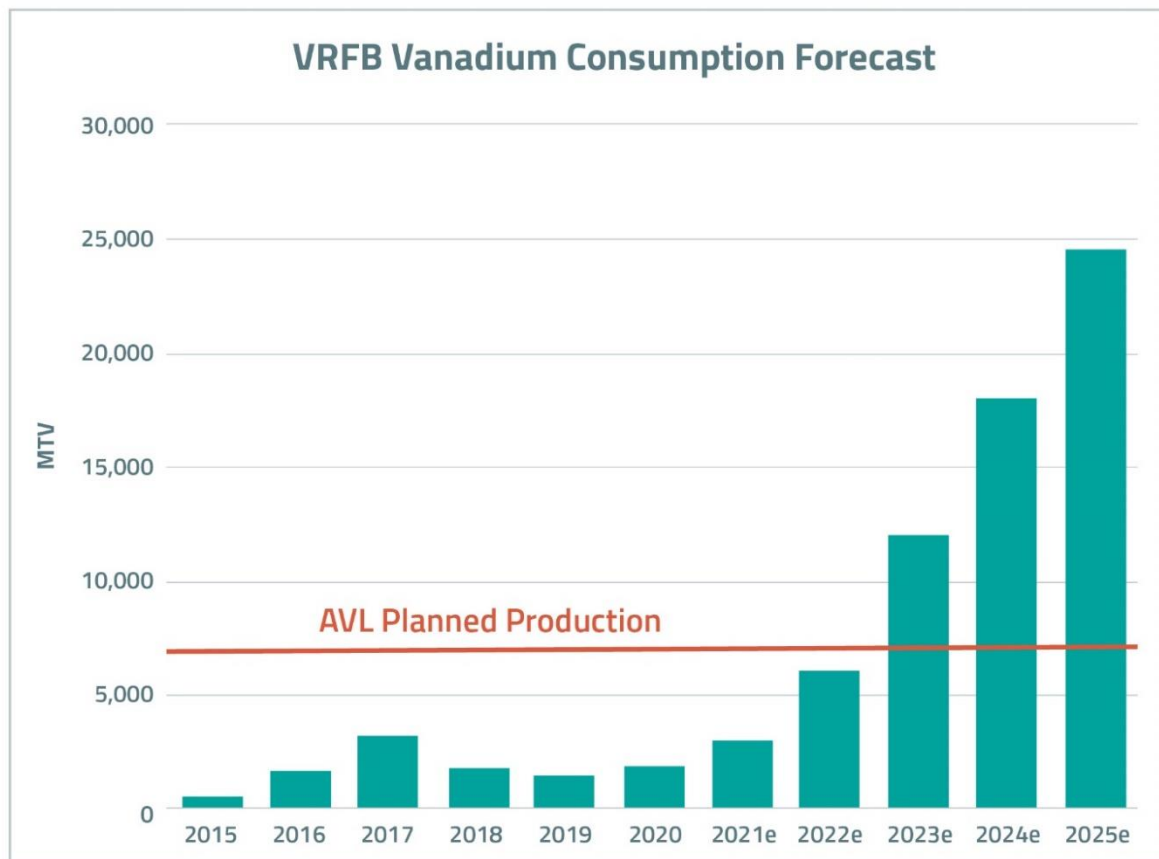
AVL was awarded a \$3.69M Federal Government grant in July 2021<sup>3</sup>, with part of the funding allocated to building and operating a commercial vanadium electrolyte manufacturing plant in Western Australia, to support the rollout of VRFBs in Australia. At present AVL is aware of at least 20 commercial global manufacturers of VRFBs. AVL’s renewable energy and battery supply subsidiary VSUN Energy is a key part of its vertical integration strategy for the VRFB market.

The steel market currently consumes most of the world’s vanadium production. VRFBs are anticipated to grow rapidly (see Figure 1) and this new demand is expected reach 25,000 tonnes of vanadium and account for over 15% of global vanadium consumption by 2025.

<sup>1</sup> See ASX announcement dated 11<sup>th</sup> August 2021 ‘AVL Secures Vanadium Electrolyte Manufacturing Technology’

<sup>2</sup> See manufacturer’s website

<sup>3</sup> See ASX announcement dated 21<sup>st</sup> July 2021 ‘AVL Awarded \$3.69M Federal Government Manufacturing Grant’



Source: TTP Squared, Inc.

**Figure 1 VRFB Global Vanadium Consumption Forecast**

With vanadium electrolyte production capabilities, AVL and VSUN Energy look forward to offering Australian businesses economic energy storage solutions to lower carbon emissions.

*For further information, please contact:*

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*This announcement has been produced 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 currently one of the highest-grade vanadium projects being advanced globally, with 208.2Mt at 0.74% vanadium pentoxide ( $V_2O_5$ ), containing a high-grade zone of 87.9Mt at 1.06%  $V_2O_5$ , reported in compliance with the JORC Code 2012 (see ASX announcement dated 4<sup>th</sup> March 2020 ‘*Total Vanadium Resource at the Australian Vanadium Project Rises to 208 Million Tonnes*’ and ASX announcement dated 22<sup>nd</sup> December 2020 ‘*Technical and Financial PFS Update*’).

VSUN Energy is AVL’s 100% owned subsidiary which is focused on developing the market for vanadium redox flow batteries for energy storage.

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, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant 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.

## ABOUT PRIMERO

Primero was founded in 2011, with a vision to create a vertically integrated EPC business that could operate in the Mineral Processing, Energy and Non-Process Infrastructure market segments as a turnkey solution provider.

Since inception the company has grown and diversified to globally delivering projects in over ten different countries spanning five continents. Primarily Western Australian based for the first four years, the group now occupies Perth, Port Hedland, and Montreal, Quebec Canada. The company’s rapid growth and international footprint is testament to our growing reputation for delivering quality outcomes and honouring our commitments in full, on time.

Primero is a subsidiary of the NRW Holdings Group.

## APPENDIX 1

The Australian Vanadium Project – Mineral Resource estimate by domain and resource classification using a nominal 0.4% V<sub>2</sub>O<sub>5</sub> wireframed cut-off for low-grade and nominal 0.7% V<sub>2</sub>O<sub>5</sub> wireframed cut-off for high-grade (total numbers may not add up due to rounding).

2020 Feb	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> %	LOI %
<b>HG</b>	Measured	10.1	1.14	43.9	13.0	9.2	7.5	3.7
	Indicated	25.1	1.10	45.4	12.5	8.5	6.5	2.9
	Inferred	52.7	1.04	44.6	11.9	9.4	6.9	3.3
	<b>Subtotal</b>	<b>87.9</b>	<b>1.06</b>	<b>44.7</b>	<b>12.2</b>	<b>9.2</b>	<b>6.8</b>	<b>3.2</b>
<b>LG 2-5</b>	Indicated	44.5	0.51	25.0	6.8	27.4	17.0	7.9
	Inferred	60.3	0.48	25.2	6.5	28.5	15.3	6.7
	<b>Subtotal</b>	<b>104.8</b>	<b>0.49</b>	<b>25.1</b>	<b>6.6</b>	<b>28.0</b>	<b>16.1</b>	<b>7.2</b>
<b>Trans 6-8</b>	Inferred	15.6	0.65	28.4	7.7	24.9	15.4	7.9
	<b>Subtotal</b>	<b>15.6</b>	<b>0.65</b>	<b>28.4</b>	<b>7.7</b>	<b>24.9</b>	<b>15.4</b>	<b>7.9</b>
<b>Total</b>	Measured	10.1	1.14	43.9	13.0	9.2	7.5	3.7
	Indicated	69.6	0.72	32.4	8.9	20.6	13.2	6.1
	Inferred	128.5	0.73	33.5	8.8	20.2	11.9	5.4
	<b>Subtotal</b>	<b>208.2</b>	<b>0.74</b>	<b>33.6</b>	<b>9.0</b>	<b>19.8</b>	<b>12.1</b>	<b>5.6</b>

The Australian Vanadium Project - Ore Reserve Statement as at December 2020, at a cut-off grade of 0.7% V<sub>2</sub>O<sub>5</sub>.

Ore Reserve	Mt	V <sub>2</sub> O <sub>5</sub> %	Fe <sub>2</sub> O <sub>3</sub> %	TiO <sub>2</sub> %	SiO <sub>2</sub> %	LOI%	V <sub>2</sub> O <sub>5</sub> production kt	Ore Reserve	Mt
Proved	9.8	1.08	59.9	12.4	8.7	3.5	63.2	Waste	244.5
Probable	22.4	1.04	61.7	11.8	8.3	2.8	158.9	Total Material	276.7
<b>Total Ore</b>	<b>32.1</b>	<b>1.05</b>	<b>61.2</b>	<b>12.0</b>	<b>8.4</b>	<b>3.0</b>	<b>222.1</b>	Strip Ratio	7.6

## COMPETENT PERSON STATEMENT — MINERAL RESOURCE ESTIMATION

The information in this announcement that relates to Mineral Resources is based on and fairly represents information compiled by Mr Lauritz Barnes, (consultant with Trepanier Pty Ltd) and Mr Brian Davis (consultant with Geologica Pty Ltd). Mr Barnes and Mr Davis are both members of the Australasian Institute of Mining and Metallurgy (AusIMM) and the Australian Institute of Geoscientists (AIG). Both have sufficient experience of relevance to the styles of mineralisation and types of

deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Barnes is the Competent Person for the estimation and Mr Davis is the Competent Person for the database, geological model and site visits. Mr Barnes and Mr Davis consent to the inclusion in this announcement of the matters based on their information in the form and context in which they appear.

### **COMPETENT PERSON STATEMENT — ORE RESERVES**

The technical information in this announcement that relates to the Ore Reserve estimate for the Project is based on information compiled by Mr Ross Cheyne, an independent consultant to AVL. Mr Cheyne is a Fellow of the Australasian Institute of Mining and Metallurgy. He is an employee and Director of Orelogy Mine Consulting Pty Ltd. Mr Cheyne has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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. Mr Cheyne consents to the inclusion in the announcement of the matters related to the Ore Reserve estimate in the form and context in which it appears.

### **COMPETENT PERSON STATEMENT – METALLURGICAL RESULTS**

The information in this announcement that relates to Metallurgical Results is based on information compiled by independent consulting metallurgist Brian McNab (CP. BSc Extractive Metallurgy). Mr McNab is a Member of AusIMM. He is employed by Wood Mining and Metals. Mr McNab has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which is undertaken, to qualify as a Competent Person as defined in the JORC 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr McNab consents to the inclusion in the announcement of the matters based on the information made available to him, in the form and context in which it appears.