

ASX ANNOUNCEMENT

25<sup>TH</sup> NOVEMBER 2021

## VSUN ENERGY TARGETS ELECTRIC VEHICLE CHARGING WITH VANADIUM REDOX FLOW BATTERY

*Australian first for AVL subsidiary as 100% renewable energy stored in vanadium battery used to charge Tesla EV.*

Australian Vanadium Limited (ASX: AVL, “the Company” or “AVL”) provides an update from its 100% owned subsidiary VSUN Energy. VSUN Energy has undertaken a successful test of an electric vehicle battery charge using renewable energy provided via a vanadium redox flow battery (VRFB).

The test involved the use of a 5kW-30kWh VRFB powered solely by solar energy. The project opens the way for vanadium battery based standalone electric vehicle (EV) charging stations anywhere in Australia.

VSUN Energy partnered with EV charging hardware and software provider Gemtek Goup for the test. Gemtek Group commercial manager Florian Popp said that Gemtek has tested a wide variety of power systems with their EV charging technologies, “Developing expertise in integrated renewable energy EV charging solutions to suit Australian requirements for mining, agricultural and regional applications has been a key focus for Gemtek,” he said. “The VSUN Energy storage system’s unique capabilities and operating life provide a substantial advantage in high temperature and remote environments”.

Utilising a VRFB to power an EV charging station means that even the most remote EV charging location can be powered using renewable energy - enabling remote EV charging anywhere in Australia.

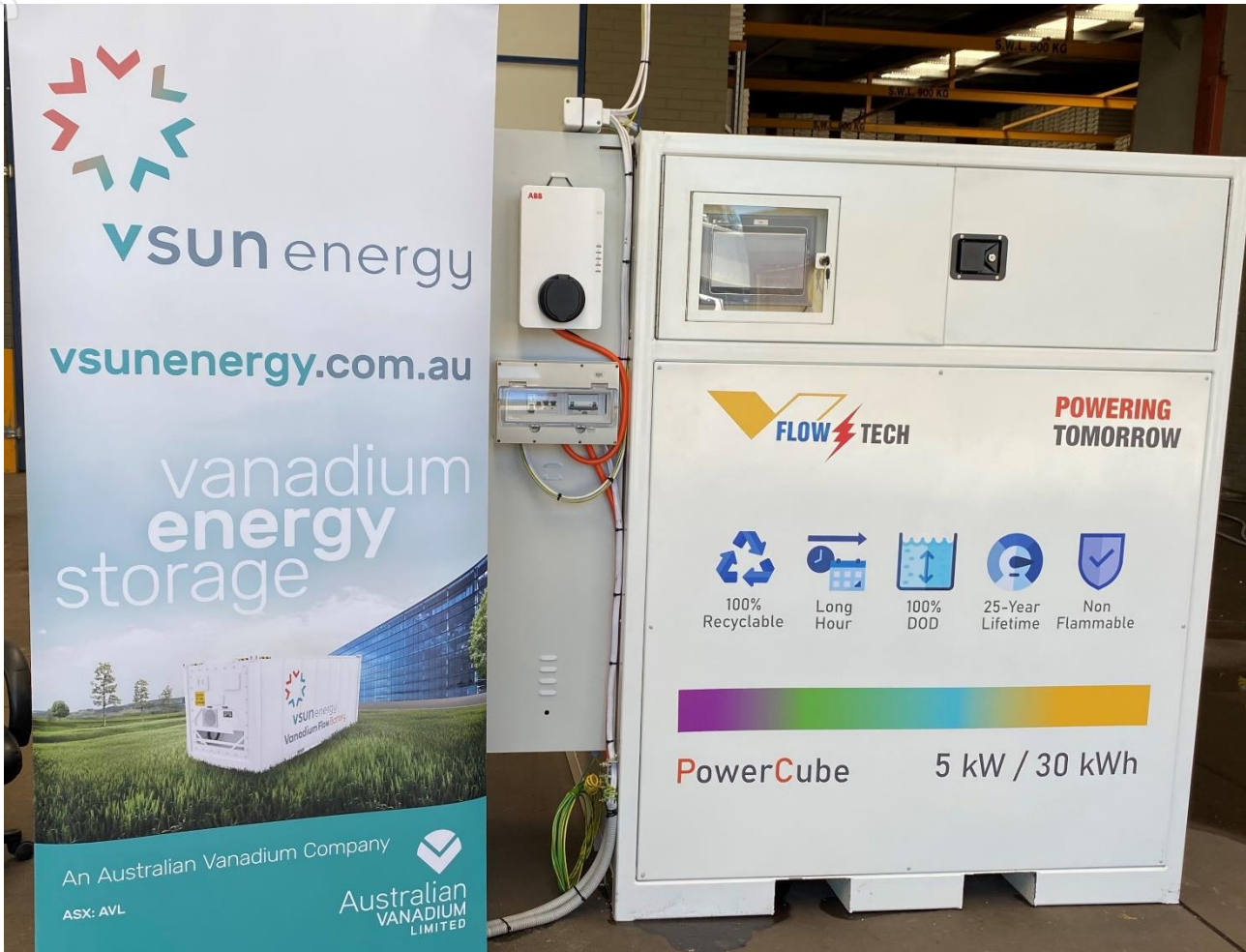
The VSUN Energy vanadium based green powered EV charging station test comes after Australian Vanadium Limited’s recent announcement to install a standalone power system based on VRFB energy storage technology at IGO’s nickel operation<sup>1</sup> in Western Australia’s remote Fraser Range region.

VSUN Energy’s Business Development Manager Zamien Sumich said that VRFBs were the “missing piece of the renewable energy jigsaw”. VRFBs are suitable for all the requirements of EV charging,

<sup>1</sup> See ASX announcement dated 11<sup>th</sup> November 2021 ‘IGO’s Noval Nickel Operation to Trial VSUN Energy Vanadium Battery Standalone Power System’

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but have the capacity to be scaled up to suit a wide range of projects, from residential energy storage through to large grid-scale industrial, mining and agricultural needs.



*Figure 1 VRFB with EV charger installed*

Some facts about VRFBs:

- They are an Australian invention, attributed to Professor Maria Skyllas Kazacos from UNSW and developed in the 1980s.
- The VRFB is well suited to the capture and storage of large quantities of renewable energy, enabling stable power output.
- The charge is stored in the battery in vanadium electrolyte which doesn't degrade, meaning that thousands of EV batteries can be charged from the one station.
- The VRFB's long life, exceeding 20 years, makes it one of the most sustainable and long-lasting ways of storing renewable energy. At the end of the battery's mechanical life, the vanadium electrolyte can be reused indefinitely.

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- The batteries can handle high temperatures without the risk of explosion.

VSUN Energy, the renewable energy generation and storage subsidiary of Perth-based Australian Vanadium Limited, is collaborating with its Singaporean partner V-Flow Tech and EV specialists Gemtek on the project. VSUN Energy is currently installing VRFBs into agricultural, commercial, mining and rural residential sites and is working to develop an urban residential battery for construction in Australia.

Vanadium is classified as a critical mineral and as the world seeks to achieve net zero carbon emissions, increased vanadium consumption in the steel market and use in vanadium redox flow batteries (VRFBs) can be major global drivers in emission reduction.

### **The Australian Vanadium Project**

AVL is developing the Australian Vanadium Project south of Meekatharra. The Australian Vanadium Project is part of an integrated vanadium value chain, spanning mining, manufacturing and downstream processing.

AVL Managing Director Vincent Algar comments, “This EV charging initiative is part of the Company’s strategy to further develop the market for VRFB energy storage technology in Australia. The intent is for AVL to not just sell vanadium into the metals sector internationally, but to be fully vertically integrated onshore here in Australia. In doing so, we are able to reduce the cost of these batteries while adding local value, content and job creation.”

The mining and processing project will enter its development phase next year, while a vanadium electrolyte manufacturing facility will be built in parallel near Kwinana in WA. The electrolyte plant is expected to be in production by mid-2022 with an annual production capacity of vanadium electrolyte of 33MWh.

For further information, please contact:

**Vincent Algar, Managing Director** +61 8 9321 5594

*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 currently one of the most advanced vanadium projects being developed globally, with 239Mt at 0.73% vanadium pentoxide ( $V_2O_5$ ), containing a high-grade zone of 95.6Mt at 1.07%  $V_2O_5$ , reported in compliance with the JORC Code 2012 (see ASX announcement dated 1<sup>st</sup> November 2021 '*Mineral Resource Update at the Australian Vanadium Project*' 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.

**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).

2021 Nov	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	11.3	1.14	43.8	13.0	9.2	7.5	3.7
	Indicated	27.5	1.10	45.4	12.5	8.5	6.5	2.9
	Inferred	56.8	1.04	44.6	11.9	9.4	6.9	3.3
	<b>Subtotal</b>	<b>95.6</b>	<b>1.07</b>	<b>44.7</b>	<b>12.2</b>	<b>9.1</b>	<b>6.8</b>	<b>3.2</b>
<b>LG 2-5</b>	Indicated	54.9	0.50	24.9	6.8	27.6	17.1	7.9
	Inferred	73.6	0.48	25.0	6.4	28.7	15.3	6.6
	<b>Subtotal</b>	<b>128.5</b>	<b>0.49</b>	<b>24.9</b>	<b>6.6</b>	<b>28.2</b>	<b>16.1</b>	<b>7.2</b>
<b>Trans 6-8</b>	Inferred	14.9	0.66	29.0	7.8	24.5	15.1	7.8
	<b>Subtotal</b>	<b>14.9</b>	<b>0.66</b>	<b>29.0</b>	<b>7.8</b>	<b>24.5</b>	<b>15.1</b>	<b>7.8</b>
<b>Total</b>	Measured	11.3	1.14	43.8	13.0	9.2	7.5	3.7
	Indicated	82.4	0.70	31.7	8.7	20.7	12.0	5.4
	Inferred	145.3	0.71	33.0	8.7	20.7	12.0	5.4
	<b>Subtotal</b>	<b>239.0</b>	<b>0.73</b>	<b>33.1</b>	<b>8.9</b>	<b>20.4</b>	<b>12.3</b>	<b>5.6</b>

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### **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 – EXPLORATION RESULTS AND TARGETS**

The information in this report that relates to Exploration Results and Exploration Targets is based on and fairly represents information and supporting documentation prepared by Mr Brian Davis (Consultant with Geologica Pty Ltd) and Ms Gemma Lee who is employed by Australian Vanadium Ltd as a Resource Geologist. Mr Davis is a member of the Australasian Institute of Mining and Metallurgy and Ms Lee is a member of the Australian Institute of Geoscientists. Both Mr Davis and Ms Lee 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 Davis and Ms Lee consent to the inclusion in this report of the matters based on their information in the form and context in which they appear.

### **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.

## 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 forward-looking 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.