Towards Sustainable Industrial Investments: Integrating Circular Economy Principles and Measuring Impact through Indicators.

30,0 credits
Organization
KTH collaboration with Scania and AstraZeneca
Location
Södertälje & Stockholm
Assignment type
Degree project Master's level

Background

Over the past decade, there has been a concerted effort within the industry to address the environmental impact of products. However, as this impact diminishes, tackling the remaining environmental concerns has become increasingly important, particularly in the extraction and production phases. This necessitates the transformation of production systems into circular and sustainable models. Achieving this shift requires a proactive approach from the outset, starting with well-informed decisions during factory investments.

Innovative approaches are imperative to break away from unsustainable technological solutions designed along linear principles (take, make, waste). Establishing the right requirements at the inception of investment projects is crucial. This is because the design phase heavily influences subsequent stages, making altering what has already been implemented challenging and costly.

A circular economy promotes systemic innovations to eliminate waste, enhance resource efficiency, and strike a better balance between economic, environmental, and societal factors. To ensure a successful transition to a circular economy in production, it's crucial to have the capability to measure and report progress. Presently, circular economy indicators are categorized into three levels: macro (global, national, regional, city), meso (industrial symbiosis, eco-industrial parks), and micro (individual firms, products) (Kristensen and Mosgaard, 2020). However, there is a lack of detailed understanding regarding measuring and documenting progress, specifically in production investment contexts.

The thesis project operates within the constellation of The GRÖN DESIGN project. A collaborative research-funded initiative focused on integrating circularity, resource efficiency, and sustainability into investment projects from their inception. This innovative approach holds significant promise in creating climate-neutral and resource-efficient factories.

Goals of the Master's Thesis

The main objective of this master's thesis is to conduct an extensive literature review focused on diverse indicators used to assess and report circularity and sustainability within production investments. It aims to identify best practices and challenges associated with these indicators. The insights gleaned from this review will be applied to improve the existing investment processes within the project case companies. Furthermore, the research will encompass diverse forms of data collection, including conducting interviews with companies in the pharmaceutical and automotive industries. The expected outcome of this thesis is to provide actionable guidance for companies on effectively measuring and reporting their progress in achieving sustainability and circularity in production investments.

The student(s) will work independently while communicating closely with Green design project partners.

To guide this research, we suggest the following as starting research questions:

RQ1: How do different industries (specifically, the pharmaceutical and automotive sectors) currently measure and report circularity and sustainability in their production investments, and what are their key indicators and methodologies?

RQ2: What practical recommendations can enhance the measurement and reporting of sustainability and circularity in production investments in these industries, aiming to improve current investment processes and environmental responsibility?

Expected outcomes

The anticipated outcome is a set of pragmatic recommendations tailored to these industries, designed to enhance the measurement and reporting of sustainability and circularity in their production investments. Ultimately, these outcomes aspire to empower companies with the knowledge and tools needed to navigate the complexities of sustainable industrial investments and promote environmental responsibility and progress within their sectors. Participating in this project can be a valuable learning experience that combines academic research with practical application, enriching the student's skill set and expanding their horizons for future career opportunities.

Requirements and the application process

We seek students who:

- Have a strong desire to work with real-life challenges and problem-solving and like to test new and outside-the-box ideas.
- Are driven, organized, and proactive in their work.
- Are registered in a master's program in Business and Economics or Engineering at KTH Royal Institute of Technology.
- It is preferred that students write their master's thesis in pairs.
- Geographical location: KTH Södertälje. Company visits in the Stockholm area may be necessary.

Apply by sending your CV and motivation letter to the contact persons below. Applications must be sent at the latest on **Nov 4th, 2023.**

Contact person (s):

KTH - Seyoum Eshetu Birkie seyoume@kth.se , Zuhara Zemke Chavez zuhar@kth.se