Lithium battery life cycle analysis

To test Discovery Learning, we present industrial-grade battery data comprising 123 large-format lithium-ion pouch cells, including diverse material-design combinations and cycling protocols.

Lithium-ion battery (LIB) recycling technologies are advancing rapidly, with higher recovery efficiencies, lower energy demand, and more complex supply chains.

To this end, we conduct a meta-analysis of Life cycle assessments on Lithium-ion batteries published over the past two decades, categorizing them by year, battery chemistry, ...

In light of the increasing penetration of electric vehicles (EVs) in the global vehicle market, understanding the environmental impacts of lithium-ion batteries (LIBs) that characterize the EVs is ...

Battery aging directly impacts power, energy density, and reliability, presenting a substantial challenge to extending battery lifespan across diverse applications.

An overview of the analysis, the results and comparison of 80 selected studies is presented. This study also aims to adopt a scientific framework to LCA in order to identify the ...

Recent projections suggest that the global production of lithium-ion batteries will skyrocket to 2,857 GWh by 2030. The frequent use of lithium-ion batteries in various systems has ...

In this work, we are undertaking for the first time the integration of battery LCA and first-principles electrochemical modeling to study the effects of cell design and operation conditions on LIB life cycle ...

First, LCAs should focus analyses of resource depletion on long-term trends toward more energy and resource-intensive material extraction and processing rather than treating known ...

Advances in low-impact chemistries, such as lithium iron phosphate, and scalable recycling strategies mitigate

these burdens, while policy incentives like carbon pricing and technological innovations, ...

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