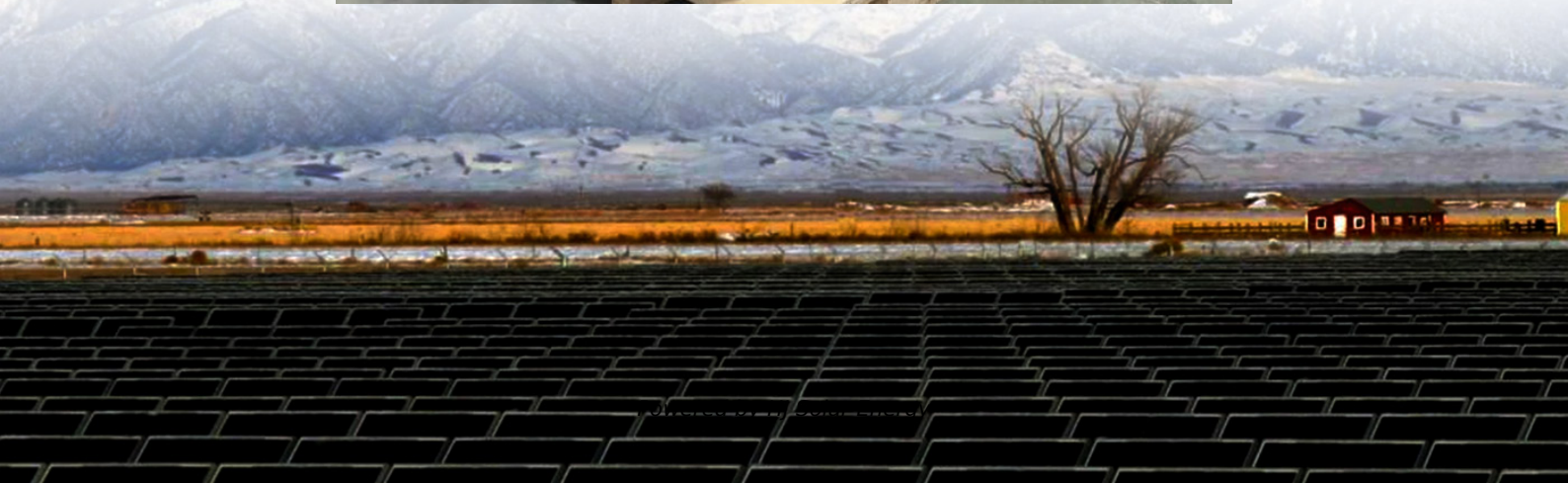


# **Total investment cost of VRFB energy storage project in Germany**





## Overview

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The project, with a total investment of more than €75 million, will benefit from the expertise of Saft, TotalEnergies' battery affiliate, which will supply the project with the latest-generation of electricity storage technology (iShift LFP—lithium-iron-phosphate— containers).

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Germany-based flow battery company VoltStorage has been granted a venture debt loan of €30 million (US\$33 million) by the European Investment Bank (EIB), guaranteed by the European Commission. The EIB has granted the loan to VoltStorage for the Munich-based company to invest in R&D as well as set.

The project, with a total investment of more than €75 million, will benefit from the expertise of Saft, TotalEnergies' battery affiliate, which will supply the project with the latest-generation of electricity storage technology (iShift LFP—lithium-iron-phosphate— containers). Commercial.

The German government financially supports the R&D in energy storage and facilitates energy storage projects due to the growing need for energy storage. Many large-scale flow batteries have been installed across the country. Germany is home to key players in the flow battery market. The growing.

The federal government supports research and development in the energy storage, hydrogen, fuel cell, and electric vehicle sectors. Public research and development incentives for EV and stationary battery research amount to between EUR 80 million and EUR 85 million every year. As the European lead.

While the initial investment in VRFB technology might be higher than traditional batteries, their long-term operational costs are significantly lower. The key lies in their design – the ability to scale energy and power



independently and a lifespan that outlasts most other battery types. These.

French firm TotalEnergies has taken investment decisions on six new battery storage projects in Germany, with nearly €160m earmarked for their development. The projects will be developed by Kyon Energy, a subsidiary acquired in 2024. Once operational, the six facilities will have a combined storage. How much does a VRFB cost?

To validate our model outputs, we compare our base case to other LCOS models of VRFBs in the open literature. Lazard's annual levelized cost of storage analysis is a useful source for costs of various energy storage systems, and, in 2018, reported levelized VRFB costs in the range of 293–467 \$ MWh<sup>-1</sup> (for mid-scale systems ~10 MWh) .

How much does Germany spend on EV and stationary battery research?

Public research and development incentives for EV and stationary battery research amount to between EUR 80 million and EUR 85 million every year. As the European lead market in the energy transition age, Germany provides the opportunity for companies to develop, test, define and market new energy storage solutions.

What's going on with Germany's new battery storage projects?

(Credit: Monika from Pixabay) French firm TotalEnergies has taken investment decisions on six new battery storage projects in Germany, with nearly €160m earmarked for their development. The projects will be developed by Kyon Energy, a subsidiary acquired in 2024. Once operational, the six facilities will have a combined storage capacity of 221MW.

Will Germany's new battery storage capacity boost its power infrastructure?

The added storage capacity will further bolster the reliability of Germany's power infrastructure. (Credit: Monika from Pixabay) French firm TotalEnergies has taken investment decisions on six new battery storage projects in Germany, with nearly €160m earmarked for their development.

Can a VRFB be rebalanced?

In contrast, VRFBs can be rebalanced to restore lost capacity without additional capital expenditure. Thus, while VRFBs have significantly higher capacity fade rates than state-of-the art Li-ion batteries, the resilience of the VRFB electrolyte may lead to cost savings over the project lifetime.



What is VoltStorage doing with a €30 million loan?

VoltStorage will use it to commercialise its existing vanadium redox flow battery (VRFB) technology and scale up its new iron-salt battery technology, or ISB. VoltStorage has been granted a venture debt loan of €30 million by the European Investment Bank (EIB), guaranteed by the European Commission.



## Total investment cost of VRFB energy storage project in Germany

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### [China's largest solar-plus-flow battery project](#)

Large-scale Vanadium redox flow battery (VRFB) technology looks set to be deployed at a 100MW solar energy power plant in China, two years after a smaller-scale demonstration project was commissioned in the ...

### [After 6 Years, The 100MW/400MWh Redox Flow](#)

...

The project is located in Shahekou District, Dalian City, Liaoning Province, with a total capacity of 200MW/800MWh and a total investment of about 3.8 billion yuan. The capacity of the first-phase project is 100 MW/400MWh, ...



### **Analysis of 45MW/225MWh Energy Storage Project in High ...**

Based on the above operational analysis, the economic data of the project obtained through the NeLCOS® energy storage calculator developed by ZH Storage are as follows: The total ...

### **Electrolyte Leasing vs. Purchasing: Economic Evaluation of a ...**

To reduce the initial investment pressure, the company innovatively adopts a vanadium electrolyte leasing model, transforming



electrolyte from a fixed asset investment into an operating lease ...

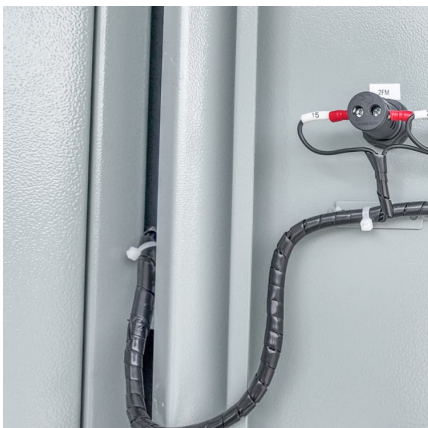


[Global electrolyte standard 'crucial for](#)

Vanadium solutions including vanadium pentoxide, the key ingredient for VRFB electrolyte. Image: Invinity Energy Systems. The development of global standards and specifications for the electrolyte used in ...

**World's largest vanadium flow battery goes online in ...**

A giant solar-plus-vanadium flow battery project in Xinjiang has completed construction, marking a milestone in China's pursuit of long-duration, utility-scale energy storage.



**China connects world's largest redox flow battery system to grid**

The second phase of the project is expected to push the full capacity to 200 MW/800 MWh. That will bring the total investment to CNY 3.8 billion, according to the Chinese ...



### Assessing the levelized cost of vanadium redox flow batteries with

Here we develop a techno-economic framework that incorporates a physical model of capacity fade and recovery from rebalancing and other servicing methods into a ...



### Overview of vanadium redox flow battery (VRFB) and supply ...

Invinity will supply an 8.4MWh VRFB to a solar-plus-storage project in Alberta, Canada. It will be paired with a 21MW solar PV plant. Sumitomo installed a 51MWh VRFB in Hokkaido. This was ...



### Economic Practice of Leasing Mode for 448MWh Vanadium ...

The NeLCOS® energy storage calculator independently developed by ZH Energy can calculate the input - output ratio of energy storage systems for customers and investors from the aspects ...



### [Vanadium power national energy storage project](#)

Energy storage solutions firm H2, Inc launched a 20MWh vanadium redox flow battery (VRFB) energy storage project in northern California in December. H2 says the 20-MWh system will be ...



### All-Vanadium Redox Flow Battery (VRFB) Electrolyte Market

Electrolyte costs account for approximately 30-40% of total VRFB system expenses, making price stabilization critical for project viability. Manufacturers increasingly ...



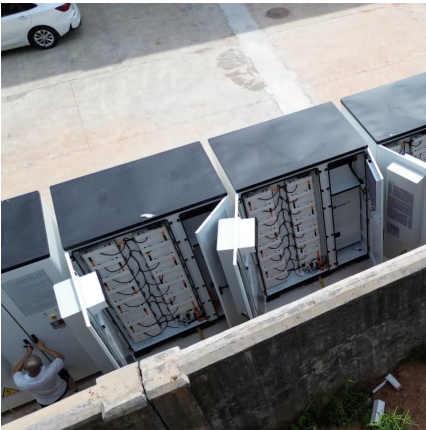
### **EWE awards contract for hydrogen storage project in northern Germany ...**

Oldenburg, March 21, 2025. The energy service provider EWE is pushing ahead with the conversion of its gas storage site in the Wesermarsch for the storage of hydrogen. As part of ...

### **Vanadium: double-edged demand**

The cumulative global demand of VRFB by 2030 is around 111 GWh, with annual demand of about 27 GWh, or 2.4% of the total required stationary storage capacity for that year -- a CAGR of 41% from 2022 to 2030 ...





### Battery and energy management system for vanadium redox flow ...

A hypothetical BMS and a new collaborative BMS-EMS scheme for VRFB are proposed. As one of the most promising large-scale energy storage technologies, vanadium ...

### Europe Vanadium Redox Flow Battery (VRFB) Market , 2025 ,(Germany

"What is the Current Size and growth rate of the Vanadium Redox Flow Battery (VRFB) Market? The Europe Vanadium Redox Flow Battery (VRFB) Market was valued at ...



### Vanadium flow battery sector gets boost with trio of ...

Austria-based CellCube commissioned a whitepaper to compare its VRFB product's environmental impact versus lithium-ion. Image: Enerox/Cellcube. The vanadium flow battery sector received a boost this week ...

### VoltStorage gets EUR30 million EU-backed loan for flow ...

The company raised EUR24 million in equity investment from Cummins Inc., a US corporation that develops and distributes engines, filtration, and power generation products, 12 months ago, with a total of EUR30 million ...



### **Design and development of large-scale vanadium redox flow ...**

Vanadium redox flow battery (VRFB) energy storage systems have the advantages of flexible location, ensured safety, long durability, independent power and ...



### **Germany's Flow Battery Market: Driving Energy Transition with ...**

Explore Germany's leadership in the flow battery market, supported by renewable energy goals, government investments, and AI-driven optimizations. Learn about ...



### [Vanadium Redox Flow Batteries: A Review Oriented ...](#)

A strong anticipated investment cost reduction for redox flow battery technologies means that by near future VRFBs have the potential to be the most cost-efficient energy storage system technology.





[Vanadium producer Bushveld invests in scale up of](#)

Enerox's Cellcube battery storage paired with solar generation at a commercial and industrial project site. Image: Cellcube-Enerox. South African vanadium producer Bushveld Minerals is investing US\$7.5 million in vanadium ...



**vrfb costs**

Cheap Energy Storage: The Game-Changer for Renewable Power Adoption Did you know that 68% of renewable energy projects face profitability challenges due to storage costs? As solar ...

**Energy storage costs**

Energy storage technologies, store energy either as electricity or heat/cold, so it can be used at a later time. With the growth in electric vehicle sales, battery storage costs have fallen rapidly ...



[Germany: TotalEnergies Pursues Growth in Electricity ...](#)

In total, these projects amount to 221 MW of new storage capacity and an investment outlay of EUR160 million. These projects were developed by Kyon Energy, a TotalEnergies affiliate acquired in 2024, and most will use ...



[VRB Energy's vanadium flow battery to be used](#)

Vanadium redox flow battery (VRFB) manufacturer VRB Energy will supply a 500kWh energy storage system to a Chinese government scientific facility with the potential that it will be used to help develop the country's ...

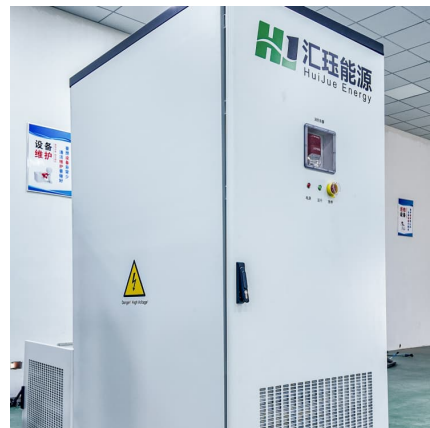


[China connects first phase of 200MW flow battery to ...](#)

The eventual total cost of the project will be around Rmb3.8 billion. CNESA said Dalian Rongke Energy Storage Technology Development is providing the VRFB storage systems -- using technology developed by the ...

[226MWh of vanadium flow batteries on the way for](#)

California's largest VRFB project to date, supplied by Japan's Sumitomo Electric Industries (SEI), has been participating in wholesale market opportunities since 2018. ...



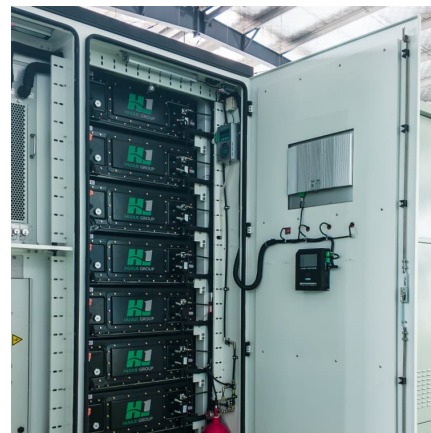


### [First Phase of 800MWH World Biggest Flow Battery](#)

An update on the project's progress which was issued in June by the trade group Zhongguancun Energy Storage Industry Alliance from Beijing said the VRFB technology ...

### [China's largest solar-plus-flow battery project](#)

Large-scale Vanadium redox flow battery (VRFB) technology looks set to be deployed at a 100MW solar energy power plant in China, two years after a smaller-scale ...



### [TotalEnergies invests \\$172.8m in German battery ...](#)

TotalEnergies plans to invest EUR160m (\$172.8m) in six new battery storage projects in Germany, totalling 221MW of capacity. The projects have been developed by TotalEnergies affiliate Kyon Energy. Most will utilise ...



### [Rising flow battery demand 'will drive global](#)

The electrolyte constitutes around 30% to 50% of the total system cost of a VRFB energy storage project, which Guidehouse noted is the highest percentage cost for a key mineral in any type of battery.



### **The price of lithium-ion battery packs continues to rise to ...**

This value represents the average value of various types of batteries, including electric vehicles, buses, and fixed energy storage projects. For electric vehicle (BEV) components, the average ...

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