University of Zurich[UZH]

Sustainability Team

Factsheet: Business Travel

Traveling to conferences accounts for a significant part of the environmental impact of academics. Every time you avoid flying, you make a tangible contribution to climate protection.

Research at ETH Zurich showed that business trips made by its members generate twice as much greenhouse gas emissions as the university's heating of buildings and power consumption combined [1]. Something similar could be true of UZH.

A flight from Zurich to New York and back generates around 2.5 tons of greenhouse gas emissions per person.[1] This already exceeds the annual per capita CO_2 budget we should stay within for climate protection reasons.[2]

This factsheet is designed to help you decide how to travel to conferences, meetings, and other events. It answers the following questions:

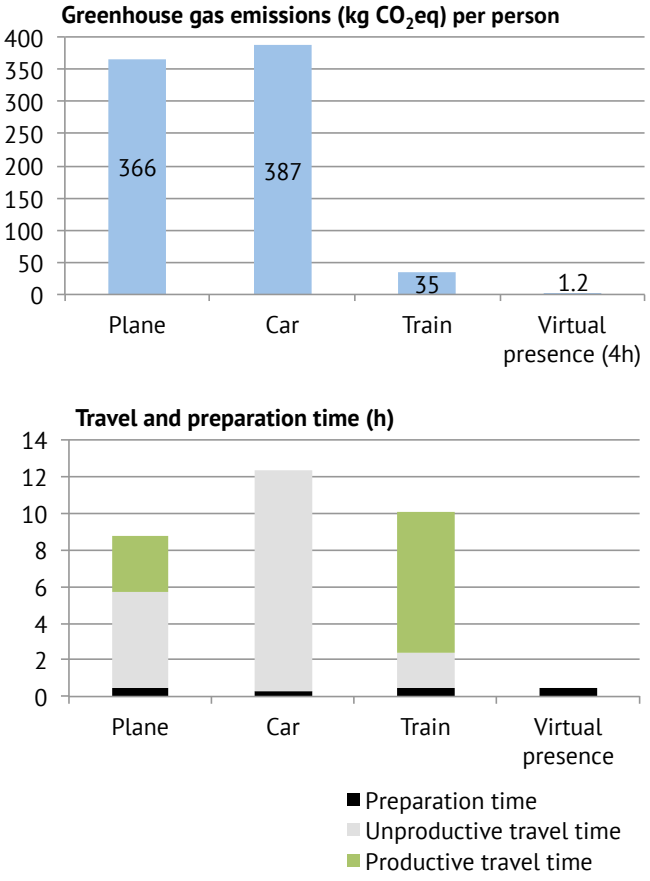
- How do traveling by plane, car, and train, and «virtual presence», differ in terms of their environmental impact?
- What are the pros and cons of the different modes of transportation in terms of time, taking into account the time that can be used productively during the journey?

Plane, car, train

In our example of a trip from Zurich to Paris (see figure), the train is 10 times more environmentally friendly than flying. A single person traveling in an average car generates even more emissions per kilometer than flying; if several people share the same car, the per capita balance improves accordingly.

The means of transportation also differ in terms of the time that can be used productively, ranging from 0% (car) to 80% (train) of the journey time.

The subjective advantages of flying or driving should therefore be weighed carefully against the environmental impact and the net time requirement of the journey.



Example: Business trip from Zurich to Paris and back

Greenhouse gas emissions in CO_2 equivalents and time requirement for a journey from UZH Zentrum to Paris Gare du Nord and back (2x600 km). Figures are based on a full life cycle assessment.[3] Medium occupancy rates are assumed for airplane and train, single-person occupancy is assumed for car. Further assumptions and sources: plane[4], car[5], train[6], virtual presence[7].

Virtual presence

Even taking data traffic into account, participating in an audio or video conference has far less environmental impact than making a physical journey. An Internet-based video conference in HD quality generates 160-290 grams of CO_2 equivalents an hour [5,6].[3] To a large extent, the distance is immaterial [6]. Only after approximately 8,700 hours or 1,000 working days of video conferencing does it thus become preferable – in terms of climate impact – to make the actual flight to New York.

Virtual presence also saves a great deal of time, even compared to the fastest means of transportation.

Of course, virtual presence cannot replace all aspects of face-to-face meetings. However, there are journeys that can be avoided without serious disadvantages by the systematic use of video conferencing and online collaboration.

Further information

The Multimedia & E-Learning Services department at UZH (MELS) is happy to help you set up a video conference:
www.id.uzh.ch/dl/multimedia/Audio-Video/Videokonferenzen.html

The Sustainability Team at UZH can advise you on sustainability issues affecting your day-to-day work:
www.sustainability.uzh.ch/en/contribute/tips.html

Recommendations

- If you are traveling within Europe, check whether you can go by train.
- When thinking about the length of a journey, remember to take into account the amount of time that you can put to good use while traveling.
- When inviting external lecturers, examiners, or reviewers to the university, or when making your own travel plans, see if a physical trip can be replaced by virtual presence.

Notes

1 Based on [2,14] with a climate factor of 2.0 [4]. The entire lifecycle with exception of infrastructure is considered.

2 Under the Energy Act of the Canton of Zurich, CO_2 emissions should be reduced to just 2.2 tons per person, per year from 2050 [3].

3 Besides direct environmental impact, the upstream and downstream impact is also considered, i.e. energy production, production and disposal of the means of transportation (proportional) or of the IT equipment required for virtual presence, respectively.

4 Greenhouse gas emissions: journey to and from the airport by public transit [7, 14], excluding infrastructure emissions, climate factor 2.0 [4]; time requirement: buying tickets (0:30h), travel to and from Zurich airport, including waiting time at railroad station (2 x 0:32h), check-in (2 x 1:30h), travel time (2 x 1:15h), waiting for luggage (2 x 0:20h), ride to and from Gare du Nord including waiting time (2 x 0:30h): [9, 12, 13] and own estimates; productive travel time: travel time less check-in time and time waiting for luggage. It is assumed that the journey to and from the airport is made by train.

5 Greenhouse gas emissions: mid-range car, EURO 4, gas [2,7,8], excluding infrastructure emissions; time requirement: filling up with gas (2 x 0:10h), travel time (2 x 6:00h): [11] and own estimates; productive travel time: none.

6 Greenhouse gas emissions: an energy mix for Switzerland, France, Germany, and Italy is assumed [7, 8], enabling comparisons also for other European destinations. Infrastructure emissions are ignored. Time requirement: buying tickets (0:30h), travel to and from Zurich railroad station (2 x 0:16h), waiting time at railroad stations (2 x 0:05h), travel time including transfers (2 x 4:26h): [9,10] and own estimates; productive travel time: travel time less time spent getting on and off the train (2 x 0:05h for each), transfer time (2 x 0:16h), walking and waiting times at railroad stations: [10] and own estimates.

7 Greenhouse gas emissions: own calculations based on [5, 6]; time requirement: time spent setting up equipment (0:30h).

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Publishing details

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