A taxonomy of circular economy indicators

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Abstract : Implementing circular economy (CE) principles is increasingly recommended as a convenient solution to meet the goals of sustainable development. New tools are required to support practitioners, decision-makers and policy-makers towards more CE practices, as well as to monitor the effects of CE adoption. Worldwide, academics, industrialists and politicians all agree on the need to use CE-related measuring instruments to manage this transition at different systemic levels. In this context, a wide range of circularity indicators (C-indicators) has been developed in recent years. Yet, as there is not one single definition of the CE concept, it is of the utmost importance to know what the available indicators measure in order to use them properly. Indeed, through a systematic literature review-considering both academic and grey literature-55 sets of C-indicators, developed by scholars, consulting companies and governmental agencies, have been identified, encompassing different purposes, scopes, and potential usages. Inspired by existing taxonomies of eco-design tools and sustainability indicators, and in line with the CE characteristics, a classification of indicators aiming to assess, improve, monitor and communicate on the CE performance is proposed and discussed. In the developed taxonomy including 10 categories, C-indicators are differentiated regarding criteria such as the levels of CE implementation (e.g. micro, meso, macro), the CE loops (maintain, reuse, remanufacture, recycle), the performance (intrinsic, impacts), the perspective of circularity (actual, potential) they are taking into account, or their degree of transversality (generic, sector-specific). In addition, the database inventorying the 55 sets of C-indicators is linked to an Excel-based query tool to facilitate the selection of appropriate indicators according to the specific user's needs and requirements. This study enriches the literature by giving a first need-driven taxonomy of C-indicators, which is experienced on several use cases. It provides a synthesis and clarification to the emerging and must-needed research theme of C-indicators, and sheds some light on remaining key challenges like their effective uptake by industry. Eventually, limitations, improvement areas, as well as implications of the proposed taxonomy are intently addressed to guide future research on C-indicators and CE implementation.

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