



University of
Kent

LEAF – Lab Efficiency Assessment Framework

Laboratories are extremely energy intensive and consume huge amounts of materials, they use 5-10 times more energy than typical non-lab areas.

What is LEAF?

LEAF is a tool developed by University College London, with King's College London support, to facilitate improving the sustainability of laboratories (e.g. chemistry, biology, IT, etc.). It contains criteria to achieve Bronze, Silver, or Gold awards depending on how many sustainability actions the laboratories take. Before making LEAF widely available, UCL piloted LEAF in 2018-2020 along with 23 other universities and research institutes.

- 235 Lab groups took part;
- £3,700 was the average annual saving reported by Lab group;
- £641k total reported savings;
- 648tCO₂e total carbon avoided (equivalent to taking 140 passenger vehicles off the road in a year);
- 99% of those surveyed said they would use LEAF again.

LEAF is now used across at least 15 countries and growing fast, with over 95 institutions registered, it has quickly become the largest green lab certification globally.

LEAF helps increase efficiency in 10 areas: waste, people, purchasing, equipment, IT, sample and chemicals management, research quality, teaching, ventilation and water.

A key feature is that LEAF allows you to quantify your savings, in pounds and carbon. This data is generated to facilitate further improvements all around – for users to share with their colleagues, for sustainability managers to share with senior management, and for the laboratory sustainability sector to baseline itself.

Laboratory-based research is essential for advancing society but it is also extremely energy and resource intensive. It's estimated that laboratories are responsible for around 2% of global plastic waste and they use 3-10 times more energy per meter squared than a typical office.

Unlike Health & Safety regulations, there is a lack of standards in place providing simple guidance on how to make labs more environmentally sustainable.

LEAF has been developed to address this lack of standards. It is user-friendly with low administration, ensuring there is enough time for the science at hand. LEAF's calculators enable users to estimate their impacts immediately, and its supporting resources provide the technical expertise to take meaningful action.

LEAF helps you identify practical steps to make your lab more sustainable; it is usually done in teams. You can spend as much or as little time as you like, but a good average is around 10 hours each academic year.

By joining the LEAF programme, laboratories reduce their carbon emissions and create an environment that supports research quality.

The scheme recognises all the great things you are already doing and provides a structure for planning your next steps. It covers equipment, space use, ventilation, procurement, waste, samples and chemicals.

The LEAF programme comprises four elements:

1. **The Framework:** An online tool that guides users through sustainability actions to save plastics, water, energy and other resources in their laboratory.
2. **Online calculators:** To help measure financial and carbon impact. You can estimate how sustainable your lab is now and track improvements.
3. **Toolkit and Resources:** From guides to sustainable lab equipment and consumables to induction and exit procedures.
4. **User Engagement & Training:** We offer each institution a tailored workshop to engage laboratory staff and students on sustainable science and to introduce LEAF.

Why LEAF?






Some key features of LEAF for users include:

- Little to no evidence required
- Few criteria total, which are sequential and goal-focused (as opposed to method-focused)
- Includes criteria on research quality, in recognition that a repeated experiment is the ultimate use of resources! Aligns with researchers' interests, as reproducibility comes to fore of research strategies

Crucially, LEAF is user-driven and non-profit – users are encouraged to feedback on how the programme may be improved. No manufacturers, suppliers, or commercial entities have input in LEAF’s contents, process, or materials.

The LEAF initiative will help you improve the sustainability and efficiency of your laboratories.

Key criteria for 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

Benefits of participating in LEAF

- Environmental sustainability accreditation through a nationally recognised scheme;
- Reduces utility costs and environmental footprint;
- Provides an opportunity for direct savings through our financial incentive schemes;
- Supports health and safety compliance within labs;
- Makes research more efficient;
- Improves chances of gaining additional research funding;
- Contributes to a bottom-up sustainability movement;
- Enables inter-lab and inter-departmental benchmarking;

- Gives recognition to individual labs and the University through a national scheme;
- Provides practical learning that improves professional skills and employability;
- Creates opportunities for students to volunteer as environmental auditors;
- Strengthens relationships between technicians, researchers, and other stakeholders;
- Aligns your lab with the University's [Environmental Sustainability Strategy](#).

For further information about LEAF and the University's engagement with the framework please contact:

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Health, Safety and Environmental Sustainability.