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## Significant Development Milestone Achieved For ⚡ V-KOR Vanadium Battery

- 3,000 cycles (9 years of full daily cycles) completed on ⚡ V-KOR vanadium battery
- No significant degradation in ⚡ V-KOR battery performance during testing
- ⚡ V-KOR battery units tested by Korea Conformity Laboratories
- The ⚡ V-KOR aims to scale up battery sizes to deliver large (1-5MW) storage units

Protean Energy Ltd (**Protean** or the **Company**) is pleased to provide an update regarding the extensive testing program carried out on both the 5kW and 25kW V-KOR vanadium battery units. Over 3,000 cycles have now been tested on the 5kW stack, representing in excess of 9 years of full daily cycles for a typical solar photovoltaic (PV) application. Additionally, over 1,000 cycles (3 years of full daily cycles) of testing have been completed on the 25kW stack. Both units have reported no significant degradation in performance.

The completion of this successful testing is considered to be representative of “in use” battery performance and supports V-KOR’s progression towards initial commercialisation via customer orders. Both V-KOR units have been independently tested by Korea Conformity Laboratories (KCL), a leading state-of-the-art national testing laboratory established over 40 years ago.

The proprietary V-KOR technology is 100% owned by Protean’s 50% owned subsidiary, KORID Energy (**KORID**). KORID is a battery developer and the V-KOR technology is underpinned by 15 granted patents. The V-KOR battery has been developed over the past five years with over US\$3 million dollars invested to date in research, development, testing and IP protection.



**Figure 1: 20kW solar PV integrated with two 25kW V-KOR battery and the electricity grid in a field test site at Seosan-si in Korea.**

KORID is jointly owned by Protean (50%) and KOSDAQ-listed DST Company Limited (50%). KORID has utilised grant funding over the past 5-year period to develop four stack sizes of flow batteries, including 2.5kW, 5kW, 10kW and 25kW units to provide commercial options to customers with varying energy consumption and storage needs.

The V-KOR business strategy involves scaling up battery unit sizes to eventually provide large (1-5MW) storage units with energy storage capacity expanded simply by increasing electrolyte volume.

In addition to the current Australian trial, two 25kW stacks are undergoing field trials with KCL as part of a solar PV and VRFB-ESS combination trial in Korea.

### About the V-KOR Vanadium Battery Systems

The Vanadium Redox Flow Battery (VRFB) was invented over 20 years ago, and there have been several implementations of this technology in various countries. The V-KOR system uses vanadium ions in different oxidation states to store energy in the form of 2 liquid electrolytes. VRFBs are proven to have excellent durability & life spans up to 20 years.

An important attribute of VRFB systems is that their energy storage capacity is independent of the power rating, allowing them to be designed for highly specific energy and power requirements and making them well suited to applications with large energy storage capacity specifications. These batteries are currently used for grid scale energy storage applications where large-scale and long duration electrical energy storage is required. They are an ideal solution for rapidly growing intermittent renewable energy generation sources such as solar and wind.

V-KOR was developed in response to the growing demand for more efficient energy storage solutions to support intermittent renewable energy production. The Company offers battery solutions built to order for commercial, industrial and grid scale applications.

V-KOR is a commercial stage technology that offers a rechargeable flow battery with the ability to store high levels of energy for longer and with a greater life expectancy than existing battery solutions. The V-KOR technology and batteries are scalable with built solutions from 2kW to 5MW or larger to suit customer requirements.

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### **ABOUT PROTEAN ENERGY LIMITED (ASX: POW)**

Protean Energy Limited is an energy company focused on the commercialisation of vanadium battery energy storage systems. The Company is also developing a multi-mineral project in South Korea through its 50% holding in Stonehenge Korea Limited (SHK). SHK is a JV company with two KOSDAQ-listed industry partners being DST Company Ltd (DST) and BHI Co Ltd (BHI). SHK owns 100% of the rights to 3 projects in South Korea, including the Company's flagship Daejon Vanadium Project.

For further information, see [www.proteanenergy.com](http://www.proteanenergy.com) or phone: T: + 61 8 9481 2277