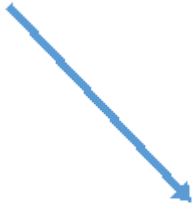
Présentation disponible sur le site du labo

Groupe de travail **Empreinte environnementale**



Empreinte carbone

Impact environnemental « au jour le jour »

gtee_umr5558@listes.univ-lyon1.fr

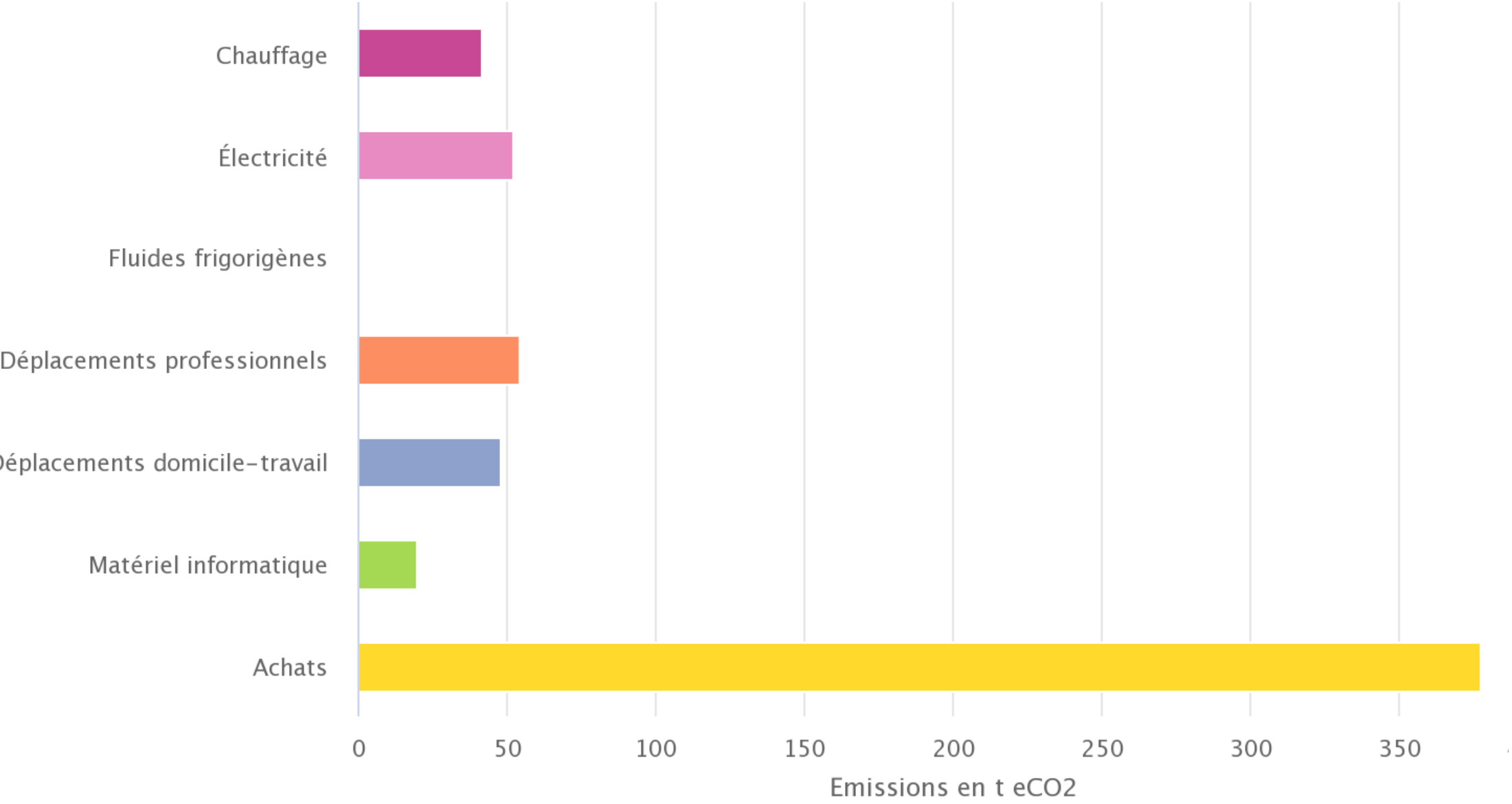
Empreinte carbone du LBBE, 2021

Périmètre :

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

https://apps.labos1point5.org/ges-1point5-results/b4d8885a-42e1-438b-be6a-c60a076cfbf6

Empreinte carbone du LBBE, 2021



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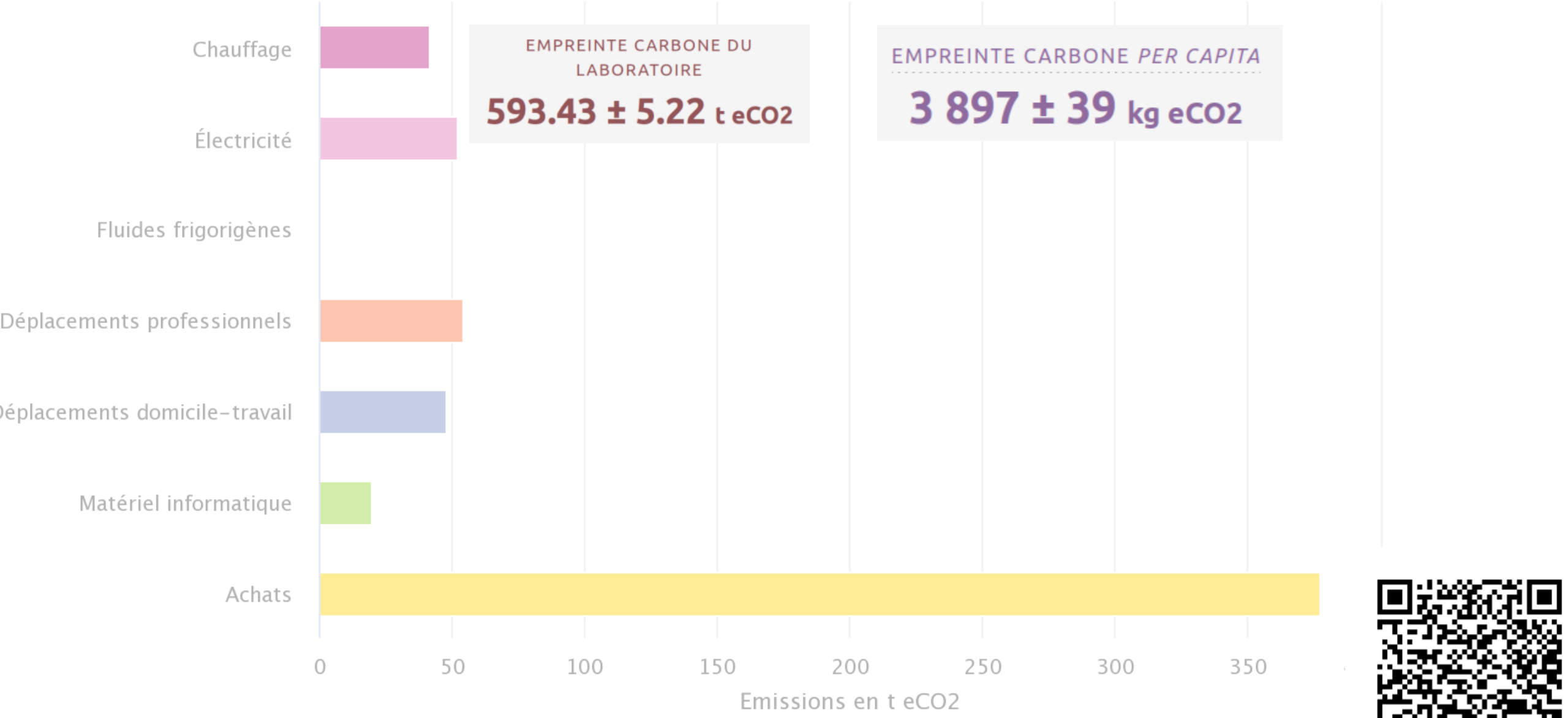
Empreinte carbone du LBBE, 2021



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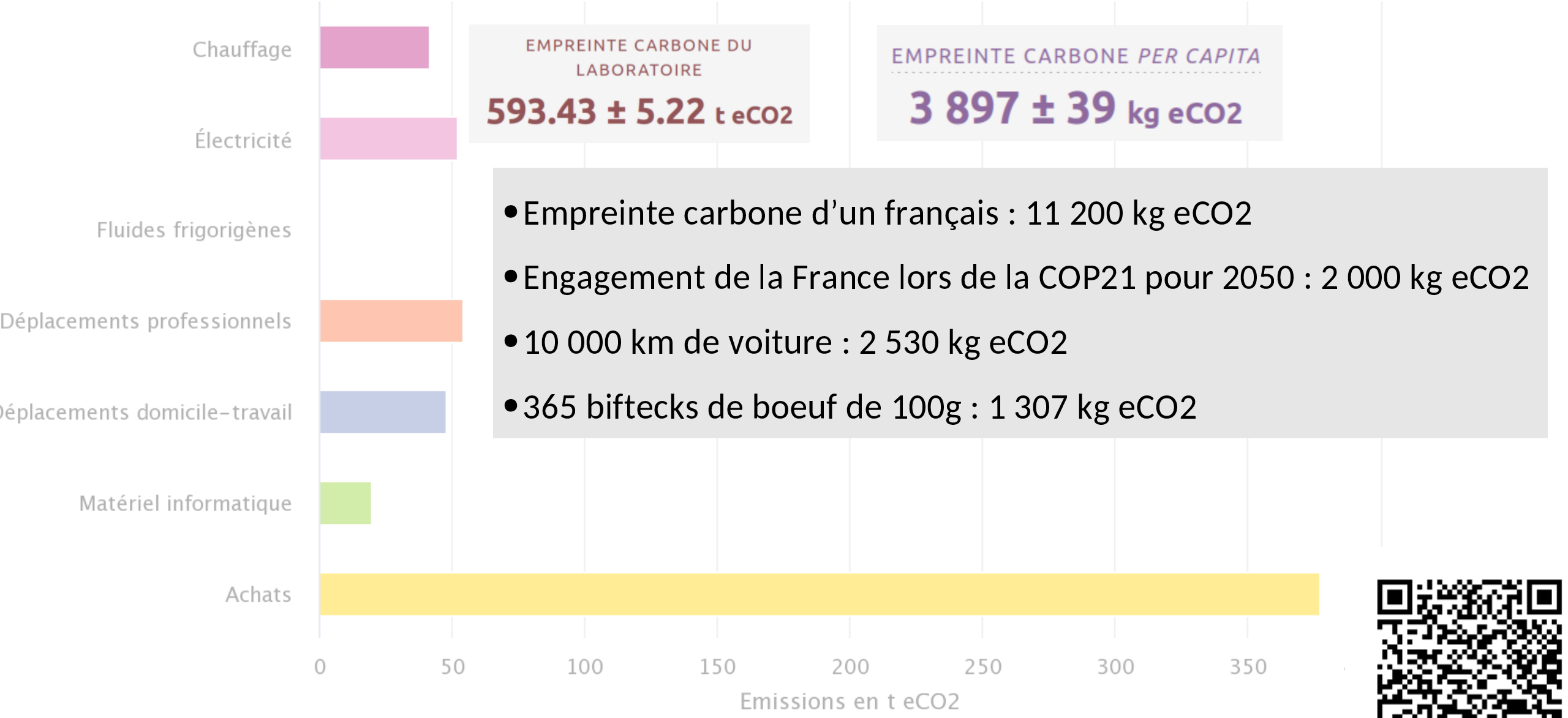
Empreinte carbone du LBBE, 2021



EMPREINTE CARBONE DU LABORATOIRE

593.43 ± 5.22 t eCO2

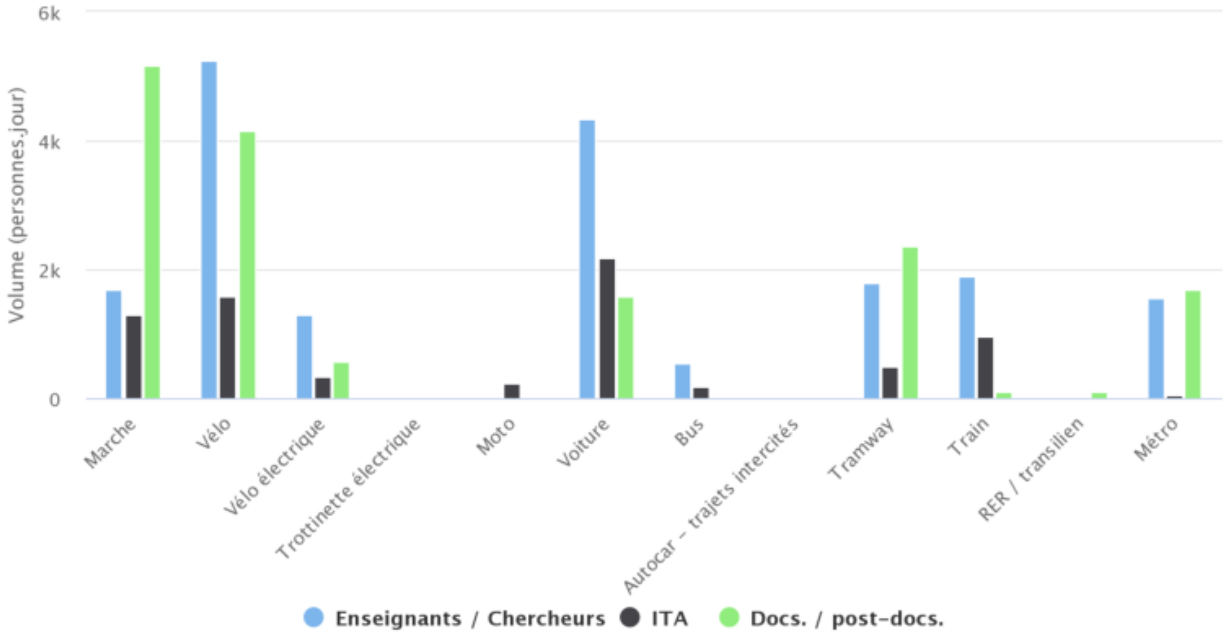
EMPREINTE CARBONE *PER CAPITA*

3 897 ± 39 kg eCO2

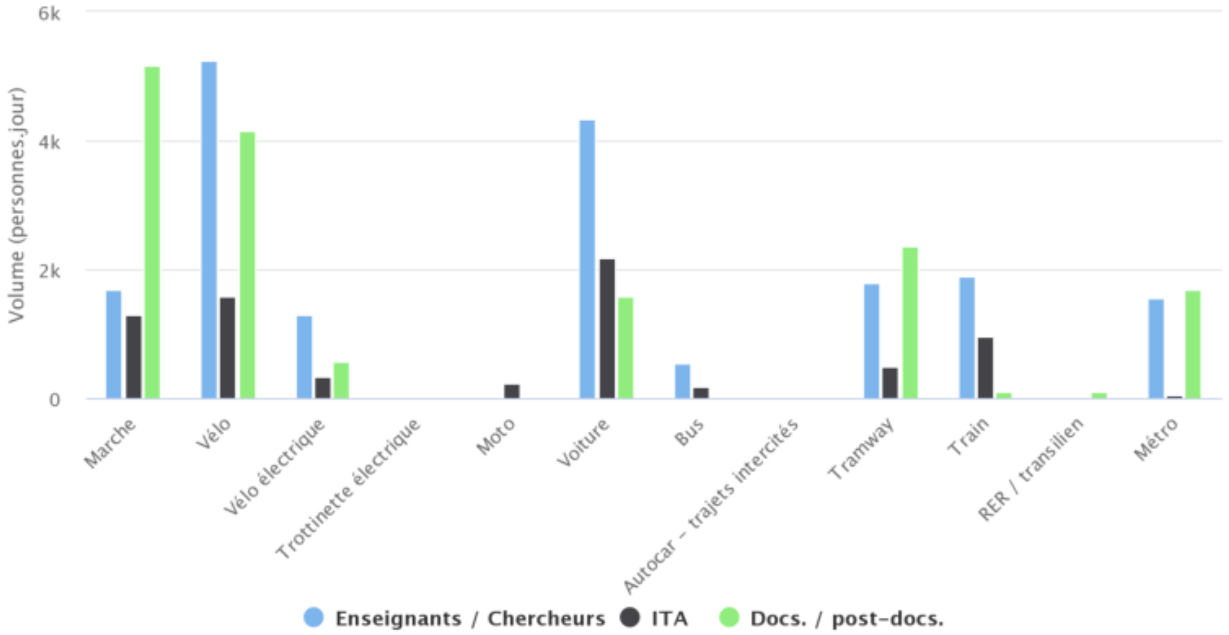
- Empreinte carbone d'un français : 11 200 kg eCO2
- Engagement de la France lors de la COP21 pour 2050 : 2 000 kg eCO2
- 10 000 km de voiture : 2 530 kg eCO2
- 365 biftecks de boeuf de 100g : 1 307 kg eCO2

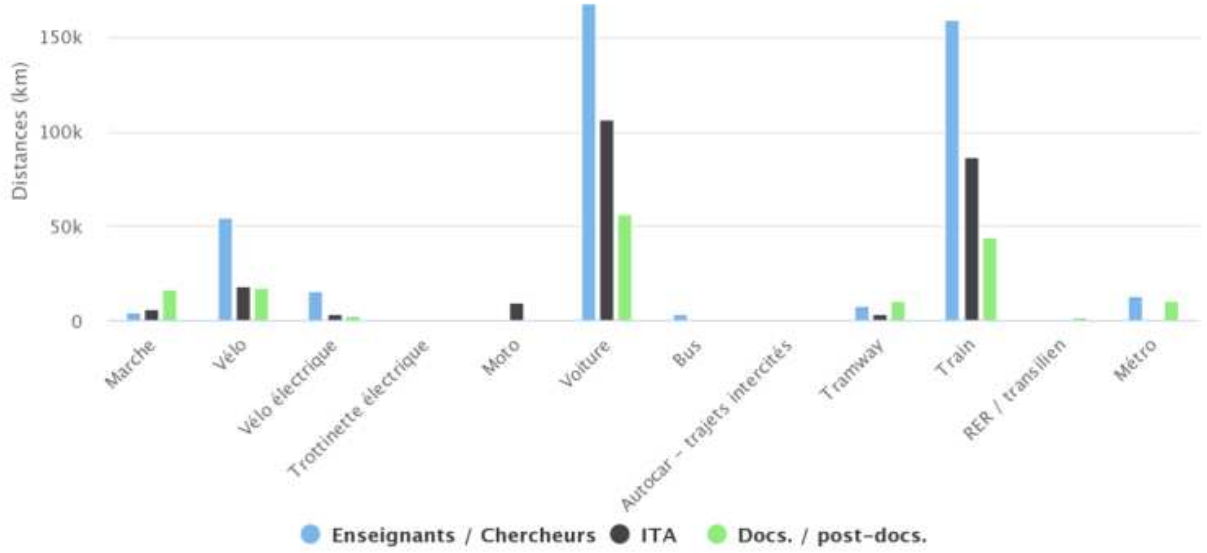
https://apps.labos1point5.org/ges-1point5-results/b4d8885a-42e1-438b-be6a-c60a076cfbf6

Déplacements domicile-travail

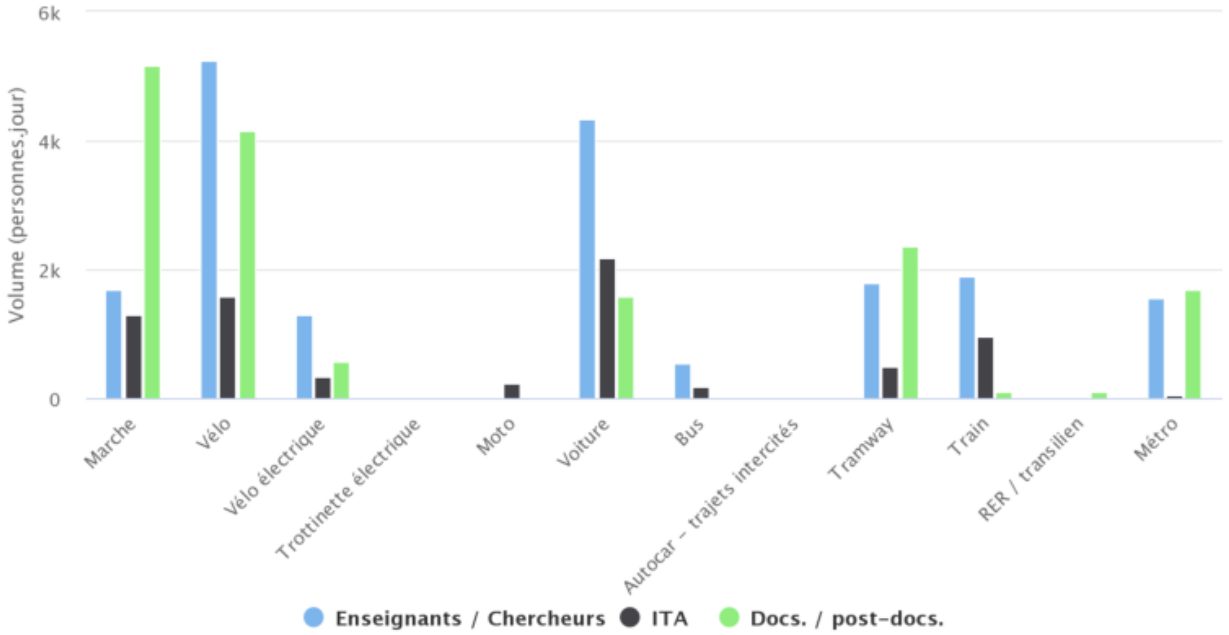


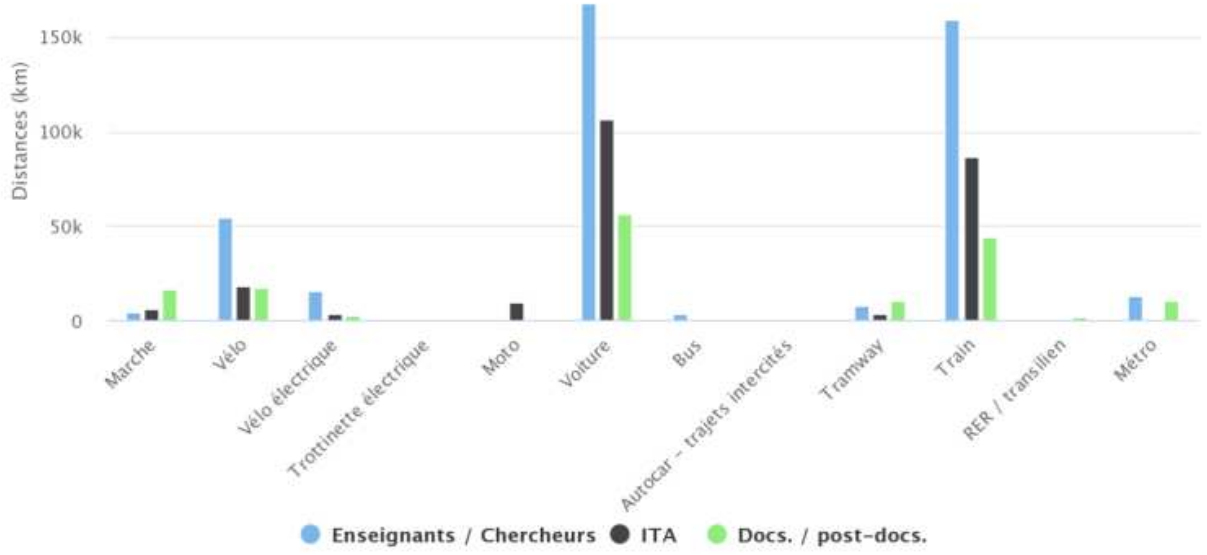
Déplacements domicile-travail

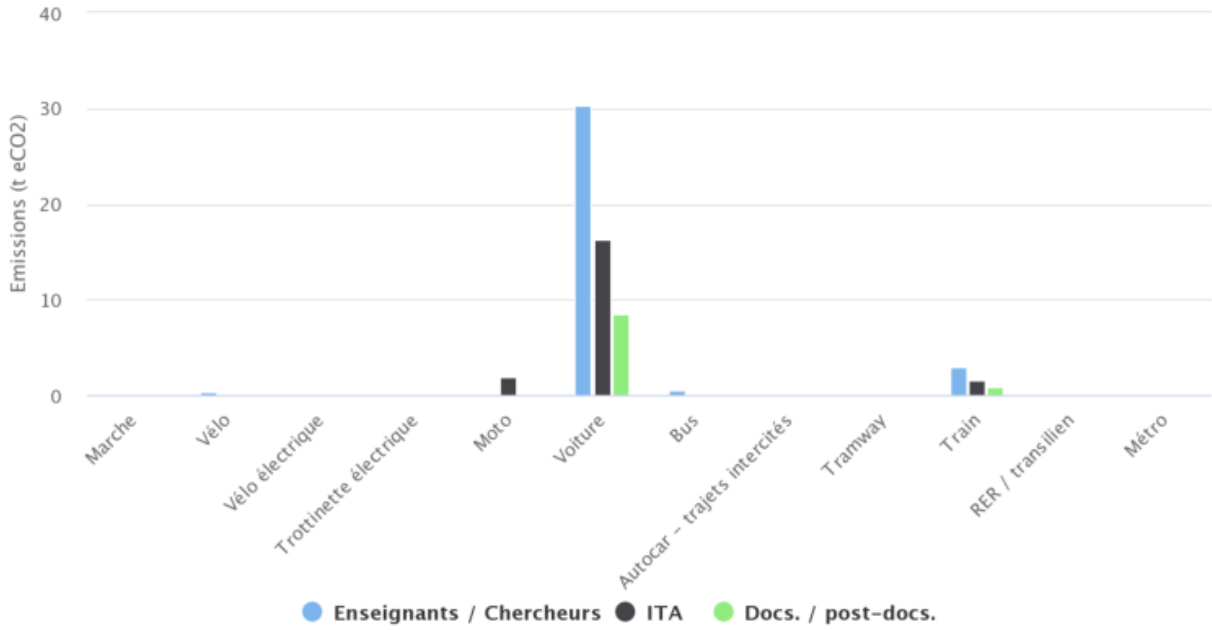




Déplacements domicile-travail







Impact écologique « au jour le jour »

- **Suggestions bienvenues ☺**

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

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- **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**

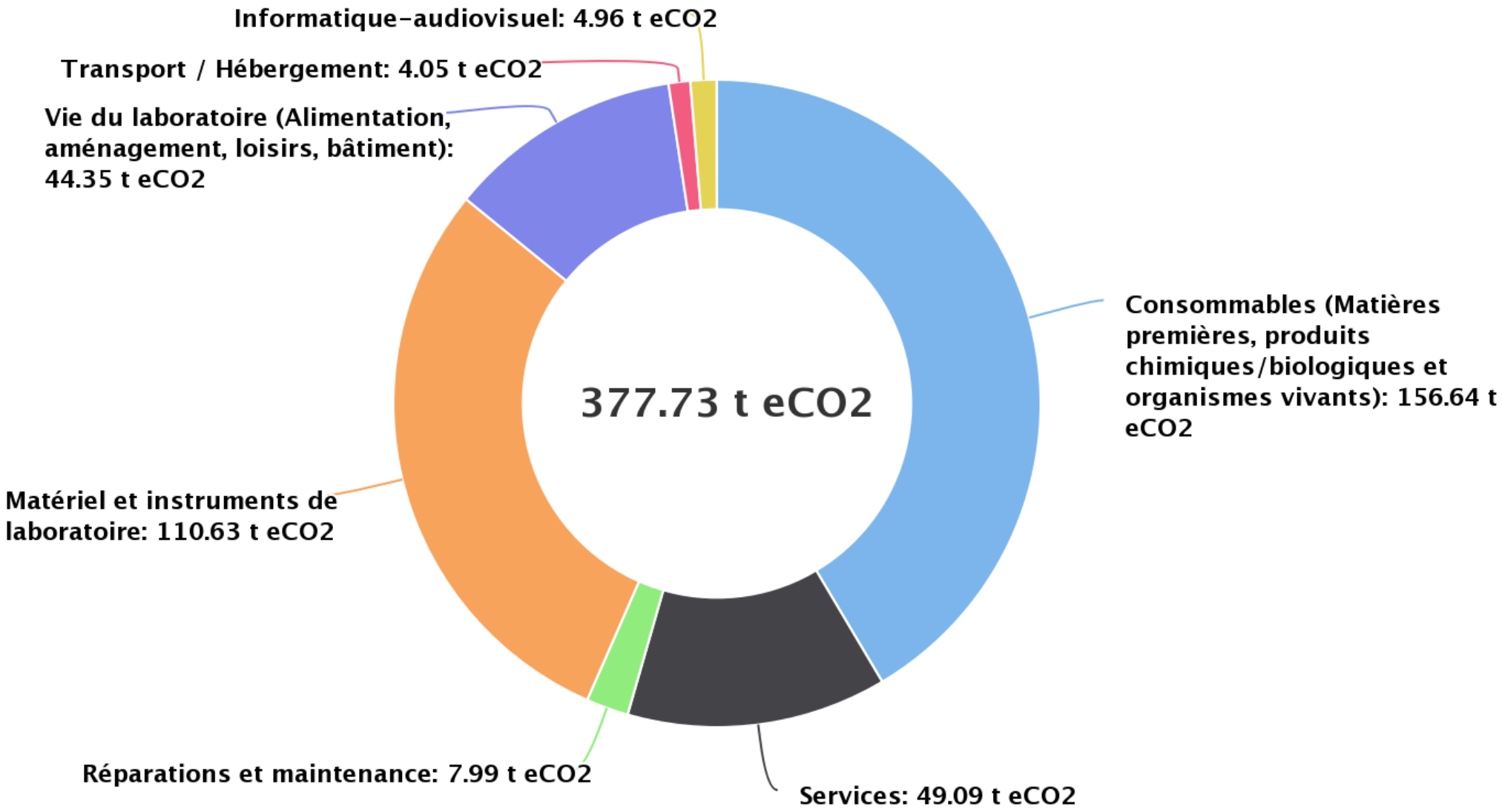
Mieux comprendre et réduire l'empreinte carbone des activités de recherche.

Outil GES

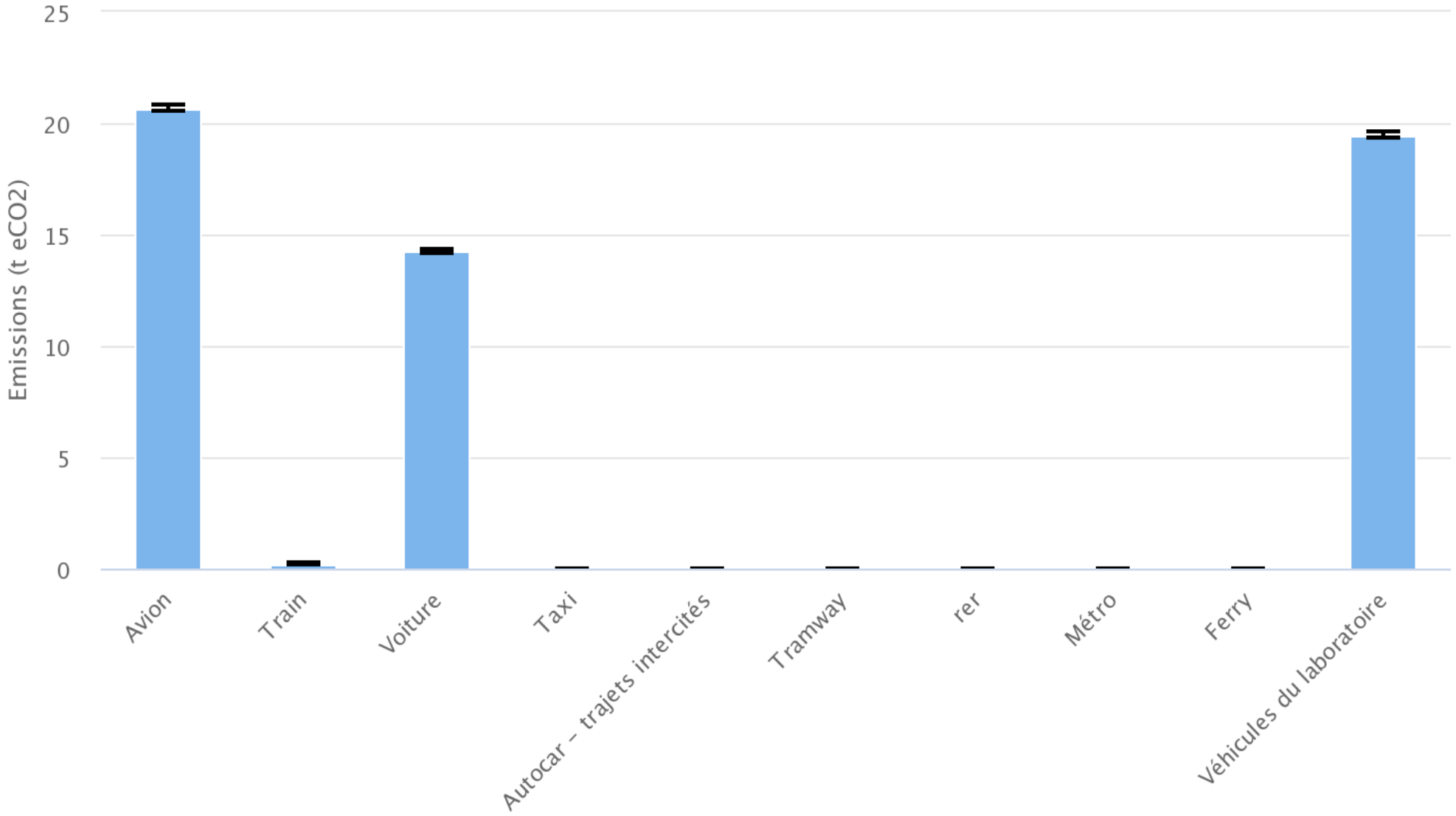
Outil *open source* permettant de calculer l'empreinte carbone et de construire le bilan gaz à effet de serre (BGES) réglementaire du laboratoire. Permet les comparaisons entre laboratoires.

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

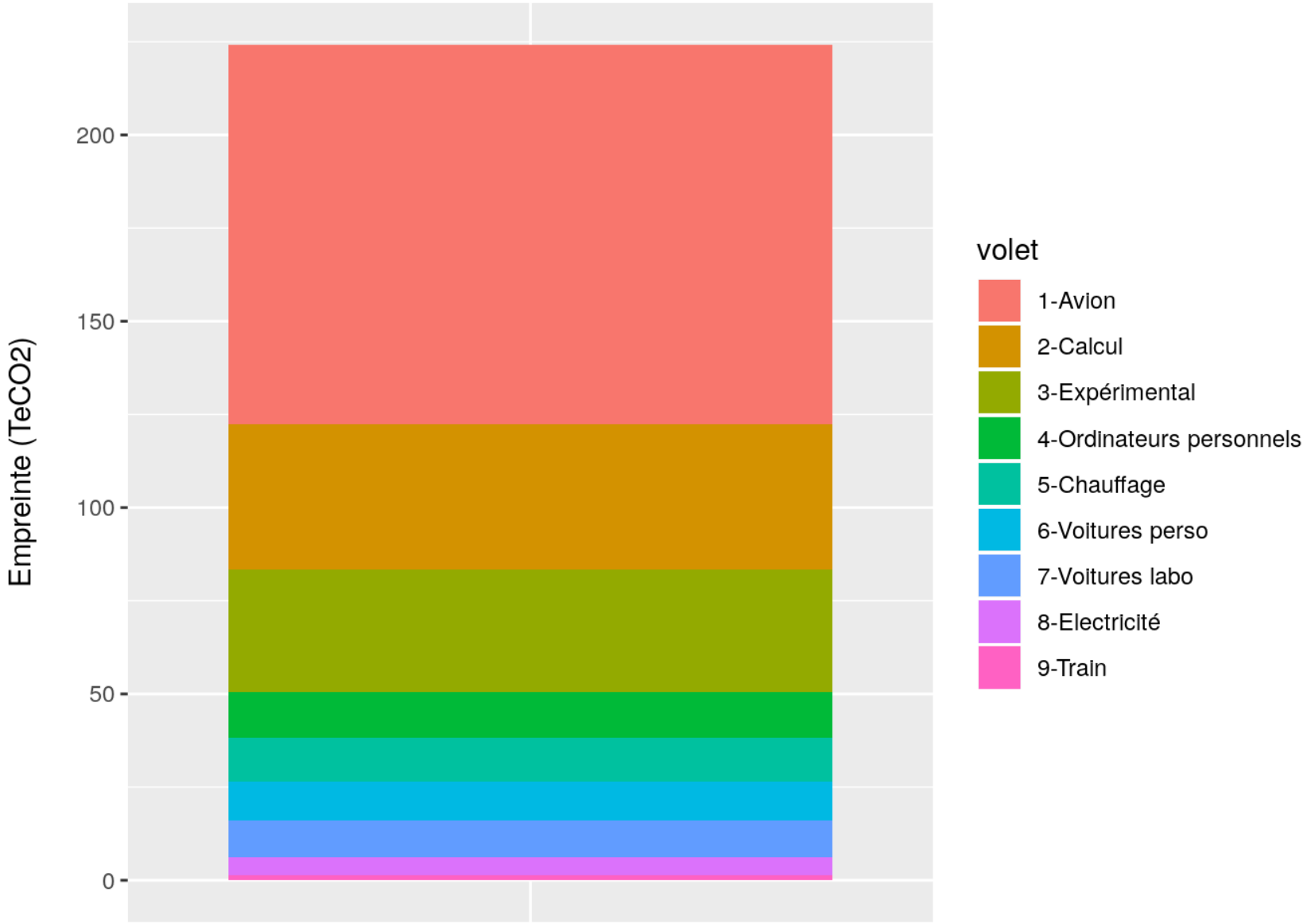
Achats


Informatique-audiovisuel: 4.96 t eCO2
Transport / Hébergement: 4.05 t eCO2
Vie du laboratoire (Alimentation, aménagement, loisirs, bâtiment): 44.35 t eCO2
377.73 t eCO2
Consommables (Matières premières, produits chimiques/biologiques et organismes vivants): 156.64 t eCO2
Matériel et instruments de laboratoire: 110.63 t eCO2
Réparations et maintenance: 7.99 t eCO2
Services: 49.09 t eCO2

Déplacements professionnels



Bilan 2018, manuel



Some examples of eCO_2 emissions

- ✈ 1 long distance flight (Paris/New York return) : 2t eCO_2
- Same distance by train : 1/40 ✈

- Laptop : 250kg eCO_2 + Screen: 430kg eCO_2 = 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 eCO_2 (1kwh electricity: 60g eCO_2)
- 1 glove: 26g eCO_2

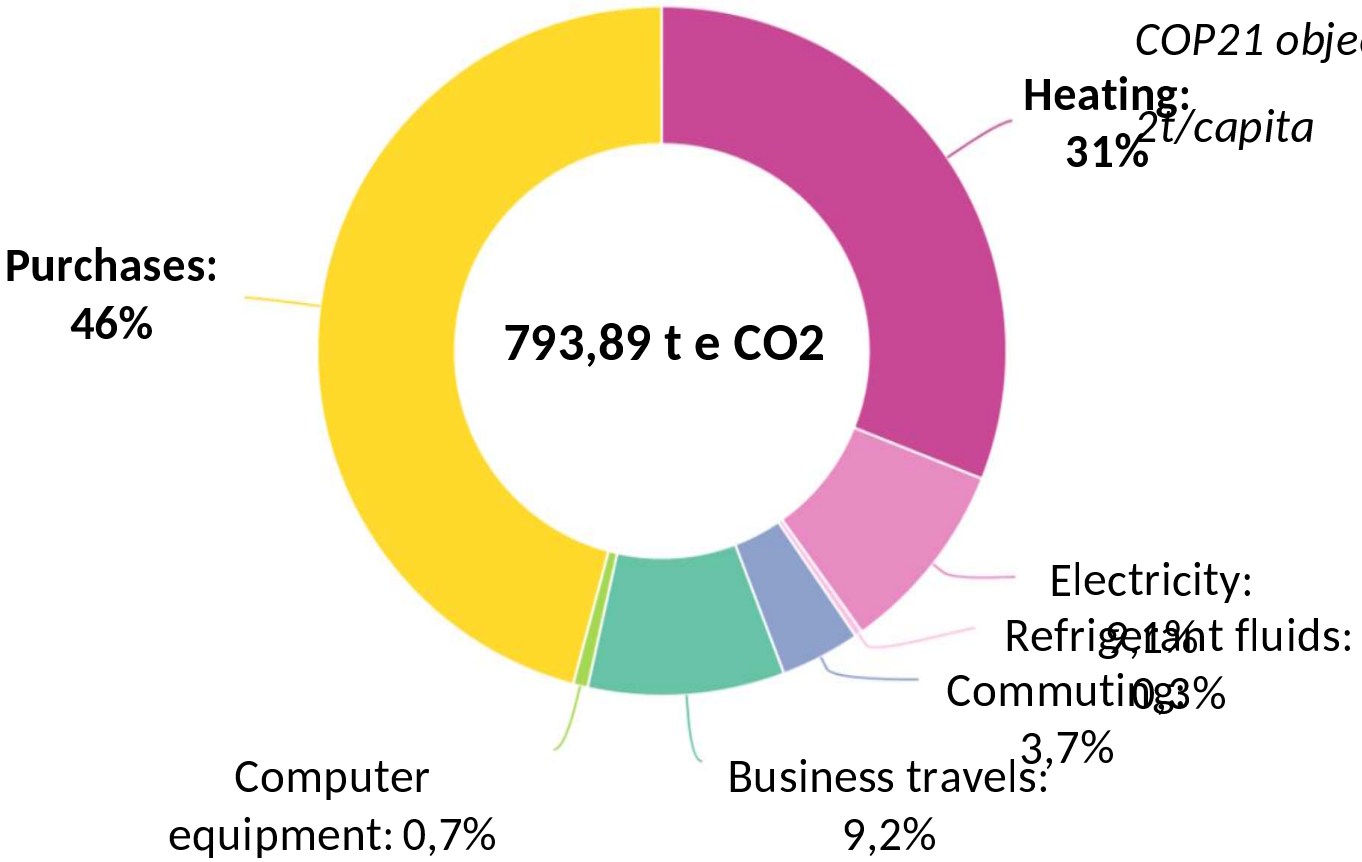
EMPREINTE CARBONE DU LABORATOIRE

793.89 +- 68.80 t e C02

eCO_2 footprint IGFL 2019

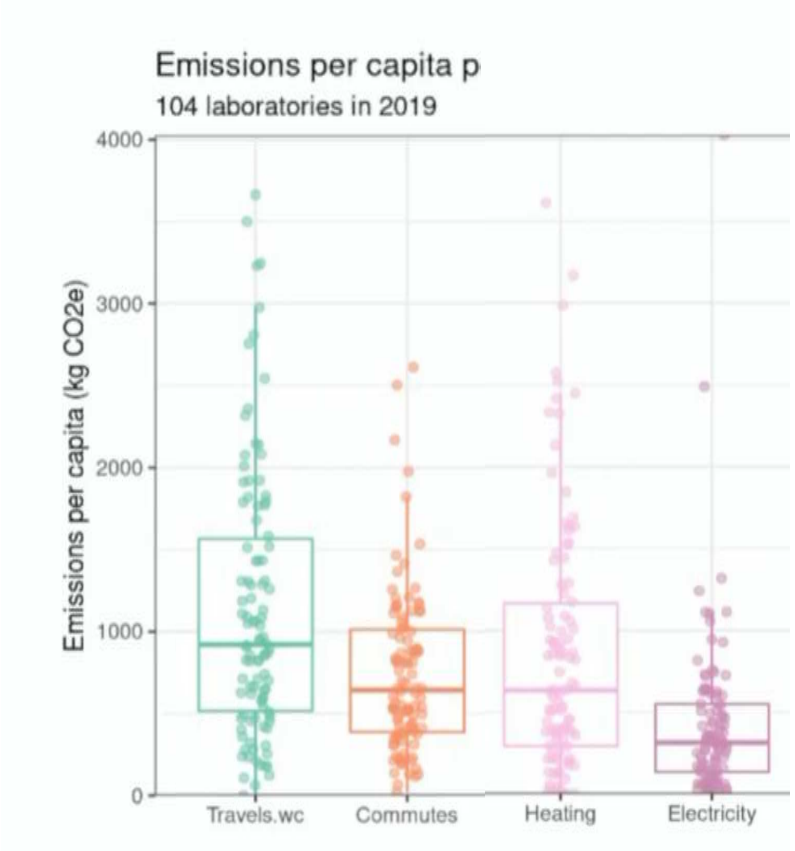
EMPREINTE CARBONE *PER CAPITA*

8.56 +- 0.73 t e C02

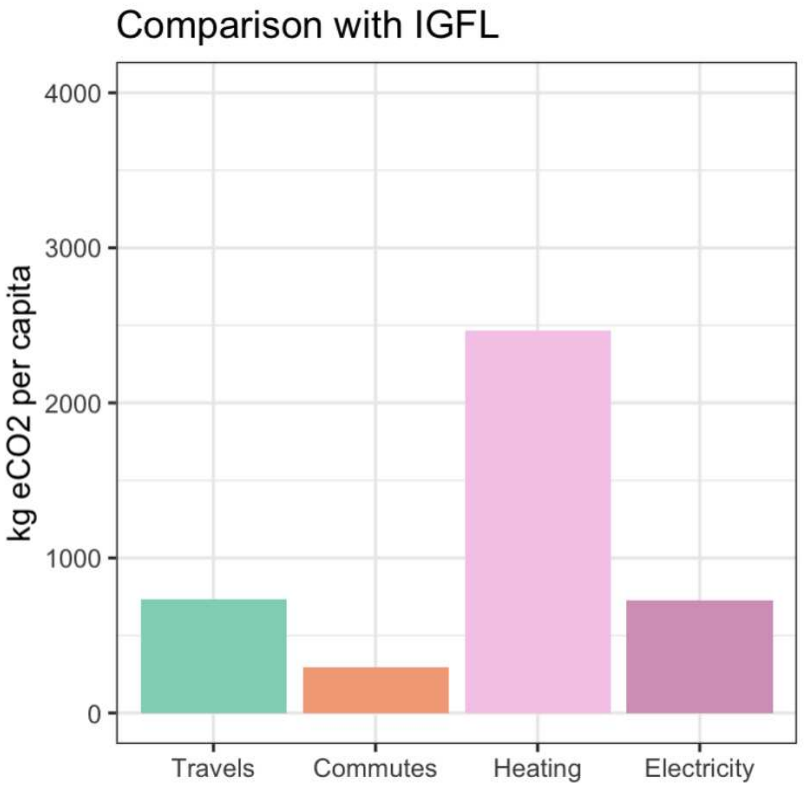


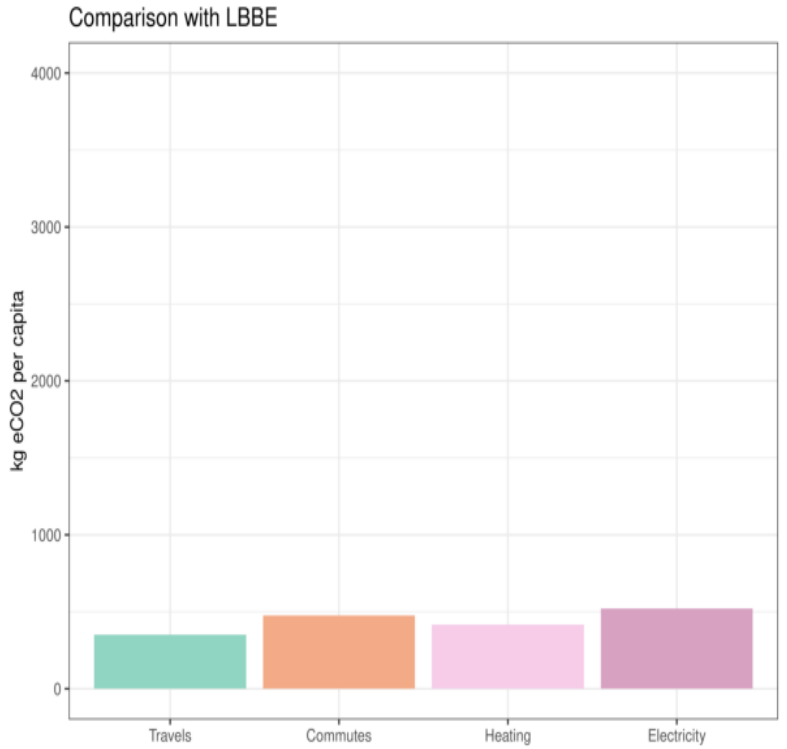
COP21 objectives: 2t/capita

Comparison with other labs

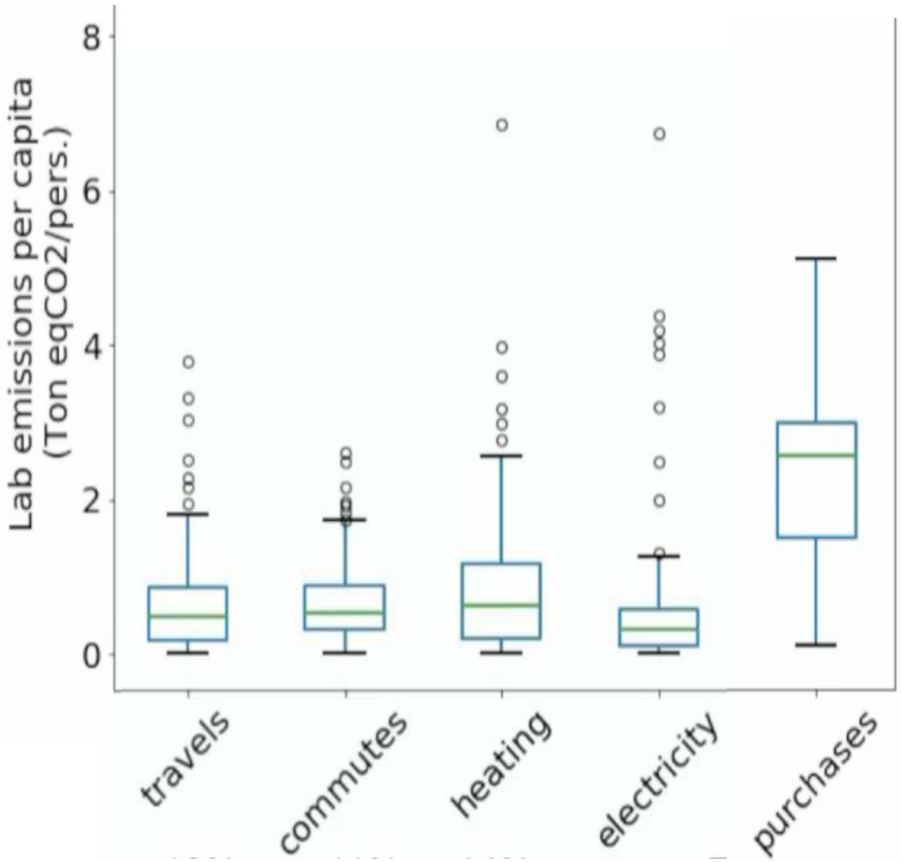


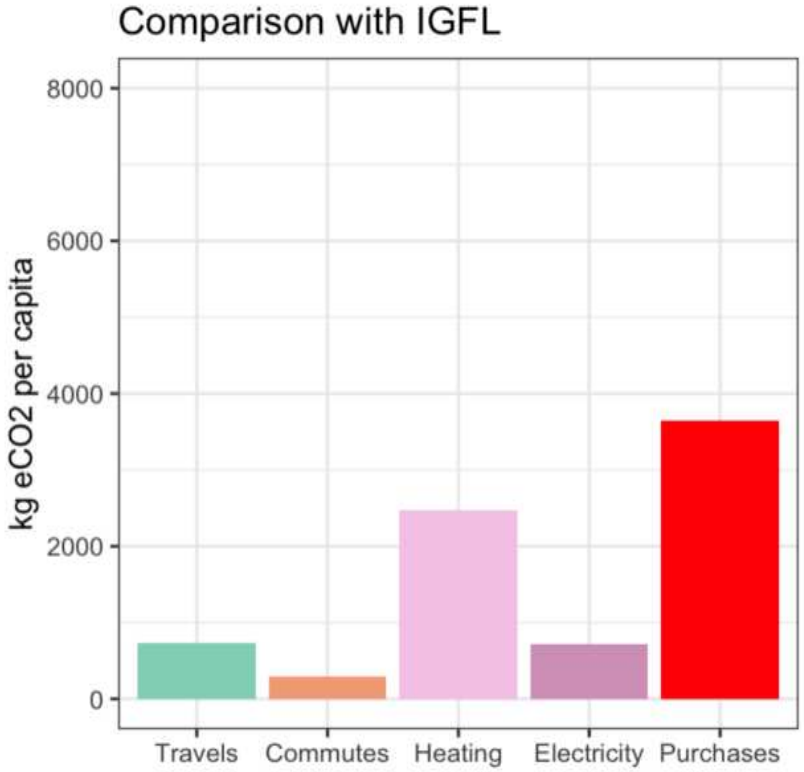
Data source: GES 1point5

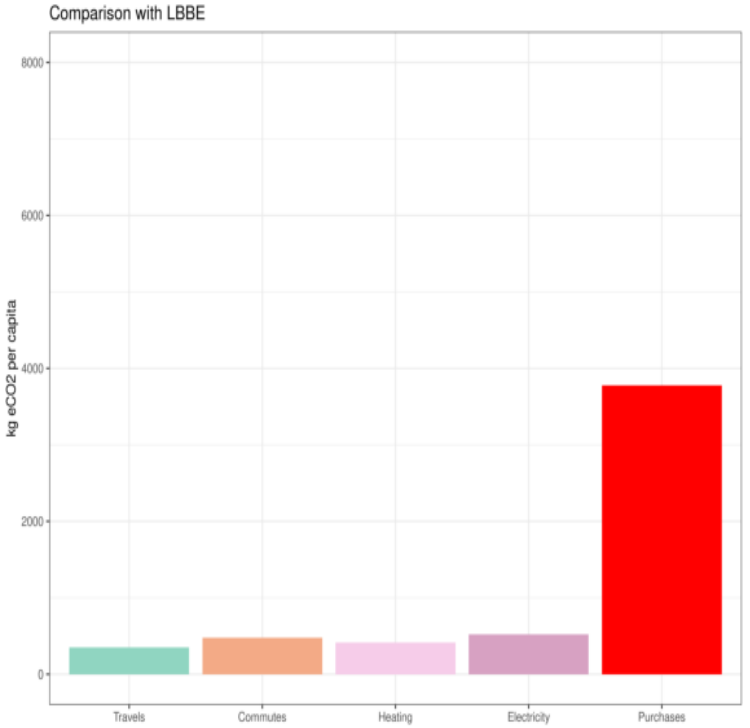




Comparison with other labs (purchases included)



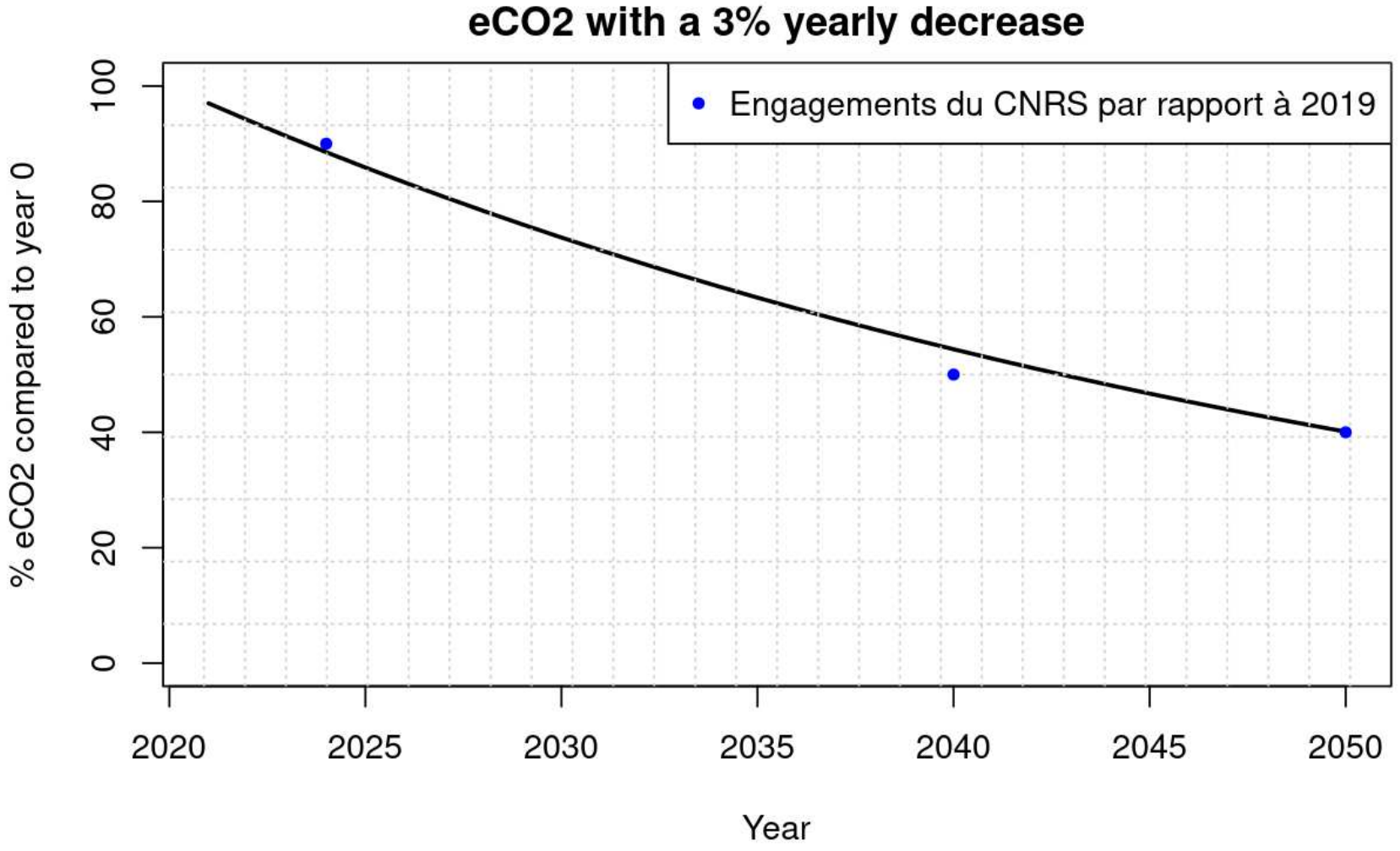




Data source: GES 1point5

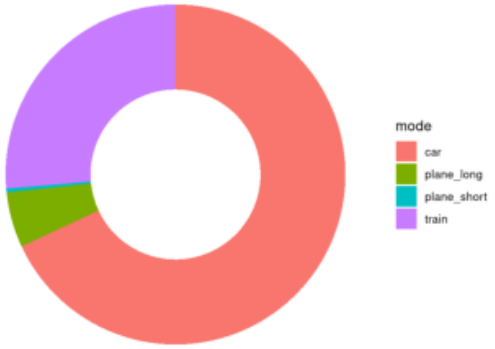
Mobilier de bureau et de salles de reunion : 12%
Froid : banques de sang, congelateurs, refrigerateurs,… : 9.8%
Thermostatisation et sechage : etuves, enceintes, bains, dessicateurs… : 8.4%
Materiels et consommables pour letude du comportement animal : 5.9%

An example of a decrease trajectory



Missions

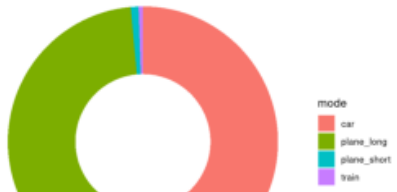
Number of missions



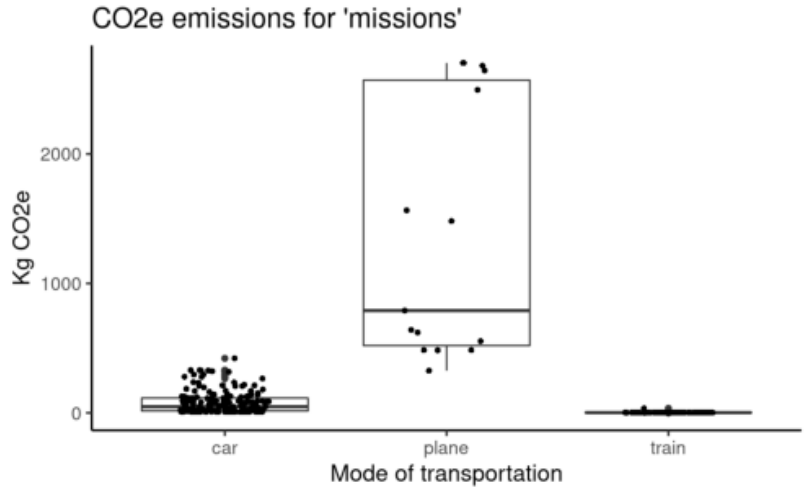
car	181
plane_long	14
plane_short	1
train	70

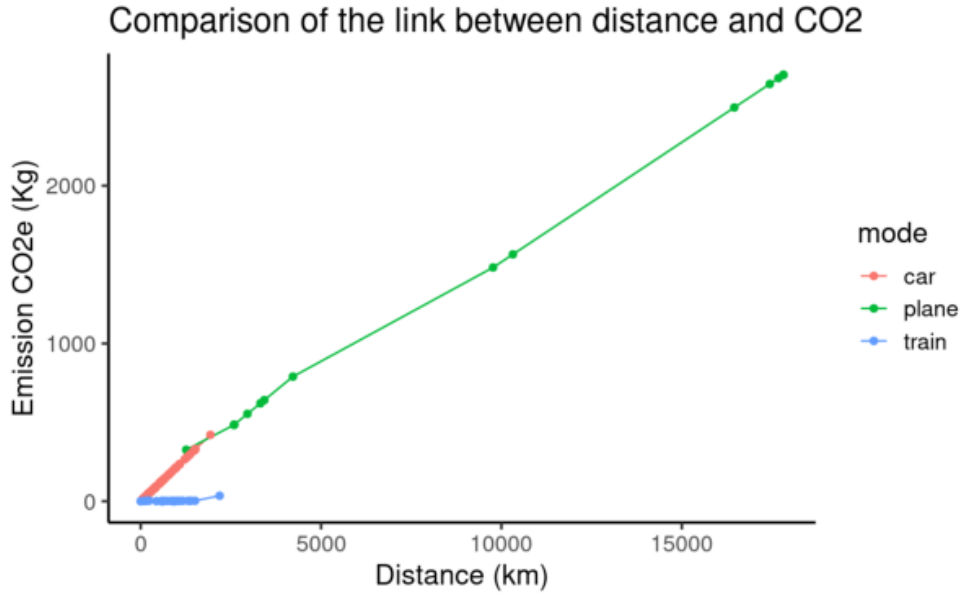
Threshold :
2300km

eCO2 missions

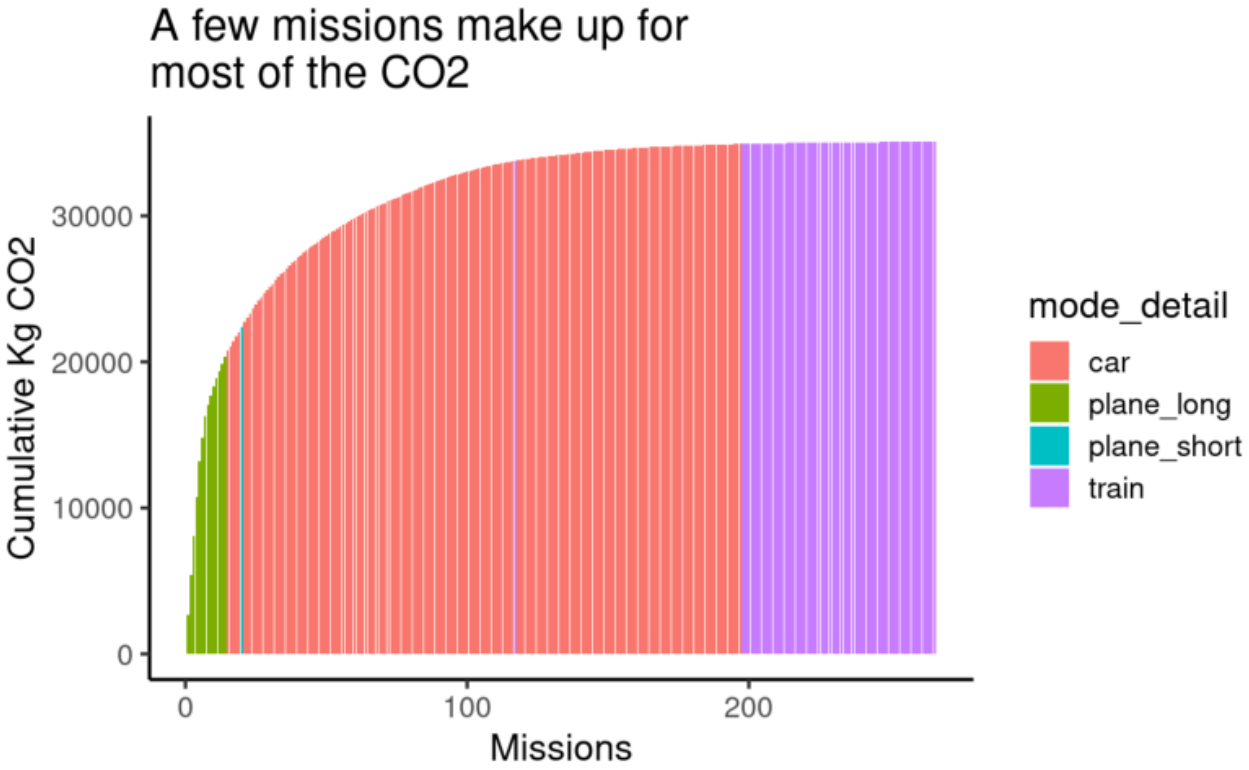


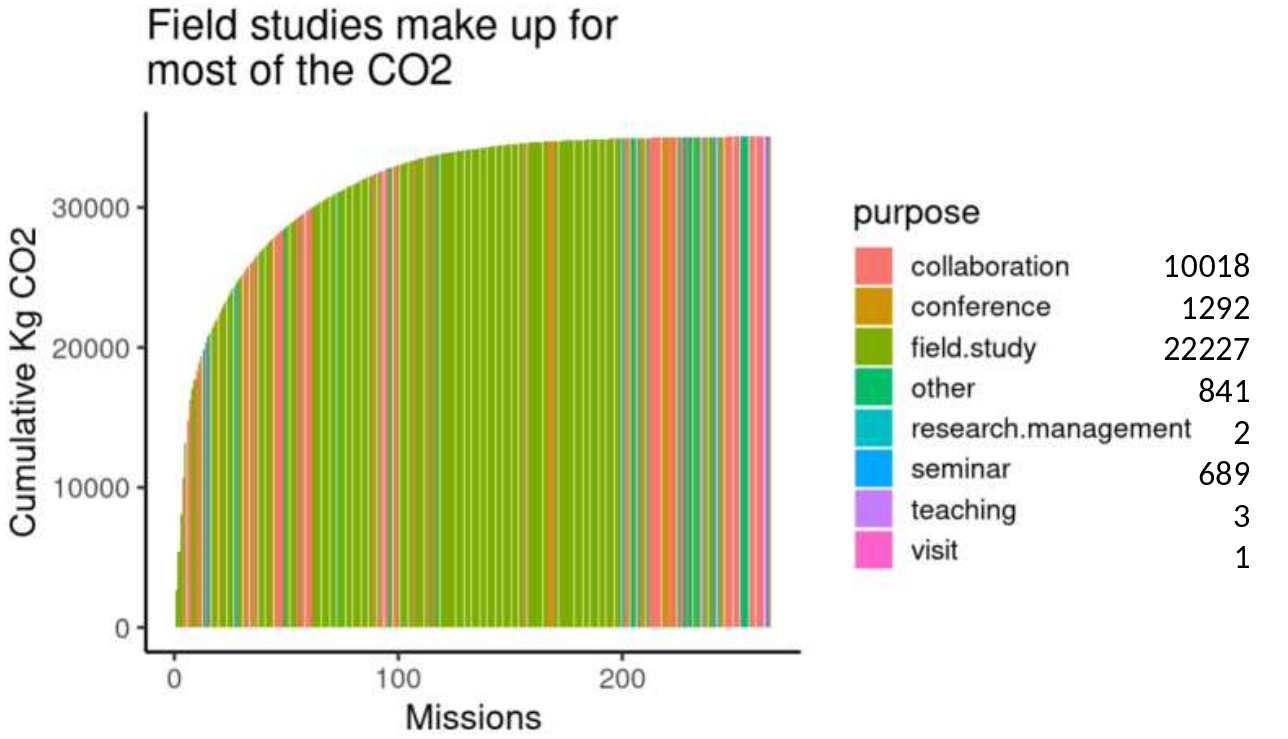
14230
20336
326
181





Missions


A few missions make up for most of the CO2
Cumulative Kg CO2
30000
20000
10000
0
0
100
200
Missions
mode_detail
car
plane_long
plane_short
train


Field studies make up for most of the CO2
Cumulative Kg CO2
30000
20000
10000
0
0
100
200
Missions
purpose
collaboration 10018
conference 1292
field.study 22227
other 841
research.management 2
seminar 689
teaching 3
visit 1

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

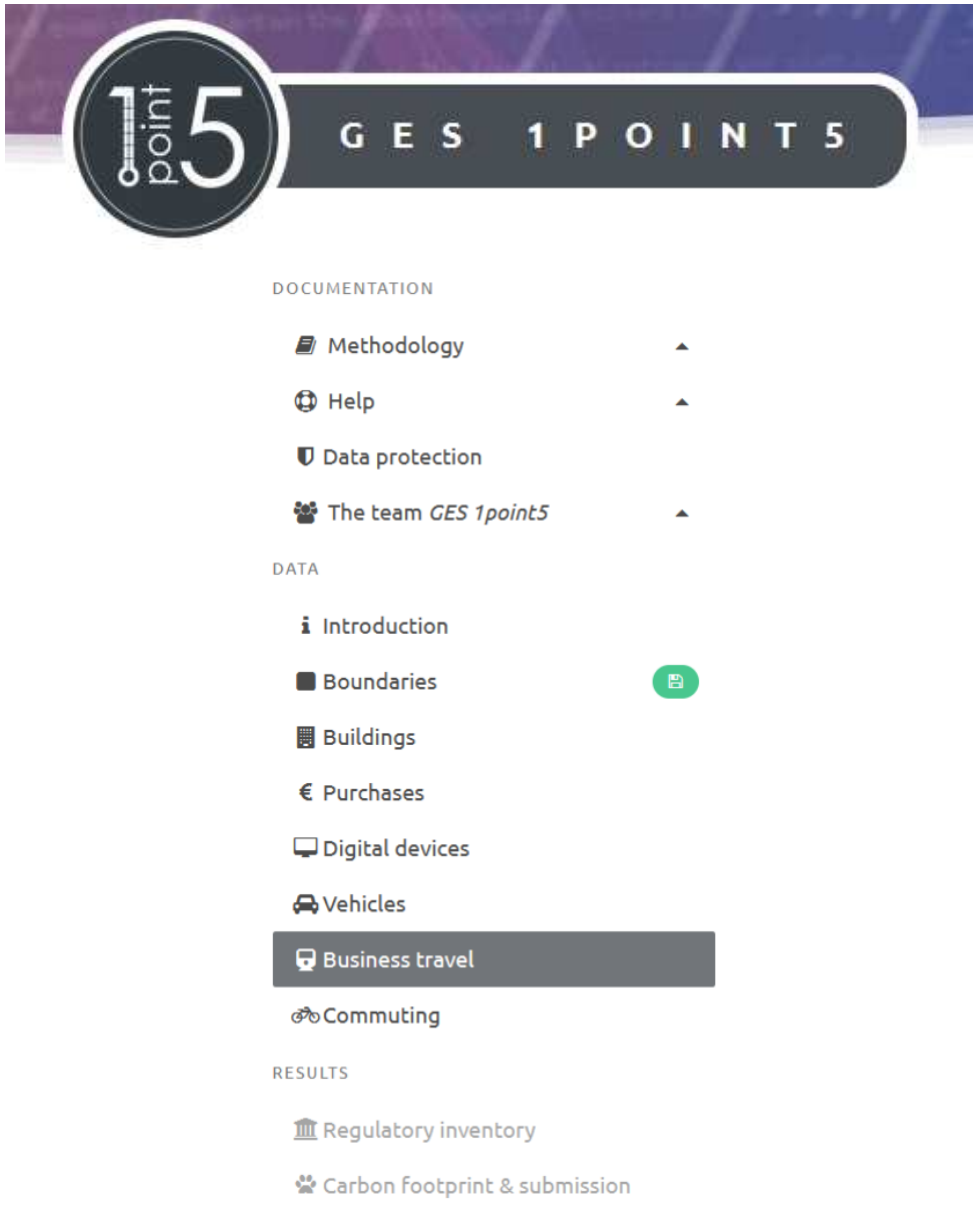
THE STRUCTURE

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

RESEARCH TOPICS

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

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. €

BUILDINGS

- Useful area: 2681 m^2
- Energy consumption: ~175.000 kWh (district heating), ~620.000 kWh (electricity)

PURCHASES

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

DIGITAL DEVICES

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

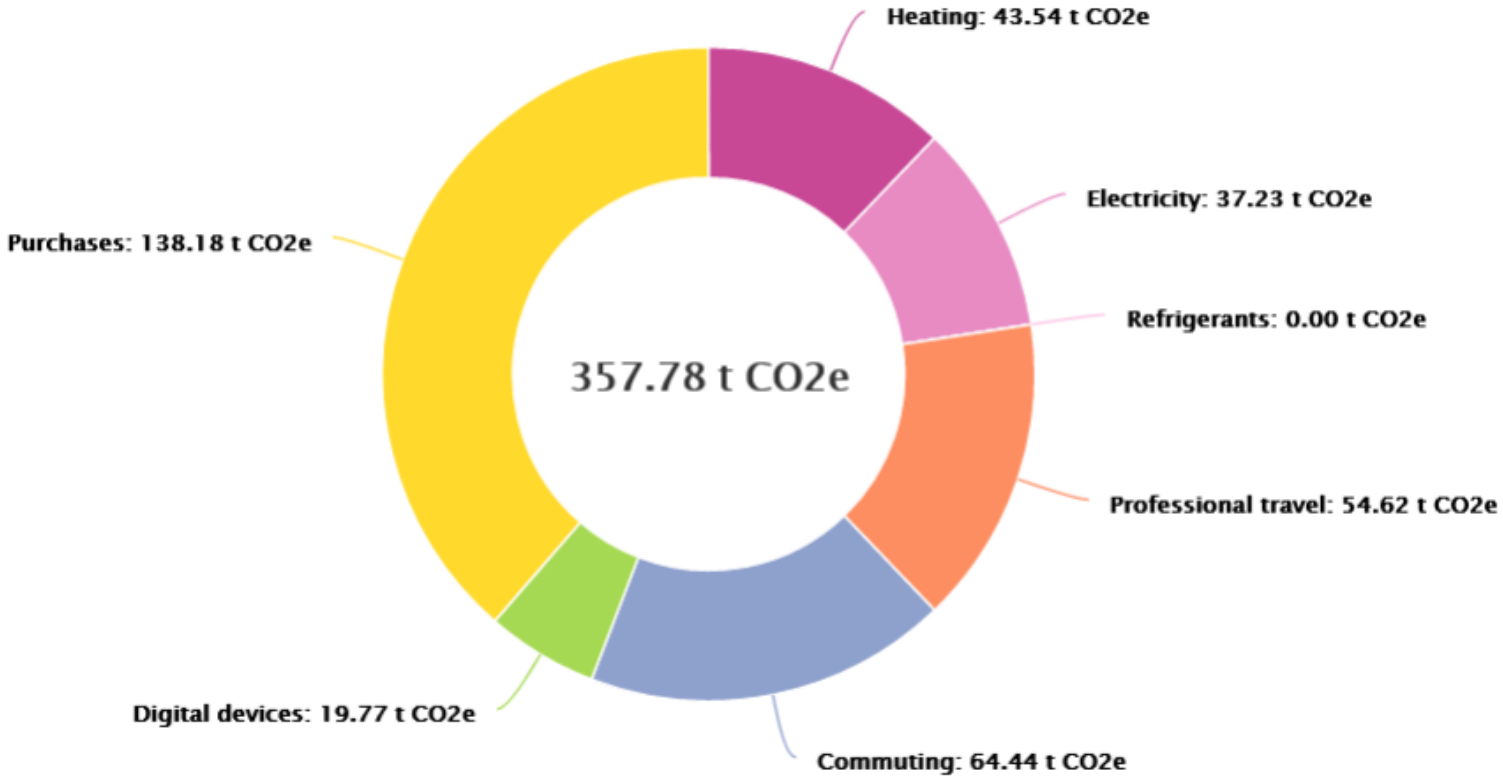
VEHICLES

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

TRAVEL

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

RESULTS


Heating: 43.54 t CO2e
Electricity: 37.23 t CO2e
Refrigerants: 0.00 t CO2e
Professional travel: 54.62 t CO2e
Commuting: 64.44 t CO2e
Digital devices: 19.77 t CO2e
Purchases: 138.18 t CO2e
357.78 t CO2e

RESULTS

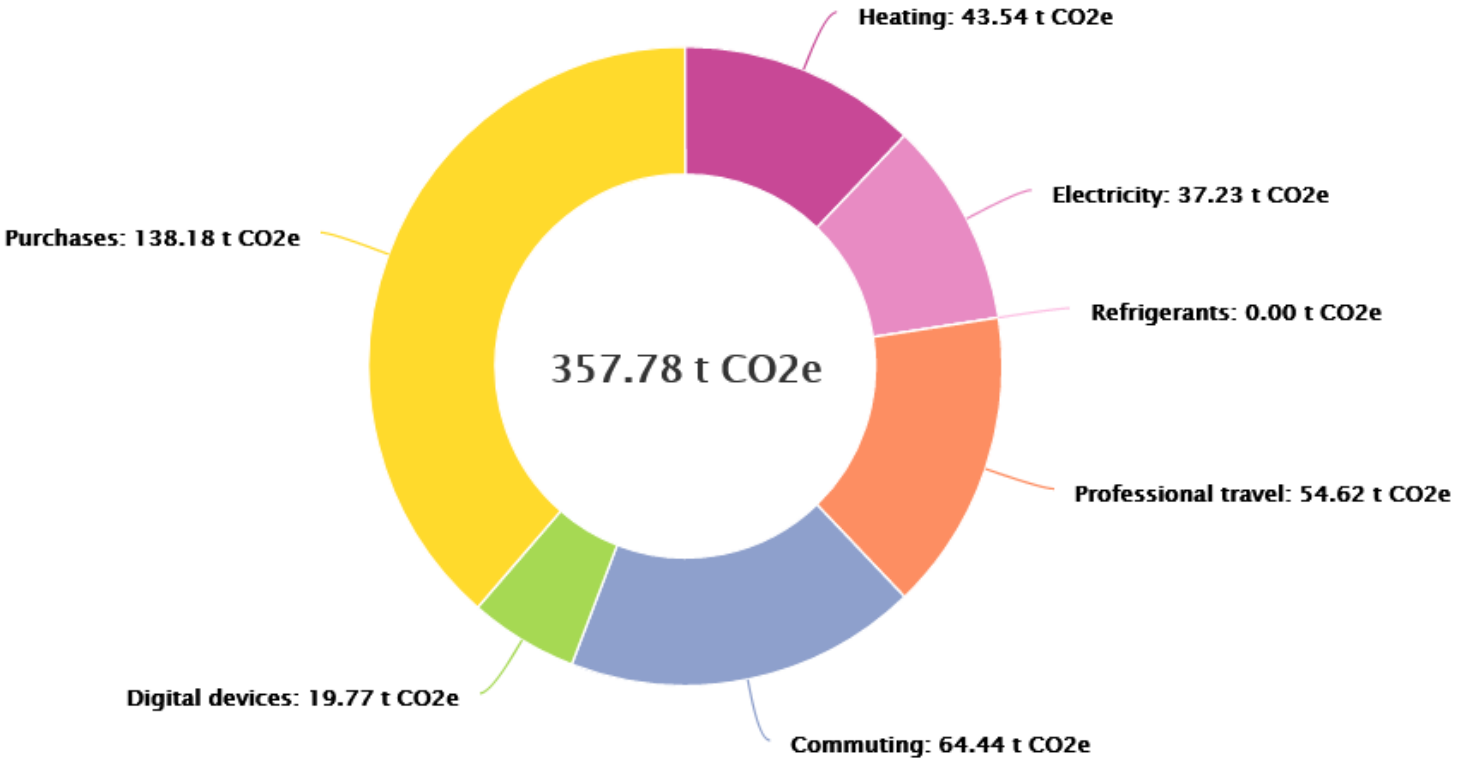
Carbon footprint	Emissions in t CO2e	Share of the total footprint
Carbon footprint of buildings	**80.78 ± 13.58**	**23 %**
|-- Heating	43.54 ± 13.06	12 %
|-- Electricity	37.23 ± 3.72	10 %
|-- Refrigerants	0.00 ± 0.00	0 %
Carbon footprint of digital devices	**19.77 ± 10.17**	**6 %**
Carbon footprint of 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

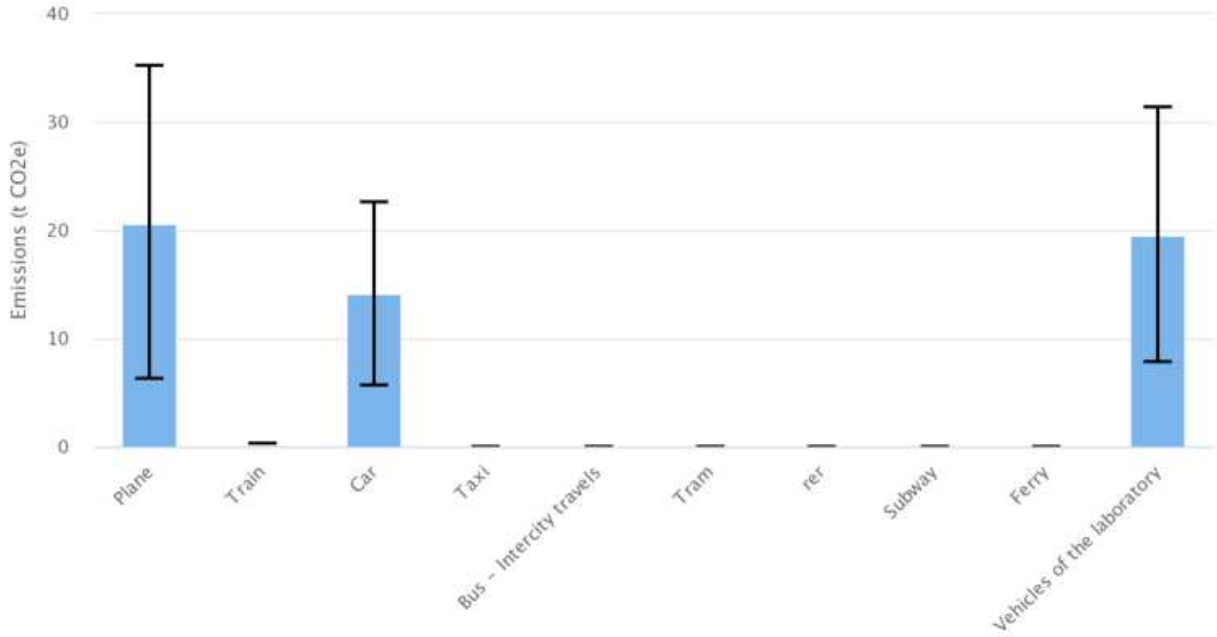
PURCHASES

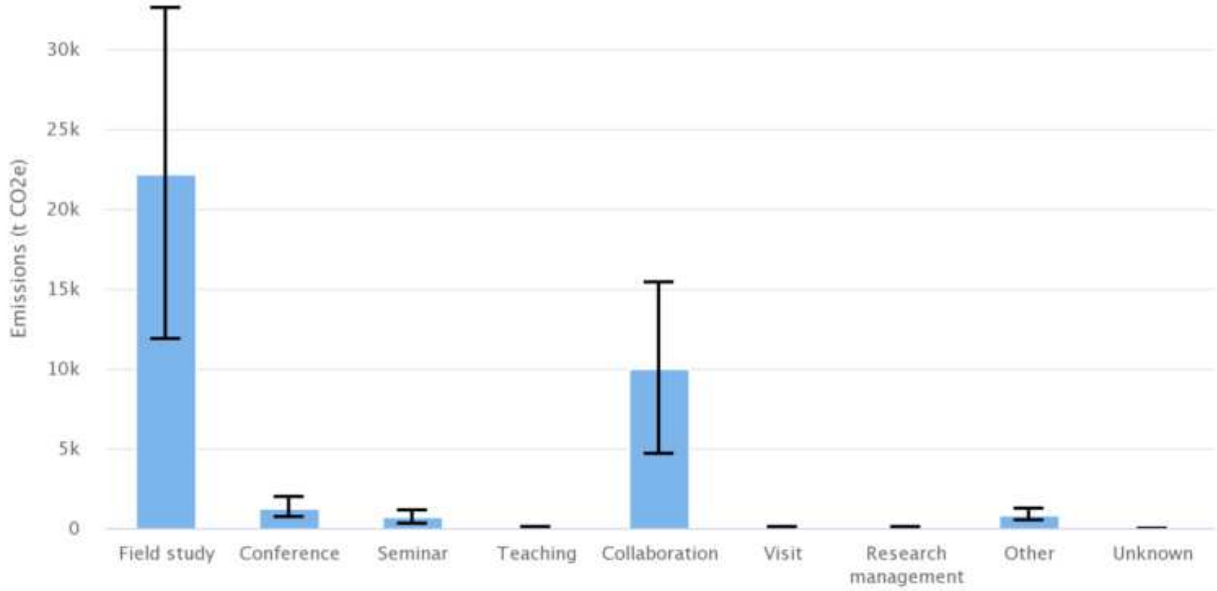


REDUCTION OF GHG-EMISSIONS

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

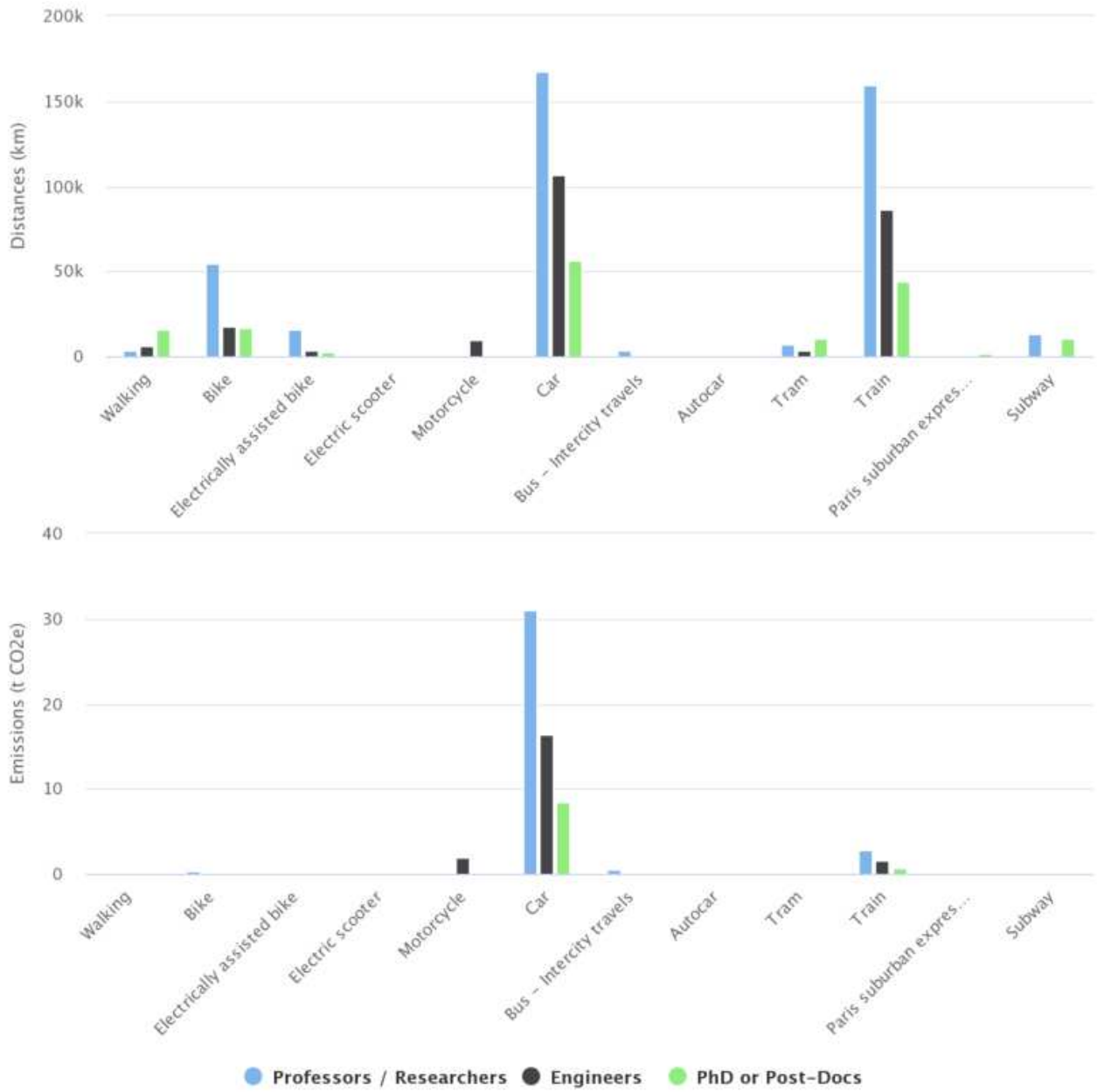




REDUCTION OF GHG-EMISSIONS

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

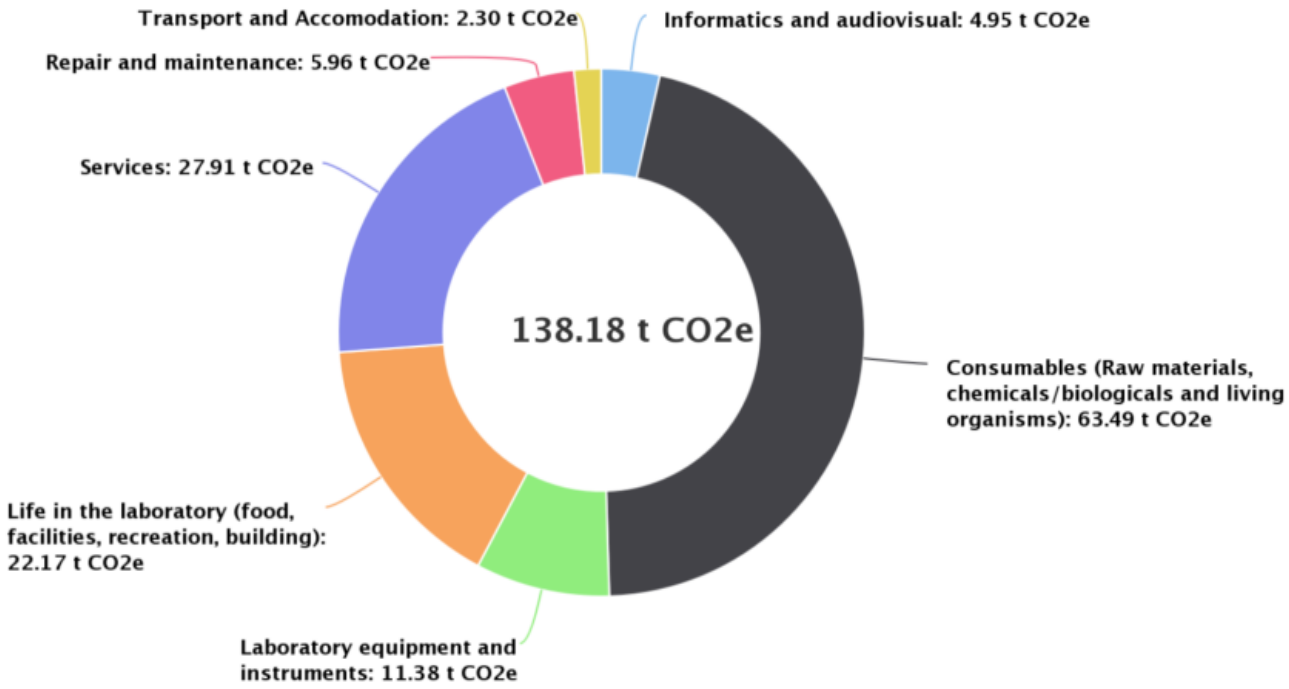


REDUCTION OF GHG-EMISSIONS

PURCHASES

- Consumables (for example chemicals and raw materials) have biggest share
  ⇨ usage of 70 % EtOH (instead of 100 %) for cleaning and desinfection 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