

European Solar and Energy Storage Solutions

Second life lithium ion battery Switzerland



Overview

Can batteries be repurposed in a second life application?

While there are options for reusing batteries in second life applications, there will ultimately be the need to recycle them. There are four main recycling methods that are actively being researched or in use in industry: (i) pyrometallurgy, (ii) hydrometallurgy, (iii) biometallurgy and (iv) direct recycling.

Are second life batteries good for the environment?

The processes of disassembly and remanufacture for second life use also add environmental burdens, although these are considered to be much smaller than those for manufacturing new batteries (Cicconi et al., 2012b). Several studies have analysed the environmental benefits of SLBs.

Can batteries be used in a Second Life format?

These batteries have many viable applications in a second life format; for example, to provide an energy store within our grid energy networks, to complement the intermittent loading associated with renewable energy harvesting methods (Zhu et al., 2021a; Martinez-Laserna et al., 2018).

Can lithium-ion batteries be used as a stationary energy storage system?

Lithium-ion battery 2nd life used as a stationary energy storage system: ageing and economic analysis in two real cases. *J. Clean. Prod.* 272, 122584. doi:10.1016/j.jclepro.2020.122584 Ramoni, M. O., and Zhang, H.-C. (2013). End-of-life (EOL) issues and options for electric vehicle batteries. *Clean. Technol. Environ.*

What are the requirements for a second-life battery?

The wide range of second-life applications means that the requirements vary enormously. Moreover, each battery will have a unique SoH state, taking into consideration all viable degradation mechanisms, and the range of operational

characteristics that it may have been exposed to in its first life.

Should lithium-ion batteries be recycled?

By extending the lifespan of lithium-ion batteries through reuse and repurposing, the immediate need for recycling is reduced, lessening the environmental impact associated with recycling processes and reducing the risk of large-scale LiB disposal because no viable alternative pathway exists.

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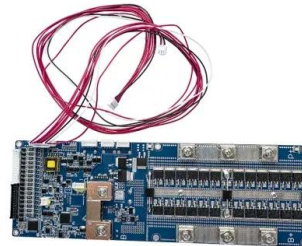


Challenges and opportunities for second-life batteries: Key

The price of a retired lithium-ion battery is estimated to be only half the price of a new battery and close to the price of a lead-acid battery, which is widely used for all stationary energy applications where there is a huge market demand that makes the economic value of second-life batteries very obvious.

Second Life of Lithium-Ion Batteries

Second Life of Lithium-Ion Batteries. Simplifying BESS deployments by mastering their associated risks With the introduction of Battery Energy Storage Systems 'BESS', a new role has been created on the value chain. It is the role of a BESS integrator. The role of an integrator can be misunderstood at times or blended with other roles at



Second Life Battery Applications

With operations throughout Europe and the United States, Ecobat is a leader in the collection, recycling, production and distribution of energy storage solutions, lead and polypropylene products, and other commodities essential to modern life. We are also leading the way on lithium battery collection and recycling management services to empower

Second Life of Used Lithium-Ion Batteries from Electric Vehicles ...

This article focuses on the reuse and recycling of end-of-life (EOL) lithium-ion batteries (LIB) in the USA in the context of the rapidly growing electric vehicle (EV) market. Due to the recent increase in the enactment of both current and pending regulations concerning EV battery recycling, this work focuses on the recycling aspect for lithium-ion batteries rather than ...



Press Release: A second life for car batteries o CircuBAT

The research project CircuBAT aims to create a circular business model for the production, application and recycling of lithium-ion batteries used for mobility purposes. Seven Swiss research institutions and 24 companies are joining forces to look for ways to boost sustainability in all stages of a battery's life cycle.

Second Life

At Modual, we harness cutting-edge technology to develop advanced second-life battery energy storage solutions, transforming the way we store and use energy. Our Swiss-engineered systems combine reliability, efficiency, and eco-friendliness, setting new standards in the energy industry.



2MW / 5MWh
Customizable

Lithium-ion battery second life: pathways, challenges and outlook

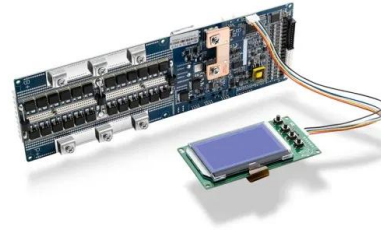
2 ???· The article discusses the challenges and outlook of lithium-ion battery second life,

focusing on recycling and repurposing pathways to reduce environmental impact and promote ...



10 New Second-Life Battery Companies , StartUs Insights

Gain data-driven insights on second-life battery, an industry consisting of 4.1K+ companies worldwide. We have selected 10 standout innovators from 460+ new second-life battery companies advancing the industry with battery upcycling, BMS, second-life energy storage system, and more.



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A second life for lithium-ion batteries

When the lithium-ion battery in the e-bike and electric car has had its day, it can be used for so-called second-life storage. One way is to test the individual battery cells and assemble them into new batteries. Thanks to faster testing methods, this way should become more economical.



Lithium-ion battery second life: pathways, challenges ...

The second-life battery industry has an established process, whereby all battery packs, once they have passed the post-auto battery assessment, undergo further SoH testing to determine the most suitable ...

Impact of Lithium Battery Recycling and Second-Life Application ...

For a typical EV battery at 50 kWh, maintaining 70% of total capacity and reaching 35 kWh before being reused as a second life until 25-30 years of operation, the total savings, including the initial cost of a brand-new battery that would be purchased and the metals recycled, equal to half the price of the brand-new battery [14,28].



Lithium-ion battery second life: pathways, challenges and outlook

A flowchart showing the end-of-life (EoL) pathways for the battery lifecycle, including decisions which need to be made at specific

stages. Qualitative ranges have been selected, as the actual

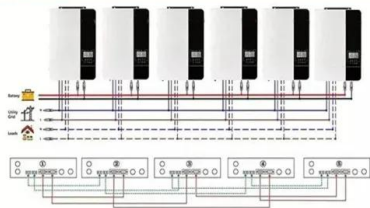


Optimal sizing and lifetime investigation of second life lithium-ion

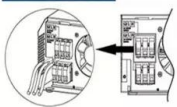
The technological advancement of lithium-ion (Li-ion) batteries has favored electric vehicles (EVs) to be driven for long distances and mitigate greenhouse gas emissions [1] spite the significant contributions of technical and environmental benefits, Li-ion battery technologies require a huge capital investment which is a hampering factor for its widespread ...



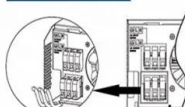
Parallel (Parallel operation up to 6 unit (only with battery connected))



AC input wires



AC output wires



Second-Life-Energiespeicher

100% autark mit dem Second-Life-Stromspeicher. Der nachhaltigste Lithium-Ionen-Batteriespeicher auf dem Planeten wird durch Wiederverwendung ausgedienter Fahrzeug-Batterien möglich. Das Gesamt-Paket: Wir planen und installieren deinen individuell dimensionierten Second-Life-Energiespeicher und kümmern uns um Installation und Service.

Lithium-ion battery second life: pathways, challenges and outlook

The second-life battery industry has an

established process, whereby all battery packs, once they have passed the post-auto battery assessment, undergo further SoH testing to determine the most suitable second life application.



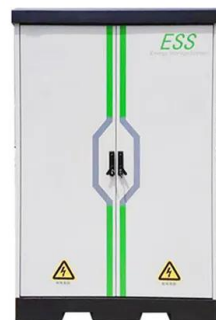
Battery recycling: Closing the loop

Although manufacturers can now guarantee a service life of eight to ten years for lithium-ion batteries, sooner or later they too will have to be recycled. In a project supported by the Swiss Federal Office of Energy (SFOE), the Swiss electric vehicle manufacturer Kyburz Switzerland AG and Empa have set themselves the goal of recycling

Corrigendum: Lithium-ion battery second life: pathways,

...

lithium-ion battery, end-of-life, second life, repurposing, state-of-health, safety, policy, regulation A Corrigendum on Lithium-ion battery second life: pathways, challenges and outlook by Patel AN, Lander L, Ahuja J, Bulman J, Lum JKH, Pople JOD, Hales A, Patel Y and Edge JS (2024). Front. Chem. 12:1358417. doi: 10.3389/fchem.2024.1358417



Second Life Marketplace

Provides NS controllers with approximately 4 hours of battery life, depending on usage. Rechargeable indefinitely. See controller manual



for charging instructions. This version of the battery slowly degrades. To maximize your battery's lifespan, avoid rapid charging. Nanite Systems power cells are sold nc/m/t.

Lithium-ion battery second life: pathways, challenges and outlook

2 ???· The article discusses the challenges and outlook of lithium-ion battery second life, focusing on recycling and repurposing pathways to reduce environmental impact and promote a circular economy. It highlights the need for clear policies, standards, and infrastructure to support these processes.



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Blueprint and Implementation of Rural Stand-Alone Power Grids ...

Operators of these stand-alone grid networks are thus potential customers for second-life battery storages. Lithium ion batteries are well suited for

rural power supply due to their cycle stability without a significant loss of capacity over a long service life and the accompanying low maintenance effort. Cham, Switzerland: 2018. pp. 289

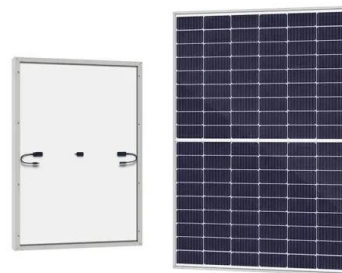


Electric car batteries could soon get a second lease on ...

The research will focus on three areas: extending a battery's lifespan, finding them a second life, and recovering and recycling materials. DESL will be involved on the topic of second-life battery applications of the project.

Critical Comparison of Li-Ion Aging Models for Second Life Battery

Lithium-ion batteries (LIBs) from electrified vehicles (EVs) that have reached the automotive end of life (EoL) may provide a low-cost, highly available energy storage solution for grid-connected



A second life for car batteries - a new research project

Seven Swiss research institutions and 24 companies are joining forces to look for ways to boost sustainability in all stages of a battery's life cycle. The project is part of the newly launched Flagship Initiative of Innosuisse, the Swiss Innovation Agency.

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