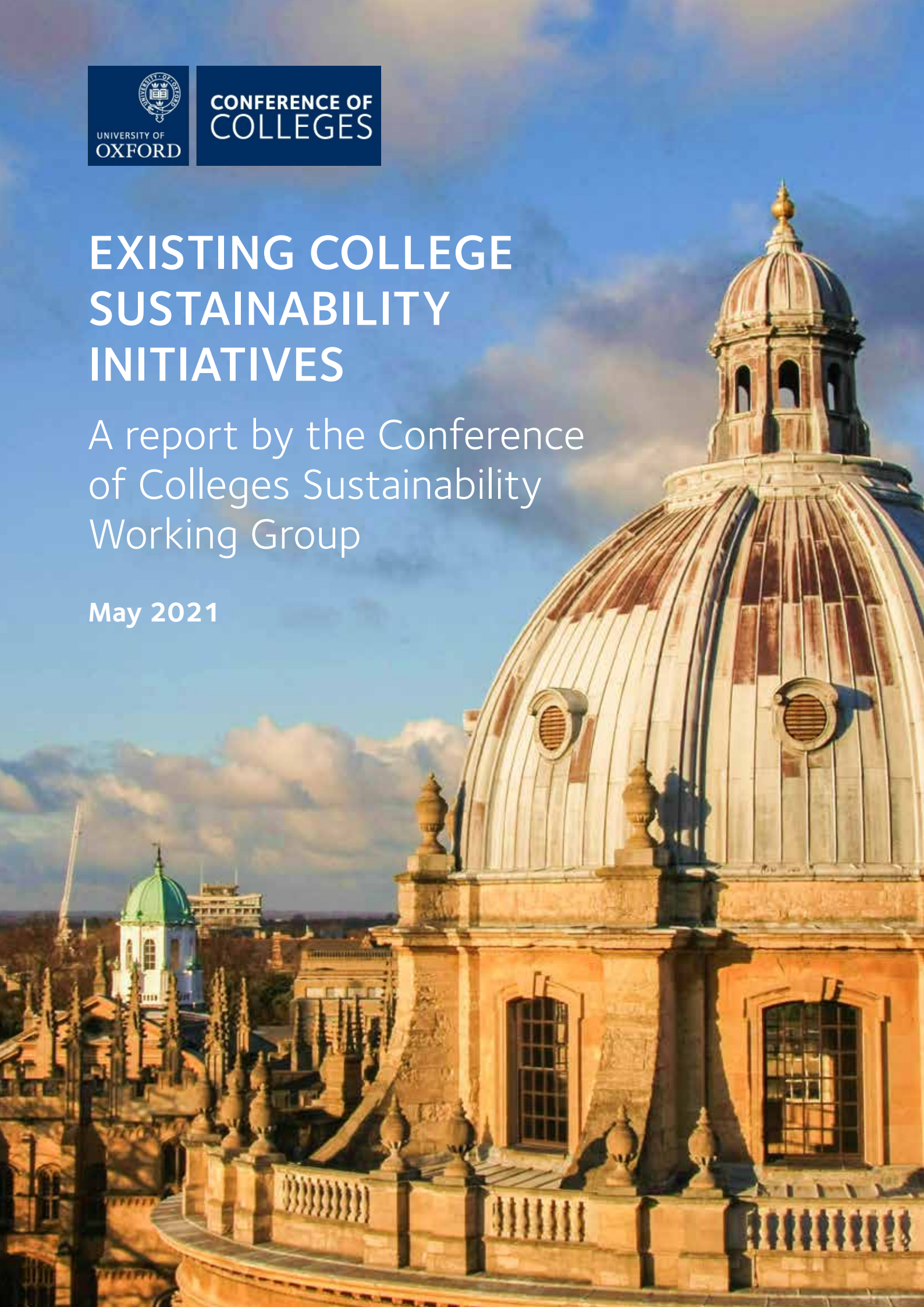
UNIVERSITY OF OXFORD

CONFERENCE OF COLLEGES

EXISTING COLLEGE SUSTAINABILITY INITIATIVES

A report by the Conference of Colleges Sustainability Working Group

May 2021



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Front and back cover
Photo credit: Adrian Scottow

Left: **Solar panels at Wolfson College.**
Photo credit: Barry Coote

Background and Introduction

We are living in a time of global environmental crises. Increasing global temperatures and unprecedented levels of biodiversity loss – both anthropogenically driven – have resulted in environmental change at a scale not seen before in human history.

As a result, every individual, organisation, and institution across the world is now having to stop and think about the consequences of their activities for the environment and make plans to reduce impact, transition to net zero carbon, and restore biodiversity.

The thirty-nine colleges and six permanent private Halls (PPHs) that form an integral part of the University of Oxford are not exempt from this process. Over the past decade, a quiet revolution has been occurring in the colleges and PPHs with the implementation of numerous actions and activities to make them more environmentally sustainable; aiming to reduce impact, manage resources in a sustainable way, and to conserve and enhance biodiversity. One issue, however, is that each college and PPH operates as a semi-independent entity. So, the actions taken, and their relative merits and successes, are not widely known, either by other colleges and PPHs or in the wider community.

This document, which has been collated by the Conference of Colleges Environmental Sustainability working group, aims to fill this knowledge gap by sharing details of the existing and planned sustainability initiatives within the colleges and PPHs. It showcases the many and varied positive actions already underway, their merits, successes and so metimes challenges involved. Its format is designed to share information and good practice and inspire positive change and wider engagement amongst the collegiate community.

Building on this report, in the next 12 months we aim to establish a comprehensive picture of the current environmental footprint of the collegiate community through an audit exercise examining energy usage, production of waste (plastic, paper, food, other) and biodiversity assets in each college and PPH. We will use this evidence-base to collectively and individually set meaningful targets for reducing environmental impact and enhancing biodiversity across the colleges and PPHs and align in our aim of becoming as close to net zero carbon as possible.

Alongside what is happening in the colleges and PPHs there is much work taking place within the University and the wider Oxford community. The Oxford University Environmental Sustainability Strategy will be published later this year, addressing nine priority areas to reach the target of achieving net zero carbon and biodiversity net gain by 2035. The Conference of Colleges and the University have also recently joined the City Council initiative of Zero Carbon Oxford, which brings together Oxford's major businesses and organisations to support plans for achieving net zero carbon emissions as a city by 2040.

The ultimate ambition must be for the colleges, PPHs, University and City Council to align and share in their actions and ambitions to make Oxford be a truly environmentally sustainable city. This report represents our first step towards achieving this aim.

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Right: **The Living Wall on the Kelly building, St Edmund Hall.** Photo credit: John Cairns

College Sustainability Contacts

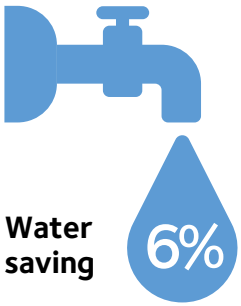
College/PPH	Code	Key contacts
All souls	**SOULS**	Rima Dapous, Domestic Bursar Thomas Seaman, Estates Bursar
Balliol	**BAL**	Fran Wright, Domestic Bursar Toby Christensen, Buildings Manager Bertrand Faucheux, Executive Chef
Blackfriars	**BFRS**	Very Revd Dr John O'Connor OP, Regent Anneli Chambliss Howes, Bursar
Brasenose	**BNC**	Matthew Hill, Domestic Bursar James Hellyer, Accommodation Manager
Campion Hall	**CAM**	Alec Thorp, Bursar
Christ Church	**CHCH**	Professor Malcolm McCulloch Pauline Linieres-Hartley, Steward Jon Down, House Surveyor
Corpus Christi	**CCC**	Nicholas Melhuish, Bursar Andrew Rolfe, Domestic Bursar
Exeter	**EXE**	Professor Sir Rick Trainor, Rector Nick Badman, Finance and Estates Bursar Babis Karakoulas, Domestic Bursar
Green Templeton	**GTC**	Sir Michael Dixon, Principal Dr Tim Clayden, Bursar Teresa Strike, Domestic Bursar Elaine Huckson, Operations Manager (Catering & Events) Steve Williams, Clerk of Works
Harris Manchester	**HMC**	Professor Jane Shaw, Principal
Hertford	**HERT**	Tom Fletcher, Principal Jamie Clarke, Bursar Gareth Tebbutt, Domestic Bursar
Jesus	**JESUS**	Ruedi Baumann, Director of Accommodation Catering and Conferences
Keble	**KEB**	Nick French, Domestic Bursar Stephen Cooke, Bursar
Kellogg	**KEL**	Gary Walker, Finance Bursar Dr Sandie Byrne, Sustainability Fellow Rodrigo Hernandez, Green Impact Coordinator
Lady Margaret Hall	**LMH**	Bart Ashton, Domestic Bursar Penny Hall, Accommodation Manager
Linacre	**LCRE**	Simon Barker, Domestic Bursar
Lincoln	**LINC**	Michele McCartney, Domestic Operations Manager Alex Spain, Bursar
Magdalen	**MGD**	Mark Blandford-Baker, Home Bursar Professor Tim Barraclough, Chair of Sustainability Forum
Mansfield	**MANS**	Nick Clements, Deputy Domestic Bursar
Merton	**MER**	John Gloag, Estates Bursar Tim Lightfoot, Domestic Bursar
New College	**NEW**	Gez Wells, Home Bursar Michael Collett, Clerk of Works Professor Barbara Rossi, Sustainability Fellow

Nuffield	**NUF**	Tom Moore, Bursar Gary Hamblin, Site Manager Olivier Goddet, Conference and Catering Manager
Oriel	**ORI**	Wilf Stephenson, Treasurer Steven Marshall, Domestic Bursar Jim Brown, Surveyor and Master of Works
Pembroke	**PEMB**	Mike Naworynsky, Home Bursar Charles Harris, Deputy Home Bursar
Queen's	**TQC**	Dr Claire Craig, Provost Marie Bracey, Domestic Bursar
Regent's Park	**RPC**	Revd Dr Robert Ellis, Principal Mike Freeman, Director of Operations
Somerville College	**SOME**	Baroness Royall of Blasidon, Principal Dr Michelle Jackson, Chair of Sustainability Group Andrew Parker, Treasurer & Domestic Bursar
St Anne's	**ANNES**	John Banbrook, Domestic Bursar
St Anthony's	**SANT**	Dr Tanya Baldwin, Bursar Matthew Morgan, Domestic Bursar
St Benet's Hall	**SBH**	Grahame Smith, Bursar Jason Bean, Maintenance Manager JCR Committee
St Catherine's	**CATZ**	Ian Wright, Home Bursar
St Cross	**STX**	Carole Souter, Master John Tranter, Bursar Suzy Hodge, Domestic Bursar
St Edmund Hall	**SEH**	Professor Katherine Willis, Principal Dr Charlotte Sweeney, Domestic Bursar Stephen Lloyd, Estates Manager
St Hilda's	**SHIL**	Chris Wood, Bursar Neil Hyatt, Head of Buildings & Projects Alex Horsfall-Turner, College Surveyor
St Hugh's	**SHUG**	Colin Bailey, Head of Estates
St John's	**SJC**	Ian Stokes, Master of Works Tim Verdon, Home Bursar
St Peter's	**SPC**	Douglas Shaw, Bursar Lidia Hemmings, Facilities Manager
St Stephen's House	**SSH**	Alison Parker, Bursar
Trinity	**TRIN**	Lynne Adam, Domestic Bursar
University	**UNIV**	Angela Unsworth, Domestic Bursar Rob Mercer, Catering manager Huw Davies, Buildings and Maintenance Manager Shane Pledge, Accommodation and Facilities Manager
Wadham	**WAD**	Frances Lloyd, Domestic Bursar Chris Cox, Buildings Services Manager
Wolfson	**WOLF**	Barry Coote, Home Bursar (Estate and construction) Richard Morin, Bursar (College capital programme and budgets) Sir Tim Hitchens, President (overall strategic direction)
Worcester	**WORC**	Dr David Steinsaltz, Chair of Joint Sustainability Committee Simon Bagnall, Head of Gardens and Grounds Mary Woodward, JCR Environmental representative Richard Noonan, Head of Works
Wycliffe Hall	**WYC**	Revd Dr Liz Hoare, Dean for Women, Tutor for Spiritual Formation

Existing Initiatives

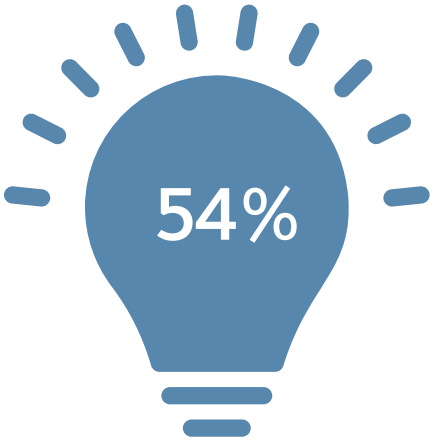
In 2020 colleges were invited to complete a survey detailing their ongoing, planned or recently completed projects across four key areas of sustainability: energy saving, water saving, biodiversity enhancement and waste reduction. The four categories align with those of the baseline audits that colleges will be asked to complete in due course. This report sets out the results of this survey.

A total of 494 actions have been reported across 44 Colleges



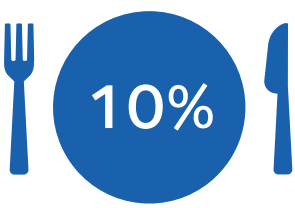
Water saving

Biodiversity enhancement



Energy saving

Waste reduction

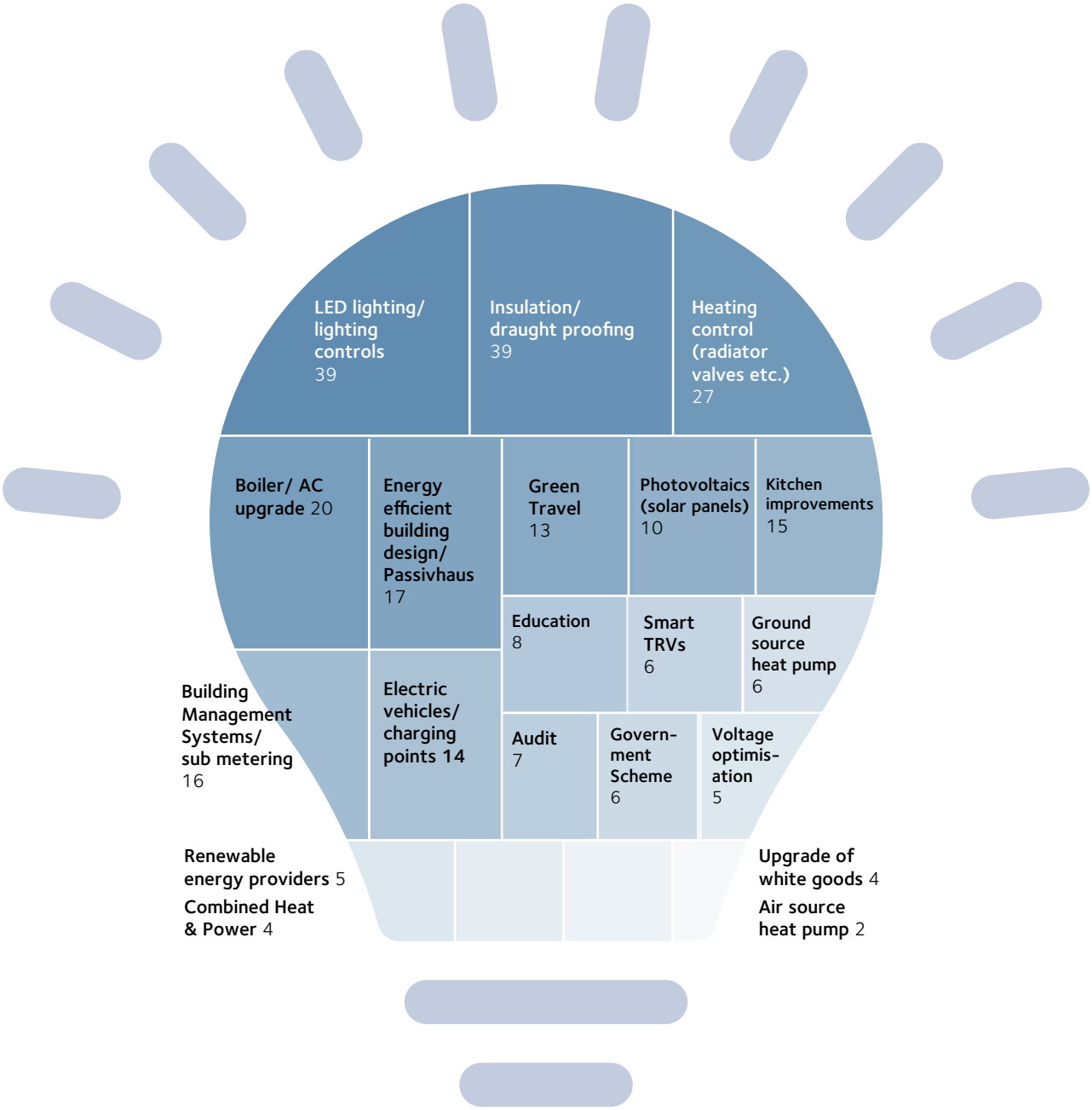


Other

Wolfson College meadows
Photo credit Barry Coote

Energy Saving

This is the largest reporting area for colleges, with 95% of colleges reporting implementation of energy saving initiatives across the following categories



Reducing Heat consumption

Insulation and Draught Proofing

SOULS, JESUS, GTC, HMC, KEB, MER, NEW, SANT, SEH, SOME, SJC, WOLF, UNIV, CATZ, WAD, BNC, KEL, HERT, ORI, RPC, STX

Draught proofing and additional insulation to walls and rooflines are the most reported energy saving actions across colleges. One college measured a 25% reduction in electric and gas use over the year before and after refurbishment of student accommodation blocks. For windows, external cladding, installing double glazing and new seals are all reported as effective means of minimising heat loss, reducing noise disturbance and improving working environments.

Challenges include obtaining listed building consent (one college reports being turned down at the pre-planning stage for a change from single to double glazing in a Grade 2 listed building), expense, design, installation within working office environments, and a lack of sustainably-sourced local suppliers.

One college ran pressure tests to identify air leaks and followed this with a rigorous draught exclusion programme to address them. Other activities included installation of doors on open staircases. Another college installed automated sliding doors at the entrance to an open staircase which was very successful in mitigating heat loss and improving comfort levels and security, but expensive to implement. Some noted the challenges in bringing about behavioural changes from college members.

Insulating valves, pipes, walls and roofs are also widely reported, with roof insulation having the most logistical complexities. It was noted that surveying roof voids is beneficial in highlighting gaps in insulation where it might have been previously removed for other works and not replaced. Replacing old curtains with better quality insulating versions is also reported to help improve thermal efficiency.

Energy efficient design/ Passivhaus

Passivhaus **buildings provide a high level of occupant comfort while using very little energy for heating and cooling. They are built with meticulous attention to detail and rigorous design and construction according to principles developed by the Passivhaus Institute in Germany and can be certified through an exacting quality assurance process.**[1]

Five colleges (**SHIL, SPC, CCC, KEL, HERT**) are adopting or have adopted Passivhaus building principles for new and existing projects across their estates, to increase the inherent thermal efficiency of their buildings and reduce carbon emissions. One project is projected to have a total reduction of around 40% of whole-life carbon usage versus non-Passivhaus design. The main challenge reported is expense associated with implementing these higher environmental standards.

CATZ, KEB, KEL, LINC, MER, NEW, SJC, SHIL, SEH, WAD, WOLF report adopting a variety of low energy strategies in the planning/ building process or refurbishment of buildings across their estates – from student accommodation to conference buildings. Some new buildings are carbon-neutral while others have been awarded a **BREEAM** 'excellent' rating. Some specialised systems have been used, including a geothermal ground water heating/cooling exchange system cast into the foundations, rainwater harvesting and adiabatic heating and cooling systems.

Usually the design incorporates a variety of the energy saving techniques outlined in this report – Ground Source Heat Pumps, solar panels, LED lighting, insulation, Building Management Systems, modern windows and Combined Heat and Power systems.

Aside from cost, challenges include working on projects that are often within a central college site and coordinating between trades when it comes to new technologies. The costs of training staff to use new technologies also needs to be factored in.

1 Source: https://www.passivhaustrust.org.uk/what_is_passivhaus.php

Reducing Power consumption

Kitchen Improvements

SOME, MER, LINC, WOLF, SJC, NUF, MGD, CATZ, WAD, KEL, ANNES, RPC, STX, ORI reported reduced energy usage in kitchens through the replacement of gas hobs with electric induction hobs and transferring from gas to electric ovens is widely reported. One college upgraded to energy efficient equipment during refurbishment which reduced energy consumption between 30-50%. It was noted that kitchen refurbishments are both time consuming and expensive.

LED lighting and lighting controls

ANNES, BAL, BNC, CAM, CATZ, GTC, HERT, KEB, KEL, LINC, MANS, MERT, MGD, NEW, NUF, ORI, PMB, RPC, SANT, SEH, SOME, SHIL, SHUG, SJC, SSH, STX, TRIN, UNIV, WAD, WOLF

One of the most common energy saving measures reported by colleges was replacing traditional incandescent lighting with LED equivalents or low energy lightbulbs. These alternatives use less energy and have longer life spans. Generally colleges have adopted a phased installation approach as refurbishments and upgrades take place. The use of room sensors and timers in conjunction with more efficient lighting was reported to help reduce energy use in many colleges. It was noted that the colour spectrum of LED lighting is being continually improved. Challenges included finding matching fittings – it was noted that changing fittings can be difficult due to heritage reasons.

Wadham reported recently changing all lights to LEDs in the main Library, including desk lights. The lights automatically dim when there is no activity in some areas, and the result has been savings of around 6.5 tonnes of carbon and £6,000 a year in electricity costs for the Library.

Upgrade of white goods

GTC, MER and WOLF reported upgrading washing machines and fridges to A+++ standard, resulting in energy savings due to reduced power and water requirements.

Voltage Optimiser/ Step down transformer

Voltage Optimisation is an energy saving technology that is used to regulate, clean and condition the incoming power supply in order to reduce the voltage supplied to the optimum level for the on-site electrical equipment and appliances.[2]

Five colleges (**LMH, NEW, TQC, GTC, CATZ**) have installed or plan to install voltage optimisers, which reportedly reduce energy consumption by 15%. A site shut down is required for installation. One issue identified by **New College**, is that certain types of electrical kit cannot perform at their best under reduced voltage (kettles, for example, take longer to boil). In this case the technology was not effective, so the system has since been shut down.

Using Renewable Energy

Air Source Heat Pumps

Air source heat pumps absorb heat from the outside air to provide heating to buildings and hot water. They are capable of extracting heat even when outside air temperatures are as low as -15°C. Air source heat pumps need electricity to run, but this is significantly less than the amount of energy provided by the heat pumps therefore making them an energy efficient method of heating buildings.[3]

Two colleges (**CHCH, WOLF**) report installing air source heat pumps – one in a new building, and one to supply background heating to greenhouses while also using a thermal blanket to minimise volume heated. Both reported quite high capital costs, but that this was offset by income from the **Renewable Heat Incentive** (RHI) which provides payments for 20 years. The government has announced the RHI will cease for new installations from March 2021. Registration with RHI, however, was reportedly very difficult, taking the best part of two years for one college to register. The interface for uploading data is reported to be clumsy.

Ground Source Heat Pumps

Ground source heat pumps (GSHPs) absorb heat from the ground at low temperatures into a fluid inside a loop of pipe (a ground loop) buried underground. The fluid then passes through a compressor that raises it to a higher temperature, which can then heat water for the heating and hot water circuits of the house. Heat pumps have some impact on the environment as they need electricity to run, but the heat they extract from the ground, the air, or water is constantly being renewed naturally.[4]

Six colleges (**CHCH, JESUS, LMH, NEW, PMB, ANNES**) reported having installed, or are planning to install, GSHP systems for heating and domestic hot water. The result is reduced energy usage, lower carbon footprint and reduced energy bills.

Colleges reported that the installation process is disruptive, and a large area of ground is required to accommodate the system. The RHI application process which can help businesses, public sector and non-profit organisations meet some of the cost of installing renewable heat technologies, is also reported to be complicated. Wadham commented that Application process for RHI was very complex and required retro-fitting additional metering to a brand new system. It is also reportedly difficult to forecast what RHI payments will result due to an opaque payment system. It was also noted that while GSHPs are very low maintenance, this remains a specialist field that is generally outside the experience of college staff.

Boiler upgrades

Sixteen colleges **SJC, CAM, JESUS, NUF, SOME, SHUG, WYC, UNIV, ANNES, MGD, CATZ, GTC, PEMB, WAD, BNC, STX** reported installing new boilers to provide energy savings. Benefits include improved efficiency, reliability and control of the upgraded systems, and being able to sustain appropriate water temperatures.

Challenges are the cost of the boilers and infrastructure, and the price of installation – both of which can be more expensive if boiler room alterations and special flues are required, particularly in listed buildings. One college reported dealing with unexpected leaks from the old plumbing system, and a site shut down is normally required for installation. It was noted that changes in regulations and the uncertain future of gas means that new projects might better consider moving to electrical solutions or ground source heat pumps.

One college commented that installing ground source heat pumps rather than new gas boilers would have led to serious delays in a building project, extra costs during archaeology and a risk of permission refusal.

Combined Heat and Power

Combined heat and power (CHP) is a process that captures and utilises the heat that is a by-product of electricity generation. By generating heat and power simultaneously, CHP can reduce carbon emissions by up to 30% compared to the separate means of conventional generation via a boiler and power station.

Four colleges (**BAL, MANS, SHIL, WAD**) reported installing CHP in buildings and accommodation complexes. All reported believing that energy efficiency was improved, but projects are yet to be formally quantified through utility bills and budget savings.

Wadham commented that as a more complex technology there were some teething issues following installation, and that it is important to budget for ongoing maintenance costs.

2 Source: https://powerstar.com/our-products/voltage-optimisation/what-is-voltage-optimisation/

3 Source: https://energysavingtrust.org.uk/advice/air-source-heat-pumps/

4 Source: https://energysavingtrust.org.uk/advice/ground-source-heat-pumps/

Pumps and pipes associated with the boreholes beneath the Rokos Quad Project, Pembroke College
Photo credit:Mike Naworynsky

Air Source Heat Pump plant room, Christ Church
Photo credit: John James

Solar panels on the Lady Margaret Hall roof
Photo credit: Bart Ashton

Photovoltaics and Solar Panels

Photovoltaics (PV) is a method to directly convert light into electricity. Although photovoltaic panels are sometimes confused with solar water heating systems, which are panels used to heat water, photovoltaics (or solar PV) work in a different way, and are used to generate electricity, not heat.[5] Both reduce carbon footprint.

Nine colleges (**CATZ, CHCH, LMH, PMB, SEH, SOME, SJC, WOLF, WAD**) report having installed or are planning to install photovoltaics, generating power that can be fed directly back into college's electricity supplies. Many noted that the levels of KWh that PV panels produce daily varies a huge amount – one college installed 40 panels, which generate an average of 30KWh per day which is approximately equivalent to the power used by a small family house. Solar panels have also been installed by **LMH** and **SOME** and are being used to preheat hot water in student accommodation blocks, for example.

Getting planning permission and physical access to roof space restricts the number of viable sites for installation. One college noted the importance of having a monitoring and evaluation solution in place *before* installation so that energy savings can be evaluated.

Renewable energy providers

CCC, KEL, SEH, CATZ, HERT

Examples include procuring energy from green energy tariffs and contracting with solar farms who offer offtake options to "power" the college. It was noted that offtake can be difficult, and challenges arise from the deal structure, expense of agreements and connectivity with the energy company. **Hertford** are in the process of replacing the electrical infrastructure and supply capacity on their main site to facilitate a move to completely renewable power. The college worked with a consultant to identify the best way to complete the work, and also with SSE to source and install a new transformer. A full site shut down was needed, along with significant investment to upgrade the site.

All colleges bar one procure their electricity and gas in a group along with the University and Oxford University Press. Electricity is procured on a 100% renewable tariff.

Efficiently Controlling Energy Use

Building Management Systems and sub-metering

Building management systems (BMS) are computer-based systems used to monitor and control building services such as lighting, heating, fire/smoke detection and alarms, smart meters, motion detectors, CCTV, security and access control etc. They may also be used to monitor and control power distribution, energy consumption and uninterrupted power supplies.

BMS and sub-metering installations were reported by thirteen colleges (**SOULS, CHCH, KEL, MER, NUF, SOME, SJC, WYC, CATZ, GTC, LINC, PEMB, WAD**) to manage, monitor, log and adjust boiler performance. This allows more reactive control of temperatures, less wasted energy, reduced labour costs and fewer complaints about heating. The monitoring of energy consumption data also becomes automated and overall costs for energy use are reduced.

Challenges arise from budgetary constraints, historic buildings, shutting down old hardware before new can be installed, and establishing network connections in basement areas. One college also commented that it is challenging to partition off specific areas in older buildings, which can result in heating large areas and water tanks for just one individual working/living on a staircase.

Smart TRVs / heating empty rooms

Smart TRVs enable colleges to remotely control the heating of rooms and ensure that it is only providing heat for occupied areas. One provider, Eco-sync is a cloud-based platform that uses internet devices, smart thermostatic radiator values machine learning algorithms, and hardware-free occupancy detection technology to identify empty rooms and create responsive heated zones where needed.

Six colleges (**SEH, CHCH, EXE, LMH, TQC, SPC**) reported using eco-sync technology in residential buildings /mixed-use staircases – either on a permanent or pilot basis. The system can be retrofitted to existing heating systems and one college reported a 20% reduction in gas usage over the heating season for residential buildings following installation.

The hardware is reasonably priced but initial development costs are quite high and ongoing subscriptions can significantly increase as more buildings/ zones are added. As it is new technology, education and troubleshooting is required. It was noted that if you can make granular level controls work easily, they can be very effective in reducing consumption. Giving residents a level of control over their own environment was also found to reduce complaints.

Heating Controls

SOULS, BAL, KEL, MANS, MER, NEW, TQC, SOME, STB, SHUG, SPC, GTC, UNIV, SEH, MGD, CATZ, LINC, PEMB, WAD, BNC, KEL, HERT, ORI

The installations of modern Thermal Radiator Valves (TRVs) have allowed colleges to improve thermal efficiency – one college has reported an 18% reduction in gas usage across all buildings since installation. TRVS are readily available, but older radiators can require significant modification for use.

Simple measures such as turning the heating off across estates between May and October each year are straightforward to implement and will be successful unless there are unusually hot or cold spells of weather, which can make consistent implementation difficult.

Various technologies have been reported being used or planned across colleges to promote energy efficiency. These include convector heaters which can use at least 50% less power, heaters with sensors that boost output only when rooms are occupied (blocked sensors by furniture can lead to reports of faulty heating), replacement of wet system heating with electrical low voltage panels, 'smart' electric radiators that can be set to offer 3 temperatures modes depending on presence detected in the room, replacing electric heating with LOT 20 compliant heaters, and where possible adding

5 Source: https://www.greenmatch.co.uk/solar-energy/photovoltaics

controls to radiators in each student bedroom to allow local heating control that can be switched off when too warm rather than opening windows. One college is exploring whether electric trench heaters can be used for ground floor public rooms, while another has installed 2 hour timers on towel radiators in a new accommodation block to avoid the radiators being constantly on.

Monitoring and Changing Behaviour

Audits

Several colleges (**KEL, UNIV, GTC, MER, SEH, WOLF**) have carried out independent energy audits to establish energy performance and assess the potential for energy reduction. **Merton** has used the services of a specialist energy surveyor to audit the college estate in terms of carbon, natural capital and biodiversity. They have also worked with a specialist external energy advisor with expertise in historic buildings to assist in reviewing carbon footprint, identify opportunities for carbon reduction, develop policies and increase college-wide awareness through improved reporting and communication.

Government Schemes (ESOS, CRC/SERC)

ESOS is a mandatory energy assessment scheme for organisations in the UK that meet the qualification criteria. The Environment Agency is the UK scheme administrator. Organisations that qualify for ESOS must carry out ESOS assessments every 4 years. These assessments are audits of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures.

CRC Energy Efficiency Scheme (formerly known as the "Carbon Reduction Commitment"), was a government scheme closed following the 2018-19 compliance year, then replaced by Streamlined Energy and Carbon Reporting (SECR).

Four colleges (**CAMP, CHCH, SJC, CATZ**) reported taking place in the ESOS - by using real energy usage data in the audit process this allows independently-verified carbon emissions figures for baseline and comparison purposes. There is a cost implication associated with these audits as they must be carried out every four years. Colleges learnt that many of the "off the peg" suggestions by consultants for energy saving opportunities are difficult to achieve within the constraints of heritage buildings.

The CRC Scheme helped **St John's** achieve a year on year reduction in carbon produced. Whilst CRC acted as an additional tax on carbon/utilities, it was a great focus on bills to look for errors. Management time in collecting data and obtaining actual reads from suppliers was challenging. Now that the CRC scheme has closed, the college will replace this with the SECR scheme to simplify the system for monitoring energy usage and billing.

Education

JESUS, GTC, KEL, STX

Education initiatives reported to be in use by a number of colleges include posters and signage to improve energy-awareness, instructions for reducing energy consumption in accommodation, labelling banks of light switches, and encouraging staff not to heat their workspaces over 21 °C. **Green Templeton** produced a welcome booklet with user instructions for a recently refurbished two-bed house. Although time-consuming to gather data on all aspects of energy usage in the house, students are now much better informed at the start of their tenancy which it is anticipated will lead to the development of good habits.

Vehicle Emissions

Electric vehicles and charging points

Ten colleges (**UNIV, BAL, CAMP, CHCH, KEB, MER, NEW, WYC, GTC, ORI**) have either disposed of petrol/diesel vans or gardening equipment or replaced them with electric equivalents to lower CO_2 output and improve air quality. One college reported that the switch to electric has been successful in terms of operational efficiency and significant noise reduction of gardening equipment, but carbon reduction is dependent upon how decarbonised the electricity source is. It was also noted that there are quite high capital costs associated with doing this and a limited range of equipment available.

Keble, Univ and Oriel now use electronic vans in the city centre. Keble use theirs to move food between two sites - the van mileage between the sites is very low, and batteries are charged on average every 10 days. It was noted that the options for electric vans are minimal, and larger capacity vehicle options are particularly limited and cost prohibitive at present.

Several colleges (**CHCH, NEW, WYC, MER, MGD, GTC, BNC, WOLF**) have installed or are planning to install electric car charging points on their sites. Those that are already installed are reported to be in regular use but policies and methodology for cross charging cost still need to be developed.

Green Local/Commuter Travel

KEL, NEW, UNIV, PMB, WAD

Various green travel initiatives have been reported. Many colleges offer Cycle to Work schemes and the provision of cycle storage, tools and repair services. Colleges promote travel benefits through the now defunct **easitNETWORK Scheme**[6] along with flexible working and charging for parking provision. Bus Pass and Park & Ride initiatives are promoted to reduce car usage. One college promotes the Personalised Travel Planning (PTP) Service to staff as part of their induction.

Pembroke reported that there has been an increased uptake for the cycle to work scheme now that the limit on purchases has been lifted, which allows the purchase of electric bicycles. The challenges are in ensuring that employees can afford the repayment costs of expensive electric bicycles, and the logistics of charging the batteries in the workplace.

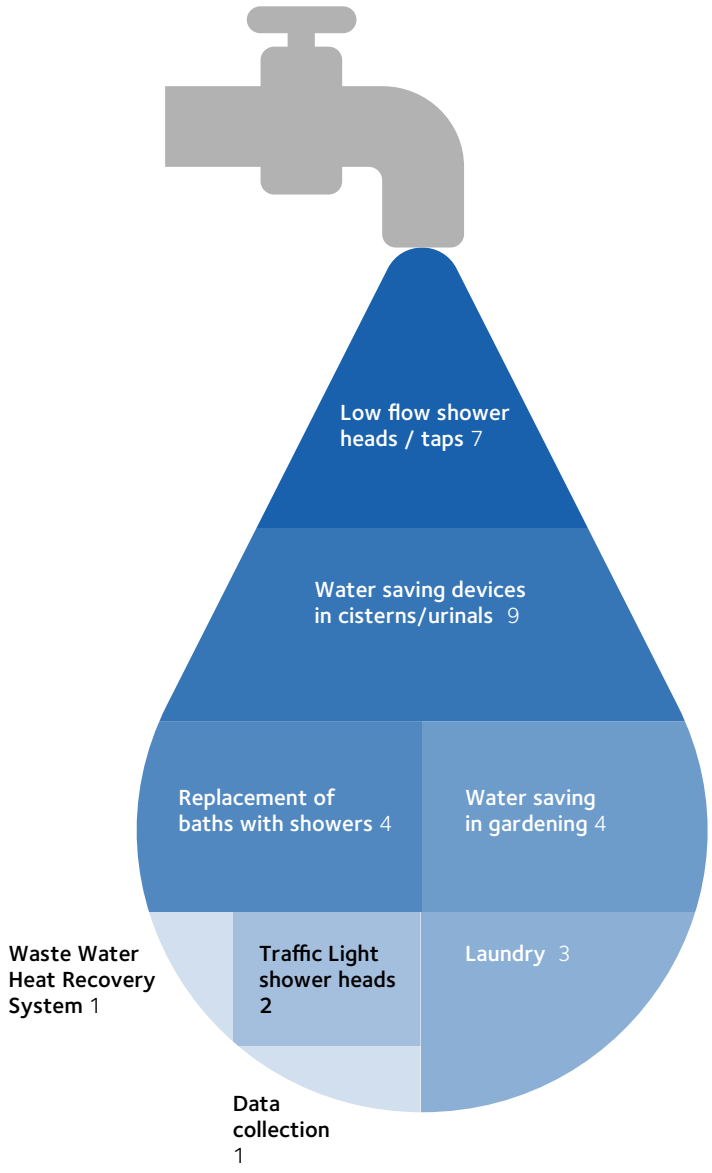
6 Great Western Railway announced that it is withdrawing its support for the easit scheme at the end of March 2020, which allows staff at participating organisations to buy discounted rail tickets to and from Oxford. See https://staff.admin.ox.ac.uk/article/easit-rail-discounts-will-end-in-march

New College electric vehicle charging points
Photo credit: Gez Wells

Electric vehicle charging point, Christ Church
Photo credit: John James

Water Saving

46% of colleges reported implementing water saving initiatives. This was the smallest category, with 31 actions reported across the following areas.



Low flow shower heads/taps

Nine colleges (**LMH, SOULS, JESUS, GTC, KEL, LINC, WAD, HERT, ORI**) reported installing low flow shower heads or retrofitting flow restrictors onto older taps. There have been some complaints about poor water flow from taps.

Water saving devices in cisterns/urinals

Some colleges (**NEW, SEH, MANS, KEL, LINC**) have replaced old cisterns with modern dual flush cisterns, or installed water saving devices in urinals. There is no specialist installation required. **St Edmund Hall** has also installed waterless urinals in their public bathrooms.

Magdalen have fitted cistern displacement devices into existing single flush cisterns to reduce water use.

Replacement of baths with showers

Four colleges (**MGD, MER, WAD, STX**) report replacing baths with shower facilities to reduce water consumption. Wadham are retaining some baths in case they are required for students with medical needs.

Merton will be fitting a high efficiency **Megaflow** hot water storage system as part of their refurbishment programme.

Traffic light shower heads

These shower heads, fitted with a coloured light-emitting diode which operates on a timer, have been installed at **St Edmund Hall** and **Wadham**. Whilst the shower is running it emits a green light, after three minutes the light turns

amber, and then after one further minute turns red. This is to indicate to the user how long they have showered for and to instil a change in behaviour to taking shorter showers. The showerheads are user-friendly and powered kinetically so no batteries are needed, and they also use 10 litres per minutes rather than the normal 15 litres per minute.

Data Collection

Univ has enabled online monitoring of water consumption via their water provider, which allows access to real time data. The intention is to compile building by building data and enable peaks and dips in consumption to be examined. Using this knowledge, long-term water saving strategies can be implemented. At present, the data provided is difficult to analyse.

Water saving in gardening

Some colleges reported planting drought-resistant species that require reduced watering. **Christ Church** installed a rainwater harvesting system to supply the Gardeners' Nursery, while **Kellogg** has two short-term accommodation properties that recycle rainwater into soakaways to help irrigate the grounds and gardens. Their Passivhaus building also filters rain water, to be recycled for their gardens.

Reduced Laundry

St Anne's have reduced the amount of laundry during conference periods by placing environmental cards into each bedroom encouraging guests to reuse towels. This has been successful as some guests use fewer towels.

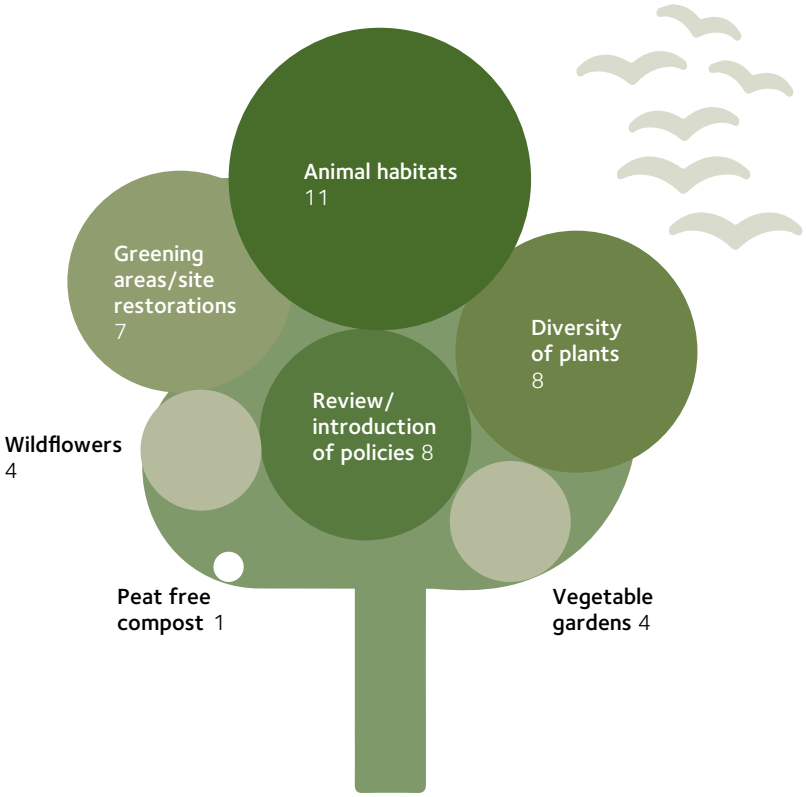
Waste Water Heat Recovery System

Pembroke are installing a Waste Water Heat Recovery System from showers in their new building due to open in August 2022. There will be 86 showers fitted with the technology, which predicts a 40%+ reduction in heating requirement for hot water. This is a new technology with limited case references in the UK. See www.recoupwwhrs.co.uk for details.

Above: **Rainwater tank, Christ Church**
Photo credit: John James

Biodiversity Enhancements

41% of colleges reported implementing biodiversity enhancements across their estates.



Animal Habitats

HMC, JESUS, STB, GTC, KEB, SHIL, CHCH, WAD, WOLF, KEL

To improve animal habitats a number of colleges have reported the provision and installation of nesting boxes, bat boxes, bug hotels, hedgehog hutches and beehives. Some are also building log piles for insects, introducing plants that attract butterflies and even installing maternity roosts for pipistrelle bats (this involved installation of both heated and unheated bat boxes, although an initial ecology survey suggests a low uptake by bats). The only challenges reported were in relation to bat boxes, which had to meet planning and **Natural England** requirements.

Christ Church have maintained wildlife corridors for small species such as badgers through their estate, and Wadham **installed two British National Standard bee hives i**n 2019. The starter colonies came from a bee farm in Warwickshire and the bees are wonderful for pollinating the flowers .

Increasing diversity of plants

Eight colleges (**KEL, SHIL, CCC, JESUS, GTC, SOME, LINC, WAD**) are reviewing and redesigning their grounds and gardens in ways that promote a more diverse range of native plant species. Colleges are also endeavouring to plant low-maintenance species that require less watering. **Jesus** are wilding parts of their gardens and reducing grass cutting.

Corpus Christi has leased a former playing field to a local charity for a notional rent (3 jars of honey), which is being used to create a biodiverse space.

Greening areas/site restoration

Six colleges (**MANS, NEW, WOLF, CCC, SEH, WAD**), report adding plants and greenery to concrete or tarmac areas, including the installation of a bedded area for herbs close to a college café, which are frequently used by the catering team. **St Edmund Hall** have successfully installed a green wall and **Wolfson** have installed a green roof, which offer both visual improvements and habitats for insects. Maintenance of these can be challenging, with scaffolding required for the green wall.

Right: **Wolfson College allotments.**
Photo credit: Barry Coote

At **Wadham's** new accommodation on the Iffley Road, there was one tree when the site was purchased. In the re-development process more than 15 trees were planted including Rowan, Beech, Malus, flowering Cherry, Petiolaris and some unusual shrubs, climbers and bulbs. Oriel are carrying out site restoration of a field that was formerly a city refuse tip. They commissioned the University Parks Department to clear the field, plant suitable hedges, boundary trees and copses.

Review or introduction of policies

Kellogg has introduced policies for tree replacement, native tree planting and pesticide usage. **Trinity** have founded a Garden Committee to research and develop biodiversity policies as part of their wider sustainability policies. There are also reports of biodiversity reviews taking place, and the promotion of biodiversity events.

Oriel run a partnership scheme to fund offset tree planting in the Amazon, funded by the college, students and alumni. The initiative has been driven by graduate students, and the key challenge has been in maintaining funding and commitment.

Vegetable Gardens

Four colleges (**KEL, WOLF, HMC, GTC**) have reported the introduction of allotments or vegetable gardens across their estates. Space requirements dictate whether this is a feasible option for colleges, but those with allotments report they are very popular and are always over-subscribed. College members and their families grow their own vegetables to varying degrees of success. The difficulty comes in ensuring people are using them.

Green Templeton are also setting up a new gardening club which will rent out an allotment, funded by Alumni. Student engagement has been high in these projects.

Wildflower planting

Four colleges (**KEB, LINC, WOLF, CHCH**) report planting native wildflowers banks or wildflower meadows, with reports that this leads to a noticeable increase in the number of insects in the area. This is a relatively straightforward action to take, and colleges have received anecdotal reports that the colourful wildflowers and hum of the insects are a 'mood lifter' for students. There can be a challenge in sourcing seed stock with reliable provenance.

Christ Church report restoration of a lost flood plain meadow flora by spreading green hay from an ancient flood plain meadow near Eynsham in partnership with the Thames Valley Wildflower Meadow Restoration Project. They are also providing ongoing Protection of Early Purple Orchids on site, and carrying out nematode treatment for Leather Jackets / lawn pests.

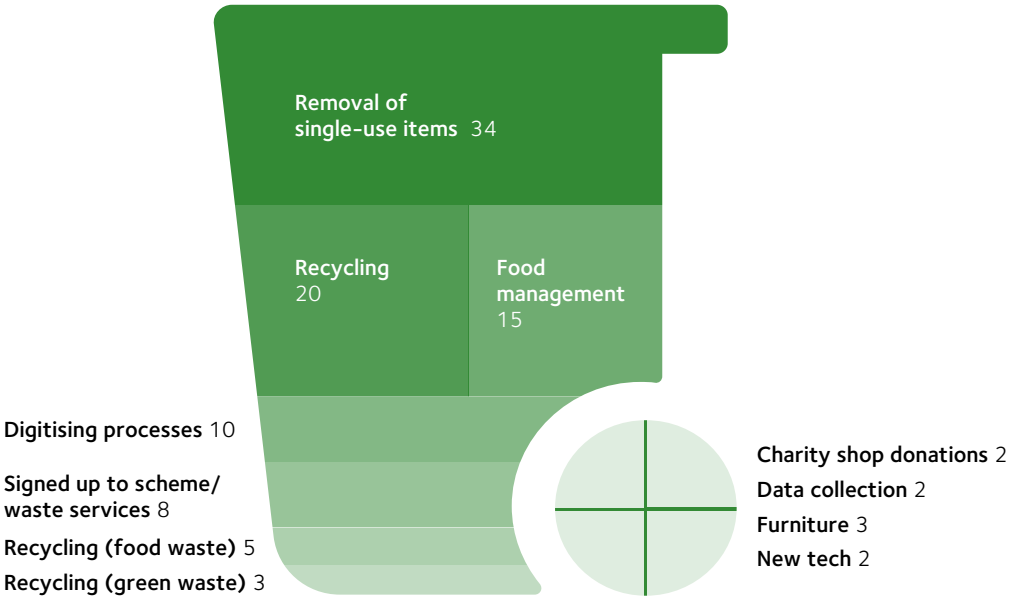
British National Standard Bee Hives, Wadham College
Photo credit: Frances Lloyd

Herb garden, St Hugh's College
Photo credit: David Hodges

Right: **Student garden, Harris Manchester College**
Photo credit: Jane Shaw

Reduction in Waste

80% of colleges reported implementing waste saving initiatives across the following categories.



Reduction/removal of single-use items

KEB, KEL, LINC, LMH, MANS, NEW, NUF, SHIL, SPC, WYC, BAL, EXE, GTC, JESUS, UNIV, SEH, SANT, ANNES, LINC, PMB, WAD, HERT, STX

The removal and reduction of single-use items such as bottled water, take-away cups, disposable cutlery and straws is common practice across the colleges. Many colleges have mains-fitted water coolers across their sites and provide reusable water bottles and coffee cups to their members. Challenges reported are the associated cost with fitting water coolers and sourcing a style of reusable cup that suits all customers, such as those that can be used in libraries.

Many colleges have also been switching to biodegradable packing for items such as sandwiches and take-away meals, as well as toiletries for B&B guests. Several colleges reported sourcing compostable dining packaging from **vegware**. With changes due to the Covid-19 pandemic there is much more packaging with take-away meals and drinks – using compostable packaging cuts down on what would have been a huge increase in plastic use. The key challenges has been educating users that the products are not plastic, as they appear to be at first glance!

There are some limitations when managing the conflict between food hygiene and environmental impact. It was noted that sustainable products can be just as good, and cheaper.

Recycling

TRIN, SOME, MANS, NUF, KEB, SOULS, CHCH, NEW, MER, UNIV, SEH, SHUG, SANT, GTC, LINC, WAD, BNC, WOLF, KEL, STX, SSH, HERT

Recycling was widely reported across the colleges to minimise waste being incinerated off-site. The most cited initiatives were the provision of separated recycling bins in accommodation, offices and communal spaces. Some colleges publish monthly statistics on dedicated environment notice boards to show recycling rates at each site and to encourage wider participation. Some colleges (**NUF, SOME**) have been working with Oxford City Council to discuss strategic methods of waste management – waste levels are monitored on an annual basis and receptacles are reviewed depending on volumes. Some waste collection companies provide regular

breakdowns of waste/recycled quantities for analysis, which offer colleges a baseline of data against which to improve. Colleges note that there can be confusion between what is recyclable and what is compostable.

A number of colleges (**TRIN, SOULS, MER, SEH, NEW, SOME, SHUG, SANT, KEB, WAD, WOLF, BNC**) run food waste recycling schemes, from both their main kitchens and accommodation. Some colleges also send their food waste to a local **anaerobic digestion plant** where it is converted into green energy. The provision of more food caddies and signage in dining halls and accommodation helps to improve engagement. At some colleges (**NEW, CHCH, KEB**) green waste is composted and recycled as mulch, and there were also reports of donating old furniture to local charities.

Wadham reported that their off-site accommodation held a 'Give Away' day where students could give their unwanted items to other students. This was particularly popular with international students.

Initiatives are proving successful – one College reports recycling 77% of all their waste.

Waste service providers and schemes

Five colleges (**LMH, LINC, BAL, CHCH, KEB**) reported switching waste providers from **Oxford Direct Services** to **Select Environmental** who provide a monthly breakdown of waste information and data. One college reported that although total waste has not been reduced, they have seen an increase in their average recycling rate to around 65%

The Estates team at **Wadham** use a recycling company collection trailer for waste that previously went into a skip. The waste goes into a static trailer on site, which is collected by a low emission vehicle on a regular basis, rather than a large fuel based lorry. When collected the company go through the trailer by hand removing anything that can be recycled, thus reducing landfill waste.

Kellogg has signed up to the **Courtauld Commitment 2025**. This is a voluntary agreement that brings together organisations across the food system to make food & drink production and consumption more sustainable.

Univ worked with their food suppliers to reduce general waste such as excess cardboard from delivery boxes. Suppliers were very happy to get involved and where possible deliveries are now being made in reusable packaging / crates / boxes. Suppliers had to purchase the reusable crates, so arrangements were made for how the college would look after them after delivery and when they would be collected by the supplier. It has been a very successful project.

Thermal screens in the Christ Church greenhouse
Photo credit: John James

New technology

St Peter's are considering installation of a Waste Station Compact (a system that removes water from food waste) in their kitchen. Reducing the volume and weight of food waste would reduce collection and associated impacts of transport.

St Anne's introduced vacuum packing machines which reduce waste by removing oxygen thereby preserving food for longer. When cooking, less of an ingredient needs to be added (i.e. only a small amount of liquor is needed to pickle, as the process of the vacuum seals the liquor around the food), reducing quantities required, with associated benefits for transport etc. As this is a new technology, in-house training was needed. St Anne's reported that they found it to be an effective method which not only allows food that is unused from a service to be contained and stored, but also opens the door to new and modern techniques in cookery. Although this method preserves by removing oxygen, thereby extending the shelf life on food, the college mainly uses it as a clean and effective way to freeze food for use at a later date as it can be stored efficiently and will not suffer to freezer burn.

Food Management

KEL, TQC, STB, MER, UNIV, ANNES, GTC, LINC, WAD, BNC, SEH, SSH, RPC

Some colleges have established working groups to create targets for minimising food waste. Colleges are also providing staff training materials on reducing food waste.

St Edmund Hall plans to use the **Winnow Waste management system** within the College catering function. There are two sides to this approach: managing food preparation waste; and educating diners about how much waste they are personally responsible for. Firstly, in the kitchens all food preparation waste is weighed and identified by a smart camera.

This gives the chefs accurate data on food waste, enabling them to alter their purchasing. Typical savings on food costs lie in the range 3-8%. Secondly, a set of scales with smart camera will be located by the tray clearing area. Diners can put their waste in the bin on the scales and the display will show the weight of waste and an estimated cost of the food that is being thrown away. The college will then create a visual display showing amount of food waste on weekly basis.

Six colleges (**STB, MER, ANNES, WAD, SSH, RPC**) have booking systems whereby meals are cooked to order and/or follow portion control guidelines to minimise waste. St Anne's noted that their system was only introduced to ensure social distancing by using time slots to book in for meals, but the impact has been vast, reaching way beyond just the original objective, creating an organised and smooth production operation.

Since 2016 **Wadham** has been working in partnership with **The Gatehouse,** a drop-in centre for Oxford's homeless and poorly housed, to deliver its leftover cooked food. Selected foods which do not get eaten by staff and students in College at lunchtime are transferred to special containers, kept chilled, then transported to The Gatehouse daily to be served to the community there. A team of student and staff volunteers take turns at making the 20 minute round trip to The Gatehouse with the cool bag each day to deliver the food. This scheme has been temporarily suspended since the onset of COVID-19.

Digitising processes

LMH, MER, NEW, WYC, SOULS, WOLF, WAD, LINC, SOME, SSH

Providing electronic committee and meeting papers has successfully helped colleges to reduce their paper waste, as well as reducing the administrative load on college office staff. Colleges reported that moving users towards the electronic format took time and that dynamic indexing is required to facilitate navigation of large sets of papers. The constraints of operating in line with Covid-19 restrictions has resulted in digitised processes being more readily accepted by some staff.

Colleges have also been encouraging alumni and friends to sign up for online versions of annual magazines, instead of hardcopy versions and Wadham reported that their Accounts Department has introduced internal electronic authorisation of invoices and encouraged suppliers to send invoices electronically.

Data Collection

As well as the colleges who get monthly breakdowns on waste information through Select Environmental, some colleges have systems in place to measure food waste in their catering outlets.

There were also reports of colleges working together to coordinate data collection to highlight the issues of non-recyclable packaging and vehicle movements within the city. This piece of work is in the planning stage, but initial responses have been very positive. Challenges arise from the limited options available and changing behaviours.

Charity Donations

GTC and **WAD** reported providing **British Heart Foundation recycle stations** around college to collect items no longer wanted by departing students. Items are donated to the charity to raise funds through their shop networks. This scheme has been running for several years – collectively about 15 colleges take part and it diverts tonnes every year from residual waste.

Furniture

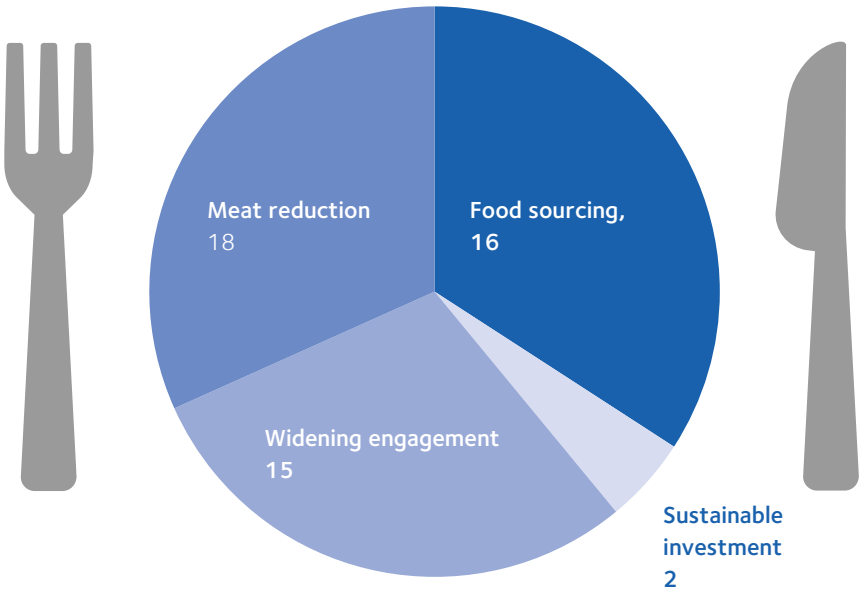
All Souls are proactively minimising furniture waste by discouraging requests for new furniture except where necessary, while **St Anne's** are replacing desk chairs with chairs that are made from recycled plastic bottles. These chairs are better quality and have a long guarantee. There are good products available from recycled material, and students and guests like them!

Oriel are replacing their Hall furniture to allow more flexible use of space. Having evaluated replacement vs recycling of existing furniture, items are being remade to the required specifications with very limited new stock. The challenges of this process have been cost and logistics.

Left: **Garden borders in New College**
Photo credit: Gez Wells

Other Initiatives

43% of colleges reported implementing sustainability focused initiatives outside of the four specified categories – the majority of these were related to sustainably sourced food and a reduction in meat consumption



Food sourcing

MER, GTC, KEL, SANT, SOME, WAD, SHUG, NEW, ANNES

Many colleges are taking steps to ensure that their food is sustainably sourced. This may be using local seasonal suppliers, **Fairtrade** / **Rainforest Alliance** suppliers for coffee, MSC-certified fish, or ethical palm oil sources. Some of these initiatives, such as buying sustainable fish, can be slightly more expensive. Several colleges report raising awareness of Fairtrade products and taking steps to become Fairtrade accredited. There are currently five colleges (**LMH, KEB, TQC, WAD, CHCH**) that are Fairtrade accredited.

At **St Hugh's** a small area of the College gardens was turned into a herb garden to grow fresh herbs for use in the College kitchens. Herbs are picked daily by the chefs for use in the day's dishes and there has been much positive feedback about the fresh flavours of the herbs. A small and affordable project, but one that has had positive gains.

Meat reduction

Fourteen colleges (**MANS, NUF, GTC, WYC, SPC, KEL, SANT, PMB, WOLF, WAD, BNC, ANNES, SOME, SSH**) reported meat reduction in their menus to lower the carbon footprint of their food. Approaches include having designated meat free days (some have been running 'Meat-free Monday's' for over a year), a reduction in the amount of meat options on offer, an increase in plant-based meals and sourcing seasonal food from local suppliers where possible. Some colleges reported using menu layouts to persuade less meat eating, by placing non meat dishes first on the menu.

One college reported lowering their total meat purchase by 33%. Another reported that it now served more vegan and vegetarian meals than all others combined.

Most colleges have had a positive reception to these initiatives, with members regarding the changes as healthy and facilitatory of a flexitarian diet. Others have been met with resistance, with pushback from staff and students on restricting choice. Catering for external bookings adds a layer of complexity, and colleges noted the need for chefs to work creatively to make vegetarian and vegan options attractive to all.

Sustainable Investment

Although only two colleges reported specific actions in this area, the majority of colleges are exploring sustainable investment options. Oxford University Endowment Management (**OUem**) is a wholly owned subsidiary of the University that manages over £4bn of charitable money on behalf of the collegiate University, and they are actively pursuing sustainable investment policies.

Widening Engagement

TQC, TRIN, ANNES, KEL, MER, LINC, WAD, BNC, NEW

Various groups have been established to include members across college communities, with the aim of promoting sustainably focused work, along with college policies. This includes a 'Green Impact Group' of fellows, staff and students, a Sustainability Committee, Green Student Ambassadors and Sustainability Fellows. One college reported the unavoidable challenge of student reps changing from year to year, which can make it difficult to get traction on certain projects. **Kellogg** offer two paid positions for students (Environmental Ambassadors) to support the College in their efforts. These positions are reported to be cost-effective, promoting reliability and accountability from the Ambassadors.

Many colleges take part in the University's annual **Green Impact Award** and **Student Switch Off** campaign. St Anne's are a member of **Green Tourism** – a certification program for sustainable business, who also run campaigns and social media initiatives.

Above: **Green Hay spreading, Christ Church.**
Photo credit: John James

Magdalen College
Photo credit: Ed Webster

Next Steps

This timeline sets out the next steps for the working group in the next 12 months and beyond. The original timeframes were impacted by the coronavirus pandemic and associated lockdowns, which made it impractical to carry out audits across college estates that would have resulted in data outputs that were not representative of a 'normal' college environment.

Phase one: Building a baseline of understanding

Action	Timescale
Production of a report summarising existing sustainability initiatives across the Colleges *(completed)*	Michaelmas Term 2020 – Trinity Term 2021
Audit of biodiversity and green infrastructure in Colleges and on College owned land in Oxford	Trinity Term 2021
Baseline audits of College: • Waste (paper, plastic, food, other) • Energy usage (electricity and gas) • Water usage	Summer 2021 – Michaelmas Term 2021
Consolidation and analysis of audit data	Michaelmas Term 2021
Production of a report summarising findings	Hilary Term 2022

Once an evidence base has been established, the working group will begin phase two of their work –determining practical steps that the Colleges can take to embed sustainable practices and move towards net zero carbon. This will involve looking at best practice and sustainable approaches in areas including, but not limited to

- Biodiversity management
- Energy consumption
- Waste management
- Local and international travel
- Food
- Working practices
- Carbon offsetting

Statement from Oxford SU on next steps

Oxford SU is the representative body for all students at the University of Oxford and supports students across the collegiate University to make change on issues that matter to them. Following policy set in student council, the student-led decision-making body, one of the SU key priorities is supporting students to act on **sustainability**, and there are a range of ways for students to get involved in supporting their colleges to act on the environmental crisis.
If you're a student interested in getting involved, contact your Common Room Environment and Ethic Rep or President who will be able to let you know about on-going college initiatives and how you can help. All students can get involved in University wide climate action activities such as **Oxford SU's Planet Pledge**, **NUS' Student Switch Off** and events ran by **Oxford Climate Society**.

Right: **Automated siding doors to minimise heat loss in an open stairway, New College.**
Photo credit: Gez Wells

Resources

University of Oxford Resources

The Environmental Sustainability Team sits within the Estates Services department and is responsible for progress on the University's Environmental Sustainability Strategy and targets, such as reducing carbon emissions https://sustainability.admin.ox.ac.uk/home

Environmental Sustainability Strategy – published in March 2021, the strategy can be viewed online https://sustainability.admin.ox.ac.uk/environmental-sustainability-strategy

The Travel team delivers sustainable travel initiatives for staff and students within the University, encouraging more energy-efficient transport https://travel.admin.ox.ac.uk/

University Environmental Targets – information about the University's Environmental Sustainability priorities https://www.ox.ac.uk/about/building-our-future/environmental/targets

Estates Services Sustainability Design Guide – a framework relaunched in 2019 to minimise the operational energy consumption of buildings and to deliver wider sustainability benefits https://sustainability.admin.ox.ac.uk/files/estatesservicessustainabilitydesignguidepdf

Student societies

Oxford SU – works in partnership with the collegiate University to improve the overall experience for students. Amplifies student voices on sustainability through representation, campaigns, tracking (http://bit.ly/SUTracker) and training https://www.oxfordsu.org/work/21266/

Oxford Climate Society – an award-winning society dedicated to connecting and developing informed climate leaders https://www.oxfordclimatesociety.com

Climate Justice Society – a student-led campaign calling for colleges to divest from fossil fuels https://oxfordunifossilfree.wordpress.com/

Nature Conservation Society – Offers talks, screenings and outdoor events on a wide range of conservation issues https://ouncs.org

Oxford based organisations, networks and charities

Oxford City Council –

- Strategy plans for a 'clean and green Oxford' https://www.oxford.gov.uk/downloads/20221/a_clean_and_green_oxford
- Guidance for sustainable business https://www.oxford.gov.uk/info/20212/energy_saving_advice/860/sustainable_business

Low Carbon Oxford – A network of organisations with a shared vision of Oxford as a low carbon city, all working together to achieve the city's ambitious target of reducingcarbon emissions. http://lowcarbonoxford.org

Local Energy Oxfordshire (LEO) – an ambitious and innovative project that is working tocreate a smart grid for the county. https://project-leo.co.uk

Wild Oxfordshire – a local charity which provides a co-ordinated and strategic approach to conservation in Oxfordshire https://www.wildoxfordshire.org.uk

Good Food Oxford – a network for a better food system in Oxford, working together for healthy, fair, sustainable systems in and around Oxford https://goodfoodoxford.org

Right: **View of Oxford city from South Park, East of Oxford**
Photo credit: Kamyar Adl

UNIVERSITY OF OXFORD

CONFERENCE OF COLLEGES

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