

ASX ANNOUNCEMENT

18 OCTOBER 2019

VSUN ENERGY SELLS VANADIUM REDOX FLOW BATTERY TO VICTORIAN DAIRY FARMER

Solar and storage system offers reduced green energy price.

KEY POINTS

- AVL's subsidiary, VSUN Energy Pty Ltd, has secured an order for an 80kW/320kWh vanadium redox flow battery.
- The vanadium energy storage system will be installed at a dairy farm in Meredith, Victoria.
- The system will be attached to a 450kW solar array.
- Ensuring a reliable supply of renewable energy is the key driver for the client.
- The agricultural sector and particularly the dairy sector, is a strong market for reliable, safe and long-duration energy storage.

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to announce the sale of a vanadium redox flow battery (VRFB) energy storage system by its 100% owned subsidiary VSUN Energy. In collaboration with renewable systems provider Profit Share Power Pty Ltd, VSUN Energy will install a 450kW solar system with an 80kW power, 320kWh energy storage VRFB at a dairy farm in Meredith, Victoria. The system will provide a minimum of four hours of renewable energy storage with its current configuration and will allow the client to increase their onsite renewable generation and consumption, far in excess of what would be capable with a solar array alone.

Meredith Dairy's goal is to have a sustainable operation with full power being supplied via onsite renewable generation. Having a battery capable of supplying many hours of power with high cycling capability was crucial in the decision-making process when selecting the energy storage technology.

The dairy is located in Meredith in the State of Victoria, Australia approximately 100km west of Melbourne. In addition to its dairy farming activities, the farm grows wheat, barley and other grains for the farm's dairy animals. Sustainability is a key area of focus and strength for the dairy, with farming techniques and energy procurement being part of this strategy.

The dairy is connected to the Powercor Distribution Network, with Tango as their retailer and has been paying a premium rate to secure renewable energy.



Figure 1: Meredith Dairy's wood boiler

AVL's Managing Director Vincent Algar commented, "Further to our recent announcement regarding the installation of a VRFB at an orchard in Pakenham, Victoria, this dairy farming project once again confirms the strength of VRFBs for the agricultural sector. Delivering reliable power generated from renewable sources in a long-life and non-flammable battery provides increased energy security.

We are delighted that Meredith Dairy has decided to pursue a battery storage product that will allow them to develop their sustainable operation and reduce overheads at the same time. Being able to secure reliable power with a fixed energy price through the installation of solar and a VRFB system gives the business economic security for years to come.

AVL's goal through VSUN Energy is to grow the demand for VRFB to ensure that the market for vanadium isn't purely driven by steel. Having two markets to supply means that there is a floor to the price, reducing the commodity's volatility."

Meredith Dairy's owner Sandy Cameron commented, "We have been paying a premium to receive renewable energy from the grid for a while now, but to provide cost security and reliability of supply at a lower price than we buy our power for now, installing our own system made sense. So many businesses have been impacted by increased energy overheads in recent years and now, with the help of Profit Share Power and VSUN Energy, we are taking control of our energy overheads, reducing our energy costs, improving our competitiveness while increasing our ability to produce power in a cleaner and smarter way. Our goal is to show that businesses can be profitable, but at the same time run a sustainable business that will have a positive impact on the planet we share with others and leave to our children. Profitability and sustainability do not need to be mutually exclusive."



Figure 2: Meredith Dairy owners Sandy and Julie Cameron

The VRFB solution for this project is being supplied by battery manufacturer Avalon Battery. The VRFB's strengths are its longevity, lack of degradation in performance over time and many thousands of cycles, non-flammability, 100% depth of discharge and the ability to re-use the vanadium electrolyte at the end of the battery's life. Avalon Battery has recently entered into an agreement with South African vanadium producer, Bushveld Minerals, to provide a leasing option for vanadium electrolyte. This reduces the capex of the VRFB and provides security of disposal at the end of the battery's mechanical life, where the electrolyte can be re-used in a different battery.

This part of the project is stage one of a two stage process which will see the expansion of the battery system and additional PV installed, with the goal for Meredith Dairy to generate 100% of their energy through onsite renewable generation.



Figure 3: Avalon Battery VRFBs

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ABOUT AUSTRALIAN VANADIUM

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. The Australian Vanadium Project is currently one of the highest-grade vanadium projects being advanced globally with 183.6Mt at 0.76% vanadium pentoxide (V_2O_5), containing a high-grade zone of 96.7Mt at 1% V_2O_5 with an Ore Reserve of 18.24Mt at 1.04% V_2O_5 comprised of a Proved Reserve of 9.82Mt at 1.07% V_2O_5 and a Probable Reserve of 8.42Mt at 1.01% V_2O_5 , reported in compliance with the JORC Code 2012 (see ASX announcement dated 19 December 2018 'Gabanintha Pre-Feasibility Study and Maiden Ore Reserve').

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.

AVL has developed a local production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries (VRFB). AVL, through its 100% owned subsidiary VSUN Energy Pty Ltd, is actively marketing VRFB in Australia.

ABOUT MEREDITH DAIRY

Meredith Dairy is an on-farm enterprise, milking sheep and goats year-round to make specialty cheeses and yoghurts. Its products are sold throughout Australia and exported around the world. The company's mission is to provide quality-minded customers with reasonably priced, excellent sheep and goat milk products, made in a socially and environmentally responsible business; from milk produced according to leading standards of environmental management and animal husbandry.



Figure 4: Meredith Dairy goats

ABOUT PROFIT SHARE POWER

Profit Share Power supplies, builds and maintains onsite power generators. After a successful site assessment, Profit Share Power uses any and all available subsidies (available for renewable power generators – whether they are reliant upon battery, solar, solar thermal, wind or any other renewable type of onsite power generation) to make the electricity those generators supply to the customer's site, lower cost than any grid-supplied electricity retailer can provide.