Evaluating business model environmental impact with Business Model Life Cycle Assessment (BM-LCA): Learnings from five case studies

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Evaluating business model environmental impact with Business Model Life Cycle Assessment (BM-LCA)

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Extended abstract

Sustainable business models have mainly developed through the application of various sustainability design principles (e.g., circularity, sharing) and methods for measuring the environmental performance for these business models have been lacking (cf. Bocken et al., 2016; Lüdeke-Freund et al., 2020). For this, a life cycle assessment methodology adapted for analyzing business model environmental performance has been developed, business model life cycle assessment (BM-LCA) (Baumann et al., 2022, Böckin et al., 2022).

A product system is not the same as a business model – the two are related but not exactly the same. This basic realization helped establishing their relationship, which paved the way for innovating on mainstream LCA methodology. In short, BM-LCA shifts the unit of analysis from the product system to the business model itself and takes its economic performance as the basis of comparison. The method achieves this by coupling the monetary flows of a business model to the material and energy flows of its product and/or service system. The method is introduced by Baumann et al. (2022) and its general methodology is presented by Böckin et al. (2022).

In principle, BM-LCA can be applied to any type of business model involving material or resource use. The method can be used for validating sustainable business models, within business model innovation for sustainability and for analysis for decoupling within a business practice. Here, findings and experiences from a handful of case studies with BM-LCA will be presented (see Table 1 below). Drawing on these, learnings about the relationship between business model innovations and environmental analysis have been made. These provide methodological indication for when there is need for a more comprehensive environmental assessment with BM-LCA and when simpler analysis is possible. The studies also shed some light on the responses of business managers and sustainability specialists to BM-LCA analyses and on the usefulness of BM-LCA to the companies.

BM-LCA has so far been applied in two completed projects and is being applied in three ongoing projects. In four of these projects, a conventional business model is compared with one or more sustainable or circular business models; in the fifth project, a circular ecosystem involving a handful companies is analyzed. The cases have been chosen to cover a variety of business models and product types, but also different levels of complexity to test the applicability and usefulness of the BM-LCA methodology. All studies have been

conducted in collaboration with different companies engaged in putting sustainable business models to the market in Sweden. The companies have been unexpectedly forthcoming in participating in the studies and have supplied our analyses with real business data.

***Table 1**. Overview of BM-LCA studies*

Product type	Studies	Reference
Garment	Linear sales and rental models	Goffetti et al., 2022
Automotive	Two sales models and three subscription-based models	Sandqvist & Westberg, 2022
Food utensils	Linear and circular business models	Claesson & Skogum, 2023 (forthcoming)
Tools	Sharing business model	Holzhausen & Troedsson, 2023 (forthoming)
Cool chain logistics	Circular business ecosystem	Baumann et al. (forthcoming)

Since BM-LCA is a novel methodology, it interesting to relate it to other research on measuring and analyzing business model environmental performance. To better understand its contribution, it will be related to the proposed frameworks for sustainable business model assessment by, for example, Bhatnagar et al. (2022) and Schlüter et al. (2023). The positioning of BM-LCA in relation to the existing toolbox for circular business model innovation tools (Bocken et al., 2019) is also made. Moreover, following the call by Snihur & Bocken (2022), the applicability of the method for analyses of firm-level business models and in business ecosystems is also analysed.

Keywords

Business models, environmental assessment methodology, life cycle assessment, cases studies, comparative analysis

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