

SUSTAINABILITY IN THE ELECTRIC VEHICLE SUPPLY CHAIN

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[dx.doi.org/10.18374/JABE-24-1.10](https://doi.org/10.18374/JABE-24-1.10)

ABSTRACT

Electric vehicle (EV) batteries, like any other power storage device, have a limited shelf life due to the deterioration of the cells and their ability to store power over time. In the case that customers return products, vehicle manufacturing companies must consider the second life of such products on the environment. These batteries provide enormous benefits to the global society, including the sustainability of businesses. In contrast, these same batteries, when transported, must follow strict costly regulations due to the type of lithium-ion being transferred. It is critical to analyze the consequences of a repurposed battery because the success of the new product will be dependent on it. This research analyzes the reverse supply chain of EV batteries and options for a second life application. A weighted factor analysis is used to determine which options manufacturers should pursue to optimize the value of second life EV batteries. The research also suggests future research opportunities for battery electric vehicles (BEVs).

Keywords: Supply Chains, Sustainability, Mobility, Reverse Supply Chains, Electric Vehicles, Technology Management, Technology Strategy, Product Life Cycle, Automotive

1. INTRODUCTION

With the developing worries on the exhaustion of earth's petrol assets, higher CO₂ discharge and global warming issues brought about by the enormous number of traditional gas powered motor vehicles (ICEVs) being used all over the planet, elective vehicles, for example, hybrid and battery electric vehicles draw additional consideration from both car industry and academic community. The total vehicle load of EVs available is projected to grow through 2050. Transportation industry is rapidly developing and turning into the second-biggest energy shopper, driving it to be one of the primary supporters of air contamination and CO₂ discharges. The utilization of batteries in second life applications in the wake of arriving at the finish of life for their underlying use is one method for decreasing natural effects and the expenses of putting away energy.

The utilization of batteries in second life applications is beginning to build up some momentum, with a few organizations commercializing second life stockpiling frameworks; in any case, the decision-making process for progressing from essential, first life applications to second life applications is not surely known. A few examinations have been completed that consider the advantages of reusing EV batteries prior to reusing in different applications. There are a few investigations and principles that propose tests to assess the condition of the battery after its most memorable life. Automobile organizations and OEM have declared various ventures and plans of action for second-life batteries, like the stationary energy storage system (ESS) to extricate extra administrations and income in post car existence with cross-cutting advantages. The capability of second-life batteries lies in their condition of wellbeing (or staying helpful life).

2. LITERATURE REVIEW

Electric Vehicles Batteries

With the ever-increasing use of batteries, the concern about handling them after they have served their useful life is becoming more and more prominent. Second life batteries are batteries that have reached the end of their "automotive" life but still have a residual capacity of about 70-80%. Once an EV battery completes the first life, it enters a second life and three options have developed for the second life which