

The cost of vanadium battery energy storage





Overview

What is the difference between a lithium ion battery and a vanadium electrolyte?

The vanadium electrolyte retains a positive end of life value which can be used to offset any recycling costs. In contrast, the lithium ion battery, assumed to be LFP which accounts for most sales today, has end-of-life costs which push LCOS up by \$6/MWh. Finally, there is some difference in efficiency costs as well.

How fast will vanadium redox flow batteries grow in 2022?

7 July 2022 According to an independent analysis by market intelligence and advisory firm, Guidehouse Insights, global annual deployments of vanadium redox flow batteries (VRFBs) are expected to reach approximately 32.8 GWh per annum by 2031. This represents a compound annual growth rate (CAGR) of 41% over the forecasted period.

Which energy storage technologies are included in the 2020 cost and performance assessment?

The 2020 Cost and Performance Assessment provided installed costs for six energy storage technologies: lithium-ion (Li-ion) batteries, lead-acid batteries, vanadium redox flow batteries, pumped storage hydro, compressed-air energy storage, and hydrogen energy storage.

Do batteries have residual value?

Some batteries have residual value when they reach the end of their useful life: vanadium electrolyte can be reused in a new battery, and NMC lithium ion batteries contain valuable metals that can be recovered and sold. Other chemistries like LFP have little residual value to offset EOL costs.

What is vanadium leasing?

Vanadium leasing, whereby a third-party company leases the vanadium,



usually in the form of VRFB electrolyte, to a battery vendor or end-user is a proposed solution beginning to gain market traction.

How much vanadium will be produced by 2031?

The VRFB deployment forecast by Guidehouse Insights would equate to between 127,500 and 173,800 tons of new vanadium demand per year by 2031, according to Vanitec calculations based off Guidehouse's projection. That would be more than twice as much vanadium as is currently produced annually today.



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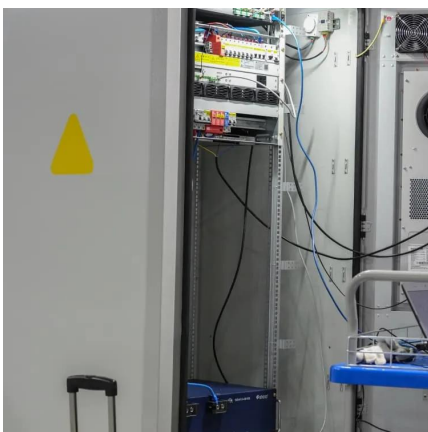
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Energy storage solutions like VRFBs are essential in enabling the energy transition to a carbon neutral world, as they provide stationary, utility-scale and long-duration energy ...



[The Future of Clean Energy in the U.S., Vanadium Redox Flow Battery](#)

Currently, lithium-ion batteries dominate the market, but safety concerns, such as fire risks, are leading companies to explore alternative solutions. One promising option is the ...



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The 2020 Cost and Performance Assessment provided installed costs for six energy storage technologies: lithium-ion (Li-ion) batteries, lead-



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[Vanadium Flow Battery Cost per kWh: Breaking Down the ...](#)

As renewable energy adoption accelerates globally, the vanadium flow battery cost per kWh has become a critical metric for utilities and project developers. While lithium-ion dominates short ...



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