

ETH GreenLabs

Biotechnet Meet-Up 2024
Bern, 18.01.2024

Who we are



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Sustainability Manager



Elisa Dultz
Senior Scientist

Laboratories focus mainly on research output

– awareness for sustainability is often lacking

Energy consumption



1 ULT freezer =
1 average household

Products and equipment



Limited sharing and
exchange between labs

Waste and chemicals



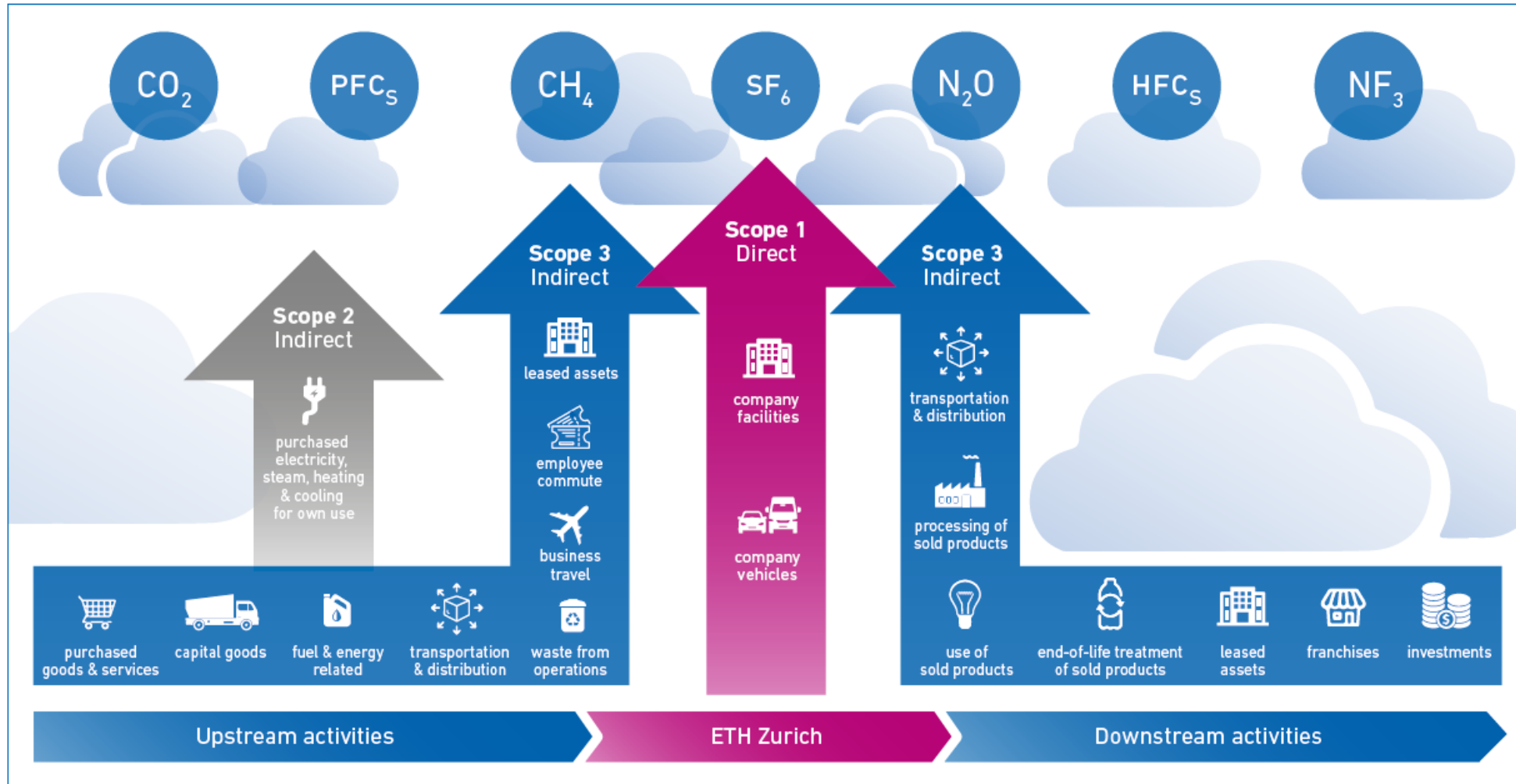
Lab plastic waste estimated
at 5.5m tons p.a.

+ Commuting, conference travel, food, etc.



Adds up to 10-40t CO₂e per scientist

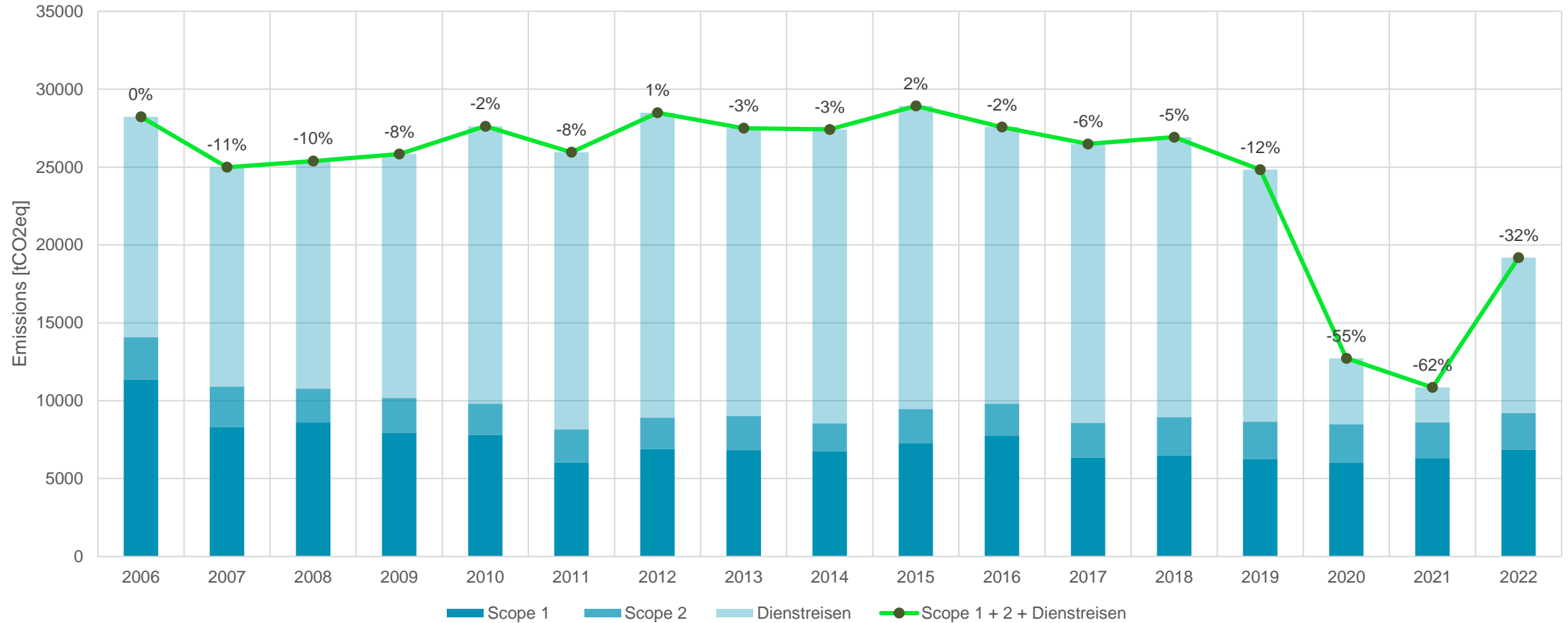
Emissions are categorized into scope 1, 2 and 3



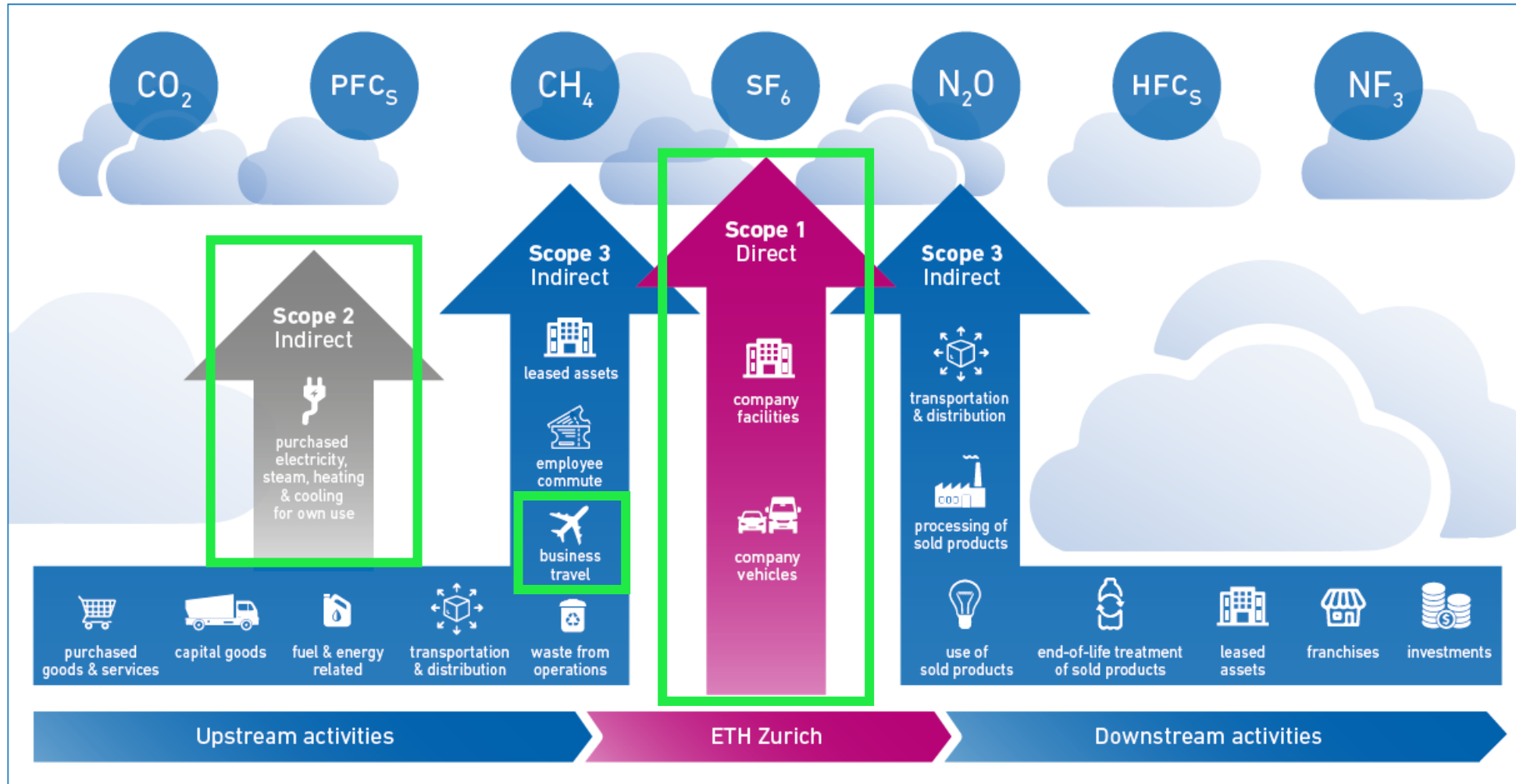
Scope 1 and 2 emissions as well as business travel have been assessed since 2006 – but what about scope 3 emissions?



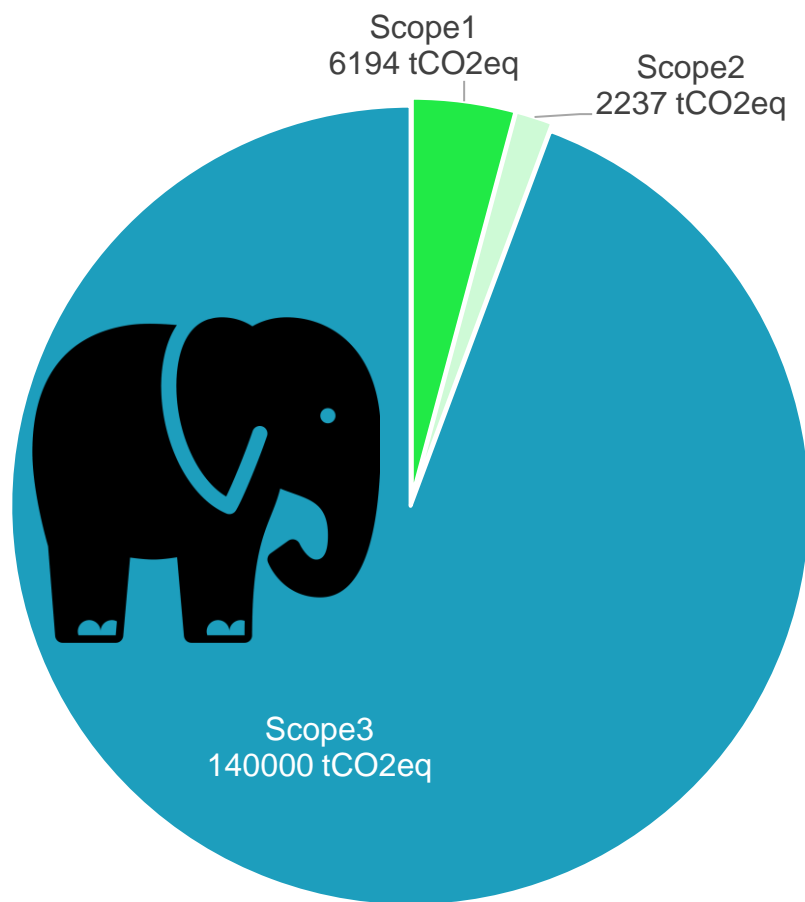
Scope 1 + 2 + business travel



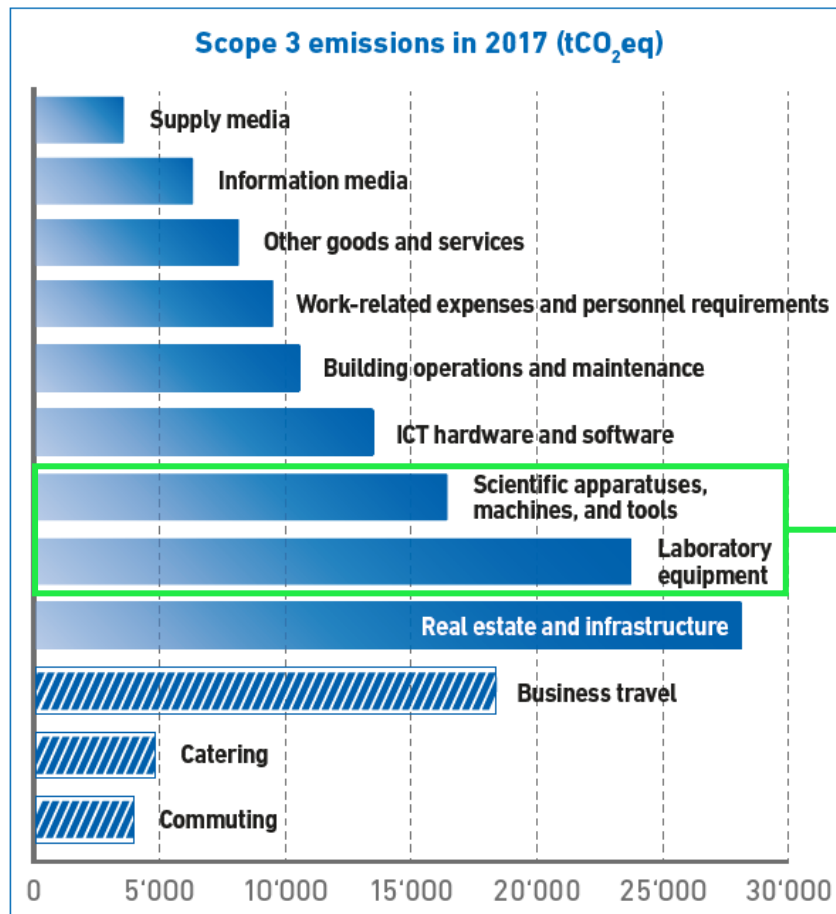
Emissions are categorized into scope 1, 2 and 3



Scope 3 is the elephant in the room – and has been overlooked until 2019



First analysis of scope 3 emissions in 2019 – lab equipment makes second place



Laboratory equipment and machinery makes up a significant portion of ETH's emissions – as well as most of its hazardous waste

Figure 3: Results of Scope 3 GHG accounting in 2019 with absolute values, uncertainty margin $\pm 10\%$ (based on 2017 data). Hatched bars are used to distinguish groups of goods for which a different methodological approach was used.

Luckily, we did not have to start from scratch

Greenlab Zurich grassroots group of UZH and ETH students and researchers formed in 2020

- Organized workshops, flyer, data acquisition
- Started close contact with ETH sustainability when idea to implement LEAF came up
- Grew into idea hub ETH GreenLabs with current project LEAF but more to be started








We purchased LEAF to assess our labs sustainability and drive initiatives forward



- Self-assessment tool targeted at research laboratories & teaching
- Developed at University College London
- Sustainability actions for lab users to save plastics, water, energy, and other resources
- Laboratories are awarded Bronze, Silver, or Gold level
- Online calculators to estimate financial and carbon savings

Example actions of LEAF



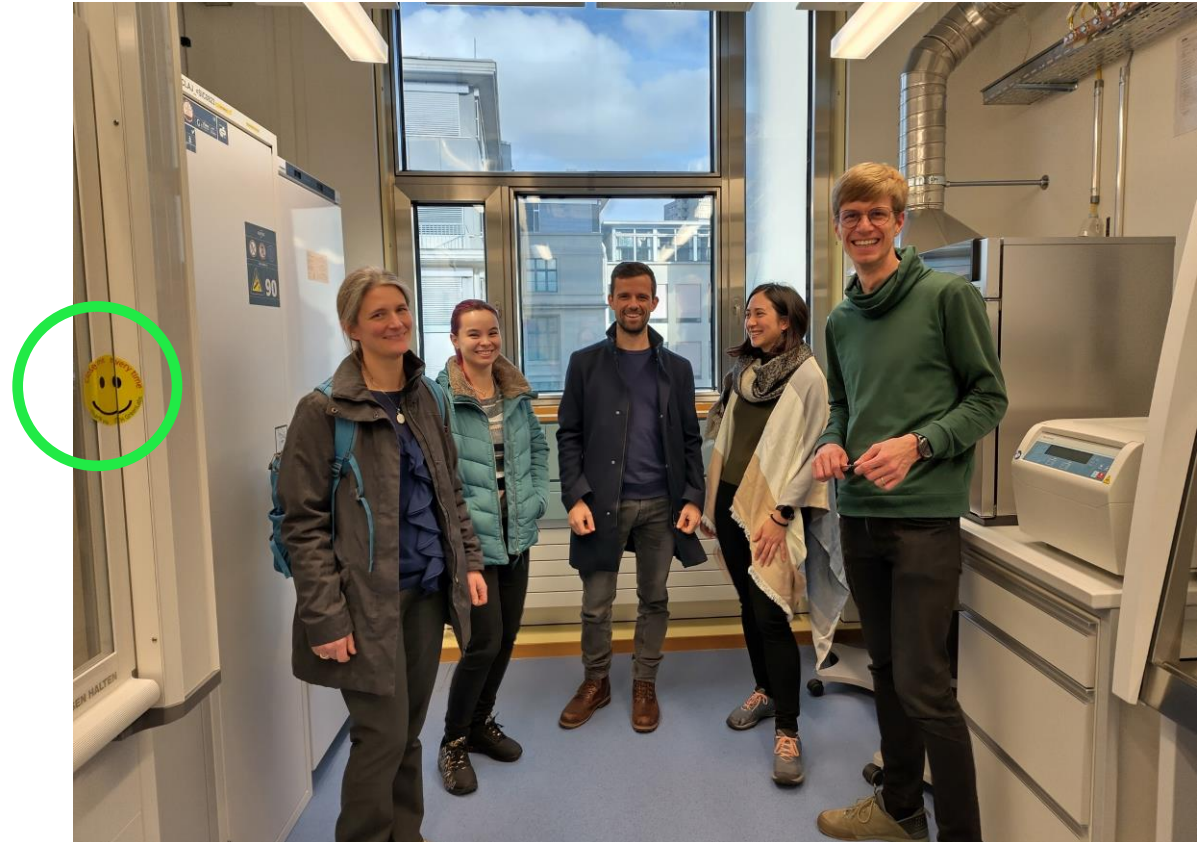
| CATEGORY | Bronze | Silver | Gold |
|--|---|--|---|
|  Waste | Provide recycling bins in the lab | Single-use plastic waste has been reduced (guidance provided) | Recycling rates have been increased, or overall waste produced has been decreased |
|  People | Samples owned by departing staff are cleared or tracked | The lab has engaged other labs on LEAF and sustainability | One action to reduce travel has been implemented |
|  Sample & Chemical Management | Labels are legible, and there's a common labeling system in place | Procedures are in place in case cold storage equipment breaks down | At least 80% of all samples and/or chemicals are clearly catalogued |
|  Equipment | Equipment is turned off when not in use | There is a system in place for communal equipment booking | Excess equipment is repaired, sold, and/or donated |
|  Ventilation | There is a clear reporting system for building issues | Fume cupboard sashes are kept closed when not in use | Solvent vapours are condensed and disposed and not released into the atmosphere |

What we have achieved so far

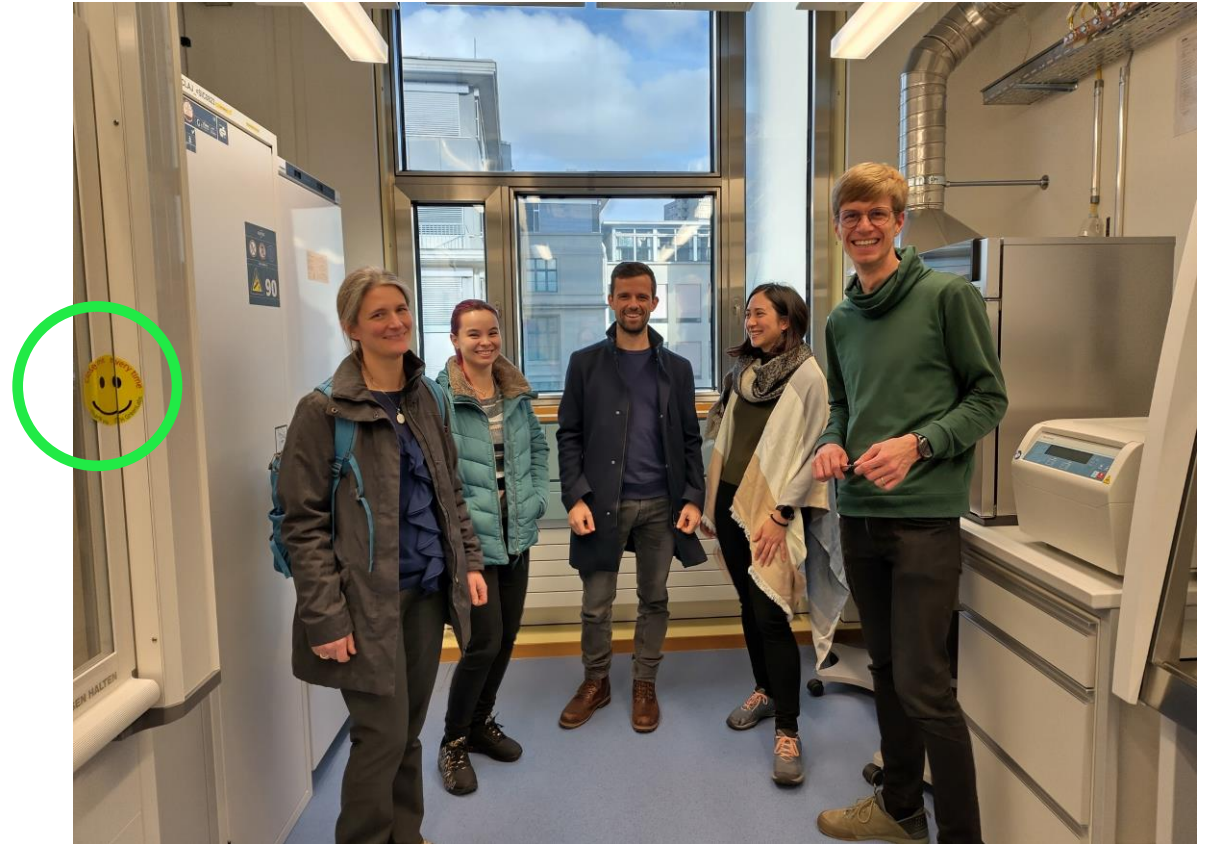
| | |
|--------------------------------|---------------------------------|
| # of labs registered | 39 |
| # of labs reviewed | 18 |
| Freezers switched to -70 °C | 14 (+ 2 at -75 °C) (10 labs) |
| Cost savings | >20.000 CHF |
| Emission savings | >10t CO ₂ e |



Certification event with ~100 participants on
January 31st



What we have achieved so far



And that's not all of course

1. Collection of "best practices" and initiatives throughout the labs
 - Tip racking via organizations
 - Freezer temperature adjustments (-70°C, -20°C vs. -18 °C, +6°C vs. +4°C)
 - ... and many more!

2. Identification of large-scale/central challenges & searching for solutions
 - Sustainable and centralized procurement
 - Central equipment exchange platforms
 - Holistic and structured waste management

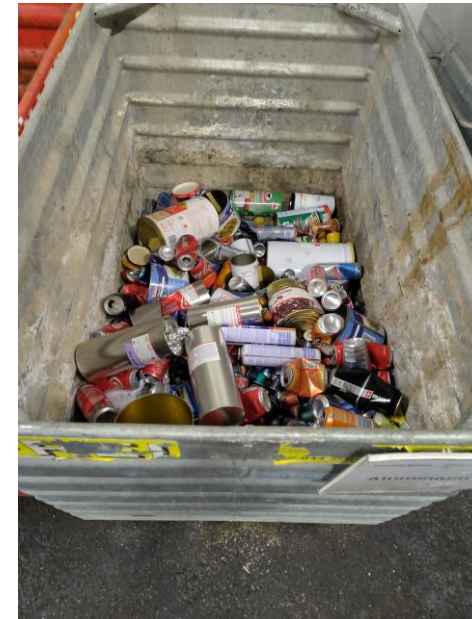
3. Networking within the institution
 - Exchange between laboratories
 - Building a sustainability community
 - Awareness for ETH Sustainability office and overall goals

But we also face some challenges

People: perceived trade-off between research (incl. trained routines) and sustainability

Operations: complexity in chemicals and equipment requires clear procedures to allow for sharing

Waste: proper separation and recycling of (hazardous) lab materials



Concrete actions to improve sustainability in your lab



1. Connect with labs and central sustainability unit to learn about existing efforts
2. Consider sustainability when purchasing
3. Evaluate lab procedures for options to save materials or reduce waste
4. Reduce energy (increase freezers temperature)
5. Replace single-use plastic for multi-use glass (e.g., serological pipets with autoclaved glass pipets, Falcon tubes with glass cylinders when measuring volumes)



SUESTINBLIE : CRESTIENNIT.E

Thank you – now let's discuss!



References and databases

1. LEAF: LEAF@ucl.ac.uk
<https://www.ucl.ac.uk/sustainable/take-action/staff-action/leaf-laboratory-efficiency-assessment-framework>
2. MyGreenLab
<https://www.mygreenlab.org/>
3. Biological Samples stored long term at -70°C or warmer
https://docs.google.com/spreadsheets/d/136A8VQmOrWUFVP_EW3Q8wF4dNmRe5I9bmM6KkC8aH1o/edit#gid=702800635
4. GreenLabs Zurich Initiative Miro board
<https://miro.com/app/board/uXjVMBLFATo=/>

Energy use of some lab instrumentation

