

Executive Summary – LCA of EPFL’s fish facility

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Introduction

A Life Cycle Assessment (LCA) of EPFL’s mice facility was conducted by Quantis in 2012 and reviewed by Zero Emission Group (ZEG) in 2019. Similarly, an LCA of the fish facility present on campus was carried out in 2023 to uncover environmental impacts and identify leverage points for improvement. This study was performed by the Sustainability Office of EPFL’s School of Life Sciences, with the support of the HES-SO Valais-Wallis.

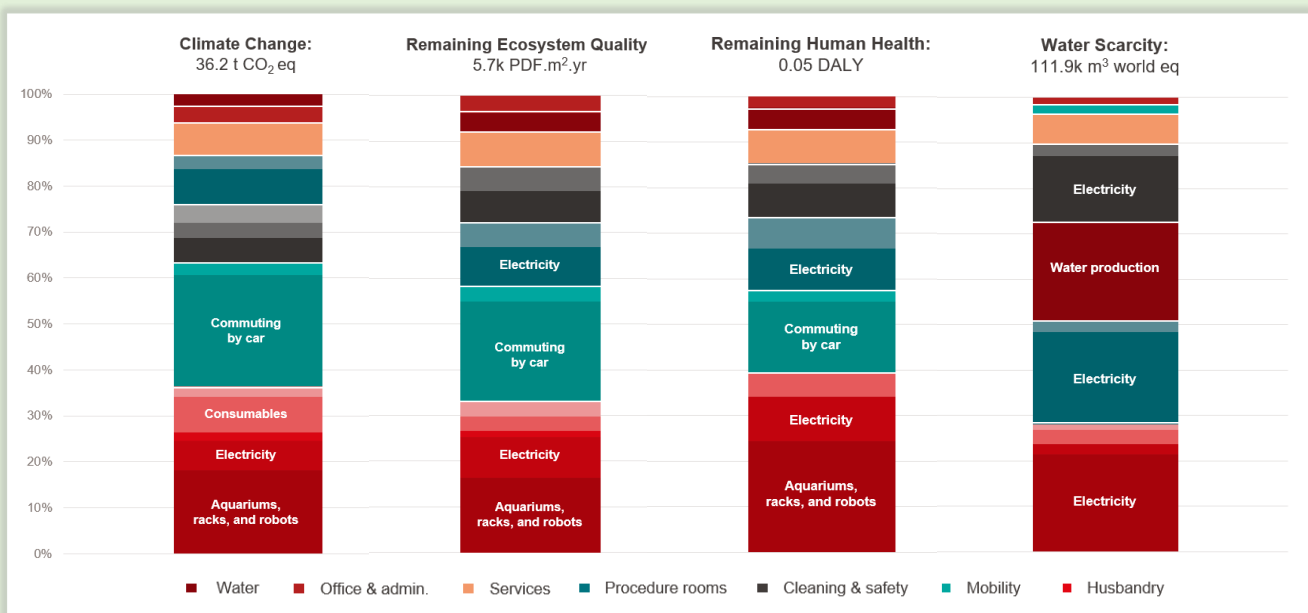
Methodology

- **Functional unit:** One year of activity of the fish facility at EPFL in 2021.
- **System boundaries:** Including the husbandry, washing facility, procedure rooms, water use, transportation, office and administration activities, and other ancillary services, but excluding all experimentation and research activities.
- **Impacts assessed:** Climate Change, Remaining Ecosystem Quality, Remaining Human Health, and Water Scarcity (*Impact World+ Footprint v2.0.1*).

Assumptions & Limitations

- Shares of energy consumption allocated with surface ratios
- Generic modelling for materials and equipment production as no supplier data available
- Quality of output water within the accepted limits of the local treatment plant so considered as standard wastewater

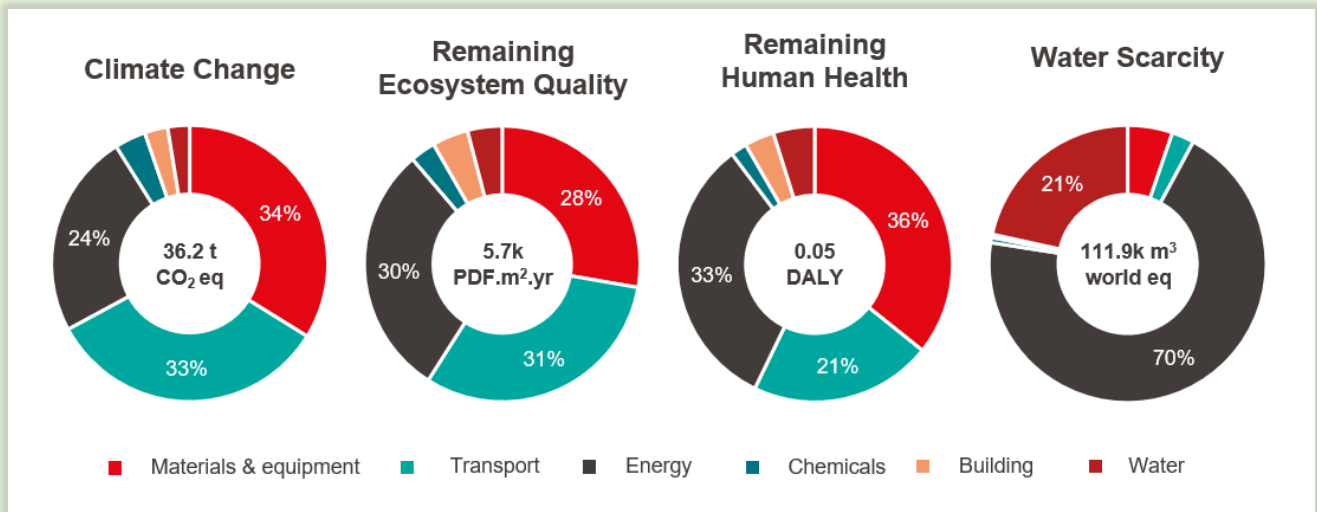
Contributions by Sub-System



Husbandry and **mobility** are the highest contributors to climate change, ecosystem quality, and human health, with **electronics** (aquariums, racks, and robots), **electricity** consumption and **commuting by car** as main sources of impact.

Husbandry, **procedure rooms**, and **water** use are the highest contributors to water scarcity, with **electricity** consumption and **water production** as main sources of impact.

Contributions by Sector



Materials & equipment, transport, and energy have significant impacts on climate change, ecosystem quality, and human health. **Energy** has by far the largest impact on water scarcity (due to the Swiss electricity mix's heavy reliance on hydropower), followed by **water** use.

Conclusion

In 2021, impacts were generated by 4 major sources :

- Materials & equipment – mainly **electronics** in the husbandry
- Transport – mainly **commuting** by car
- Energy – mainly **electricity** consumption in the husbandry and procedure rooms
- Water – mainly **water** production

Recommendations

Electronics

- Maintain and repair to increase the lifespan and avoid replacement
- When replacement is necessary, find lower impact alternatives with spare parts available

Commuting

- Promote public transportation and car sharing

Electricity

- Identify unnecessary consumption
- Optimize consumption through behavior change and the installation of timers, where appropriate
- When equipment replacement is necessary, find more energy-efficient alternatives

Water

- Explore solutions to optimize water consumption in reverse-osmosis water production
- Explore solutions to improve the filtration and re-circulation of water
- Explore options to reduce the number of water renewals in aquariums

Product or process changes must be modelled and compared with the baseline before implementation to avoid any unintended burden shift.