

Social Life Cycle Assessment of Hydrogen Production Technologies: A Comparison of Polymer Exchange Water Electrolysis and Anion Exchange Water Electrolysis

Bachelor / Master thesis

Motivation

Hydrogen plays a crucial role in decarbonizing industries, transportation, and the energy sector. As the hydrogen sector continues to grow, Polymer Exchange Water Electrolysis (PEWE) and Anion Exchange Water Electrolysis (AEWE) stand out as promising technologies by supporting a sustainable energy transition through cleaner alternatives compared to traditional hydrogen production methods. However, social aspects play a pivotal role in shaping the overall sustainability of these technologies, too. Going beyond the considerations of ecological and economic factors, it is therefore crucial to gain a comprehensive understanding of social impacts associated with hydrogen production.

Key Objectives

The main objective is to identify, assess, and critically evaluate the multifaceted social sustainability dimension embedded in the life cycle of hydrogen production technologies, contributing valuable insights to the discourse on a just and sustainable hydrogen economy. Your research includes a systematic analysis of existing social life cycle assessment (S-LCA) studies evaluating of PEWE and AEWE technologies. Following the current state of research, you conduct a separate S-LCA to identify and compare social hotspots in the life cycle of PEWE and AEWE technologies (such as employment generation, health and safety implications, community engagement, and socio-economic considerations). Based on the assessment results, you identify areas for social improvement for future development of hydrogen production technologies.

Requirements

- Specialisation in Environmental Engineering, Mechanical Engineering, Electrical Engineering, Energy Engineering etc.
- Basic understanding of S-LCA methodology is desirable.
- The thesis can be written in **English or German**.

The content and scope of the thesis can be adapted depending on your desired focus and type of thesis.

For further information or any questions please contact

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