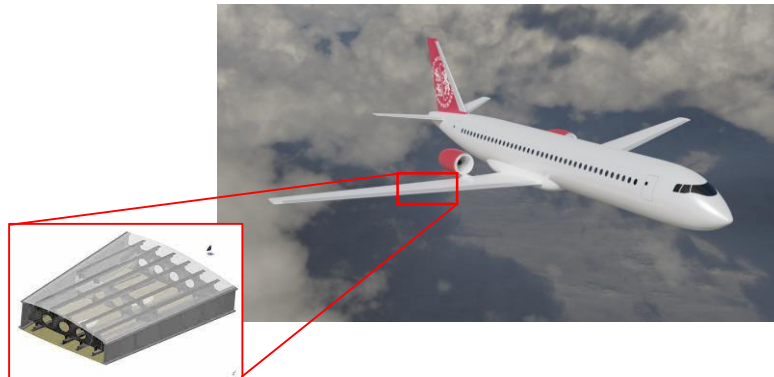


## Student project / Master thesis

# Comparative Structural Analysis of a Sustainable Medium-range Commercial Aircraft Wing



The need for sustainable and energy-efficient air transport pushes the aviation industries toward the design of the next-generation aircraft, with dramatic energy consumption, emission, and noise. The Cluster of Excellence SE<sup>2</sup>A – Sustainable and Energy Efficient Aviation is an interdisciplinary research center investigating technologies for a sustainable and energy-efficient air transport systems. Scientists from fields of engineering, economics, and chemistry are working on the reduction of drag, emissions, and noise, life-cycle concepts for airframes, improvements in air traffic management, and new technologies for energy storage and conversion. The overall project is structured into three core research areas: “Assessment of the Air Transport System”, “Flight Physics and Vehicle Systems”, and “Energy Storage and Conversion”.

Present Student Project focuses on a trade study of wings of four configurations of the medium-range aircraft with future airframe and propulsion technologies. Kerosene and liquid hydrogen configurations with both forward- and backward sweeps shall be compared to determine weight limitations of each wing configuration and draw a preliminary conclusion regarding the best future aircraft configuration.

### Project Details:

- Project duration: 3-6 Months
- Project start date: November-December 2022

### Work Plan:

The work consists of two major tasks:

- Development of structural analysis capabilities for rapid preliminary sizing of aircraft wingboxes using classical structural analysis methods
- Assessment of four wing configurations, estimation of wing weights, mission simulation with updated airframe weights, and recommendations regarding the best candidate for the new aircraft.

*Minimum Requirements:*

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- Experience in structural analysis and design using classical textbook methods
- Solid programming skills in one of languages: Python, MATLAB
- Ability to work independently
- Fluency in written and speaking English

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