# EXPERIMENTAL RESEARCH RESOURCES

Facilitators: Estelle Pignon, Vikrant Minhas

| **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** |
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| Plastic overconsumption | Re-think the magasin’s list to be more sustainable (Ask Christophe to remove or add items). For example the plastic recipients to weigh chemicals can be replaced by paper ones.  Use more glassware  Keeping track of consumables at lab and department level so that we have clearer data on usage. → Modify the software to order (Ask Michael Bekcle) |  |
| Machines overconsumption | Ask the Decanat to enforce a rule to only choose the most sustainable machine when buying a new one (or put a threshold)  Allowing funds to be used more flexibly according to current needs / sharing. Remove the rule that if we don’t spend all the money we don’t get as much the next year. |  |
| Lack of knowledge on best practices : material, protocols, alternatives available, | Need LCA (Life cycle analysis( for the different products, machines etc. It should be made easily accessible.  A database and calendar for machines should exist at the building level. This would increase shared use at a larger scale. |  |
| Behaviour:  Inefficient/sub-optimal use of existing resources and maintenance. Lack of sharing of equipment or chemicals. Using the wrong bins, trashing usable items. We often use the easiest route, easiest solution and we forget that this is a privilege that we have. | Raise awareness to the newcomers: put rules that they have to follow before they start bad habits. For example impose the use of glass pipette as soon as they start, or the non-autoclaved tips.  Try to place orders for products from more nearby supplier to reduce transport. The information could be written on the ordering form, easily seen.  Devote some time and effort (on the lab level) by members to make common stocks of consumables to reduce waste due to overconsumption. Have a clear system that everybody uses. | Some people suggested to have explanation posters in the hall that describe the environmental impact and the price of commonly used consumables or machines. Or have the price of the machine written on it.  Some thought it would be better to have an in-person explanation when the newcomers arrive. either a class or someone in charge of doing a tour of the labs and raise awareness. |
| Infrastructures and rules:  There is a lack of awareness of the work of the people in the kitchen (energy and time to prepare media for example)  We have too much money! We spend without thinking enough  There is not enough ressources for sustainability based projects. | Extra money from grants to use for sustainability projects. (Rectorate, Decanat, UNIL)  Sustainability team to give a tour of the department to raise awareness of the work it takes to prepare media. |  |
| Culture and values:  Quantity is not quality! We should not make more data just because we can. → Valuing productivity more than environmental impact → Publish or Perish.  There is a lack of awareness of how much the products and machines cost  Waste and individualism  Undervaluing of the technical staff  Overconfidence about current or past efforts  Superstition about certain protocols that make people do things too many times or use too many tubes. | Create a lab sustainability officer who will meet with representatives. It should be a PI, and there should be one in each department |  |

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# COMPUTATIONAL RESEARCH RESOURCES

Facilitator(s): Nicolas Chesaux

| **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** |
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| * Overconsumption of computing infrastructure (HPC cluster) * Overconsumption of data storage infrastructure * Overconsumption of AI, in particular LLMs for research and education * Hardware acquisition does not consider how components are created/assembled * Accumulation of old laptops due to purchases of more recent hardware even though they are still functional * Need to have better data on hardware purchases, AI usage, and specific needs for decision making | * Just use less computing power, data storage and AI (in particular LLMs) * Understand the impact of AI (cost-benefit analysis) * Collect more precise data on computing resources usage * Prioritize the use of personal desktops available on any computer instead of personal laptops | * Usage of computing resources responds to needs and a thorough analysis of the costs and benefits should be conducted: what would be the impact on research output? |
| * There is wasteful usage of resources because of systemic pressure to run fast analyses to produce research output * There is little awareness of the ecological cost of computing tools and ways to diminish it * Researchers do not archive data nor take time to do data management and rather store it * Research objectives do not include low/efficient resource usage | * UNIL should create awareness of the ecological costs of computing by informing researchers * Researchers should receive feedback on the ecological cost of their computing usage (e.g. is it getting better/worse? how does it compare to others?) * Researchers should test code before running it to avoid failure/overrequesting memory (linked to institutional mandates to test code) |  |
| * The process of archiving data in smaller formats and retrieving it from the archives is slow -> disincentive * Lack of clear guidelines and framework on how programs should be written, how the HPC cluster should be used -> no reward or punishment * UNIL does not offer hardware that can be upcycled (parts cannot be replaced to better fit higher computing needs) * Computing is made cheap with respect to other research resources (e.g. lab material), therefore there is no consideration for overconsumption | * The university should create offices where workstations can be shared (with the use of a personal desktop) * There should be mandatory training on environmentally-friendly computing behavior (e.g. green algorithms) * Particular rules should be applied for heavy jobs (mandatory checks) * Research groups should be required to share data, analyses and results to not run the same process twice/learn from other processes | * Shared desktops could pose a problem of privacy * Confidentiality is also a concern when sharing data/programs/results * Mandatory checks of building green algorithms/not using LLMs could slow research down significantly * Increasing the cost of computing is not really a solution because the cost would still be small compared to other resources |
| * Replicability in science means that data is stored multiple times and at different locations (similar to samples in freezers). Risk of loss is unacceptable * It is considered unacceptable for platforms (data, computing) not to have 100% up time. Standards are too high -> too many resources are used * Individualism means that sharing hardware is considered uncomfortable * Building green algorithms/failure-free programs is not valued morally by researchers * Researchers don’t use existing offers to improve code because time/comfort is valued more | * Researchers should define their research projects based on a cost-benefit analysis of ecological cost vs. how research output contributes to society * UNIL should lobby/take political actions to pressure technology companies into producing environmentally and socially friendly hardware * Lobby to make producers internalize (pay for) the ecological cost of computing resources |  |

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# ENERGY AND SPACES

Facilitator: Bouke Bentvelsen

| **LAYER** | **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** |
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| Visible problem | Space distribution due to status | - attribute space based on needs not on status  - bookable shared office space, meeting rooms, reservation from planete unil  - find new, more sustainable energy source: water pipe? -> solar panels? -> wind power?  -more detectors for the lights (corridors)  -Share lab equipment I.e. pcr machines) and storage space between groups | - ideal but not realistic → you never have all employees at the same time & diff people need diff thinhs  - who pays for maintenance? |
| Visible problem | Lights on during the night | Turn the lights off during the night |  |
| Visible problem | Source of energy → we are aiming for reduction but we aren’t aiming for replacement for our energy source | - invest more time and resources into getting data about the energy we use  - political support  - |  |
| Visible problem | For biophore we don’t have details of electricit consumption → data availability, where does the energy go exactly? | Share data with everybody to motivate transparency, encouragement |  |
| Behaviours & activities | People want a comfortable work space | Sharing on a voluntary basis (with reward) | -Reward → extra day home officer extra coffee cups |
| Infrastructure & rules | old buildings have a bad isolation |  | - isolation improvement and replacement is really expensive |
| Infrastructure & rules | too many people for the given space than what was planned when it was built |  |  |
| Structure & values | PI’s need a private space to have conversations -> don't want to share -> not a "good" example |  |  |
| Structure & values | Home office can be seen as 'lazy' or not serious | - make home office more accessible  - build trust | - |
| Structure & values | Cutting down is seen as more straight forward than replacing | - education /sensitisation  - signs & reminders |  |
| Structure & values | pessimistic mindset, ‘small/isolate actions do not count or make a difference’ |  |  |

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# PROFESSIONAL MOBILITY

Facilitator: Lilia Uribe Ramirez

| **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** |
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| Visible Problems:  -The frequent travel by some members of the community, particularly professors, who often exceed the needs of their academic responsibilities. This was seen as a factor contributing to an unnecessarily large carbon footprint. | -Limit the number of authorized trips per person, particularly those that are funded or reimbursable. | - Restricting a student’s or professor’s ability to present at various events also restricts their professional development. |
| Behaviour and activities:  -In some cases, when professors choose to decline an invitation to present at an international event explaining to the organizing committee that the reason is to reduce their carbon footprint they are still asked to recommend someone else to take their place, which makes the researcher’s decision pointless. | -Encourage an increase in the number of virtual conferences, and to reserve slots for virtual lectures during in-person congresses.  -Give time during congresses to talk about the impact of air-travel and to hold a moment of silence after congress talks.  -Empower researchers to respect their values and accept their decision to attend congresses virtually.  -Raise awareness of train discounts like interrail, eurorail, etc. | -In-person meetings are also a great way to create networking opportunities.  -There is a general belief that virtual conferences cannot substitute the value of face-to-face interactions provided by in-person events. |
| Infrastructure and Rules:  - Sometimes, the decision to take a flight instead of the train is related to the cost and/or the speed at which one can travel, besides the high time-expensive planification of the complete itinerary.  - In some graduate programs, it is a requirement for students to complete research stays at different universities or research centers during their studies. As a result, students are often required to travel. | -Built a platform for academics that provides tools allowing to find the most optimal train itineraries below 9h-long  -Make travel payment or reimbursement contingent upon selecting the option with the lowest carbon footprint.  -Request that the student mobility requirement to not be mandatory for program members. |  |
| Culture and Valued:  -Many individuals choose to continue traveling because attending international conferences brings prestige not only to the researcher but also to the members of their research group. It is also beneficial for building a strong CV.  -People who value sustainability may feel afraid of being judged by others. | -Value equally virtual-talks as in-person talks after the end of each conference or on paper.  -On the university’s database with research groups (or ORCID, Researchgate, etc.), share values and ethics of each lab, as well as if they have collaborations with universities outside EU for their research.  -Make a database of groups having local collaborations and their research subjects.  -Encourage communication between PIs and researchers to respect their decision of not traveling abroad due to climate anxiety. |  |

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# BEYOND RESEARCH: FOOD AND COMMUTING

Facilitator: Théodora Steiner

## FOOD

| **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** | **OTHER NOTES, COMMENTS** |
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| VISIBLE PROBLEMS   * Large contribution of meat in CO2 and large consumption * increasing consumption of eggs + dairy (alos to compensate the decrease of meat consumption) | At unil cafeteria :   * less non-vegetarian options / more veggie choices * more vegetarian days during the week * no beef nor lamb in menus anymore * “CAP2037 meals” = meals with a lower environmental impact, below that a certain threshold but can include meat e.g. chicken   When events in Biophor, among each individual groups, in departments, with all 3 departments, etc   * vegetarian or vegan menu | * cultural sensitivity / values to cows in Switzerland | the participant frequently said that when it is not said that the menu is vegetarian, people sometimes even dont realize and it is ok, while of you say it > comments and people not happy about it  and at the same time, have to precise for veggie/vegan people  > how to handle that ? |
| BEHAVIOR AND ACTIVITIES   * Centrality of meat in the middle of the meals * dont want to cook, easier to by something, and choices with meat are higher | * campaigns for alternatives to meat and about impact of meat to inform and sensibilize people * Banane could share its vegetarian recipes to give ideas, be in a sharing process and inspire * kitchen staff education on nutrition and veggie cooking | * feeling punished for eating meat |  |
| INFRASTRUCTURES AND RULES   * clash with guidelines and labels e.g. fourchette verte bc I dont remember (theo) * meat = source of protein * poor quality and choices of vegetarian dishes at cafeteria * cafeteria is too expensive | * improve quality and choices of vegetarian menus * subsidise meals according to their impact i.e. make meals with low environmental impacts more cheap than meals with high impact i.e. with beef |  |  |
| CULTURE AND VALUES   * perception of organic or local food as compensating other impacts |  |  |  |

## COMMUTING

| **PROBLEM(S)** | **SOLUTION(S)** | **TENSION(S)** |
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| VISIBLE PROBLEMS   * Minority come by car but it is a majority of CO2 | * more expensive parking, less places | expensive parking :   * mostly PAT and PI : do they care ? why do they take the car ? * impact on families or people that do not have other possibilities to bring the car (economical-social reasons, geographical, health, etc) |
| BEHAVIOR AND ACTIVITIES   * differences in commute between unil (PAT, students, PI) but dont know why * missing data on motivation of car commute, why do people use they car ? * comfort of car (hard to be competitive) | * make alternative commuting fun e.g. events, talks * give subsides/financial help for public transport, ½ tariff, or electric bike (EPFL does) * give the possibility for people who wants to try alternative to have e.g. a free week of public transport / electric bike /other to test it * promote unil car sharing e.g. an app, parking place less expensive if car sharing |  |
| INFRASTRUCTURES AND RULES   * safety of alternative to car to commute > danger and feeling of danger for people using alternatives to car bc of low quantity and quality of infrastructures * car first, infrastructure are 1st made and thought for them * poor infrastructure for people with handicaps | * charging station for ebike at unil * bike lanes * unil shuttles - train stations > to facilitate transports between unil and train station |  |