

The Laboratory Efficiency Assessment Framework (LEAF)

The need for lab sustainability

Research laboratories are responsible for producing a significant percentage of a university's carbon emissions. They tend to consume up to ten times more energy and four times more water per square metre than other academic spaces. Research laboratories also consume high amounts of plastic and it is estimated that they are responsible for generating around 2% of plastic waste worldwide!

It is imperative that the university community addresses these issues and develops methods to minimise the negative environmental effects of laboratory-based research and education. To this end, the Sustainability Team at University College London (UCL) has developed a lab sustainability framework that enables the assessment of labs against a set of relevant criteria.

What is LEAF and how does it work?

Short for Laboratory Efficiency Assessment Framework, LEAF is a user-friendly online tool which aims to support more sustainable and cost-effective laboratory management, teaching and research. The framework consists of criteria and corresponding actions to fulfil. The rationale for each action is explained within the online application and participants are directed to supporting documents. These include technical and procedural guides and numerous other resources that aid in implementing the framework within a laboratory space.

LEAF's main criteria cover subjects such as waste, water, energy, travel, research quality, and procurement. Baseline calculators are also provided to enable users to quantify the impact of their actions by comparing the financial costs incurred and carbon consumed before and after sustainable practices have been introduced. The online calculators provide clear values to incentivise users to improve their sustainability performance and track their ongoing progress. Participants in the LEAF program receive bronze, silver or gold awards based on their ability to meet LEAF guidelines and their overall performance.

Why introduce LEAF?

LEAF can allow researchers to partake in the global effort against climate change and make a difference by adopting the best practices to carry out high-quality research in a sustainable way. Uniform standards have been enabling educational institutions to create and maintain safer, more efficient and diverse working environments. Similarly, there is a need for universities to continue to enforce uniform standards across other areas to keep up with current challenges such as the Climate and Environment Emergency.

Introducing the standards presented within this framework reduces the overall ambiguity often associated with sustainable lab practices, as LEAF provides a comprehensive set of guidelines and resources that allow users to evidence the impact of their actions in a quantifiable manner.

With LEAF, users can minimise utility costs, reduce a lab's carbon footprint, and improve the overall efficiency of their research. Additionally, opting for LEAF helps users qualify for several financial incentive schemes and more importantly, improves the chance of success when applying for research grants with organisations that are increasing their emphasis on environmental research impact. LEAF participants with no prior knowledge will gain insight and first-hand experience in implementing changes that contribute to more sustainable research and education.

Introducing the LEAF programme can also enable lab users to carry out transparent environmental audits to identify any discrepancies in their current work and aim for improvement. Besides this, LEAF allows exceptionally well managed laboratories to gain recognition for their efforts.

LEAF is supported by the UKRN (UK reproducibility network), in recognition that high-quality research is sustainable research, and by the National Technician Development Centre (NTDC), in recognition that the application of sustainable lab practices improves career development and visibility for technical staff. Email LEAF@exeter.ac.uk for more information.

To take part in LEAF, simply:

- Register on the LEAF website: https://app.ucl.ac.uk/leaf/leaf_external
- If your lab is missing from the institution structure shown on the LEAF Homepage, please contact the LEAF team at LEAF@exeter.ac.uk, who will add it for you.
- Follow the instructions on the user guide to get started with your application.
- Don't forget to add your lab's baseline data into the provided calculators to estimate the financial and carbon impacts of making changes.
- Arrange regular meetings with your team to review the criteria and decide how you want to tackle them throughout the year.

