

Environmental assessment of sodium-ion batteries for integrated mobile base station equipment



Overview

This work provides a complete and comprehensive update of the state of knowledge in the field of life cycle assessment of SIB. It develops and discloses a specific tool for dimensioning and assessing SIB cells, including a cell-specific model of an advanced hydrometallurgical. The environmental report examines the technological characteristics of sodium-ion batteries and the activities in research and industry from materials production to cell production and the emergence of user markets. The environment report deals with sodium-ion batteries as an alternative battery. Sodium-ion batteries (SIB) are among the most promising type of post-lithium batteries, being promoted for environmental friendliness and the avoidance of scarce or critical raw materials. This means an anticipated demand of about 50 GWh of sodium-ion cells required in 2030.



Article Content

Comparative life cycle assessment of lithium-ion, sodium-ion, and

the use of lithium-ion batteries (LIBs), alternative batteries like sodium-ion batteries (SIBs) and solid-state batteries (SSBs) are emerging as relevant alternatives. In this study, we analyze, based on

Life Cycle Assessment of Lithium-ion Batteries: A Critical Review

Therefore, a strong interest is triggered in the environmental consequences associated with the increasing existence of Lithium-ion battery (LIB) production and applications in mobile and

Environmental Impact Assessment of $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ Cathode

Environmental footprints of sodium-ion battery $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ cathode fabrication are quantified with life cycle assessment to guide sustainable electrochemical energy storage alternatives.

Life cycle assessment of sodium-ion batteries

Abstract Sodium-ion batteries are emerging as potential alternatives to lithium-ion batteries. This study presents a prospective life cycle assessment for the production of a sodium-ion battery with a layered

A systematic review of the life cycle analysis of sodium-ion batteries ...

In this systematic review of Life Cycle Assessments (LCA) of SIBs, we critically analyse the existing literature on SIBs in terms of chemistry, technologies, methods, and best practices.

Future climate impacts of sodium-ion batteries

Last but not least, the rapid development of other promising battery technologies, like all-solid-state sodium ion batteries, requires future studies to assess their environmental performance,

Comprehensive assessment of carbon emissions and environmental

Request PDF | On Sep 1, 2023, Xin Lai and others published Comprehensive assessment of carbon emissions and environmental impacts of sodium-ion batteries and lithium-ion batteries at the ...

Environmental report on sodium-ion batteries

The environmental report examines the technological characteristics of sodium-ion batteries and the activities in research and industry from materials

Technology Strategy Assessment

About Storage Innovations 2030 This technology strategy assessment on sodium batteries, released as part of the Long-Duration Storage Shot, contains the findings from the Storage Innovations (SI) 2030

On the environmental competitiveness of sodium-ion batteries under a ...

Sodium-ion batteries (SIB) are among the most promising type of post-lithium batteries, being promoted for environmental friendliness and the avoidance of scarce or critical raw materials. However, the

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On the environmental competitiveness of sodium-ion batteries under a ...

This work provides a complete and comprehensive update of the state of knowledge in the field of life cycle assessment of SIB. It develops and discloses a specific tool for dimensioning and assessing

Comprehensive assessment of carbon emissions and environmental

Sodium-ion batteries (SIBs), a valuable supplement to lithium-ion batteries (LIBs), have attracted global attention due to their low price and rich raw materials. However, few studies have

Life cycle assessment on sodium-ion cells for energy storage ...

Key drivers for the expected entrance of sodium-ion storage are the low price, high abundance of cell materials and expectations of a more safe and sustainable battery.

Sodium-ion battery

A sodium-ion battery (NIB, SIB, or Na-ion battery) is a rechargeable battery that uses sodium ions (Na +) as charge carriers. In some cases, its working principle

On the Environmental Competitiveness of Sodium-Ion Batteries -

Summary Among the current post-lithium-ion battery (LIB) developments, sodium-ion batteries (SIBs) are considered as the most advanced, with several start-ups already aiming to

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This document contains a long list of words beginning with "ab-" or "ac-". It does not appear to be a coherent text, but rather a collection of unrelated terms.

Comparative life cycle assessment of lithium-ion,

Abstract The transition toward electrification of transportation has resulted in a rapid increase in the demand for battery cells. While this demand is

(PDF) Life cycle assessment of emerging batteries

This thesis explores the environmental impacts of emerging battery technologies: an all-organic battery, all-solid-state batteries (ASSBs), and sodium-ion batteries (SIBs) by life cycle...

Life cycle assessment on sodium-ion cells for energy storage systems

With the perspective of the 16 environmental effects, a sodium-ion current state scenario was put in focus. On top of this, a decarbonized scenario is presented for the EF2.0 Climate Change impact.

Engineering of Sodium-Ion Batteries: Opportunities and Challenges

The recent proliferation of sustainable and eco-friendly renewable energy engineering is a hot topic of worldwide significance with regard to combatting the global environmental crisis. To curb

From lab to market with sustainable sodium-ion batteries

Sodium-ion batteries are emerging as a complementary technology to lithium-ion batteries, but are not yet ready for widespread practical adoption. This Review provides an overview

(PDF) On the environmental competitiveness of sodium-ion batteries ...

It provides the corresponding inventory data for five different types of SIB and compares their environmental impacts with those of competing LIB, taking into account the full life cycle...

A methodology for absolute environmental sustainability assessment

The proposed methodology is illustrated using a comparative case study of a sodium-ion battery (NaNMC type) and a lithium-ion battery (LiNMC type). An economic allocation- based

Prospective life cycle assessment of sodium-ion batteries made from ...

Batteries are enablers for reducing fossil-fuel dependency and climate-change impacts. In this study, a prospective life cycle assessment (LCA) of large-scale production of two different

Beyond Lithium: Evaluating Sodium-Ion Batteries for the Next ...

Sodium-ion batteries (SIB) are gaining attention as a sustainable, cost-effective alternative to lithium-ion technology in electric vehicles (EVs), driven by concerns over lithium's scarcity, high

Environmental report on sodium-ion batteries

A new Fraunhofer FFB environment report deals with sodium-ion batteries as an alternative battery technology. The researchers analyse the

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://mypaarl.co.za>

Email: info@mypaarl.co.za

Phone: +27-63-214-5897

Address: 23 Paarl Main Road, Unit 5, Paarl, Western Cape, 7646, South Africa

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