MSc Thesis Opportunities in SETA Project

[Sustainable Energy Transformation in Aviation (SETA)](https://www.kth.se/indek/side/current-projects/seta-1.1017817) is an ongoing research collaboration between KTH Royal Institute of Technology and Linköping University and aims to support Sweden’s transition to fossil-free aviation by 2045. The project focuses on new fuels and technologies to decarbonise aircraft, such as advanced biofuels, electro fuels, hydrogen-propulsion systems and electric aircraft.

The unit of [Sustainability, Industrial Dynamics and Entrepreneurship](https://www.kth.se/indek/side/about-the-unit-of-sustainability-industrial-dynamics-and-entrepreneurship-1.960416) at INDEK is looking for MSc students to engage in 30 ECTS thesis projects (January – June 2023). The thesis projects will directly contribute to the ongoing research of the SETA project with the possibility for future publication in academic journals and/or as policy briefs.

# Proposed projects

We are looking for motivated MSc students with a range of disciplinary backgrounds, research interests and competences. The projects proposed are open to development by students in line with their own interests. As the projects will contribute to ongoing research at INDEK, there are opportunities for close collaboration with industrial actors and organisations involved in aviation in Sweden (and beyond).

Projects proposed (and related research questions) include:

1. ***What is the role of air passengers in the future of aviation?***

*Possible methods*: surveys, interviews, public forums, workshops, case studies

**Project 1.1:** Consumer views on new technologies (i.e., electric aircraft, hydrogen-propulsion systems) is relatively unknown, yet aviation is a ‘demand-driven’ mode of transport. What do air passengers think about new technologies? How can we foster trust and educate the general public about the technological future of aircraft?

**Project 1.2:** Gotland is a Swedish island in the Baltic Sea about 100 kilometres from the Swedish mainland. As an island, Gotland is accessible by sea and by air. The environmental impact of both the aviation and maritime industries are widely known, and yet no one has investigated why travellers to Gotland might choose to take the ferry, and why they might choose to fly? Factors such as cost, travel time, ease of travel etc. can be investigated.

**Project 1.3:** How is business travel changing? Do companies and organisations still need to fly even after the COVID-19 pandemic? How are their policies changing for business travel? How can business and industries support sustainable aviation? Which new sustainable business models can be developed based on new alliances between companies that rely on business travel and airlines?

1. ***What will electrification of air transport need?***

*Possible methods*: case studies, interviews, cost-benefit analysis, emission-energy-economy modelling

**Project 2.1:** Electrification of air transport means changes in infrastructure, regulations, operation, and more. What are these changes? Who’s affected? What role do airport have in this change, e.g., Bromma airport as a hub for electric aviation? What would this mean for the airport? What would this mean for aviation in Sweden?

**Project 2.2:** With fuel prices fluctuating, what will the future price of fuels and technologies be? How does pricing affect investment decisions of airlines and airports?

1. ***How is Sweden a role-model for sustainable aviation?***

*Possible methods*: case studies, interviews, policy analysis

**Project 3.1:** The Nordics appear to lead the way in sustainability transitions, but how does it compare between countries? [Norway has a goal to achieve 100 percent domestic electric flights by 2040](https://avinor.no/en/corporate/emission-free-aviation-in-2040). How does this compare to the Swedish goal for 100 percent fossil-free domestic flights by 2030? What are the differences and similarities between countries, what lessons can be learnt and knowledge shared to bring about transitions faster? Why are some countries forerunners and others laggards in innovation for sustainable aviation?

**Project 3.2:** The roadmap for [fossil-free aviation 2045](https://www.diva-portal.org/smash/get/diva2:1523447/FULLTEXT01.pdf) paves the way to achieve fossil-free aviation by 2045, but what role does the State have in supporting change? What can State agencies (i.e. Energimyndigheten, Trafikverket etc.) do to support transitions in aviation?

Interested students should contact Emily Christley ([emilych@kth.se](mailto:emilych@kth.se)), Emrah Karakaya ([emrahka@kth.se](mailto:emrahka@kth.se)), and Frauke Urban ([fraukeu@kth.se](mailto:fraukeu@kth.se)) to discuss MSc thesis opportunities further. Students should indicate their research and methods of interest. All ideas for the development of thesis projects are encouraged and welcomed.

More information about the SETA project can be found [here](https://liu.se/en/research/graduate-school-in-energy-systems/energiomstallning-for-en-mer-hallbar-flygindustri). Research publications from the project so far:

Kulanovic, A., Nordensvärd, J. 2021. Exploring the political discursive lock-ins on sustainable aviation in Sweden. *Energies.* 14 (21), 7401. <https://doi.org/10.3390/en14217401>

Lai, Y.Y., Christley, E., Kulanovic, A., Teng, C.C., Björklund, A., Nordensvärd, J., Karakaya, E., Urban, F., 2022. Analysing the opportunities and challenges for mitigating the climate impact of aviation: A narrative review. *Renew. Sustain. Energy Rev*. 156, 111972. <https://doi.org/10.1016/J.RSER.2021.111972>

Lai, Y.Y. Karakaya, E., Björklund, A. 2022. Employing a Socio-Technical System Approach in Prospective Life Cycle Assessment: A Case of Large-Scale Swedish Sustainable Aviation Fuels. *Front. Sustain.* <https://doi.org/10.3389/frsus.2022.912676>