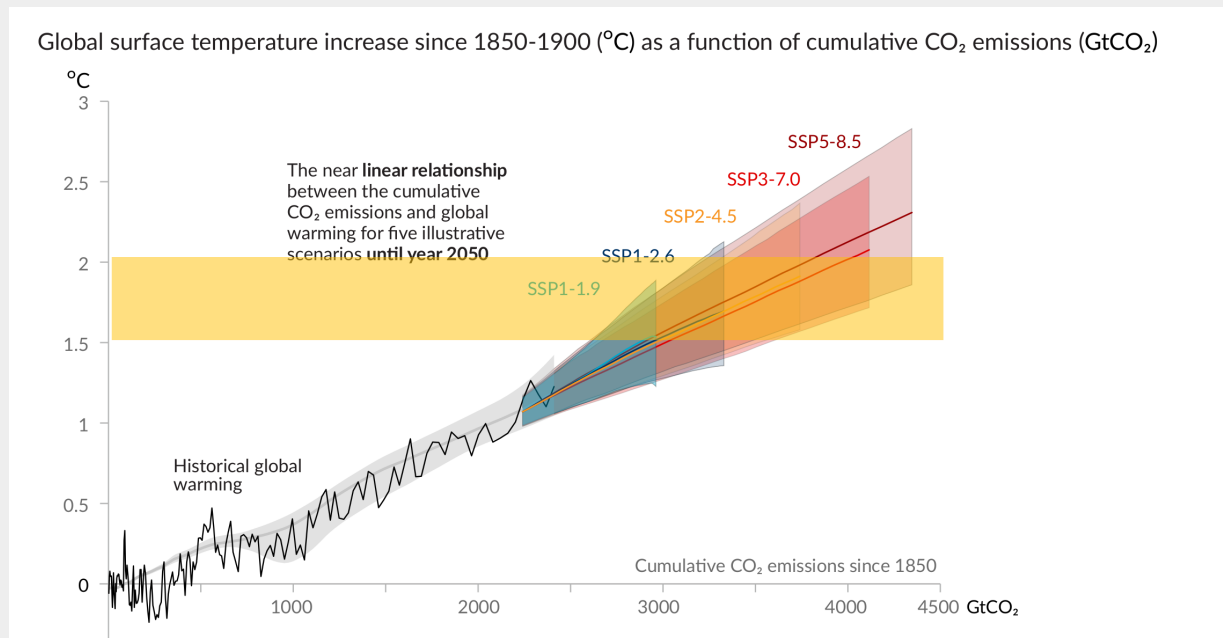


Towards Climate Sustainability in Academia



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*2nd EuCAPT Symposium
May 23 – 25, 2022*

IPCC 2021 AR6 WG1 Fig. SPM.10

The academic system in the context of the climate crisis

- Academia is part of the solution
through research, education, evidence-based policy advice
- Academia is part of the problem
*through emissions from our own operations
(direct emissions, infrastructure, computing, duty travel,..)*

IPCC (2022):

300 Gigatons CO₂ emissions “remaining” for 83 % chance to limit global warming below 1.5 degrees → 1 t per capita per year until 2050

for comparison:

return flight Geneva – US : ~ 2 t CO₂eq

supercomputing : 200 cores for 1 year ~ 20 MWh ~ 4 t CO₂eq

particle collider: 180.000 t CO₂eq/year (cooling/detection)

carbon footprint EU (2019): 6.8 t CO₂eq/year/person

atmosfair.de

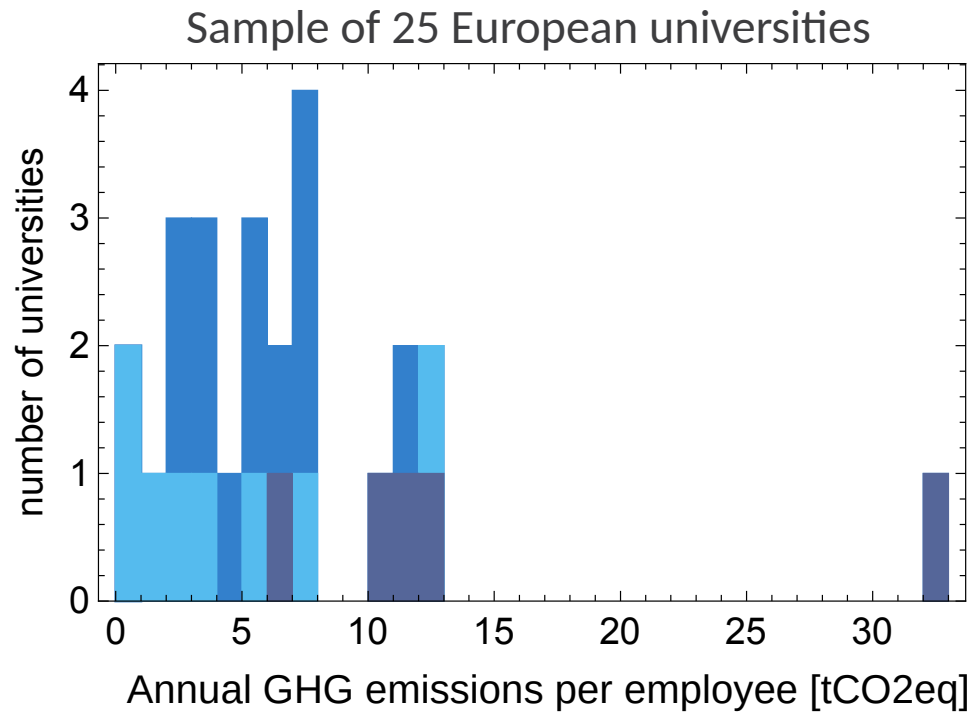
[Jahnke et al `20 \(MPIA\)](#)

[CERN `18 environmental report](#)

<https://ec.europa.eu/eurostat>

Valerie Domcke - CERN/EPFL

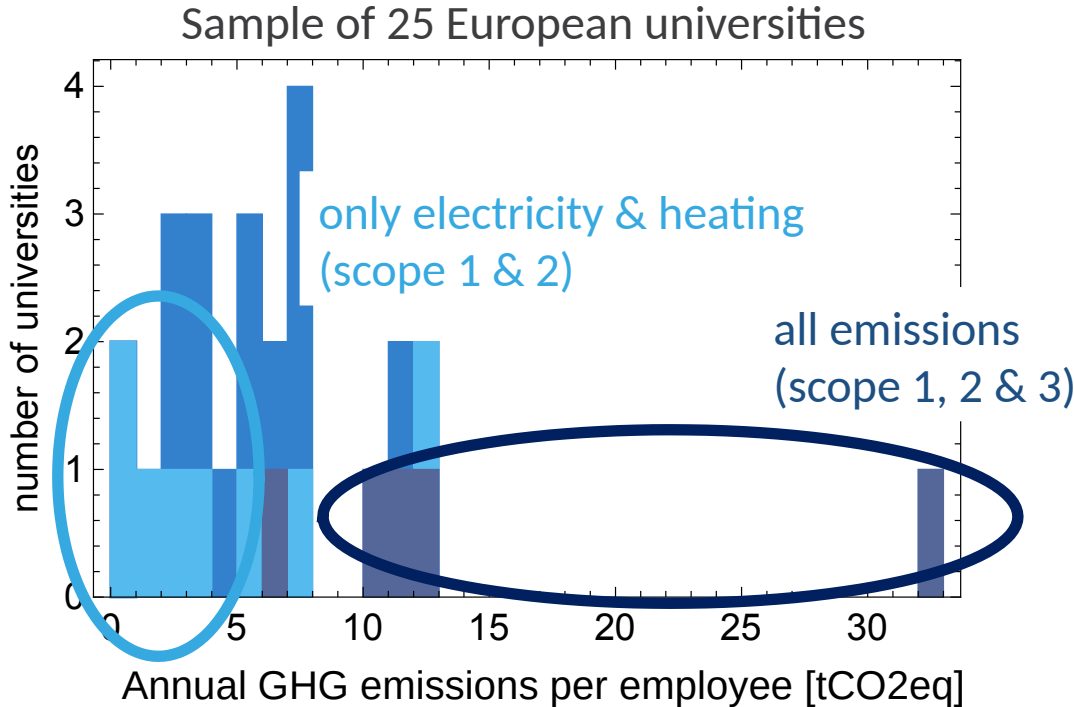
emissions of universities and research institutes



Source:
[ALLEA report](#) on
climate sustainability
in the academic system

see also snowmass paper
on the climate impact of
particle physics,
arXiv: 2203.12389

emissions of universities and research institutes

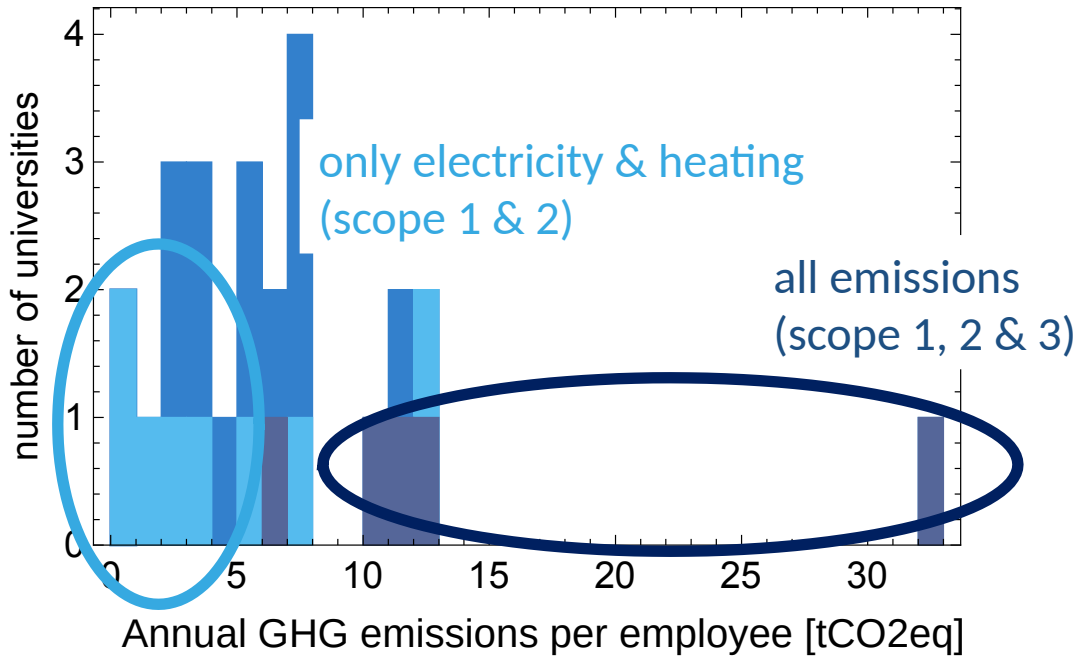


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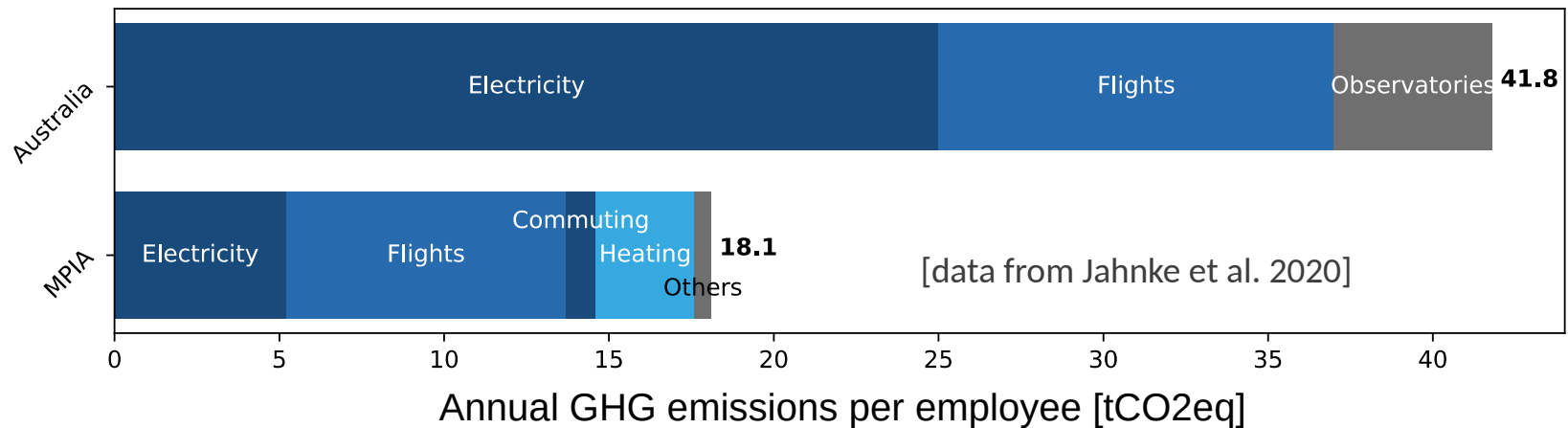
Sample of 25 European universities



Source:
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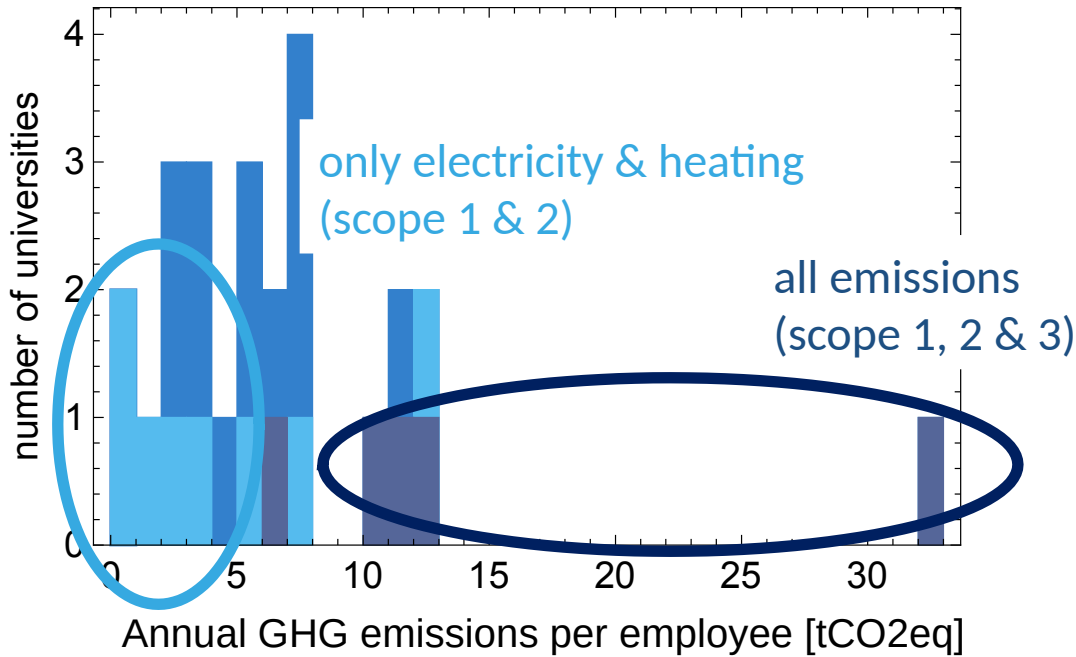
see also snowmass paper on the climate impact of particle physics, arXiv: 2203.12389

2 research institutes in astronomy:



emissions of universities and research institutes

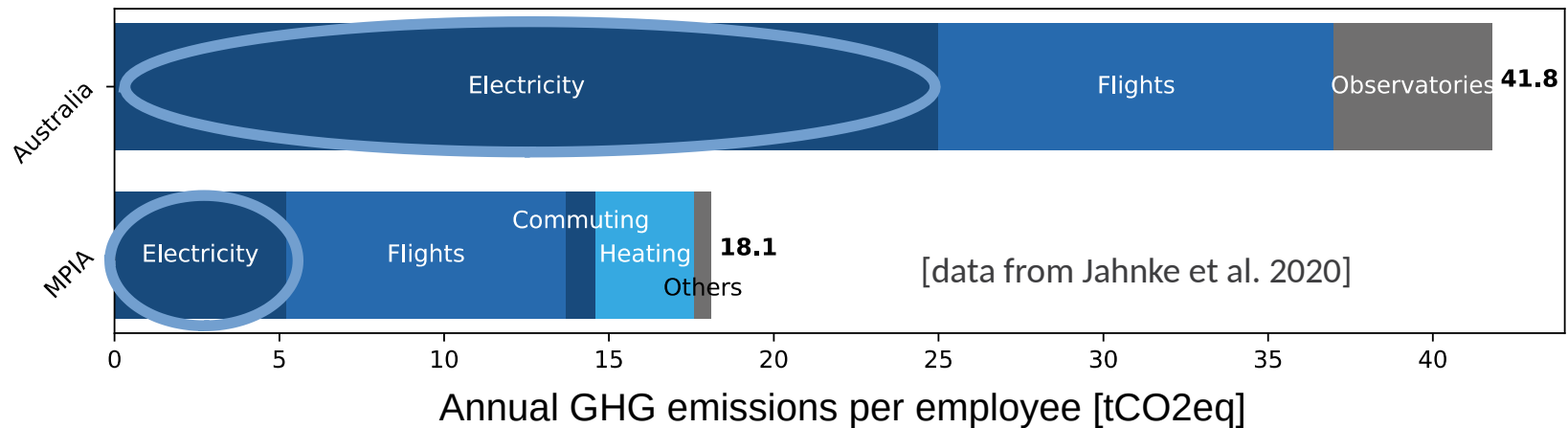
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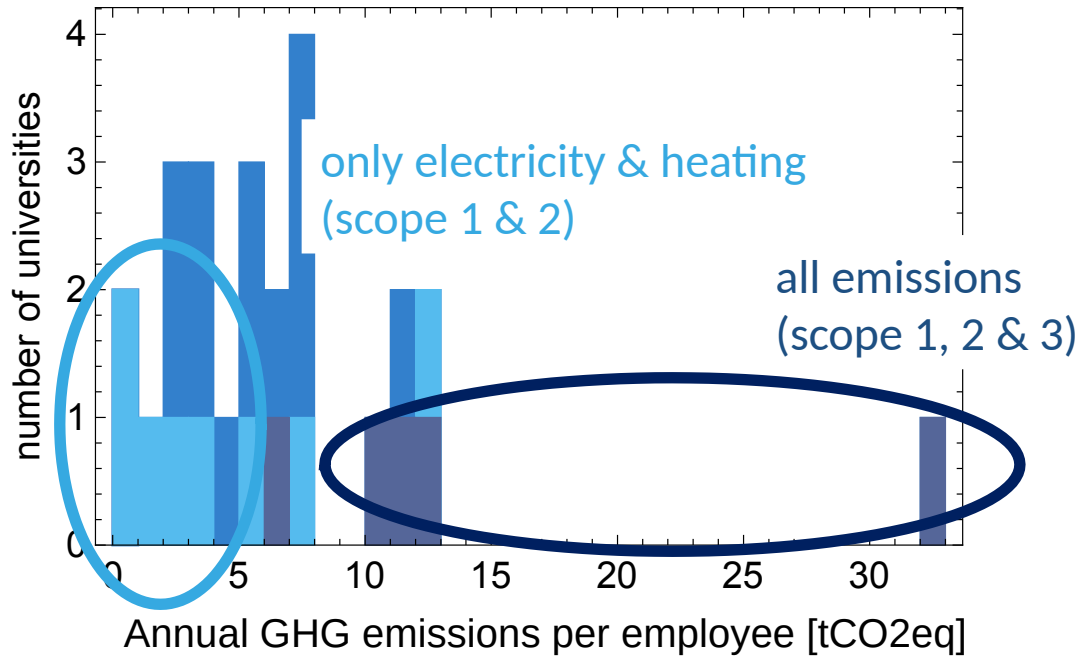
2 research
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[data from Jahnke et al. 2020]

emissions of universities and research institutes

Sample of 25 European universities

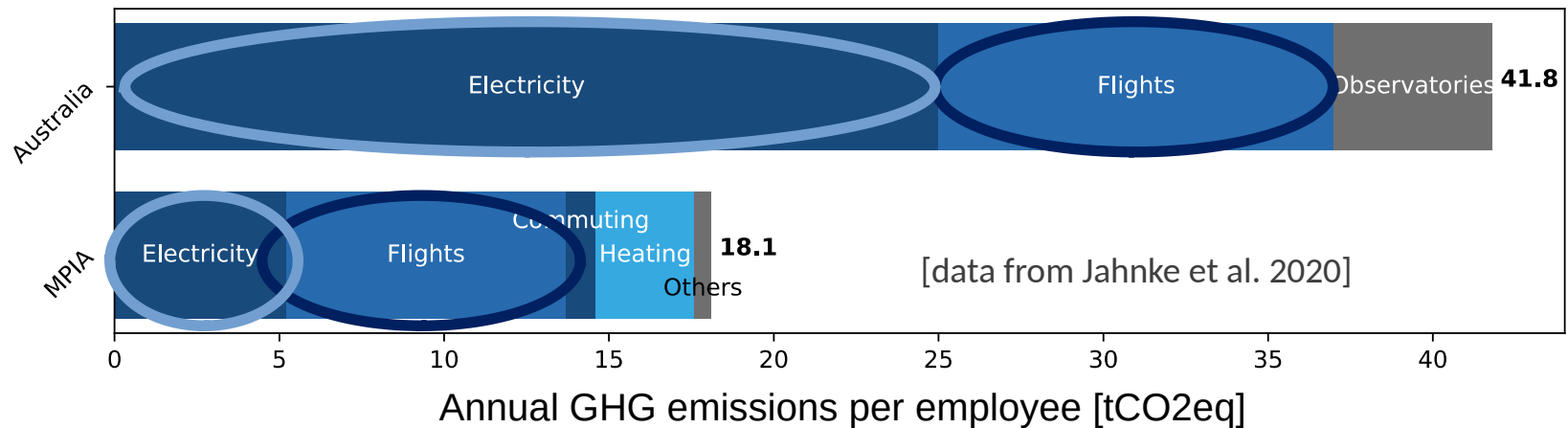


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2 research institutes in astronomy:

~ 10 tCO2eq / year / employee from air travel



Majority from scientific computing 3 / 6

duty travel

Air travel identified as a significant or even dominant source of emission (accounting standards not uniform)

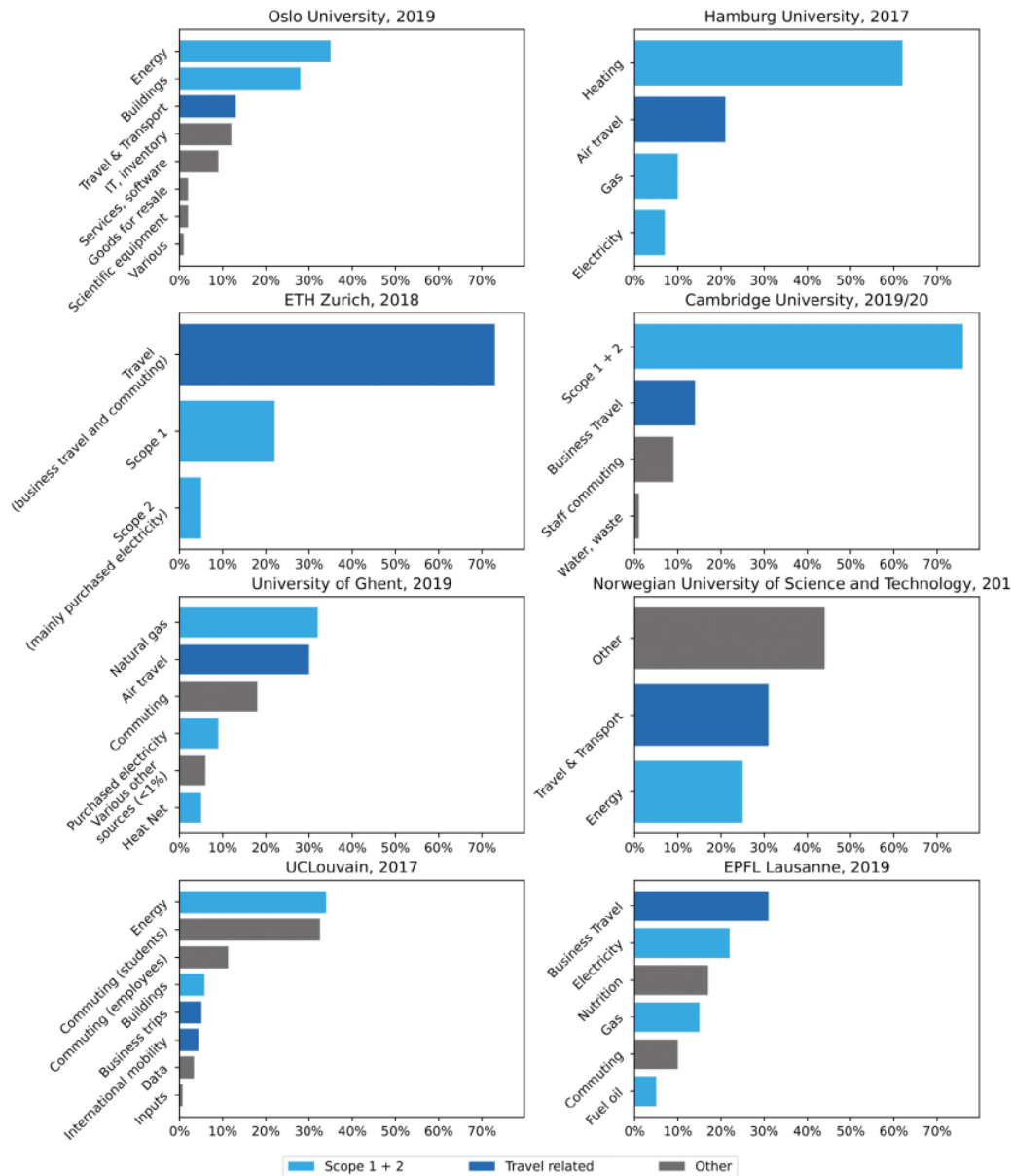


Figure 2: Relative fraction of different emission sources for various European universities.

duty travel

Air travel identified as a significant or even dominant source of emission (accounting standards not uniform)

Long distance flights cause the majority of the emissions

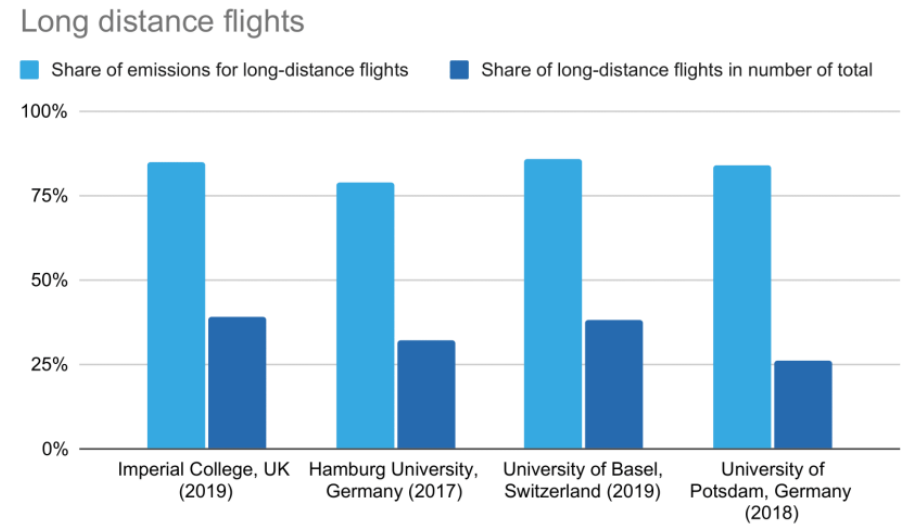
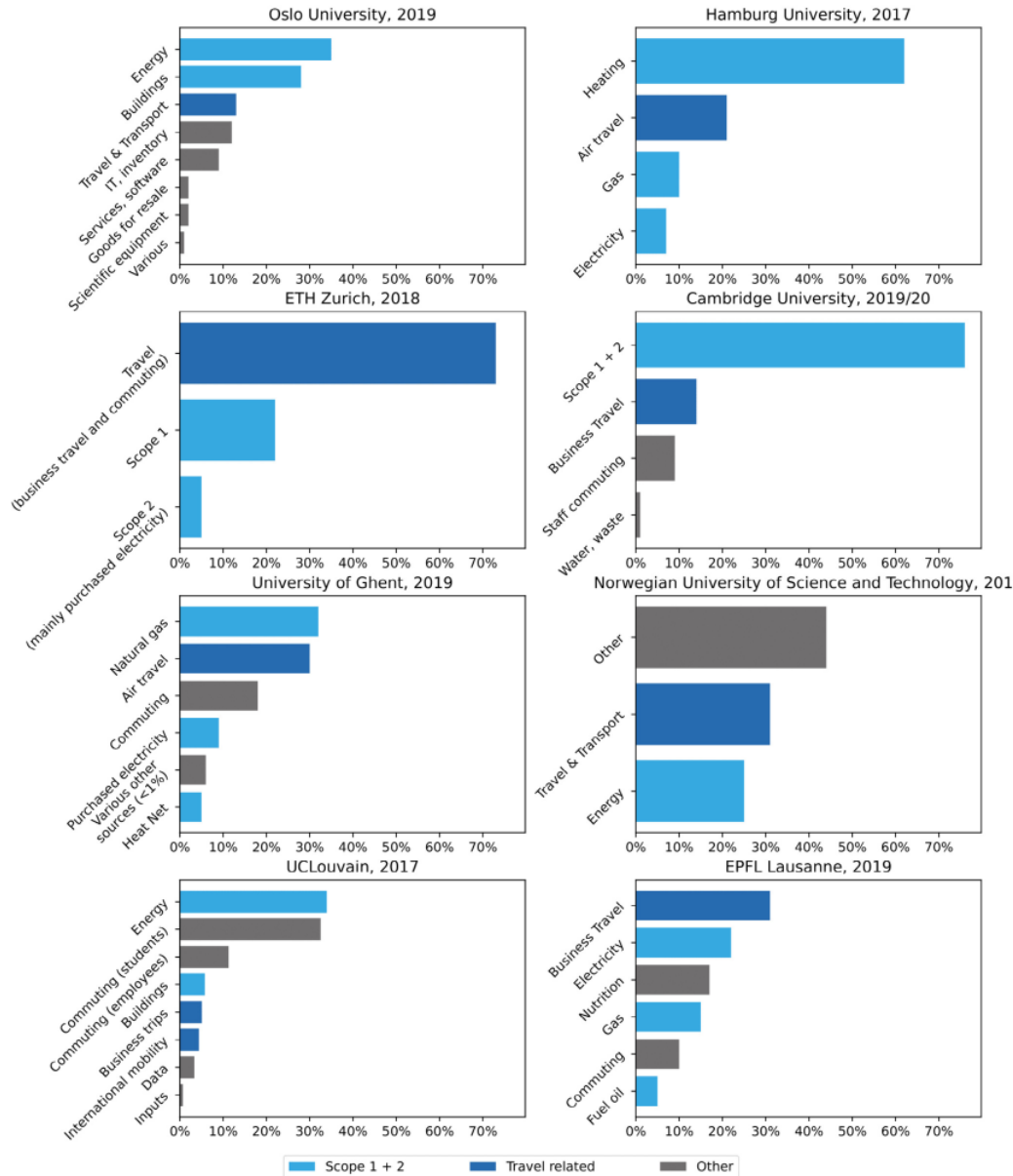
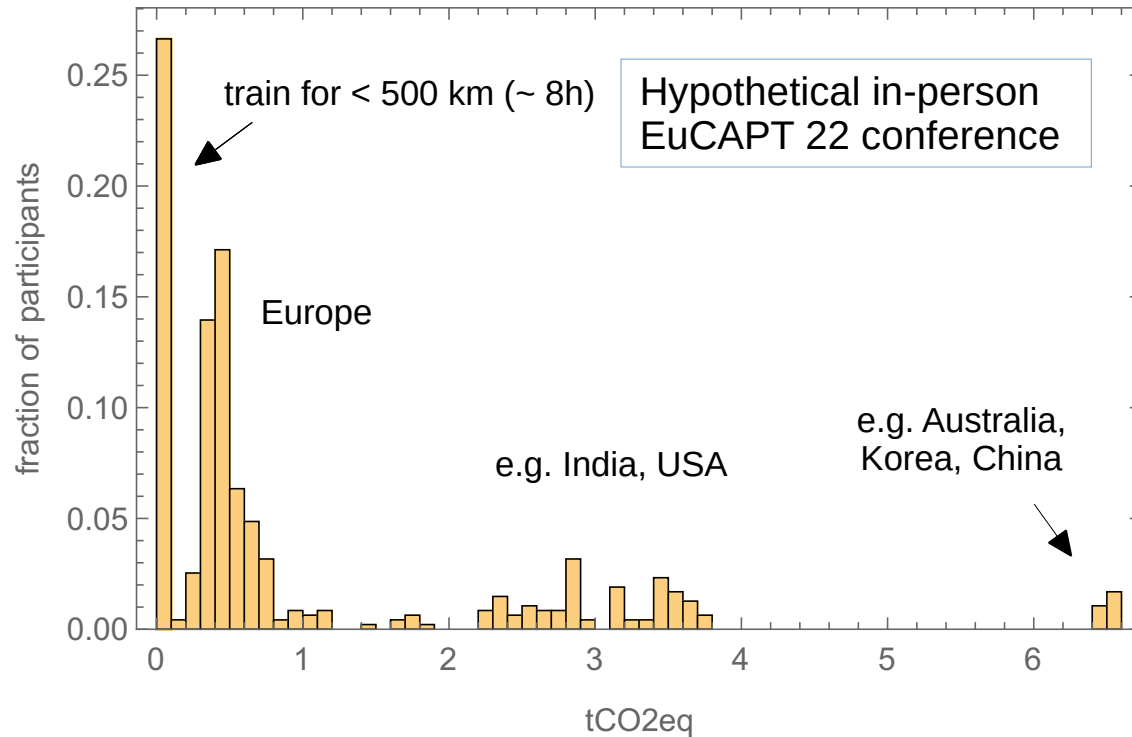


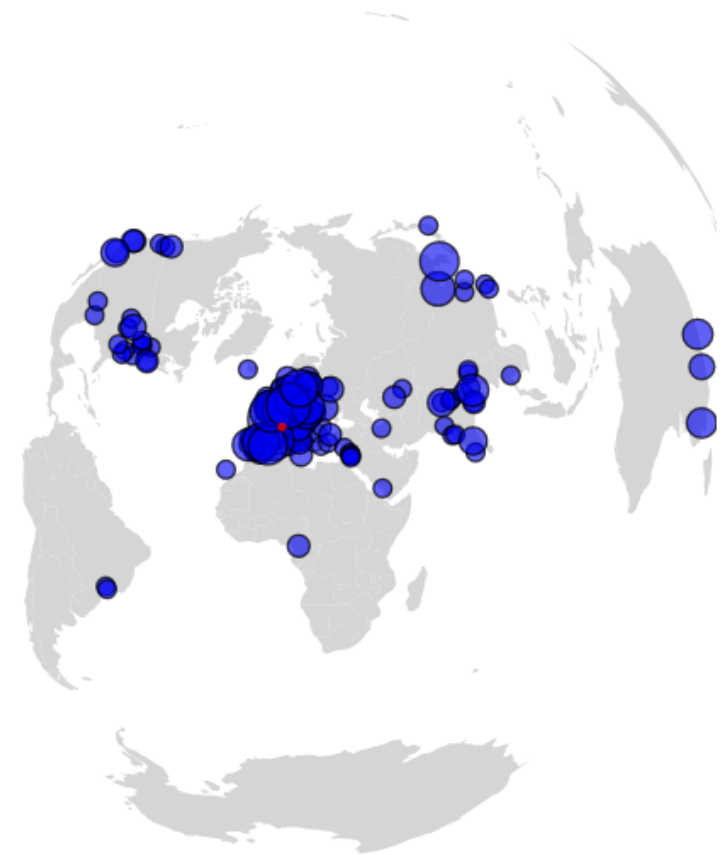
Figure 3: Relative share of emissions and the number of long-distance flights at various universities.

Figure 2: Relative fraction of different emission sources for various European universities.

EuCAPT 2022



train for < 300 km (~ 5h) : + 20 t CO₂eq



emissions from travel only
(<https://travel-footprint-calculator.irap.omp.eu/>)

flight emissions averaged from Atmosfair,
ADEME, MYCLIMATE, DEFRA models

based on EuCAPT 2022 participant list

470 t CO₂eq / 473 participants ~ 1 t CO₂eq / participant

what next?

Energy consumption / GHG emission as a factor in proposing / planning / developing and upgrading experiments?

Travel culture: what travel is necessary?
reconsider means of travel and trip durations.

What is a conference? Challenges and opportunities of online formats.
Online conferences can also be more inclusive.

Funding organizations / universities / hiring committees: wrong incentives?

.....

every ton counts / many parallel efforts needed !