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The economic dimension of sustainability: New perspectives from a ceramic tile manufacturing context.

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Abstract

Circular economy practices are especially interesting for the ceramic sector which is an energy- and raw material-intensive industry. Even with a remarkably positive impact on the environment, circular practices must be sustainable in socioeconomic terms. Appropriate assessment tools are therefore needed in order to implement sustainability in the business models of ceramic producers.

For this purpose, the Life Cycle Sustainability Assessment Framework (LCSA) is one of the most widely adopted methodologies in the evaluation of sustainability and it enables to consider each of the three pillars of sustainability: environmental, economic and social. The Life Cycle Costing (LCC) is the economic assessment tool of the LCSA. The literature underlines the existence of at least two categories of LCC. The Conventional LCC is a pure economic assessment of the costs incurred by the company in the different phases of the product life-cycle. The Environmental LCC considers the life-cycle costs of a product incurred by the actors involved, including externalities that are expected to be internalized. Nevertheless, for decision making, the LCC is generally considered as a mere extension of the environmental sustainability assessment and it continues to have significant limitations as the economic pillar of sustainability. It has an unclear system of boundary definition and, therefore, it does not include different perspectives of the economic agents involved. The aim of this research is to overcome the above mentioned LCC limits offering a new approach to the economic dimension of sustainability, starting from the ceramic tile-manufacturing context. To do so, a new comprehensive LCC calculation tool for the ceramic sector will be presented. Along the entire ceramic supply chain, the most relevant and measurable circular practices will be selected and included in this new tool considering the whole ceramic manufacturing supply chain. The tool will consider both internal costs and externalities and it will offer the opportunity to compare different scenarios with different levels of sustainability practices, assessing their feasibility in economic terms.

The analysis should provide, through an operative case, an illustration of the implementation of a broad LCC definition in a manufacturing reality. The research could

be an inspiration for future economic assessments of sustainability in manufacturing processes, even in sectors different from the ceramic one.

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