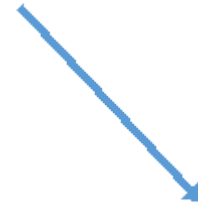


Groupe de travail Empreinte environnementale



Empreinte carbone



Impact environnemental
« au jour le jour »

Empreinte carbone du LBBE, 2021

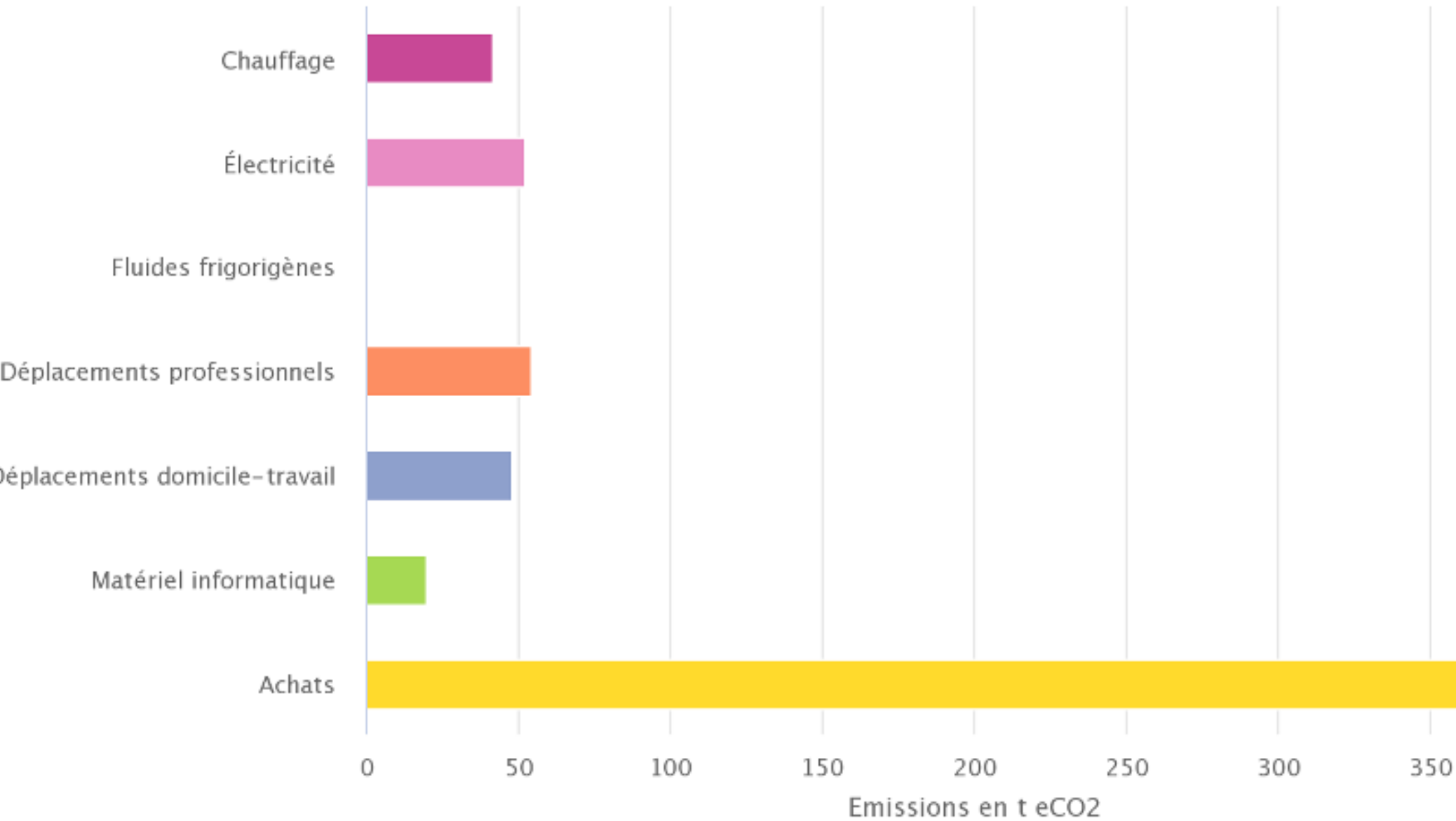


Périmètre :

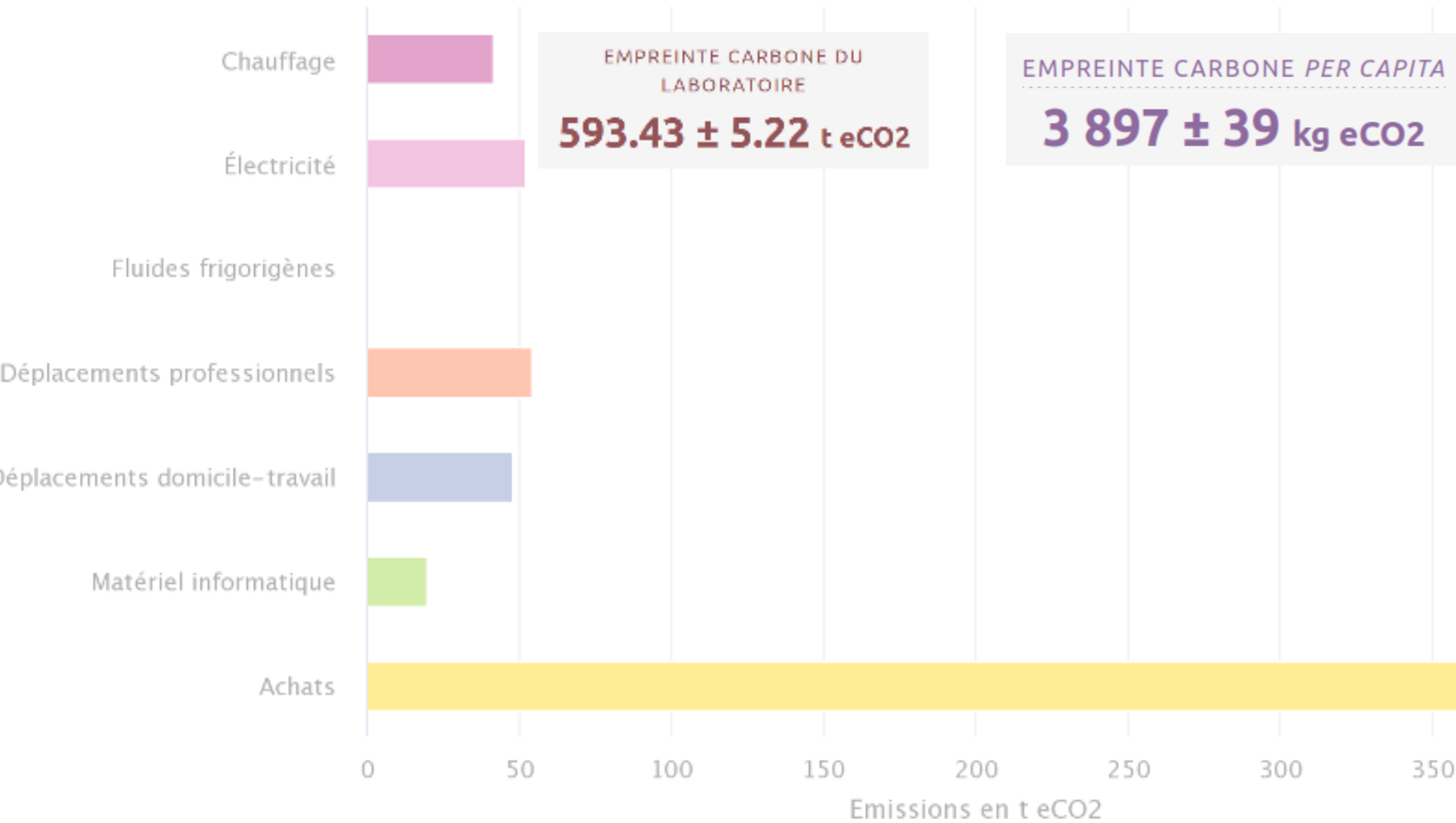
- site de la Doua.
- 6 millions € de budget
- 34 chercheurs, 42 enseignants-chercheurs, 25 ITA, 55 doctorants et post-doctorants.



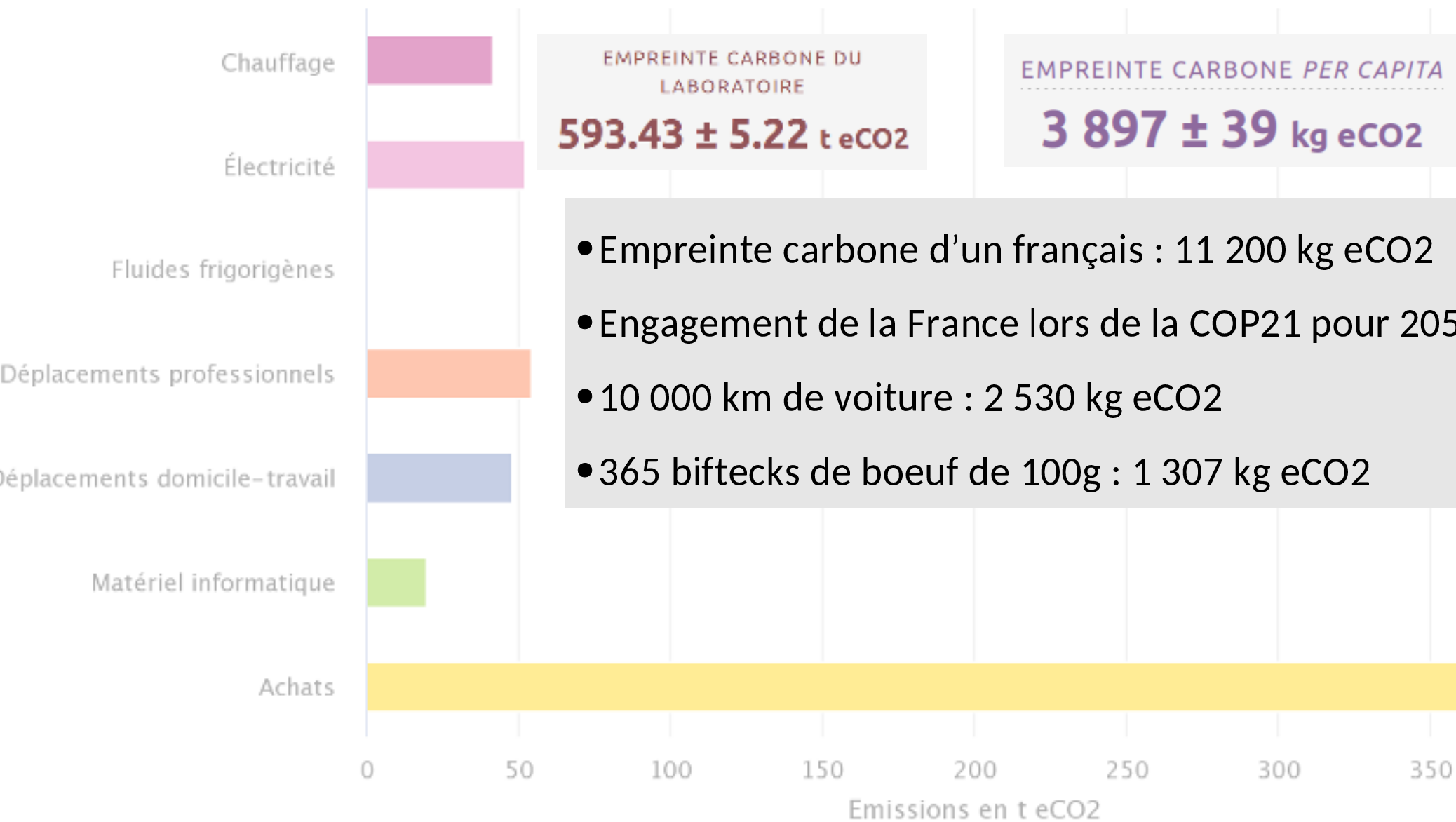
Empreinte carbone du LBBE, 2021



Empreinte carbone du LBBE, 2021



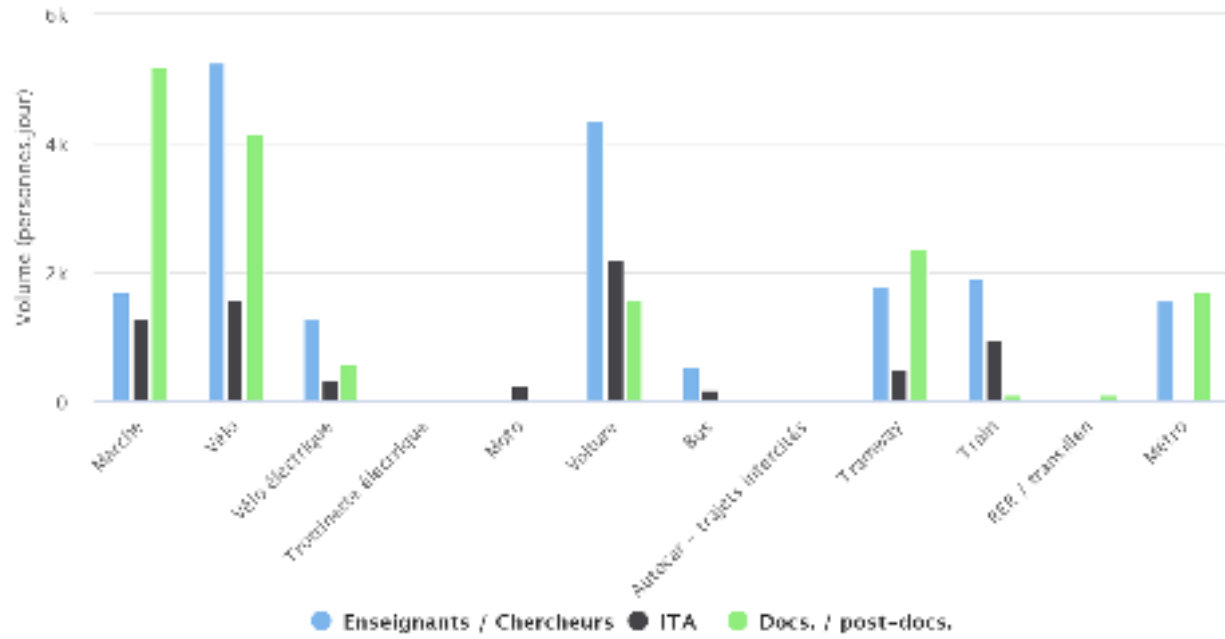
Empreinte carbone du LBBE, 2021



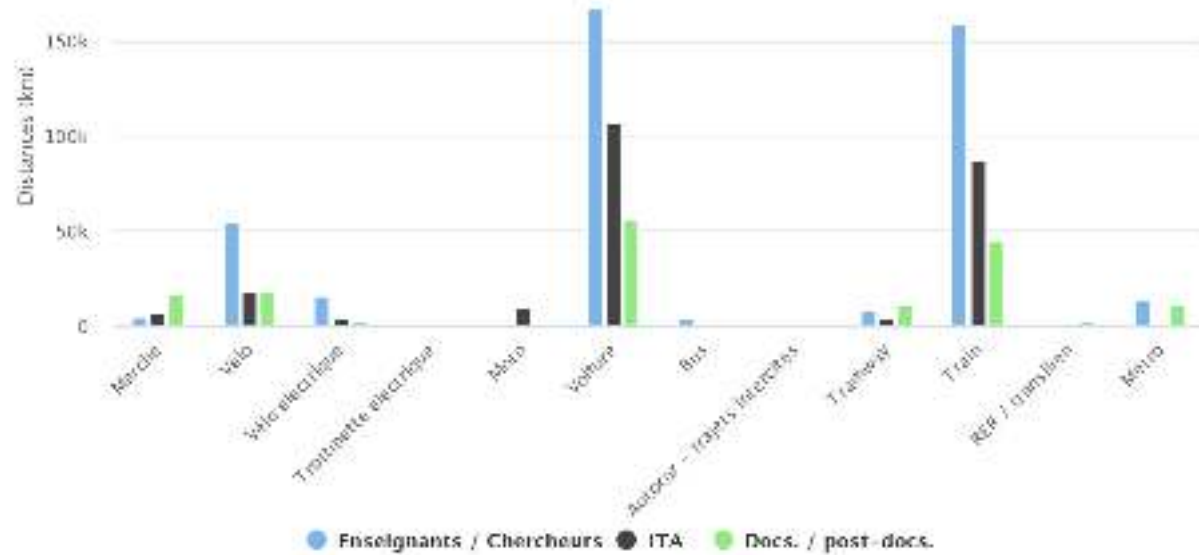
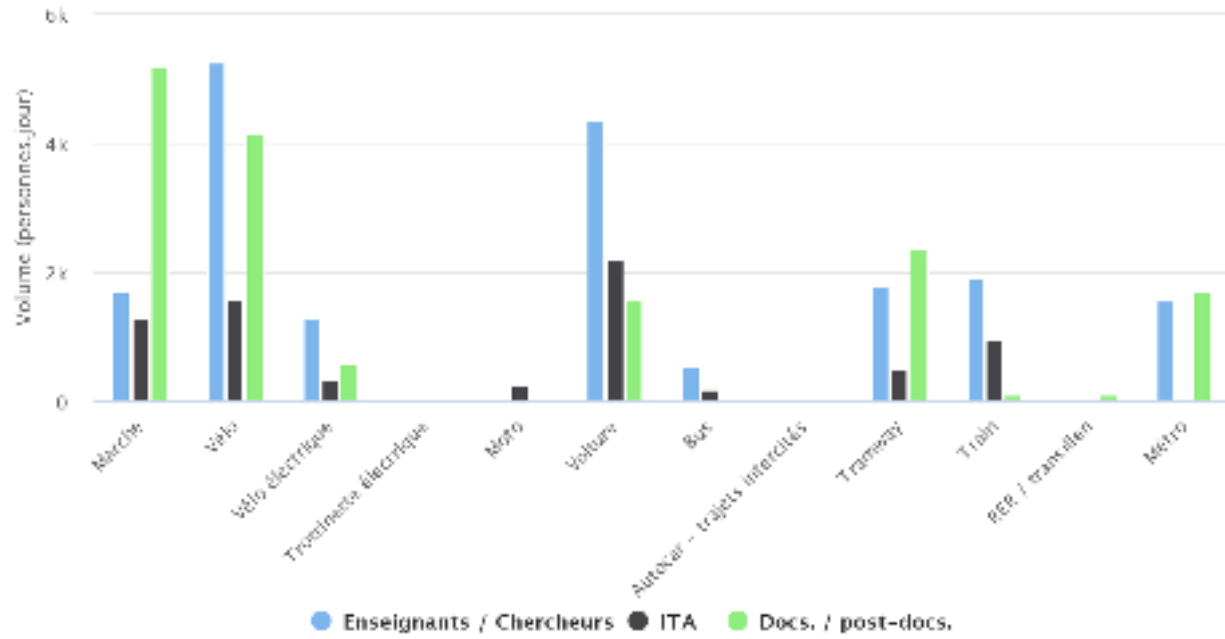
- Empreinte carbone d'un français : 11 200 kg eCO2
- Engagement de la France lors de la COP21 pour 2050 : 2 000 kg eCO2
- 10 000 km de voiture : 2 530 kg eCO2
- 365 biftecks de boeuf de 100g : 1 307 kg eCO2



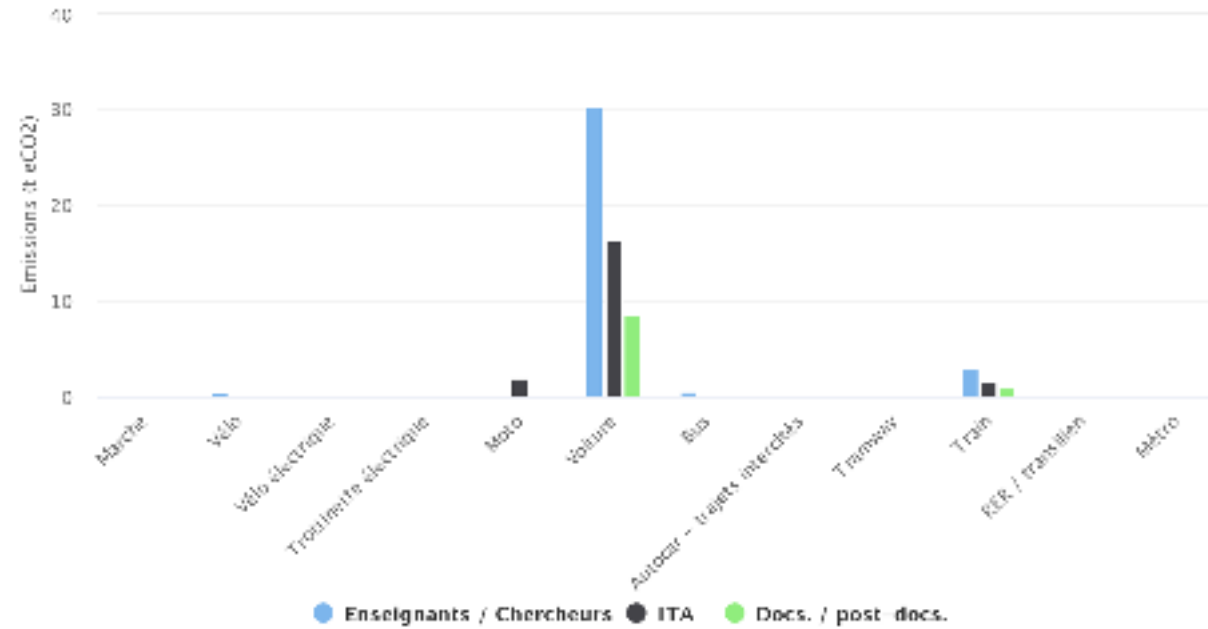
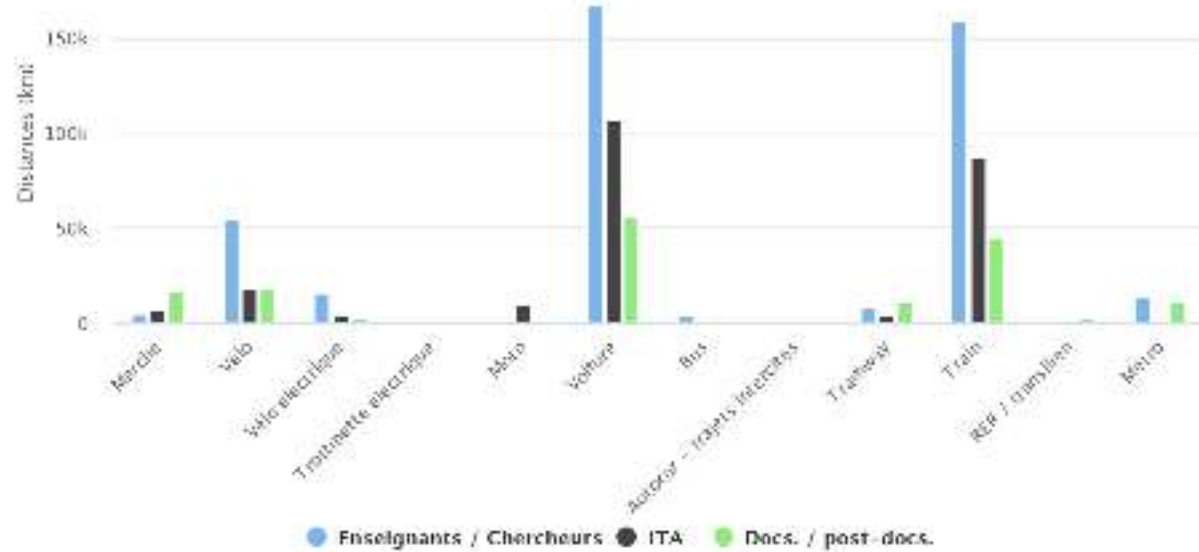
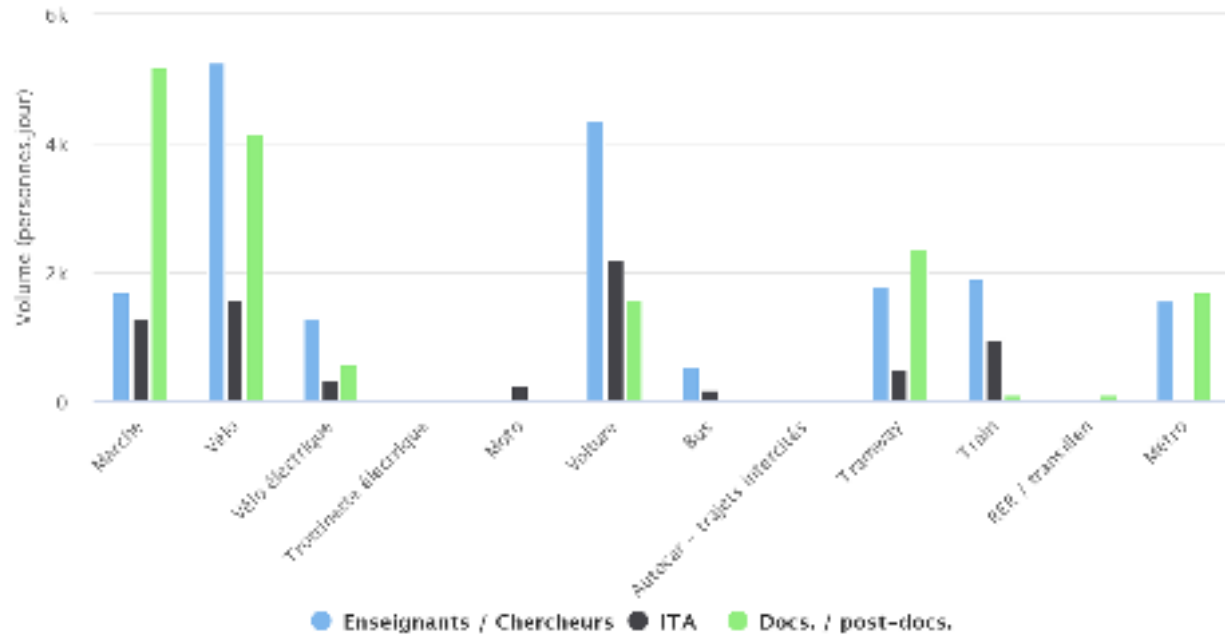
Déplacements domicile-travail



Déplacements domicile-travail



Déplacements domicile-travail



Impact écologique « au jour le jour »



- **Suggestions bienvenues** 😊

ex récents : stylos pour tableaux, compost dans les salles de pause...

gtee_umr5558@listes.univ-lyon1.fr

Welcome!

- **Possibilité de rejoindre le groupe de travail de façon durable ou temporaire (suivi d'un projet)**

Atelier Empreinte Environnementale

Quelques pistes de réflexion :

- Des idées à implémenter rapidement ?
- Quels objectifs pour le labo ?
- Comment y arriver ?
- Au-delà de l'empreinte carbone ?
- ...

Transparents supplémentaires

Empreinte carbone du LBBE



Groupement de recherche
soutenu par le **CNRS**,
l'**INRAE**, l'**ADEME** et l'**INRIA**



**Mieux comprendre et
réduire l'empreinte
carbone des activités
de recherche.**

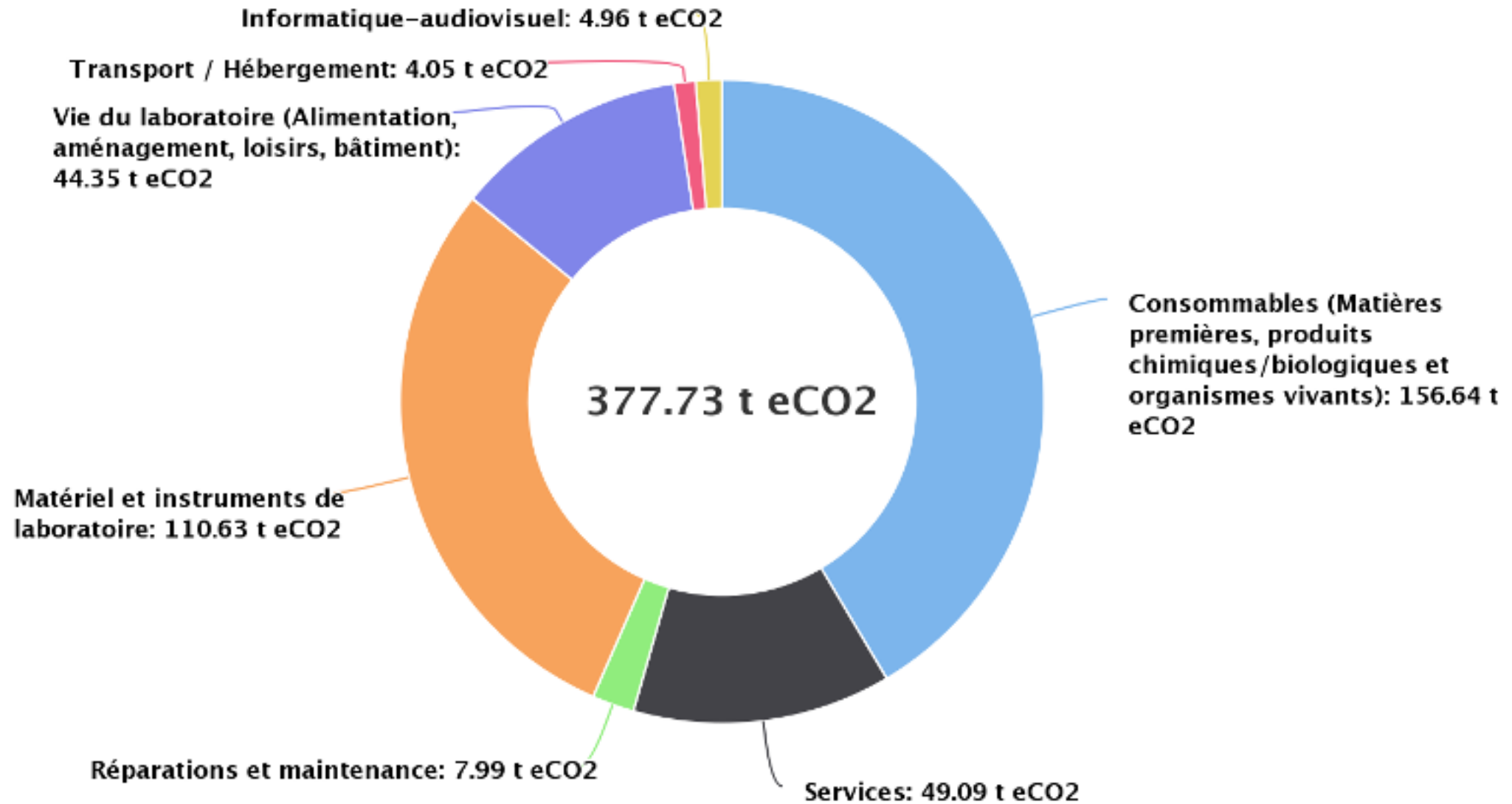


Outil GES

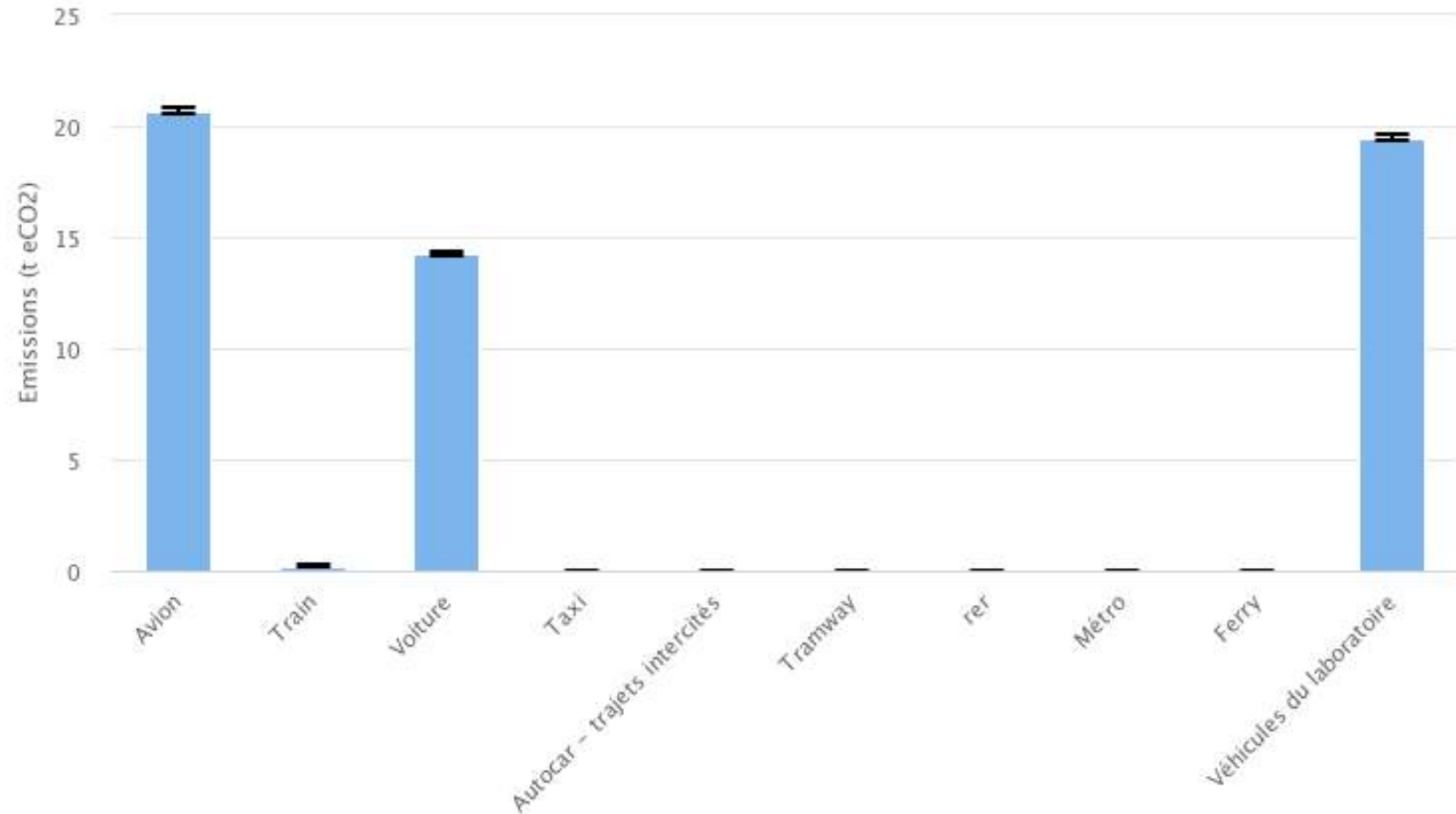
Outil *open source* permettant de calculer
l'empreinte carbone et de construire le bilan gaz à
effet de serre (BGES) réglementaire du laboratoire.
Permet les comparaisons entre laboratoires.

Identifier les **leviers d'actions** permettant de réduire
l'impact des activités de recherche sur les émissions de gaz
à effet de serre

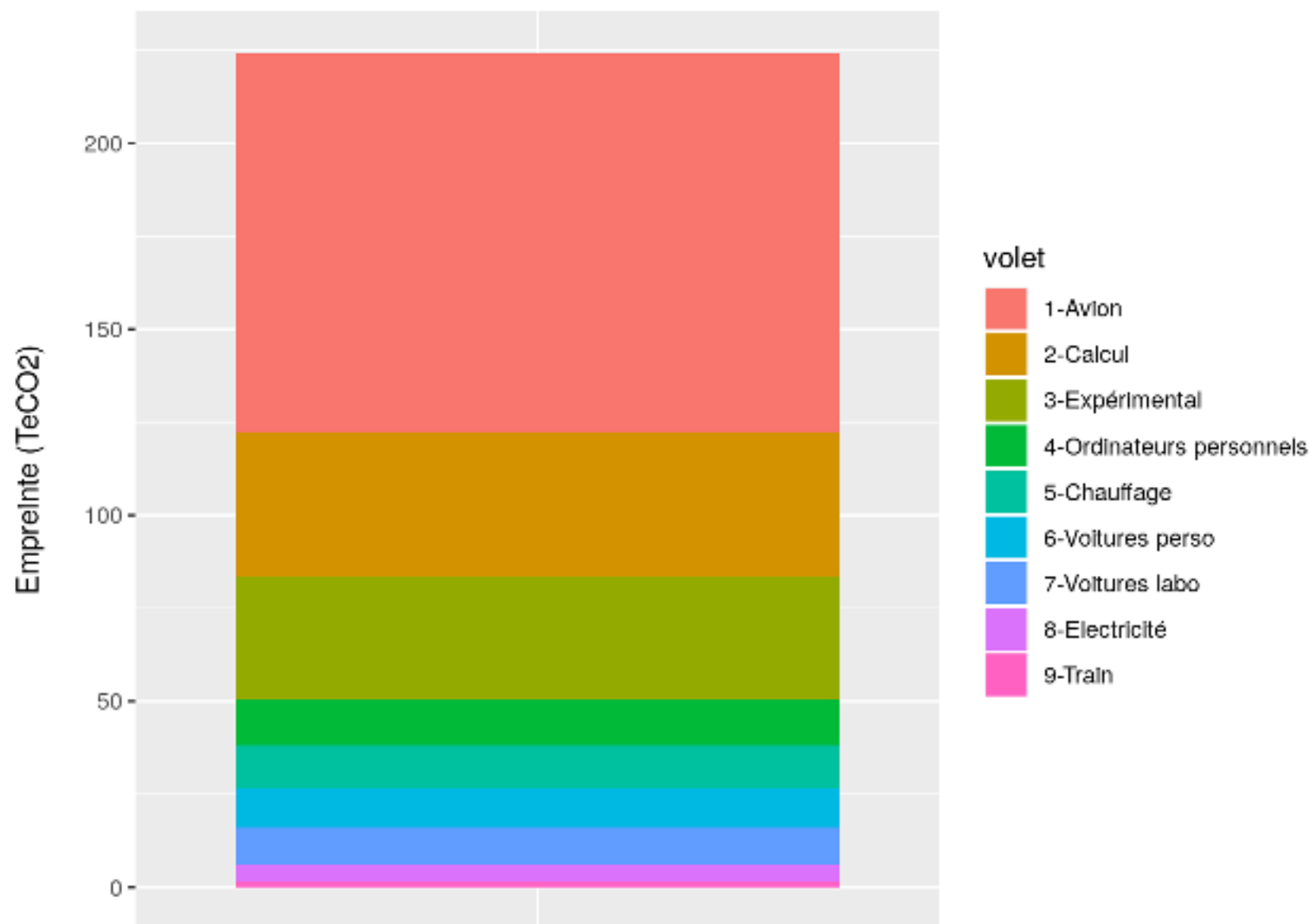
Achats



Déplacements professionnels



Bilan 2018, manuel



Some examples of eCO₂ emissions



- ✈ 1 long distance flight (Paris/New York return) : 2t eCO₂

- Same distance by train : 1/40 ✈

- Laptop : 250kg eCO₂ + Screen: 430kg eCO₂ = 1/4 ✈



- 2h visio (2 persons) : 1/10 000 ✈

- 1 email (with 2MB doc attached) : 1/100 000 ✈



Computation time/servers not taken into



account!

- Lighting of an office during closed hours : 500kWh/year = 30kg eCO₂ (1kwh electricity: 60g eCO₂)



- 1 glove: 26g eCO₂

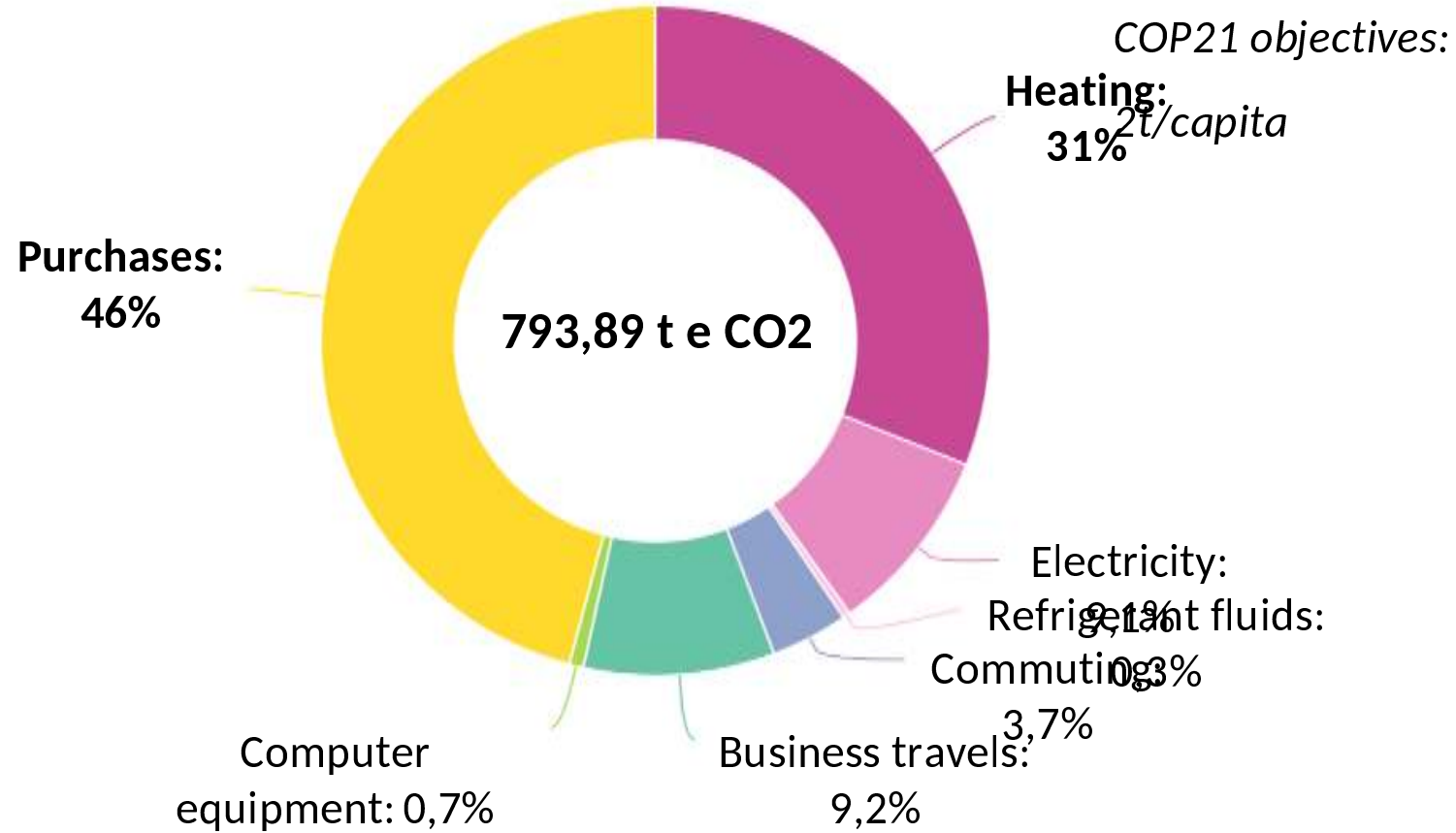
EMPREINTE CARBONE
DU LABORATOIRE

793.89 +- 68.80 t e CO2

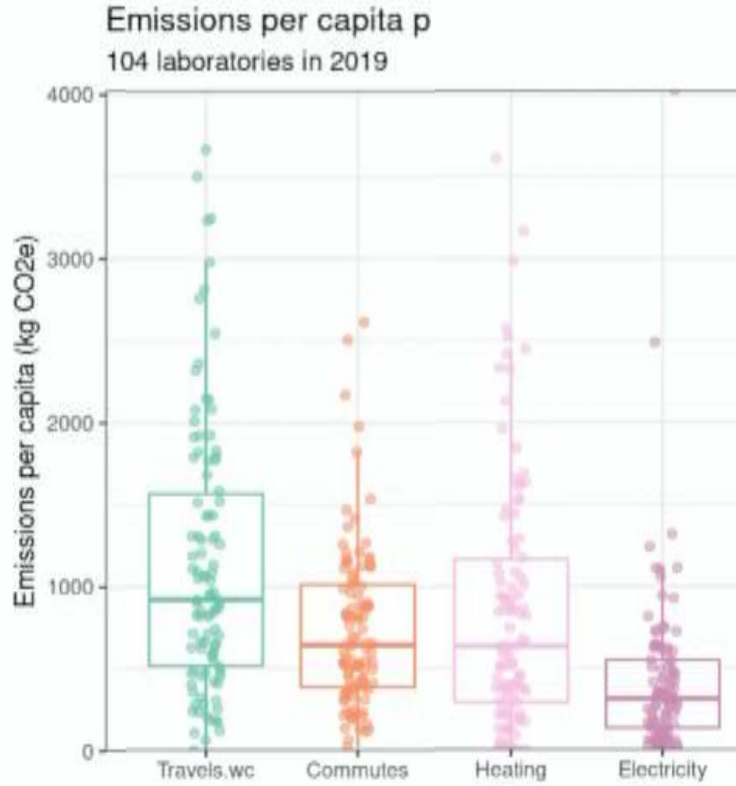
eCO₂ footprint IGFL 2019

EMPREINTE CARBONE
PER CAPITA

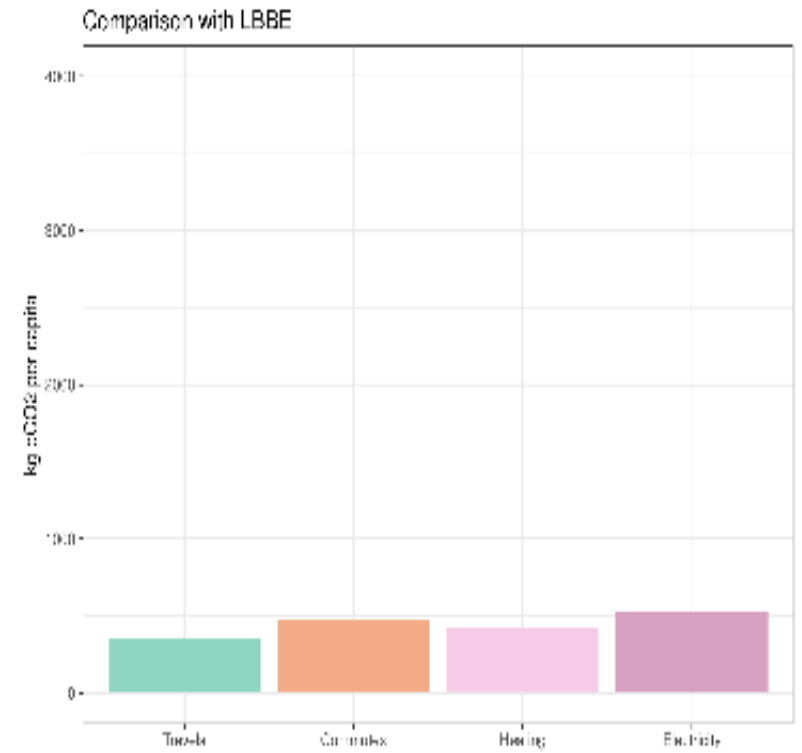
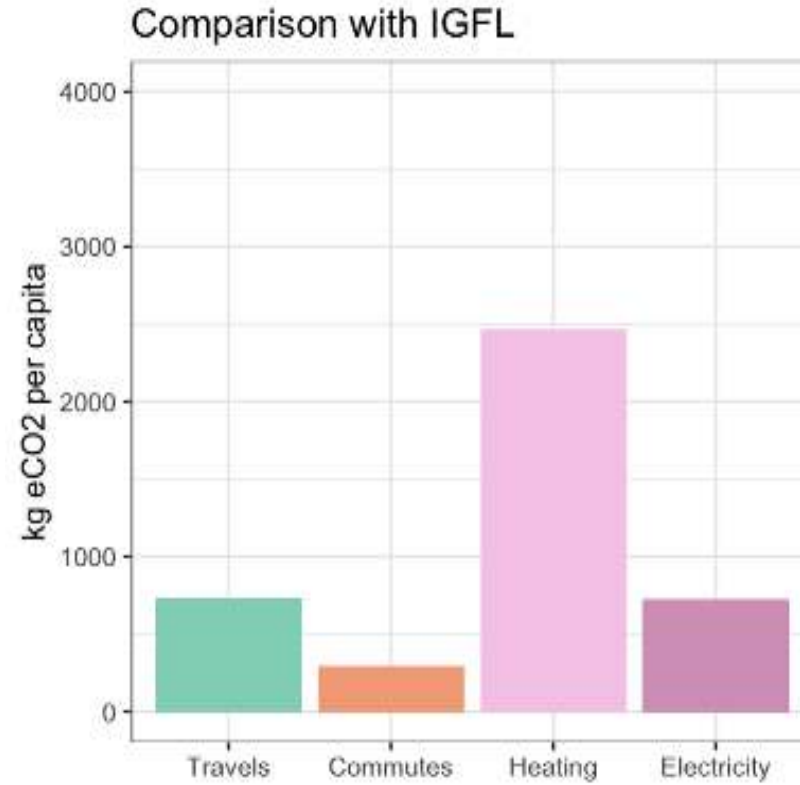
8.56 +- 0.73 t e CO2



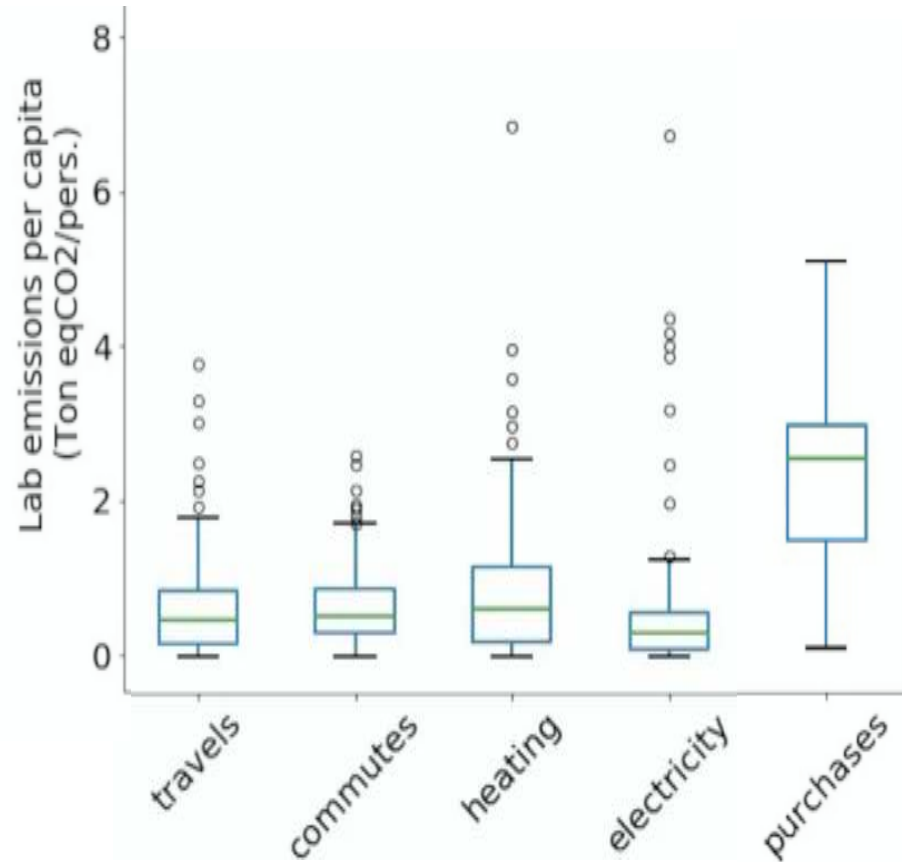
Comparison with other labs



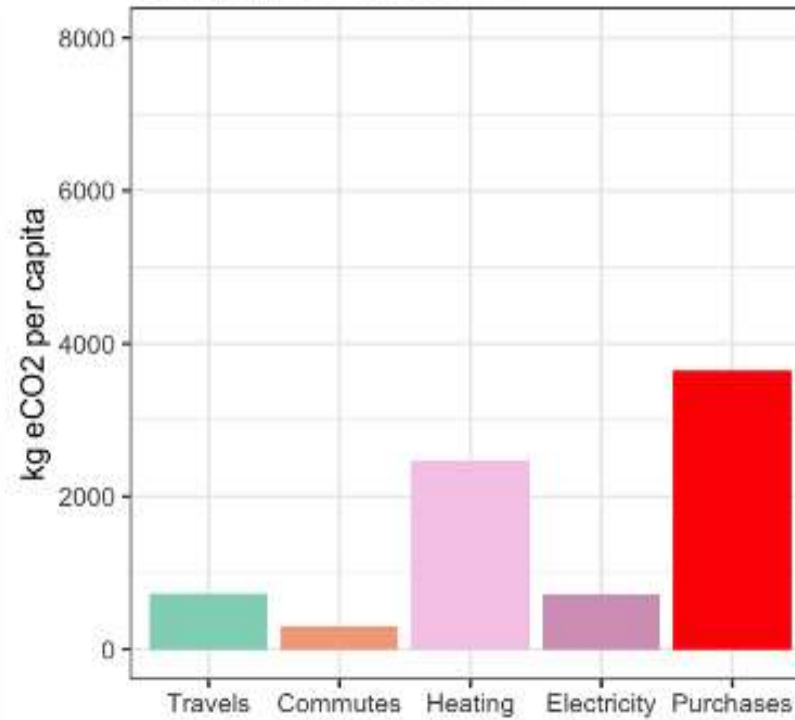
Data source: GES 1point5



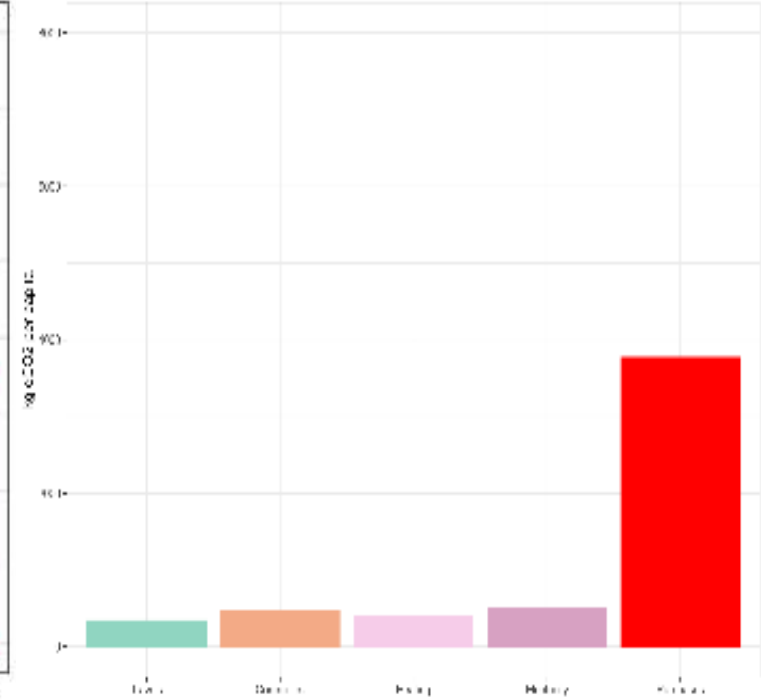
Comparison with other labs (purchases included)



Comparison with IGFL



Comparison with EBE



Data source: GES 1point5

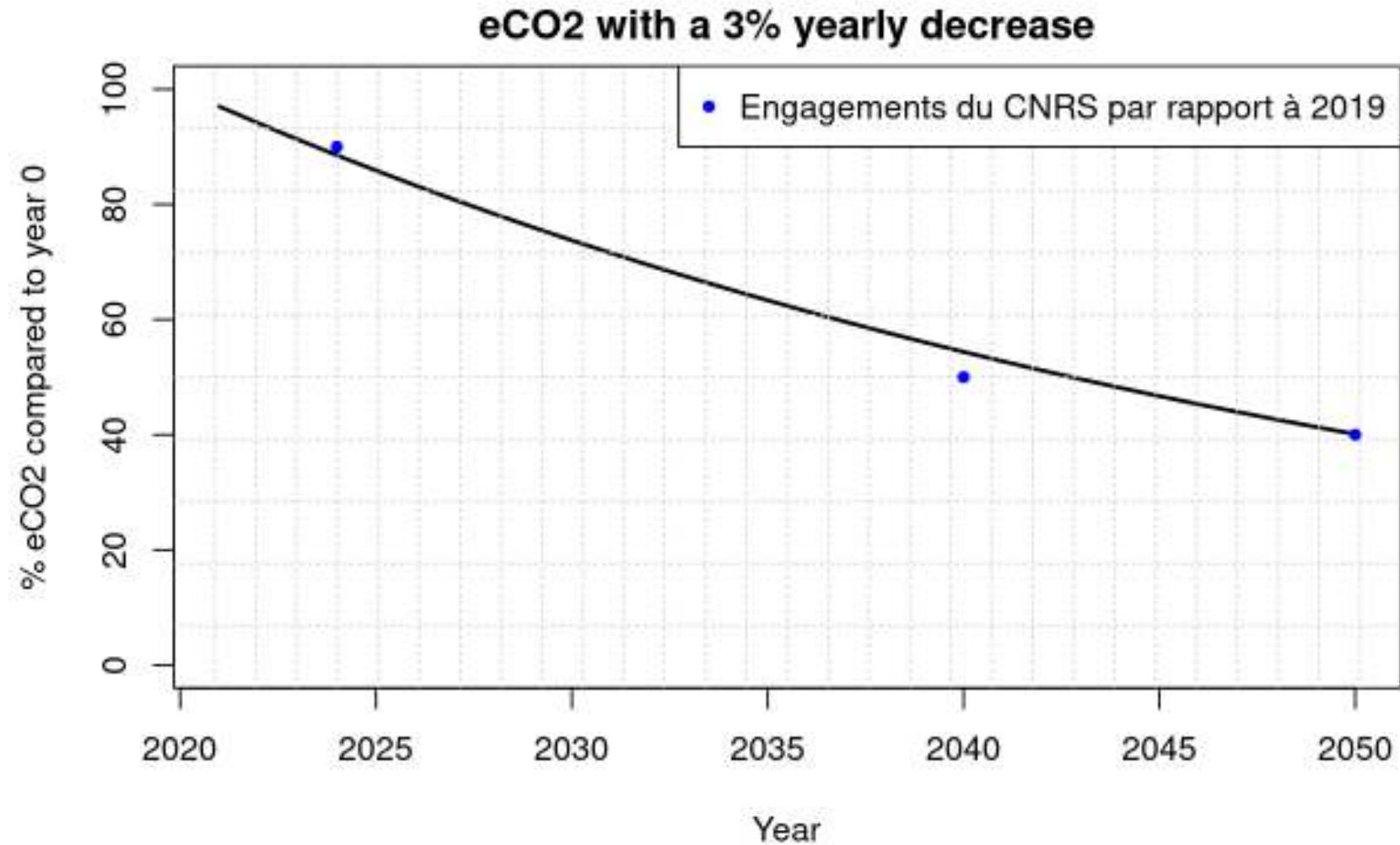
Mobilier de bureau et de salles de reunion : 12%

Froid : banques de sang, congelateurs, refrigerateurs,... : 9.8%

Thermostatisation et sechage : etuves, enceintes, bains, dessicateurs... : 8.4%

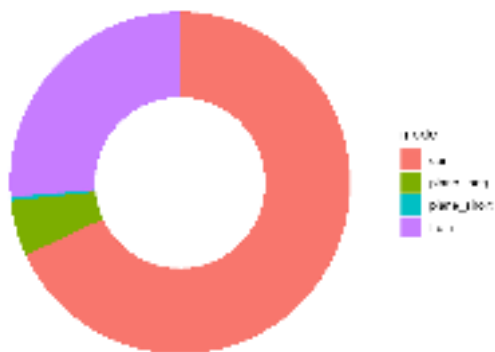
Materiels et consommables pour letude du comportement animal : 5.9%

An example of a decrease trajectory



Missions

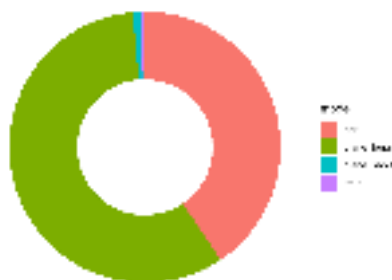
Number of missions



mode	count
car	181
plane_long	14
plane_short	1
train	70

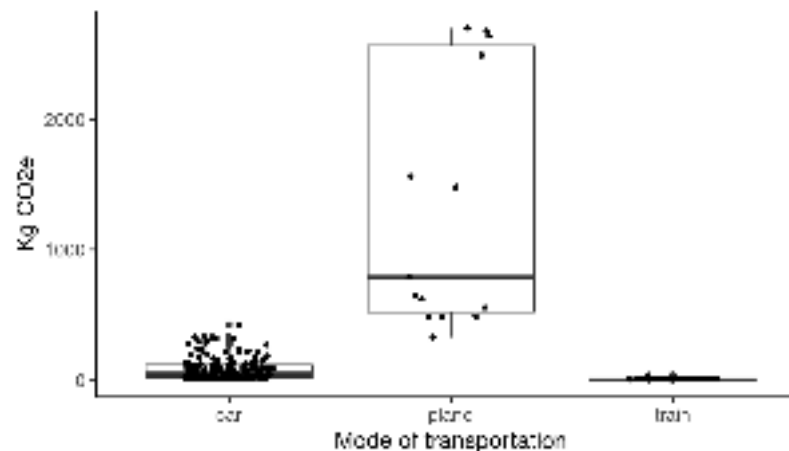
Threshold :
2300km

eCO2 missions

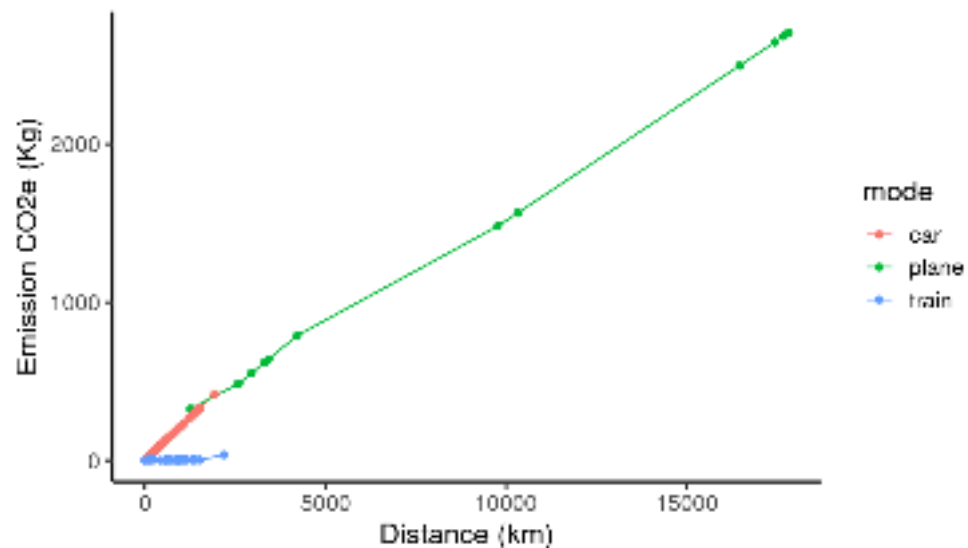


mode	eCO2
car	14230
plane_long	20336
plane_short	326
train	181

CO2e emissions for 'missions'

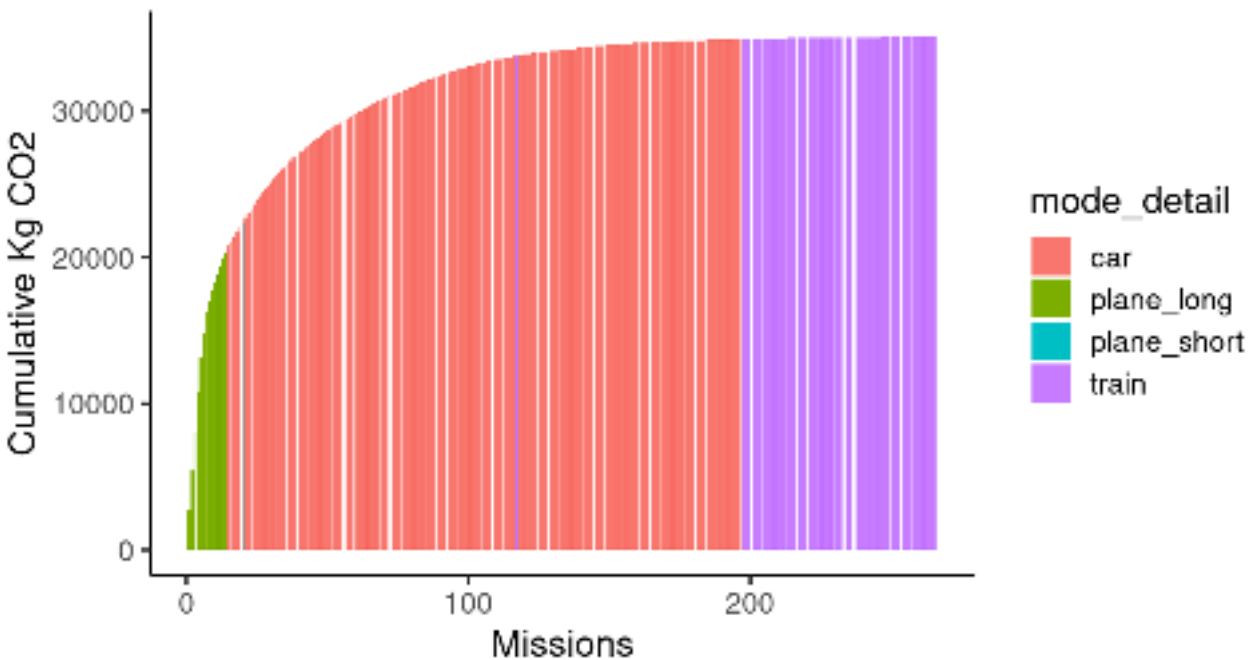


Comparison of the link between distance and CO2

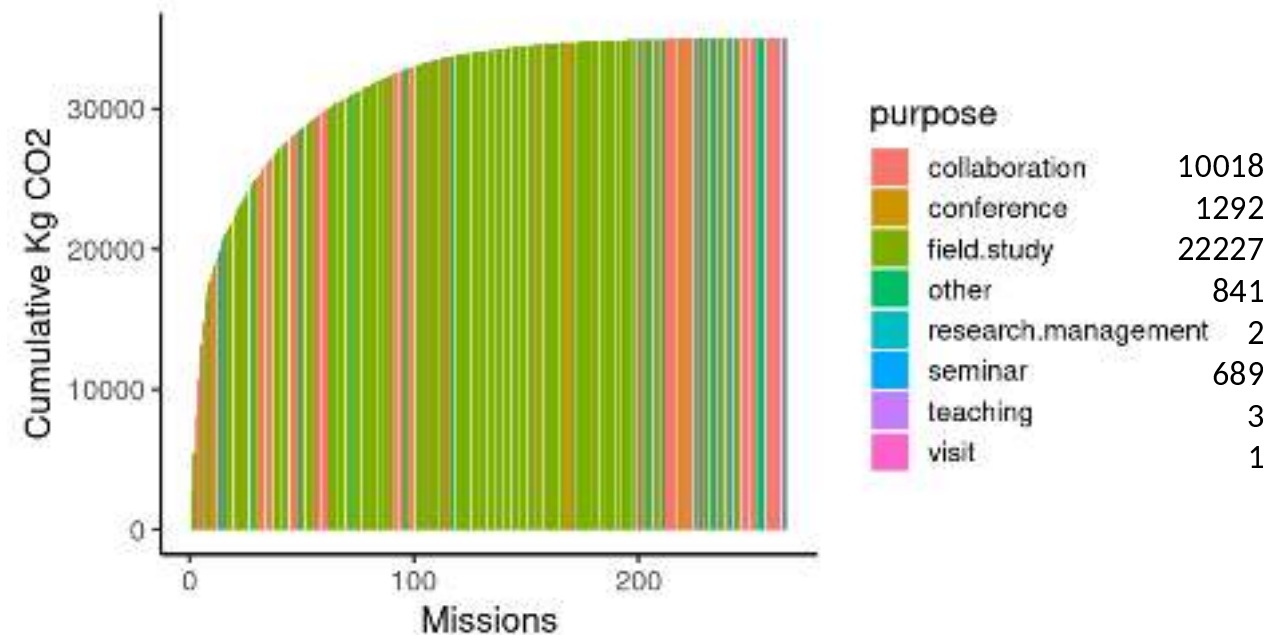


Missions

A few missions make up for most of the CO2



Field studies make up for most of the CO2



CARBON FOOTPRINT LBBE 2021

Laurane Mangé, Martin Schuster

AGENDA

INTRODUCTION

- The client: LBBE
- The tool: GES 1point5

OUR DATA

- Boundaries
- Buildings
- Purchases
- Digital devices
- Vehicles
- Travel

RESULTS

- Raw results
- Reduction of GHG emissions
- Error analysis

THE CLIENT: LBBE



THE LABORATORY

- Biometry and Evolutionary Biology Laboratory (LBBE)
- part of CNRS and University of Lyon

RESEARCH TOPICS

- Various aspects of Biometry (or Biostatistics) and Evolutionary Biology

THE STRUCTURE

- Lab includes three departments, each divided in several groups
- 211 members with annual budget of ~ 6 mio. €



DOCUMENTATION

- Methodology
- Help
- Data protection
- The team *GES 1point5*

DATA

- Introduction
- Boundaries
- Buildings
- Purchases
- Digital devices
- Vehicles
- Business travel**
- Commuting

RESULTS

- Regulatory inventory
- Carbon footprint & submission

THE TOOL: GES 1POINT5

PRESENTATION

- "*GES 1point5*, developed by *Labos 1point5*, is a tool aiming at calculating the carbon footprint and building the greenhouse gas (GHG) inventory of your laboratory." (<https://apps.labos1point5.org/ges-1point5>)
- Web tool
- Only valid for laboratories in France

CARBONE FOOTPRINT FEATURE

- Sum of CF of different aspects of laboraories (buildings, travels, purchases...)
- Based on most significant aspects of laboratories
- Has limitations for some of the data (ex purchases)

PROBLEMS ENCOUNTERED

- Word "Voiture" for the missions isn't recognized
- Adapting document formats

DATA

BOUNDARIES

- Total headcount of laboratory: 211 (36 researchers, 62 professors, 34 engineers, 79 PhD or Post-Docs)
- Annual budget: 6 Mio. €

PURCHASES

- Total amount: ~460.000 €
- 164 different purchases of goods and services

VEHICLES

- 6 cars used or leased in 2021
- 4 diesel cars, 2 gasoline cars

BUILDINGS

- Useful area: 2681 m²
- Energy consumption: ~175.000 kWh (district heating), ~620.000 kWh (electricity)

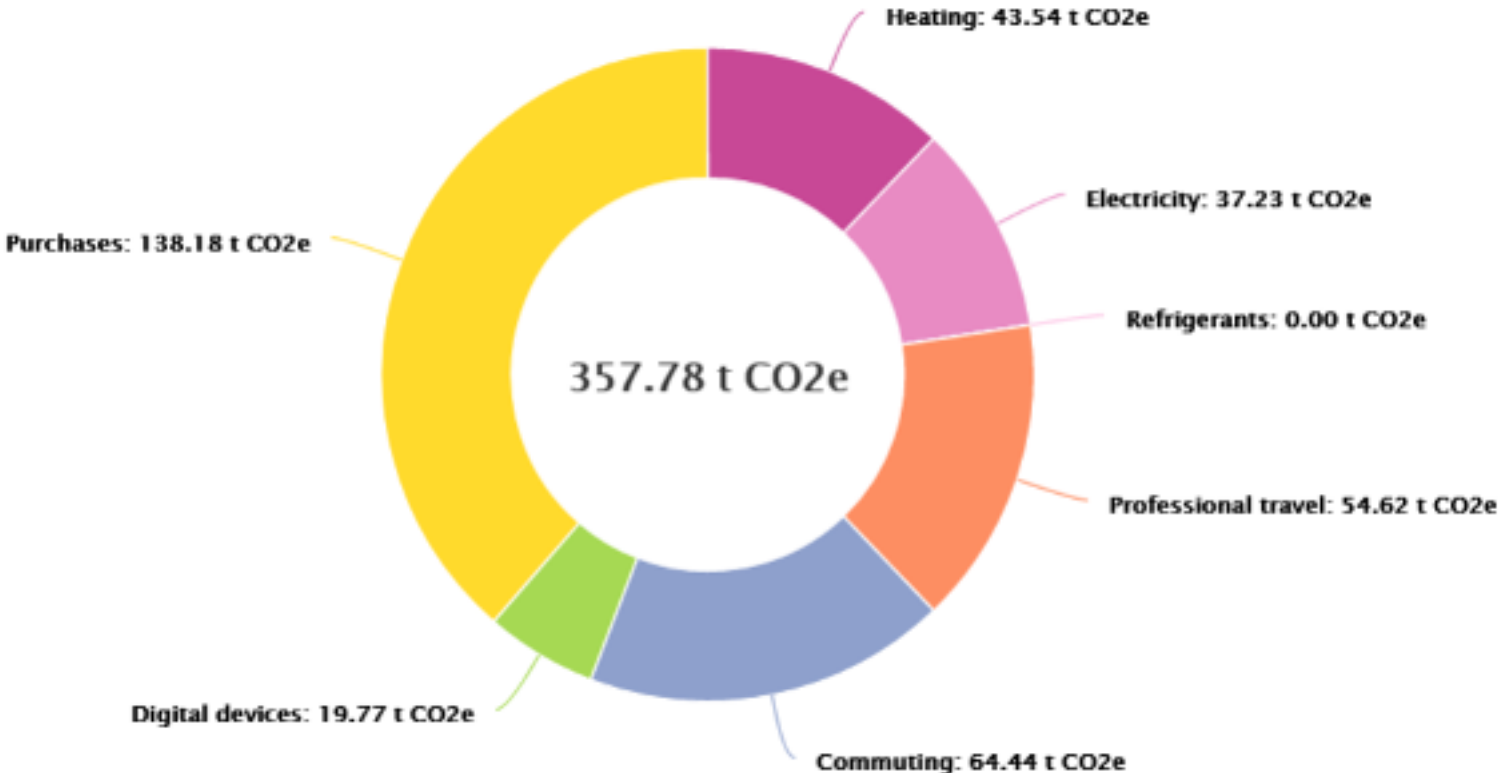
DIGITAL DEVICES

- 71 digital devices paid for in 2021 (based on last inventory)
- 66 Laptops and 5 PCs

TRAVEL

- 257 business trips (~250.000 km total)
- Commuting: 11 km per day and person on average

RESULTS



RESULTS

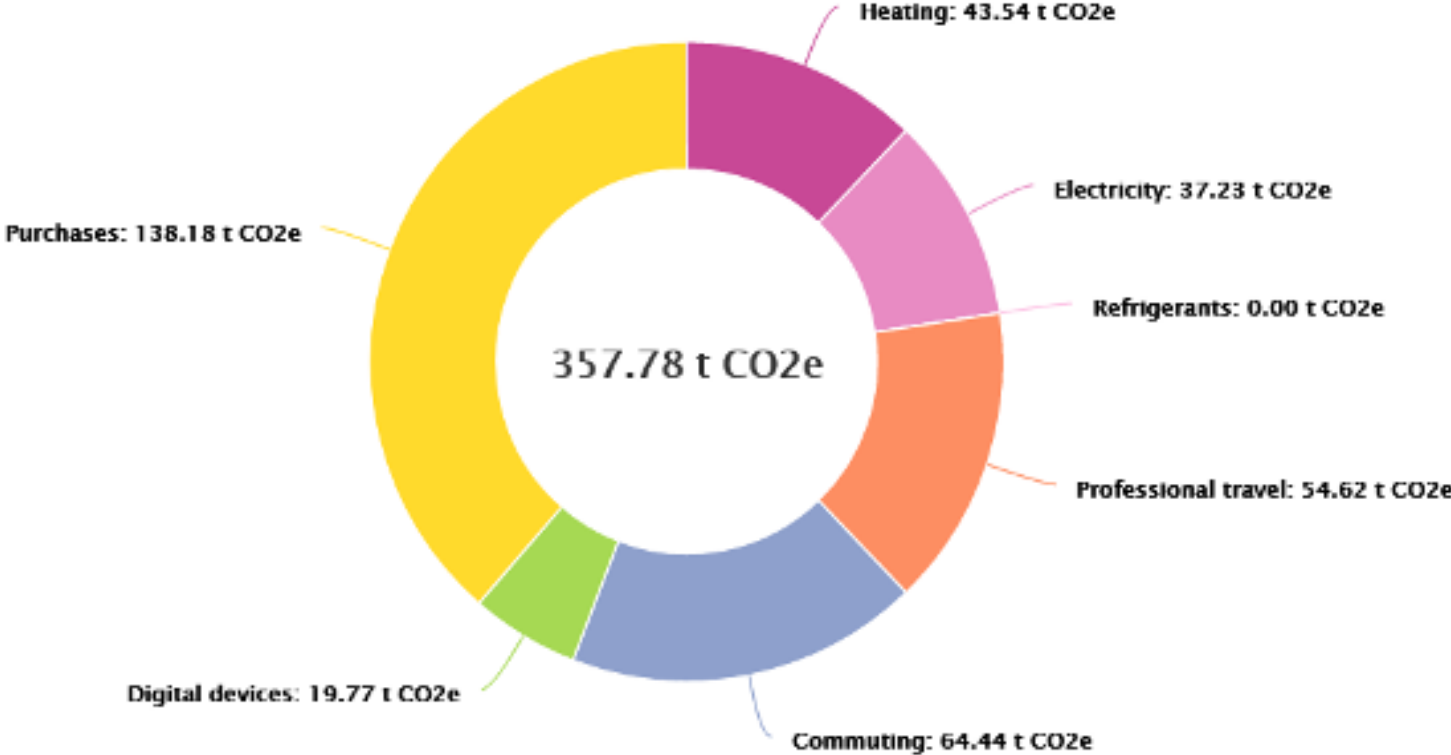
Carbon footprint	Emissions in t CO ₂ e	Share of the total footprint
Carbon footprint of buildings	80.78 ± 13.58	23 %
– Heating	43.54 ± 13.06	12 %
– Electricity	37.23 ± 3.72	10 %
– Refrigerants	0.00 ± 0.00	0 %
Carbon footprint of digital devices	19.77 ± 10.17	6 %
Carbon footprint of purchases	138.18 ± 16.73	39 %
Carbon footprint of travels	119.05 ± 29.26	33 %
– Commuting	64.44 ± 20.90	18 %
– Professional travel	54.62 ± 20.48	15 %
– Vehicles	19.58 ± 11.75	5 %
– Business travel	35.04 ± 16.78	10 %
Total carbon footprint	357.78 ± 37.74	100 %

REDUCTION OF GHG-EMISSIONS

PROFESSIONAL TRAVEL

COMMUTING

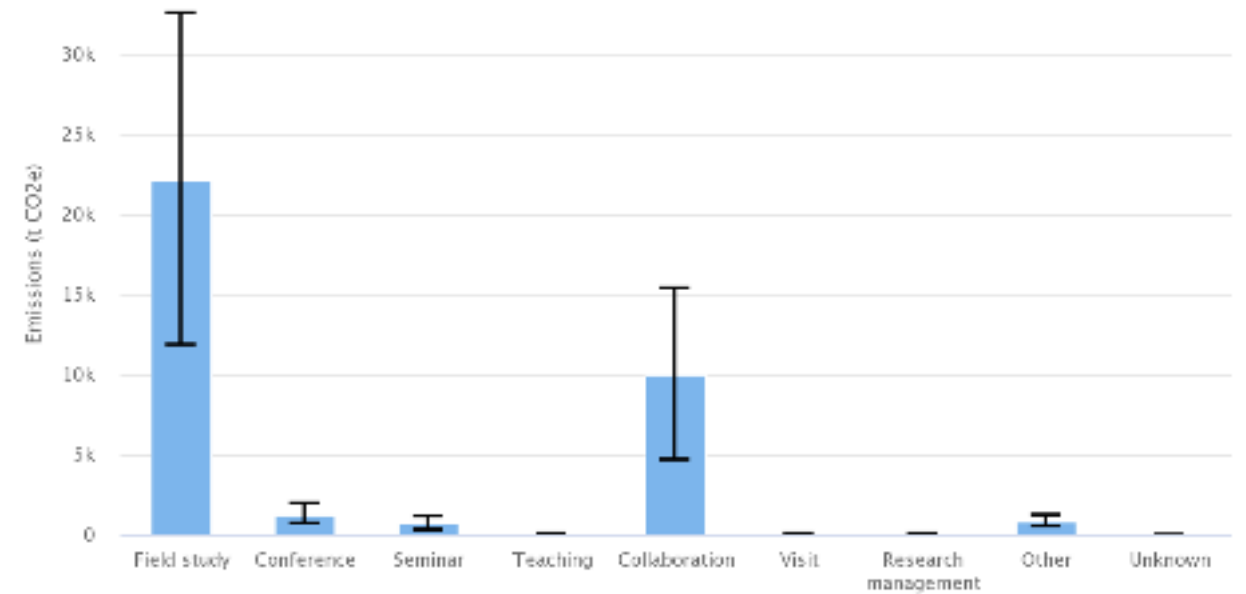
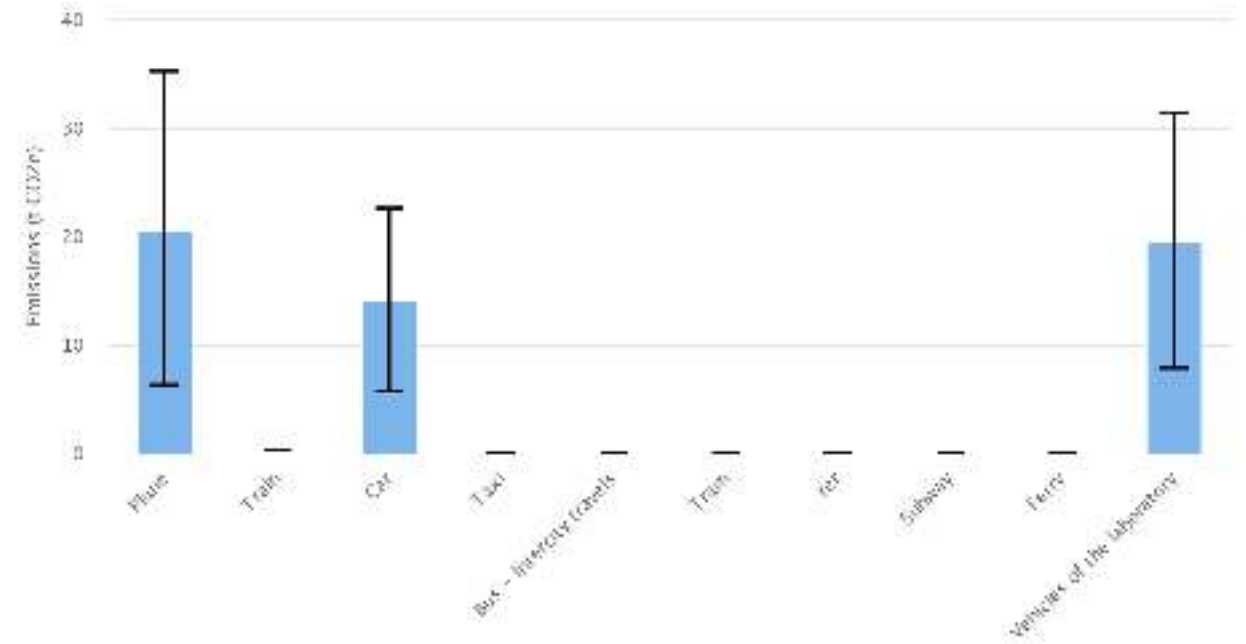
PURCHASES



REDUCTION OF GHG-EMISSIONS

PROFESSIONAL TRAVEL

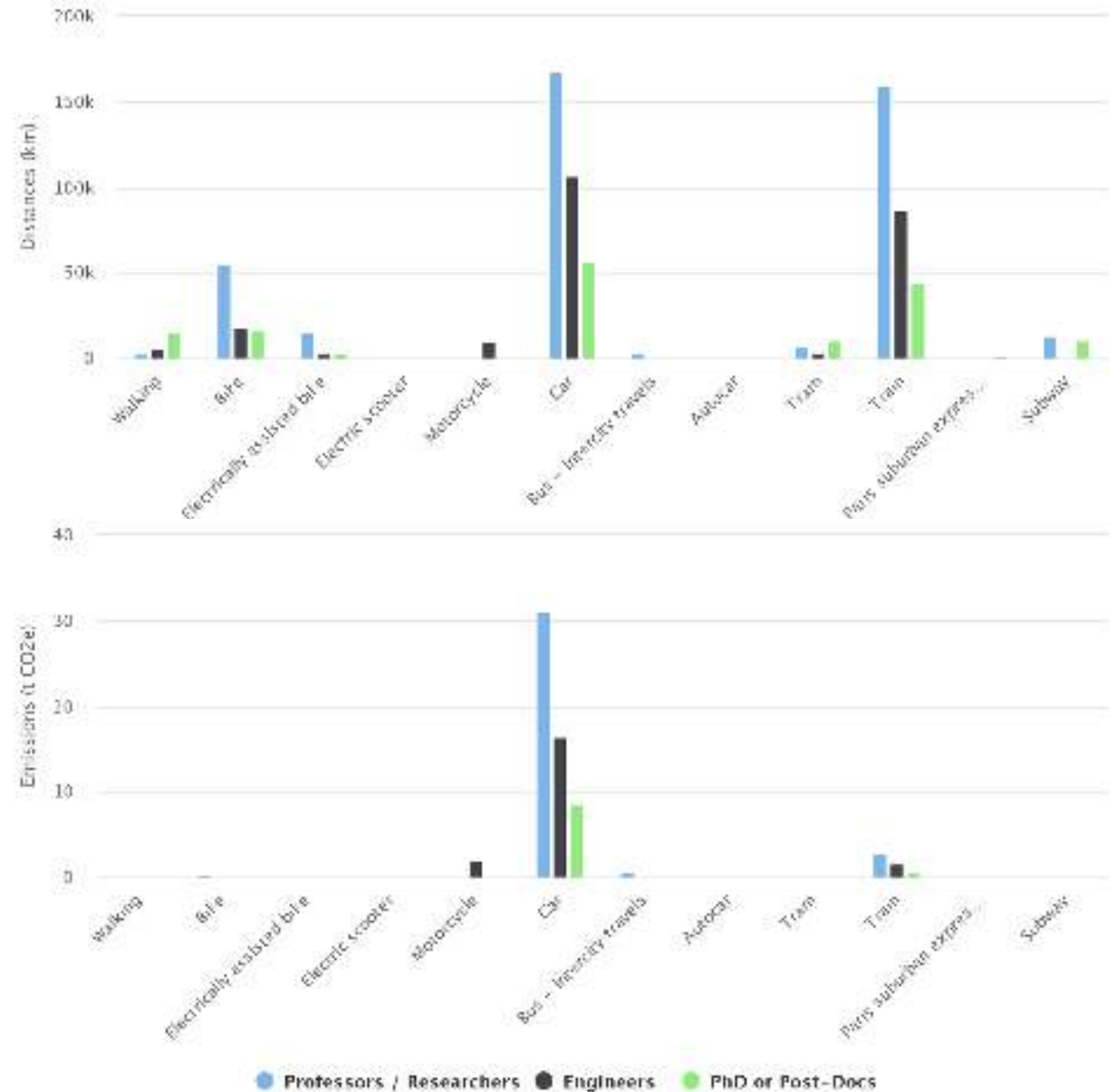
- Travels with plane have largest share on emissions
 - ➔ potential of GHG reduction if remote work is possible
- Most common purpose of travel is field study and collaboration
 - ➔ substitution of travel with remote work difficult



REDUCTION OF GHG-EMISSIONS

COMMUTING

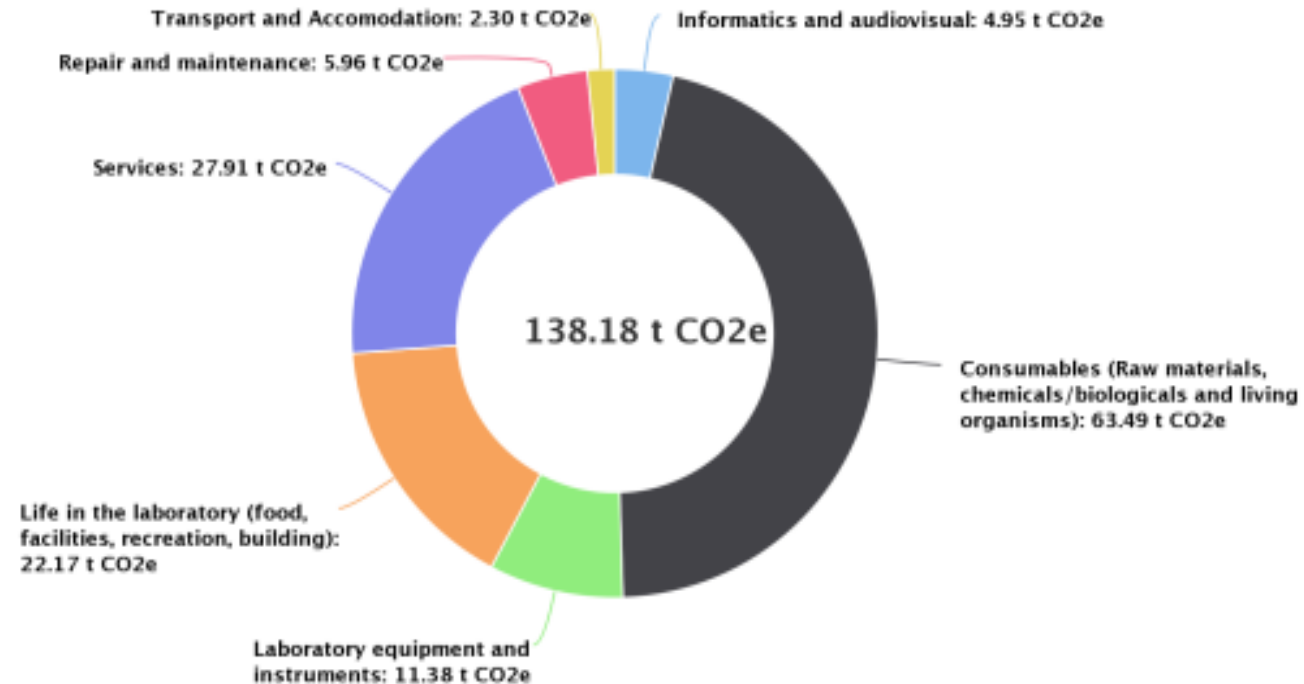
- Most common types of transport are car and train (almost same distances)
- Reduction of emissions possible through increased working from home
 - ➔ highly organised and plannable laboratory work necessary



REDUCTION OF GHG-EMISSIONS

PURCHASES

- Consumables (for example chemicals and raw materials) have biggest share
 - ➔ usage of 70 % EtOH (instead of 100 %) for cleaning and disinfection purposes
 - ➔ further decrease of emissions from consumables difficult (chemicals can't be reused)
- If possible, reuse of laboratory equipment (falcon tubes, 5 mL pipette tips) should be considered



ERROR ANALYSIS (BASED ON ESTIMATES MADE)

VEHICLES

- For 4 of the 6 vehicles, the km travelled in 2021 were estimated based on the year of purchase of the vehicle and the total km travelled since.

BOUNDARIES

- Annual budget estimated : average between lowest and highest given values

DEVICES

- About 1/6th of the devices catalogued were considered for this study. We were not able to clearly identify which ones were purchased in 2021.



THANK YOU

Laurane Mangé, Martin Schuster