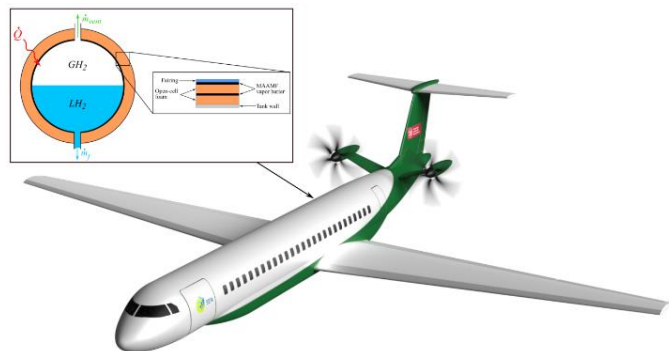


Master thesis / Student Project

Topic	Design sensitivity of hybrid fuel cell architectures or near-future fleet
Subject focus	Conceptual Aircraft Design, Design space exploration
Contact	Dr.-Ing. Stanislav Karpuk, IFL Raum 033 s.karpuk@tu-braunschweig.de, Tel. 0531 / 391 9929
Requirements	<ul style="list-style-type: none">• Solid programming skills in one of languages: Python, MATLAB• Fundamentals of conceptual aircraft design (EVV 1-2 courses required)• Experience with aircraft design software (SUAVE, CEASIOM, or other) is a plus• Fluency in written and speaking English

Introduction

The need for sustainable and energy-efficient air transport pushes the aviation industries toward the design of next-generation aircraft, with dramatic energy consumption, emission, and noise. The Cluster of Excellence SE2A – Sustainable and Energy Efficient Aviation is an interdisciplinary research center investigating technologies for sustainable and energy-efficient air transport systems. One of the important streams of technology assessments is related to the overall aircraft design and the search for more sustainable solutions in the near future.



The present project focuses on a low-fidelity design space exploration of possible fuel-cell-powered alternatives for aircraft fleets of the near future. It is expected that the student provides design recommendations for potential energy network solutions for 2035-2040 to achieve a combination of tangible reductions in overall aircraft emissions with appropriate operating costs for commuter, regional, and medium-range aircraft sectors. Some potential airframe solutions will be implemented as well.

Task Description

- Development of a rapid analysis model for fuel cell hybrid energy network analysis.
- Investigate several market segments with various energy network options. Consider potential future technologies being available by 2035-2040.
- Report obtained results and provide recommendations for future research initiatives.

Start date: Immediate