

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

Downloaded from: https://research.chalmers.se, 2025-07-01 00:14 UTC

Citation for the original published paper (version of record):

Baumann, H. (2023). Evaluating business model environmental impact with Business Model Life Cycle Assessment
(BM-LCA): Learnings from five case studies. New Business Models Conference Proceedings 2023. http://dx.doi.org/10.26481/mup.2302

N.B. When citing this work, cite the original published paper.

research.chalmers.se offers the possibility of retrieving research publications produced at Chalmers University of Technology. It covers all kind of research output: articles, dissertations, conference papers, reports etc. since 2004. research.chalmers.se is administrated and maintained by Chalmers Library

Maastricht University Press • New Business Models Conference Proceedings 2023

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

Henrikke Baumann¹

¹Chalmers University of Technology

Maastricht University Press

Published on: Jun 21, 2023

URL: https://pubpub.maastrichtuniversitypress.nl/pub/cdwx1bit

License: Creative Commons Attribution 4.0 International License (CC-BY 4.0)

Henrikke Baumann

Environmental Systems Analysis, Dept of Technology Management and Economics, Chalmers University of Technology, SE-41296 Göteborg, Sweden

henrikke.baumann@chalmers.se

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.

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)

Tuble 1. Overview of Divi-LCA studies	Table 1.	Overview	of BM-LCA	studies
--	----------	----------	-----------	---------

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

References

Baumann, H., Böckin, D., Goffetti, G., Tillman, A. M., & Zobel, T. (2022) Switching the focus from product function to business profit: Introducing Business Model LCA (BM-LCA). In *10th International Conference on Life Cycle Management (LCM 2021), E3S Web of Conferences*, vol. 349, p. 06004. EDP Sciences.

Bhatnagar, R., Keskin, D., Kirkels, A., Romme, A. G. L., & Huijben, J. C. C. M. (2022) Design principles for sustainability assessments in the business model innovation process. *Journal of Cleaner Production*. 377, 134313.

Bocken, N., Miller, K., & Evans, S. (2016) Assessing the environmental impact of new Circular business models. In *Proceedings of the "New Business Models"—Exploring a Changing View on Organizing Value Creation, Toulouse, France*, 1, 16-17.

Bocken, N., Strupeit, L., Whalen, K., & Nußholz, J. (2019). A review and evaluation of circular business model innovation tools. *Sustainability*, *11*(8), 2210.

Böckin, D., Goffetti, G., Baumann, H., Tillman, A. M., & Zobel, T. (2022) Business model life cycle assessment: A method for analysing the environmental performance of business. *Sustainable Production and Consumption*. 32, 112-124.

Goffetti, G., Böckin, D., Baumann, H., Tillman, A. M., & Zobel, T. (2022) Towards sustainable business models with a novel life cycle assessment method. *Business Strategy and the Environment*. 31(5), 2019-2035.

Lüdeke-Freund, F., Dembek, K., & Rosati, F. (2020) Assessing and Managing the Sustainability Performance of Business Models: Status Quo and Research Agenda. In *5th International Online Conference on New Business Models*, pp. 457-462.

Sandqvist, J., & Westberg, H. (2022) *Evaluating business model environmental performance with BM-LCA*. A *comparative case in an automotive company*. MSc thesis, E2022:112, Chalmers University of Technology, Sweden.

Schlüter, L., Kørnøv, L., Mortensen, L., Løkke, S., Storrs, K., Lyhne, I., & Nors, B. (2023) Sustainable business model innovation: Design guidelines for integrating systems thinking principles in tools for early-stage sustainability assessment. *Journal of Cleaner Production*. 387, 135776.

Snihur, Y., & Bocken, N. (2022) A call for action: The impact of business model innovation on business ecosystems, society and planet. *Long Range Planning*. 55(6), 102182.