

# Can vanadium liquid flow energy storage make money

Are vanadium flow batteries a good choice for energy storage?

Vanadium flow batteries are one of the most promising large-scale energy storage technologies due to their long cycle life, high recyclability, and safety credentials. However, they have lower energy density compared to ubiquitous lithium-ion batteries, and their uptake is held back by high upfront cost.

What are vanadium redox flow batteries?

Vanadium redox flow batteries (VRFBs) provide long-duration energy storage. VRFBs are stationary batteries which are being installed around the world to store many hours of generated renewable energy. VRFBs have an elegant and chemically simple design, with a single element of vanadium used in the vanadium electrolyte solution.

How many litres of vanadium can be produced a year?

Primary vanadium producer Bushveld Minerals in South Africa is completing construction of its BELCO electrolyte plant which is expected to start operation in H1 2023, with an initial capacity of eight million litres per year. This production can be expanded to deliver 32 million litres per year.

Why is vanadium a problem?

However, as the grid becomes increasingly dominated by renewables, more and more flow batteries will be needed to provide long-duration storage. Demand for vanadium will grow, and that will be a problem. "Vanadium is found around the world but in dilute amounts, and extracting it is difficult," says Rodby.

Why is vanadium electrolyte so expensive?

One of the main costs affecting vanadium electrolyte is the price of moving it. Essentially when you transport the electrolyte you are moving acid and water. To reduce the cost of the battery, manufacturing the electrolyte close to the installation makes a lot of sense.

Is vanadium a sustainable solution?

US Vanadium can recycle spent electrolyte from VRFBs at a 97% vanadium recovery rate. This makes the VRFB a truly sustainable solution- the vanadium resource is only being borrowed from future generations, not consumed at its expense. One of the main costs affecting vanadium electrolyte is the price of moving it.

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The chemistry means each cell has a higher electricity output than other flow batteries, but it comes with a challenge--finding ways to stop the growth of tree-like dendrites inside the cell, ...

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