61. Title: Vanadium Redox Flow Battery

Inventor: Prof. Anil Verma, Department of Chemical Engineering

Keywords: Vanadium redox flow battery, Electrolyte, Vanadium pentoxide

Domain: Renewable energy

Summary: Vanadium Redox Flow Battery (VRFB) which is an efficient replacement to pollution-causing diesel generators. VRFB utilizes liquid electrolyte to store electrical energy. During charging, the electrical energy is stored in the liquid electrolyte and during discharging the stored energy is used for various application. The VRFB can store energy from kWh to MWh range. It is highly suitable wherever diesel generators are used.

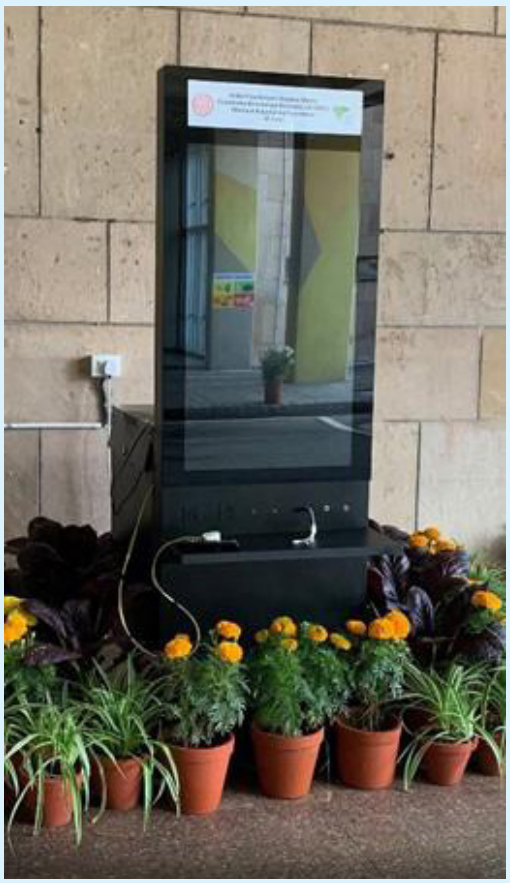

Image: Vanadium Redox Flow Battery installed at IIT Delhi Campus

Advantages:

- Charging operation of around 9 hours in a day
- Vanadium pentoxide is an inexpensive replacement to vanadium sulfate in synthesizing vanadium redox flow battery (VRFB) electrolytes.
- It is non-polluting (no emissions), easily scalable, safe and environmentally friendly, and highly durable.
- One of the major differences between the flow and conventional battery is the independent scaling of power and energy capacity.

Applications:

- In rural electrification
- E-vehicle charging station
- Domestic and commercial power back-up

Scale of Development: Large Scale Prototype is developed and deployed at IIT Delhi and performance is evaluated.

Technology Readiness Level: 8

IP Status: Indian Patent Application 201711018872