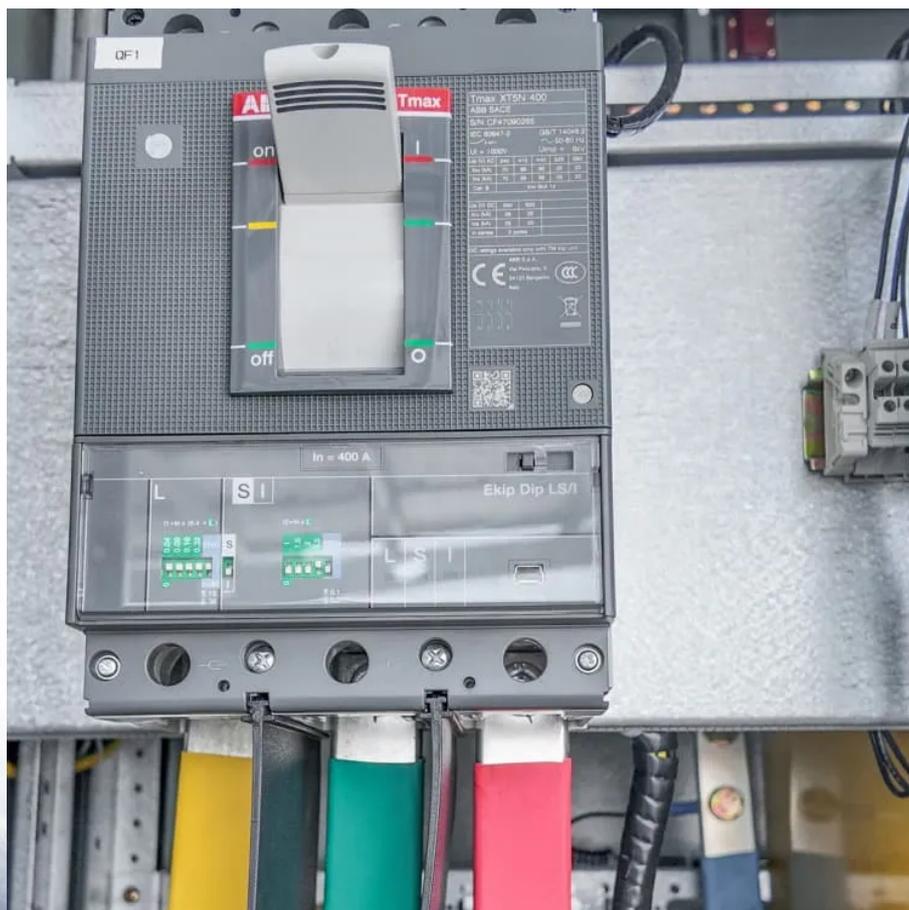


# Environmental assessment of liquid flow batteries for Hungarian solar container communication stations





## Overview

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How are flow battery technologies based on environmental impact?

The production of three commercially available flow battery technologies is evaluated and compared on the basis of eight environmental impact categories, using primary data collected from battery manufacturers on the battery production phase including raw materials extraction, materials processing, manufacturing and assembly.

Are flow batteries a promising technology for stationary energy storage?

Among the various types of battery storage systems, flow batteries represent a promising technology for stationary energy storage due to scalability and flexibility, separation of power and energy, and long durability and considerable safety in battery management ( Alotto et al., 2014; Leung et al., 2012; Wang et al., 2013 ).

Can life cycle assessment reduce the environmental burden of battery production?

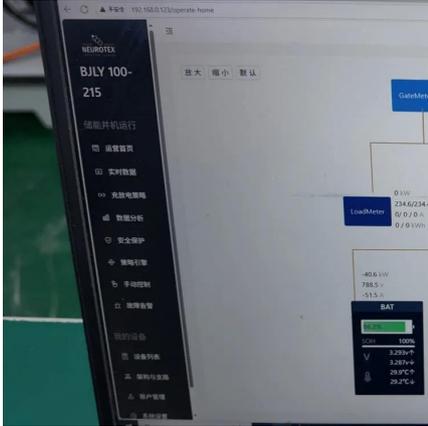
It was demonstrated that the application of life cycle assessment (LCA) to recycling processes like hydrometallurgical or pyrometallurgical, together with the recovery of metal fractions from the supporting structures of battery packs, allowed to reduce the environmental burden of battery production by more than 35 %.

Are flow batteries sustainable?

Flow batteries are seen as one promising technology to face this challenge. As different innovations in this field of technology are still under development, reproducible, comparable and verifiable life cycle assessment studies are crucial to providing clear evidence on the sustainability of different flow battery systems.



## Environmental assessment of liquid flow batteries for Hungarian so

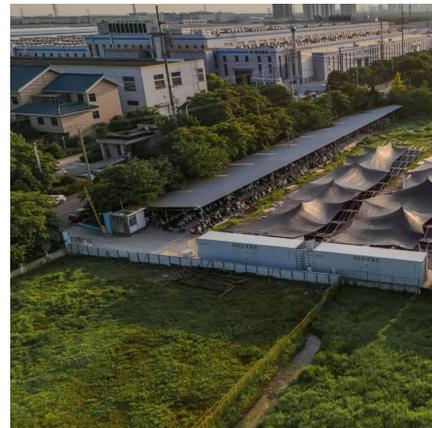


### [The dangers of batteries in communication base stations](#)

Nov 18, 2025 · Nov 1, 2024 · This study conducts a comparative assessment of the environmental impact of new and cascaded LFP batteries applied in communication base stations using a life ...

### [Life Cycle Analysis of Energy Storage Technologies: A](#)

Apr 10, 2024 · This study offers a thorough comparative analysis of the life cycle assessment of three significant energy storage technologies--Lithium-Ion Batteries, Flow Batteries, and ...



### [Life Cycle Assessment of Lithium-ion Batteries: A Critical ...](#)

May 1, 2022 · Evolving technological advances are predictable to promote environmentally sustainable development. Regardless the development of novel technologies including Li-ion ...

### [Environmental Impact Assessment to Be Mandatory for Battery ...](#)

Jul 22, 2024 · The government will make it compulsory for all those involved in the production of all types of batteries and their components, as well as those involved in the management of ...



[Life cycle assessment of a vanadium flow battery based on ...](#)

Jan 1, 2023 · Vanadium flow batteries (VFBs) are safe and reliable options for stationary day storage of energy. VFBs are already operated worldwide under a wide variety of ...



[Market and Technology Assessment of Flow Batteries for ...](#)

Oct 16, 2025 · Market and Technology Assessment of Flow Batteries for Developing Economies This report was commissioned by the Faraday Institution and written by 1Foresight Transitions ...



[The incorporation of 2D materials into membranes to ...](#)

Jun 1, 2023 · This review analyses the environmental impacts of redox flow batteries (RFBs) manufacturing reported recently, with a focus on the global warming potential (GWP), to ...





### Flow battery production: Materials selection and environmental ...

Oct 1, 2020 · Furthermore, our results indicate that materials options change the relative environmental impact of producing the three flow batteries and provide the potential to ...



### Comparative analysis of environmental and economic assessment ...

Oct 15, 2025 · Electrochemical batteries are acknowledged as a critical technology to counterbalance the intermittence and mitigate the fluctuation of renewable energy resources, ...

### Batteries and sustainability: the relevance of life cycle assessment

Oct 1, 2025 · It was demonstrated that the application of life cycle assessment (LCA) to recycling processes like hydrometallurgical or pyrometallurgical, together with the recovery of metal ...



### [Life cycle assessment of lithium-ion batteries and ...](#)

Oct 15, 2023 · The life cycle of these storage systems results in environmental burdens, which are investigated in this study, focusing on lithium-ion and vanadium flow batteries for renewable ...



## The roles of ionic liquids as new electrolytes in redox flow batteries

Dec 1, 2020 · Redox flow batteries (RFBs) have emerged as a prominent option for the storage of intermittent renewable energy in large and medium-scale applications. In comparison to ...



## [Life cycle assessment \(LCA\) for flow batteries: A review of](#)

Oct 1, 2022 · Based on a review of 20 relevant life cycle assessment studies for different flow battery systems, published between 1999 and 2021, this contribution explored relevant ...

## [Environmental performance of integrated solar flow battery ...](#)

Apr 15, 2023 · Integrated solar flow batteries (SFBs) are developed from a novel technology combining the functions of electricity generation and storage in one inte...



## [Redox flow batteries as energy storage systems: materials, ...](#)

Apr 3, 2025 · The rapid development and implementation of large-scale energy storage systems represents a critical response to the increasing integration of intermittent renewable energy ...



[Redox flow batteries for energy storage: their promise. ...](#)

Aug 1, 2019 · The deployment of redox flow batteries (RFBs) has grown steadily due to their versatility, increasing standardisation and recent grid-level energy storage installations [1]. In ...



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