An environmental comparison of virtual meetings and travel

A compilation by the REMM group, May 2021











Comparing virtual meetings and conferences with travel

- Traveling by air: *
 - generates 300 times more CO₂ emissions than having a virtual meeting
 - · adds 5 hours of unproductive time
- Arranging a physical conference: **
 - generates 66 times more CO₂ emissions than a virtual conference

- * based on a return trip Zürich Paris (Warland et al, 2016)
- ** based on a US conference with 200 participants (Faber, 2021)









Comparing the aviation Industry with digital technologies globally

- Global aviation: accounts for 3,5 % of the effective radiative forcing emissions (greenhouse effect) *
 - 2.8 % of CO2 emissions (excluding land use change)
 - Only direct use, not infrastructure or auxiliary services
 - Business travel contribute with \$336 billion of the 1.1 trillion dollar travel industry revenues subsidises leisure travel **
- Digital services: accounts for 3,7 % of GHG emissions ***
 - Includes emissions from the whole life-cycle (incl. extraction, production, use, end-of-life)
 - The impact in the networks from videoconferencing is not as pronounced, and dwarfed by e.g. YouTube and Netflix ****

Sources:: * Richie, 2020 & Lee et al., 2021 ** McCartney, 2020 *** The Shift Project, 2019 **** NCTA, 2020









More details...













Comparison between a virtual meeting and various modes of business travel – CO2 eq. emissions

• An Internet based video conference in HD quality generates 160-290 grams of CO₂ per hour.

After 8 700 hours, or 1 000 working days, or more than
4 ½ years of video conferencing does it become preferable – in terms of climate impact – to take a flight from Zurich to New York.

• Comparing CO₂ emissions from a business trip from Zurich to Paris and back with a virtual meeting:

- Plane: 366 kg CO2
- Car 387 kg CO2
- Train: 35 kg CO2
- Virtual meeting (4 hours): 1,2 kg CO2

→ Ca **300 times more CO**² emissions from flying as compared to having a virtual meeting.















Comparison between a virtual meeting and various modes of business travel - time

- In addition to CO₂ emissions time is another important aspect
- Comparing time requirements for a business trip from Zurich to Paris and back *
- How do we use the time 'saved' when using the virtual meeting option? **
 - 72 % use the time for more work
- 61 % use it to for more leisure time



Example: Business trip from Zurich to Paris and back

Greenhouse gas emissions in CO_2 equivalents and time requirement fo 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-persor occupancy is assumed for car. Further assumptions and sources: plane⁴ car⁵, train⁶, virtual presence⁷.











Comparison between a virtual and a physical conference

- A one-day virtual conference with 200 participants
 - Generated 1,324 kg of CO2 emissions
 - 64 % from network data transfer
 - 19 % from the pre-conference planning meetings
 - 11 % from computer use during the conference.
- Comparison with a physical conference:
 - Assuming 164 participants would fly
 - Generating 88 tons of CO2 emissions.
 - This value is larger than the entire amount of emissions generated by the virtual conference by a factor of over 66
 - Does not include other relevant factors of in-person conferences, such as local travel, food consumption, electricity consumption at the venue, and so forth.











GHG emissions from aviation

- Global aviation (including domestic and international; passenger and freight) accounts for:
 - 1.9 % of greenhouse gas emissions (which includes all greenhouse gases, not only CO₂) *
 - 2.5 % of CO₂ emissions **
 - 2.8 % of CO₂ emissions (excluding land use change) **
 - 3.5 % of 'effective radiative forcing ' a closer measure of its impact on warming **



* 2016, ** 2018











GHG Emissions from Digital Technologies

- Global GHG emissions from Digital technologies *
 - accounted for about 3.7 % 2019
 - up from 2.3 % 2013
 - have increased 9 % annually
 - are expected to increase further
- The impact in the network from videoconferencing is not as pronounced, and dwarfed by e.g. YouTube and Netflix **













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