

# AVL successfully produces Vanadium Electrolyte from Pilot Plant

Company seeking to rapidly commercialise local vanadium electrolyte production to supply growing energy storage market

## Highlights

- Vanadium electrolyte pilot plant successfully installed and commissioned at UWA.
- First batches of vanadium electrolyte successfully produced from pilot plant by AVL personnel.
- Concept Study for Australian-based commercial vanadium electrolyte plant to commence.
- AVL aiming to value add to V<sub>2</sub>O<sub>5</sub> products within Australia.

Australian Vanadium Limited (ASX: AVL, “the Company” or “AVL”) is pleased to update the market on the latest developments in its energy storage strategy.

## Vanadium Electrolyte Pilot Plant

Further to the Company’s ASX announcement ‘Australian Vanadium Purchases Pilot Electrolyte Plant from C-Tech Innovation Ltd’ dated 7<sup>th</sup> June 2016, the vanadium electrolyte pilot plant has now been successfully installed and commissioned at the University of Western Australia.

Company personnel have been successfully operating the pilot plant to produce vanadium electrolyte suitable for use in vanadium redox flow batteries (VRB) (see Plates 1 and 2 overleaf). VRB are energy storage devices designed to store large amounts of energy, which is usually generated from renewable sources.

The installation of the pilot plant has enabled AVL to develop vanadium electrolyte production expertise and capability within Australia. The Company aims to develop both stand-alone and mine-attached vanadium electrolyte production capacity to support the growing demand in the VRB energy storage sector.

The pilot plant is being used to test and verify the production of vanadium electrolyte products that are suitable for use in third party VRB. Initially the Company plans to supply vanadium electrolyte to VRB being sold in Australia, New Zealand, the Pacific and Asia. However, the Company has also been approached by battery manufacturers in Europe who are seeking long term electrolyte supplies.

## Commercialisation

Following the successful pilot plant installation and operation a range of additional batches of vanadium electrolyte will be produced and analysed over the coming weeks. Information will be gathered from the testing including reviews by vanadium battery researchers and manufacturers. Plans for a larger commercial plant will then begin to be evaluated by the Company as part of a Concept Study. Technology options, plant sizing and location will be assessed to determine the ideal commercial model, capital and operating costs for the commercial plant.

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## ASX ANNOUNCEMENT

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Blesberg Lithium, Tantalum



The potential rapid development of a commercial plant in Australia is in keeping with AVL's strategy to offer investors involvement in the entire energy storage value chain and provide early cash flow opportunities. The Concept Study will be advanced with the assistance of C-Tech and other experts in the vanadium electrolyte sector.



Plate 1: Initial Vanadium dosing of Acid



Plate 2: Balanced Vanadium electrolyte

## Distribution

Ongoing discussions on the future sale and distribution of vanadium electrolyte continue with numerous VRB manufacturers, who are experiencing rapid growth in demand for their large-scale storage systems. Demand for electrolyte quality vanadium pentoxide is rising and strongly supports the integration strategy adopted by AVL.

## Pilot Plant – Background Information

### Location

The pilot plant is located within the Molecular and Chemical Sciences building at the UWA and was recently commissioned following shipping from C-Tech in the United Kingdom. Installing the pilot plant at a university provides a cost-effective solution for the Company and represents an excellent opportunity for collaboration between the commercial and educational fields in this technology space. It is envisaged that researchers and students at the university will have the opportunity to assist with and learn about the processes required, providing commercial knowledge application within an educational setting. The university offers state of the art analytical equipment and itself is accredited with decades of theoretical and research knowledge.

### Sourcing V<sub>2</sub>O<sub>5</sub>

AVL has sourced low-cost, high quality vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) for quality testing purposes from a wide variety of global sources including Brazil, China and Africa. The company was also approached by two independent sources who have made samples available for use as a suitable starting material for vanadium electrolyte. To date the company has sourced material from six international sources for the pilot test work. Securing a ready supply of high purity V<sub>2</sub>O<sub>5</sub> or vanadium rich material will enable AVL to rapidly develop commercial electrolyte production to support local and regional VRB sales and service the anticipated rapid growth in large-scale stationary energy storage market development.

## Further information

Please visit our [website](#) for further information or contact Managing Director, **Vincent Algar; +61 8 9228 3333**

### About Australian Vanadium Limited

AVL is a diversified resource company with an integrated strategy with respect to energy storage, seeking to offer investors a unique exposure to all aspects of the vanadium value chain – from resource through to steel and energy storage opportunities as well as other energy storage metals exposure through the acquisition and evaluation of lithium/tantalum projects.

AVL is advancing the development of its 100%-owned, world-class Gabanintha vanadium project. Gabanintha is currently one of the highest-grade vanadium projects being advanced globally with Measured, Indicated and Inferred Resources of 91.4Mt, grading 0.82% V<sub>2</sub>O<sub>5</sub> and containing a discrete high-grade zone of 56.8Mt, grading 1.0% V<sub>2</sub>O<sub>5</sub> reported in compliance with the JORC Code 2012 (see YRR ASX Announcement 10 November 2015).

AVL is aiming to develop a local production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries (VRB).

AVL, through its 100%-owned subsidiary VSUN Energy Pty Ltd, is actively marketing VRB in Australia through a distribution agreement with world-leading flow battery manufacturer, GILDEMEISTER Energy Storage GmbH.

As part of its broader energy metals focus, AVL has also commenced a staged acquisition of a controlling 50.03% interest in the Blesberg Lithium-Tantalum Project in South Africa (see ASX Announcement 21 December 2016).

*The information relating to the Gabanintha Project 2015 Mineral Resource estimate reported in this announcement is based on information compiled by Mr John Tyrrell. Mr Tyrrell is a Member of The Australian Institute of Mining and Metallurgy (AusIMM) and a full time employee of AMC (AMC Consultants Pty Ltd). Mr Tyrrell has more than 25 years' experience in the field of Mineral Resource Estimation. He has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and in resource model development 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. Tyrrell consents to the inclusion in the report of the matters based on the information made available to him, in the form and context in which it appears.*

*The information is extracted from the report entitled "Substantial high-grade vanadium resource highlights Gabanintha's world-class potential" released to ASX on 10 November 2015 and is available on the company website at [www.australianvanadium.com.au](http://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, in the case of estimates of Mineral Resource 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 has not been materially modified from the original market announcement.*

<http://www.australianvanadium.com.au/wp-content/uploads/2015/02/Gabanintha-Resource-Update-2015-10-Nov-Final.pdf>