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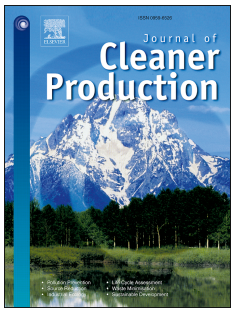

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Dominik Jasinski, James Meredith, Kerry Kirwan

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A Comprehensive Framework for Automotive Sustainability Assessment

Dominik Jasinski[a], James Meredith[b], Kerry Kirwan[a]

[a] Warwick Manufacturing Group, University of Warwick, Coventry. CV4 7AL. UK

[b] Department of Mechanical Engineering, University of Sheffield. S1 3JD. UK

Abstract

Business efficiency, stakeholder pressure and the need for legislative compliance compel the automotive sector to design and manufacture fuel-efficient, low-impact, environmentally responsible and sustainable vehicles. Managing and responding to these multiple and sometimes conflicting interests requires the measurement of economic, environmental and societal performance. Although a number of automotive sustainability measures are mentioned within the literature, there is no single and unique approach for the complete and integrated sustainability assessment of vehicles. This study has developed a comprehensive automotive sustainability assessment framework by selecting a set of sustainability assessment criteria from the literature and refining these through an interview study with 24 automotive experts from academia, car manufacturers, consultancies and non-governmental organisations. Based on this approach, 26 midpoint and 9 end-point environmental, resource, social and economic impact categories have been identified for the construction of a framework for automotive sustainability assessment. The proposed framework can be used as a decision-supporting tool at the early stages of the vehicle development process. It allows source and sustainability issues to be identified throughout the entire vehicle life cycle and provides the means to sharpen analysis and discussion around these issues. The framework can also serve as a design structure for a wide range of sustainability assessment methods and tools (e.g. multi-criteria decision adding or sustainability accounting methods). It serves as guidance on what needs to be measured in an integrated sustainability assessment of vehicles and leaves the choice of what to include in the decision-making process to the discretion of individual companies.

Keywords: sustainability assessment, automotive, sustainability assessment criteria, interview study.

Corresponding author: Dominik Jasinski

Tel.: +44 (0)24 7657 2528

E-mail address: d.jasinski@warwick.ac.uk