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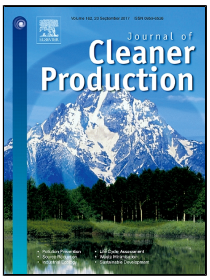

Modelling Barriers to the Adoption of Industrial Sustainability Measures

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Modelling Barriers to the Adoption of Industrial Sustainability Measures

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Abstract

Sustainability is constantly gaining relevance among industrial decision makers, policy makers and scholars. In order to be sustainable, firms need to implement industrial sustainability measures, however there are many barriers to doing this. This work is based on a review of literature on barriers to the areas of occupational health and safety, eco efficiency, energy efficiency and to sustainability and contributes to industrial sustainability research by presenting a novel, integrated theoretical model of barriers to implementation of sustainability measures. The model encompasses previous literature review contributions and is intended to characterize and evaluate barriers to the adoption of industrial sustainability measures in all its areas. We have conducted a preliminary validation of the model investigating eight northern Italian manufacturing firms, looking at its ability to represent barriers to sustainability, usefulness and ease of use. We conducted semi-structured interviews to people responsible of the different areas of industrial sustainability, complemented by questionnaires and secondary materials. Results show a positive overall judgment of the model by all the interviewees. Moreover, the model was able to be applied to issues deriving from different perspectives and different areas of industrial sustainability. The findings can help firms and policy makers overcome barriers and they also provide insight into the different perspectives on the adoption of industrial sustainability measures than can be used to promote their adoption.

Keywords: Industrial Sustainability, Barriers, Measures, Energy efficiency, Eco efficiency, Occupational Health and Safety

1 Introduction

In recent years, the interest of policy-makers and industrial decision-makers in the sustainability of industrial activities has dramatically grown. The industrial sector is a domain in which there is real need to improve sustainability (Rademaekers et al., 2011): current modes of production are unsustainable and substantial technological, managerial, organizational and behavioral changes are required to make them more sustainable (Blok et al., 2015).
The Triple Bottom Line model (TBL) proposed by Elkington (1998) identifies sustainability as the intersection of three different pillars, namely economic, environmental and social. In the industrial context we can refer to corporate sustainability (CS), industrial sustainability (IS) and manufacturing sustainability (MS). CS usually relates to the strategic level (Lozano et al., 2015) and MS to the production system level (Garetti and Taisch, 2012), however IS relates to the industrial plant level. Indeed, IS accounts for all the actions that are referred to production plant (and not just the production line), i.e. requiring actions at the levels of material, product, process, plant and systems of production (Tonelli et al., 2013), as well as integration into normal operations (Evans et al., 2009), and it has been considered as the research domain of the present study. IS has been often identified in literature with the areas of occupational health and safety (OHS) (Pagell and Gobeli, 2009), and eco efficiency (EE) (Gimenez et al., 2012), with a growing relevance of energy efficiency (EnEff) issue within EE (Pehlken et al., 2015). OHS and EnEff can be identified using the TBL model as the intersections of

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