Life Cycle Assessment (LCA) in automotive sector: case study in an exhaust valve producer

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Abstract

Depending on the production sector and type of product, the environmental impacts of products placed on the market may be more significant outside the "factory-gate", i.e., those impacts may be more associated with the upstream and/or downstream life cycle stages of manufacturing. This is the case in many automotive industries, where environmental impacts of vehicles and their components show more significant contributions during the use phase compared to the manufacturing. Thus, this article aims to contribute to further research involving Life Cycle Assessment (LCA) studies in the automotive sector, focusing on the case involving the production of exhaust valves in Brazil. For this, a LCA was applied in a cradle-to-grave perspective of exhaust valves, and the results indicated that more than 90% of the impacts are due to the use phase of the product in vehicle engines. Thirteen midpoint impact categories were evaluated, including global warming potential, particulate matter formation potential, and human toxicity potential. Finally, suggestions for improvement were proposed to minimize part of the environmental hotspots identified in the study.

Keywords: *Environmental Management. Sustainable Production. Automotive Industry. Life Cycle Management.*