

Engineering Solutions for Sustainable Development

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Abstract

Sustainable engineering (SE) focuses on systems that use energy and resources sustainably, addressing economic and climate change challenges (Global extreme weather this year in July is "virtually impossible" or "new extreme" in Antarctica without climate change). A radical shift in infrastructure planning is necessary to achieve net-zero emissions. Factors such as New Developments (NDs), nature-based solutions (NbS), life-cycle analysis (LCA), whole-life carbon (WLC), sustainable materials (SM), and green construction materials enable sustainable infrastructure. The identification of skills for upcoming infrastructure engineers, intelligent and sustainable built environments, IoT, and Integrated Workplace Management Systems (IWMS) are challenges. A circular economy approach to managing LC may be a more efficient and reliable means of achieving zero emissions.

1.0 Background: Role of Engineering in SD

Sustainable engineering (SE) focuses on systems that use energy and resources sustainably, addressing economic and climate change challenges (Global extreme weather this year in July is "virtually impossible" or "new extreme" in Antarctica without climate change). A radical shift in infrastructure planning is necessary to achieve net-zero emissions. Factors such as New Developments (NDs), nature-based solutions (NbS), life-cycle analysis (LCA), whole-life carbon (WLC), sustainable materials (SM), and green construction materials enable sustainable infrastructure. The identification of skills for upcoming infrastructure engineers, intelligent and sustainable built environments, IoT, and Integrated Workplace Management

Systems (IWMS) are challenges. A circular economy approach to managing LC may be a more efficient and reliable means of achieving zero emissions.

2.0 Strategies:

2.1. Factors enabling better infrastructure:

Carbon emissions have transitioned from being an optional to becoming a critical in the built environment and explore how to assess design options against one another as part of a net-zero design process and how emissions could be reduced through material specifications. This includes digital optimisation to achieve material and economic efficiency. Challenges and its aspirations for the future NDCs and LCA, as shown in Fig 1.

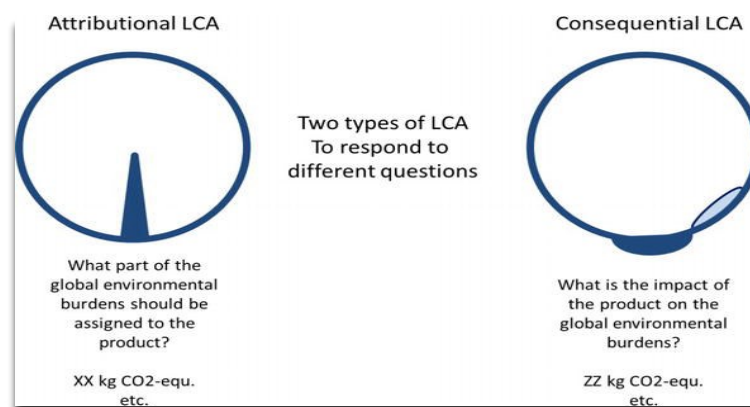


Fig 1 : Life Cycle Analysis(LCA) *Source: Weidema BP. Market Information in Life Cycle Assessment.*