

Title of Project:

Scalable and Sustainable Vanadium redox flow battery-based Smart Micro-grid Solution for 24/7 renewable energy.

APPROVED

Description of Project:

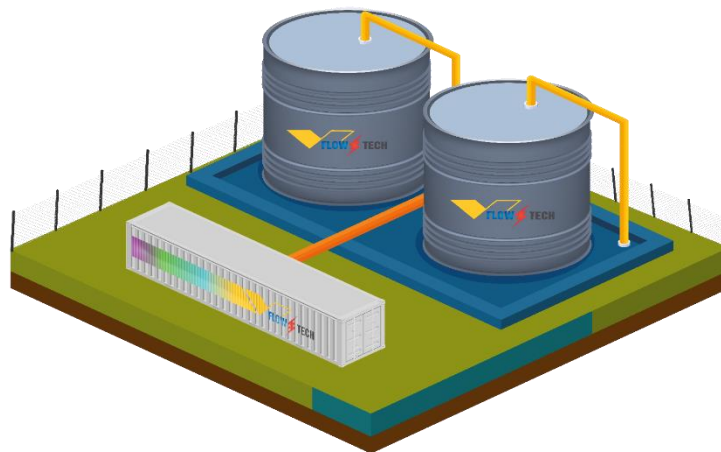
We aim to build a scalable and sustainable flow battery solution in a smart micro-grid to power industrial loads and test the solution in Singapore’s hot and humid conditions. The project would develop key technology enablers to support Singapore’s energy transition, including:

1. Develop a MWh to GWh scalable flow battery technology using tank infrastructure;
2. Develop a vanadium recovery process from industrial waste;
3. Develop a smart cloud-based energy management system to manage intermittent renewable energy generation and dynamic industrial loads.

Potential benefit:

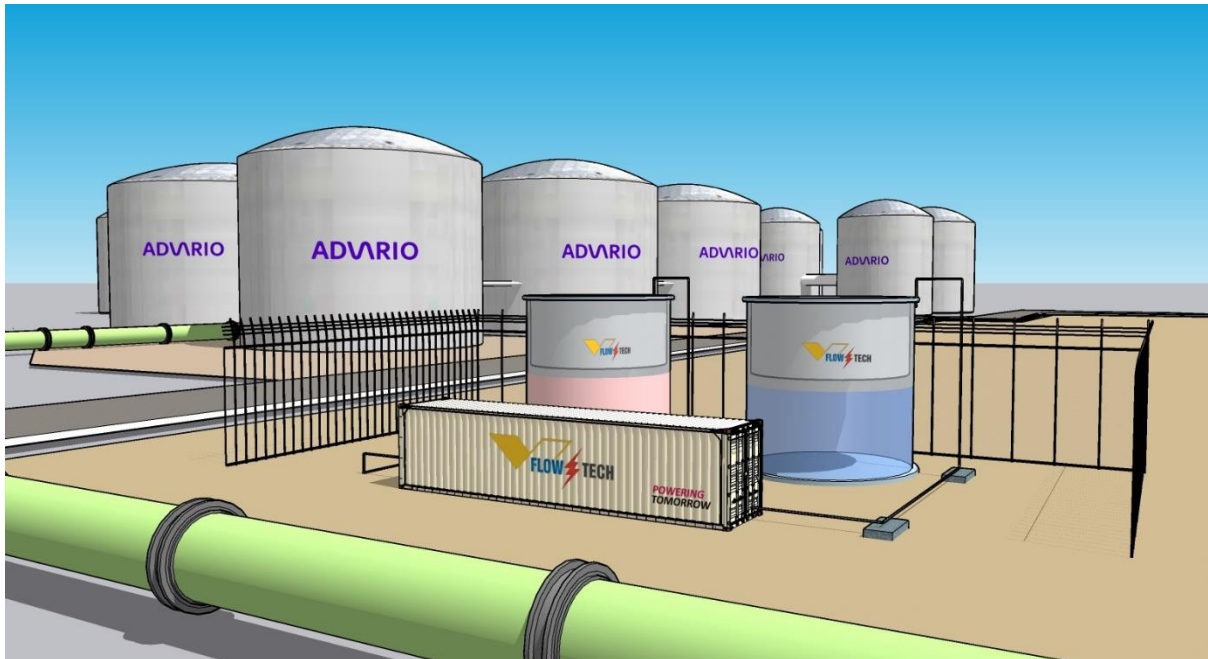
The innovative ESS design demonstrates strong synergies with Jurong Island companies which own storage tanks that can be used for energy storage.

This project could accelerate renewable energy development for the clean energy transition and reduce the environmental impact of industrial waste in Jurong Island. The project will be test-bedded at Advorio Singapore Chemical facility on Jurong Island and decarbonise its oil tanking operations.



Existing large steel storage tanks are repurposed to deploy redox flow battery energy storage system. Vanadium electrolytes, which are used in the redox flow batteries, can be produced from recycled industrial waste, which enhances circularity on Jurong Island.

(Link to download high-resolution image: [Please click here](#))

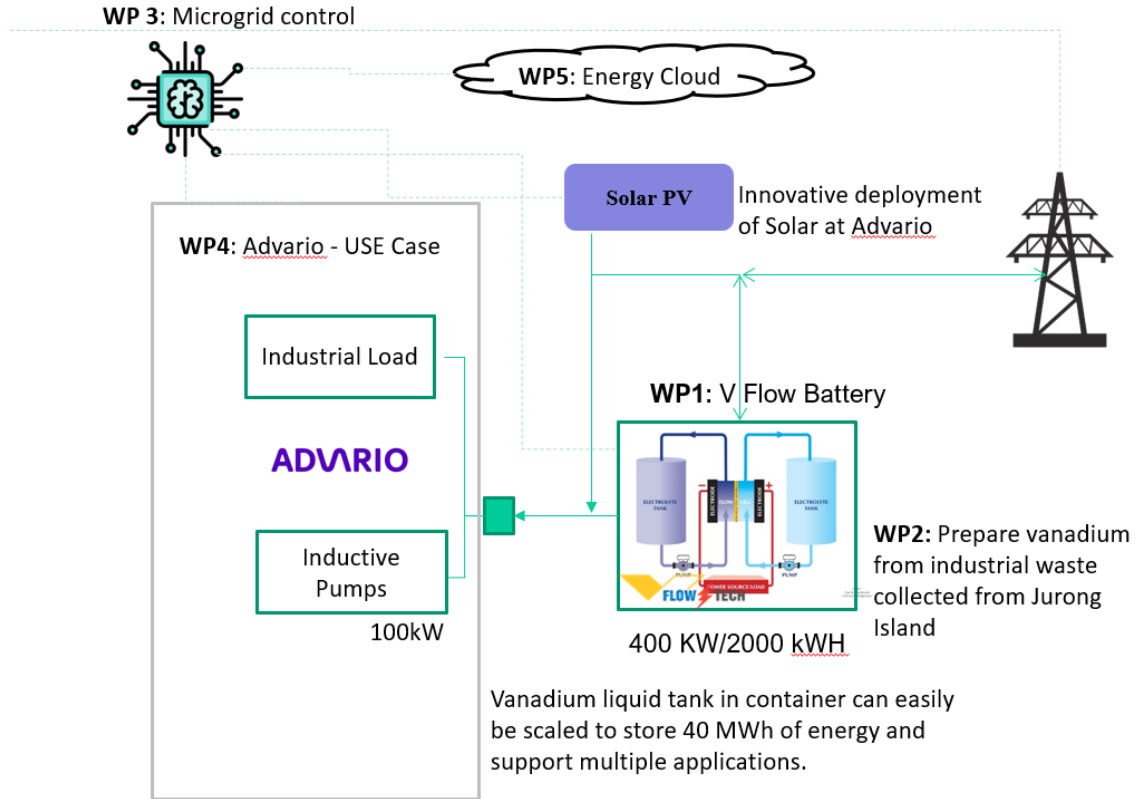


Schematic of the Proposed Flow battery system at the test bed.
(Link to download high-resolution image: [Please click here](#))



Different technologies selected to work together in the Jurong Island test bed.

NOVELTY & APPLICABILITY



Key Features of Micro-grid controller