THEORETICAL BACKGROUND

Transport, aviation, and climate change

Transport sector: 23% of global energy-related CO₂ emissions

Aviation: 3.5% of global effective radiative forcing, projected to double over next 20 years, 60%–20% of allowable CO₂ by 2050 (Our World in Data, 2020; EASA, 2023)

Transport sector: 23.2% of EU total GHG emissions in 2019 (EIA, 2021)

Aviation: EU’s fastest growing transport sector (EIA, 2020)

EU Fu to SE package: reduce aviation emissions by 5% by 2030 and 60% by 2050

Transport sector: 28.2% of Austrian GHG emissions in 2020 (UBA, 2022)

Aviation: high growth rates (+14.7% passengers in 2019 (Statistik Austria, 2020)), 2.98 million tons emissions in 2019 based on kerosene fuelled in AUT (VCO 2020); Kapeller et al. (2019) show likelihood of underestimation

Carbon lock-in and low-carbon mobility

There exist three main approaches for making changes towards more sustainable mobility (cf. Creutzig et al., 2018):

Avoid (Reduction approach)

Travel less by avoiding for example unnecessary travel

Shift (Alteration approach)

Travel differently by shifting to other modes of transport

Improve (Efficiency approach)

Travel more efficiently by using for example less fuel or other technology

THIS RESEARCH PROJECT

Aim of the project and research questions

To achieve the climate targets, all sectors must reduce their greenhouse gas emissions. The transport sector faces particularly great challenges due to rising emission figures. Especially in air travel, the so-called “carbon lock-in” plays a major role. While air travel for leisure, business or academic travel has been reduced due to the COVID-19 pandemic, it has drastically changed this situation and opened a window of opportunity for rethinking air travel.

The TRANSFLIGHT project supports climate policy at the national and international levels in the context of the current crucial issue of air travel by taking advantage of the COVID-19 window of opportunity. For this, the following main research questions shall be answered:

- What experiences/challenges/chances has the COVID-19 pandemic brought about in relation to the organization of long-distance travel practices?
- How have travel preferences and behavioural intentions in the domains of leisure, business and academic travel changed?
- Which new digital technologies and virtual mobility play an alternative to physical travel, and which potential other courses for actions exist?
- How will emission pathways evolve based on a range of scenarios including different levels of behaviour change?
- Which strategies and policy implications for working towards low emission travel practices do result from these findings and what are preconditions for successful implementation?

Preliminary results

- Lock-in factors differ for avoid-, shift- and improve-behaviour, but perceived behaviour control plays a key role for escaping lock-in for all three behaviour types of leisure air travel (WP1).
- The pandemic has altered user behaviour. During the COVID-19 pandemic, the CO2 emissions associated with air travel dropped by about 75% from the summer peak in 2020 and about 25% in 2021, which indicates a fast recovery rate to business-as-usual in leisure air travel activities (WP4).
- In WP5, we have prepared a series of three international online workshops: a) Scoping the challenge, b) Learning from front runners, and c) Roadmaps

Keywords: air travel, emission reduction, demand side, behaviour change, carbon lock-in, policy

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https://ourworldindata.org/transport-energy-use-in-air-travel


4 http://www.icao.int/ctp/publications/Pages/Annex5-AirTransport.aspx