MiVEGEC
Maladies Infectieuses et Vecteurs
Écologie, Génétique, Évolution et Contrôle

Institut de Recherche pour le Développement
FRANCE
French National Research Institute for Sustainable Development

Environmental good practices lab booklet

2024

Do you wonder how to save energy, improve the greenhouse gas balance, use less water, reduce waste, without compromising the quality of your work?

This guide aims to share ideas and tips to enable everyone to contribute to reducing the environmental impact of the laboratory on a daily basis.

Mivegec 1point5

Energy

Save energy in my office

- I turn off the lights anywhere when I leave, or as soon as natural light is sufficient.
- I arrange my workstation to make the most of daylight.
- I turn off my computer, monitor, and devices on standby when leaving in the evening (and on holidays!). I can use a power strip with a switch to easily turn everything off.
- Before holidays, I turn off everything that can be turned off. Do I need to leave the fridge on in my office (if I own one)?

Save energy in the lab

- I turn off and unplug any unused equipment.
- Unplug them before long holiday breaks!
- I start refrigerated centrifuges shortly before use. I keep the lid closed throughout the experiment. At the end, I set the temperature to ambient before turning off the centrifuge.
- I autoclave only what really needs to be decontaminated and optimise autoclave load.
- I turn off devices in the evening/weekend when they are not in use (computers, PCR machines, water baths, centrifuges, PSM...).

Did you know?

16% of the IRD Center's energy expenses are attributed to lighting!

10% of the electricity consumption in France is attributed to the standby devices!

Appliances on standby consume the equivalent of a nuclear power station!

Air-conditioning and heater

In warm days,

- I freshen up the rooms by opening the windows in the morning. Then, close the windows and lower the blinds as soon as the outside temperature exceeds the one in the office.
- I set the air conditioner to a minimum of **26°C** and I maintain a maximum difference of 5-8°C between the outside and inside temperatures. I keep windows and doors closed when the air conditioning is on.
- In the lab, report any malfunctions to the room manager.
- In my office, when I leave at the end of the day, I turn the air conditioner off.

In cold days,

- Clear the radiators of anything that could obstruct proper heat diffusion. Close the doors.
- The recommended temperature in offices is **20°C max** (wearing winter clothes in winter is OK!).
- I still freshen up the room in the morning for 5-15 min (turn off the heaters!). It reduces air-borne disease spreading.
- When I leave in the evening, or before holidays, I lower the heating by 3-5°C without turning it off.

Did you know?

50% of the annual energy consumption in offices is due to heating (ADEME).

Digital

Hardware

- I extend the lifespan of my office equipment for as long as possible.
- I keep my computer at least 5 years.
- I choose a reasonable compromise between comfort and energy for screen size.
- I regularly sort through data that I really need to keep.
- If I do have unused equipment, I contact the Mivegec1point5 group to find another user
- I my equipment is out of order, I contact the Assistance Informatique to recycle it.

Internet

- I use bookmarks in my browser for addresses I visit regularly and not run a search request each time.
- I close unused tabs.
- I regularly empty the downloads folder.
- I do not use vide-based websites to listen to music/podcasts (e.g. YouTube…) to reduce 10 to 20 times the impact.

Print

- I only print what is necessary, preferably in black and white, double-sided.
- I remove unnecessary images and advertisements before printing.
- I print in toner-saving mode, which saves 15% of ink.
- I reuse single-sided printed sheets as drafts.
- At the IRD Center in Montpellier, I dispose of paper waste in the blue bins.
- I unsubscribe from paper newsletters that I don't read.
- I use the multifunction printers of the Institute. I do not buy personal printer.
- If I already have a personal printer, I buy recycled paper only.

Energy

- I set my computer to automatically enter sleep mode after short periods of inactivity. I don't use animations as screensavers (it's counterproductive!).
- I turn off my computer and screen when I leave in the evening.
- I preferentially use collaborative tools provided by IRD or Mivegec (Mivegec Collab…) to work as well as storing data locally and securely.

Email

- I regularly empty the trash in my email inbox and the "sent messages" folder.
- I don’t keep old mail on my email server if not needed.
- When I am a recipient of a message distributed to a list, I don't use 'reply all' if my message only concerns one or two people.
- I use sharing tools when I need to send large files (>200ko) (Filesender); I use compressed files, hyperlinks, or URLs.
- I unsubscribe from newsletters I don't read.
- I block unwanted messages.
- I do not use pictures in my e-mail signature

Did you know?

Multifunction copiers saves 50 % of energy compared to accumulated single-use devices (printer, scanner, copier).

An email without an attachment produces 4g of CO2e. Each day worldwide, we send 306.10⁹ emails, of which 60% are never read.

Digital technologies are responsible for as many greenhouse gas emissions as civil aviation. (FOR REAL!!)

Trips

Missions

- I consult the mission tree (see annexe), which encourages asking the right questions to optimize and rationalize my travel.
- Whenever possible, I prioritize video conferencing instead of travels for meetings.
- I limit my participation in conferences that require air travel.
- After a conference, I capitalize on it by sharing the knowledge with my colleagues upon return, in the form of a seminar.

Evaluate the impact of my mission

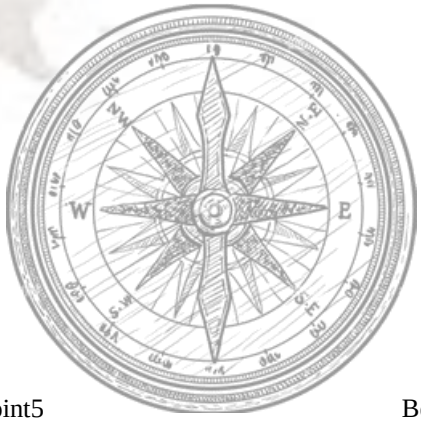
https://apps.labos1point5.org/travels-simulator

Commuting

- For inter-site travel within Montpellier, I adopt the habit of using public transportation, walking, carpooling, or cycle.
- Mivegec has shared bikes for Païre.

Evaluate the impact of my commute

https://apps.labos1point5.org/commutes-simulator



Means of transport

- I travel by plane for international trips or those exceeding 10 hours by train.
- When travelling by plane, I use the train as a way to reach an air hub.
- I buy second class tickets.
- I encourage my visitors to make similar choices.

Did you know?

Montpellier-Paris journey emits:

2 kg CO_2e by train

99 kg CO_2e by plane.

Did you hear of...?

- **klaxit.com**

  app to organize carpooling

- **velocite-montpellier.fr**

  to optimise my cycling route

- **Employer sustainability mobility package:**
  - ✓ **CNRS:** *https://intranet.cnrs.fr/Cnrs_pratique/recruter/Pages/B%C3%A9n%C3%A9ficier-du-forfait-mobilit%C3%A9s-durables-2022.aspx*
  - ✓ **IRD:** *https://www.ird.fr/intranet/nouvelles-modalites-pour-le-forfait-mobilites-durables*
  - ✓ **University of Montpellier:** *drh-pilotage-paye@umontpellier.fr*

Contact your administrator to learn more

Purchases

Order

- Group the orders from the same supplier to reduce transportation impact.
- Better to buy in bulk packaging rather than multiple small ones.
- Search for responsible suppliers in terms of packaging/waste reduction.
- I choose alternatives allowing room temperature transport, without dry ice, ice packs, polystyrene…

Optimise

- Share my equipment whenever possible. Sharing is caring!
- I establish, consult or update inventories to avoid waste.
- If I need a very small quantity of a product or want to conduct a test, I ask around if someone can lend it to me or request samples from the manufacturer.
  users.labomivegec@listes.ird.fr
  mpl-petites-annonces-request@listes.ird.fr
- I maximize the reuse of polystyrene boxes as iceboxes or transport boxes.
- I store dry ice in the dedicated green box in room 349

Refurbished or second-hand equipment

More and more suppliers offer to buy refurbished or second-hand equipment. Have a look before considering buying a new one!

For example:

- https://intranet.cnrs.fr/Cnrs_pratique/acheter/boursemateriel/Pages/default.aspx
- https://labequipement.fr/
- https://shop.labexchange.com/fr/
- https://depot-vente.dutscher.com/

Ressourcerie

I use the Ressourcerie link to offer the equipement/reagents that I do not use any more, and I have a look into it before buying new things:

- https://lite.framacalc.org/0v2fvz9hld-a72v

Evaluate the impact of a purchase

https://apps.labos1point5.org/purchases-simulator

Did you know?

Purchases represent the highest source of greenhouse gas emissions for MIVEGEC!

In the lab

Can I reduce the amount of reagents / consumables required?

- I consider the volume of consumables needed and order enough stock, without excess/under-restimation.
- I can use leftover reagents or consumables from previous experiments.
- In general, kits, pre-cast gels, and ready-made media generate more waste than self-prepared reagents and solutions

How can I limit energy consumption?

- I choose protocols consuming less energy (cold, heat,…)
- I turn off devices in the evening/weekend when they are not in use (computers, PCR machines, water baths, centrifuges, PSM...). I unplug them before long holiday breaks!
- I start refrigerated centrifuges shortly before use. I keep the lid closed throughout the experiment. At the end, I set the temperature to ambient before turning off the centrifuge.
- I autoclave only what really needs to be decontaminated/sterile and I optimise the autoclave load

Cold management

- I properly label my tubes/boxes (name, contents, date...).
- I sort my reagents and samples to limit the space occupied in the various cold storage areas (+4°C, -20°C, -70°C, liquid nitrogen).
- I ensure that the back of the devices or the filtered part can be ventilated by fresh air.
- I participate in the regular defrosting of freezers organized by the laboratory.
- I do not buy new fridge/freezer except for replacing old device.

How to extend the lifespan of devices?

- I take care of collective equipment and report any malfunctions to the responsible parties. I properly clean the equipment.
- I turn off PCR machines after use, program my runs with a final temperature of 10-15°C instead of 4°C, and avoid running overnight.
- I turn off centrifuges and leave the lid slightly open after use to prevent mold inside.
- I clean and dry the balances or any shared equipment after use.
- I regularly clear the memory of computers and lab equipment (qPCR machines, gel images…).
- I use and observe the booking schedules (otherwise, bottlenecks can lead to the purchase of new equipment).

Mivegec resource portal:

I consult and fill out, if necessary, the equipment's life record:

http://bioinfo-web.mpl.ird.fr/qhsmivegec/affichetteequipement/fichedevieexistant.php

username : [last name]

password : insecte (*)

* This password can be changed after logging in. In case of any issues, please contact luc.abate@ird.fr

And after the experiment?

- I clean the benches with an appropriate product.
- I dispose of any samples I don't need to keep.
- I consider sharing negative results to avoid useless (and endless) repetitions!

How to limit the impact of my experiment waste?

- I use containers of just the right volume for my needs (no 15 ml tube if a 1.5 ml microtube is sufficient; a strip of 8 PCR tubes rather than a plate with many empty wells).
- I reuse plastic consumables (pipettes, tubes, plate), as long as it does not impact the quality of my work.
- I use a reusable benchtop bin rather than a new 50ml tube every time.
- In cell culture, I favour reusable tools: spatulas, spreaders, etc.
- Considering plastic culture decontamination for reuse? https://www.ugap.fr/achat-public/tristel-duo-orl-desinfectant-pour-dm-orl-carton-de-6-x-250-ml_3805281.html
- I rinse and reuse my weighing boats when possible.
- I adhere to waste sorting guidelines: chemical, biological, electrical waste, recyclable waste, papers and cardboard, household waste, non-contaminated plastics, batteries, etc.
- I DO NOT discard clean paper and packaging in biological or chemical waste. Many clean packages can be disposed of in recycling bins (empty glove boxes, non-contaminated cardboard, plastic film…).
- I prefer refillable tip boxes to reduce plastic waste.
- For Starlab references, I dispose of the racks, worn out boxes, and inner lids in the designated carton for disposal and recycling. The dark blue boxes are reused in the lab.
- I use filter tips only when necessary
- When possible, I prefer reusable glass items (that can be decontaminated and autoclaved) instead of single-use plastic ones.
- If I damage glassware, I consider leaving it to Mivegec1point5 to have it repaired.
- I choose protocols using less dangerous reagents.

Compare the impact of single-used plastic vs glass.

https://mchanut.shinyapps.io/calculateur-empreinte-carbone-inrae

Recycling chemical plastic containers:

I recycle non-hazardous and recyclable chemical bottles I must check that the product was not dangerous and that the type of plastic can be recycled.

1- I check the pictogram

All Absent

1 of them Present → STOP DO NOT recycle

Chemical waste

2- I check the plastic type

Other

→ STOP DO NOT recycle

Chemical waste

3- Prepare for recycling

Rinse, discard liquid in appropriate waste jar
Remove label
Place in recycling bin

Other

Break - Coffee

- I use a reusable cup/mug instead of disposable cups.
- I avoid buying individual appliances and rather use communal ones.
- For communal pots, I borrow the cup-cutlery kit from Mivege1point5. The cups are 100% made in France from plant-based materials. *At the end of their life, they will be biodegradable and compostable. The kit contains everything needed to wash the cups*
- I take part into the organic waste sort in order to have it recycled as compost.

What else?

- I encourage my colleagues and students to adhere as closely as possible to the suggestions in this guide.
- I can discuss my efforts and the initiatives implemented at Mivegec with other laboratories.
- I can communicate with the Mivegec 1point5 group to share new ideas for environmental best practices and contribute to their dissemination, or become involved in the group.

When I leave the lab: To do list

- I leave contact details to be reached after my departure to facilitate communication if needed.
- I sort my samples and reagents, disposing of anything that will not be useful to my colleagues. I update the inventories.
- I dispose of my disposable lab coats in the appropriate bins (medical waste or chemical waste).
- I organize and back up my digital data, leaving a copy for my supervisor or colleagues.
- I finish my lab notebook and provide access to my supervisor

CO2 converter:

https://impactco2.fr/?co2=0&theme=default&title=1

First Reduce, then Reuse. Last but not least, recycle.

Thank you for your participation.

Follow those advises, it's participating actively at the reduction of the environmental impact of **MIVEGEC.**

Every change matters.

mivegec1point5@ird.fr

Annexe : TRAVEL TREE