



Reducing CO₂ emissions from air travel

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Overview

- Why do scientists fly?
- Flight reduction (general)
 - Why should we reduce flights (Knowledge) 
 - Do we **want** to  and how **can** we  reduce flights
- Flight reduction project at ETH Zurich
 - Why should we reduce flights (Knowledge) 
 - Do we **want** to  and how **can** we  reduce flights
- Lessons learned

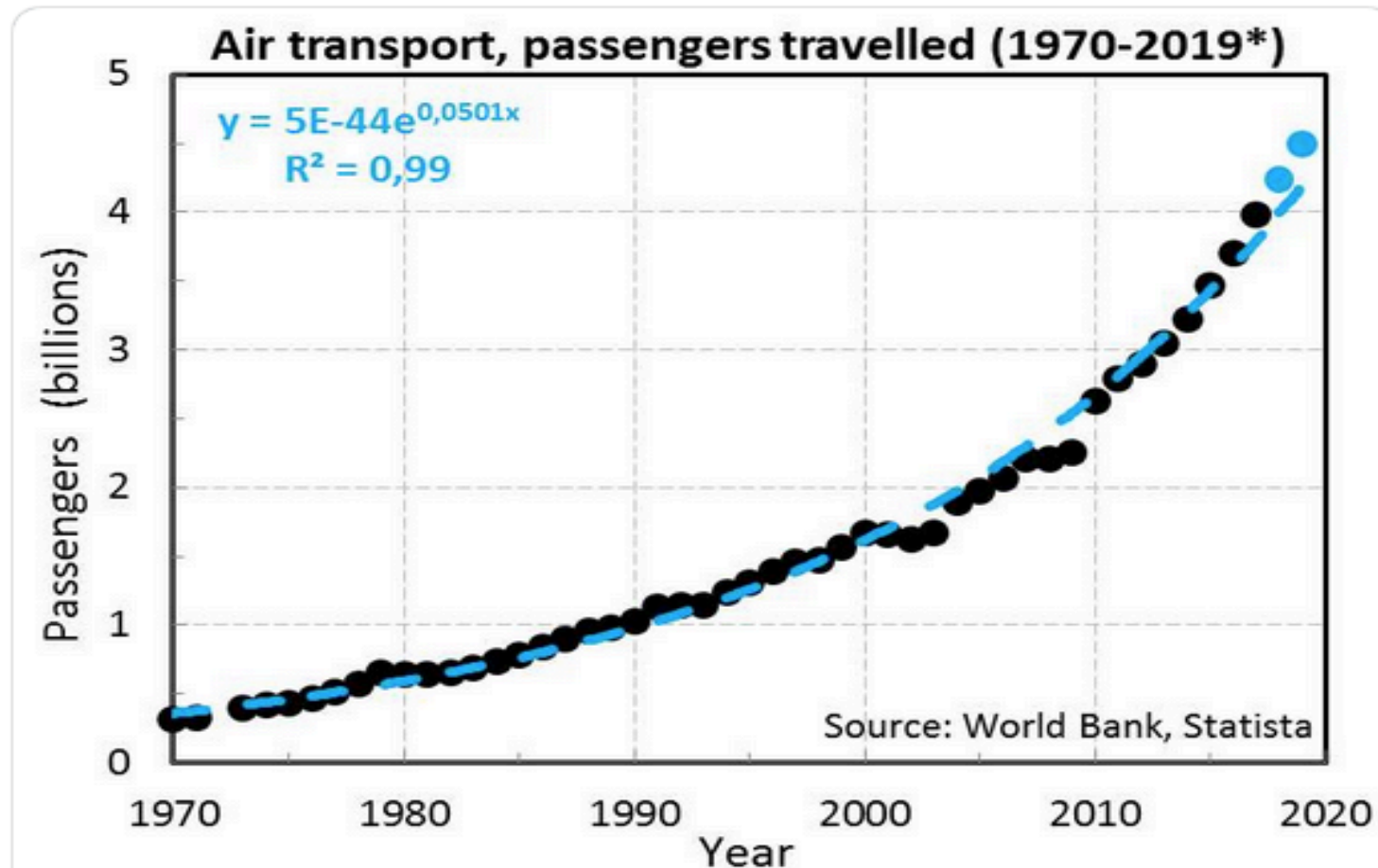
Why do scientists fly? (Interviews at ETH Zurich)



Reasons for air travel 	Benefits from air travel 	Materiel / immaterial costs of air travel 
• Conferences • Project meetings, Workshops • Excursions • Field research • PhD examinations • Committees • Long-term strategic collaborations	• Presentation of own research • Networking • New partnerships and projects • Flying is the most efficient form of travel (time, costs) • Job enrichment • Sensitisation to other cultures	• Money • Absence for supervision and teaching • Work-Life-Balance, family time • GHG emissions • Increased workload and overtime

modifiziert von: C. Robledo, H.J Althaus; Framework concept reduction air travel ETH Zurich

Development of worldwide air travel from 1970 – Jan 2019



from: <https://twitter.com/Lacertko/status/1089558645606625282>

Why is the reduction of flights relevant for universities?

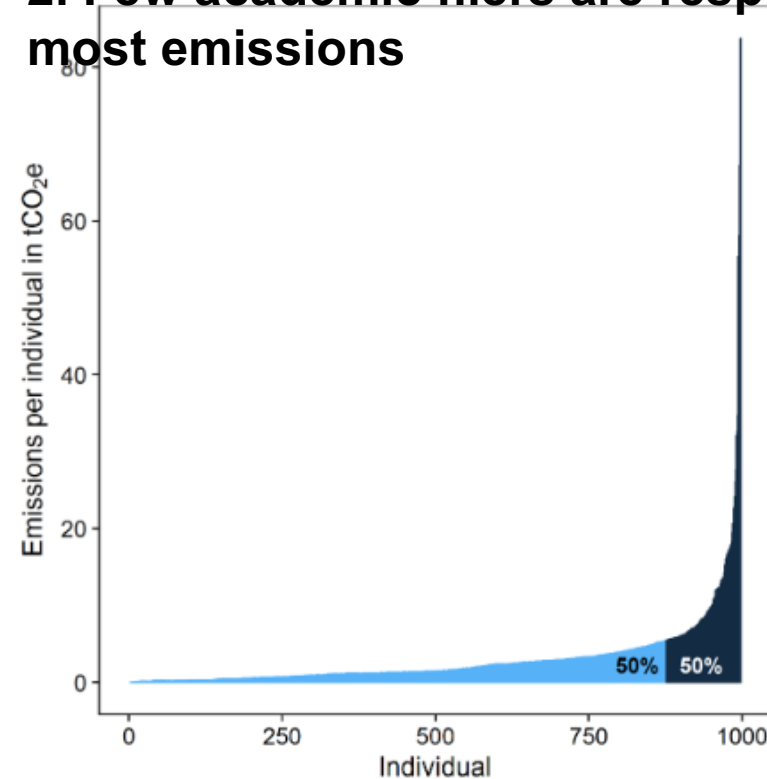


1. Scientist fly a lot more than the average person (Burian, 2018)

“On average, Swedish sustainability academics fly 72% more frequently for work alone than average Swedes do in total per year. Related emissions from these flights (2.61 t CO₂-eq) are more than twice as high as those of the flights taken by an average Swede”

→ “Academics fly a lot and it has a big climate impact” (K. Nicholas)

2. Few academic fliers are responsible for most emissions



Air travel emissions of 1509 individuals across 8 departments at UBC:

- 1/3 did not fly
- 80% emissions by 25% fliers
- 50% emissions caused by 8% fliers

Wynes and Donner, 2018: Business-related air travel emissions for the 997 individual travellers (one third of the people in the 8 units did not fly during the sampling period). Light blue indicates those travellers responsible for the first 50% of emissions and dark blue indicates those responsible for the second 50%.

Why is the reduction of flights relevant for universities?

3. Leading by example

«Academic leaders reducing flying increase public willingness to reduce their own emissions»*

Leaders who give up flying because of climate change seem to influence the attitudes and behaviour of others. „Leading by example by giving up flying appears to send a powerful and effective message“**

→ **Trendsetting**

4. Credibility

The public finds scientist who fly less more credible ***

* <https://www.slideshare.net/kimberlynicholas/academic-flying>

** [S. Westlake](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3283157), 2017, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3283157

*** Attari et al. (2016, Climate Change)

Why is the reduction of air travel difficult?



- **General:**
 - Surveys regularly reveal that environmental issues are considered important, but this does not automatically translate into respective action*
 - From knowledge → to awareness → to action
- **Universities:**
 - **Internationalisation** and hence (overseas) travel have sometimes become a value of its own → reconsider incentives/evaluation criteria
 - **Conflict of interest** between scientific excellence and flight emissions → evaluate necessity of travel and number of people travelling; do multi-purpose travel
 - **Costs:** flights are massively subsidised and prizes don't reflect real costs
 - **Time:** save time by not travelling (and using VC); high-quality travel time on train
- **Conclusion:**
 - Science requires innovation and creativity
 - «Business as usual» is no option

* Kuckartz 2008; <http://www.bpb.de/izpb/8971/umweltbewusstsein-und-umweltverhalten?p=all>

Media interest: societal responsibility and a reputation problem

Schweizer sind Vielflieger
Fliegen zum Spottpreis:
Bei dieser Politik zahlt das
Klima drauf (Kassensturz
25.9.2018)

„Your Next Conference:
Combat Greenhouse
Gas Emissions and Stay
at Home“, Editorials
December 2017

Heute Paris, morgen Boston:
Wie viel Fliegen für die Forschung
darf es sein?

Die Hochschulen tun sich schwer mit einer Reduktion ihrer CO₂-Emissionen

Höchste CO₂-Emissionen der Welt:
Bei den Schweizern fliegt das Gewissen nicht mit
(Aargauer Zeitung, 5.12.2018)

„Eine Flugreise ist das grösste
ökologische Verbrechen“
Süddeutsche Zeitung, 31. Mai
2018, 16.26h

Schweizer Unternehmen und
der CO₂-Ausstoss
(SRF, 10 vor 10, 26.9.2018)

Klimastreik



Neue Volkskrankheit: Flugscham

Eine wachsende Anzahl Schweden
meidet Flugreisen wegen
Gewissensbissen (Tagi, 22.11.2018)

Zuwenig Kapazität? Die Hälfte aller Flugzeuge ab Kloten
fliegt in Bahndistanz: Schweizer Umweltministerin wünscht
mehr Flugverkehr 47 Prozent mehr Luftverkehr erwartet der
Bund bis 2030. Damit das möglich wird, will Leuthard die
Kapazität der Flughäfen erhöhen. (Hanspeter Guggenbühl /
19. Dez 2018)

TagesAnzeiger
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Leben // Gesellschaft Style Essen & Trinken Wohnen Bildstreifen

Du sollst nicht fliegen
Es ist fast egal, wie man lebt: Ob man Abfall trennt, Bäume streift
allein der Verzicht auf ein Transportmittel: Das Flugzeug.

Sternstunde Philosophie:
„Dürfen wir noch fliegen“?
22. Oktober 2017



Activities at ETH Zurich

- 2016/2017: **Student** initiative to reduce air travel emissions
- 2016: Vice President Human Resources and Infrastructure initiates the **mobility platform** with one thematic focus on flight reduction ([www.ethz.ch/air travel](http://www.ethz.ch/air-travel))
- 2016: Mobility platform commissions a **concept** on how to reduce air travel at ETH
- 2017: Governing Board decision: top down decision by the governing board
- 2017/2018: Bottom up implementation by the departments to define a **reduction goal** with the respective **measures**
- 2018: ETH-wide reduction goal of average **11%**
- 2019 - 2025: **Implementation** and **monitoring**
- 2022 und 2025: **Evaluation**

Important points

- Bottom-up initiative: the departments differ, they know best where they have reduction potential
- Quality of research and teaching should not suffer, career chances of (young) scientists should not be impeded
- Technical measures have been very successful in reducing direct CO₂ emissions from infrastructure, but technology will not cause a reduction in flight emissions in the near future
- It needs a cultural change to reduce CO₂ emissions from flights



Alternatives to Flights

- **Conferences** → selection, multi-purpose travel, video presentations
- **Project meetings** → VC, Skype
- **Excursions** → how often, where to, how many people
- **Field research** → longer stays, VC (high-quality equipment on both sides needed)
- **PhD exams** → per VC, adapt regulations if needed
- **Committees** → partly per VC
- **Long-term strategic collaborations** → which ones are useful and relevant?

Expectation Management of Wicked Problems

Tame Problems

Characteristics:

- clear description
- clear objective
- clear solution

Examples:

- solving an equation in mathematics;
- analyzing the structure of some unknown compound in organic chemistry
- accomplishing checkmate in five moves

→ Science has developed to deal with „tame“ problems

Quelle: Rittel H & Weber M, 1973, Jones RN, 2011

Wicked Problems

Characteristics:

- cannot be definitively described
- nothing like the undisputable public good, no objective definition of equity because of a pluralistic society
- no "solutions" in the sense of definitive, objective or optimal answers

Examples: nearly all issues of public policy

→ Some aspects of a tame problem can be solved with science, but dealing on a scientific basis with „wicked“ problems overall is bound to fail

→ Be realistic and take a long term view

Slide adapted from: G Hirsch-Hadorn

Air travel reduction at ETH Zurich – Status quo:

- **Measures of the departments**
 - **Internal Carbon Pricing:** money can be used for compensation, internal research projects and teaching
 - **Compensation:** only preliminary measure, not part of the reduction goal
 - **Recommendation:** 1 intercontinental conference/PhD, train until 600–800 km with 1. class tickets, more VC (job interviews, PhD defenses, project meetings etc.), combine different activities (conference, meetings, field work)
 - **Transparency** about flights within departments
 - Support conferences in **Europe**, bi-annual conferences (instead yearly)
 - Support **VC ETH-wide**, adapt ETH regulations (less incentives for flights)
- **PhD project** to study the transformation process related to ETH Zurich's flight reduction project (Agnes Kreil)

„Typical“ arguments

- “Developing technology helps more...”: Great, but it’s not either or.
- “It harms our excellence...”: How do we define excellence? Are the ways to be excellent while flying less? No prescriptions (yet), bottom up commitment.
- “My contribution is small”: Everyone’s is of course.
- “I already do a lot...”: Shared resource, zero emissions required. Every ton I emit means one ton less for someone elsewhere, or the next generation.
- “Compensate elsewhere...”: Soon there will be no ‘elsewhere’ left. If we can’t do it, who else can?
- “It’s too costly, too difficult, it cannot be done...”: There are opportunities. The end goal should not prevent us from making a step. Every ton helps. And we haven’t even started.

→ If we can’t do it, who can?

from R. Knutti

Lessons Learned

- **Top down** support is essential
- **Bottom up** travel decisions by individuals → involve all staff and students (not just interested individuals)
- **Transparency**
- Good database for monitoring
- Change framing: from reduction to **alternatives** for flights
- Important role of **champions** and **influencers**, **Trendsetting**
- Discussion about conflicting targets (personal contacts/international research cooperations/field work **AND** climate goals)
- **Wicked problem** → there are no simple solutions but different and creative approaches (trial and error)
- **Cultural change needs endurance**
- **Common** approach of many universities needed to be successful

