

Integrating Value Chain and Sustainability Assessments to assess Circular Economy Strategies in the Built Environment

Presented by:

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The built environment is a significant contributor to GHG emissions and resource consumption. The circular economy (CE) can enable reaching the EU's goal to become CO₂ neutral by 2050. Circular business models help closing, intensifying, slowing down, dematerializing and narrowing resource loops. However, approaches are lacking to assess environmental, social, economic and technological feasibility. A comprehensive overview of how circular economy strategies align with supply chain actors' business models is unexplored.

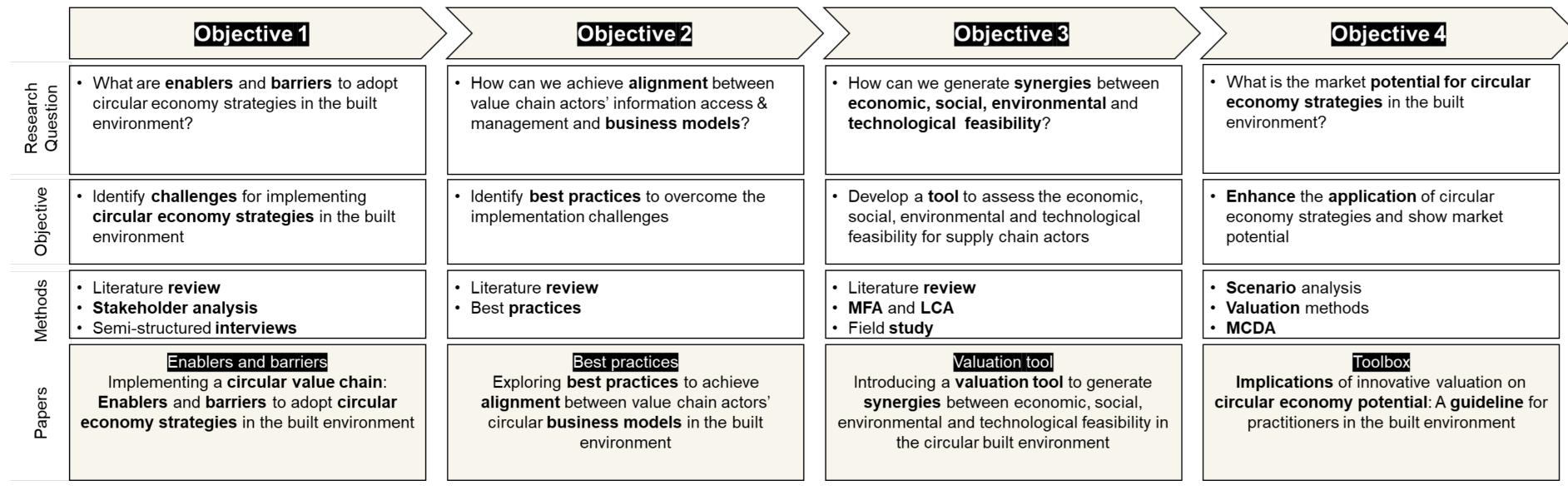


Figure 1: Objectives and tasks for the PhD project

Background

There are several barriers inhibiting the application of CE in practice (Hart et al., 2019). The greatest challenges lie in the role of society and supply chain actors (Pomponi and Moncaster, 2016). A circular value chain encourages the supply chain actors to retain the highest value (Dewagoda et al., 2022). Nevertheless, application of CE design principles and the quantitative evidence of this potential is lacking (Eberhardt and Birkved, 2022).

Aim

The aim of this research is to develop an innovative, quantitative approach to assess the economic, environmental, social and technological feasibility of circular economy strategies and utilize the market potential by proposing a toolbox for supply chain actors.

The PhD will be divided into four objectives which are summarized in Figure 1.

Method

The research will be based on qualitative and quantitative methodologies to enhance the applicatibility of the research outcomes.

Qualtitative methods are systematic literature review, stakeholder analysis, semi-structured interviews, best practices and case studies whereas material flow analysis, life cycle assessment, multi-criteria decision analysis and valuation methods are quantitative methods.

Future Results

The results of the PhD project are highly applicable for value chain actors in the circular built environment. First, enablers and barriers to adopt circular economy strategies are derived.

Second, best practices for value chain actor alignment in the built environment are proposed. Third, an innovative valuation tool to assess environmental, social, technological and economic feasibility is developed. Lastly, a toolbox for practicioners is derived based on market potential assessment.

Perspective

The PhD project is part of the EUfunded research program QuiVal (Quantum-inspired real estate valuation).

References

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