Overview

The Living Laboratory brings together students, academics and staff to test new ideas, apply research to practice, and develop new solutions for enhancing sustainability within the University. Students bring enthusiasm and ideas, academics bring world-renowned expertise and research, and staff bring practical advice and assistance, leading to more innovative interventions and effective results.

Activities

- **Academic projects**
- **Voluntary projects**
- **Internships**
- **Award scheme**

Practical assistance

- Provision of data and information
- Linking up with relevant contacts

Collaboration

- ‘Go-to place’ for information on environmental activities across the University
- ‘Connecting the dots’ between different initiatives

Communication

- Highlights stories of success
- Increases awareness of the Environment and Energy section

Engagement

- Provides opportunities for students to get involved
- Helps engage people who are not already involved in environmental action

Outcomes

- **Effects on University operations**
  - Enhanced links between academics and Estate Management
  - Use of research to apply on the estate
  - Allows for work to be done that might not otherwise be focused upon

- **Environmental impacts**
  - Cuts resource use and reduces the University’s environmental footprint
  - Demonstrates that the University is acting in a sustainable way on multiple scales

- **Culture change across the University**
  - Embeds sustainability into the fabric of the University
  - Fosters greater innovation
  - Allows new approaches to be trialled

- **Teaching and research**
  - Contributes to the impact agenda of academic research
  - Provides local and relevant examples and case studies to enhance learning
  - Allows operational and administrative areas of the University to contribute to the core aims of teaching and research

- **Student experience**
  - Students learn professional skills
  - Improves students’ employability
  - Provides meaningful opportunities for students to contribute to improving the University’s environmental sustainability

For more details on Living Lab projects please see the website: www.environment.admin.cam.ac.uk/living-lab
“The Living Lab has provided so many useful contacts to expand the reach and impact of my research.”
Emma Garnett, PhD Student, Zoology

84 students
25 staff involved directly

“The Living Lab provided such a big boost to us, with lots of help throughout.”
James Wark, Social Innovation Programme project participant

68% of students at Cambridge say it is important to learn about using resources efficiently to limit the impact on the environment and other people.

63% say it is important to learn about how human activity is affecting nature.

78% say it’s important to learn about challenging the way we do things now.

The support from the Living Lab has been invaluable to us.”
Jacob Ashton, Climate Forum

26 projects completed

“The Living Lab helps create sustainability projects from the bottom up that students really believe in.”
Dr Ruchi Choudhary, Architectural Engineering

6 (out of 9) areas of the University’s Environmental Sustainability Vision, Policy and Strategy supported

7 events
383 participants
The Living Laboratory for Sustainability: Annual Report 2017-18

Sustainable food

Following the University’s sustainable food policy launch in February 2017, the Living Lab has supported the University Catering Service (UCS) in implementing the policy and continues to liaise with academics to inform operations.

Seek academic input

Academics from three departments within the University have provided their expertise to determine the most impactful interventions, resulting in four key principles as set out below.

Departments of

- Geography
- Zoology
- Psychology

Expertise

- Focus on the most impactful interventions

Priority areas

- Less ruminant meat
- Only sustainable fish
- More plant-based options
- Cut food waste

Link research and practice

The student projects below are all significantly shaping the development and implementation of the sustainable food policy.

Matt Ewen and Anya Doherty

Matt’s and Anya’s final year undergraduate research projects were inspired by the University’s work on sustainable food. Matt looked at catered food to understand consumer choices and their impacts. College catering data was used to explore methods for reducing emissions. Offering fewer ruminant meat meals was a simple but effective intervention to shrink emissions. Anya studied which methods were most effective for calculating carbon emissions of certain menus.
Collaborate and engage

UCS worked with several Cambridge Colleges to run vegan training for chefs, delivered by the Humane Society International (pictured right).

Colleges’ actions on sustainable food were collated and publicised on the University’s website.

A sustainable food policy template was provided for Colleges.

The University approved catering supplier tender was developed to encourage all suppliers to adopt the Sustainable Food Policy.

Benefits and outcomes

**Effect on University operations**

The Living Lab was involved in the Sustainability Sub-Group of the Catering Managers Committee which “aims to get the University and the Colleges to minimise the impact of their catering operations on the environment, and to promote sustainable practices and consumption.”

**Environmental impacts**

- The removal of ruminant meat from menus has reduced annual carbon emissions by 109 tonnes and water consumption by 26 million litres.
- A compostable packaging initiative has prevented 2.5 million plastic items from being disposed of.
- Removing plastic bottles from sale will save 40,000 a year from going to waste.
- A ‘KeepCups’ initiative has saved 93,000 disposable cups.

**Culture change across the University**

This sustainable food policy has won both TUCO and Green Gown Awards showing that this is both ground breaking and timely.

**Teaching and research / Student experience**

Students interest in sustainable food research has grown with multiple undergraduate students planning on publishing their final year projects on sustainable food.
Biodiversity and ecosystems

The Living Lab is supporting the University’s commitments on biodiversity and ecosystems through the Ecological Advisory Panel (EAP). It has assisted in the development of a biodiversity baseline for the University’s estate. This baseline gives the University a platform from which to begin meeting its targets by supporting the development of the University’s Biodiversity Action Plan.

Seek academic input

The Ecological Advisory Panel (EAP) has also overseen and given input to: (i) the recruitment of ecologists for surveys across the urban estate; and (ii) student summer projects.

Staff at the Botanic Gardens gave advice on wildflower meadow planting, and surveying bat and bird box occupancy.

Link research and practice

The Living Lab set up a student internship, enabling the collation of previous research, data records and assessments inside and outside of the University to inform the baseline assessment.

Sam Buckton
Internship 2018

Sam used expertise from his Zoology degree to synthesise information from several sources into a report covering the whole estate. Sam also considered the best way to hold data for future biodiversity management.

MPhil in Conservation Leadership

Students were tasked with developing a ‘citizen science’ project to engage staff and students (pictured above). They proposed an annual ‘swift survey’ and partnered with a local charity, Action for Swifts, to run the first round.

Students from Zoology and Plant Sciences carried out summer projects looking at (i) invertebrate populations in Madingley Wood colonising the 800 Wood and (ii) genetic markers of resistance to ash dieback.
Collaborate and engage
• Members of the EAP visited Hope Farm with the University’s Rural Surveyor and several members of University Farm staff (pictured right).
• Ben Walton (biodiversity intern) and Emily Dunning (Living Lab Coordinator) visited John Day (urban biodiversity advisor at RSPB) and Richard Winspear (head of technical advice, RSPB) to understand best practice in supporting biodiversity on working farms.
• Sam Buckton collaborated with NatHistCam, The Wildlife Trust and the Botanic Gardens in developing the biodiversity baseline.

Benefits and outcomes

Effects on University operations
The Biodiversity baseline gives us a point from which we can measure future progress.

Student experience
“It’s been one of the most interesting and addictive projects I’ve ever had the privilege to work on!”
Sam Buckton, Summer 2018
Biodiversity Intern

Environmental impacts
Swift, bird and bat boxes have been put up on the University Estate. Several Green Impact teams have asked for advice on Biodiversity projects, which initiated a Social Innovation Programme project on biodiversity actions in urban spaces.

Teaching and research
At least two of the undergraduate summer students that the Living Lab funded to carry out research projects over the summer are going on to use their research as part of their final year projects.
Energy and carbon management

The Living Lab has supported a number of initiatives investigating energy and carbon emission reduction ranging from formal academic projects through to ‘hackathons’ and idea incubation.

Seek academic input

2017’s Carbon Challenge winners proposed a hydroponics project in the Dyson Building. This project has now been realised by a group of PhD students who used their technical skills to model the effectiveness of hydroponics to regulate office atmospheres.

Link research and practice

An informational poster on thin film photovoltaics was used to explore proposals to install thin film PV on University buildings. This was produced by a student, Ana-Maria Marcu. Aurelia Hibbert looked at sources of uncertainty in the Energy Cost Metric, an approach to assessing lifecycle energy impacts of construction projects. Key sources of uncertainty were associated with cost and energy prediction highlighting the need for further research with a larger sample size.

Collaborate and engage

• IARU virtual conference on business flights – 16 participants from Cambridge attended this international conference where they discussed methods to improve data capture and discouraging frequent flying.
• A Green Hackathon looking at reducing business flights in the University resulted in Peregreen and CO₂ reduction. These are both ideas for University travel planners which would compare carbon emissions, price, time and factors like WiFi availability over routes.
• Carbon Challenge – The Living Lab’s annual idea generation competition. In 2017-2018 the brief was for ideas to reduce flying across the University. The winning idea was to gamify virtual conferencing using a Massive Multiplayer Online Game (MMO) to encourage early career researchers to fly less (pictured right).
• Environment and Energy staff members and external partners ran a low carbon culture and leadership workshop with CISL.

Bryn Pickering, Carbon Challenge winner
Benefits and outcomes

Student experience
Matt Ewen
Internship 2018

Business flights are a key environmental impact of the University’s activities. This internship has involved working on improving the accuracy of the University’s scope 3 reporting for business flights, talking to other Universities to hear about what they’ve been doing and some early strategy work to reduce carbon emissions from business travel.

Environmental impacts and effects on University operations

The hydroponics project has the potential to reduce the Dyson building’s emissions and act as a pilot for future projects across the University’s estate.

Teaching and research

Aurelia’s work on the Energy Cost Metric displays how a specific research focus can be usefully applied to a particular problem on the University’s estate.
Waste management

With a range of global and national challenges in the waste management sector this year, interest in the topic of waste has been high among staff and students. High-profile campaigns and documentaries have raised consciousness of the problem of plastic waste in particular. The Living Lab has sought to capitalise on this by partnering with students and staff at the University to investigate and seek solutions to the issue.

Seek academic input

The Living Lab collaborated with the UCS to raise awareness of approaches being taken to reduce plastics within catering operations including consulting with the University’s Environmental Sustainability Strategy Committee. As part of this project, the Living Lab helped provide specialist support and advice from academics in the Engineering Department.

Link research and practice

Three undergraduate Engineering projects focused on waste management at the University supervised by Clare Barlow. These projects:

- Looked at battery recycling and auditing the University’s battery waste.
- Studied recycling habits of members of the Engineering department and developed a series of posters and educational resources for use within Engineering.
- Reviewed the use of Energy from Waste for the treatment of University waste.

The Living Lab supplied data and context and organised a visit to Mick George Ltd., the University’s waste contractor.

UCS has replaced single use plastics with compostable Vegware.

Collaborate and engage

A Social Innovation Programme project run through the Cambridge Hub looked at waste management across the University and made a series of recommendations. These ranged from quick wins on bin signage through to major structural and operational changes.

Two PhD students, Francesca O’Hanlon and Lucia Corsini, run the Cambridge edition of the #OneLess campaign where students pledge to reduce their use of water bottles. Francesca and Lucia have worked with the UCS to design University of Cambridge branded stainless steel water bottles, which are now available in all University Catering Outlets.

Benefits and outcomes

Student experience

A ‘bin busting’ exercise took place in November 2017 to find out what types of things we throw away. 16 students took part and the results have been invaluable in engaging staff and students on the topic of waste. They have been featured in the University’s sustainability newsletter, and helped the Environment and Energy section to target its recycling communications. For example, we found that a large proportion of waste is plastic laboratory disposables resulting in several departmental initiatives tackling this issue.
Sustainability in teaching and research

Seek academic input

The Living Lab provided input to the University’s Environmental Sustainability Strategy Committee and Education Committee in January 2018 to seek guidance on engaging with course leaders about the sustainability content of taught courses across the University.

Collaborate and engage

- There was a Social Innovation Programme project in collaboration with Cambridge Hub that focussed on sustainability in teaching in Lent 2018. A small group of students mapped how sustainability is taught on all undergraduate papers by reviewing course information online. This provided invaluable information informing the University’s aspirations around sustainability in teaching and research within its Environmental Sustainability Vision, Policy and Strategy.
- Student demand for sustainability content in the curriculum was assessed using the NUS Skills Survey and the Living Lab’s Student Engagement Survey, both of which are disseminated annually.

Benefits and outcomes

Teaching and research / Student experience

The University’s Education Committee was consulted for guidance on proposed approaches for auditing how sustainability is currently taught in the curriculum across the University. A new intern has also been recruited to pick up this work and move it forwards.

Culture change across the University

CISL made its “Sustainability Essentials” course available to all undergraduates at the University in collaboration with the Careers Service.

Student experience

A sustainability careers workshop run with CISL and the Careers Service gave students the opportunity to examine their motivations and passions to work in sustainability.
Partnership and student engagement

Ambitious Futures
Jaspyr Geddes-Rainbow worked with the Environment and Energy section to streamline its student engagement. She looked at student inductions and Green Officer support resulting in a student engagement strategy.

Spotlight on Sustainable Research
This month of activities focused on sustainability research around the University in February 2018.

- **Hydroponics tour** – This project to grow food and community in the Dyson building while reducing the building’s carbon footprint is the first of its kind. The tour took a number of visitors on a journey round the hydroponic units that are up and running.
- **Sustainability 101 event** – Cameron Brick from the Department of Psychology, Lucy Bruzzone from CISL, and Emma Garnett from the Department of Zoology gave short talks focussed on areas that people struggle with when encouraging sustainable behaviours in their places of work or study.
- **Sustainable research event** – Scientific research is energy and resource intensive – research uses more energy per m² than any other activity in the University, consumes large volumes of treated water and chemicals, and produces huge amounts of complicated waste. This event, run by Environment and Energy staff, gave researchers the opportunity to meet and talk about tackling this problem.

Partnership
Cameron Brick and Sander van der Linden from the Departments of Maths and Psychology offered expertise to inform Environment and Energy’s engagement work. One student, Rose Ngo, put together a handout to summarise the main psychological barriers to pro-environmental action.

Engage for Change
A ground breaking student training programme designed with and run through the Cambridge Hub, ran for the first time in Easter 2018. Students are empowered and supported to make pro-environmental change in their colleges, departments or lives. Each student identifies a project to carry out and realise within the six week period of the programme.

This results not only in development for the students but in positive change more broadly. A small group of students have gone on from Engage for Change to establish a volunteering group called Cambridge2Environment which provides volunteering opportunities for students.

Climate Forum
The Living Lab supported the annual student climate forum, attended by 220 students, in February 2018.

Green officers support
Termly meetings and pre-term webinars gave College Green Officers an opportunity to exchange knowledge on driving change in their colleges.
Future plans 2018/19

There is a new Living Lab Coordinator. We wish the old coordinator, Emily Dunning, very well on her new adventures. The new coordinator, Amy Munro-Faure, is excited to take on the uniquely exciting proposition of the Living Lab.

Biodiversity
The University’s work around biodiversity is constantly developing and this will be a focus over the next year. There will be a new Social Innovation Programme project addressing urban biodiversity. There is also a growing collaboration with the Nature, Health and Built Environment Research Group and a number of other students potentially interested in projects looking at leadership around biodiversity.

Sustainability in Teaching and Research
This is going to be a focus over the next year. With the spotlight on Sustainability growing ever brighter in public discourse, creating as many opportunities to inform education and research as possible seems essential.

Aviation
A focus on business flights carried out as part of the University’s teaching and research activities is developing into a tangible new focus area with the Living Lab Intern, Matt Ewen, providing useful insights into air travel-related data. Longer-term, the Living Lab will seek to support further examination of the issue, and to investigate effective methods of behaviour change and providing alternatives to business flights.

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