Assistant Professorship of Sustainable Future Mobility
TUM School of Engineering and Design
Technical University of Munich

Decarbonizing the aviation sector through Power-to-X systems

Type: Semester Thesis / Master Thesis (*Remote supervision)*
Content: Theoretical (Simulation)
Possible start: August 1/2025

Assistant Professorship of Sustainable Future Mobility (SFM)

Our group carries out research in the areas of *novel concepts in aviation propulsion, and Hyperloop technology as well as safety technology*. We use the principles of technical thermodynamics as a focus in research supported by elements of fluid mechanics, heat and mass transfer, acoustics, chemical reaction kinetics and systems dynamics. The Professorship aims to motivate students to develop modern technology for today and tomorrow.

Job Description

The aviation industry's net-zero carbon emissions target (2050) is focused on delivering a maximum reduction in emissions. In this context, the SFM group is researching and developing technical and environmental analyses for sustainable aviation (SAF) fuel production, specifically on PtX systems.

This research aims to determine a ***methodological framework for environmental analysis of SAF pathways with PtX systems*** considering the European scenario based on the *2050 ICAO Vision for Sustainable Aviation Fuels.*

Power-to-X - how does it work?.
Source: *International PtX Hub.*
https://ptx-hub.org/how-ptx-works/

Topics

- SAF technologies
- Current status and future prospects for PtX
- Renewable hydrogen production
- Beyond SAF: Power to fuel, Power to methanol and Power to ammonia

Your Tasks

- Literature research on processes SAF/PtX systems
- Environmental assessment of promises SAF pathways/PtX systems
- Data processing of emission factors

Recommended Prior Knowledge

- Interest and preliminary knowledge in thermodynamics
- Good and well-structured programming skills (*Python, MATLAB, etc.*)
- Skills in data processing
- Good communication (*English skills*)

Contact: If you are interested in this topic, please send your application to **Dr. Pablo Silva Ortiz** (pablo.silva@tum.de). If you have any questions, do not hesitate to contact us.

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