



Bachelor Thesis

Techno-economic assessment of cost of hydrogen from plasma cracking (in cooperation with iplas GmbH)

Hydrogen is expected to play a pivotal role in the transformation of energy systems. The greenhouse gas emission intensity of hydrogen depends on the primary energy source and the applied conversion technology. While much focus currently lies on electrolysis using electricity from volatile renewable energy sources (RES), such as wind and solar PV, other technologies are being explored.

Plasma Cracking invented by IPLAS GmbH is one example for such an alternative technology. It has the advantage of being independent from volatile RES and can potentially produce hydrogen at lower costs. Since carbon black is produced instead of gaseous CO₂, emissions can be effectively and sustainably reduced.

The thesis is written in cooperation with iplas GmbH (<https://www.iplas.de/de/green-hydrogen>).

Key tasks and objectives of the thesis

- Analysis and comparison of hydrogen production costs (levelized costs of hydrogen, LCOH) from plasma cracking and other production technologies
- Explicit incorporation of costs of CO₂ emissions
- Discussion of advantages and drawbacks of plasma cracking

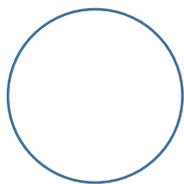
Your profile

- Student in economics, focus and interest in energy and techno-economic analysis

Literature

- Dincer, I. and Canan A. "Review and evaluation of hydrogen production methods for better sustainability." *International journal of hydrogen energy* 40.34 (2015): 11094-11111.
- Al-Qahtani, Amjad, et al. "Uncovering the true cost of hydrogen production routes using life cycle monetisation." *Applied Energy* 281 (2021): 115958.

Contact



Contact

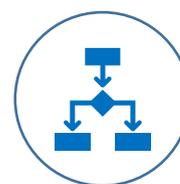
E-Mail: david.schlund@ewi.uni-koeln.de

Topics



- Hydrogen production
- Technology cost

Methods



- Levelized Cost of Hydrogen
- Life Cycle Assessment