

## Kongres Container

# Croatia s vanadium reserves for all-vanadium flow batteries



## Overview

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Redox flow batteries (RFBs) are a promising electrochemical storage solution for power sector decarbonization, particularly emerging long-duration needs. While the battery architecture can host many different r.

Are vanadium redox flow batteries a good choice for energy storage?

E-mail: [yansong.zhao@hvl.no](mailto:yansong.zhao@hvl.no); [yansong.zhao2004@gmail.com](mailto:yansong.zhao2004@gmail.com) Vanadium redox flow batteries (VRFBs) have emerged as a promising contenders in the field of electrochemical energy storage primarily due to their excellent energy storage capacity, scalability, and power density.

Can vanadium flow batteries decarbonize the power sector?

Vanadium flow batteries show technical promise for decarbonizing the power sector. High and volatile vanadium prices limit deployment of vanadium flow batteries. Vanadium is globally abundant but in low grades, hindering economic extraction. Vanadium's supply is highly concentrated as co-/by-product production.

Why is vanadium a problem?

High and volatile vanadium prices limit deployment of vanadium flow batteries. Vanadium is globally abundant but in low grades, hindering economic extraction. Vanadium's supply is highly concentrated as co-/by-product production. Opportunities for growth of vanadium supply lie in principal and secondary streams.

Why is the global vanadium market so volatile?

With so few countries dictating the production, the global vanadium market has experienced strong price volatility in response to local changes (see Fig. 1) , and this uncertainty increases risk for investments in large-scale and capital-intensive VRFB systems to attract investment.

What is vanadium redox flow battery (VRFB)?

Among the various types of RFBs, vanadium redox flow battery (VRFB) stands

out for its ability to eliminate cross-contamination between electrolytes, a common issue in other flow battery chemistries which induces self-discharge of the device.

How can we reduce the cost of a vanadium battery?

One method to reduce the burden of the vanadium price does exist via a new market of electrolyte leasing, where a third-party company leases the vanadium - usually in the form of VRFB electrolyte - to a battery vendor or end-user.

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