# Indonesia second life battery applications

Are second-life batteries a viable alternative to stationary batteries?
This story is contributed by Josh Lehman,Relyion Energy Second-life batteries present an immediate opportunity,the viability of which will be proven or disproven in the next few years. Second-life batteries can considerably reduce the cost as well as the environmental impact of stationary battery energy storage.

Are second-life batteries the future of energy storage?
The potential for second-life batteries is massive. At scale,second-life batteries could significantly lower BESS project costs,paving the way for broader adoption of wind and solar power and unlocking new markets and use cases for energy storage.

Are SLB batteries good for second-life applications?
As mentioned in Section 3,batteries with different SOH levels would be available for second-life applications. Typically,SLBs with a higher remaining capacity yield more revenue,but they may come at a higher cost. To make effective use of SLBs,the cost of maintaining and refurbishing these batteries must be outweighed by their benefits.

Should EV batteries be merged into second-life applications?
After regrouping, specific management strategies are necessary to deal with the low energy and power capabilities, large inconsistencies, and potential safety concerns when integrating retired batteries from different EVs into second-life applications.

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 .

Are second-life batteries more reliable than fresh batteries?
However, spent batteries are commonly less reliable than fresh batteries due to their degraded performance, thereby necessitating a comprehensive assessment from safety and economic perspectives before further utilization. To this end, this paper reviews the key technological and economic aspects of second-life batteries (SLBs).

Fig. 5 Comparison of first and second life battery application. requirements [27]. Fig. 6 SLB ESS Applications [21]. 4520 Mohammed Hussein Saleh Mohammed Haram et al. different climate conditions ...

Second-life Battery (SLB) applications would reshape the landscape of the end-of-life for those retired EV

batteries with relatively high remaining capacities. Except for the explicit economic and environmental benefits of giving these batteries a second life, the implications for the other aspects of sustainability should also be recognized. ...

Challenges in the assessment of the retired battery system vary with the role of the company that is responsible for the second-life application. 6 If the EV manufacturers act as the reuse companies, they may have a large amount of information about the battery operation history (such as the number of full equivalent cycles and maintenance ...

Telecom and datacenter backup services: Currently the largest second-life application in the world, as the application needs stable power supply. Behind-the-metre storage services (BTM) : Residential or commercial ...

The vehicle consumption is 175 Wh/km under the Worldwide Harmonized Light Vehicles Test Procedure (Database 2022).Based on Belgian national statistics, the total mileage is 133,668 km (FEBIAC 2020), leading to a total delivered energy over the first life of 23,392 kWh.The battery"s cycle life is calculated thanks to the cell datasheet (Lima 2022), and the ...

The average lifetime of a battery used in an EV is typically estimated to be between 8 and 15 years [14,17,20,22,23,24,25,26,27,28,29,30,31,32,33].Thus, considering the significant increase in the number of EVs sold [], more than 200 GWh of batteries from EVs will have reached their end of first life (EOFL) by end of this decade and will need to be replaced [].

E. Second-Life Application The usage of a former traction battery in its second life is again characterized by more or less frequent sequences of charging and discharging. In contrast to its automotive first life the differences between specific usage profiles and operation schedules is much larger than with powering an EV

By simultaneously optimizing the battery system for both life cycles, the potential of the battery system for second-life applications can be exploited already in first-life development by identifying design elements and construction methods that benefit the second-life usability without affecting the first-life system in a negative way. This ...

The figure below illustrates the potential cost structure of a repurposed battery in a second-life application where the buying price is the maximum value paid for the used battery. If this value could be passed through to the original owner, it could help to defray the cost of an electric vehicle.

This review investigates the critical phases, economics, market, problems, future importance of new production, second life, and recycling, and reveals potential challenges and solutions. ...

Using batteries after their first life in an Electric Vehicle (EV) represents an opportunity to reduce the

environmental impact and increase the economic benefits before recycling the battery. Many different second life applications have been proposed, each with multiple criteria that have to be taken into consideration when deciding the most suitable ...

In 2025, second-life batteries may be 30 to 70 percent less expensive 1 Comparing cost outlook on new packs versus on second-life packs, which includes costs of inspection, upgrades to hardware, and upgrades to the battery-management system. than new ones in these applications, tying up significantly less capital per cycle.

are not suitable for other applications in which energy density or fast-charging capability play a subordinate role. After the first life, these batteries can be converted into a 2nd-life appli-cation as stationary storage systems, where these used battery cells substitute new battery cells. The 2nd-life application as

Second-life batteries (SLBs) find applications in stationary systems, combined with renewable energy sources, grid support, and behind-the-meter-electricity storage for residential, commercial, and industrial properties. Figure 1 shows ...

The potential to use "second-life" batteries in stationary battery energy storage systems (BESS) is being explored by several startups, along with some grant programs and a few EV manufacturers.

In addition, for the same battery size, Vehicle to Grid provides more economic profit than second-life applications. Nevertheless, only in a few cases does this appear to be more profitable than ...

Battery retirement. The lifetime of LIBs ranges from 5 to 15 years and the cycle life varies from 1000 to 10,000. 9 The volume of retired EVBs is expected to increase exponentially driven by increasing deployment of EVs as a green transportation choice. 10 Chen and colleagues 11 estimate that 1 million EVB packs will be retired in 2030 and 1.9 million in ...

"Second life" battery technology offers a promising avenue for repurposing EV batteries. After being retired from vehicles, these batteries typically retain 50-80% of their capacity. They can be used in other applications and when a second-life battery is used instead of a new battery, it significantly reduces carbon emissions.

Battery-News presents an up-to-date overview of planned and already implemented projects in the field of second-life applications for lithium-ion batteries. The relevant data derive from official announcements by the ...

The paper also examines State of Health (SOH) degradation in the second life application, showing a decline from an initial 49.17% to 44.75% after 100 days and further to 29.25% after 350 days in ...

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Giving EV batteries a second life maximizes their value, extends their lifetime before recycling, and contributes to a circular battery economy. This IDTechEx report provides forecasts and analyses on second-life EV battery repurposers and business models, automotive OEM activity and partnerships, end-of-life (EOL) battery diagnostics players, key markets, ...

applications such as load shifting, renewable energy storage, back-up power, etc. [3-5]. Further, battery second use (B2U) could postpone the recycling phase which entails cost and waste. Repurposing retired batteries for second-life applications extends their total service life, which in turn increases EV value.

Finally, the application of the second-life BESS in power systems is modeled in a detailed economic dispatch (ED) problem. This is how second-life BESS"s performance translates into cost savings ...

While overcoming these challenges of second life of battery applications, it is very important to understand the battery from its first life usage. As the number of EVs increases, role of regulator becomes very vital to keep a cap on too many variables in development of market for second life of batteries.

The historical operation data of SLBs over their first-life applications significantly affect how the battery ages in second-life applications. For example, the fast charging in a cold environment will cause significant lithium plating, which leads to capacity loss and even takes the risk of thermal runaway caused by lithium dendrites ...