

## Masterarbeit

Am Lehrstuhl für Betriebswirtschaftslehre ist in der Arbeitsgruppe „Ressourcenmanagement in der bebauten Umwelt“ eine Abschlussarbeit zu folgendem Thema zu vergeben:

### Life cycle and cost assessment of innovative biobased construction materials and products

Data science and analysis

#### ■ Background

Climate change demands for greenhouse gas reduction or mitigation and multiple energy and resource efficiency actions. However, it needs to be assessed, if and how new materials and products really contribute to (inter)national sustainability goals and to climate goals in particular. Also, it is necessary to assess the associated cost to discuss and decide on favorable framework conditions for their usage.

#### ■ Content of the work

Aim of the thesis is the **data collection and assessment of novel mycelium materials and products for the construction** industry. The envisioned assessment of the pilot stage process should focus on the lifecycle assessment (LCA) method and the material-flow cost accounting methods (MFCA) or similar methods with its main outcomes of CO<sub>2</sub>e emissions, primary energy demand, carbon efficiency and cost. For the required data collection, a review of relevant literature has to be performed, as well as expert interviews with fellow researchers and associated industry partners. Furthermore, the assessment includes the comparison with traditional/conventional materials and products to provide sound decision support. The LCA analysis should be performed in openLCA software (based upon an existing model). The cost assessment can be done via MS Excel, Python, Java, or Matlab. The calculations should be done for a case study product and can be associated with a market study or an optimization. This work is related to a current research project in the research group, then focus on industrial ecology, resource management in value chains and circular economy.

#### ■ Requirements

This thesis is suitable for students in industrial engineering, civil engineering and architecture and similar fields. Intrinsic motivation, proactiveness and affinity to numbers are helpful. You will be able to enhance your knowledge on new, sustainable materials and circular economy and you will gain proficiency in techno-economic assessments and LCA software.

#### Start / Duration

As of now, 6 months

#### Contact

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