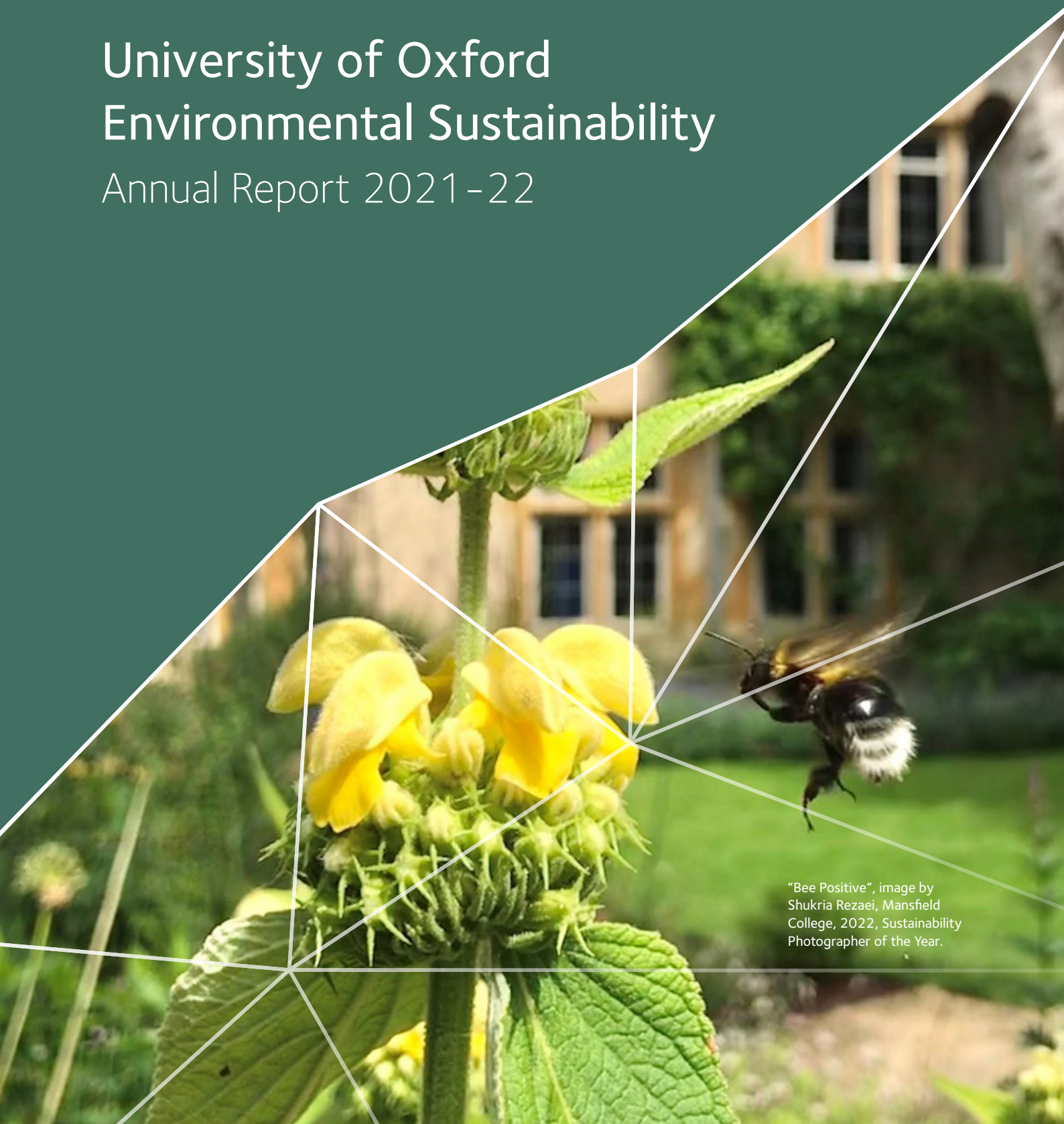
University of Oxford Environmental Sustainability

Annual Report 2021-22



"Bee Positive", image by Shukria Rezaei, Mansfield College, 2022, Sustainability Photographer of the Year.

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Foreword by Harriet Waters

2021 – 2022 has been a fascinating time for the Environmental Sustainability team. The Environmental Sustainability Strategy had been adopted the previous year, committing us to achieving net zero carbon and net gain in biodiversity by 2035, but this year we started working in earnest to reach these goals.

We have spent much of the year in planning mode, whilst we set up the mechanisms behind the Oxford Sustainability Fund and developed policies and targets to support the implementation of the strategy. Crucially we have brought in an international travel policy, with a flight reduction target, more sustainability-focused guidance and a carbon levy on flights paid for by the University. Tackling emissions from flying which have traditionally been an increasing indirect (Scope 3) set of emissions is a really important development and shows that there are actions that can be taken to reduce our Scope 3 emissions. Another way of tackling indirect emissions is the work we have done on waste reduction. We now have waste reduction and recycling targets, with a pilot scheme which will increase our knowledge of what the barriers are to reaching these. Reducing flights and waste will also reduce our supply chain impact on biodiversity, a true win-win.

Direct emissions from University buildings are still a very high priority, but we now have a published approach for how we account for these, and we have started to develop four clear workstreams to progress towards our ultimate net zero goal.

With the upcoming legislative requirements for biodiversity net gain, biodiversity on our estate will be increasingly important in the next year. With that in mind, we are assessing the data available on our estate, repeating our environmental profit and loss report to look for any biodiversity impact trends and taking on a biodiversity officer. Our commitment to raising awareness and engagement with biodiversity was highlighted across the University by events such as the Meat the Future exhibition at the Museum of Natural History, numerous events and activities at Wytham, and the celebration of the 400th anniversary of the Oxford Botanic Garden.

This year, for the first time since summer 2019, we celebrated the Vice Chancellor's Environmental Sustainability Awards. At last, we could come together with the hundreds of people across the University who are delivering the day-to-day work and decisions to promote environmental sustainability in University departments and colleges. Over a hundred LEAF (Laboratory Efficiency Assessment Framework) and Green Impact teams worked this year, hundreds of students, academics and colleges, groups and individual initiatives, are all part of the growing movement in the University dedicated to leading the way for environmental sustainability.

In order to deliver the strategies, polices and initiatives needed to achieve our goals, our team will be expanding over the coming year. Implementing the strategy over the coming years is not going to be easy. In some areas we are not yet sure how to do it. But there is a real sense of hope and enthusiasm, which we hope to harness.

Harriet Waters
Head of Environmental Sustainability

Introduction

This report reviews the environmental sustainability work of the University of Oxford between August 2021 and July 2022.

It focuses on the University's functional estate – the buildings that are used for its day-to-day activities. It includes all the buildings and facilities that either support or directly deliver research or education, such as specialist research buildings, teaching laboratories, lecture halls, sports facilities, libraries, museums, offices, and ceremonial buildings.

Information relating to carbon emissions has been based on invoiced consumption or value. The carbon footprint has been calculated in line with the University of Oxford Emissions Report. The report does not cover the operations or buildings of the colleges or of Oxford University Press, which are independent entities.

We trust that you will find the information useful. We would welcome feedback from our readers to help us continue to improve the way we communicate our environmental sustainability performance.

For more information, contact the Environmental Sustainability team.
Email: sustainability@admin.ox.ac.uk
Phone: + 44 (0) 1865 6 14605
Website: sustainability.admin.ox.ac.uk

@OxfordEnvSust

"Resilience",image by Daphne Parramon-Dhaw, 2022 Winner, Sustainability Photographer of the Year.

Section 1: Introduction

Overview

This year has seen many significant developments in environmental sustainability. In November 2021, world leaders gathered at the COP26 conference to agree a path towards fulfilling the Paris Agreement. Extreme weather events became more frequent and severe, from record-breaking world-wide temperatures to raging wild-fires and floods, providing a glaring and unavoidable message that urgent action is needed to reduce global emissions and support biodiversity. Meanwhile, the global energy crisis placed discussions of energy supply, usage, and efficiency centre-stage.

This report details the bold, necessary action the University is taking in response to the climate crisis.

2021-22 saw significant progress toward the Environmental Sustainability Strategy's headline target of achieving net zero carbon and biodiversity net gain by 2035.

The Environmental Sustainability Subcommittee (ESSC) approved important targets and policies aimed at reducing carbon emissions. This included the Carbon Management Scheme, setting out the University's approach to net zero carbon emissions. Alongside this, the Oxford Sustainability Fund (OSF) was set up, providing £200 million over 15 years for University sustainability initiatives. The introduction of a new travel policy seeks to reduce indirect (Scope 3) emissions, including a flight reduction target, and a carbon levy for all University related flights.

The ESSC Biodiversity subgroup identified the priority actions needed for the attainment of biodiversity net gain. Meanwhile, the University continued to lead global action on ecosystem restoration and serve as a centre for biodiversity education and research. The University launched the Alliance of Nature-Positive Universities in collaboration with the United Nations Environment Programme (UNEP). Wytham Woods, the University's research woodland, marked the 75th anniversary of the Great Tit study - the longest running study on an individually marked animal population in the world.

Additionally, the Oxford Environmental Sustainability team continued to offer opportunities to engage with environmental issues through the Green Impact and LEAF (Laboratory Efficiency Assessment Framework) schemes.

As we look forward to a new academic year, we hope this report can offer information but also a sense of optimism and hope for important institutional action on environmental sustainability.

Structure

This report presents the highlights of the environmental sustainability work within the fields of carbon emissions and biodiversity. It details the progress made towards the headline Environmental Sustainability Strategy goals of net zero carbon and biodiversity net gain by 2035 up to July 2022.

The report presents carbon accounting and biodiversity profit and loss due, to University activity in the recent year. The data is also available in the University's Financial Statements. The methodologies to calculate and present carbon emissions and biodiversity impact are detailed in the 2019-2020 Emission Accounting report and Environmental Profit and Loss report respectively.

The report also lists several further activities delivered by the Environmental Sustainability team and others, as examples of the actions taken to deliver the environmental strategic goals.

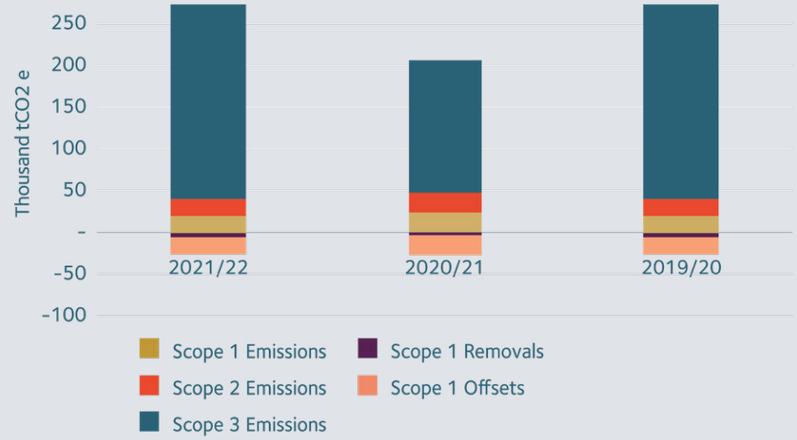
"Let it grow!"
Image by Jack Frowde,
2022 Sustainability
Photographer of the Year.

Section 2: Carbon

The University's Environmental Sustainability Strategy, approved by Council in 2021, states the University's commitments to achieving net zero carbon emissions and a net gain in biodiversity by 2035. The strategy lists ten priority focuses for achieving these goals.

In 2022 the University published our own approach to carbon emission reporting tailored to the needs of the institution. This approach, based on existing protocols, offers a reliable measuring and reporting of carbon equivalent emissions from University operations, including direct sources and indirect sources. The table below offers a categorised summary of emissions from the University. The emissions, representing data for 2021-22 academic year are calculated, where possible, using physical measurements and UK conversion factors. Between 2019-20 and 2021-22, Scope 1 carbon emissions increased by 10%. This reflects residual additional heating demand to accommodate COVID mitigation measures. It should be noted that this overall increase represents a 20% improvement on 2020/21 figures when gas use increased significantly to maintain heated, fresh air in University buildings. Scope 2 carbon emissions fell by 9% over the same period, following a demand reduction of 2% and a fall in the UK grid carbon factor. Scope 3 emissions dropped by 31% between 2019/20 and 2020/21 before increasing back to trend in 2021/22. This is mainly due to a dip in purchased goods and services, employee commuting and business travel.

Oxford University Annual Carbon Emissions



University of Oxford Carbon Emissions (tCO2e)	2021/22	2020/21	2019/20
Scope 1 Emissions	19,854	25,009	18,097
Scope 1 Removals	- 4,534	- 4,534	- 4,534
Scope 2 Emissions	20,737	21,487	22,883
Scope 2 Offsets	- 20,737	- 21,487	- 22,883
Scope 3 Emissions	230,823	158,406	229,356
Total Gross	**271,414**	**204,901**	**270,336**
Total Net	**246,143**	**178,881**	**242,919**

The Carbon Management Scheme

In 2022, the Environmental Sustainability Strategy Subcommittee (ESSC) approved the Carbon Management Scheme. The scheme outlines the University's approach to meeting the target of net zero carbon emissions by 2035.

The scheme consists of four key measures that work together to move the University toward a carbon-free future:

Energy Efficiency

The University will reduce its carbon footprint by investing in projects to improve the energy efficiency of buildings. These projects work on a 'spend to save' basis – investment in installations and upgrades to lighting, heating, and building materials will reduce carbon emissions while also saving money in the long term. The Carbon Management Fund allocates £1 million per year for this purpose.

Heat Decarbonisation

Heating buildings is a major source of the University's carbon emissions. Making the switch to low carbon heating systems will play an important part in reaching net zero. This year, £298,000 BEIS funding was secured to identify options and begin planning the decarbonisation of heat at the University. This would include sites in the Old Road Campus and the Science Area. Low carbon heating systems are now being piloted in the Oxford city centre and in rural locations.

Low-carbon Standards

This year, the Mechanical and Electrical Design (M&E) philosophy, which sets the standard for all new University builds, is being re-launched with a greater focus on energy efficiency and environmental sustainability. Work has also started to review the University Sustainability Design Guide to ensure that capital investment projects over the value of £1 million are subject to rigorous environmental sustainability standards.

Carbon Offsetting

The University prioritises the reduction and removal of carbon emissions. However, some carbon emissions are unavoidable. Reaching net zero will require offsetting these unavoidable carbon emissions. Carbon offsetting is included in this report for completeness but is not due to be adopted until 2030.

Oxford Sustainability Fund

In 2022, the Oxford Sustainability Fund (OSF) was established to provide £200 million over 15 years for sustainability initiatives within the University. The OSF will play an important role in reaching the targets of net zero carbon and biodiversity net gain by 2035 through funding vital projects and initiatives.

The OSF is a step forward from the existing Carbon Management Fund, which has supported carbon reduction projects since 2013.

The following table accounts for the sum spent on carbon management projects during 2021-2022.

Type of project	Sum of Spend 2021-22
Building fabric	£409,605
Building services	£419,866
Project management	£183,987
IT	£186,864
Behaviour change	£19,117
Building Management Systems (BMS)	£19,007
Equipment replacement	£36,323
Grand Total	**£1,274,770**

Carbon Management Fund in numbers

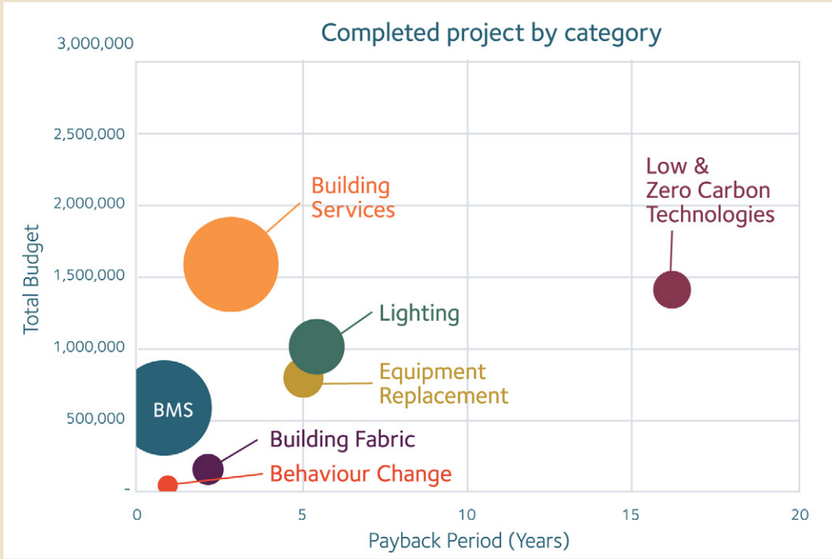
Total spend since 2013
£7,485,316

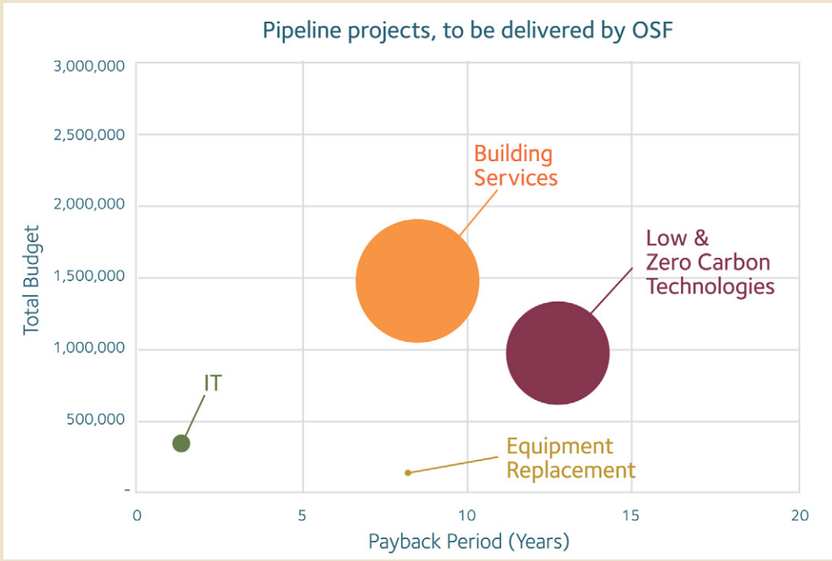
Annual energy savings
£1,884,376

Carbon savings tCO2e/ year
7,121

Project average payback period
3YEARS

The following charts present projects delivered by the CMF between the years 2013-2022.





Note: Bubble size reflects carbon savings.

Image by Susan Davis, Terri Adams in her glassblowing workshop in the department of Chemistry.

Carbon Reduction Projects

Below are some examples of carbon reduction projects from across the University:

Draught proofing system

Installing an innovative draught proofing system to reduce draughts from glazing across the University, assists in reducing heat and energy losses. The system, suitable for listed buildings, has been tested and successfully installed in the Weston and Old Bodleian buildings and is now approved for installation in more than 60 other University buildings.

Draught proofing a window at the Bodleian Library

IT efficiency projects - IT server room improvement

Following a successful pilot in the department of Engineering Science which reduced the energy expended on cooling by over 70%, the University is now making similar changes in larger scale IT server rooms.

The new technology adjusts the cooling system in line with the server load rather than running it at a set level the whole time, thus saving energy at times when server usage is lower. Three IT server rooms now have this technology installed.

The systems are expected to reduce energy spent on cooling by at least 40%. The next step will include capturing the heat generated by the servers for use elsewhere, thus increasing the efficiency of the building as a whole.

Glassblowing workshop project

The glassblowing workshop, located in the department of Chemistry, designs, constructs and repairs glass scientific research equipment.

The project was initiated by the building managers with the aim of improving ventilation in the glassblowing workshop, managed by Inorganic Chemistry Laboratories.

The project addressed ventilation, heat recovery, energy efficiency and maintenance requirements. The result has been a more comfortable working environment, alongside a reduction in heat and energy demands.

This project is an example of how a holistic approach can reduce energy demands as well as improve working conditions in the space.

Section 2: Carbon

Reducing Scope 3 Emissions

Scope 3 emissions include all indirect emissions, which come from sources owned or controlled by other entities in the value chain and third-party payments.

These include materials suppliers, third-party logistics providers, waste management, travel, etc.

Scope 3 emissions are more difficult to capture, manage and thus reduce. The University's supply chain is varied and distributed which requires addressing data from diverse and dispersed sources.

International Travel Policy

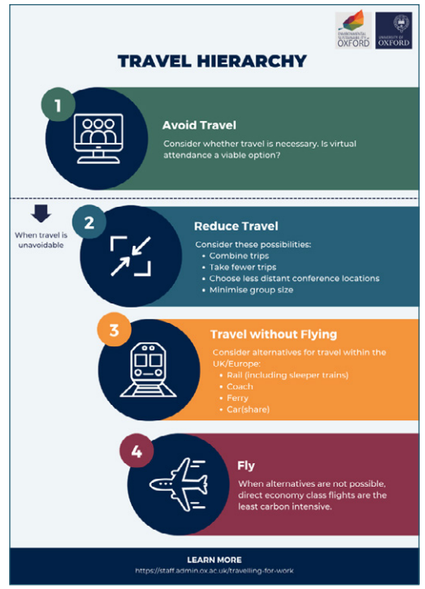
The University has taken steps to reduce its Scope 3 emissions due to flights.

Flights are a significant source of the University's Scope 3 emissions. During spring 2022, the Planning and Resource Allocation Committee (PRAC) approved a travel policy setting a flight reduction target of 20% by 2024/25 against the 2018-2019 base line. Additional targets were set to achieve an additional 10% reduction by 2030/31, and a further 5% reduction by 2034/35.

The travel policy sets out a range of measures to reduce carbon emissions from business flights taken by the University.

These include:

1. Introducing a travel hierarchy for business travel.
2. Setting a flight levy of £30/tCO2e on all flights made on University business, to compensate for flights' carbon emissions. The levy will be allocated to the OSF to fund reduction of carbon emissions from University buildings. The flight levy rate will be reviewed every two years.
3. Setting rail as the default for domestic journeys under seven hours.
4. Setting Eurostar as the default means of transport to Paris and Brussels.
5. Not permitting first-class flights.
6. Required pre-approval process for premium economy and business-class flights.



Waste

As part of the implementation of the strategy, the subcommittee set two major waste reduction and recycling targets:

- **10% reduction in total waste mass per staff and student, and**
- **40% recycling rate from total waste mass by 2025.**

Additionally, a pilot project in two University buildings examined the barriers to increasing recycling rates and offered solutions that are being tested during the 2022-23 academic year. These solutions relate to areas including infrastructure, staff and student engagement, and modifying cleaning contracts.

Work done by interns in summer 2022 identified additional means to reach waste reduction targets, such as assessing single-use plastic use in laboratories.

Waste and recycling engagement at the Manor Road building as part of a pilot project to reduce waste and increase recycling rates.

Capital Projects

In 2017 the University adopted its Sustainability Design Guide (SDG) with a focus on reducing carbon emissions from capital projects through a 'fabric first' approach. The guide has led to a reduction in carbon emissions in new builds. However, the guide falls short in setting principles for use by the University when required to decide the best value for money with regard to sustainability interventions.

In 2022 the following refurbishment principles were agreed:

- Stating that refurbishing buildings should be prioritised over rebuilding them, as this will have lower lifecycle carbon emissions in most cases;
- setting minimum efficiency principles for building fabric improvements (e.g. draught proof, insulation, etc.); and
- removal of gas heat sources should be prioritised and supported by other low carbon technologies.

The SDG is currently being updated. The new version will include more principles for use at the design stage of a project, including a framework for making decisions on refurbishment vs demolition, a flexible approach to certification to various standards and a strengthened biodiversity requirement. In addition, lifetime cost of carbon has been set as the favoured metric to assess the benefit of future interventions.

Institute for Global Health building at Old Road Campus.

An approximately 4,500 square meters building that is set to be used for research, teaching and office space.

The building is designed to meet Passivhaus certification requirements. It is designed to have robust insulation and excellent energy efficiency. The building will be fully powered by electricity, eliminating all building related Scope 1 carbon emissions.

The Stephen A. Schwarzman Centre for the Humanities building

The Stephen A. Schwarzman Centre for the Humanities building is aiming for Passivhaus certification. The building is shaped to reduce surface area with architectural detailing to minimise thermal bridges and improve insulation to deliver superb energy efficiency and user comfort. The building will not have an independent gas connection, although at least in the early stages it will be able to draw heat from gas boilers at the neighbouring Andrew Wiles Building if necessary. This will be among the biggest buildings in Europe to incorporate these technological and design elements.

Architecture image of the proposed Institute for Global Health Building

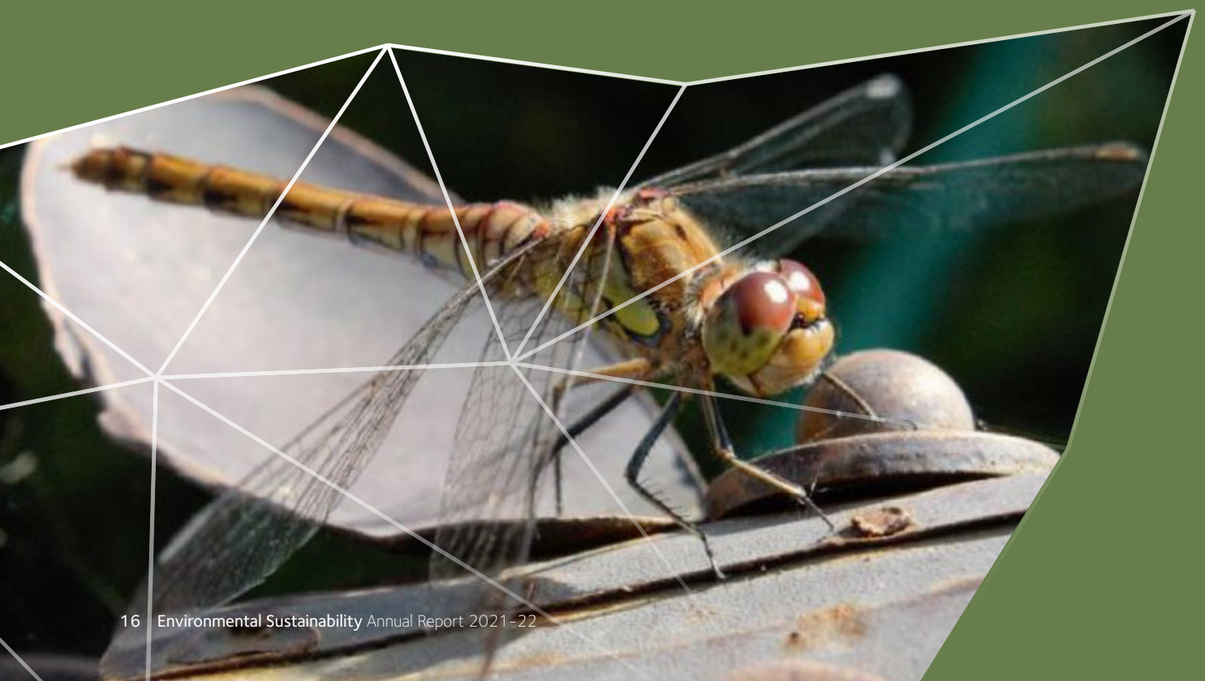
Section 3: Biodiversity

Biodiversity is crucial to supporting all life on Earth. In the context of the precipitous decline of animal and plant species in recent years, positive biodiversity impact must be a goal for organisational environmental sustainability strategies.

The strategy has a headline target of biodiversity net gain by 2035. Addressing the University's principal biodiversity impacts through its operations and supply chain, as well as, enhancing biodiversity on the University's estate.

This year, a biodiversity subgroup identified priority actions for the academic year, which will begin with a comprehensive mapping of the ecological data available across the University estate. This data will enable the University to identify priority areas where biodiversity on the University estate can be enhanced. Meanwhile, the University continued to be a global pioneer and play an important role in biodiversity action, learning, and research.

"Dragon", image
by Vikki Rose, 2020
Sustainability Photographer
of the Year



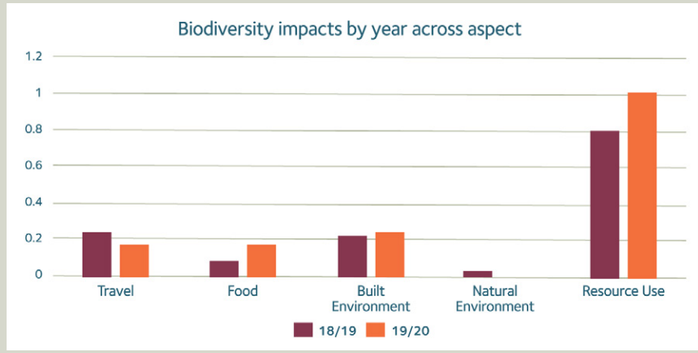
Biodiversity impact report

In the 2020/21 Financial Statement, the University introduced quantified reporting on biodiversity net gain for the first time. This identifies and addresses University biodiversity impacts across operations and the supply chain, and aims to offer means to enhance biodiversity on the University estate. Oxford University has set the strategic ambition to achieve a net gain in biodiversity by 2035.

The first biodiversity impact assessment performed for Oxford in 2020 considered the 2018/19 year. The second, in 2021, considers the 2019/20 year and applies different methodology, in line with rapidly progressing scientific literature on the topic. The assessment methodology has been refined and these results are presented here, for years 2018/19 and 2019/20. The variation in resource use is likely to be caused by reduced spend on goods and services due to COVID closures. Paper and cardboard, for instance, have a high supply chain impact.

The analysis represented in this chart confirms that the majority of the impact on biodiversity associated with University activities is caused by greenhouse gas emissions (GHG). This finding confirms that throughout the supply chain, greenhouse gas emissions associated with that supply chain have the greatest impact on global biodiversity.

The accounts are scheduled to be brought up to date, including 2021/22 data by summer 2023. All updated reports will be available on the University Environmental Sustainability website.



Nature Positive Universities Network

In November 2021, the United Nations Environment Programme (UNEP) and the University of Oxford launched the network of Nature Positive Universities - an alliance of universities world-wide on a mission to restore biodiversity within their operations and supply chains.

The network is part of the UN Decade of Ecosystem Restoration, post-2020 Biodiversity Framework, and the Sustainable Development Goals. It demonstrates the collaborative, global approach needed for impactful institutional action to preserve the natural environment.

So far over 300 universities have expressed an interest in joining the alliance. Which will implement changes to research, teaching and other activities to restore biodiversity in their campuses, cities, the wider communities in which they are embedded, and beyond.

Biodiversity Research and Learning

In April 2022, the Oxford Department of Zoology, Environmental Sustainability team, and the University of Kent published an assessment of the University of Oxford's biodiversity impact in the leading scientific journal, Nature.

The study is ground-breaking for being the first of its kind to provide a methodology to assess the biodiversity footprint of large organisations.

Working closely with the University's Estates team, researchers conducted a comprehensive assessment of the broader environmental impact and biodiversity losses associated with day-to-day running of the University, including factors such as purchasing data, travel bookings and utility bills, from the 2018-19 and 2019-20 academic years.

The research sets a baseline for the University's biodiversity impact and modelled options for the University to pursue actions to address the impact.

"Oxford has a wealth of world-leading expertise in climate and environmental science, and a major strength of the University's Sustainability Strategy is that it was developed and evidenced in collaboration with our own researchers."

Harriet Waters, Head of Environmental Sustainability at Oxford University, and a co-author of the study.

READ MORE

Wytham Woods

The Great Tit study is the longest continuous study of an individually marked animal population in the world.

This year, Wytham Woods, the University's research woodland northwest of Oxford, marked the 75th anniversary of the Wytham Woods Great Tit study - the longest running study on an individually marked animal population in the world. Notably, University of Oxford scientists found that the Great tit population are hatching a month earlier in 2022 than when the study started in 1947 – a clear indication of how animal populations are responding to the changing environment.

Wytham Woods also continued to serve as an important space for citizen environmental education. Wytham researchers brought environmental science to Glastonbury Festival 2022 as part of 'Sex & Bugs & Rock 'n Roll' campaign. The Woods also received a Vice-Chancellor's Award for the 'Classroom with Leaves' project educating students on woodlands.

Wytham Woods contributing to new science area based in the Green Futures Field at Glastonbury Festival.

Biodiversity Action

The Environmental Sustainability team continues to promote opportunities for individual and group action and engagement on biodiversity.

The Green Impact Scheme once again encouraged the University community to take positive action on biodiversity, from growing produce to setting up bug hotels and bird feeders. This year 13 Green Impact teams took action to improve biodiversity in their area by adding wildlife habitats and wildflower patches.

Nature Conservation Society

This year, an exciting project led by the Oxford University Nature Conservation Society saw students establish a biodiversity garden on the History Faculty grounds. This pilot project showcases the native wildflower and grasses of Oxford, as well as providing a functional space for nesting and feeding.

Images from Oxford University Nature Conservation Society social media

Section 4: In case you missed it

LEAF

This was the second year that the University offered the Laboratory Efficiency Assessment Framework (LEAF) scheme. The scheme helps laboratory managers to identify practical steps to make their labs more sustainable, covering all aspects of lab operation and use.

Participation rose from 23 to 77 lab teams across the Medical Sciences, MPLS, and Social Sciences divisions. The scheme was also recognised for the first time at the Vice-Chancellor's Awards.

In the coming year, we seek to engage more labs in the scheme, and to collect precise data on the carbon and financial savings made by participating labs.

The Queen's Platinum Jubilee Challenge

This year, representatives of Oxford University took part in the Queen's Platinum Jubilee Challenge aiming to encourage leading UK universities and further education colleges to work together to tackle challenges of the higher education sector in reaching net zero carbon. The Queen's Platinum Jubilee Challenge includes a Student Challenge that aims to encourage innovative thinking from students. Nine teams of Oxford students submitted a project proposal to the challenge presenting a variety of brilliant ideas to reduce carbon emissions and promote sustainable behaviours at the University.

Energy Invoicing and reporting

Accurate energy usage reporting is crucial to environmental sustainability.

Each year, Oxford Environmental Sustainability processes over 10,000 invoices for the University estate. We record a range of data including energy certificates, metre readings and waste.

All buildings and facilities within the University's functional estate can request access to view their energy usage by contacting: energyteam@admin.ox.ac.uk.

Utility contracts

The Environmental Sustainability team is always working on ways to manage and improve the University's utility contracts. This year, the University signed a new contract with EDF, ensuring the ongoing purchase of renewable energy. Additionally, the University's water contract was switched to Wave, a company that has established its credentials in assuring efficient water use, supplying us with automatic meter readings and data on water consumption. Alongside this, the team successfully implemented a strategy to control expenditure and protect the University from energy price spikes.

"Wings", image by Aimee Stewart, Nuffield Department of Surgical Sciences, 2022 Sustainability Photographer of the Year

Conclusion

Moving forward with implementing the University's strategic goals for environmental sustainability is a complex process that requires cooperation with all colleagues from across the University community.

The immediate challenge facing the University at the time of writing this report comes from the soaring energy prices and predictions of further price increases beyond 2022. These lead to unplanned operational costs for the University. The University's gas and power purchases are over 80% hedged through the 2022/23 financial year. This provides a degree of budget certainty for the current financial year. The remaining cover will be sought as rates and market liquidity improve.

As part of the Environmental Sustainability Strategy and with the goal of reducing carbon emissions in mind, the University has been putting efforts into reducing its energy consumption, particularly gas. Energy efficiency and reducing demand remain the primary measures for mitigating price risks. A reduction of 10% in gas consumption would reduce costs by 17%. A reduction of 10% in electricity consumption would reduce costs by 19%. The University has reduced much of the excess gas demand seen during 2020/21 as a part of efforts to mitigate COVID risks. Gross emissions from electricity continue on a downward trend.

Overall, Scope 1, 2 and 3 carbon emissions have remained constant between 2019/20 and 2021/22. A significant drop in emissions 2020/21 was experienced. This was mainly due to reduced purchased goods and services, employee commuting and business travel.

The coming year is expected to offer plenty of opportunities for staff and students to engage with environmental sustainability through Green Impact, LEAF, and Sustainable Students Oxford (SSO) network. We extend an invitation to all staff and students to take action and pursue better environmental practices in their department, building, lab or team.

Get in touch

Email: sustainability@admin.ox.ac.uk
Phone: +44 (0) 1865 614605
Website: sustainability.admin.ox.ac.uk

@OxfordEnvSust

ENVIRONMENTAL SUSTAINABILITY at OXFORD

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