

The social costs of air travel in academia: A case study on a German-Indonesian research project



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Introduction & Background

- Air traveling is ubiquitous in academia, especially in international research collaborations such as the CRC 990
- Pro: Important for capacity building, disseminating knowledge and tackling international challenges
- Contra: Contribution to climate change via GHG emissions
- Aim of this project: Estimation of emissions and damages caused by academic jetsetting

Outcomes of interest

- Carbon dioxide (CO₂) equivalents
- Social costs of carbon (SSC): Monetized (future) damages caused by emitting one ton of CO₂ (equivalents) today
 - Including loss in agricultural productivity, human health and the value of ecosystem services, property value etc.
 - 30€ per ton of CO₂ (Nordhaus, 2017)

Data

- Travel data from German-Indonesian research project CRC 990 funded by the GRF for 5 years (2013-2017)
- Exemplary data extract :

From	To	Days	Destination
01.01.2014	15.01.2014	15	Indonesien
13.07.2014	17.07.2014	5	Bayreuth
13.09.2014	19.09.2014	7	Norwegen
...

- Including: all business trips paid by the CRC for staff (~70 persons) affiliated to the University of Göttingen
- Excluding: Indonesian counterparts' trips, domestic flights and stops
- Distances computed via google maps
- Trips with a linear distance > 800 km assumed to be flights
- CO₂ equivalents of air travel: CO₂ emissions caused by kerosene x Radiative Forcing Index (RFI)
- Kerosene consumption per passenger: 0.0306 l/km (Girardet and Spinler, 2013)
- CO₂ emission per liter kerosene: 0.0026 t/l (Nojoumi et al., 2009)
- RFI accounts for non-CO₂ warming effects and is assumed to be around 3 (IPCC, 2013)

Results



	Overall (2013-2017)	Per year & capita
Roundtrips	442	≈ 1.26
Distance	9,636,107 km ≈ 240 times around the world	27,532 km
Emissions	2,282 t of CO ₂ eq. ≈ 1,141 persons' yearly budget compatible with 2° Celsius goal	6.52 t of CO ₂ eq.
Social costs	68,569 € ≈ 20% of CRC costs for air travel	196 €

Conclusions

- Air travel in the CRC contributes to climate change and is associated with substantial social costs
- Conservative estimates, e.g. counterparts not included: travel expenses of counterparts ≈ 30% of all travel expenses
- Difficult to contrast with potential benefits
- Lowering air traveling in academia desirable to attain climate goals
- Future research shall investigate university-, country- and worldwide academic traveling

Recommendations

- Research institutes should monitor and publish their emissions (e.g. carbon tracker on homepage)
- Market-based solutions to lower emissions:
 - Paying for emissions (offsetting)
 - Implementing carbon trade scheme between chairs, CRCs or Universities
- Funding agencies should consider social costs of carbon when approving research proposals
- Simple advice: Using video conferences