

Logistics of EV Batteries in Germany - State of the Art

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Abstract

In order to counteract climate change and thus herald the mobility transition from combustion engines to battery electric vehicles in Germany, the German government has set the target of registering a total of 15 million electric vehicles by the end of 2030. This is accompanied by enormous demands on battery logistics, as car manufacturers generally decide to have the finished battery systems installed in the bodywork at physically separate locations. Both the transportation of lithium-ion batteries as hazardous goods and their storage are subject to a large number of regulatory requirements. In particular, the handling of critical or critical/defective batteries is complex from a logistics perspective in terms of regulation. In order to keep lithium-ion batteries in the cycle for a correspondingly long time and to ensure that a circular economy can function in general, several stakeholders from different groups must collaborate with each other. Once the battery has reached around 80% state-of-health, the end of the automotive application has been reached. However, this does not mean that it has to be recycled immediately in line with the circular economy. The aim is to extend the life of the battery, for example as second-life energy storage. Other so-called "R strategies", e.g. reuse or remanufacturing, are also conceivable alongside recycling, depending on the state of health determined. Once the end-of-life of the battery has been reached, it must be recycled using various processes so that critical raw materials such as lithium, cobalt or nickel can be recovered.

Keywords

EV batteries, logistics, circular economy, regulations and sustainability.

Biography

Max Plotnikov has been a research associate at the Fraunhofer Institute for Material Flow and Logistics in the Software & Information Engineering department since February 2022. His research focuses on the exchange of information between individual actors in the circular economy of battery logistics. As part of the "InnoLogBat" research project, he is researching efficient and sustainable battery logistics together with other research partners and industrial partners. Max Plotnikov completed both his bachelor's and master's degrees at the Technical University of Dortmund. He is currently working on his doctorate at the same university.