

Return of electric vehicle batteries after first life – how to apply the Circular Economy

BY ROGER ELIAS (May 2024)

Have you ever considered what happens to the batteries of vehicles when they are not usable anymore? Was your first thought that they should be recycled? Or maybe used to power something else? Whatever the decision is, they will need to be transported and prepared for that. This is where things get tricky.

The core idea of the Circular Economy is to change the way we produce and consume our goods. Instead of creating something, using it, and then disposing of it, we should be able to reuse it infinite times. Transform it into something completely new. Anything, but throw it away!

This gets even more critical with goods that can have a huge impact on our planet and in our economy, such as the batteries that power the (not so) new holy grail of the automotive industry: electric vehicles.

Heavy, bulky, dangerous, you name it. Electric vehicle batteries carry a series of challenges when we think about moving them around. And it does not get easier when we consider what should be done with them when their power is not good enough to continue moving our vehicles. Add to the bowl local regulations changing and conflicting with each other, a volume supposed to increase on more than 100 times for the upcoming years, and an infrastructure not ready to deal with all of this: you have the scenario companies are facing nowadays. There is a need to perform an assessment of this environment, understand what is working well and what is not, and start to draw the processes that will guide companies to become efficient and effective in connecting

batteries returning from their first life to their second one. And repeat this, preferably, forever.

The concept of a Battery Return Center is a concrete way of applying the strategies of the Circular Economy to solve many of the challenges connected to the return flow of electric vehicle batteries. Are you wondering why is this not super popular yet? Well, there is of course a big number of variables to consider. There is also no consensus on what the “best practices” in the industry for that actually are. However, companies in this area are increasingly driving themselves towards the idea of standardizing their return flow processes and looking for concrete short- and long-term solutions.



In this industry full of uncertainties due to its short history, understanding the capabilities behind the return flow of the batteries can be a key element in creating standardization, flexibility, and scalability for companies to successfully propose different strategies and solutions to the increasing number of batteries that we will be producing and, eventually, returning. A Battery Return Center is not the place that will solve all these present and future problems, but it will make them a lot easier to deal with.

This popular scientific article is derived from the master thesis: *Electrical vehicles batteries lifecycle: Return center capabilities*, written by Roger Elias (2024).