



LMD-Climaction information meeting

Actions to be proposed and other thoughts

March 2022

Introduction

- Since July 2019, the management has commissioned LMD-Climaction, formed with volunteers from the lab, to put the LMD on a path that is compatible with the *Sustainable Development Goals* of the United Nations.
- In April 2021, LMD-Climaction presented the 2019 LMD's carbon footprint (method in appendix) to the General Assembly, along with the results of an opinion survey that received responses from approximately 50% of the LMD's members.
- Since then, LMD-Climaction has been working on developing measures to reduce the laboratory's environmental and social footprint. These reflections and propositions of actions have so far focused on the **Missions**, **Digital**, and **Purchases** items, and need to be discussed with as many people as possible and revised in line with our concerns, before being put to a vote at the General Assembly.

Carbon Footprint



2019

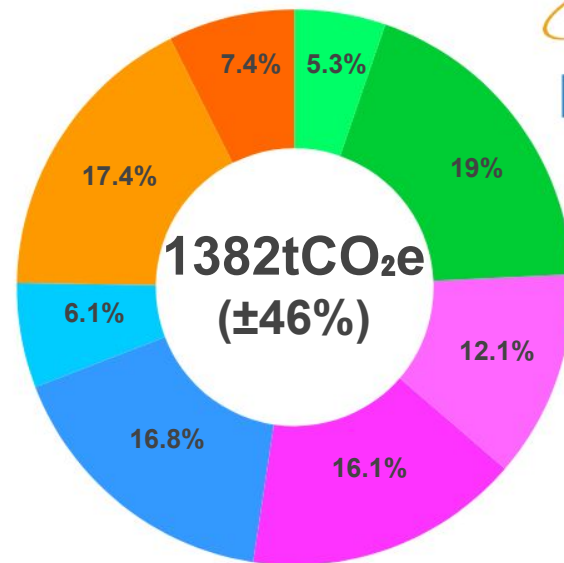
	[% total]	[tCO ₂ e]	[δtCO ₂ e]	[% incert.]
HEBERGEMENT				
[bâtiments / énergie]	7,4	102 ± 31	30	
[achats et services]	17,4	240 ± 106	44	

	[% total]	[tCO ₂ e]	[δtCO ₂ e]	[% incert.]
DEPLACEMENTS				
[domicile-travail]	6,1	84 ± 51	61	
[missions]	16,8	232 ± 119	51	

	[% total]	[tCO ₂ e]	[δtCO ₂ e]	[% incert.]
DISPOSITIFS				
[campagnes terrain]	16,1	222 ± 133	60	
[clusters calcul]	12,1	167 ± 68	41	

	[% total]	[tCO ₂ e]	[δtCO ₂ e]	[% incert.]
ACHATS				
[instruments]	19	263 ± 105	40	
[fonctionnement]	5,3	73 ± 29	40	

BILAN LMD				[% incert.]
total LMD en tCO ₂ e	1382	± 642	46	
total LMD en tCO ₂ e / personne	8,3	± 3,8		
extrapo tCO ₂ e publique / français	0,7	± 0,32		
% objectif <2° (2 tCO ₂ e)	35	± 16		

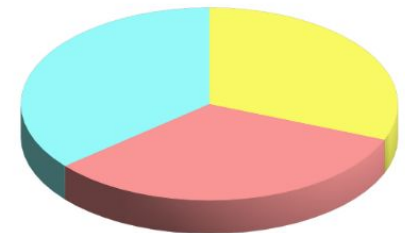


+ POSTER coming soon...

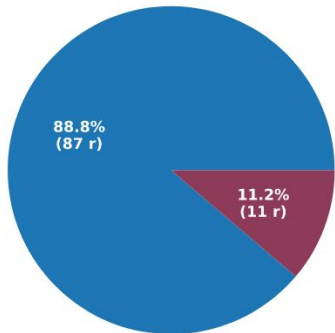
If the entire public service emitted like the average LMD member, it would account for 0.7±0.32tCO₂e in the consumption-based footprint of each French citizen.

Today the public service accounts for ~1.1tCO₂e in the average total footprint, which is about ~10t. The target for this total footprint in 2050 is 2t/inhab./year, so the public service must significantly reduce its carbon emissions.

	[%]	[tCO ₂ e]	[δtCO ₂ e]
Vie du laboratoire (hébergement + achats fonctionnement + domicile/travail)	36,2	499 ± 217	
Déplacements recherche (missions + campagnes terrain)	32,9	454 ± 252	
Moyens recherche (achats instruments + clusters calcul)	31,1	430 ± 173	



Missions



88% would like a

calculator to estimate and monitor their individual footprint

monpetitcarbone.fr/en/calculateur

New travel

Travel name: EGU

Departure date: 5/22/2022 | Date of return to residence (not mandatory): 5/28/2022

Is the return route the same as the outward route? Yes

Fill in the different sections of your travel here (only those associated with your outward route)

Section n°1

Transport mode: Plane

Departure location: Paris | Arrival location: Vienne

+ Add a section

Save

DISTANCE: 2 067 km | CARBON FOOTPRINT: 231 kgCO₂e

⇒ 2022: awareness year - carbon footprint calculator (MonPetitCarbone) mandatory for the missions (pdf file generated by the calculator to be attached to the mission order)

to be voted!

Missions

⇒ **2023+:** Implementation of CO₂ reduction measures (still to be devised), **with some following ideas :**

- based on carbon footprints 2019/2021 + MonPetitCarbone 2022 data
- CO₂ emission ceiling / long haul flight limits?
- individual / team / staff category limits?
- progressive trajectory
- carry-over credits

Missions

- Reminder of the government circular (13/11/2020): obligation to travel by train in France if the trip is < 3h by train.

to be voted!

⇒ Vote to ban air travel in continental France, and in Europe for trips < 5h by train?

- Under discussion:
 - Allow long trips (e.g. night trains), to be incorporated in missions policy to come. At the moment, not accepted by management if the transport adds an overnight stay to the mission (legal liability).
 - Facilitate first class by train, with a standardized letter from the direction

Digital

Reminder of the orders of magnitude for the digital:

- **90% for High Performance Computing** (HPC - 45Mh computing time \approx 167 tCO_{2e} in 2019)
- **4 tCO_{2e}/Mh** of computing, of which ~36% for manufacturing, ~7% for storage

Areas of work:

- GENCI/Labos1point5 discussions for a footprint provided by the computing centres
- Seminar to raise awareness about the impacts of digital technology to be organised with the IPSL-Climactions group (HPC, "everyday" digital technology)
- Seminar on code optimisation by external experts? (for both modelling and inversion algorithms)
- Life cycle: discussions with J. Lenseigne, responsible practices already existing (eco-info audit?)
- A labelling was considered but eventually discarded (Label NR, <https://label-nr.fr/>)

Purchases

Purchasing Charter:

(under development, to be discussed and voted)

- > 25/40k€: at least X% environmental / social requirements in the tender
- > 5k€: request for carbon footprint/Life Cycle Analysis in addition to the 3 quotes
- < 5k€:
 - i. if going through France-Lise Robin: encourage responsible purchasing (e.g. green logo on UGAP) in agreement with the credit holder
 - ii. if using MatInfo (computer equipment): little room for manoeuvre, but possible personal adjustments (size of computer, reparability index, etc.)
 - iii. if using the Purchasing Card : raising awareness among cardholders

Purchases

- Discussions to be held with instrument managers on the life cycle and data sharing
- Going outside the market for an ESAT (Établissement et Service d'Aide par le Travail) for part of the office supplies: under progress for SU / X / CNRS purchases
- Caterers: list of responsible caterers - environmental criteria to be addressed when requesting a quote (example below, under progress at SU, addressed at X, complicated at ENS because of 2 contractual caterers?)

Objet

Demande de devis Traiteur

Votre message

Nous souhaitons une prestation à faible impact environnemental donc nous avons les questions supplémentaires suivantes :

- les produits travaillés sont-ils d'origine responsable ? (par exemple : produits frais, de saison, issus de l'agriculture biologique ou d'une démarche agro-écologique, circuits courts, ...)
- les prestations proposées permettraient-elles une part de 50 % végétarien minimum ? (proportion à discuter)
- une prestation sans plastique/limitant les déchets est-elle envisageable ?
- quelle serait la prise en charge des restes alimentaires en fin de journée ?

En vous remerciant grandement pour votre temps, veuillez agréer mes sincères salutations.

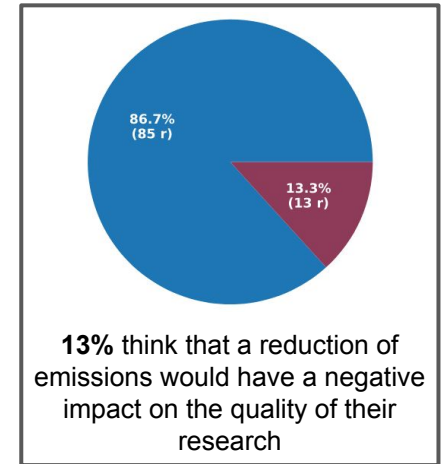
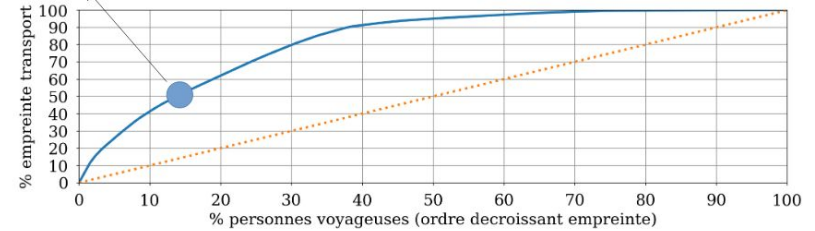
En utilisant ce formulaire, vous acceptez le stockage et le traitement de vos données par ce site.

ENVOYER

To go further

- Would you like to be made aware of/trained on specific subjects?
- Would it be interesting to encourage environmental footprint estimations in funding applications?
- With unlimited resources (*allocated hours, storage, simulation speed*), should we restrict ourselves on HPC?
- Should we reach for more equality in the missions?
- Is the improvement of instrumental/modelling data sharing possible / desirable?
- How can we reconcile environmental ethics and academic freedom?
- Is our research resilient to upcoming crises?

50% of emissions induced by 14% of the traveling staff



Summary

⇒ Do you have any comments ?

To be voted
after General
Assembly :

⇒ Do we want the LMD to adopt a policy to reduce its Greenhouse Gases emissions?

⇒ Do we make mandatory the use of the carbon footprint calculator **MonPetitCarbone** for all missions?

⇒ Do we ban air travel in continental France, and in Europe if trip < 5 hours by train ? (*)

() except for specific exemption expressly asked to the direction.*



LMD-Climaction

thanks you for your interest in this presentation.

Your participation is essential to develop an environmental strategy for the whole LMD that is both ambitious and respectful of our work.

Appendix :

★ Contact list of LMD-Climaction active members is shown on :

<https://climactions.ipsl.fr/groupes-de-travail/lmd-climactions/>

★ The results slides from the opinion survey from April 2021 are in the following file (*in French*) :

2021_04_14_AG_LMD_Sondage.pdf

★ Reminder of the 2019 carbon footprint methodology (more information - *in French too* - in the file *Methodologie_bilan_carbone_2019_du_LMD.pdf*) :

- Hosting (SU / X / ENS): pro rata in staff and surface of the hosts carbon footprints, for *bâtiments et énergie* (scopes 1&2) and *achats et services* (scope 3)
- Commuting: usage of results of a survey (65% of responses) processed by GES1.5 and extrapolated
- Missions: anonymised GESLAB extraction for CNRS+SU missions, extrapolated for X et ENS
- Field campaigns: scoring of campaigns, and evaluation with commissioned institutes or through carbon footprints done by the campaign managers
- Computing clusters: clocking of computing hours, conversion into electrical kWh (GENCI+eco-info) and conversion into CO₂e (ADEME and eco-info emission factors)
- Purchases: emission factors (ADEME, CEDA) relative to NACRES codes and sectorial extrapolation for purchases with missing factors