

# Transformation toward sustainable academia: ETH Zurich's Air Travel Project



*Making academia more sustainable necessitates reducing emissions from academic air travel substantially. This requires a transformation of the academic system, including norms, practices, institutional rules, and framework conditions. We reflect on how the ETH Air Travel Project aims to reduce air travel at ETH Zurich while maintaining scientific excellence.*

Ariane Wenger , Giuliana Turi

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Emissions from the aviation sector are among the most difficult to mitigate due to non-CO<sub>2</sub> effects, difficulties surrounding the electrification of airplanes, and substantial lifecycle emissions associated with sustainable aviation fuels (Nick and Thalmann 2022). Other methods employed to limit the aviation sector's climate impact are carbon offsetting and carbon removal. However, both approaches can have potential negative impacts, such as biodiversity loss, high energy demand, and mitigation deterrence (Nick and Thalmann 2022). It is anticipated that these technological solutions will drive up the costs of air travel, potentially exacerbating disparities in air travel accessibility based on financial means. Thus, a reduction in the demand for air travel through individual behavior change is inevitably needed.

Within academia, a movement has emerged to prioritize the reduction of air travel emissions, aligning with the pursuit of net-zero targets. Several academic institutions, including ETH Zurich, have already adopted targets and measures to reduce their air travel. Given the substantial greenhouse gas (GHG) emissions associated with air travel, it often accounts for a significant portion of a university's carbon footprint. Researchers are among the privileged few worldwide who fly frequently, although air travel is unequally distributed even within academia, as factors such as geographic location, funding, and status influence researchers' air travel behavior (Whitmarsh et al. 2020). Furthermore, reducing academic air travel is considered important to maintain credibility as researchers and to serve as a role model for the public (Köhler et al. 2022).

ording, emission calculations, and data provision at the professorship level. Consequently, a new air travel data monitoring system was developed, and emissions collection for the 2016 to 2018 reference period commenced.

In 2019, the new monitoring system was integrated into ETH Zurich's financial portal, *ETHIS*. It allows flights to be recorded from all organizational units with flight number, flight date, service class, function of the traveler, and travel purpose. The system boundary covers ETH Zurich employees and invited guests whose travel expenses are paid by ETH, along with BSc and MSc students who fly as part of their curriculum. The collected information is shared with *atmosfair gGmbH*, who calculates the corresponding emissions based on the VDR standard methodology (*atmosfair gGmbH* 2016).

All 16 ETH departments and some central units set reduction targets for 2025, ranging from 5% to 50%, relative to 2016 to 2018 baseline emissions per full-time equivalent. The institution-wide target of 15% reduction by 2025 was derived as the average of the individual targets. Several entities have since devised specific measures to attain these targets, including implementing carbon pricing systems, encouraging virtual conference attendance, and creating hybrid conference hubs. These measures resulted from a collabora-

Ariane Wenger, MSc (corresponding author) | ETH Zurich | Institute for Environmental Decisions | Transdisciplinarity Lab (TdLab) | Zurich | CH | ariane.wenger@usys.ethz.ch

Dr. Giuliana Turi | ETH Zurich | ETH Sustainability | Zurich | CH | giuliana.turi@sl.ethz.ch

**D-USYS:** Dr. Lara Modolo | ETH Zurich | Department of Environmental Systems Science (D-USYS) | CHN H 45 | Universitätstr. 16 | 8092 Zurich | CH | +41 44 6328133 | lara.modolo@usys.ethz.ch

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## The ETH Air Travel Project: Walking the talk on the path to sustainability

In 2017, ETH Zurich launched the *Air Travel Project* to motivate its members to reduce GHG emissions from their air travel. The project is now managed by ETH Sustainability, the university's sustainability office, and aims to align emission reductions with scientific excellence and researchers' career growth. Early requirements by the departments included improved air travel data tracking, precise re-

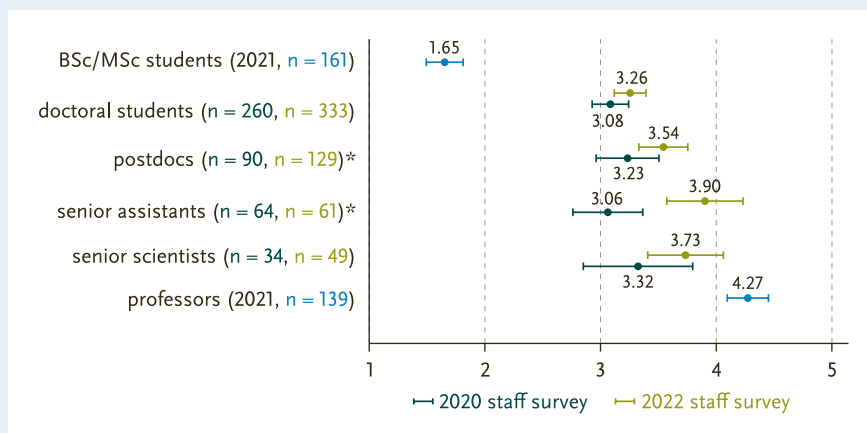
rative, bottom-up approach, primarily within the departments. In the past, some departments purchased compensation certificates for their flights. While ETH Zurich does not view offsetting as a substitute for genuine emissions reduction, it acknowledges it as an additional measure and interim solution.

The *ETH Air Travel Project's* objective is not to eliminate academic air travel completely. Instead, its goal is to avoid and reduce air travel emissions whenever feasible, thus being in line with climate regulations and ensuring a climate-friendly institution while maintaining academic air travel's essential role in research and academic success.

### Perceptions around air travel at ETH Zurich

Since 2018, the *ETH Air Travel Project* has benefited from significant scientific support, thanks to the efforts of two doctoral theses conducted at the Transdisciplinarity Lab (TdLab) within the Department of Environmental Systems Sciences (Kreil 2021). Both theses have been instrumental in shedding light on the perception and acceptance of the *Air Travel Project* by ETH members through several surveys conducted between 2020 and 2022.

The results show that most surveyed professors and scientific staff at ETH Zurich were aware of the *Air Travel Project*, whereas students exhibited slightly lower familiarity with it. Importantly, all surveyed groups expressed strong support for the project. The consensus among ETH members was that addressing GHG emissions stemming from academic air travel is of paramount importance. However, attitudes toward the relevance of air travel varied across different academic positions and between years (figure 1). The 2020 survey of scientific staff unveiled concerns that abstaining from air travel might hinder relationship-building and career advancement opportunities. Nevertheless, participants proposed more ambitious reduction targets than initially set. Interestingly, during the COVID-19 pandemic, ETH members recognized the potential for substituting some work-related air travel with virtual communication. In the surveys con-



**FIGURE 1:** Perceived relevance of air travel for participants' studies/work at ETH Zurich across academic positions. The relevance was measured on a five-point Likert scale from 1 (very irrelevant) to 5 (very relevant). Error bars represent 95% confidence intervals. Significant differences between years are marked with an \*. BSc/MSc students and professors were only surveyed in 2021.

ducted in 2021 and 2022, respectively, professors and scientific staff viewed virtual communication more favorably compared to before, although virtual meetings were perceived as more positive than virtual conferences (figure 2). While virtual formats were seen as insufficient for fostering relationships and collaborations, they were acknowledged for their effectiveness in reducing emissions, saving time and costs, alleviating travel stress, and enhancing inclusivity among participants.

The survey findings underscore the importance of addressing GHG emissions from academic air travel and highlight the applicability of virtual communication, emphasizing the broader imperative of academic system transformation for sustainability.

### From voluntary measures to climate commitment

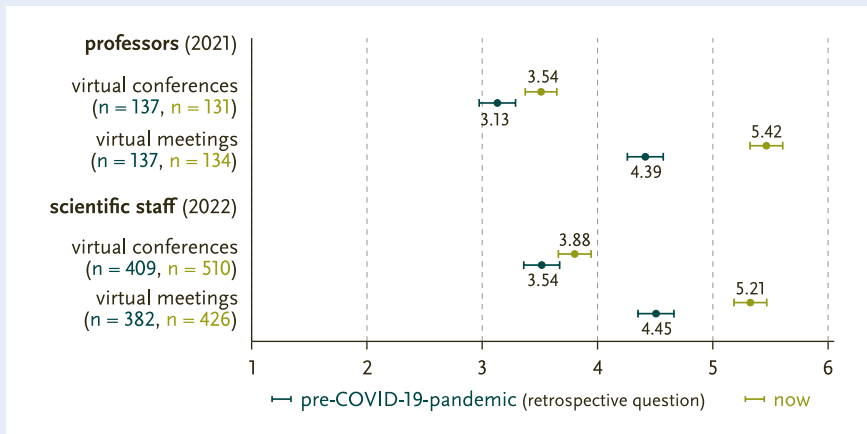
The *ETH Air Travel Project* has solidified its status as a flagship initiative for ETH net-zero aspirations with a substantial historical data foundation. Through the establishment of voluntary reduction targets, the accompanying research via two doctoral theses, the integration of data collection into the *ETHIS* financial portal, continuous progress monitoring, and the option for implementing targeted measures in the departments and central units, significant strides have been taken toward a transformative process.

Nevertheless, following the COVID-19 pandemic, air travel emissions at ETH Zurich have rebounded to over 60% of their pre-pandemic levels (figure 3). In 2022, ETH Zurich's air travel alone amounted to over 9,000 tons of CO<sub>2</sub>-equivalent emissions, making it the largest contributor within the system boundaries of the Federal Administration's climate package (*Klimapaket Bund*). This development emphasizes the constraints of voluntary measures within the project and the common norm among researchers to view in-person attendance at conferences and meetings as crucial to academic advancement. Additionally, air travel remains indispensable for field research, workshops, and seminars abroad where virtual alternatives are limited.

To spearhead the global drive toward achieving net-zero GHG emissions, ETH Zurich must adjust its air travel reduction objectives to surpass the voluntary targets set in 2019 and harmonize with the broader climate package framework. Through a concerted approach, the university can position itself as a trailblazer in the pursuit of a sustainable and environmentally responsible academic community.

### Individual norms, institutional lock-ins, and external framework conditions

The structural and deep embedding of air travel in the academic system and the norms and attitudes of researchers regard-



**FIGURE 2:** Attitudes of ETH members toward virtual communication. Attitudes were measured on a Likert scale from 1 (very negative) to 5 (very positive). Error bars represent 95% confidence intervals.

ing air travel present a stark contrast to the need for swift and substantial reductions in academic air travel. Literature has shown that researchers often consider air travel as a prerequisite for academic success and excellence, given the apparent systemic pressure on researchers to establish an international reputation (Nurse-Bray et al. 2019, Hopkins et al. 2019). Researchers attach great importance to face-to-face interactions at conferences, workshops, or meetings, viewing them as essential for exchanging scientific knowledge, building and maintaining professional networks, and enhancing one’s visibility within the scientific community (Schrems and Upham 2020). Moreover, the phenomenon of conference tourism often motivates researchers, offering opportunities to visit attractive destinations, reunite with friends and family nearby, and escape from everyday life and obligations (Tanford et al. 2012).

In addition, individual researchers face significant pressure to fly due to institutional lock-ins and framework conditions within academia. As illustrated by Hansen and Ren (2020), academia’s reward system places a strong emphasis on individual recognition, achieved primarily through the accumulation and conversion of different forms of credibility, including data, networks, grants, and publications. These conversions of credibility predominantly occur at academic events, requiring researchers’ consistent physical presence (Hansen and Ren 2020). Furthermore, ac-

ademia imposes numerous formal and informal directives and expectations that compel researchers to travel to diverse locations. These include the normative requirement for early career researchers to take up temporary positions abroad. Universities also influence researchers’ air travel behavior through policies related to conference attendance and research funding, promotion criteria, sabbatical mandates, the promotion of international collaborations and affiliations with global networks and communities, as well as offering incentives and rewards tied to specific transportation modes, such as counting travel time as working time (Tseng et al. 2022).

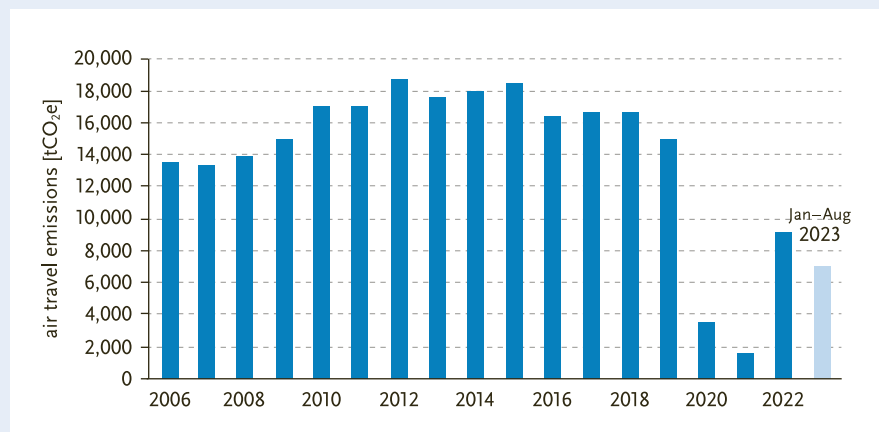
Researchers’ air travel choices are also affected by factors beyond the academic sphere, such as the broader transportation

infrastructure. These include the availability of ground-based transportation (often influenced by geographic location), travel duration, costs, and the perceived comfort of various transportation modes (Schrems and Upham 2020, Hopkins et al. 2019). Additionally, individual researchers’ personal circumstances and obligations, such as caregiving responsibilities, physical or mental health, visa requirements, and mobility constraints significantly shape their travel behavior (Whitmarsh et al. 2020, Henderson 2021).

**Shaping the way to a transformation of academic travel behavior**

To attain net-zero GHG emission goals and make academia more sustainable, the academic landscape needs to be reshaped. This transformation involves not only adapting and creating new framework conditions within and outside academia, but also changing norms, attitudes, and practices of researchers that have been established and internalized over decades. This transformation will not only require time, but also collective action of all stakeholders of the academic system “to change the rules of career success” (Köhler et al. 2022, p. 8). Collaboration among global academic institutions is essential to maintain equitable conditions and prevent disparities between universities. Additionally, organizing more virtual and hybrid scientific events can make academia more inclusive and lead to greater diversity by enabling those who face travel barriers to

**FIGURE 3:** Air travel emissions at ETH Zurich from 2006 to 2023 in tons of CO<sub>2</sub> equivalents (tCO<sub>2</sub>e). Data from 2023 (light blue bar) are provisional and only cover flights until mid-August.



## Nachhaltigkeit

## A-Z



## K

## wie Kreativität

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participate. Consequently, the academic reward system should gradually incentivize and prioritize research that minimizes air travel.

Specifically, every facet of the academic system should be targeted to create long-term change. Researchers can rigorously reassess the necessity of air travel for various purposes and consider alternatives like virtual communication. Prioritizing flights according to their relevance for research and one's academic career becomes crucial. Furthermore, reducing air travel can provide opportunities for localized research and a more deliberate approach to individual research and teaching. Conference and meeting organizers should explore innovative ways to achieve their goals with reduced air travel, and experiment with novel event formats. The assessment of air travel emissions can also be included in research proposals and thus be part of the evaluation criteria used by funders and policymakers. Additionally, the new generation of early career researchers could collectively decide to fly less to ensure that they do not disadvantage each other in their academic careers, thus aligning the transformation of the academic system with their career development.

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