

Insights and Case Study in the fashion industry through Organisational Life Cycle Assessment

Salik Ahmed ^{1,4}, Marco Ciro Liscio ^{1,2}, Paolo Sospiro ^{1,2,3,4}, Irene Voukkali ⁵, Antonis A. Zorpas ⁵

1 EUAbout, Bruxelles, 1000, Belgium

2 C.I.I./Dipartimento di Ingegneria dell'Informazione, Università Politecnica delle Marche, Ancona, Via Brecce Bianche 12, 60131, Italy;

3 Università Telematica eCampus, Novedrate (CO), 22060, Italy;

4 CREAR/Dipartimento di Ingegneria Industriale, Università di Firenze, Firenze, 50139, Italy;

5 Laboratory of Chemical Engineering and Engineering Sustainability, Sustainable Environmental Engineering, Faculty of Pure and Applied Sciences, Open University of Cyprus, Giannou Kranidioti 89, Latsia, Nicosia, 2231, Cyprus

Keywords: Organizational Life Cycle Assessment, Circular Economy, Small-Medium Enterprises, Fashion Industry, Case Study

Presenting author email: m.c.liscio@pm.univpm.it

The increasing emphasis on sustainability imposes substantial challenges for businesses, particularly for Small and Medium Enterprises (SMEs) with constrained resources. Product Life Cycle Assessment (LCA), which typically focuses on individual products or services, limits the ability of micro, small, and medium enterprises (MSMEs) to fully evaluate their environmental impacts at an organizational level. Moreover, these enterprises often lack the capacity to assess the entire life cycle, as they usually operate within a specific segment of the broader value chain. Sustainable development remains a cornerstone of global policy, reaffirmed by the United Nations' Agenda 2030 (United Nations, 2015) and the European Green Deal (European Commission, 2019). These frameworks aim to protect society and the environment from pollution and resource depletion. However, tackling issues like climate change and excessive resource consumption necessitates substantial changes in business models and lifestyles, given their direct effects on human lives, economies, and ecosystems (Wafa W., et al., 2022). The life-cycle approach is crucial for gaining a comprehensive understanding of environmental impacts throughout the cradle-to-grave journey of products and processes. Life Cycle Assessment (LCA), with its standardized methodology, serves as a valuable tool to identify environmental hotspots, facilitate informed decision-making, and enable solution comparability (Liscio, M.C., Sospiro, P., 2023).

Despite its potential, SMEs often struggle to adopt LCA due to resource and expertise limitations. This is particularly evident in the fashion industry, where many SMEs operate at the initial stages of the value chain, making it difficult to conduct full life-cycle analyses of their products (De Ponte C., Liscio M.C., Sospiro P., 2023). To address these challenges, Organizational Life Cycle Assessment (OLCA) provides a promising alternative by assessing a company's overall environmental impact. OLCA evaluates organizational input, and output flows and considers both upstream and downstream activities, delivering a holistic perspective on the environmental performance of the entire value chain (Forin, S., Martinez-Blanco, J., Finkbeiner, M., 2019).

This study applies OLCA within the context of the fashion industry, focusing on a specific case study of a fashion company in Italy. The OLCA methodology was employed to identify critical environmental hotspots and inform targeted recommendations to enhance the company's sustainability performance. The analysis revealed significant areas for improvement in the company's operations, supply chain management, and resource utilization.

Based on the OLCA findings, the company was provided with actionable suggestions to transition towards a more sustainable business model

This case study demonstrates how OLCA can support decision-making by providing a detailed understanding of an organization's environmental footprint and enabling the formulation of strategic actions to improve sustainability. By integrating OLCA with traditional product LCA, businesses can achieve a more comprehensive evaluation of environmental impacts, fostering genuine environmental responsibility while avoiding burden shifting and greenwashing.

The findings underscore the transformative potential of OLCA in shaping corporate sustainability strategies, particularly for SMEs. By addressing both organizational and product-level impacts, OLCA empowers businesses to adopt sustainable practices, achieve long-term environmental goals, and contribute to broader societal efforts to combat climate change. This Italian fashion company serves as a compelling example of how OLCA-driven insights can drive targeted, actionable change in sustainability efforts, ultimately aligning business operations with environmental stewardship.

References

Ahmed S., Liscio M.C., Sospiro P., Voukkali I., Zorpas A.A. (2024). Advancing Sustainable Development Through Environmental Performance Monitoring: The Organisational Life Cycle Assessment. *Business Strategy and the Environment*, <https://doi.org/10.1002/bse.4115>.

De Ponte C., Liscio M.C., Sospiro P. (2023). State of the art on the Nexus between sustainability, fashion industry and sustainable business model. *Sustainable Chemistry and Pharmacy*, 32, 100968. doi:<https://doi.org/10.1016/j.scp.2023.100968>

European Commission. (2019). 'The European Green Deal'. COM (2019)640 final. European Commission. Retrieved 2023, from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52019DC0640>

Forin, S., Martinez-Blanco, J., Finkbeiner, M. (2019). Facts and figures from road testing the guidance on organizational life cycle assessment. *The International Journal of Life Cycle Assessment*, 24, 866–880. doi:<https://doi.org/10.1007/s11367-018-1533-x>

Liscio, M.C., Sospiro, P. (2023). Life Cycle Assessment on fashion industry: four case studies. *CEST2023*. doi:<https://doi.org/10.30955/gnc2023.00283>

United Nations. (2015). Sustainable Development Goals. Retrieved 2023, from <https://sdgs.un.org/goals>

Wafa W., et al. (2022). Organizational Life Cycle Sustainability Assessment (OLCSA) for a Higher Education Institution as an Organization: A Systematic Review and Bibliometric Analysis. *Sustainability*, 14(5), 2616. doi:<https://doi.org/10.3390/su14052616>