

SHAPING THE FUTURE OF AIR TRAVEL

Moving beyond carbon
lock-ins in the air travel sector

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Actionable knowledge for transformation.

About CET

Climate change is one of the greatest societal challenges of our time. While we have acquired substantial knowledge about physical climate changes and their impacts on society, new knowledge is needed on how to achieve rapid, just and deep transformation of society.

The Centre for Climate and Energy Transformation (CET) is based at the Faculty of Social Sciences and is a hub for interdisciplinary research with a basis in the social sciences in this area. CET brings together researchers from three partner institutions - the University of Bergen, NORCE Norwegian Research Centre AS and NHH Norwegian School of Economics.



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This report presents findings from research undertaken by the Centre for Climate and Energy Transformation at the University of Bergen and the Department of Environmental Systems Sciences at the University of Graz to gather evidence on the state air travel demand reduction in the EU. It presents co-created transition scenarios that build on diverse stakeholders from government, academia, and civil society. The findings outlined in this report are based on a series of workshops carried out in March 2023.

TRANSFLIGHT

Project name: TRANSFLIGHT: Shaping the Future of Air Travel

Funder: Klima- und Energiefonds Austria

Project period: 2021 - 2024

Project leader: Alfred Posch, University of Graz



Introduction

The imperative to reduce emissions from air travel stems from the pressing need to address the escalating challenges posed by climate change¹. The sector is today responsible for 2.4% of total anthropogenic emissions of CO₂, though it contributes significantly more to global warming due to the impacts of non-CO₂ gases at high altitudes. With climate emissions projected to double over the next 20 years, the sector plays a pivotal role in the current climate crisis². Acknowledging the substantial climate impacts of aviation, it becomes imperative for stakeholders in various sectors to proactively engage in sustainable practices that curtail emissions and foster the transition to a low-carbon future.

The TRANSFLIGHT workshop series, conducted in March 2023, brought together key stakeholders from the business and academic travel sectors. Focused on the future of aviation and travel, the workshops explored contemporary best practices in international air travel and scrutinized the policy implications of the Paris Agreement for reducing air travel emissions. The overarching objective was to foster mutual learning and identify tangible opportunities for the rapid reduction of carbon emissions within the respective organizations.

The three workshops were designed to explore the targets, policy measures, and associated roadmaps to curtail the demand for air travel within the EU. Here below we provide a short description of the workshops.

Workshop 1 - Scoping the challenge: Aligning organizational travel goals with the Paris Agreement - March 7th at 1330-1500 CET

In this workshop, we examined the implications of global, European, and national climate targets (including sub-targets for the aviation/transport sector) for various organizations. We established the implications of the Paris Agreement for local activities and strategies and offered a space to learn how setting ambitious climate targets for transport can foster innovation in our organizations.

Workshop 2 - Learning from frontrunners: Best practices for low-carbon travel in Austria and the Nordics - March 21st at 1330-1500 CET

In this workshop, a number of frontrunner organizations shared their work in reducing emissions from air travel. We discussed the range of approaches employed by these organizations, such as the role of ICT solutions, behavior change campaigns, target setting, and regulatory measures.

¹ IPCC, *Special Report 1.5 — Summary for Policymakers*.

² Larsson et al., "International and National Climate Policies for Aviation."

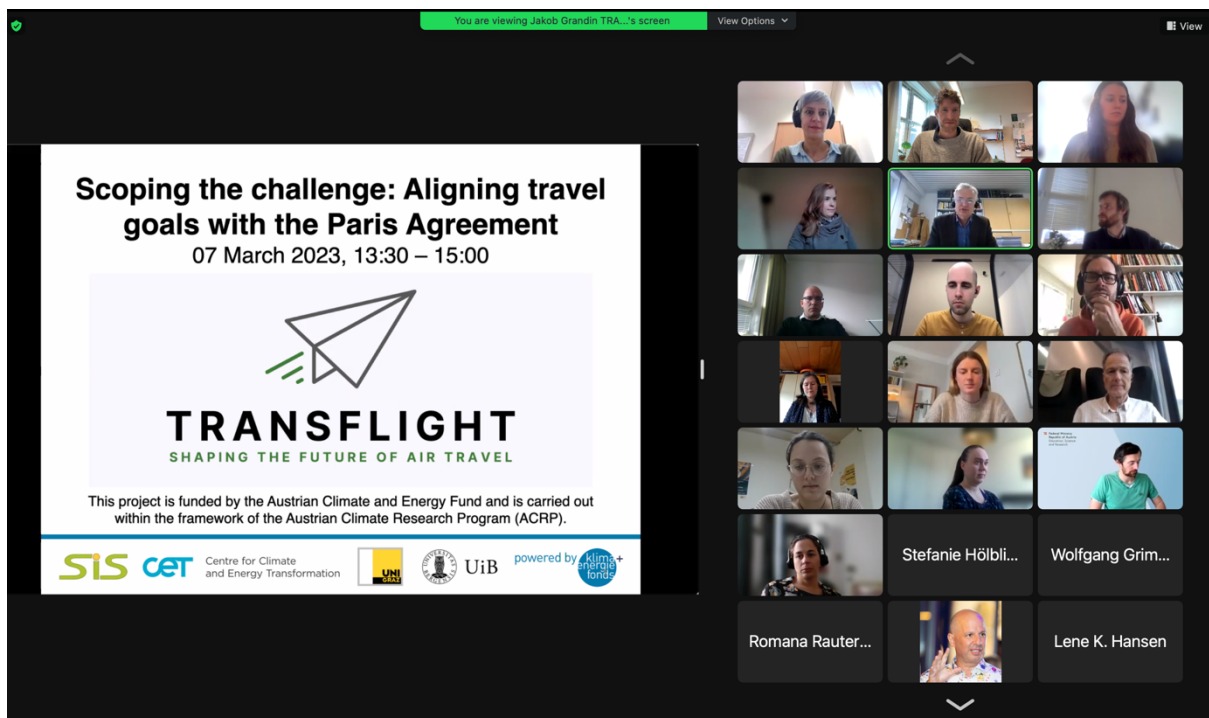


Figure 1. All workshops were carried out online in March 2023.

Workshop 3 - Roadmaps: Policy implications and concrete measures for rapid decarbonization of air - March 28th at 1330-1530 CET

Acknowledging that a rapid decarbonization of the aviation sector is necessary to meet international climate commitments, this final workshop aimed to explore the policies and measures required to bend the emissions curve. It gathered participants from the business, leisure, and academic sectors, and participants identified concrete measures to reduce emissions from aviation and international travel.

Methods – Backcasting changes in air travel demand

Based on a methodology known as “backcasting”, the TRANSFLIGHT workshops aimed at building roadmaps for reducing the demand for air travel in line with the emission reduction required to fairly contribute to the Paris Agreement temperature goals. Backcasting is a strategic planning and foresight methodology that contrasts with traditional forecasting by working backward from a desired future state to the present. This method has been widely employed in the context of sustainability and long-term planning³. Instead of predicting future developments based on current trends, backcasting starts with a vision of a desirable future and then determines the steps needed to reach that vision.

For these workshops, we adapted the backcasting methodology to structure the discussions during the three workshops (see figure 2 below). Workshop one focused on long-term goals for 2040, which were then detailed into shorter- and longer-term milestones. In workshop two, participants were presented with a number of low-carbon travel initiatives, policies, and practices by front-running organizations. This served as input to the discussions and allowed participants to discuss the breadth of measures that could be employed to reduce air travel demand. Workshop 3 built on the insights from the workshop 1 and 2 to articulate the necessary actions to achieve the long-term goal. This last workshop aimed at collecting insights into the challenges that might be encountered, steps that need to be taken, and resources needed to achieve the goal.

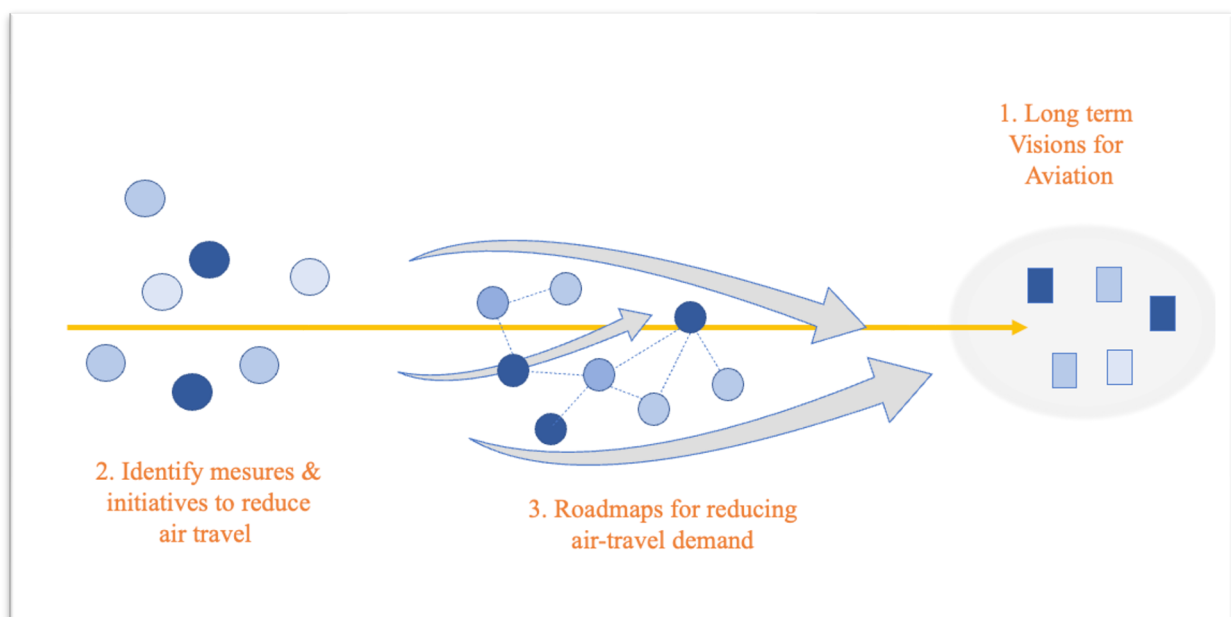


Figure 2. Schematic outline of the backcasting approach used in the TRANSFLIGHT workshops.

The next sections reports the results from each of the TRANSFLIGHT workshops, starting with the goals for and visions developed by workshop participants.

³ Phdungsilp, “Futures Studies’ Backcasting Method Used for Strategic Sustainable City Planning.”

Future of air travel: mapping goals and visions towards 2040

The first workshop invited participants to articulate both emission reduction targets and qualitative visions of reduced air travel demand. A presentation by Jesse Schrage on the theme of “Aligning organizational travel goals with the Paris Agreement” aimed at providing an overview of global and regional targets for aviation. The presentation gave input on what Paris-compliant pathways for aviation would entail (see figure 3 below), which was then discussed in each group. Overall, all groups agreed on the necessity for the ambitious emission reduction pathways as detailed in the presentation, equating to a 10 to 15% reduction of emissions per year.

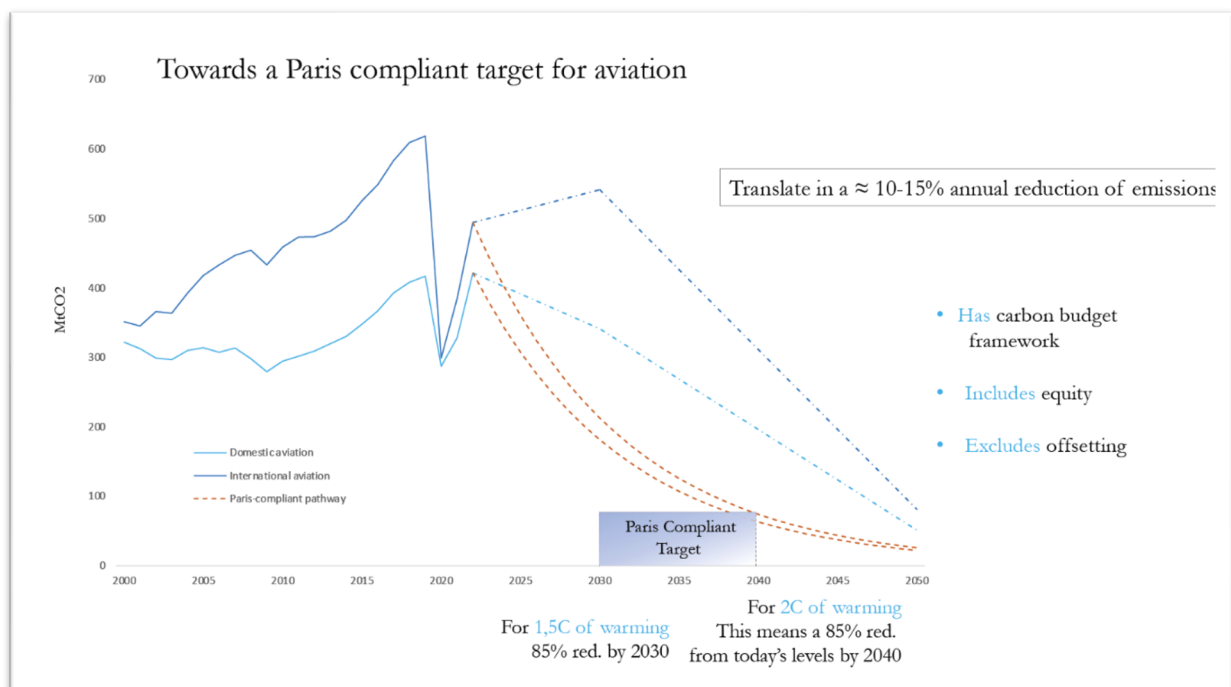


Figure 3: Mapping Paris-compliant pathways in the aviation sector by Jesse Schrage, presented during workshop one.

When it came to articulating a more qualitative understanding of what low-carbon travel will look like in 2040, workshop participants articulated a number of critical dimensions. First, participants stressed the need to maintain the same type of interactions that traveling allows today. Trust building and creating relationships is reliant on physical presence and participants stressed that there is a need for developing and maintaining those relationships while also reducing their associated environmental footprint. In this, participants stressed the crucial role of communication technologies in that they should allow for the sort of small exchanges and randomness that physical presence at e.g. conferences or seminars allows.

Participants also stressed the need to reconsider the need and purpose of air travel. Some participants expressed the need to question the purpose of fast air travel and to re-consider how slower forms of moving might be beneficial for some organizations. For one participant “there should be much more patience doing that kind of travel, and should be recognized by the academic community. We need a shift in travel culture”. This undeniably also affects how

success and academic prestige are understood, and participants expressed how achieving a reduction of air travel towards 2040 will require articulating guidelines and criteria.

Finally, another set of milestones that were discussed by participants was the need for increased knowledge on emissions from air travel, and its alternatives. Accurate information on emissions from air travel is still missing in many organizations and participants stressed how such information should provide the first step towards articulating air travel policies. A clearer picture of organizational emissions from air travel was also mentioned as holding pedagogical value for communicating the value of transport alternatives. Increased knowledge of train routes in Europe was also mentioned as a key knowledge gap in organizations.

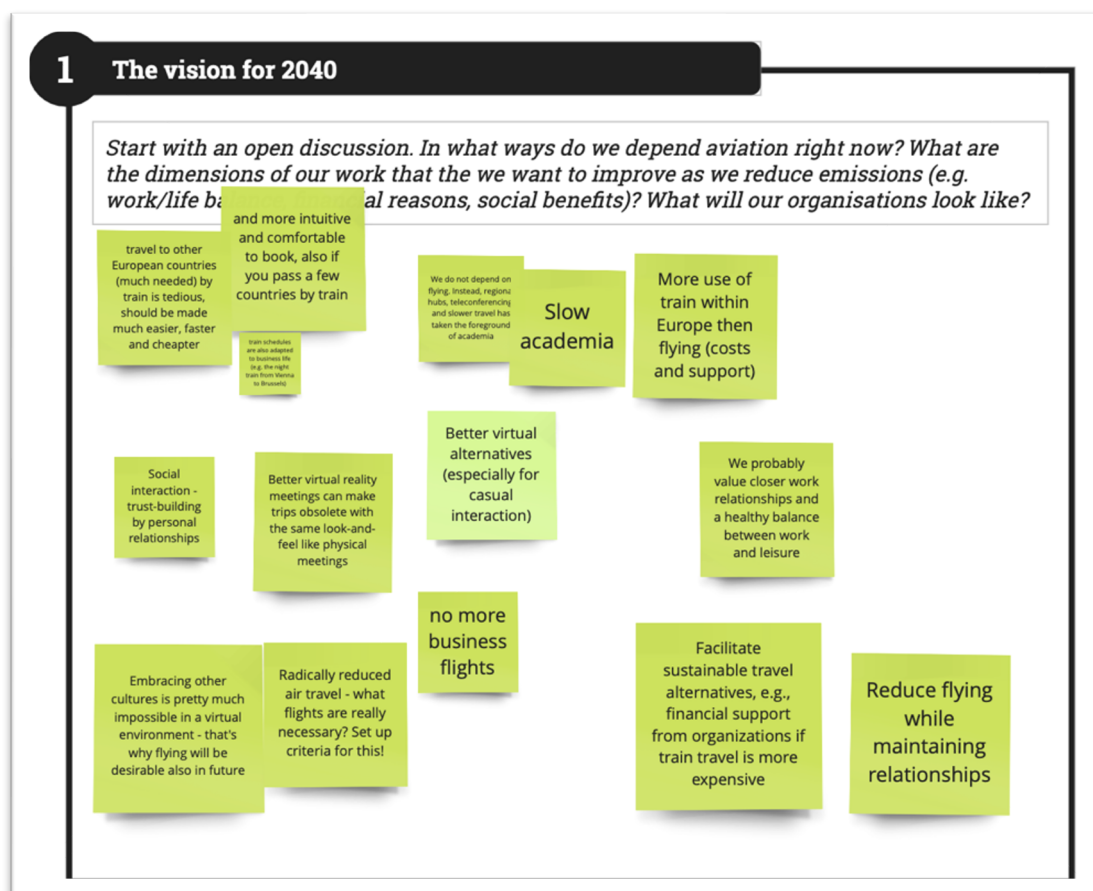


Figure 4: participants were asked to provide a detailed picture of their 2040 vision for low-carbon traveling.

Measures and initiatives to reduce the demand for air travel

The second and third workshops delved into measures for reducing short- to long-distance trips, such as personal travel budgets, increased online meetings, shifting travel modes, regional conference hubs, and transitioning to longer stays over shorter trips. In this process, participants were asked to articulate a range of measures and draw from a variety of Avoid, Shift and Improve type measures. During the workshop, we used 'avoid' to denote options that reduce unnecessary air travel; 'shift' to describe the replacement or substitution of air travel to already existing alternative travel modes; and 'improve' to mean improvements in efficiency in existing technologies⁴.

A wide diversity of measures were discussed by workshop participants (see table 1 below for a brief overview), and these varied widely, from measures that enhance institutional support to avoid or shift from air travel to improved IT infrastructure, to changes in travel budgets, and alterations in organizational culture to facilitate slower modes of work and travel. Critically, the social aspects of travel, including trust-building, knowledge exchange, and socialization, were underscored as crucial elements that need to be maintained as the volume of air travel reduces.

Considering the measures discussed, a majority of measures suggested by the participants were *procedural measures* to change air travel practices. These consisted of the development of Net Zero Travel guidelines in organizations, the development of teleconferencing policies, and methods for "good" online collaboration (infrastructure mostly existing in companies). At the same time, participants also stressed the need to establish asynchronous methods of work and collaboration like many "all remote" companies already do and to provide more support from travel agencies in arranging travel by train and bus booking. Finally, academic participants also stressed the need for multi-hub conferences in parallel to new virtual means of facilitation and co-creation.

While these measures were put forth as short-term measures to be enacted before 2030, participants also mentioned longer-term measures to be implemented, such as the need for conference organizers to mandate low-carbon traveling when available, or the need for collaboration with data collection and field research.

⁴ Creutzig et al., "Demand-Side Solutions to Climate Change Mitigation Consistent with High Levels of Well-Being."

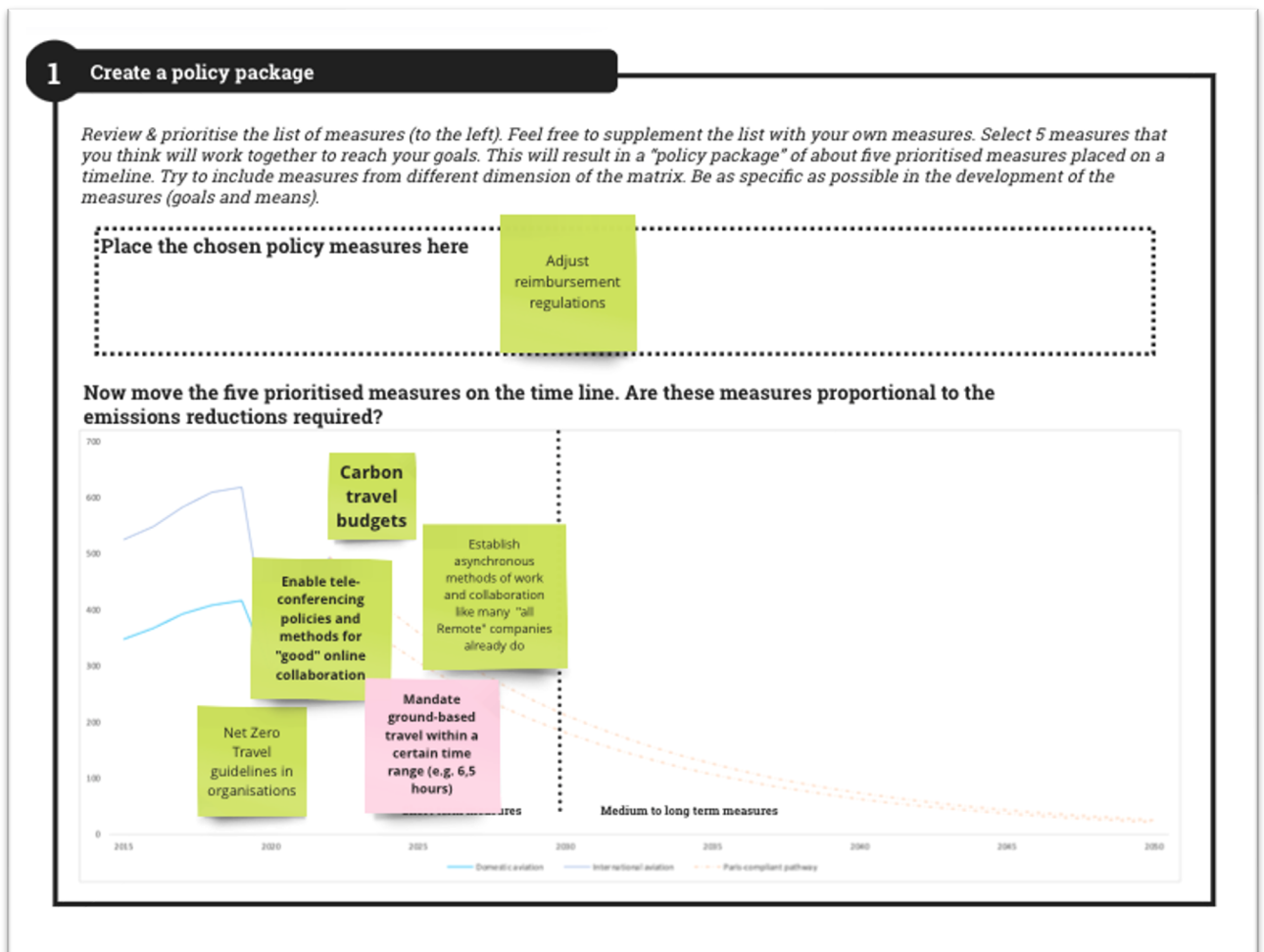


Figure 5: Participants were invited to create a policy package, drawing on a diversity of avoid, shift or improve measures, distributed over short- and long-term implementation

A second set of measures prioritized by participants were *regulatory measures*. Short-term measures concerned the need for personal carbon travel budgets which would mandate ground-based travel within a certain time/distance range (e.g. no flights if the destination can be reached in e.g. 6.5 hours by ground travel), mandatory CO₂ compensation, stricter carbon travel budgets and the need for adjusted reimbursement regulations.

To a lesser degree, participants also recommended a set of *economic instruments* to be implemented. These concerned the cost coverage for premium rail tickets, the provision of regulation concerning travel time accounting as work time, and the subsidization of conference tickets if traveling by land.

Overall, when considering the timeline of implementation, participants stressed the need to increase the stringency of regulatory policies over time (such as the size of the allocated travel budget). When considering whether short- or long-term measures should be implemented, across the various groups the workshop participants prioritized shorter-term measures to reduce air travel demand. These concerned a number of push and pull measures across the avoid, shift and improve type interventions.

Measure type	Measure
Avoid	<ul style="list-style-type: none"> • Carbon fee on flying • Carbon travel budgets • Establish asynchronous methods of work and collaboration like many "all Remote" companies already do • Demand better justification for business trips • Enable tele-conferencing infrastructure
Shift	<ul style="list-style-type: none"> • Reporting and ranking of travel emission reduction efforts • Travel agency support train/bus booking • Cost coverage for premium rail tickets • Train bragging • Net Zero Travel guidelines in organisations • Mandate ground-based travel within a certain time/distance range (e.g. 6,5 hours or 600km) • Enable tele-conferencing policies and methods for "good" online collaboration (infrastructure mostly existing in companies) • Adjust reimbursement regulations • Higher cost coverage for Interrail students • Travel agency support train/bus booking • Cost coverage for premium rail tickets • Articulate regulation concerning travel time accounting (counting as work time) • Cost coverage for additional overnight stays if using train for long distances • Regional conference hubs • Changing funding requirements to include less necessity for travel • Cheaper conference ticket if travelling by land
Improve	<ul style="list-style-type: none"> • Mandate direct flights when available • Encourage direct flights • Enable fewer but longer stays

Table 1. Avoid, Shift and Improve measures to reduce air travel demand

Roadmaps for reducing air-travel demand

In the third and final workshop, participants discussed a range of strategies that could be employed to advance a reduction of air travel demand. Building on the measures that were previously identified, this part aimed at identifying the barriers and opportunities for advancing ambitious air travel reduction measures, developing relevant communication strategies to advance these measures, as well as identifying relevant stakeholders. The results of this process are described below.

Barriers and opportunities for a reduction of air travel demand

The exploration of barriers and opportunities revealed a number of challenges related to changes in technology and infrastructure, institutional constraints, behavioral resistance, and contextual factors. Conversely, a number of opportunities were identified in research and development, in the gamification of emission reductions, and in fostering positive motivation through leadership commitment and early adoption of sustainable practices.

These are provided in more detail in Table 2, below.

	<i>barriers</i>	<i>opportunities</i>
Technological and infrastructural	<ul style="list-style-type: none"> • Lack of and/or insufficient knowledge of about methods for effective online collaboration • Corporate IT infrastructure does not live up to expectations of effective online collaboration. • Inadequate internet connections on trains. 	<ul style="list-style-type: none"> • Increased use of webinar technologies. • New ways of collaboration lead to more networking and better ideas. • To demonstrate the "modern", agile workplace.
Institutional (formal)	<ul style="list-style-type: none"> • Time and costs pertaining to train travel. • Existing employment contracts create barriers to slow travel • Strong trends promoting internationalisation and the perception that international cooperation always depends on physical contact. • Expectations from funding agencies and conference organisers. • Bureaucracies that are slow to change. • The topic of emissions from travel ignored by travel agencies. 	<ul style="list-style-type: none"> • Opportunities for large savings in travel budgets if more meetings are done virtually. • Gamification of emission reductions by individuals (e.g. Guter Tag App) • New business opportunities as a result from an improved information flow between different actors.
Institutional (informal)	<ul style="list-style-type: none"> • Corporate cultures which value air travel • Leadership styles focused on "stay in office" and "presentism" 	<ul style="list-style-type: none"> • Travel carbon budgets are an opportunity to raise awareness within a company. • Using early movers and frontrunners as role models to demonstrate that slow travel and virtual collaboration works.
Behavioural (individual)	<ul style="list-style-type: none"> • Resistance from affected staff • Personal convenience • Rejection of technology 	<ul style="list-style-type: none"> • Preference of millennial employees to work online and fly less.

Behavioural (social)	<ul style="list-style-type: none"> • Missing awareness and knowledge about climate change 	
Contextual factors	<ul style="list-style-type: none"> • Day trips may not be possible by train due to long distances. • Inadequate connections between ground travel systems in different countries. • Involvement of partners/researchers that live far away. • Organisation and logistics of multi-hub conferences may more complex than regular conferences 	<ul style="list-style-type: none"> • Virtual collaboration and/or slow travel may be more inclusive in terms of finance, broad representation of countries, disabilities, etc. • Travelling less may mean better work/life-balance and costs less. • Scientific evidence on climate change as a threat.

Table 2. Barriers and opportunities for reduced air travel demand

How to Frame Measures and Communicate the necessity for air travel demand reduction?

In workshop 3, participants were asked to reflect on an overall strategy to reduce air travel demand. These ideas were then organised into three categories of awareness, motivation and alternatives. Overall, these reflect the need for increased communication and visibility around the topic of air travel demand reduction. The ideas are detailed in Table 3, below.

<i>Awareness</i>	<i>Positive motivation</i>	<i>Alternatives</i>
<ul style="list-style-type: none"> • Clear communication of responsibility and net zero contributions at individual, team, organisation, industry and government levels. • Emissions targets and/or travel carbon budgets. • Seminars about the climate crisis to create awareness about problem, how it calls for fundamental changes in how we live, and everyone is affected. • Develop methods to demonstrate the footprint of different departments to raise awareness amongst managers. 	<ul style="list-style-type: none"> • Train bragging • Positive encouragement • Highlighting benefits and positive examples • Creation of positive incentives, e.g. company-wide contests and prizes for lowest carbon budgets • Making the case that a great place to work in the future is to be able to choose which mode to work (online, office, travel) 	<ul style="list-style-type: none"> • Reframing the picture of "success", ie. the "successful academic" or the "successful employee". • More active co-operation between actors (travel agencies, conference organisers, universities) will help everyone feel more involved and offer new opportunities. • Foreground available train connections. • Increase internationalisation and/or collaboration between researchers without travelling. • Clear commitment from leadership.

Table 3. How can action on air travel demand be mobilized?

Identifying actors and responsibilities for implementation

When asked about whose responsibility should be engaged in reducing air travel demand, we found participants to discuss a wide set of actors, stressing the need for a wide mobilization on these questions.

The responsibility for implementation was distributed among various actors, including individual organizations, local entities, national governments, and the EU/global community. Carbon travel budgets, stakeholder collaboration, and support for sustainable academic travel were emphasized at the organizational level. National actors, such as airlines, train companies, and online booking providers, were identified as pivotal contributors, along with national governments incentivizing low-carbon traveling by setting a maximum of business flights per person and per year. At the EU/global level, participants pointed to the crucial role of funding agencies and the EU commission in advancing measures such as making flights more expensive, mandatory disclosure of CO₂ emissions in booking tools, and lobbying for EU funding programs to consider travel emissions. An overview of the various actors discussed is provided in Table 4, below.

Scale	Actors and responsibility for implementation
Own organisation	<ul style="list-style-type: none"> • University rectorate • Group leaders • Sustainability and environmental coordinators • Academic front runners
National government	<ul style="list-style-type: none"> • Providers of travel funds • National railway and bus providers • Ministry of transport to support and incentives reliable, fast transportation infrastructure
EU/Global	<ul style="list-style-type: none"> • EU funding programs to include travel emissions in their funding criteria • EU funding for low carbon conferences • EU commission to promote peer learning activities
Others	<ul style="list-style-type: none"> • Alliance of universities • Travel agencies • NGOs • Airlines

Table 4. Identifying relevant actors and responsibilities for implementation

Remaining questions, challenges, and new insights

Air travel has received increasing attention in the climate debate in recent years and there is a critical need for articulating policies to curb the demand for air travel. The TRANSFLIGHT workshops gathered participants across leisure and academic domains to identify tangible opportunities for the rapid reduction of emissions.

Importantly, the workshop series highlighted the dependence of measures on stakeholder willingness and the need for precise company policies. This will undeniably rely on significant cultural changes: bold decisions, integration of flying into net-zero targets, employee involvement, and transparency in decision-making were recognized as imperative for reducing air travel demand. This relies on the support and buy-in from senior levels of management in organizations. Further changes, such as a progressive rethinking of travel-related work practices, and the reframing of success in work culture emerged as critical factors. However, such changes rely on strong coordination with a diversity of actors. For the participants, efforts at the EU level to lobby for political measures were underscored as ongoing challenges and areas requiring further exploration.

In conclusion, continued efforts are needed to support ambitious policies to reduce air travel demand. In this light, the TRANSFLIGHT workshop series laid the groundwork for transformative changes in sustainable academic and leisure travel, offering a roadmap for stakeholders to collectively address the challenges posed by carbon lock-ins in air travel demand. Critically, further articulating low-carbon pathways for air travel will rely on broadening the range of actors and measures to also include those outside of the sector of aviation. The continued collaboration across stakeholder groups is essential for realizing the vision of a more sustainable and responsible approach to academic and professional travel.



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