Flying in a Climate-Constrained World
Reconciling Europe’s Demand for Aviation with its Climate Ambition

by Maximilian Held*, Kyle Seymour*, Saskia Adam*, Dr. Gil Georges, and Prof. Konstantinos Boulouchos

*) These authors contributed equally to this poster.

Why It Matters
Global air traffic is expected to triple by 2050 compared to 2015. In order to curb CO₂ emissions from global aviation, the International Civil Aviation Organization (ICAO) established the Carbon Offsetting and Reduction Scheme in International Aviation (CORSIA). It aspires to cap CO₂ emissions at 2020 levels. If aviation were to contribute its fair share to a carbon-neutral future by 2050, emissions reductions would have to be even higher. While other measures (operational or aircraft design improvements) can reduce aircraft emissions to a certain extent, only Sustainable Aviation Fuels (SAFs) can bring their CO₂ footprint down to zero.*

Our Research
We assess the costs of SAFs via a cost optimization of future production sites dependent on the potential of on-shore wind and solar power in European countries. The findings of this research project will provide guidance for policy-makers and the industry regarding their strategies towards a cost-efficient supply of SAFs, considering a ramp-up until 2050.

Key Results

Jet fuel demand in 2018, in liter per capita
Portugal: 167
Switzerland: 250

SAF costs in 2030 to provide the total national jet fuel demand of 2018 with SAFs, in EUR per liter (marginal costs)
Portugal: 2.0
Switzerland: 2.4

Electricity demand in 2030 to provide the total national jet fuel demand of 2018 with SAFs, as share of current (2018) gross domestic electricity production
Portugal: 100%
Switzerland: 100%

Conclusions:
- A pan-European SAF production strategy promises significant cost reductions compared to the domestic supply of each country’s own demand.
- Switzerland is likely to be a net importer of SAFs.
- The future SAF demand will create a high, additional demand for renewable electricity in the future.

Fuel Production Paths

FUEL PRODUCTION COSTS

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If you are interested in learning more about the modelling assumptions, underlying costs data, etc., please contact the corresponding author. Note that the presented figures are preliminary findings and may change for different assumptions on costs, efficiencies, land availability, etc. More thoroughly assessed findings will be published in 2021.