



New Energy Battery Supply Chain Disassembly Process

It has now been just over a year since the US Congress signed into law the Inflation Reduction Act (IRA). Already, the IRA has been followed by more than US \$110 billion in clean energy investments, with just over \$70 billion earmarked for the US battery supply chain, particularly downstream cell projects (so-called gigafactories). The first ...

The focus of research has shifted from lead-acid batteries to lithium batteries, and the supply chain and circular economy related to NEV battery recycling ...

At present, several developed countries are actively recycling power batteries. The United States has successively established the Rechargeable Battery Recycling Company and the Portable Rechargeable Battery Association to guide the public in cooperating actively with the recycling of waste batteries and promote the recycling of ...

As the global growth of electric vehicles (EVs) continues, the demand for lithium-ion batteries (LIBs) is increasing. In 2021, 9% of car sales was EVs, and the number increases up to 109% from 2020 (Canalys, 2022). After repeated cycles and with charge and discharge over the first five years of usage, LIBs in EVs are severely degraded and, in ...

The rapid development of green products, such as electric vehicle (EV) batteries, has brought about challenges in recycling and remanufacturing. To help tackle these challenges, in this research, we investigate how process innovation affects green product remanufacturing. Specifically, using game-theoretic models, we analyze process ...

Recycling plays a crucial role in achieving a sustainable production chain for lithium-ion batteries (LIBs), as it reduces the demand for primary mineral resources and mitigates environmental pollution ...

WASHINGTON, D.C. -- The U.S. Department of Energy (DOE) today announced up to \$30 million in funding to develop innovative solutions that support the creation of a circular electric vehicle (EV) battery supply chain. Funded by DOE's Advanced Research Projects Agency-Energy (ARPA-E), the Catalyzing Innovative ...

A comprehensive techno-economic assessment of the disassembly process was conducted, which identified cost hotspots in battery pack designs and to guide design optimisation strategies that help ...

Salvaged materials can be used in new batteries, and recycling can help get the overall production cost of EV batteries under the national goal of \$60/kWh. ... the U.S. Department of Energy's (DOE) Vehicle Technologies Office (VTO) launched the ReCell Center, bringing together industry, academia, and national laboratories to develop ...



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The sales price of new energy vehicles varies with the dominant players in the supply chain, and the supply chain leaders can make sufficient profits by setting the optimal price based on their leadership position; with an increase in government subsidies, the level of government subsidies will affect product pricing and the profitability of ...

The document carries out a scientific layout in the four aspects of the recovery: the recovery, echelon utilization and disassembly of power battery, and the ...

The development of lithium-ion batteries has played a major role in this reduction because it has allowed the substitution of fossil fuels by electric energy as a fuel source [1].

Vision for the Lithium-Battery . Supply Chain. By 2030, the United States and its . partners will establish a secure battery materials and technology supply chain that supports long-term U.S. economic competitiveness and equitable job creation, enables decarbonization, advances social justice, and meets national security requirements.

This paper establishes a closed-loop supply chain (CLSC) model composed of a power battery manufacturer and a NEV retailer. The benchmark scenario of CLSC members without blockchain ...

Nowadays, the reverse supply chain management receives much attention because of its critical role in environmental protection and economic development. Disassembly is very important in the reverse supply chain. It aims at dismantling valuable components from end-of-life products which are then remanufactured into like-new ones ...

Direct methods, where the cathode material is removed for reuse or reconditioning, require disassembly of LIB to yield useful battery materials, while methods to renovate used batteries into new ones are also likely to require battery disassembly, since many of the failure mechanisms for LIB require replacement of battery ...

The rapidly increasing adoption of electric vehicles (EVs) globally underscores the urgent need for effective management strategies for end-of-life (EOL) EV batteries. Efficient EOL management is crucial in reducing the ecological footprint of EVs and promoting a ...

With the growing requirements of retired electric vehicles (EVs), the recycling of EV batteries is being paid more and more attention to regarding its disassembly and echelon utilization to reach highly efficient resource utilization and environmental protection. In order to make full use of the retired EV batteries, we here discuss various ...

This work examines the key advances and research opportunities of emerging intelligent technologies for EV-LIB disassembly, and recycling and reuse of ...



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DOI: 10.1016/j.resconrec.2024.107786 Corpus ID: 270807610; Disassembly technologies of end-of-life automotive battery packs as the cornerstone for a circular battery value chain: A process-oriented analysis

Context. The EVs market is growing fast, setting new records year by year. According to the Global EV Outlook 2023 of the International Energy Agency (IEA) [], the number of EVs globally reached 26 million in 2022 with an increment of 60% relative to 2021, reaching 10 million of sales (6 million only in China) in a year. The 14% of new cars ...

This work proposes a stochastic disassembly sequence planning problem with consideration of noise pollution and energy consumption to achieve disassembly profit maximization and finds that the proposed model and approach can make better disassembly plan for the investigated problem with maximal profit. Nowadays, the ...

Apple today announced a new 2025 target to use 100 percent recycled cobalt in all Apple-designed batteries. ... Recovered haptics components from the Daisy robot disassembly process. ... Apple was the first electronics company to publish a list of cobalt and lithium refiners in its battery supply chain, with cobalt in 2016 and lithium in ...

Battery Recycling and Technology Process Selections . MICHIGAN. PROJECT NAME: Supplying Refined Battery Materials into the United States Electric Vehicle Battery Supply Chain by Synergizing Lithium-ion Battery Recycling with Mine Waste Reclamation . APPLICANT: Michigan Technological University (Houghton, MI) Federal Cost Share

The used power batteries of new energy vehicles have become a combined issue of environmental pollution, resource scarcity, and economic sustainability. Power battery recycling is inevitably becoming the key link in the formation of the green closed-loop supply chain for new energy vehicles and the green cycle of the new energy ...

In order to answer these questions, this paper constructs a two-party game model based on a closed-loop supply chain perspective, analyzes the behavioral decisions of manufacturers and retailers in the process of new energy battery recycling, explores the key parameters affecting new energy battery recycling, and then provides practical ...

Lithium-Ion Battery Supply Chain Considerations: Analysis of Potential Bottlenecks in Critical Metals, Elsa A. Olivetti, Gerbrand Ceder, Gabrielle G. Gaustad, and Xinkai Fu, Joule 1, 229-243, October 11, 2017

If successful, this effort can make domestic battery supply chains more robust and circular. That in turn can enable rapid deployment of EVs in the U.S. A cheaper, less wasteful recycling process. In most battery recycling today, the chemical structure of end-of-life battery components is broken down into the raw



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materials used in ...

Keywords Cascade utilization · Extended producer responsibility · Supply chain · Energy storage · Power battery · Game theory 1 Introduction To effectively address the energy pressures and environmental issues stemming from petroleum dependence, the State Council of China issued two versions of the New Energy

This study explores the influence of cascade utilization and Extended Producer Responsibility (EPR) regulation on the closed-loop supply chain of power batteries. Three pricing decision models are established under the recycling model of the battery closed-loop supply chain are established in this paper: benchmark model, EPR ...

As manual disassembly of LIBs is inefficient and labor-intensive, it is essential to develop automated disassembly based on the standard size and shape of battery packs to reduce costs and labor.

Introduction. The supply chains for lithium-ion batteries (LIBs) illustrate the intertwining of national security concerns with climate and trade policies, as the United States aims to strengthen supply chains by relocating production of essential items, including those vital for meeting climate objectives, back to domestic or nearby shores.

August 23, 2021 | Researchers at the Department of Energy's Oak Ridge National Laboratory have developed a robotic disassembly system for spent electric vehicle battery packs to safely and efficiently recycle and ...

Evolutionary game theory provides a systematic and effective research framework for studying new energy battery recycling due to its ability to portray the ...

We guess that in the process of supply chain transmission, it is likely that the lithium battery industry will pass on the overflow of raw material prices to the automobile industry. ... the lithium battery industry and new energy automotive industry exist in a strong dynamic correlation. The relationship is increased from 2016 the current time ...

Recycling and Utilization of New Energy Vehicles Power Battery - Mandates information on battery recycling at all stages from manufacturers, automakers and recyclers to ...

2. Analysis in Digital Upgrade Plan for New Energy Battery Production . 2.1. Enterprise level overall planning . The overall planning of the enterprise layer is an important foundation to ensure the digitization and networking of the manufacturing process of new energy batteries. In the process of adapting to the

The used power batteries of new energy vehicles have become a combined issue of environmental pollution, resource scarcity, and economic sustainability. Power battery recycling is inevitably becoming ...



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It can be found that sustainable management of the supply chain is an indispensable factor for Tesla to become a representative company in the new energy vehicle industry.

Considering the effective utilization of power battery, the cascade utilization was introduced power battery closed-loop supply chain, the system decision-making problem of the power battery dual circulation closed-loop supply chain composed of a manufacturer, recycler and cascade utilization enterprise was the research object. Under the scenario of ...

Battery Supply Chain February 2023. Contents ... The Li-Bridge Process 6 IV. Li-Bridge's Goals for the U.S. Lithium ... Dr. William Acker, New York Battery and Energy Storage Technology Consortium Brian Collie, Boston Consulting Group Danny Kennedy, New Energy Nexus

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