Price advantage analysis of second-life batteries

Are second-life batteries a cost advantage?
We estimate that,at current learning rates,the 30 to 70 percentcost advantage that second-life batteries are likely to demonstrate in the mid-2020s could drop to around 25 percent by 2040. This cost gap needs to remain sufficiently large to warrant the performance limitations of second-life batteries relative to new alternatives.

Are repurposed second-life batteries economically viable?
The technical and economic viability of these batteries is highly dependent on battery degradation studies and the availability of data. This review suggests that,the majority of economic or techno-economic studies ignore the capacity dispersion among repurposed second-life battery cells.

Is a battery's functional capacity accurate in a second-life application?
The analysis of reviewed literature reveals that accurate estimate of the battery's functional capacity and remaining useful life in second-life applications is a primary concern. Lack of first-use data and efficient ageing parameter control during these applications contribute to the problem's ambiguity.

What is the global demand for second-life batteries?
According to the joint report by McKinsey and the Global Battery Alliance,the projections estimate the global supply of second-life batteries will reach 15 GWhby 2025 and further increase to 112-227 GWh by 2030 . Besides,McKinsey also reported that the global demand for Li-ion batteries is expected to skyrocket in the next decade .

What challenges does the Second-Life battery market face?
The second-life battery market faces several major challenges. First, retired EVBs have a wide range of chemical and electrical properties and states of health. There are no comprehensive standards to test performances of different cell chemistries, cell formats, and battery pack designs.

Can second-life batteries be used in stationary storage applications?
The use of second-life batteries in stationary storage applications has proven to be a better alternative to disposal and recycling[20,31]. Hence,an accurate estimation of the battery's useful capacity and remaining life in second-life applications should be assessed with utmost attention.

6 ???· From an environmental perspective, the second-life batteries" main advantage is that it eliminates the need for manufacturing new batteries, but this comes with various other environmental issues. Firstly, it takes either 250 tons of Spodumene (a mineral ore) or 750 tons of brine rich in minerals to manufacture a single ton of lithium-ion [184].

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A material-flow analysis is conducted to estimate the number of batteries becoming available for second-life applications from both the Ostrobothnia region and Finland up to 2035. The cost of repurposing batteries is evaluated for four different scenarios, with the batteries being processed either on the pack, module, or cell level. Three ...

Second-life Batteries (SLBs), repurposed from retired EV batteries, offer a sustainable energy solution. This paper provides a step-by-step technical assessment, covering battery removal from cars ...

According to BNEF"s 2022 Battery Price Survey25, LIB pack prices, which were above $732/kWh in 2013, fell 79% in real terms to $151/kWh in 2022, and by 2026, average prices will be below $100/kWh.

Overall, the key determining factors of the economic benefits include electricity pricing structures such as peak electricity price and demand charge, cost of purchasing and repurposing second-life EVBs, battery performance parameters such as efficiency, DOD, and lifetime, and other factors such as discount rate, utilization rate of battery ...

By 2030, we expect more than 17 GWh of EV batteries to become available for repurposing from cars, buses, vans, and trucks, as shown in Figure 2. Battery costs still constitute close to 40% ...

Therefore, this study investigates the life cycle economic impacts of future SLB in Flanders, Belgium. It focuses on collecting, dismantling, repurposing, using them in a ...

Following a critical review of the research in SLBs, the key areas were identified as accurate State of Health (SOH) estimation, optimization of health indicators, battery life ...

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Effects of raw materials prices on battery manufacturing Note: (1) Lithium carbonate; (2) calculated from CNY to USD using constant exchange rate of CNY/USD = 0.16 Source: Arthur D. Little, Benchmark Mineral Intelligence, Het Financieele Dagblad, Trading Economics Figure 3. Effects of raw materials prices on battery manufacturing Material prices have risen due to ...

By 2030, we expect more than 17 GWh of EV batteries to become available for repurposing from cars, buses, vans, and trucks, as shown in Figure 2. Battery costs still constitute close to 40% of total EV costs across the industry, a significant factor in EV manufacturing.

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Likewise, in studies such as (Neubauer and Pesaran, 2011b) (Casals et al., 2019b), the second life evaluation is based on battery health in the form of remaining energy throughputs in general and excluding the battery duty cycles in different second-life applications, whereas in exercise, batteries" contributions to different second-life applications cannot be ...

Utility-scale lithium-ion battery demand and second-life EV1 battery supply,2 gigawatt-hours/year (GWh/y) Second-life EV battery supply by geography (base case2), GWh/y 0 40 80 120 2020 2025 2020 2025 2030 183 1 1 2030 Rest of world China Utility-scale lithium-ion-battery-storage demand European Union United States Second-life EV batteries ...

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.

Feasibility of utilising second life EV batteries: Applications, lifespan, economics, environmental impact, assessment, and challenges October 2021 Alexandria Engineering Journal 60(5):4517-4536

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