

Method Matters: Exploring and Avoiding Errors in Life Cycle Assessment

Vasilissa NIKONOVA

Università degli Studi della Campania «Luigi Vanvitelli», Department of Architecture and Industrial Design, Aversa, Italy
Rome, 09-13.09.2024

Life Cycle Assessment (LCA) is a powerful tool for evaluating the environmental impacts of products throughout their entire life cycle, from raw material extraction to disposal. However, the accuracy and reliability of LCA results are often compromised by methodological errors and inconsistencies. This study systematically investigates these issues, focusing on variations in assessment methods, assumptions, and data sources that can lead to divergent outcomes for the same product.

This study aims to identify and correct common LCA errors, offering strategies to improve the accuracy and relevance of LCA interpretations. By enhancing the reliability of LCA, we can better support sustainable decision-making and environmental management across various industries.

Key challenges include accurately defining system boundaries, selecting appropriate data, and choosing relevant methods. For example, the improper choice of functional units, such as using kilograms instead of square meters when discussing packaging materials or the improper use of popular methods without considering their limitations can also skew conclusions. As an example is the calculation of Global Warming Potential (GWP), which often overlooks CO₂ uptake, significantly affecting the carbon footprint of wood flooring. This material naturally sequesters carbon through photosynthesis, and ignoring this factor results in misleading conclusions. Addressing such errors is crucial for ensuring precise and reliable LCA results.

As scientists, we need to understand that more data and detailed information don't always translate to better communication. Accurate LCA results are essential for informing policies, guiding product development, and fostering environmentally responsible practices. By improving the methodologies and addressing inconsistencies, this study contributes to more reliable environmental assessments, ultimately supporting a more sustainable future.