



ASX ANNOUNCEMENT

10<sup>TH</sup> NOVEMBER 2021

## VANADIUM MOU SIGNED WITH SPANISH VRFB MANUFACTURER E22

*AVL and E22 to collaborate on offtake of vanadium pentoxide, vanadium electrolyte and battery sales into the Australian and global markets*

### KEY POINTS

- E22 is a Spanish vanadium redox flow battery (VRFB) manufacturer and subsidiary of global solar and battery specialist Gransolar Group.
- AVL is developing the Australian Vanadium Project south of Meekatharra in Western Australia, the world's next primary critical mineral vanadium mine for high-strength, low-alloy steel and energy storage.
- Funded partly by an Australian Government grant, AVL will build a value-adding vanadium electrolyte manufacturing plant in Kwinana, WA, capable of producing 33MWh of energy storage capacity for the VRFB sector.
- VSUN Energy, the renewable energy generation and storage subsidiary of AVL, is actively developing markets for VRFBs in Australian markets.
- E22's VRFB products offer a diversity of power and energy storage sizes, providing flexible implementation options in long duration storage.
- Memorandum of Understanding signed for:
  - Vanadium pentoxide supply for E22's global battery installations;
  - Vanadium electrolyte supply for VRFB installations in Australia;
  - Vanadium electrolyte leasing for VRFB projects in Australia; and
  - Sale of VRFBs through AVL's subsidiary VSUN Energy.

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to announce that in conjunction with its 100% owned subsidiary VSUN Energy, it has signed a Memorandum of Understanding (MOU) with Spanish vanadium redox flow battery (VRFB) manufacturer E22.

The MOU provides a basis for opportunities relating to VRFBs, including:

- Vanadium products ( $V_2O_5$ ) offtake to E22 in Spain to support global battery sales.

- Vanadium electrolyte manufacture and supply in Australia for E22 VRFBs.
- Sales agreement with AVL's 100% owned subsidiary VSUN Energy for VRFB sales in Australia.

Managing Director, Vincent Algar comments, *"What attracted us to E22 in particular was the mid-size VRFB that they are able to supply and the credibility offered through their parent company. Small to medium sized commercial applications, in addition to mining and agricultural industries, require a system that is smaller than the majority of the VRFB manufacturers currently supply. The requirement is for a robust and reliable system that can be increased in size and redeployed as needed. We are delighted to be working with the E22 team and have found their engineers to be very responsive and that there is a strong desire to develop this market in Australia."*

E22's Managing Director, Jaime Vega Marcos comments *"We're sure a sustainable and green future needs a long duration, recyclable and reliable alternative. This collaboration with AVL and VSUN Energy has a high potential in developing a growing market. The strong and reliable proposal that the companies can jointly offer will help bring that boost to VRFB technology deployment."*

E22 manufactures small to large-size VRFBs, with the smaller VCUBE50 being a size that is well suited to the development of VSUN Energy's standalone power system (SPS). The SPS forms part of the project partly funded through the Modern Manufacturing Initiative (MMI) Australian Government grant that AVL was awarded in July 2021<sup>1</sup>.

The SPS design is currently being finalised by VSUN Energy, with its proposed location for a mining application being powered by a combination of solar and potentially wind. A site has been selected, with final agreement to be confirmed.

The MMI grant also includes funding towards the build of a 33MWh annual capacity vanadium electrolyte manufacturing facility in Western Australia. Primero Group has been engaged for early contractor involvement in the plant build<sup>2</sup> which is to be based on technology licensed from U.S. Vanadium LLC<sup>3</sup>.

The vanadium electrolyte project is part of the Company's vertical integration strategy, from minesite and processing through to energy storage installation and maintenance.

The VCUBE50 provides 4 hours of power in a 20' container which includes all monitoring. The system provides at least 20 years of operation with full depth of discharge and no restrictions on cycling.

<sup>1</sup> See ASX announcement dated 21<sup>st</sup> July 2021 'AVL Awarded \$3.69M Federal Government Manufacturing Grant'

<sup>2</sup> See ASX announcement dated 27<sup>th</sup> September 2021 'Vanadium Electrolyte Manufacturing Plant Build Awarded to Primero'

<sup>3</sup> See ASX announcement dated 11<sup>th</sup> August 2021 'AVL Secures Vanadium Electrolyte Manufacturing Technology'



*Figure 1 E22 250kW/675kWh VRFB installed in Zamora, Spain*

E22 is a manufacturer, Engineering Procurement and Construction (EPC) contractor and service provider of VRFBs, Li-ion batteries, power control systems (PCS) and energy management systems (EMS). The PCS and EMS are critical elements in the co-ordination and optimisation of performance for battery projects. E22's system has been engineered to provide the best outcomes for operation and monitoring of the system's health.

The key terms of the MOU are:

- The MOU is non-binding.
- Memorandum of Understanding includes potential formal agreements in relation to:
  - Sales of E22's VRFBs in Australia;
  - Vanadium pentoxide offtake arrangements to support E22's global VRFB sales; and
  - Vanadium electrolyte manufacture and supply in Australia.
- One or more formal and binding agreements concerning the above to be negotiated.
- Each party must pay its own costs in relation to the MOU and any agreements contemplated by the MOU.
- The MOU is for a term of 2 years with an option to renew for a further 12 months by agreement in writing, with a 30-day notice period on either side for termination.

AVL and VSUN Energy are looking forward to continuing to develop our relationship with E22. VSUN Energy also offers VRFBs from other manufacturers, enabling systems from 5kW through to 60MW+ to be offered to customers.

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.*

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## 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>

## **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.

## 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.