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Environmental impacts of the potential nationalization of the production of LI-Ion cells for electric vehicle batteries in Brazil

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Abstract

This paper presents the results of the Life Cycle Assessment in order to compare the benefits of a potential nationalization of the production of Li-Ion battery cells in Brazil. To elaborate the analysis, several sources of the specialized literature and the Brazilian productive sector were consulted to modify the Life Cycle Inventories (LCI) for battery cells, present in Ecoinvent V 3.1. The results, obtained through the CML2000 method, indicate that potential nationalization of batteries would cause a product that has disadvantages in five of nine categories of environmental impact compared to a battery that reflects conditions of production in the world average. Additionally, it has been found that the anode and cathode are the main contributors to most impact categories. Finally, impact contributions throughout the manufacturing process lifecycle were analyzed, without including final provision, for three categories of impact: global warming, human toxicity and eutrophication, in order to look for the critical or major contribution steps. The results for global warming show that aluminum production is the main contribution due to the intensive use of energy in aluminum production. Regarding human toxicity and eutrophication the results show that the extraction of metals such as copper are linked to the greatest impacts.

Keywords: *Life Cycle Assessment, Life Cycle Inventories, Lithium Battery Cell, Product Nationalization, Electric Vehicles.*
