Recycling international

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Title: Resource savings by "Advanced Battery Recycling"

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In 2009 an LCA study together with Ghent University, Umicore Cobalt & Specialty Materials (CSM) and Umicore Battery Recycling (UBR) was performed regarding the environmental impact of recycling NMC batteries in the Hofors facility in Sweden[1]. Focus of this LCA study was on the resource side of the recycling process and the overall resource savings were quantified as the Cumulative Exergy Extracted from the Natural Environment (CEENE) values[2]. It was concluded that 51% natural resources are saved when switching from virgin resource supply to the recycling of cobalt and nickel for the production of Li-ion battery cathode material.

Today, Umicore invested in a new "Advanced Battery Recycling Facility" in Hoboken, Belgium, which includes an improved battery recycling process. In this presentation, an overview of the improvements and a quantitative evaluation of the extra resource savings by the advanced recycling process will be presented. This will include direct comparison of both battery recycling facilities (Val'Eas process vs UHT process) as well as the impact of the new facility on the complete Li-ion cathode material production chain. Making these quantitative evaluations, taking into the life cycle aspects, allows Umicore to evaluate and benchmark the progression towards environmentally sustainable production and recycling processes.

References:

1. Dewulf, Jo; Van der Vorst, Geert; Denturck, Kim; Van Langenhove, Herman; Ghyoot, Wouter; Tytgat, Jan; Vandeputte, Kurt. Recycling rechargeable lithium ion batteries: Critical analysis of natural resource savings. RESOURCES, CONSERVATION AND RECYCLING (2010) 54 (4) 229-234
2. Dewulf, Jo; Bösch, Michael; De Meester, Bram; Van der Vorst, Geert; Van Langenhove, Herman; Hellweg, Stephanie; Huijbregts, Mark. Cumulative exergy extraction from the natural environment (CEENE): a comprehensive life cycle impact assessment method for resource accounting. ENVIRONMENTAL SCIENCE & TECHNOLOGY (2007) 41 (24) 8477-8483

Short CV of the speakers