

WE OFFER

MASTER/BACHELOR/PROJECT-THESIS

In the field of CCU (CO₂ capture and utilization), CO₂ transportation and energy system modelling

Title:

„Techno-Economic Assessment of Sustainable Platform-Chemical Import Pathways in CCU-based Supply Chains utilizing CO₂ Export“



Background:

This thesis is associated with the DirectCCE project and the NEFI scenario modelling, which aim to investigate systems for capturing and utilizing CO₂ to produce value-added products, including methanol.

Producing e-methanol using CCU technologies can reduce CO₂ emissions compared to fossil fuel-based production methods. However, CCU is driven by electricity costs significantly more expensive compared to fossil-based methanol. Therefore, seeking possible solutions to make e-methanol economically competitive in the market can be the goal of near-future research. This project aims to techno-economically assess the possibility of capturing CO₂ from Austrian industries and transporting it to North Africa to produce methanol there. Due to the high potential for renewable electricity, the hydrogen production cost is less than in Austria. Therefore, North Africa can be one of the most important candidates for producing platform chemicals like methanol. It is assumed that the produced e-methanol will be returned to Austria as a feedstock for industries.

This investigation shall provide detailed economic information regarding the possibility of producing e-methanol in North Africa by importing CO₂ and exporting the e-methanol back to Austria. Moreover, this scenario needs to be compared to the on-site production cost of e-methanol in Austria, with consideration of H₂ import.

Outline of the content:

- Investigating the CO₂, H₂, and e-methanol transportation costs
- Development and adaptation of existing transportation models
- Assessing and comparing the pathways of e-methanol production
- Graphical visualization of grid infrastructure and CO₂ emissions
- Sensitivity analysis within the scenario assumptions
- Written documentation of the project

Requirements:

- Data analysis skills, programming skills advantageous
- Spoken English skills are essential
- Motivation, teamwork, and reliability
- Interest in CCU, transport, and industrial process technologies

Work Load: ca. 6 months (MA, PJ)



You are interested? Please contact:

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