Cc Florence Santrot

Carbon Footprint Assessment 2023

Methodology

A group of academics from multiple disciplinary backgrounds (climate & non-climate related)

> A research group comprising 271 members
> A think tank with 553 participants
> A carbon assessment module covering 1180 labs & research organization

Open-source tool for assessing the carbon footprint of research organizations

> Published methodology (ERL, ER: IS, Nature Astr., Nature Rev. Phys.) & a dozen working papers in open-access
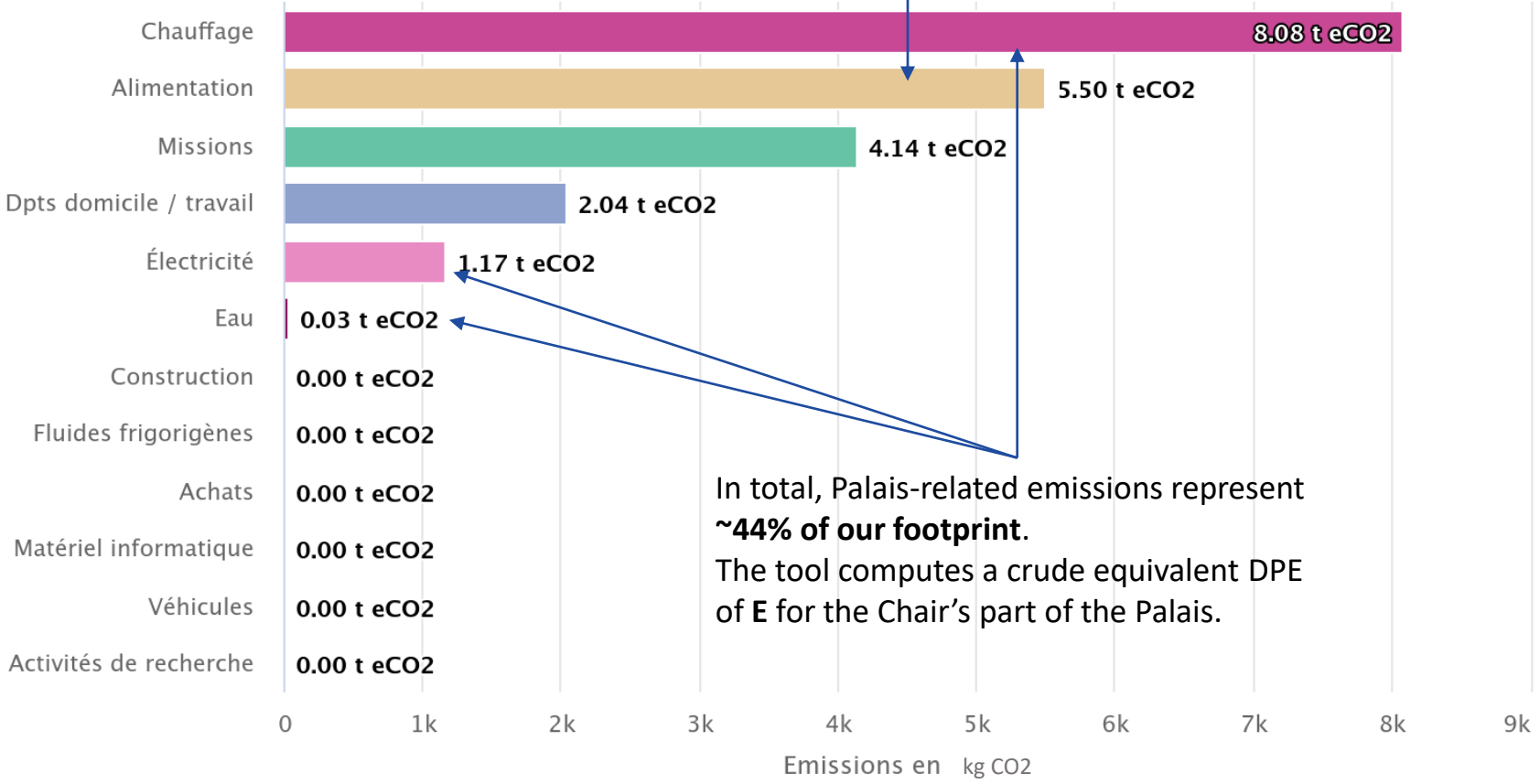> Aligned with France's normative framework regarding carbon assessment

Perimeter

> Calendar year 2023
> Scope 1, 2 & 3 with *(indirect) operative control [caused and controled by the activity of the CEC]*
> Building & energy, commuting & missions, IT w/o elec, goods & services
> Permanent staff, but interns accounted in commuting and eating habits surveys

Results

Payed & non-payed for by the Chair meals, linked with the presence at the Chair

In total, Palais-related emissions represent **~44% of our footprint**.
The tool computes a crude equivalent DPE of **E** for the Chair's part of the Palais.

Chauffage — 8.08 t eCO2
Alimentation — 5.50 t eCO2
Missions — 4.14 t eCO2
Dpts domicile / travail — 2.04 t eCO2
Électricité — 1.17 t eCO2
Eau — 0.03 t eCO2
Construction — 0.00 t eCO2
Fluides frigorigènes — 0.00 t eCO2
Achats — 0.00 t eCO2
Matériel informatique — 0.00 t eCO2
Véhicules — 0.00 t eCO2
Activités de recherche — 0.00 t eCO2

Emissions en kg CO2

EMPREINTE CARBONE DU LABORATOIRE
20.95 ± 2.43 t eCO2

EMPREINTE CARBONE *PER CAPITA*
658 ± 78 kg eCO2
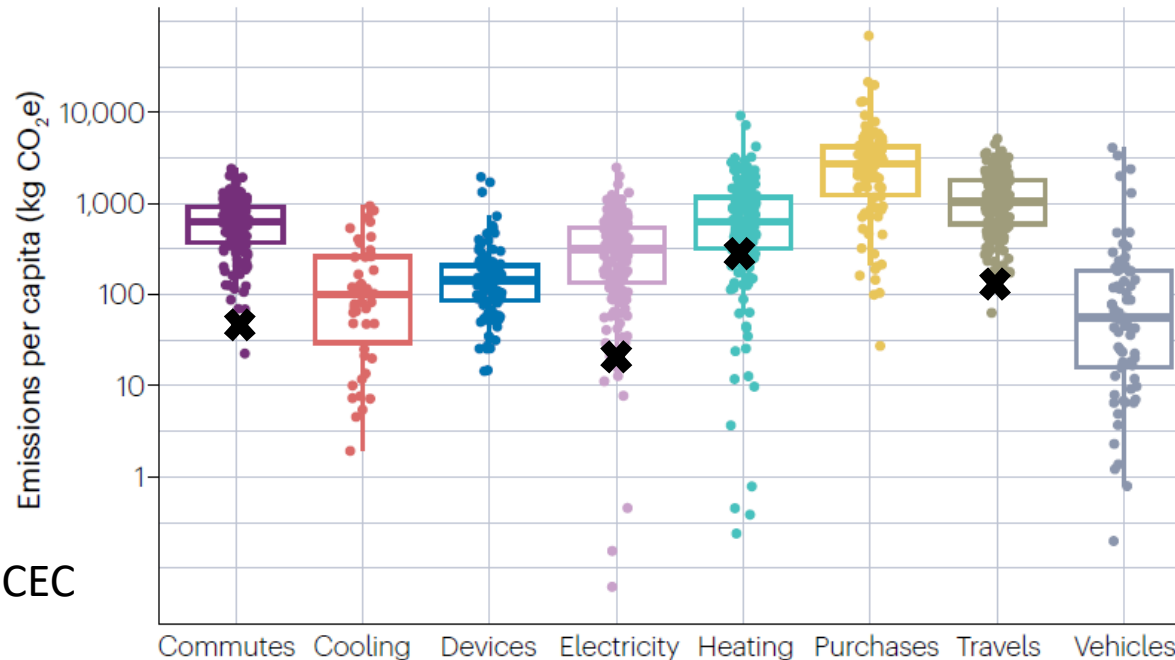
Comparison with registered labs

Fig. 1 | Per capita GHG emission (kg CO_2e) per source of emission in 2019 (that is, total research unit carbon footprint divided by the number of staff member within these units). Each research unit in the GES 1point5 database provides one estimate per source (dots) assembled into box plots (median, and interquartile ranges) for each source independently. This illustrative plot assembles stabilized and submitted assessments from $n = 154, 149, 115, 149, 149, 79, 159$ and 156 research units, respectively, for each source. These research units can be affiliated with one or several broad research domains (science and technology, environmental sciences, life and health sciences or human and social sciences).

Results from known labs:

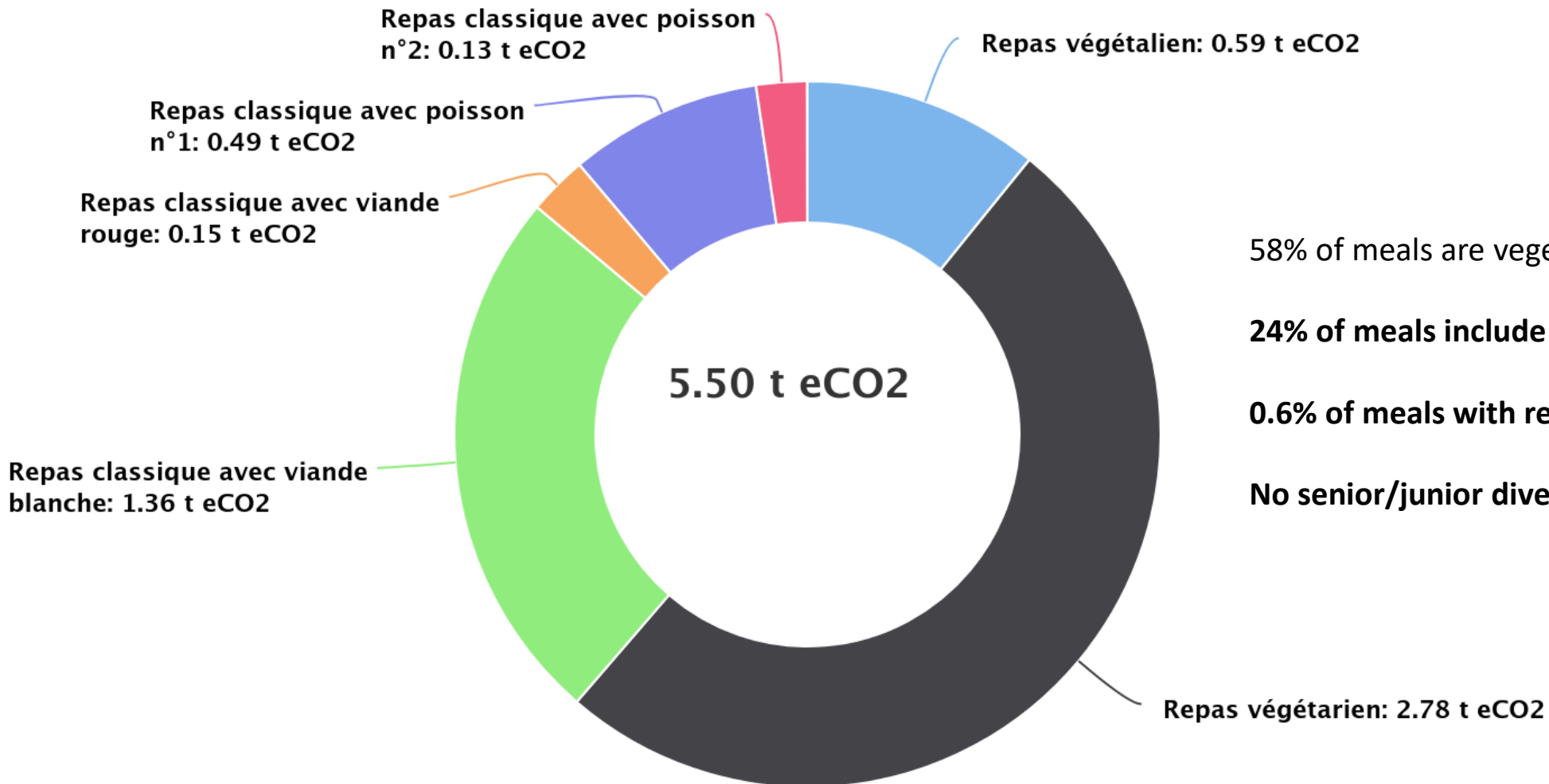|	
ILB 2023 (incl. CEC)	1,4 tCO2eq / pers
LGI 2021	0,96 tCO2eq / pers
CEC	**0,66** tCO2eq / pers

Source: *"How research can steer academia towards a low-carbon future"*, par Tamara Ben Ari, 2023, *Nature Review Physics* & Own calculations for CEC

Focus – Eating habits

Repas classique avec poisson n°2: 0.13 t eCO2

Repas classique avec poisson n°1: 0.49 t eCO2

Repas classique avec viande rouge: 0.15 t eCO2

Repas classique avec viande blanche: 1.36 t eCO2

Repas végétalien: 0.59 t eCO2

5.50 t eCO2

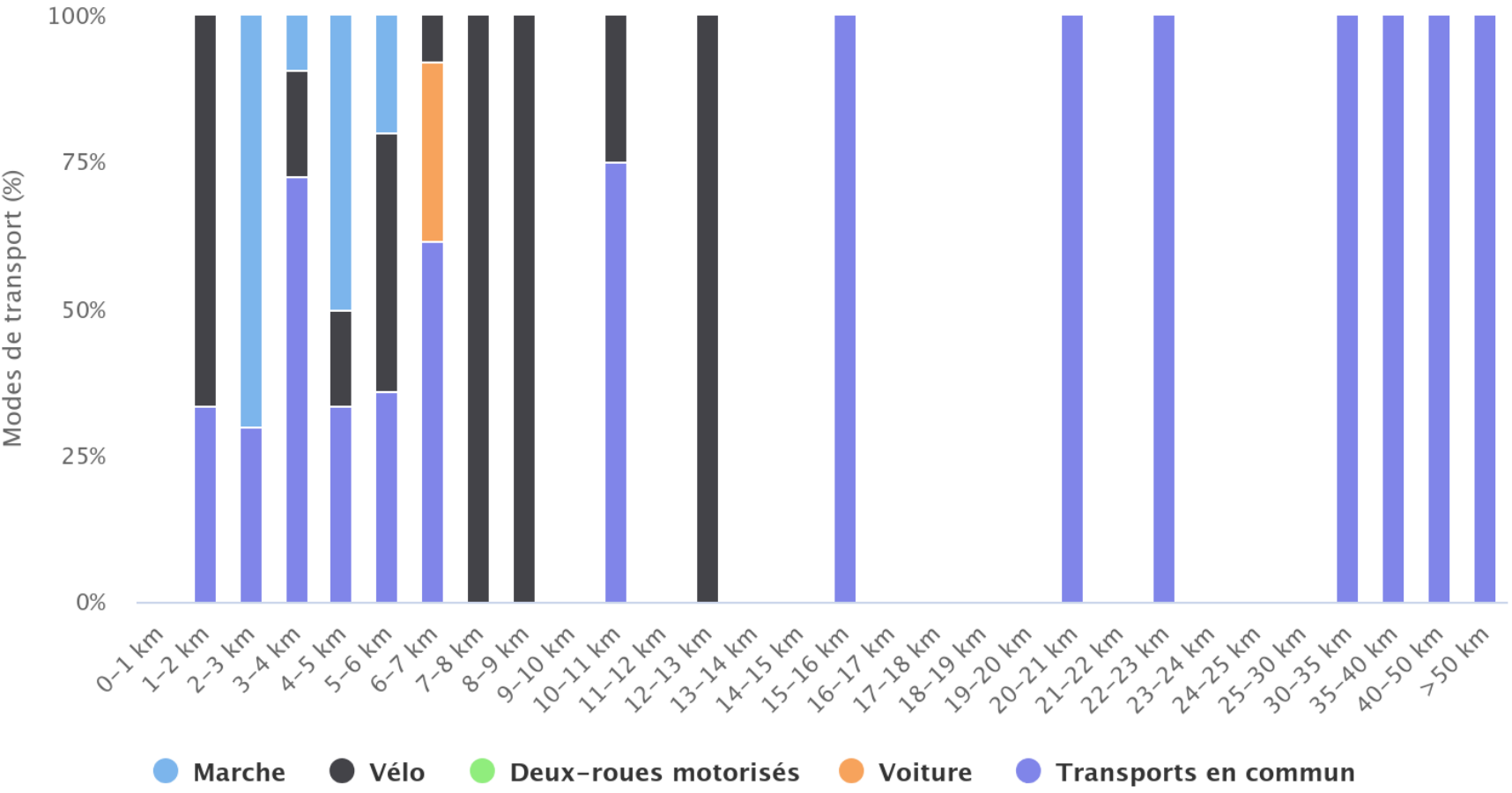Repas végétarien: 2.78 t eCO2

58% of meals are vegetarian -> 50% of emissions

24% of meals include meat/fish -> 38% of emissions

0.6% of meals with red meat -> 2,7% of emissions
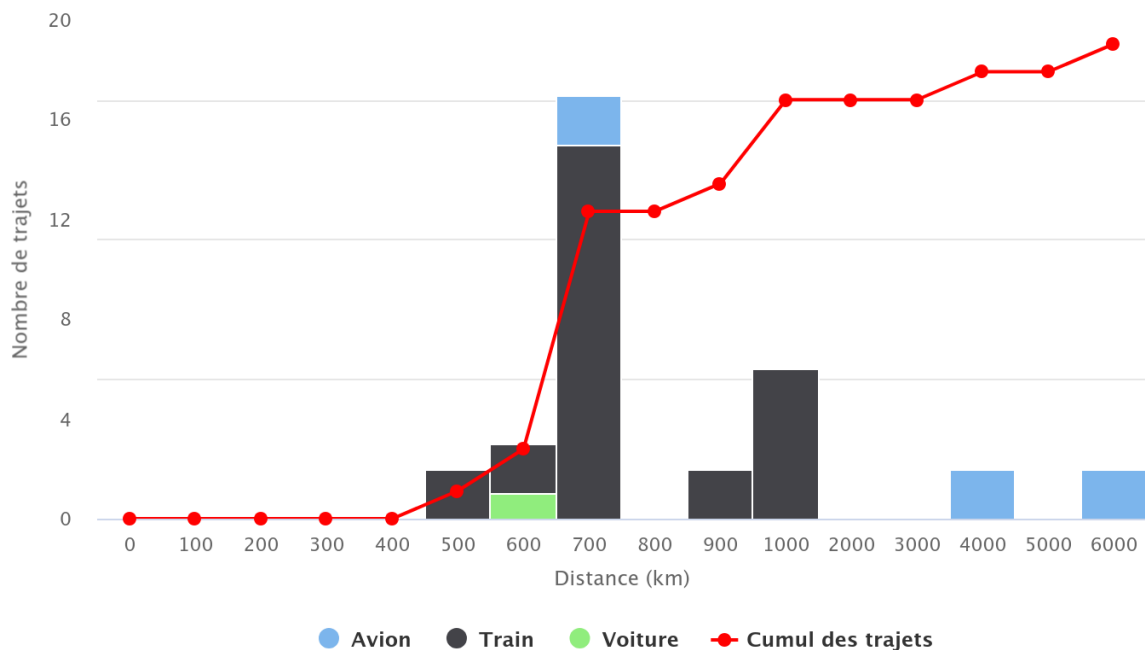
No senior/junior divergence

Response rate: 77%

Focus – Commutes

Response rate: 77%

Focus – Missions

18 missions surveyed
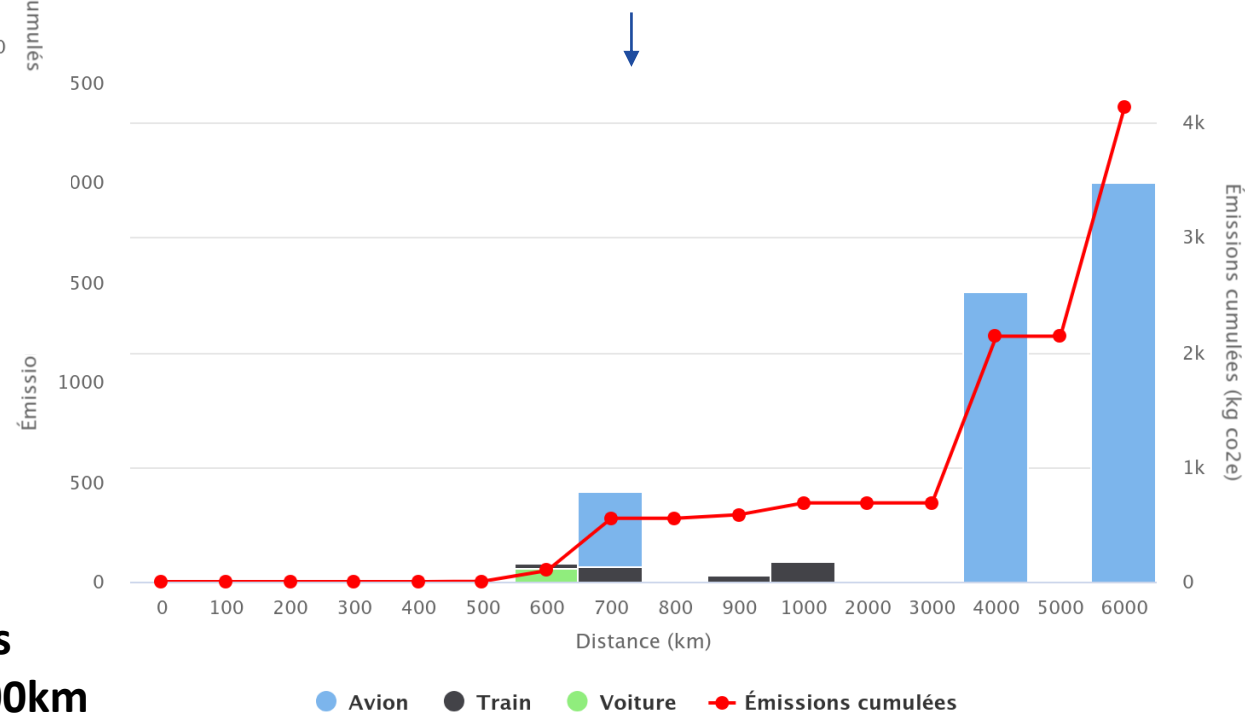
Emissions

Number of trips

2 long-distance missions ~ 83% of CEC trips emissions

« France » size missions : 11 missions / 13% of trips emissions

1 mission < 800km in plane => 68% of emissions for trips < 800km

What next?

The carbon assessment confirms the relevance of the 'Charte éco-responsabilité' targeting sponsored food supply

  Second source of emissions

  Full control from Chair members vs. Uncontrolled emissions from being located in the Palais

  Apart from the FLM, focus on the continuous information of Chair members since most meals are unsponsored

  Display a chart of the carbon footprints of different eating habits?

Plane trips for mid-distance missions pollute as almost 6 non-plane equivalent trips with CEC behavior

  Long-distance trips are always done by plane, and induce the overwhelming majority of emissions

  Discuss plane limitations, with different perspectives on mid and long distances

Carbon footprint assessment is a sustained effort in the long run

 Necessary comparison of footprints over the years, this was only a first effort

  Participation of approx. 75% of the members on a 3 weeks-long survey with 1 week notice & 1 reminder

  Maintain a contact list of 1st year alumni for easy access to the surveys (**non**-CEC mail adresses)

  Modify the missions' form so as to encode members without CEC-funded missions during the year

Thank you for your participation and « à l'année prochaine »!

Same role of plane for CEC missions as for the general lab population
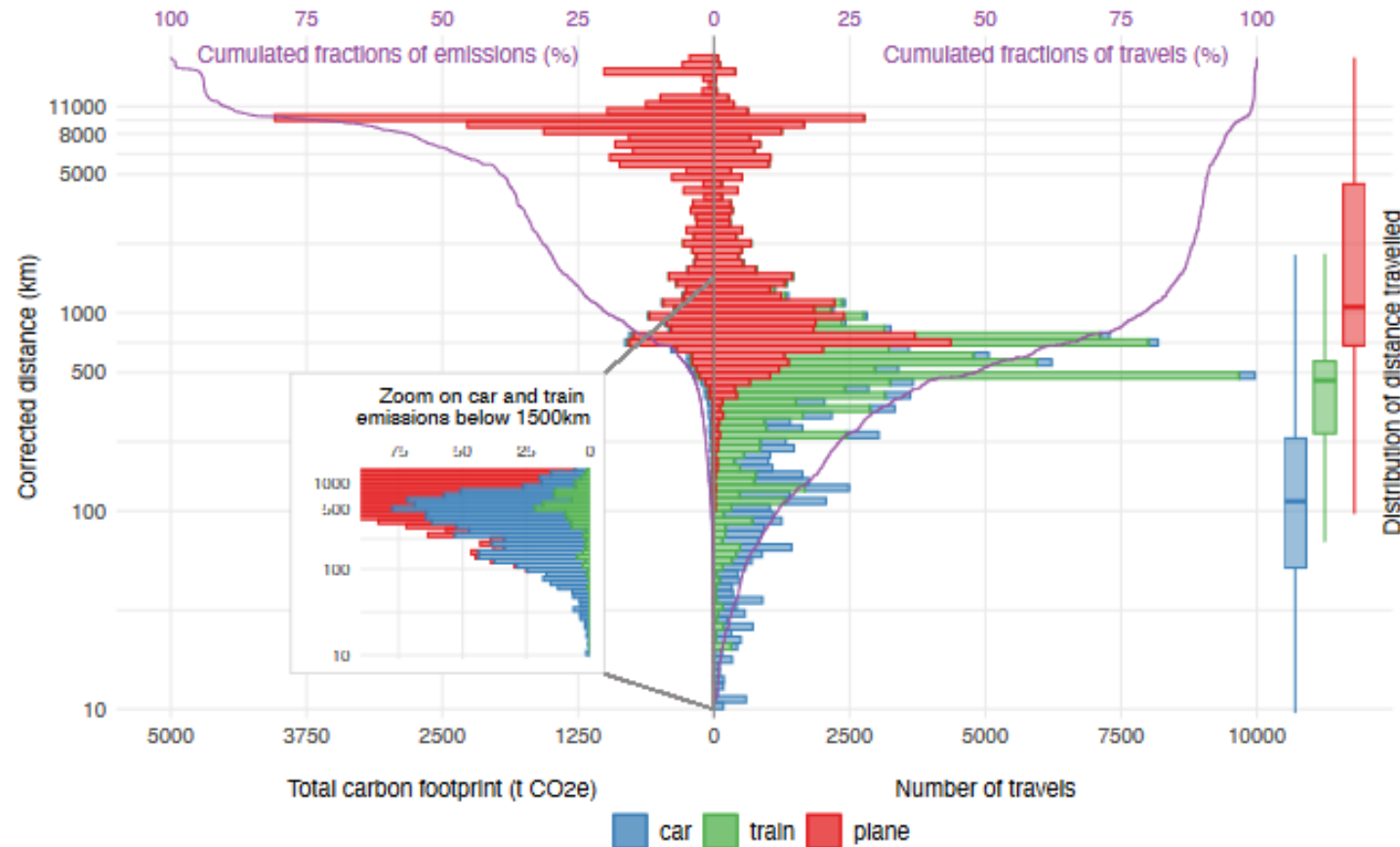
Data: 37,081 academic travels in 159 research units in France in 2019

Avg trip:

    3000 km in HSS
    3100 km in LHS
    2800 km in ST

Source: **Flight quotas hold the most significant potential for reducing carbon emissions from academic travel**
Tamara Ben-Ari, Gaëlle Lefort, Jérôme Mariette, Olivier Aumont, Laurent Jeanneau, Alexandre Santerne, Aymeric Spiga, Philippe-Emmanuel Roche, *EarthArXiv, 2023 (pré-publication)*