

Environmental Sustainability Analysis of H₂ Production and Use in Norway

Introduction

Reducing the carbon footprint of the energy, transportation, and industrial sectors is a major challenge in the fight against climate change that requires inventive solutions. This research aims to improve hydrogen-based value chains in Norway through advanced Life Cycle Assessment (LCA), promoting sustainability-driven innovation. It aims to quantify the climate change mitigation potential and identify environmental co-benefits and trade-offs of large-scale deployment of H₂-based technologies in Norway, particularly in hard-to-abate sectors

Primary objective

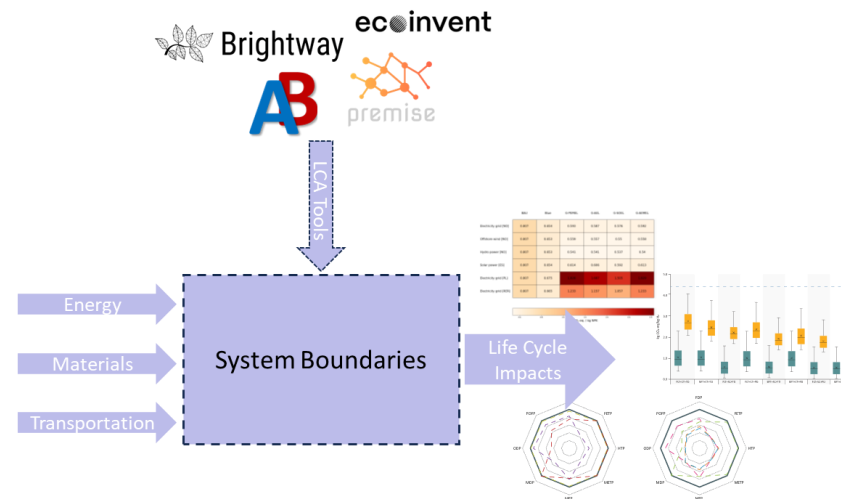
- Promote H₂ technologies to fulfill a green shift in Norway

Secondary objectives

- Identify environmental co-benefits and trade-offs
- Assessment of H₂ impact on the environment

Methods

The research focuses on two key areas. Method development involves refining integrated assessment tools that combine LCA with future scenario data for tailored prospective assessments in Norway. Applications include using these refined methods to assess specific value chains representing different combinations of hydrogen production and use.



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Related projects: FME HYDROGENi

Educational Background:

- BSc Environmental Engineering (ADNSU)
- MSc Engineering (NTNU)
- MSc Industrial Ecology (NTNU)

Supervisor: Francesco Cherubini

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Estimated progress of the PhD project:



Publications (WIP)

- Environmental implications of alternative production, distribution, storage, and leakage rates of hydrogen from offshore wind
- Environmental assessment of H₂ use as a reducing agent in the metallurgical industry
- Perspective LCA assessment of hydrogen use in NPK fertiliser production