



THE CAMBRIDGE *green*
CHALLENGE



Introduction

"The University of Cambridge attracts the finest minds from around the world to research and expand the boundaries of knowledge. Much of our research contributes significantly to understanding and solving the environmental sustainability challenges faced by society. In addition, we have a responsibility to ensure that all our graduates have the skills, knowledge and understanding to contribute to a sustainable world. However, enhancing these positive impacts does not give us an excuse to ignore the direct negative impacts of our own operations."

Professor Sir Leszek Borysiewicz, Vice-Chancellor
Environmental Sustainability Vision, Policy and Strategy



The University of Cambridge is committed to making a positive impact through outstanding environmental sustainability performance.

A new Environmental Sustainability Vision, Policy and Strategy was launched in 2015. Our policy framework shows how our environmental sustainability vision aligns with the University mission and one of its core values. It contains four underpinning principles and three priority areas, and conveys the University's key environmental sustainability impacts and the supporting approaches available to manage these impacts.

In order to deliver our policy aspirations, the University is implementing its multi-step Environmental Sustainability Strategy. This contains details of the aims, targets, key performance indicators and implementation mechanisms relating to the key impacts and supporting approaches.

This report is an overview of progress in 2015/16 towards the aims and ambitions contained in the Environmental Sustainability Strategy 2015-2020. It does not cover the 31 Cambridge Colleges, which are independent institutions with their own property and income, and their own environmental policies and initiatives. It is the first of what will become an annual report.

Content

At a glance	3
Progress against targets	4
Our journey	6
Energy and carbon management	7
Water management	12
Biodiversity and ecosystems	14
Waste management	16
Sustainable procurement	21
Sustainable construction and refurbishment	24
Travel	27
Teaching and research	30
Partnership and engagement	31
Key performance indicators	34
Breakdown of our 2015/16 carbon emissions figures	35
Find out more	37

Underpinning principles

- ✓ To build on our academic excellence to enable positive change through our research, knowledge-transfer, learning and education.
- ✓ To maximise the wider positive impact of the University's environmental sustainability actions at local, national and international level through communication, collaboration, partnership.
- ✓ To create a culture where the University community is engaged, empowered and supported in improving their personal and collective environmental sustainability practices.
- ✓ To protect and enhance the natural environment by reducing our direct environmental impact.

Supporting policies and plans

- ✓ Carbon Management Plan
- ✓ Strategic Framework for the Development of the Estate
- ✓ Sustainable Food Policy
- ✓ Sustainable Procurement Policy
- ✓ Travel Plan



Governance

The University is a confederation of Schools, Faculties, Departments and Colleges. The University is governed through its central bodies - principally the Regent House, the Council and the General Board of the Faculties - that are advised and supported by an extensive network of committees, boards and syndicates.

The Environmental Sustainability Strategy Committee provides strategic oversight of the University's commitment to environmental sustainability embodied in its Environmental

Sustainability Policy and Strategy. It is chaired by the Vice-Chancellor (or duly appointed deputy) and reports directly to the University Council and General Board.

Implementation of the Environmental Sustainability Policy and Strategy is coordinated and undertaken by the Environment and Energy section in Estate Management.

Materiality

Material environmental sustainability issues are those that are of most importance to our stakeholders. Our staff and students are our largest stakeholder groups and as part of the development of our Environmental Sustainability Vision,

Policy and Strategy we held a wide ranging consultation exercise involving around 550 individuals and 11 different University committees and groups. Table 1 describes the issues that we have identified as material and report against.

T1

Material environmental sustainability issues

Material issue	Overarching aims
Energy and carbon	To reduce scope 1, 2 and 3 carbon emissions while supporting the University's plans for growth in research activity, staff and student numbers.
Water	To conserve water through efficient use and management.
Biodiversity and ecosystems	To be a leading organisation within the sector in limiting negative and, where possible, having positive direct and indirect impacts on biodiversity and natural ecosystems so that the University's practical performance in this area matches its aspirations to be a global leader in conservation and food security research.
Waste	To minimise and actively manage waste through elimination, reduction, reuse and recycling.
Sustainable procurement	To positively influence the sustainability performance of suppliers and the sustainability credentials of the goods and services that we purchase.
Sustainable construction and refurbishment	To reduce the environmental sustainability impacts of our construction and refurbishment projects.
Travel	To provide viable and accessible sustainable travel options for staff and students for travel to work, travel at work and travel for work which results in a reduction of carbon emissions.
Environmental sustainability in teaching and research	<p>To undertake world-leading research that is related to environmental sustainability and to ensure that our operations are informed by this research where possible.</p> <p>For all staff and students to have access to formal or informal opportunities to develop their knowledge, skills and understanding relating to sustainability matters and solutions.</p>
Partnership and engagement	<p>To facilitate opportunities where staff and students can develop and share their knowledge, skills and experience to engage with and contribute effectively to achieving the University's environmental sustainability aspirations.</p> <p>To develop formal and informal collaborative partnerships with regional, national and international stakeholders.</p>

At a glance in 2015/16



336 buildings,
49 are listed

Over
30

energy and carbon
reduction projects
undertaken, estimated
to **save 870 tonnes**
of carbon per annum



70%

of waste recycled
or composted

1,867,298 kWh

generated via onsite renewables



Living Lab
projects
undertaken

22

'Spotlight on'
roadshow events,
engaging an estimated
643 staff

652,807m²

gross internal floor area of the estate

43

Green Impact teams



5

Finalists in the
Green Gown
Awards 2016



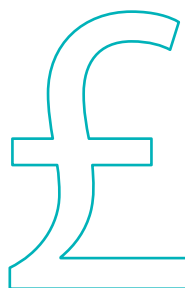
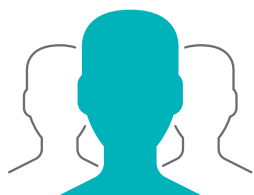
18,306
students



10,289
staff FTE

103
members

of the Environment and
Energy Coordinators Network



926,273,000
total University income

75%

of staff regularly commuting
to work by sustainable
modes of travel



8,500

cycle spaces on the estate









11

electric vehicle
charging points
on the estate



Progress against targets

	Target	Current Progress	2015/16
Energy and carbon management	To reduce Scope 1 and 2 carbon emissions from building-related energy use by 34% by 2020/21 against a 2005/06 baseline	Our energy-related carbon emissions have increased by 8% since our baseline year. However, in recent years, emissions have decreased, by 10% between 2013/14 and 2015/16	
Water management	To reduce water consumption by 20% by 2020/21 against a 2005/06 baseline	Water consumption has increased by 12.8% since our baseline year	
Biodiversity and ecosystems	In the expert opinion of the Ecological Advisory Panel, that no construction, refurbishment or maintenance work on the estate has a net negative impact on biodiversity and that, where possible, the impact is net positive	The Ecological Advisory Panel will be established in 2017 and report to the Environmental Sustainability Strategy Committee	
Waste management	To send zero non-hazardous waste to landfill by 2020/21	In 2015/16 2,488 tonnes of waste was sent to landfill. The introduction of the new waste contract in the summer of 2016 will help us meet this target by changing how waste is treated and disposed of	
Waste management	To achieve continuous year-on-year reductions in waste arising per FTE staff and students	To date, waste data has shown significant yearly variation with no clear trend. Improved data accuracy from 2016/17 will help evaluate our progress against this target	
Waste management	To recycle at least 95% of total waste produced at the University by 2016/17	During 2015/16 we recycled 70% of our waste	










We can do better



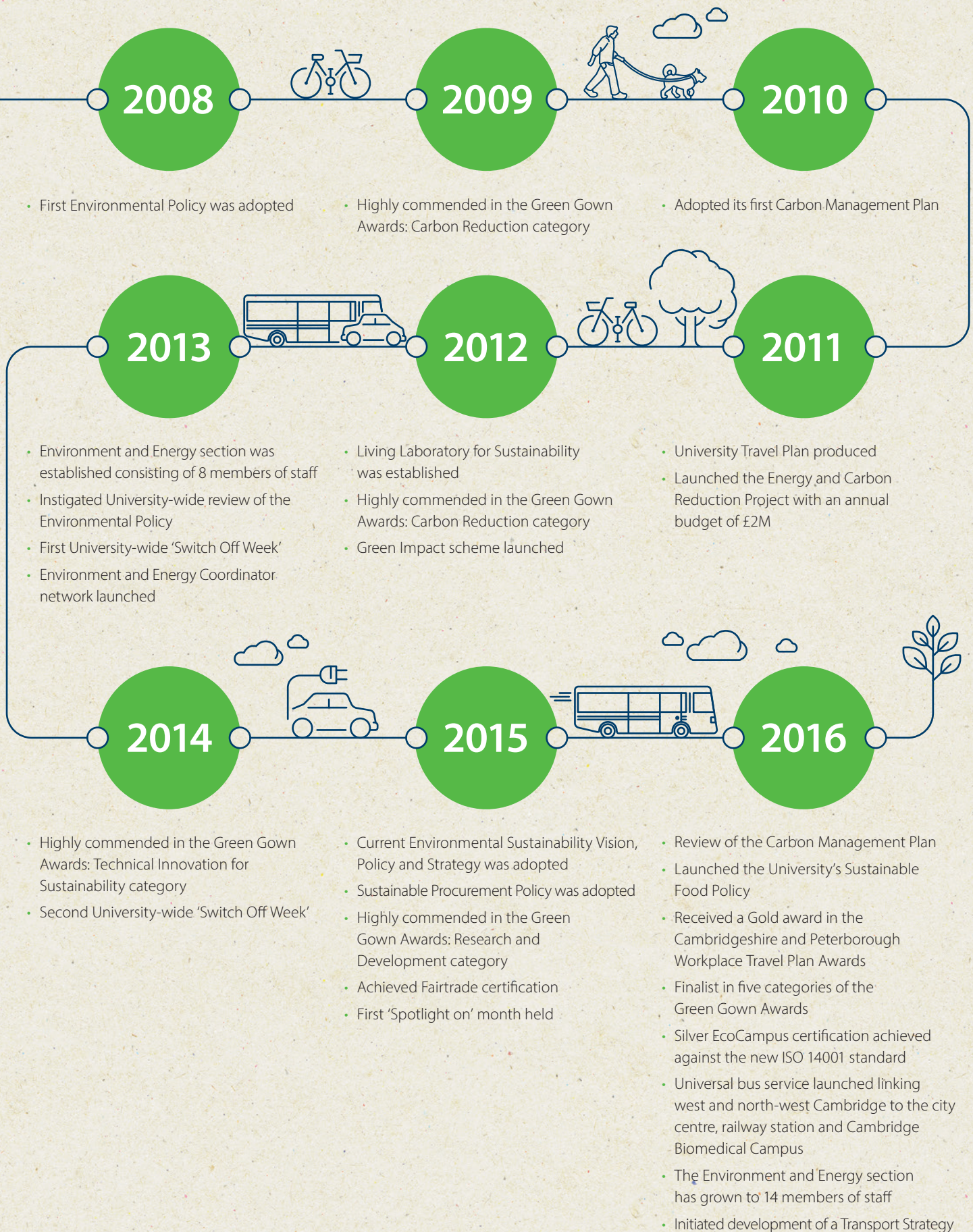
We are making good progress



We have achieved our target

	Target	Current Progress	2015/16
Sustainable procurement	That central University procurement frameworks are more attractive financially, more environmentally friendly and faster than other routes, and therefore, more institutions use them	Sustainability criteria are included in the tenders for central procurement frameworks as and when they come up for renewal. Further work needs to be undertaken to encourage institutions to use them	
Sustainable procurement	To achieve at least level 4 'Enhance' across all themes of the Sustainable Procurement Flexible Framework by December 2015	Level 4 achieved in December 2015	
Sustainable procurement	For institutions to consider sustainability criteria within their procurement activity	Guidance is provided to institutions on how to include environmental, economic and social aspects when specifying specific goods or services and how to include sustainability criteria when evaluating tenders from potential suppliers. Further work needs to be undertaken to encourage institutions to consider sustainability criteria within their procurement activity	
Sustainable construction and refurbishment	To establish and implement a standard for sustainable construction at the University of Cambridge that is context specific and is considered a leading approach in comparison with our peers	Our new approach to sustainable construction will be launched in 2017 and will embed sustainability into all our capital projects: new build, refurbishment and fit-out	
Sustainable construction and refurbishment	By 2020/21, for 95% of buildings (by floor area) to have a minimum Display Energy Certificate rating of 'D'	46% of our buildings have a minimum Display Energy Certificate rating of 'D'	
Travel	At least 75% of staff to be regularly commuting to work by sustainable modes of travel by 2016/17	In 2015/16 75% of staff regularly commuted to work by sustainable travel modes including car share, bus, train, cycle, walking, and motorbike	
Travel	To reduce per capita carbon emissions from business flights by 25% by 2020/21	Our per capita emissions reduced by 4% between 2014/15 and 2015/16	

Our journey



Energy and carbon management

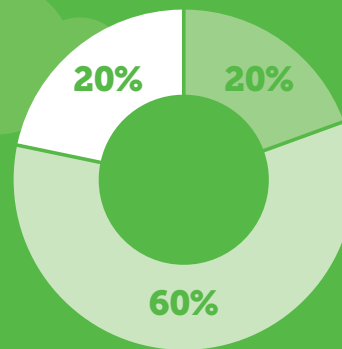


F1

2015/16 carbon emissions

As a research and science-based university, it is not surprising that we consume a lot of energy: in 2015/16, our total energy consumption was 221 million kWh and cost £15.8M. The carbon emissions associated with our energy use (known as Scope 1 and 2 emissions) represent one of our biggest areas of environmental impact, in particular those arising from our electricity use (Scope 2 emissions), as illustrated in Figure 1.

Another significant source of carbon emissions are those that arise as an indirect result of the goods and services that we buy; the waste that we generate; the water that we use; and the travel that our staff carry out for commuting and business travel purposes. These are known as our Scope 3 emissions.



- **Scope 1:**
19,238 tCO₂e (20%)
- **Scope 2:**
58,348 tCO₂e (60%)
- **Scope 3:**
19,983 tCO₂e (20%)

A full breakdown of our Scope 1, 2 and 3 emissions in 2015/16 is on page 35.



The University Library

The University Library houses a vast and valuable collection, which needs to be kept under specific environmental conditions. As a result, the building also has one of the largest carbon footprints at the University. A top priority has therefore been to reduce energy consumption while keeping the collection under optimal conditions.

A number of ECRP-funded projects have helped to improve the building's temperature and humidity management. The seven existing chillers have been centralised and replaced with three energy efficient models that provide quicker and more accurate response control, with improved monitoring to

allow increase in energy to be quickly identified and rectified. Three large, slow-response boilers have been replaced with ten smaller, more efficient modular units that allow for a more tailored and targeted approach to heating the building.

Substantial energy and cost reductions have already been achieved. The chiller replacement alone has led to cost savings of £144,000 per annum and reduced emissions by 630tCO₂e. Thus the Library's collections are maintained under improved conditions while the building's carbon footprint has been reduced by approximately 16%.



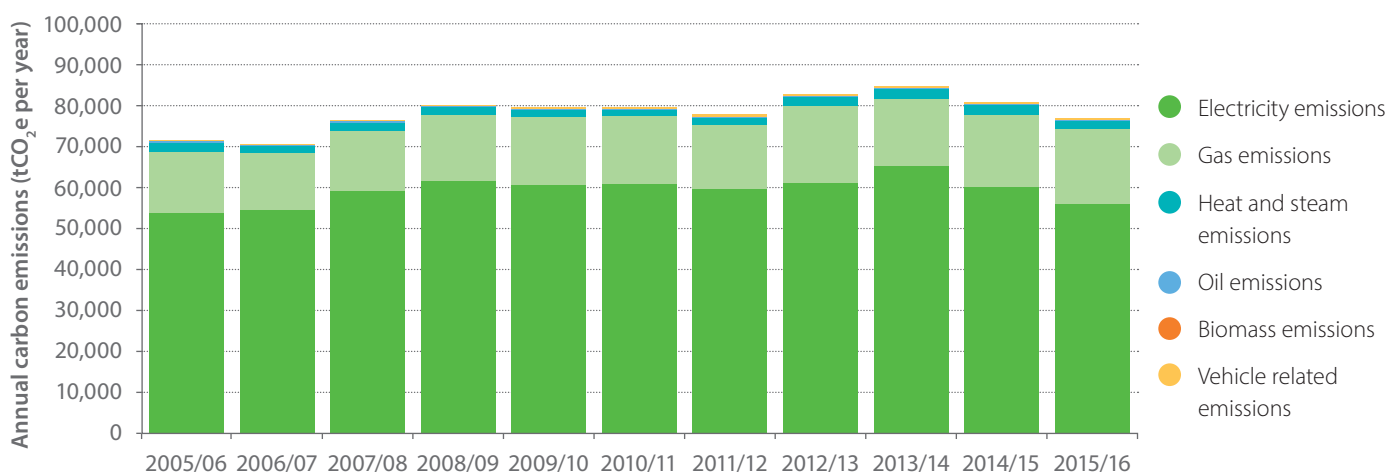
*Chiller replacement has led to cost savings of **£144,000** per annum and reduced emissions by **630tCO₂e**.*

Trends and progress against targets

- Our total Scope 1 and 2 emissions have increased by 8% since our baseline year (2005/06).
- Our annual Scope 1 and 2 emissions reached a peak in 2013/14 and since then have started to decrease. Between 2013/14 and 2015/16, they reduced by 10% (Figure 2).
- We began to measure our Scope 3 emissions in 2012/13, and have set a 2014/15 baseline for measuring our per capita emissions from business flights.
- Per capita emissions from business flights have decreased by 4% since 2014/15.

F2

Total annual Scope 1 and 2 carbon emissions



Carbon performance explained

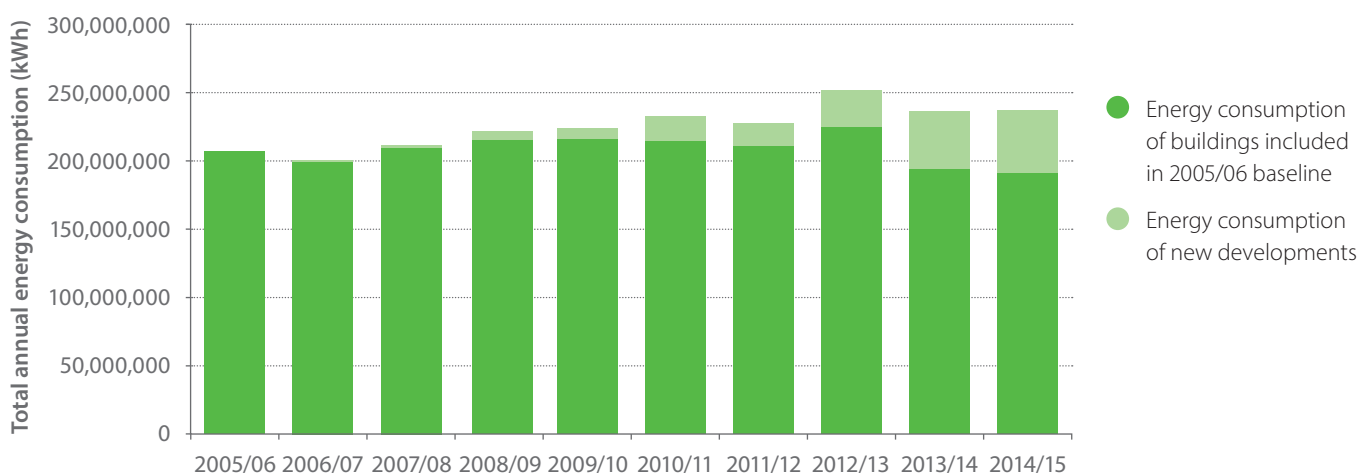
We recognise that we need to do more to reduce our emissions, across all scopes. To inform us on the best way to achieve this, we commissioned a review of our current Carbon Management Plan (CMP) in 2016.

The review included analysis of the factors that have contributed to the increase in Scope 1 and 2 emissions since our baseline year, and this confirmed that the development

and expansion of the University estate has been the primary cause. This is illustrated in Figure 3, which shows the proportion of our total annual energy use that can be directly apportioned to new buildings that were developed between 2005/06 and 2014/15.

F3

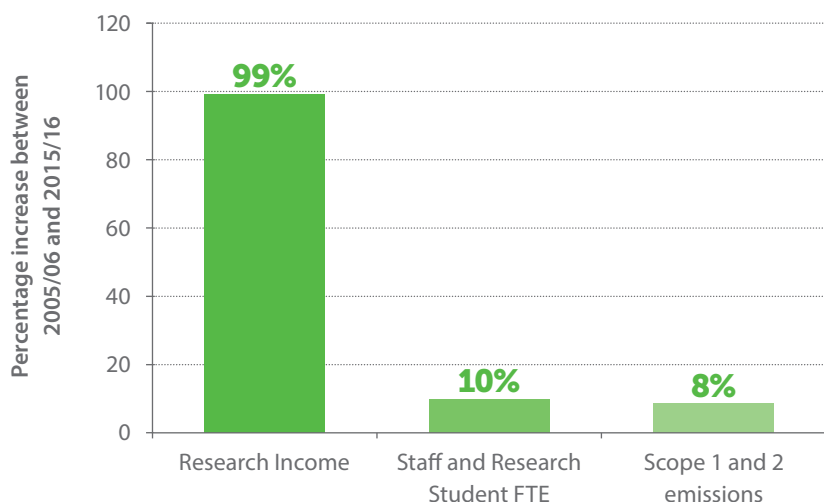
Contribution of new developments to total annual energy consumption



We also know that an increase in the level of research activity being undertaken by the University, as denoted by increased levels of research funding and staff and research student numbers, has contributed to an increase in our emissions, but that has been to a lesser extent than growth of the estate.

F4

Percentage increase in level of research funding, staff and research student numbers, and carbon emissions since our base year



Our current 34% carbon reduction target, adopted in 2010, was set to be in line with the sector-level target¹. However, our target was adopted without a clear understanding of the impact that ongoing growth of the University, in terms of the size of its estate and its level of research activity, would have on our emissions; or of what action we would need to take to reduce our emissions within the context of this growth.

Following the review of our current CMP, we now have a better understanding of how changes to the estate and the University's activity have affected our emissions since our 2005/06 baseline year. We also know that had our estate not grown between 2005/06 and 2015/16 emissions from our buildings would have reduced, by an estimated 7% (Figure 3).

This tells us that the work we have been doing to reduce our energy use and carbon emissions is working, but that we need to do more of it, and take steps to reduce the carbon impact of our new developments and research activity, if we are to reduce our overall emissions. Following the CMP review, we have a clearer idea of how to achieve this.

The CMP review has also increased our understanding of what we need to do to reduce our Scope 3 emissions and, in particular, emissions arising from business flights.



Whole Building Lighting Replacement Project

The lighting of buildings represents a significant proportion of the University's total energy consumption. Typically, lighting is replaced either when luminaires fail beyond economic repair or when an area of a building is refurbished, which means that there is little consistency in the type or quality of luminaires and controls installed throughout the building. This has impacts on energy consumption, maintenance, building aesthetics and building user experience.

The Whole Building Lighting Replacement Project has selected buildings based on their floor area and the age or quality of existing luminaires. All luminaires (except efficient T5 fluorescents)

were replaced with LED equivalents. Each LED luminaire has daylight and movement sensors built in that allow them to operate at minimal energy consumption whilst ensuring the lighting guidance levels are achieved.

During 2015/16 twelve buildings had LED fittings installed throughout the building, replacing their existing mixed and inefficient lighting at a cost of £1.1M. These new fittings will result in annual cost savings of £110,000 and will save 408tCO₂e per annum. A further £1.5M worth of lighting projects are currently planned with estimated annual savings of £180,000 and 630tCO₂e.

¹Carbon Reduction Target and Strategy for Higher Education in England. Higher Education Funding Council for England, 2010.

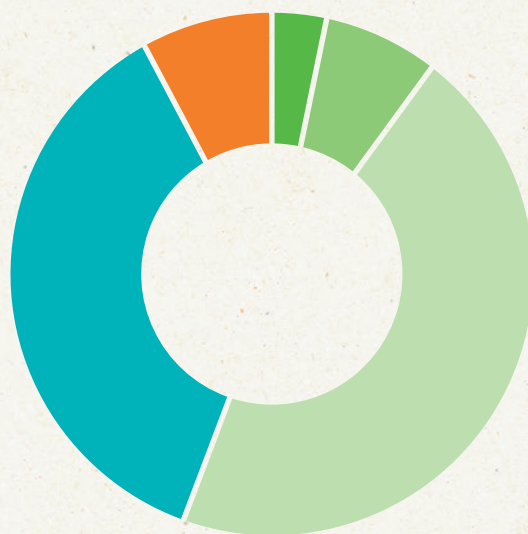
What we've done

In 2011, the University established its Energy and Carbon Reduction Project (ECRP), with an annual budget of £2M, to support the implementation of projects that reduce our building-related energy use and associated emissions. Since its inception, the ECRP has provided funding and resources to support the completion of 68

building-related projects, at a cost of around £6.6M. The projects that have completed to date are estimated to reduce the University's carbon emissions by around 2,018 tCO₂e per year and energy costs by around £508,000 per year. A breakdown of these projects by type, and some examples, is provided by Figure 5.

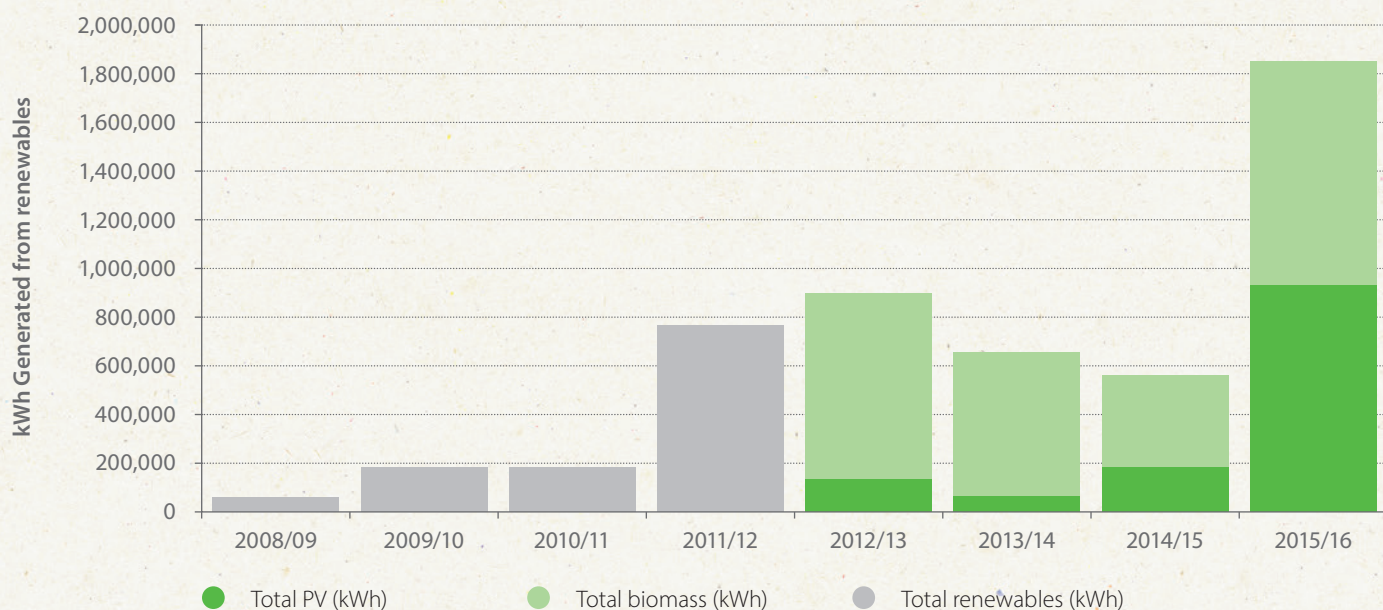
F5 Annual carbon savings from completed ECRP projects, broken down by project type

- **Building Management System improvements 3%**
Example: Adjustments to the controls and set points of the BMS systems in 75 buildings. Estimated to save over £120,000 and 500tCO₂e per year
- **Equipment improvements 7%**
Example: Modifications to two plant growth rooms at our Plant Growth Facility, to incorporate LEDs. Estimated to save over £9,000 and 55tCO₂e per year
- **HVAC projects 45%**
Example: Provided additional funding for enhanced controls and insulation as part of boiler replacements in 10 buildings. Estimated to save over £11,000 and 60tCO₂e per year
- **Lighting upgrades 37%**
Example: Whole building lighting upgrades with LEDs and controls in 12 buildings. Estimated to save over £100,000 and 400tCO₂e per year.
- **Other projects 8%**
Example: Funded installation of solar panels on roof of Engineering Department. Estimated to save over £21,000 and 40tCO₂e per year.



We have significantly increased the amount of energy generated by renewable energy technologies on our estate (Figure 6)

F6 Amount of electricity generated by on-site renewables



- As part of the review of our Carbon Management Plan, we have consulted a wide range of stakeholders to establish what level of carbon reduction the University believes it should and is able to commit to, and to test the acceptability and applicability of a range of specific carbon reduction measures. This work is informing the development of a revised set of carbon reduction targets for the University.
- We have launched a Green Labs programme to support lab users and managers in reducing the carbon impact of their research activity. This includes: funding to support departments in replacing old and inefficient ultra-low temperature freezers with new and energy efficient models; provision of guidance and resources; and the establishment of a best practice group.
- We have invested in improvements to our energy metering network, including the installation of more automated metering, to support more effective energy management and make it easier for us to identify opportunities for efficiencies to be made.

In progress /future plans

- ✓ We will publish a revised Carbon Management Plan for the University in 2017. As part of the revised Plan, we are developing several new strands of work to reduce our emissions across all scopes, including initiatives to make our estate more efficient; reduce the carbon impact of new developments; decarbonise our energy supply; and support a low carbon culture across the University.
- ✓ We have increased opportunities for staff and students to become actively involved in carbon reduction through the launch of the Cambridge Carbon Challenge.
- ✓ We are exploring opportunities to introduce a series of more innovative approaches to reducing energy consumption across our estate, including demand control ventilation systems and the development of centralised cold storage facilities.
- ✓ We are expanding our Equipment Replacement Programme to include other types of research equipment, including drying cabinets, and developing a programme of training and events to support lab users and building managers in reducing carbon emissions from our labs and buildings.
- ✓ We have another 30 ECRP projects in the pipeline for delivery or completion during 2016/2017, which are expected to collectively reduce the University's carbon by over 2,000tCO₂e per year.



The Department of Plant Sciences

With support from the ECRP, the Department of Plant Sciences are taking a multi-faceted approach to reducing the energy use and carbon emissions associated with its operations, through the implementation of a range of building improvements, equipment-focussed initiatives and behavioural change activities. A Departmental Energy Coordinator has been appointed to coordinate and facilitate the delivery of these projects and monitor their performance. The post holder was shortlisted as a finalist in the Sustainability Professional award category of the 2016 EAUC's Green Gown Awards.

A key project being taken forward by the Department is the replacement of fluorescent lamps used in its Plant Growth Facility with efficient light emitting diodes (LEDs). The first stage of this project is now complete and the second stage is well underway. The importance of this work was recognised in the Green Gown Awards in 2015, where it was Highly Commended.

Other projects include a building-level lighting upgrade, chiller replacements, equipment improvements and a series of staff engagement initiatives that culminated in the Department achieving the Gold award in the University's Green Impact scheme in 2015/16.



The second stage of the LED replacement project will save an additional £18,000 and 68tCO₂e per year.

Water management



Cambridge University Botanic Garden

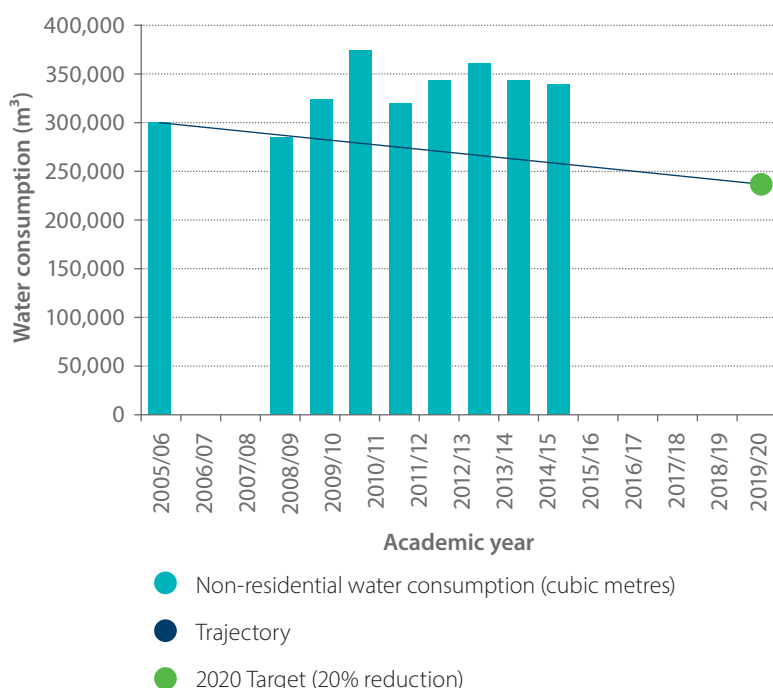
At the Cambridge University Botanic Garden, a number of initiatives have been put into place in order to minimise water use. Staff at the Garden have a firm commitment to sustainability, including an aim to carry out as little irrigation as possible, and plants are selected which are more able to grow in the relatively dry local climate. The Garden has invested in large rainwater tanks which collect from the glasshouse roofs and surrounding buildings. This water, stored in underground tanks, provides the main source of water for the glasshouses, particularly in the summer months. Additional water needs are obtained under licence from boreholes in the Garden, avoiding the need to use purified mains water.

The Garden has also developed an irrigation system in several glasshouses to minimise water waste, with a similar outdoor system also used for the tree and shrub nursery. This method cuts down on water use significantly compared to handheld watering techniques. The landscape and machinery team at the Garden also trialled the use of automatic water timers on the water cannons used to water large areas such as lawns. On larger beds the Garden is moving from water cannon to the use of soak hoses on timers, which dramatically reduces water wastage.

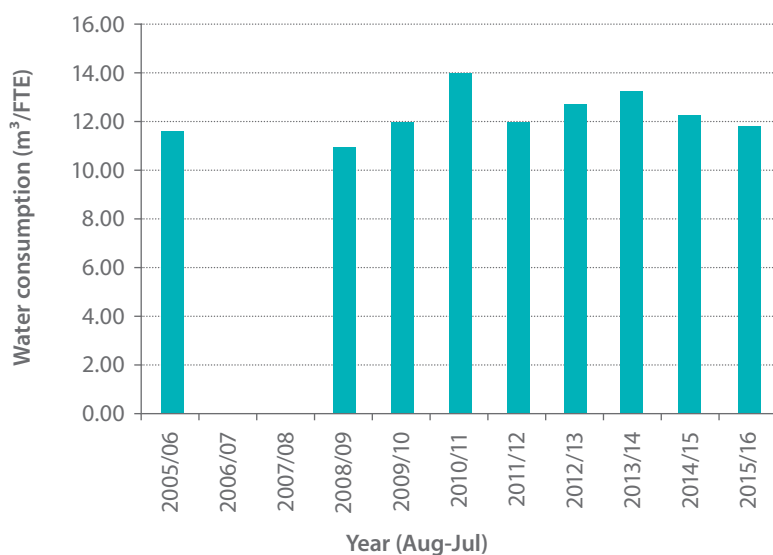
Trends and progress against target

- Overall water consumption has increased by 12.8% since 2005/06 (Figure 7).
- Water consumption decreased by 1.4% over the past year (2014/15 - 2015/16).
- We need a reduction of 7.3% per year to reach the 2020 target (using 2015/16 as baseline).
- Water consumption per staff/student member (FTE) is approximately the same in 2015/16 as in 2005/06 (Figure 8).

F7 Annual water consumption



F8 Water consumption per staff/student member



What we've done

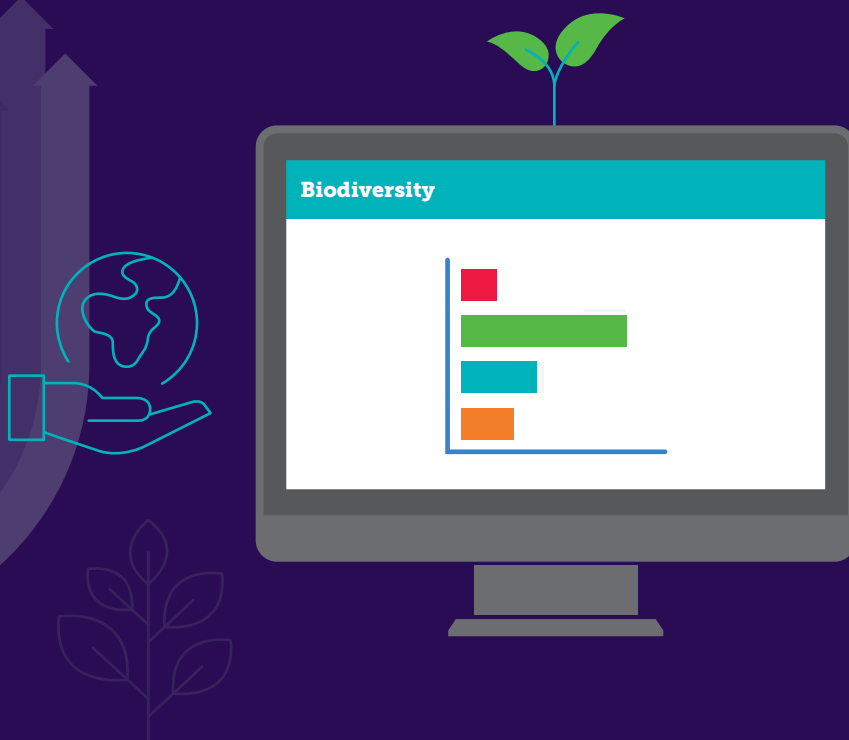
To date we have focused attention on reducing energy consumption and carbon emissions. However, the University is situated in a water stressed area of the UK and droughts in the summer months are predicted to be the number one climate change risk facing Cambridge. As such, water reduction is becoming an increasing priority. We have recently worked with our water supply company to replace 30 water meter loggers on high consuming buildings to allow for automated leak detection and this is planned to be rolled out to the remaining meters.

In progress /future plans

- ✓ We plan to roll out water saving products in some of our existing high consuming laboratories to trial their effectiveness. If this is successful we will include these within future designs for new laboratories and refurbishment projects.
- ✓ We have grey water harvesting schemes in two of our buildings that utilise the stored grey water for toilet flushing. We will consider utilising grey water harvesting in more new buildings in future.



Biodiversity and ecosystems



What we've done

The rural estate (including the University Farm) is included within a Higher Level Stewardship agreement with Natural England that covers the period from December 2013 until December 2023. The parkland setting for Madingley Hall is of historic interest, being a Registered Park and Garden. As part of the Higher Level Stewardship agreement, a Parkland Management Plan has been produced. This document is advisory, but it ensures that the historic interest of the park is considered when land management decisions are taken.

A Woodland Management Plan is being finalised covering approximately 96ha of woodland. The development of this management plan included consultation with academics within the University, Natural England and South Cambridgeshire District Council. The plan will shortly be sent to the Forestry Commission for final approval.

In 2016 we adopted a Sustainable Food Policy that aims to minimise the indirect biodiversity impacts of the food that we purchase.

In progress /future plans

- ✓ An Ecological Advisory Panel will be established in 2017 to provide strategic oversight of the University's commitment to biodiversity and ecosystems embodied in its Environmental Sustainability Policy and Strategy. It will be responsible for overseeing the undertaking of a baseline assessment of biodiversity on the University estate and the development of a Biodiversity Action Plan.



Sustainable Food Policy

The University Catering Service (UCS) has utilised the expertise of academics within the University and advocates locally to introduce a number of sustainable food initiatives, in order to reduce the negative environmental impact of the food we eat. The University's new Sustainable Food Policy aims to:

- reduce the consumption of ruminant meat (e.g. beef and lamb)
- promote the consumption of vegetarian and vegan foods
- ensure that no fish from the Marine Conservation Society (MCS) 'Fish to Avoid' list is served in the University and seek Marine Stewardship Council certification
- reduce the amount of food that is wasted in the University
- source food and other products locally where possible in order to sustain the local economy and reduce environmental impacts
- use Fairtrade products where applicable, and promote products which actively support Fairtrade initiatives
- ensure that animal welfare standards are adhered to for any animal produce purchased and to insist on Red Tractor Assured standards as minimum, where applicable

- communicate to customers, staff and suppliers our commitment to serving sustainable food.

Progress on the implementation of the policy to date includes:

- the removal of ruminants (beef and lamb) from UCS menus excluding the Main Dining Hall and Riverside Restaurant in the University Centre
- the Main Dining Hall no longer serves ruminant meat as a main option every day
- an increase in vegetarian and vegan options at cafes and Main Dining Hall
- training of chefs and catering staff in cooking vegetarian food
- the introduction of a new vegetarian catering menu.

Waste management



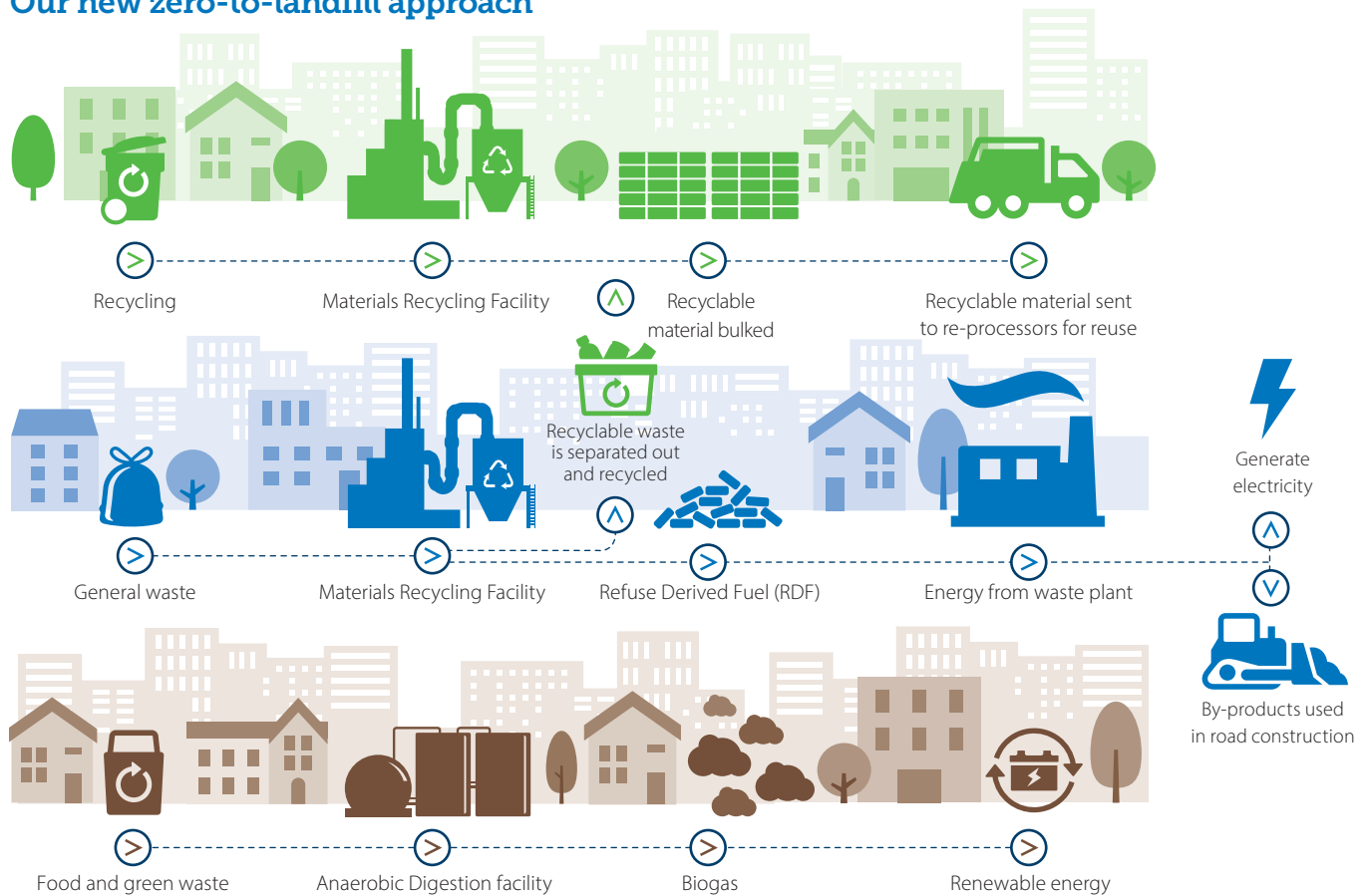
Simple but effective recycling changes in PDN

Before 2015, the Department of Physiology, Development and Neuroscience (PDN) was facing challenges with recycling practices. Different-coloured recycling bins around the department were leading to confusion when throwing away waste, and the bins were generally too small for their purpose. To solve these problems, the department replaced all recycling bins

in the department with large, bright green bins. By buying in bulk the department was able to secure a discount, and the consistency of the bins helped to clear up uncertainties about which bin to use. Bins were clearly labelled with updated signs and recycling posters were displayed on notice boards around the department. Additionally, cleaners were required to

empty the recycling bins separately from the waste bins. The changes have had a big impact - in a recent survey, PDN's recycling rates proved to be one of the best-performing in the University. Only 19% of the material in the general waste bins was found to be recyclable, much better than the University average of 43%.

Our new zero-to-landfill approach



Trends and progress against targets

While there is some way to go to reach the waste and recycling targets set out in the Environmental Sustainability Vision, Policy and Strategy we have already made great strides to improve our understanding and control of our performance, including the introduction of a new waste contract in 2016, which brought the collection of multiple waste streams under one supplier. Under the new contract each bin is chipped and can therefore be weighed

before being emptied. We are also in the process of renewing our Design Standards for capital projects which will state our requirements for the provision of construction waste data. At the same time, we have renewed efforts on communication to and engagement with staff and students and we are hopeful that this will drive improvements in performance in the coming years.



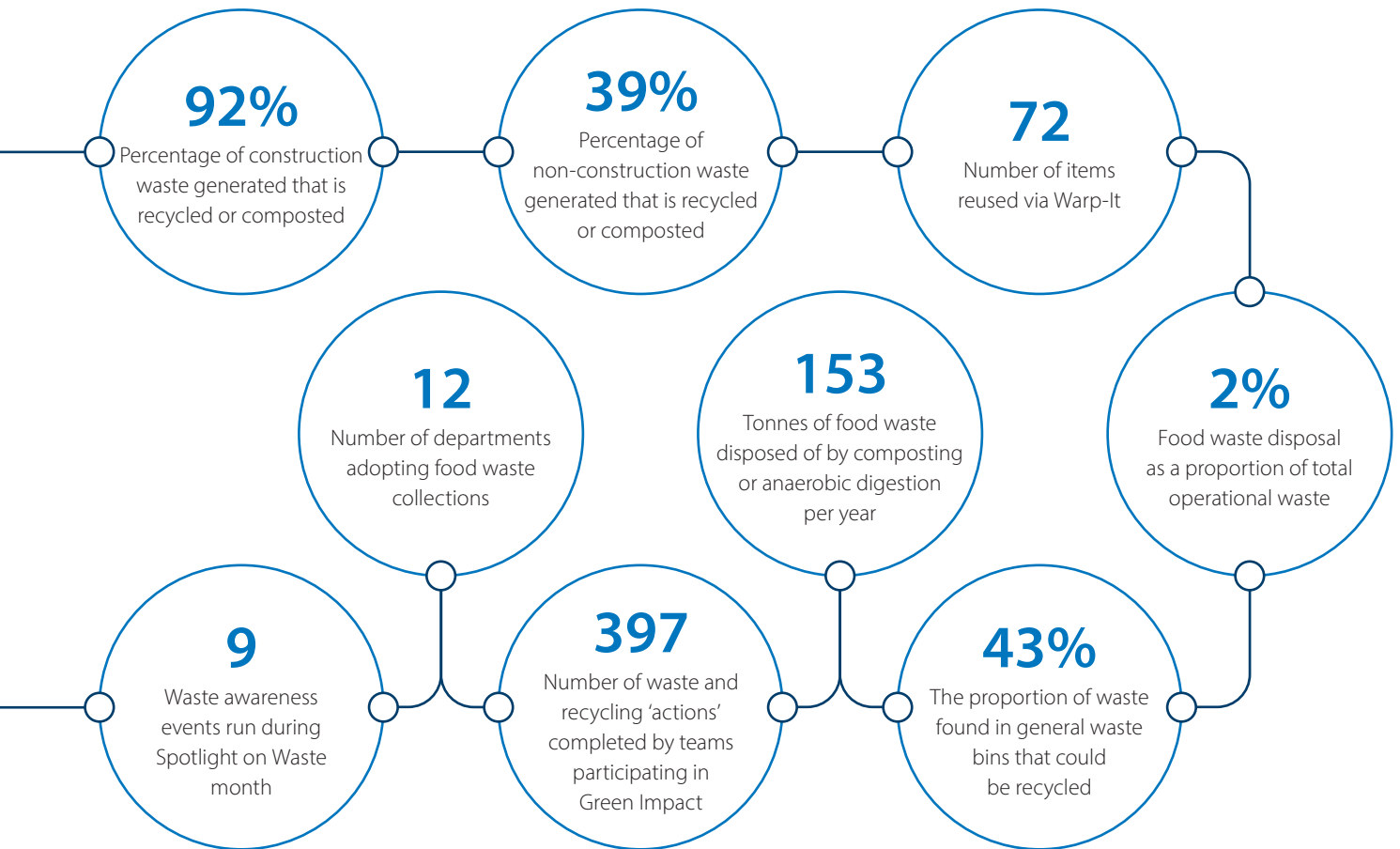
State of the art waste collection at NWCD

The North West Cambridge Development (NWCD), a residential area of 3,000 houses opening in 2017, is to be the University's largest development in its 800-year history. It also aims to be one of the most sustainable projects yet, with environmental sensitivity built into the design. In terms of waste management, the development plans to tackle issues such as unsightly bins, inefficient bin collection and low rates of recycling. The NWCD's answer to waste management issues is to have

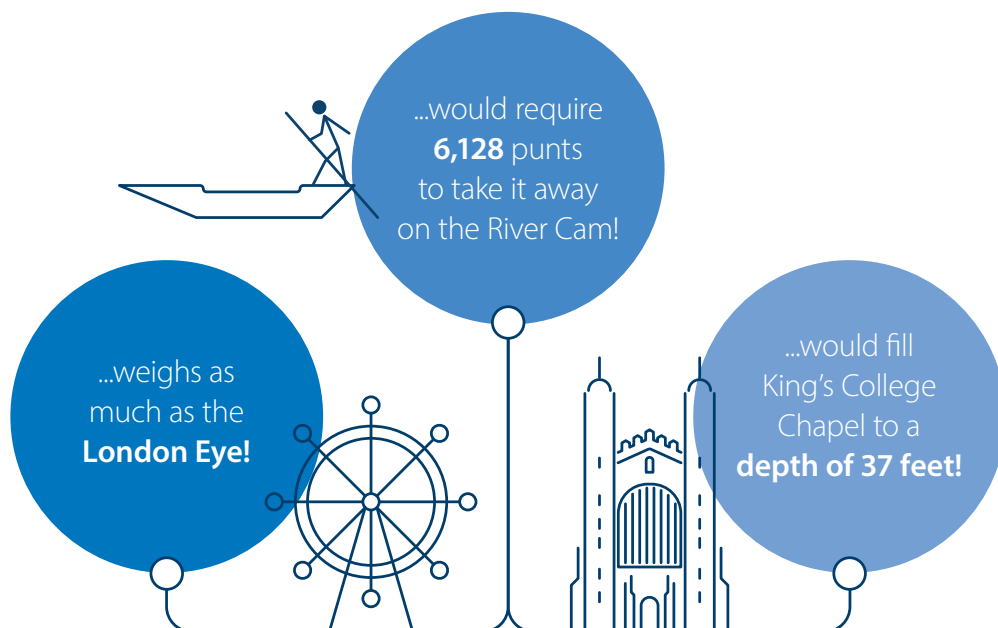
an underground bin system, one of the largest of its kind in the UK. By locating the waste system underground, the site will avoid the 9,000 wheelie bins that would otherwise have been required. Instead, waste will go into subterranean containers with sensors that alert the collection company when they are full. This means that refuse trucks only come to collect the bins when needed, cutting unnecessary mileage and emissions. Additionally, the site will have separate compost bins

in close proximity to each residential unit, from which compost will be generated to use in their gardens and allotments. Awareness of recycling procedures will be promoted across the site so that residents are able to maximise their recycling efforts. As well as maximising recycling rates, these initiatives will have other benefits to residents such as reducing vehicle movements on the site and providing greater opportunities for greenery in the place of bin storage areas.

Performance in 2015/16 in detail



The University's waste from a single year



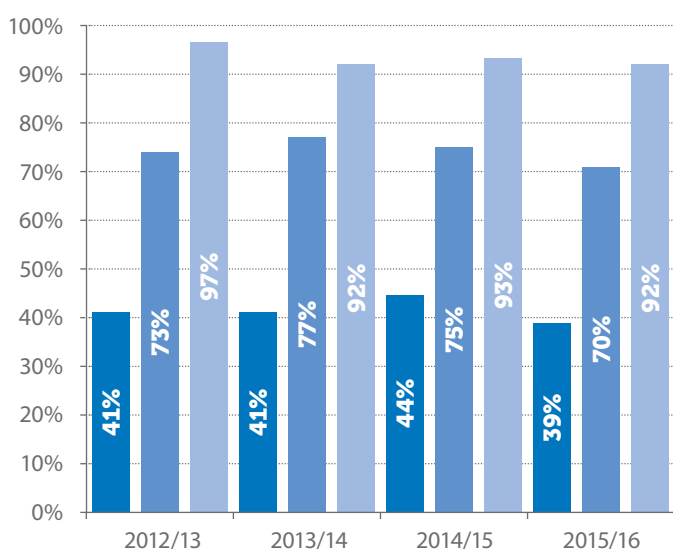
Waste performance explained

A waste audit carried out in December 2015 found that recycling performance varies significantly between buildings and departments. Of the nine departments audited, between 15% and 75% of the waste put into the general waste bins should have been put into the recycling bin.

This demonstrates that significant progress needs to be made in educating staff and students, providing clearer signage, and making waste infrastructure easier to understand and use.

F9

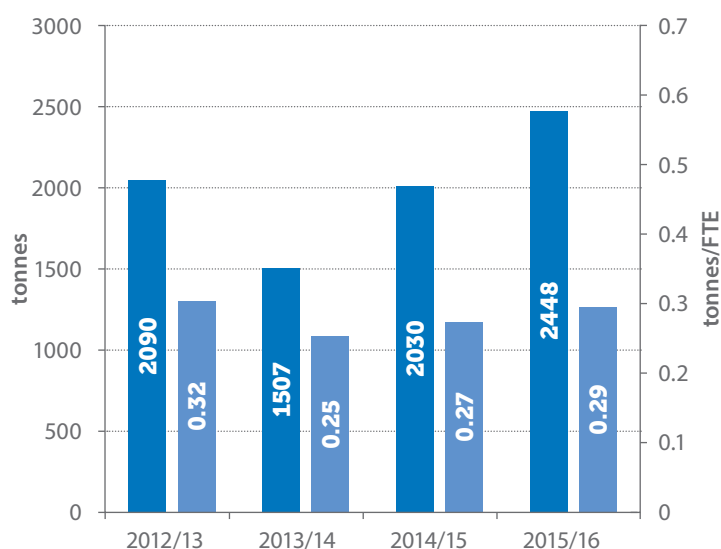
Recycling rates for operational and construction waste



- Construction recycling rate
- Operational recycling rate
- Total recycling rate

F10

The University's waste outputs



- Total sent to landfill
- Output per FTE staff and student



Café culture change

The University Catering Service has been doing everything it can to reduce waste and encourage reuse and recycling practices. This has included:

- Selling high quality refillable 'KeepCups' to staff and students and offering a discount on hot drinks whenever the cups are used. In 2014/15 the scheme avoided the use of over 27,000 disposable cups!
- Food waste bins are now available across all University Catering Service outlets, and this is sent for anaerobic digestion.
- Introducing 'Vegware' compostable packaging. The cups, sandwich wrappers, food boxes and cutlery are made from recycled or renewable plant-based materials rather than plastic, so can go straight into the food waste bin. In the first six months, Vegware saved 2.6 tonnes of virgin materials being used, reduced waste going to landfill by 6.6 tonnes, and helped prevent 5.4 tonnes of carbon emissions being emitted.
- Giving used cooking oil a new life as biodiesel! Oil from the University Centre's catering operations amount to around 100 litres every week. This is sent off to be heated, cleaned and filtered before being recycled for use as a fuel with a carbon output 90% lower than that of regular diesel. As part of the partnership the University Centre receives a discount on its next purchase of cooking oil, so everyone wins!

What we've done

- The University's main operational waste contract was re-tendered in 2016 with a 'zero waste to landfill' approach. This means that waste that cannot be recycled now goes to an energy-from-waste facility instead of going to landfill. In addition, the new contract allows us to offer food waste collections to any building on our operational estate, and this is sent for anaerobic digestion. Individual external bins are chipped and weighed, providing monitoring data on a building and site basis across the University.
- In 2014, the University started to use Warp-It, an internal web portal aimed at facilitating resource reuse by allowing staff to advertise items that they no longer need to others across the University.
- The Environment and Energy section has now held two Spotlight on Waste months. These have included multiple 'waste roadshow' events across the estate, and staff have been taken on tours of our waste contractors' Waste Recycling Facilities.
- In December 2015 a 'bin-busting' session was organised by the Living Laboratory for Sustainability, where students carried out an audit of 11 departments' external bins to determine the composition of and contamination rates within our operational waste.
- In 2016 a waste and recycling guidance document was produced, setting out a checklist and step-by-step actions that can be made to improve recycling practices within a department. The guidance was developed by collating best practice from a range of departments and has been publicised widely.

In progress/future plans

- ✓ A Waste Management Plan has been developed, setting out initial plans for addressing waste management issues in 2017 and improving monitoring of performance. Based on this plan a longer-term plan will be developed to work towards the targets set in the Environmental Sustainability Vision, Policy and Strategy. The plans for waste management include action under five key focus areas:

1. Building legal and policy compliance
2. Providing appropriate infrastructure and systems
3. Communications and behaviour change
4. Collecting and reporting data and information
5. Providing training and support.



Sustainable procurement



Tender for the Clinical Schools Café

The procurement team at the University of Cambridge are actively engaged in embedding sustainability into our day to day work practices. In a tender for the Clinical Schools Café, the Category Manager focussed on sustainability and looked at local sourcing, animal and marine welfare standards e.g. Red Tractor, Marine Conservation Society "Fish to Avoid" list as well as the Marine Stewardship Council's certification and chain of custody schemes. We have a policy on Fairtrade which is

adopted where applicable and these standards are iterated from policy, to bid, to final contract.

The commitment of the Category Manager in charge of this project extended beyond the basics and led to the consideration of the environmental cost of red meat production versus arable crops and has resulted in a focus on less red meat and more vegetarian and sustainable crop alternatives.

What we've done

*In 2015/16 the University's total non-pay spend was **£339.1M**.*

In 2015, we published a Sustainable Procurement Policy which aims to ensure that staff involved in the procurement of goods, services and works throughout the University consider appropriate environmental, social and economic factors in their purchasing decisions.

We include environmental, economic and social aspects when specifying specific goods or services and include sustainable criteria when evaluating offers from potential suppliers.

The University uses a variety of consortia frameworks including regional and national agreements. The format of these tenders is highly formalised and includes significant detail requested on sustainability policies, carbon reporting, and environmental and

social impacts. Procurement users and University stakeholders benefit from a user friendly time efficient process, which has not compromised on core principles like sustainability and which has full compliance with the University's financial regulations and the public sector procurement rules.

Frameworks are promoted with users through: internal purchasing forums such as the Scientific Procurement Group; via the procurement newsletter; the website listing all consortia frameworks together with their buyer guides; and through access to framework suppliers through events such as the annual Procurement Exhibition.

We are starting to include environmental information on the University's electronic marketplace to help purchasers make

informed decisions, for example, the energy consumption of freezers so that purchasers can take this into account when deciding which models to purchase. We also use symbols such as a tree to indicate to users the environmental friendliness of the products.

Category Managers in the procurement team are either fully qualified or participating in training delivered by the Chartered Institute of Purchasing & Supply (CIPS), which includes aspects in several modules around sustainable supply chains and ethical sourcing.





Tender for waste management contract

In August 2016 the University of Cambridge re-tendered its main waste contract. The criteria required the tendering organisation to be ISO 14001 accredited (the international standard in environmental management systems), and required that 100% of our waste was diverted from landfill. Procurement Services worked closely with Facilities Management and the Environment and Energy section to shortlist the seven potential suppliers to three - two local and one multi-national.

The contract, awarded to Mick George Ltd, is 'zero waste to landfill', thanks to treatment of recycling waste in a state-of-the-art Materials Recycling Facility which separates materials to be sent to re-processors for reuse. General waste is also sent to the Materials Recycling Facility, with recyclable waste separated out and recycled and the residual material sent to be used as Refuse Derived Fuel (RDF) in an energy-from-waste plant. The by-products following combustion are used in road construction. A new food and green waste collection has also been introduced, which is sent for Anaerobic Digestion providing a source of biogas. The contract is priced on a 'per tonne' basis rather than a 'per lift' basis, in order to encourage greater efficiency in vehicle movements, while a lower cost for recyclable waste collections compared to general waste provides a financial incentive for the University to increase its own recycling. The current figures suggest a 20% financial saving over the previous contract.

In progress /future plans



In future, we intend to continue to actively promote the CIPS Sustainability Index to suppliers, and continue to grow the number registered on the portal. We also endeavour to maximise the number of procurement staff attending procurement training courses relating to sustainability.

Sustainable construction and refurbishment



David Attenborough Building

When the David Attenborough Building (formally the Arup Building) needed refurbishing, it was clear that sustainability needed to be at the heart of the project. The main reason for the refurbishment was to create a new working space for the Cambridge Conservation Initiative (CCI), a unique collaboration between nine conservation organisations and the University of Cambridge that seeks to transform biodiversity conservation.

A consultation process at the outset with future tenants, architects and sustainability engineers resulted in the development of a bespoke sustainability framework, with targets across 10 themes, including: biodiversity and ecology; energy and carbon; health and wellbeing; transport and mobility; waste and water. Headline sustainability features of the refurbished building include:

- A large biodiverse green roof to promote urban biodiversity
- Greatly improved thermal comfort achieved through internal insulation
- New double glazing and an efficient ventilation system that maximises natural ventilation
- A low carbon heat supply from a Combined Heat and Power system
- Rooftop electricity generation from solar photovoltaics
- Metering infrastructure to facilitate competitive energy and water monitoring throughout the building.

A large atrium forms the centre of the building, acting as the heart of the campus, with a shared reception area and visitor facilities. A four-storey tall living green wall, featuring biodiverse rich vegetation, provides a compelling visual focus around which people move and interact as part of their daily routines. The Campus provides a vibrant working environment for around 500 individuals from CCI's partner organisations, including c. 150 academics and 350 practitioners.



Maxwell Centre

The BREEAM excellent rated Maxwell Centre was opened on the 7 April 2016. The new £26M science facility was developed to foster advanced research in several scientific fields and was set to provide a new home for 'blue skies' research, enabling it to be translated into products of importance for the industrial sector.

The new four storey facility contains research laboratories complemented by seminar rooms, interactive spaces and dedicated hubs. Scientists from industry now occupy the facility alongside the Cambridge research groups to promote a two-way flow of ideas.

Building in future flexibility was of utmost importance. The 1,200m² lab area has no movement joints in the floor slab and just seven internal columns allowing the labs to be easily changed in the future to cater for different laboratory configurations. The complex and challenging doubly curved roof was designed to reflect the curved roof of the existing Physics of Medicine Building. The design also features meeting rooms and balconies which cantilever out into the internal courtyard.

The high specification mechanical works include laboratory and natural ventilation systems, fume cupboard extraction system and full medical gases, new low temperature hot water and processed chilled water systems, and an automatically controlled Building Management System. An innovative layered laboratory design ensures services to individual laboratories can be changed without affecting the others.

What we've done

The University's Strategic Framework for the Development of the Estate commits to developing the estate sustainably as one of four key performance areas, and includes the following specific goals:

- Promote our built and cultural heritage (goal 3)
- Deliver flexible and adaptable space (goal 7)
- Improve sustainable travel options (goal 8)
- Reduce carbon emissions (goal 10)
- Conserve natural resources and enhance biodiversity (goal 11)
- Improve space efficiency (goal 12).

A new approach to sustainable construction will embed sustainability into all our capital projects: new build, refurbishment and fit-out. Our priority is to build and operate buildings which demonstrate clear, ongoing value to their users: providing high quality internal and external environments and effective management of environmental impacts. We recognise the clear link between efficiency optimisation and reduced operational costs over the life-time of the building.

Our aim is to achieve the best balance between any upfront costs associated with sustainable design measures and clear value benefits across the lifecycle of our buildings. This includes the consideration of health and wellbeing benefits for our building users – providing productive, comfortable working environments to ensure the highest possible levels of occupant satisfaction. Our emerging approach to sustainable construction therefore goes beyond 'ticking the box' and emphasises the need for early commitment and planning to deliver tailored, best practice outcomes.

Site-specific sustainability frameworks are developed as part of masterplanning work. Frameworks are currently in use or under development for the North-West Cambridge Development, New Museums Site, West Cambridge and Old Press Mill Lane. These frameworks put sustainability at the heart of site-development from the initial masterplanning stages, through the design and construction stages, to the operation phase. They set out site-level sustainability aims, targets and actions under several principles and are used to set the sustainability brief for each phase of the development.

BREEAM certifications

Year	Building name	BREEAM certification
2016/2017	Maxwell Centre	Excellent
2016/2017	Electrical Engineering Department Building Annexe	Very good
2015/2016	The Simon Sainsbury Centre	Excellent
2015/2016	The James Dyson Building	Very good
2014/2015	Cambridge Astrophysics	Excellent
2014/2015	7 West Road	Excellent
2014/2015	Chemical Engineering and Biotechnology Building	Very good
2014/2015	Department of Materials Sciences and Metallurgy	Very good
2013/2014	Cambridge University Sports Centre	Excellent

In progress/future plans

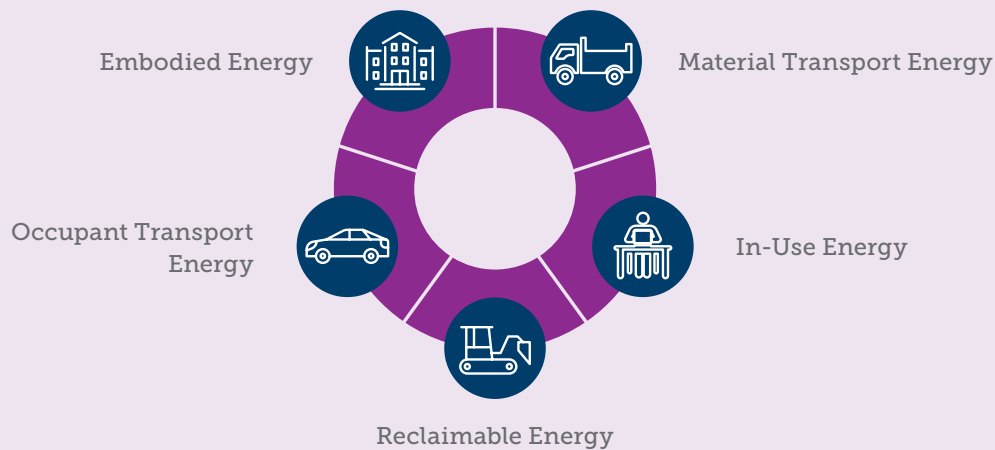
- ✓ The outputs of the work to develop a new approach to sustainable construction will be embedded within our new Design Standards that are due to be adopted in 2017.
- ✓ A Design and Sustainability Review Panel is being established to review proposals for capital building projects and site masterplans at key design stages. This panel will form a key

part of the project management process and will advise in relation to the implementation of sustainability measures and achieving the University's environmental objectives. The panel will be involved in value engineering decisions to help ensure that decisions take into account life-time cost and carbon savings.



Energy Cost Metric for Civil Engineering building

A pioneering new approach that accounts for energy use alongside cost within building design, construction and use has been developed. Through the development of plans for a new Civil Engineering Building, the late Professor Sir David MacKay led the creation of a tool to integrate low energy objectives into building design, alongside building costs. This 'Energy Cost Metric' takes a holistic view of energy, incorporating all of the following aspects:



The Energy Cost Metric highlights aspects of the design that are most significant in terms of overall energy consumption, and quantifies the balance between energy and cost, thus supporting sound decision making for low energy design.

Energy brief overall ambitions

The 'Energy Brief' for the new Civil Engineering building has the following components, which the Energy Cost Metric will support.



Very-low-energy buildings

Multiple component bespoke metric.



Pleasant

Finding a balance between energy performance and the comfort of occupants.



Zero-bling

Not being swayed by a desire to parade green credentials in order to secure BREEAM accreditations or showcasing technologies that might run counter to the true attainment of very-low-energy.



Upgradeable

Technology and use of space may change and must be upgradeable.



Well measured

It may be easy to promote a building's green credentials but without accurate measurement such claims are meaningless.

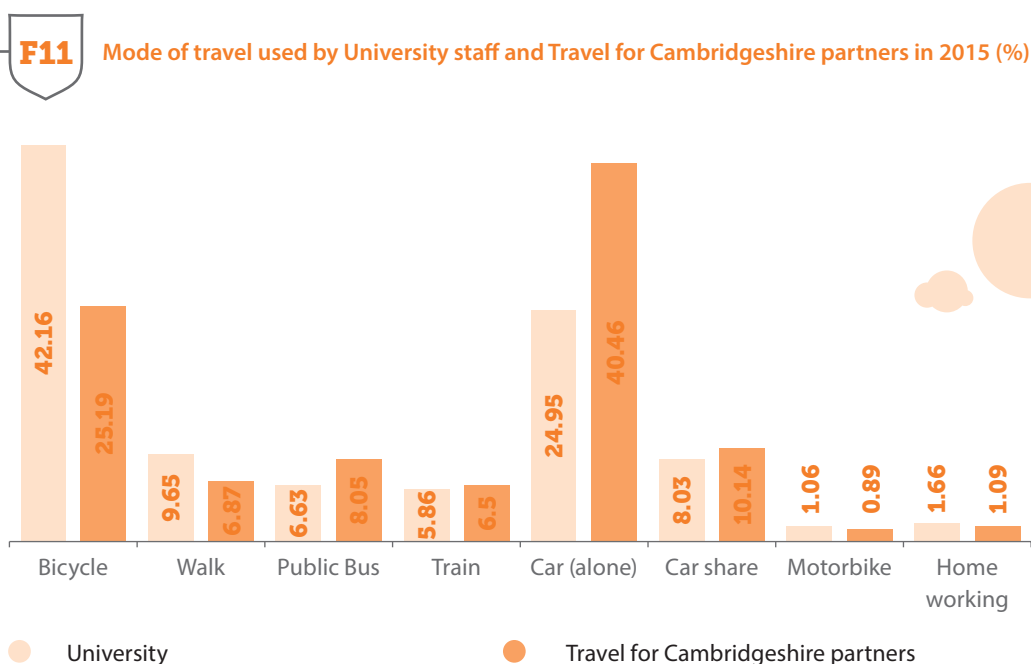
It is hoped that following use and implementation in the context of the new Civil Engineering building, the Energy Cost Metric could be used as a tool across many more projects.

Travel

How our staff travel

Every October a Travel to Work survey is completed by University staff. The University had a 24% participation rate in 2015, meaning approximately 2,640 staff members completed the survey.

The mode of travel used by University staff is shown in Figure 11. This indicates that over 50% travel by 'active' travel modes. For comparison, the darker orange column provides the mode used by other Cambridge commuters from the Travel for Cambridgeshire partners².



Trends and progress against targets

In comparison to commuters from across Cambridgeshire and national travel data, the University has a particularly high rate of sustainable travel, especially active travel. The University has been effective at maintaining this level of sustainable travel; however future developments have the potential to have adverse effects on this if not proactively managed from the outset.

This includes the relocation of parts of the estate out of the city centre and the growth in staff numbers generally. Both of which could result in greater car usage. For staff situated outside of the city centre, sustainable travel to other University sites and the city centre during the working day will be of utmost importance.

²74 organisations took part in the Travel to Work survey including a total of 11,821 valid responses.

What we've done

The University employed its first Transport Manager in January 2015 and this enabled the University to make significant progress in sustainable travel.

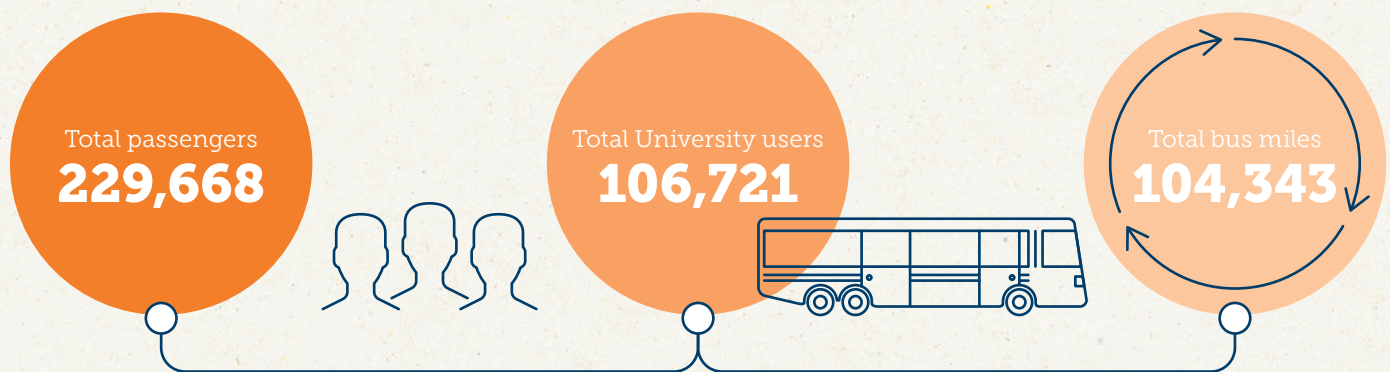
The University was awarded 'Go Ultra Low Company' status in June 2016, in recognition of the University's efforts to electrify its fleet. The use of electric vehicles among staff has also been facilitated by the presence of 11 charging points on University property.

A travel segmentation study was published in October 2015. It provided detailed information about staff and student travel and outlined the reasons why particular travel modes were chosen.

The findings of this study have been used to inform a number of travel initiatives that encourage staff to move towards sustainable travel.

The University subsidised bus route, the Universal, connecting the Cambridge Biomedical Campus (CBC) with the city centre and new developments in West Cambridge was tendered in April 2016. The winning bid, put forward by Whippet, has resulted in a new fuel efficient fleet (Euro 6 compliant), the incorporation of a railway station stop within the bus route and a greater frequency of service for the 106,000 University staff who use the service.

Bus Patronage



Planning permission requirements for new buildings and major refurbishments specify that buildings have a Site Travel Plan. Through the implementation of such plans, the 1,100 staff of Greenwich House, David Attenborough Building and the Maxwell Centre have access to pool bikes, Dr Bike repair sessions, bike security marking and travel planning materials such as maps. Travel Plan Coordinators have been recruited in these buildings and in the Judge Business School to champion sustainable travel. These members of staff will continue to work in their building, with the support of the Environment and Energy section, to encourage staff to travel sustainably.

April 2016 was designated 'Spotlight on Travel' month and the Environment and Energy section held a number of travel roadshows on sites across the University. Staff were made aware of sustainable travel incentives in the University, including staff discounts on tickets, discounts on cycling equipment, and membership of car-sharing clubs.

The University Travel Newsletter was published for the first time in July 2016 and was delivered to 1,400 subscribers.

Cycle parking was extended at a number of sites to serve high numbers of staff and students cyclists. Buildings included: Greenwich House, the Roger Needham building, Mill Lane Lecture Theatre, New Museum Site, and the Chemical Engineering Building.

In progress/future plans

- ✓ The formulation of a Transport Strategy to set out plans for achieving the University's travel goals is underway and will be completed in 2017.
- ✓ The Car Parking Policy is under review and the Car Parking Project Board will continue to assess improvements to our existing system that will lead to a fair and sustainable allocation of parking permits.
- ✓ The Environment and Energy section will continue to promote sustainable travel options through events like 'Spotlight on Travel' month, through our internal communication channels and in our work to put in place the provisions of Site Travel Plans in a further four buildings during 2017.
- ✓ Infrastructure changes will include the extension of existing pool bike schemes, the incorporation of Site Travel Plan measures like bike repair stations, the provision of car club services in the North West Cambridge Development and the increase in number of electric vehicle charging points which will include rapid charge points for taxis in North-West Cambridge and the CBC.



'Go Ultra Low Company' status for the University's fleet



Estates Facilities have taken a number of steps in recent years to make the University fleet sustainable. These steps include: reducing fleet size, tracking vehicle use, driver training, the development of the Sustainable Fleet Management Policy and the introduction of electric vehicles. Last year alone, these changes have resulted in a carbon emissions reduction of ten tonnes and a saving of 4,000 litres of fuel.

In June 2016 this resulted in the University's being awarded 'Go Ultra Low Company' status in recognition of how plug-in cars and vans form an increasingly important part of our fleet. The accolade also recognises our commitment to boosting electric vehicle uptake over the next five years and as part of our long-term transport strategy. In the coming years electric vehicles in our fleet will boost our eco-credentials, make a real difference to the environment by reducing carbon emissions and they will help to improve air quality in our region.



Connecting Greenwich House to the wider University with pool bikes

In January 2016, 300 staff moved from central Cambridge University sites to Greenwich House, a site in West Cambridge 3 miles from the city centre. Prior to the move concerns were raised about how staff would travel between University sites throughout the day, so to facilitate this a pool bike scheme was set up.

Staff need to register to use the scheme and can choose between one of four bike types: electric, folding, hybrid and comfort bikes. There are 17 pool bikes in total at Greenwich House.

The implementation of the pool bike scheme has been a success and has had the following benefits:

- **Encouraging staff to cycle more and reduce car use:** in total, 61 staff members have registered to use the scheme. The bikes were used for over 758 journeys in the first six months of operation.
- **Reduction in carbon emissions:** a distance of approximately 2732 miles has been travelled using pool bikes, equating to a

saving of 679kg of CO₂ (assuming that those journeys would have been made by a standard sized petrol car).

- **Reduction in local air pollutants:** Cambridge was declared an Air Quality Management Area (AQMA) in 2004 as levels of nitrogen dioxide were above the national objective in some locations of the city. The reduction in business journeys travelled by car has assisted in reducing emissions of NO₂ and particulate matter into Cambridge's air space and particularly within the city centre.
- **Financial benefits:** Without the scheme it is likely that the University would have had to purchase additional vehicles to assist staff in travelling between University sites.
- **Health:** Increased cycling is linked to increased productivity and lower absenteeism as there are health benefits in increased physical activity.

Teaching and research



What we've done

Links with many departments have been forged through the Living Laboratory for Sustainability. In 2015/16, projects were undertaken with staff and students in the Departments of Architecture, Engineering, Plant Sciences, Zoology, Land Economy and Geography, as well as the Cambridge Institute for Sustainability Leadership and the Careers Service. The Living Lab has provided support to an Engineering and Physical Sciences Research Council (EPSRC) project called the Energy Efficient Cities Initiative, led by Ruchi Choudhary (Reader in Architectural Engineering). The project aims to help reduce the uncertainty in modelling the energy management of non-domestic buildings. Support has been provided through data provision and use of University buildings for modelling. Six academic papers have been published to date that make use of a range of University buildings.

There is a proliferation of teaching and research on sustainability at the University of Cambridge. Below are a snapshot of initiatives, courses and research groups integrating or focusing upon sustainability in a meaningful way.

- Three strategic research initiatives (interdisciplinary networks bringing together a critical mass of expertise) on food, energy and public health.
- Cambridge Conservation Initiative is an innovative new partnership between the University and the many leading international conservation organisations based here, supporting new collaborations and transformations in knowledge and practice.
- Cambridge Forum for Sustainability and the Environment facilitates cross-disciplinary conversations to address pressing sustainability challenges.
- Many undergraduate courses include lectures on sustainability topics, in particular Architecture, Engineering, Geography, Human, Social and Political Science, Land Economy and Zoology.
- A number of Masters courses and graduate programmes provide full and part-time opportunities focused specifically on sustainability matters, such as the MPhil in Conservation Leadership, MPhil in Engineering for Sustainable Development and the Postgraduate Certificate in Sustainable Business, to name a few.



The Living Laboratory for Sustainability

The Living Laboratory for Sustainability aims to provide opportunities for students to help improve environmental sustainability across the University estate, through projects, internships and research. Funded by Santander, the Living Lab contributes to the enhancement of the educational experience of our students, their employability and their opportunities for innovating and creating change. The project generates a huge number of collaborations and relationships built with students and staff across the University. For more information about these projects, take a look at our annual reports on the Living Lab webpages: www.environment.admin.cam.ac.uk/living-lab/yearly-review. Our Living Lab Coordinator Emily is convenor of the new Environmental Association of Universities and Colleges (EAUC) Community of Practice on Living Lab. This community of practice is a platform for members to share and learn from each others' experience.

In progress/future plans



We are currently conducting a review of existing approaches to integrating environmental sustainability into teaching and research within the University. We are gathering information on good practice and learning from other institutions and their approaches to integrating sustainability into teaching and research, to then inform our future work in this area.

Partnership and engagement



What we've done

Over the last few years, the University has done a lot to maximise opportunities where staff and students can develop and share their knowledge, skills and experience to engage with and contribute effectively to achieving the University's environmental sustainability aspirations.



Environment and Energy Coordinator Network

Environment and Energy Coordinators (EECs) are a network of staff volunteers who act as champions for environmental issues within their department and as a point of contact between the Environment and Energy section and department staff, students and senior management. They encourage their colleagues to make small changes to everyday work practices that collectively make a big difference across the University.

Due to the diverse and extensive nature of the University, there is no one-size-fits-all approach so there needs to be a local focus for activity within departments to make the message relevant and effective. EECs play a key role in providing this local focus, understanding the culture of the department and being able to encourage others to change their attitudes and behaviour to take environmental aspects into consideration. On-going support and assistance is provided to EECs as part of our mission to reduce carbon emissions and address other environmental issues across the University's estate and encourage sustainable behaviour across our academic, teaching and administrative activities.

'Spotlight on' months

Building on the success of the University's Switch Off Weeks in 2013 and 2014, we instigated a series of themed 'Spotlight on' months which aim to raise awareness of particular issues and provide impetus for engagement and action being taken within departments. In 2015-16, 'Spotlight on' months have been held focusing on waste, energy and travel.

Greenlines

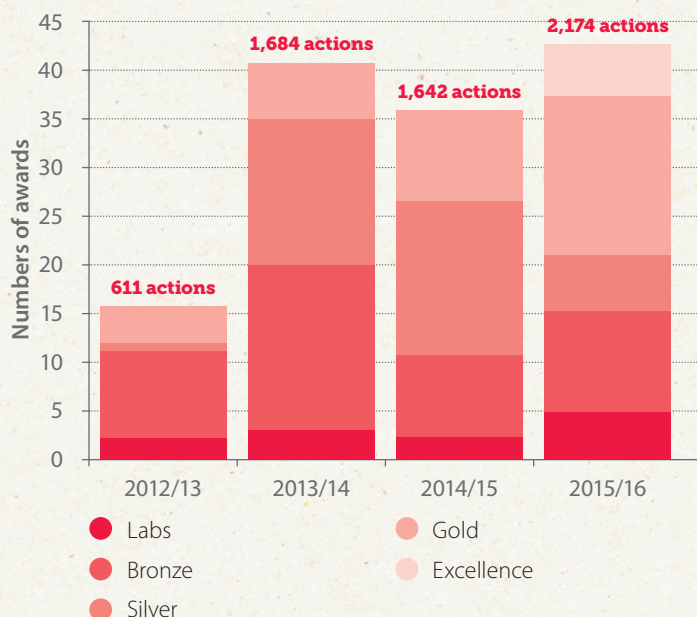
Greenlines, the University's sustainability newsletter, provides information about all things sustainable going on around the University – from events and opportunities available to University staff and students, to announcements about awards and initiatives, to facts, advice and guidance. Two editions are issued monthly, one for staff and one for students.

Green Impact

One of the main ways staff and students at the University of Cambridge are able to get involved in improving the sustainability performance of their place of work and study is through Green Impact. The scheme supports and encourages institutions and Colleges across the University in reducing their environmental impacts with support from the Environment and Energy section. Small teams sign up to an online workbook and progress through simple, clear and easy criteria and are recognised for their efforts at an awards ceremony at the end of each year.

Although Green Impact is run in numerous Universities and other organisations nationwide, at the University of Cambridge the scheme has been tailored to include locally-relevant targets and actions, including a dedicated award available to the 31 Colleges, and a 'Labs' award aimed specifically at research facilities. As more teams have reached the highest 'Gold' award, a new 'Excellence' award was introduced in 2015, leading to five teams carrying out their own sustainability projects ranging from lab equipment replacement initiatives to a sustainable May Ball.

2015-16 was the most successful Green Impact year ever for the University (Figure 12). Forty-three Green Impact teams between them completed 2,174 actions to 'green' their places of work and study. While making tangible environmental improvements and saving energy and resources is the main goal of Green Impact, the awards also saw some teams embracing the fun side of 'going green', through group cycle rides or holding wacky jumper competitions. In 2016 some teams also spread their sustainability impact outside of their own offices by doing things like running fundraising charity events, installing bird boxes, and working with student societies.



Staff and students keep coming back to take part in Green Impact – many of them have helped their department or College obtain the highest 'Gold' award! What was it that participants of last year's Green Impact said was the best bit about taking part?

"Raising awareness while having fun and building team spirit!"

"Realising savings in our energy usage."

"Making people aware of what impact they can have."

"Improving the department!"

"Listening to people's ideas and coming up with simple solutions."

"Seeing the difference we made!"



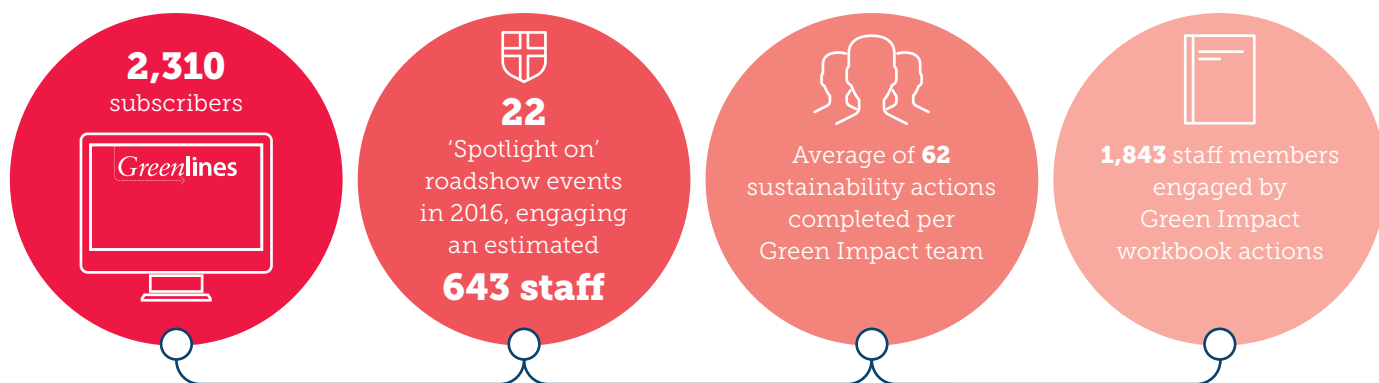
Increased focus on student engagement

In 2016, we surveyed over 900 students on their engagement with environmental sustainability at the University. This has provided us with a useful insight into student attitudes to environmental sustainability, awareness of the University's initiatives on sustainability, and preferences for communications and engagement. It is informing our future work in this area to better engage students in sustainability while they are here.

Through the Living Laboratory for Sustainability we piloted a project brokering an opportunity for student teams to work with one of the Colleges, Lucy Cavendish, on a sustainability project. This provided the opportunity for students to gain practical experience, and enabled the college to receive support for assessing their efforts around reducing energy use.

"A very rewarding experience where I gained insights into the energy policy as well as employed and polished my analytical skills to return something back to my University and society at large"

Mudassar Ahmed, student on the Lucy Cavendish sustainability project



In progress/future plans

- ✓ As part of an internship carried out in the summer of 2016 focusing on how the Environment and Energy section can better engage with students on the topic of sustainability, a number of different student engagement materials have been produced including:
 - guidance on delivering an effective induction on sustainability matters
 - a template information sheet that Colleges can tailor and leave in student rooms at the beginning of term
 - a series of template presentations for student inductions.
- ✓ On the back of this, we have also developed similar guidance documents, templates and presentations for staff inductions too.
- ✓ In 2017 we will be launching our first ever sustainability induction training model for all new starters which will help staff to be aware of the University's environmental sustainability ambitions and what they can do as individuals to contribute.
- ✓ In 2016/17 we will be updating our Communication and Engagement Strategy and over the next few years we hope to continue to grow the network of EECs and increase the number of staff and students involved in Green Impact.



Nan Taplin, EEC and Environmental Hero

As recently as February 2013, the Faculty of Modern and Medieval Languages as a department was not taking any action on environmental or sustainability issues. With the department based in a listed 1950s building, there was little scope for major energy improvements, so the opportunity for increasing environmental performance was limited, while the nature of the faculty's research meant that there were few direct links to environmental or sustainability issues. Nan Taplin, a departmental secretary in Modern and Medieval Languages, initially volunteered to act as the department's representative for Switch Off Week in 2013.

In the following years Nan became one of the University's most enthusiastic and successful Environment and Energy Coordinators. Initially, Nan simply helped to put environmental issues on the department's radar through a number of simple initiatives such as placing posters around the department, holding events such as a wacky jumper day and serving colleagues with green lemonade and cakes (while wearing a green wig!) Once departmental awareness was increased, she began generating enthusiasm among wider staff and bringing them onboard, for instance by setting up a green 'pledge tree' and holding a 'green bake sale'. Switch off audits helped to spread

ownership of colleagues' own performance and the impact of their actions on the department's environmental footprint. Subsequently, Nan worked to secure buy-in and change practices. To secure a more official level of departmental commitment, she set up a committee including a range of staff and students, to widen involvement. The committee reported to the Faculty Board, giving greater prominence to environmental actions and issues.

Nan was awarded the University's Environmental Hero award in 2014 and was a Finalist in the Green Gown Awards 'Sustainability Champion' category in 2016.

Key performance indicators

Table 2 reports against the KPIs contained in our Environmental Sustainability Vision, Policy and Strategy.

T2

Key performance indicators

	2014/15	2015/16
Total Scope 1 and 2 carbon emissions (energy and fuel use) (tonnes)	80,788	77,586
Carbon emissions from water use (tonnes)	383	381
Total Scope 1 and 2 carbon emissions per staff and students (tonnes/FTE)	2.9	2.7
Carbon emissions from water use per staff and student (tonnes/FTE)	0.014	0.013
Total Scope 1 and 2 carbon emissions per total income (tonnes/£1000)	0.095	0.084
Carbon emissions from water use per total income (tonnes/£1000)	0.0005	0.0004
Percentage of energy generated from onsite renewable or low carbon sources (%)	0.25	0.84
Total water consumption (m ³)	343,535	338,656
Total water consumption per staff and student (m ³ /FTE)	12.3	11.8
Percentage of new buildings and major refurbishments confirmed by the Ecological Advisory Panel as having no net negative impact on biodiversity	Unable to establish until Ecological Advisory Panel set up.	
Waste sent to landfill (tonnes)	2,030	2,448
Waste mass generated per FTE staff and students (tonnes/FTE)	0.29	0.28
Percentage of waste generated that is recycled or composted (construction and non-construction waste) (%)	74	70
Level achieved on the Flexible Framework	4	4
The percentage of new buildings that are certified at least BREEAM Excellent or equivalent (%)	50 (2 of 4)	50 (1 of 2)
The percentage of buildings that have a minimum Display Energy Certificate rating of 'D' (%)	42	46
External awards for sustainable construction/design	0	0
Percentage modal split for commuting by staff single occupancy car journey (%)	24	25
Percentage modal split for commuting by staff car share (%)	8	8
Percentage modal split for commuting by staff bus (%)	8	7
Percentage modal split for commuting by staff train (%)	6	6
Percentage modal split for commuting by staff cycle (%)	42	42
Percentage modal split for commuting by staff walk (%)	10	10
Percentage modal split for commuting by staff motorbike (%)	1	1
Percentage modal split for commuting by staff other (%)	1	1
Per capita carbon emissions from flights (tonnes/FTE)	0.77	0.74
Number of institutions participating in Green Impact	37	43
Number of members of the Environment and Energy Coordinator Network	97	103

Breakdown of our 2015/16 carbon emissions figures

In 2016, we commissioned a review of how we calculate our carbon emissions, to ensure that we are monitoring and reporting our emissions in line with best practice³. In light of the review, we have made some improvements to our approach and adjusted our emissions figures for all years since our target baseline year in accordance with our revised approach. As a result, the historic annual emissions figures reported here vary slightly from those reported previously.

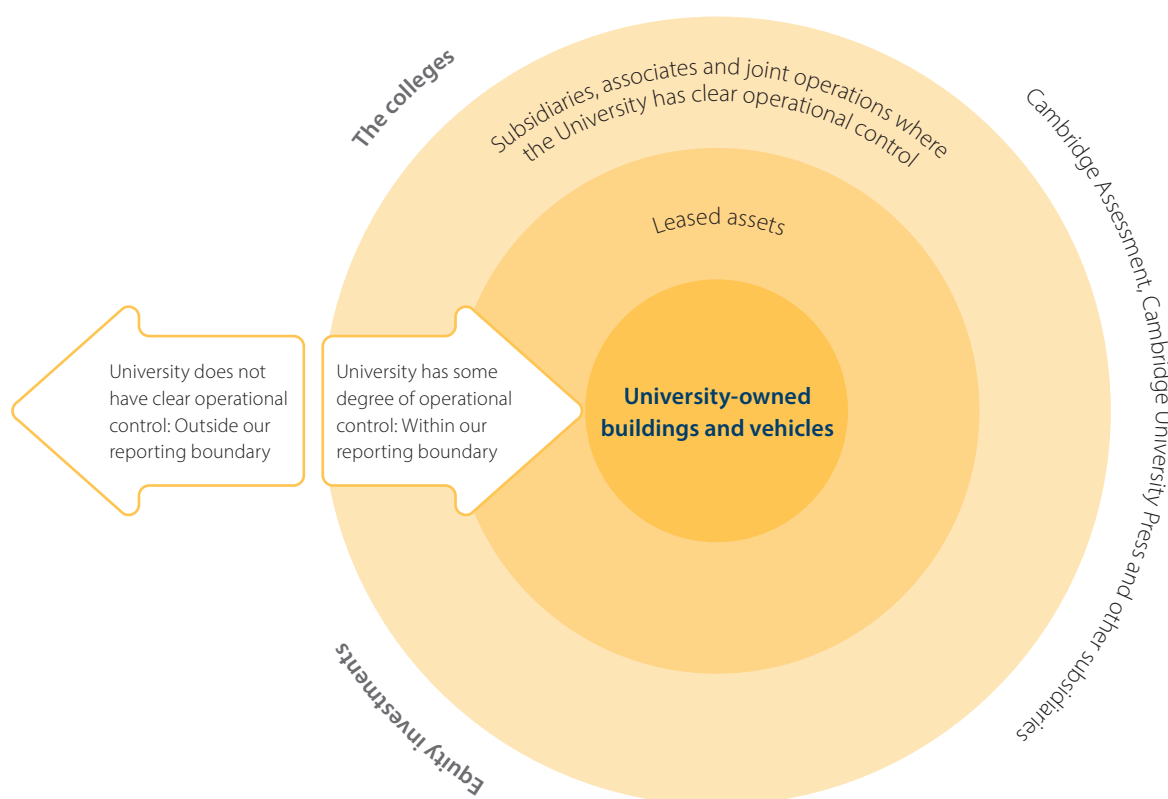
The review also made some recommendations on how we can further improve our approach to emissions monitoring and reporting in future, and we are prioritising the work that we will need to do to achieve this.

A key consideration in reviewing our approach to carbon emissions reporting has been to establish that all relevant operations and sources of emissions for which the University is responsible are captured in our calculations. Under best practice guidance on emissions reporting, there are a number of different

approaches that we could have taken to defining the boundary of our operations. We have decided to adopt what is known as the Operational Control approach, under which the emissions sources and operations included in the reporting are, to a greater or lesser extent, within the control of the operational functions of the University. Figure 13 illustrates which operations are included in our emissions reporting under this approach, and which are excluded.

F13

Our carbon emissions reporting boundary



³Environmental Reporting Guidelines: Including mandatory greenhouse gas emissions reporting guidance June 2013, Department for Environment, Food and Rural Affairs.

A breakdown of our 2015/16 carbon emissions is provided below together, for comparison, with our figures for 2014/15 and 2005/06. In calculating these figures, we have applied Government-published carbon conversion factors⁴.

Emission source	Emissions Figures tCO ₂ e			Notes
	2015/16	2014/15	Base year (2005/06)	
Scope 1 Emissions				
Gas	18,659	17,369	15,015	
Oil	242	273	436	
Biomass	12	5	0	The carbon conversion factors used for these calculations only account for the nitrous oxide and methane emissions from biomass combustion; the carbon dioxide emissions value is set to zero to account for the carbon dioxide absorbed by fast-growing bio-energy source during their growth
Diesel	308	289	229	
Petrol	17	18	15	
Liquefied Petroleum Gas	0.10	0.10	0.08	
Fugitive emissions	Not quantified	Not quantified	Not quantified	We do not currently measure fugitive emissions from air conditioning units on our estate; we will explore options for quantifying emissions from this source in future
Scope 2 Emissions				
Electricity	56,483	60,314	54,136	
Purchased heat and steam	1,865	2,520	2,157	
Gross emissions total				
Scope 1 and 2 total	77,586	80,788	71,989	Our Scope 1 and 2 figures include emissions from buildings that the University leases from a third party
Scope 3 Emissions				
Supply chain	Not quantified	Not quantified	Not available – we began measuring our Scope 3 emissions in 2012/13	We do not currently quantify emissions from our supply chain, as there is not an accurate way of doing this. We are working to improve the data we hold on the impact of our supply chain, and to identify priority areas for improvement
Water	381	383		
Waste	435	723		
Business travel	11,138	11,030		
Commuting	8,029	8,121		Commuting figures include staff commuting only; we do not currently quantify emissions from student commuting. A 2015 survey found that 91% of students commute by walking or cycling
University-owned buildings occupied by a third party	See notes	See notes	See notes	Where the University has full operational control over the building, these emissions have been included in our Scope 1 and 2 figures. In future, we may report emissions from University-owned buildings over which we have no operational control as part of our Scope 3 emissions

Emission source	Emissions Figures tCO ₂ e			Notes
	2015/16	2014/15	Base year (2005/06)	
Net Emissions (Scope 1 and 2 only)				
Exported renewables	0	0	0	We do not currently export any renewable energy to the grid and therefore cannot offset the renewable energy that we generate against our gross Scope 1 and 2 emissions
Net emissions total (Scope 1 and 2)	77,586	80,788	71,989	
Out of scope emissions				
Direct carbon dioxide emissions from biomass consumption	323	132	0	These do not form part of our emissions but we have reported them for transparency

⁴See <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

Find out more

Environment and Energy website

www.environment.admin.cam.ac.uk

Environmental Sustainability Vision, Policy and Strategy

www.environment.admin.cam.ac.uk/policy

Carbon Management Plan

www.environment.admin.cam.ac.uk/energy-and-carbon

Greenlines publication archive

www.bit.ly/2kPGwht

Living Laboratory for Sustainability

www.environment.admin.cam.ac.uk/living-lab

Sustainable Procurement Policy

www.admin.cam.ac.uk/offices/purchasing/guides/SustainableProcurementPolicy2015.pdf

Sustainable Food Policy

www.environment.admin.cam.ac.uk/sustainable-food

Strategic Framework for the Development of the Estate

www.em.admin.cam.ac.uk/strategic-framework

Thermal Comfort Policy

www.environment.admin.cam.ac.uk/files/uoc_thermal_comfort_policy_web.pdf

Travel Plan

www.environment.admin.cam.ac.uk/files/travel-plan-2011.pdf

University research groups focussed on sustainability

www.environment.admin.cam.ac.uk/environmental-sustainability-teaching-and-research#groups

Get involved

The Cambridge Green Challenge is your challenge to build a more sustainable University. It challenges you to take responsibility for your impact during your time at Cambridge. It asks you to join fellow staff and students in taking on challenges to make Cambridge a more sustainable place.

There are lots of ways to get involved.

Make a difference in your department or college

Green Impact, the University's environmental accreditation scheme, supports and encourages departments and colleges across the University to reduce their environmental impacts. With support from the Environment and Energy section, you can form a small team, sign up to the online workbook and progress through simple, clear and easy criteria towards recognised awards and targets.

www.environment.admin.cam.ac.uk/green-impact

Be the change maker in your department

Environment and Energy Coordinators (EECs) are a network of staff volunteers who provide a local focus point for environmental and energy issues. They encourage their colleagues to make small changes to everyday work practices that collectively make a big difference across the University.

www.environment.admin.cam.ac.uk/EECs

Keep up to date

Sign up to our monthly sustainability newsletter Greenlines
www.environment.admin.cam.ac.uk/greenlines



@CambridgeSust



www.facebook.com/CUenvironment



www.environment.admin.cam.ac.uk



UNIVERSITY OF
CAMBRIDGE