Potential of Circular Economy in Sustainable Buildings

Last Modified on 20/06/2019 11:49 am CEST

Authors: Leonora Charlotte Malabi Eberhar, Harpa Birgisdottir and Morten Birkved
Date of publish: February 2019

Why did we conduct this research?

The building industry contributes to resource scarcity by consuming vast amounts of natural resources and produces in addition large amounts of waste, both contributing to a considerable portion of the environmental impacts induced by the demands of a growing world population. Manufacturing of most building materials require large amounts of material and energy resources. These materials are nevertheless either down-cycled or ends up as waste after demolition. The need for improved resource efficiency will increase parallel to the growing human demands to ensure that future needs. Circular economy principles can potentially facilitate minimizing the aforementioned pending issues emanating from the building industry through recirculation of building materials.

Key findings:

- High complexity of the supply chain as well as focus on short-term goals such as short-term profit that misfit the long-term goals of sustainability.
- Potential environmental impact saving as well as economic benefits could be further increased through a higher degree of reuse, which was confirmed through a case study designed for disassembly.
- The buildings' overall environmental impact savings could potentially be improved through optimized materials choice combinations (wood, steel and glass, thereby enabling easier disassembly for both reuse and recycling).
- Certain circular economy principles that fit better together with certain building types, materials and components, advocating combination of different life cycle design and construction strategies specific for different material and component groups and their inherent characteristics.

Reference:

Eberhardt, L. C. M., Birgisdottir, H., & Birkved, M. (2019, February). Potential of Circular Economy in Sustainable Buildings. In *IOP Conference Series: Materials Science and Engineering* (Vol. 471, No. 9, p. 092051). IOP Publishing.

Link:

https://www.researchgate.net/publication/331314147_Potential_of_Circular_Economy_in_Sustainable_Buildings