

# The University of Gloucestershire

## Carbon Management Plan



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<sup>1</sup> As part of the second Capital Investment Framework, HEFCE require HEIs to have carbon management plans meeting certain requirements and signed off by the governing body. See HEFCE circular letter 17/2010

## University of Gloucestershire

### Carbon Management Plan (CMP)

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## Foreword from University Council

Climate change is one of the greatest challenges facing the world today. The United Nations Intergovernmental Panel on Climate Change has concluded that climate change is unequivocal and that human activities make a big contribution.

We recognise that at the University of Gloucestershire, we have a role to play by educating, inspiring and showing leadership to our students, our staff and the community in which we operate.

This Carbon Management Plan forms part of the University of Gloucestershire's strategic vision as part of one of our stated priorities to become a sustainable university and to be recognised as a sector leader on sustainability. The ambitious target of reducing our carbon emissions by a minimum of 30% in five years demonstrates our commitment to sustainability. We are pleased to be working in partnership with the Carbon Trust on this important agenda.

## Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for Higher Education Institutions - it's all about getting your own house in order and leading by example. The UK government has identified the university sector as key to delivering carbon reduction across the UK in line with its Kyoto commitments and the Higher Education Carbon Management programme is designed in response to this. It assists universities in saving money on energy and putting it to good use in other areas, whilst making a positive contribution to the environment by lowering their carbon emissions.

The University of Gloucestershire was selected in 2008, amidst strong competition, to take part in this ambitious programme. The University of Gloucestershire partnered with the Carbon Trust in order to realise substantial carbon and cost savings. This Carbon Management Plan commits the University to a target of reducing CO<sub>2</sub> by a minimum of 30% by 2014 in absolute terms from a baseline year of 2005/06.

If the University takes no action (business as usual or BAU) it will see an increase in emissions and so the reduction target relative to BAU is actually 51% and this underpins potential financial savings over BAU to the organisation of around £528,000 per year by that date.

There are those that can and those that do. Universities can contribute significantly to reducing CO<sub>2</sub> emissions. The Carbon Trust is very proud to support the University of Gloucestershire in their ongoing implementation of carbon management.



Richard Rugg  
Head of Public Sector, Carbon Trust

## Management Summary

The purpose of this plan is to present the strategic framework along with detailed, quantified projects that will enable the University of Gloucestershire to set out and move towards its low carbon vision over the next five years.

It details the range of drivers for making these changes from ensuring security of supply and complying with legislation through to meeting student expectations with respect to corporate social responsibility and contributing to HEFCE's carbon reduction strategy for the HE sector as a whole. Underpinning all of these various drivers is cost. Reducing carbon emissions makes good business sense both now and in future years.

This plan identifies a range of projects that can be carried out immediately and also the steps required to ensure that low carbon thinking is embedded into the anticipated transformational changes that will be taking place across our organisation over the next few years.

It quantifies the resources required, both in terms of people and financial investment along with the roles and responsibilities for those who will be key to realising our low carbon ambitions, although ultimately everybody will have a part to play.

The goal of the Carbon Management Plan is to reduce the University of Gloucestershire's CO<sub>2</sub> emissions from the use of energy and owned/leased vehicles by a minimum of **30%** by the end of financial year 2013/14 against a baseline of 2005/06, by 40% by the end of 2019/20, and finally to achieve an overall reduction of 80% by 2049/50.

The total baseline carbon footprint attributable to our use of energy and on-site owned/leased vehicles is 4,833 tonnes CO<sub>2</sub>. 'Indirect' emissions from the supply of water, treatment of waste water are not included in the target. It is envisaged that other 'indirect' emissions such as business travel and staff and student commuting travel will be added at a later date when more robust data is available. The minimum 30% reduction after five years will be equivalent to **1,450 tonnes CO<sub>2</sub>** of avoided emissions per annum.

There is a clear financial benefit in saving this amount of carbon. If we do nothing and assume annual energy cost increases of 10%, costs will rise from £681,000 to £1,460,000 by 2014. With a 30% CO<sub>2</sub> reduction, over the five year period, these costs are limited to around £932,000, a saving of £528,000 for financial year 2013/14 alone. Purely from a financial perspective, this carbon reduction will more than pay for itself. From an environmental perspective it will be a strong demonstration of the University's commitment to sustainability.

The University's' commitment to the environment is well documented with an annual environmental report published since 1992. Although the University is not subject to CRC or the EU Emissions Trading Scheme (2005), we nonetheless aspire to be a leader in Sustainability and Carbon Management.

As part of the Climate Change Bill (2008) the UK government has a legally binding commitment to reduce carbon emissions by at least 34% by 2020 against a 1990 baseline. As the University does not have enough data on our 1990 consumption figures to meet these specific targets, we have decided to base our reduction on our 2005/06 consumption and commit to a minimum 30% reduction by 2014. This is aligned with HEFCE's carbon reduction strategy which, although set against 1990, will be using 2005/06 as the baseline year for assessment purposes.

**The latest report from HEFCE on carbon reduction targets sets the sector-level targets of 34% by 2020 and 80% by 2050 against a 1990 baseline. These are equivalent to a reduction of 20% by 2012 and 35% by 2017 with a target of 48% by 2020 against a 2005 baseline.**

HEFCE has already signalled to institutions a more demanding approach to carbon reduction and the need for carbon plans. Their 2008 and 2009 grant letters from the Secretary of State asked them to establish a link between performance against carbon plans – in effect, carbon reduction – and future capital allocations. The adoption of this plan will secure future capital funding.

This reduction will be achieved by rationalising our use of space, various technical improvements, energy efficiency measures and awareness campaigns for both students and staff. The details of these various projects can be seen in section 4 of this plan.

## 1. Introduction

The University of Gloucestershire has always been at the forefront of Sustainability and Environmental awareness resulting in the University being the first University in England to gain full accreditation under ISO 14001 for its Environmental Management System.

The University's' commitment to the environment is well documented with an environmental report as far back as 1992. The University is committed to carbon management and emissions reduction, as underpinned by the University's Strategic Plan and Corporate Plan as well as by its Sustainability Strategy. All of which can be viewed on the University's public web site.

<http://www.glos.ac.uk>

Sustainability is central to the University of Gloucestershire and has therefore been the basis for initiatives, changes in technology and management practices, all of which have contributed to achieve carbon reductions to date since 2005/06.

In addition to this the University has also increased its renewable electricity to 100% of all electricity consumed on campuses.

Engaging in the Carbon Management Programme is therefore the next step forward for the University and contributes to the current Sustainable Development Policy and related strategies that the University is committed to under ISO14001.

The purpose of this plan is to present the strategic framework along with detailed projects that will reduce carbon dioxide emissions across the whole of the University by a **minimum of 30%** by 2013/14 and by 40% by 2019/20. It is a live document and is intended to be reviewed annually, to monitor progress and to be revised when appropriate as new measures are identified.

It demonstrates that the University is concerned about its impact on the environment, sustainable development and climate change.

Achieving a minimum target of 30% reduction in CO<sub>2</sub> emissions by 2013/14 is both a challenge and a sensible precaution for both the financial and environmental sustainability of the University.

Throughout the University there are various departments looking to reduce the environmental impact of the institution. These come under the remit of the Sustainable Development Committee.

The Committee meets four times each year and is dedicated to discussing the environmental responsibility of the University through compliance with ISO14001 and with the University's Carbon Strategy.

This Carbon Management Plan for the University of Gloucestershire will therefore bring together the various efforts around the University to create a cohesive approach to carbon management and embedding carbon emissions reduction in the assessment of all University activities.

## 2. Carbon Management strategy

### 2.1 Context and drivers for Carbon Management

This section sets out the context and drivers for carbon management. Key drivers are described below with a summary table given at the end of section 2.1.

#### 2.1.1 Global

Climate change and resource depletion are arguably the two most important sustainability issues currently affecting global society. Rising global temperatures will bring changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather, all of which will have unpredictable human and economic costs.

In order to operate in a sustainable manner now and into the future all organisations will need to address these issues. In the longer term, sustainable operation of an organisation is not an option, but is essential to ensure its continued existence.

#### 2.1.2 Legislative requirements

**The Climate Change Act 2008** – Since the Stern review publication in 2006 the UK government has set targets for carbon reduction which are included in the Climate Change Bill 2008, with a legally binding commitment for the UK to reduce CO<sub>2</sub> emissions by at least 34% by 2020, against a 1990 baseline, 80% by 2050.

**European Energy Performance of Buildings Directive** – In response to the European Energy Performance of Buildings directive, the UK government has instigated two schemes, namely the Display Energy Certificate and Energy Performance Certificate schemes. The former relates to all public buildings with an internal area over 1,000 square meters, which must now display an energy certificate based on its actual energy consumption. The latter relates to new buildings, and those for sale or rent which must have an Energy Performance Certificate based on its design in terms of thermal properties and efficiency of energy using systems such as lighting and air conditioning.

**Carbon Reduction Commitment (CRC)/EU-ETS** – The University of Gloucestershire is currently below the CRC threshold of 6,000 MWh of half-hourly metered electricity consumption and below the EU-ETS threshold of 20 MW of installed boiler plant, and therefore is not obliged to participate in either of these two schemes. However, as these schemes develop and reach maturity, there is a strong likelihood that the thresholds may be dropped to encompass more of the United Kingdom's emitters. Additionally, to meet the long-term aspirational sector target of 100% emissions reductions by 2050 will, in all probability, require some degree of offsetting for which these schemes will be a likely vehicle.

#### 2.1.3 Economic

**HEFCE capital allocations** – From 2011, HEFCE capital allocations have been linked to carbon reduction. All higher education institutions (HEIs) in England are required to develop individual carbon reduction strategies, targets and associated carbon management plans. These carbon management plans are required to include:

- a. A carbon management policy or strategy – this can be part of a wider environmental/sustainability policy.
- b. A carbon baseline for financial year 2005/06 that covers all scope 1 and 2 emissions (see section 3.1 below). This year has been used as a baseline because it is used for reporting

against UK targets, and robust data for scope 1 and 2 is available at institutional level. This provides the necessary consistency across the sector against which progress can be monitored and reported. Additionally, institutions are encouraged to measure a baseline for scope 3 emissions and in the longer term these are expected to be included.

- c. Carbon reduction targets. These must:
  - cover scope 1 and 2 emissions, although institutions may choose to set additional targets for wider aspects
  - be set against a 2005/06 baseline. Institutions may choose to set their reductions in context by setting additional targets against an alternative baseline year
  - be set to 2020, because this is the timescale for interim government targets. This will provide consistency across the sector against which progress can be monitored and reported. Institutions may also set interim milestones
  - be publicly available.
- d. An implementation plan to achieve absolute carbon emission reductions across scopes 1, 2 and 3 including timescales and resources. These may cover capital projects and actions to embed carbon management within the institution, for example, through corporate strategy, communication and training.
- e. Clear responsibilities for carbon management.
- f. A commitment to monitor progress towards targets regularly and to report publicly annually.
- g. The carbon management plan and targets must be signed off by the governing body.

**Energy Prices** – The University has been affected by substantial rises in gas and electricity prices in the past with a likelihood of severe increases in the future as world fossil fuel reserves are depleted. The 30% minimum carbon reduction is therefore both a sensible precaution for the financial and sustainable future of the institution.

**Climate Change Levy (CCL)** – The University currently purchases 100% renewable electricity, which is exempt from the CCL but which nonetheless carries a premium usually equivalent to the current rate for CCL. The University is subject to the CCL for its gas consumption.

## 2.1.4 Strategic

The University of Gloucestershire has an overall Sustainability Strategy and a Carbon Strategy and is committed to implementing the Strategy through a series of dynamic and specifically focussed objectives and targets, including: Utilities (Gas Water and Electricity), Waste Management, Construction, Transport and Procurement. The Carbon Management Plan is an extension of these strategies and articulates the Carbon Management priority in precise terms, setting out a road map of how to these targets will be achieved.

Reducing our reliance on fossil fuels is essential to long-term security of energy supply and business continuity.

## 2.1.5 Reputational

Increasingly students are becoming more discerning with respect to the green credentials of institutions where they are considering to study. Historically, the University of Gloucestershire has an excellent track record, finishing first in the Green League in 2008. While the assessment criteria for the Green League is cause for some debate and subject to change over time as it improves, it is nonetheless an important yardstick by which conscientious students may make their choice.

Competition is increasing amongst HE institutions to maintain and improve their position in the Green League. Carbon Performance and other related environmental indices form the backbone of

the league. A strong carbon management plan which covers a broad scope of emissions (including travel, waste and transport) is vital to league table success.

### **2.1.6 External Stakeholders**

The University is forging partnerships with other organizations such as Cheltenham Borough Council, the County Council and further education colleges, and further afield with a view to widening its impact of progress in the field of sustainability. To maintain its credibility as a leader in sustainability we must continue to demonstrate real and demonstrable improvements in our own organization.

## 2.1.7 Drivers for change

Twelve carbon-related drivers for change have been identified and the table below shows the range of drivers and their actual or potential impact on the University:

<i>Category</i>	<i>Driver</i>	<i>Areas of impact</i>	<i>Nature of impact</i>	<i>Importance</i>	<i>Issues related to carbon management</i>
<b>Legislative</b>	Stricter Building Regulations	Estates	Government ambition in Budget 2008 for all new non-domestic buildings to be zero carbon by 2018.	High	Lack of proper understanding of energy efficiency of current building stock will reduce our ability for cost-effective specification of new build/ refurbishments
	EU Energy Performance of Buildings Directive	Estates/ Facilities Management	All 'public' buildings over 1,000 m <sup>2</sup> must have a Display Energy Certificate. Increased costs of certification	High	Poor visible energy efficiency carries reputational risk  Higher visibility of carbon performance by all building users
<b>Political</b>	Government's Common Minimum Standards	Estates/ Facilities Management	Common Minimum Standards require post-completion and post-occupancy assessment	Medium	These are an effective way of driving the continuous improvement in design, construction and management of our buildings to meet the 2013/14 target above
	Shift to 'spend to save' thinking across the public sector	Estates	Whole-life costs would have priority over initial capital costs	Medium	It can cost more initially to achieve higher sustainability standards but there are longer term savings in operating costs
<b>Economic</b>	HEFCE carbon reduction targets	Estates/ Facilities Management	Capital funding is linked to performance against carbon management plans	High	Lack of capital funding if a Carbon Management Plan meeting HEFCE's requirements are not met
	Increasing utility costs	Estates/ Facilities Management	Increased utility costs may lead to reduced funding for core University activities	Low	Cost savings through energy efficiency, although the current utilities budget (gas, oil and electricity) is just over 1% of turnover

<b>Category</b>	<b>Driver</b>	<b>Areas of impact</b>	<b>Nature of impact</b>	<b>Importance</b>	<b>Issues related to carbon management</b>
	Strategic Plan Goal 5: To be a successful and sustainable organisation	All	To ensure that income increases at a greater level than costs, and that costs are controlled and deliver value for money	High	Help in achieving the University's strategic vision and ensuring its future health and viability
<b>Reputation</b>	Maintaining market position in sustainability leadership	All	Failure to put into practice the University's stated position on sustainability	High	Loss of reputation
<b>Aspirational</b>	To be acknowledged as an exemplar for sustainability	All	Creating sustainable futures across the communities served by the University	High	To help achieve the Vision and Values of the University
<b>Existing objectives, plans and policies</b>	Sustainability Strategy	Academic and Research delivery	Complementing academic /research activity on sustainability	High	To help achieve the objectives of the Sustainability Strategy
	Estates Strategy	Estates/ Facilities Management	Ability of the Carbon Management Plan to reinforce existing campus masterplan objectives (e.g. better space utilisation)	High	To help achieve the objectives of the Estates Strategy
<b>Operational</b>	Provision of healthier and more comfortable learning and working environment	Facilities Management	Improved image and reputation	Low	Improvement in learning and working productivity (e.g. through appropriate ventilation strategies, avoidance of overheating, etc) and reduction in utilities running costs

Table 1: Drivers for change

## 2.2 Strategic sustainability ambitions

The University's Strategic Plan sets out the new sustainability ambitions of the University for 2012-17. These are focussed on improving:

- Performance - improve sustainability performance and meet our carbon commitments;
- Profile - as a leader in sustainability with a reputation in education for sustainability;
- Participation - engage students, staff and stakeholders in sustainability activities;
- Partnerships - build partnerships locally, nationally and internationally in the area of sustainability;

whilst retaining the ambition of embedding sustainability across the full range of University activities.

Over the lifetime of the Strategic Plan, the University will:

- improve our carbon emissions in transport, waste, food, and procurement; and
- support professional departments to set and progress their own sustainability targets and contribute to improving the sustainability performance of the University as assessed by external indices and benchmarking schemes.

## 2.3 Strategic themes

### 2.3.1 Utilities:

The University has an existing set of utilities objectives and targets that makes a commitment to managing resources, such as energy and water, efficiently and to effectively minimise the environmental footprint of the institution, minimise environmental damage, prolong the life of fossil fuel reserves, improve working conditions and make a positive contribution to sustainable development.

### 2.3.2 Waste Management:

The University has an existing set of waste management objectives and targets and is committed to responsible management of its waste. The University recognises the significance of 'reduce, reuse and recycle' and has set a number of targets to achieve this.

### 2.3.3 Transport:

The University has an existing set of transport objectives and targets and is committed to encouraging staff and students to walk, cycle or use public transport and to discourage and thereby reduce the use of private vehicles by those travelling to, from and between the University and when conducting University business. The movement of staff, students and goods to and between University campuses in motorised vehicles involves significant consumption of fossil fuel and generates noise, emissions and congestion.

The University currently runs its own intercampus bus service with subsidised travel for all staff and students during term time. It also has a contract in place with Stagecoach for subsidised travel on all Stagecoach bus in the Gloucestershire area and limited access over a wider regional area.

The University also offers a cycle purchase incentive through a company called Cyclescheme by which staff can save up to 40% on the price of a cycle due to a salary sacrifice arrangement.

All University car parks have a pay and display system with an annual parking permit scheme for staff and students. Also as part of the terms of occupancy, first year students in student residencies are not allowed to bring vehicles to the University.

#### **2.3.4 Sustainable Procurement:**

The University has an existing sustainable procurement strategy with a number of objectives and targets and is committed to the responsible management of its procurement process in order to deliver value for money whilst actively pursuing environmental and socially responsible products, services and buildings. Procurement of goods, services and works has a significant impact on the University's sustainable future and affects the environmental, social and financial aspects of the University. The University has a long history of incorporating environmental criteria into its procurement decisions such as the purchase of "green" electricity which has been purchased since 1994, and is embedded into University policy.

#### **2.3.5 Sustainable Construction:**

The University complies with current building regulations. A new set of Sustainable Construction objectives and targets is to be agreed, but will form an important part of our carbon reduction strategy. Refurbishment projects offer the best opportunity for making step changes in energy efficiency and we aim to exceed regulations and strive for BREEAM excellent ratings.

### **2.3 Targets and objectives**

These are the targets and objectives of the Carbon Management Plan up to 2019/20:

<p><b>The University of Gloucestershire will reduce the CO<sub>2</sub> emissions associated with the use of heat and electricity on campuses, as well as the use of on-site vehicles, by a minimum of 30% by the end of financial year 2013/14, from a baseline of 2005/06</b></p>
<p><b>The University of Gloucestershire will then reduce its CO<sub>2</sub> emissions associated with the use of heat and electricity on campuses, as well as the use of on-site vehicles, by 40% by the end of financial year 2019/20, again from the baseline year of 2005/06</b></p>
<p><b>The University of Gloucestershire will develop a Carbon Strategy in line with BS EN 16001:2009 Energy management systems</b></p>
<p><b>The University of Gloucestershire will link future carbon reduction target setting into the University's strategic planning process.</b></p>

**The University of Gloucestershire will raise awareness of climate change and carbon management at both strategic and individual levels across the University, and will encourage collective responsibility and action amongst staff and students.**

**The University of Gloucestershire will review on an annual basis its Carbon Strategy which includes all of its objectives and targets for Utilities, Waste Management, Transport, Procurement, Construction and ICT**

**The University of Gloucestershire will aspire to become a leader in the HE sector for carbon reduction**

**The University will establish baseline emissions and set reduction targets for scope 3 emissions from water use, waste, transport and procurement.**

### 3. Emissions baseline and projections

#### 3.1 Scope

The targets in this Carbon Management Plan relate to the scope 1 'direct' emissions associated with the use of gas and oil for heating, and the use of on-site vehicles (owned or leased by the University), and the scope 2 'indirect' emissions from the purchase of electricity.

The Plan includes a section on scope 3 'indirect' emissions from water use, waste, transport and procurement that sets out the baseline data and emission reduction targets wherever possible

'Scope 1' emissions are defined by the World Resources Institute (WRI) as the direct emissions that occur from sources owned or controlled by the organisation, for example emissions from combustion in owned or controlled boilers/furnaces/vehicles.

'Scope 2' emissions are from the generation of purchased electricity consumed by the organisation.

'Scope 3' emissions are all other indirect emissions which are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation. Examples include the supply of water and treatment of wastewater; production and treatment of waste; business travel; staff/student commuting; and procurement. From 2012/13, HEFCE will require Scope 3 to be reported in the Estates Management Statistics to gain an accurate measure of carbon emissions.

The University follows the guidance from the Department for Environment, Food and Rural Affairs (defra) on carbon reporting and uses the conversion factors they publish annually. This information can be found at:

<http://www.defra.gov.uk/environment/economy/business-efficiency/reporting/>

#### 3.2 Scope 1 and 2 Emissions Baseline

The baseline year for the University scope 1 and 2 emissions is financial year August 2005 to July 2006, and the emissions for that year were:

- 'direct' (scope 1) emissions from:
  - the on-site combustion of gas for heating and hot water – 1,760 tonnes;
  - the on-site combustion of oil for heating – 160 tonnes;
  - the use of University owned or leased vehicles – 16 tonnes.
- 'indirect (scope 2) emissions from the purchase of grid electricity – 2,897 tonnes

This gives a carbon baseline of **4,837 tonnes of CO<sub>2</sub>**. A 30% reduction by 2013/14 means this has to be reduced by 1,454 tonnes to 3,383 tonnes.

Figure 1 shows the percentage breakdown for the baseline year.

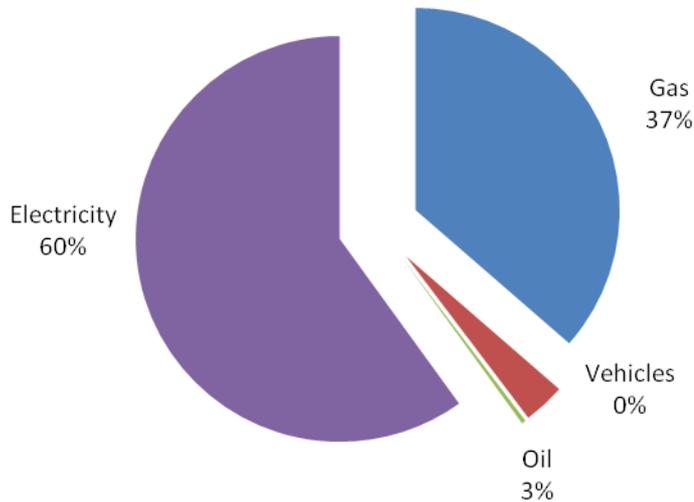
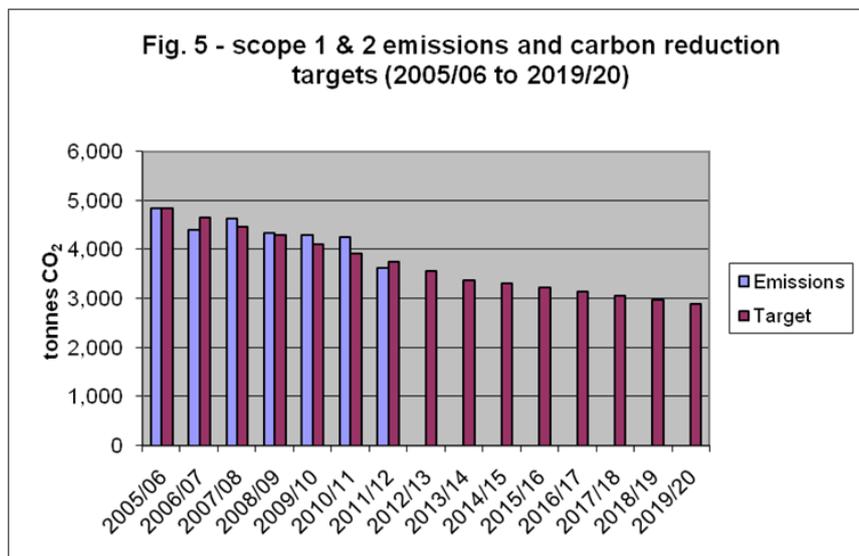


Fig.1: Scope 1 & 2 CO<sub>2</sub> emissions 2005/06)

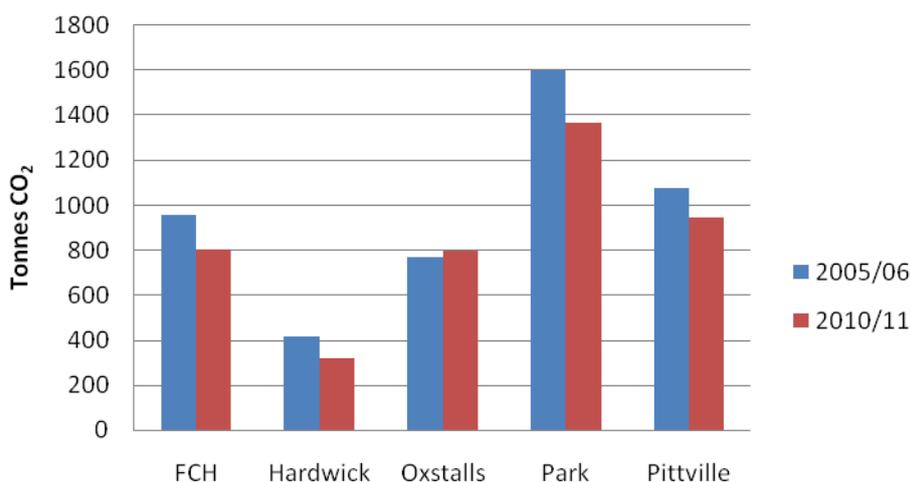
### 3.3 Progress to date

At the end of financial year 2011/12, scope 1 & 2 emissions were tonnes 1,165 tonnes lower at 3,672 tonnes, a reduction of 24.8% on the baseline year. Scope 1 emissions (gas, oil and vehicles) were down by 28% and scope 2 emissions (electricity) were down 23%. Annual progress and target emissions up to 2013/14 can be seen in figure 2.



To meet the target a reduction of 887 tonnes over the next three years will be needed. The Pittville relocation project (benefits will be seen in financial year 2011/12) and the introduction of Automatic Monitoring and Targeting<sup>1</sup> (aM&T) in 2011/12, will both make major contributions. Further energy saving projects will be identified and progressed as part of the Maintenance Investment Plan (MIP) 2011-2020. See Section 4 for further details of carbon reduction projects.

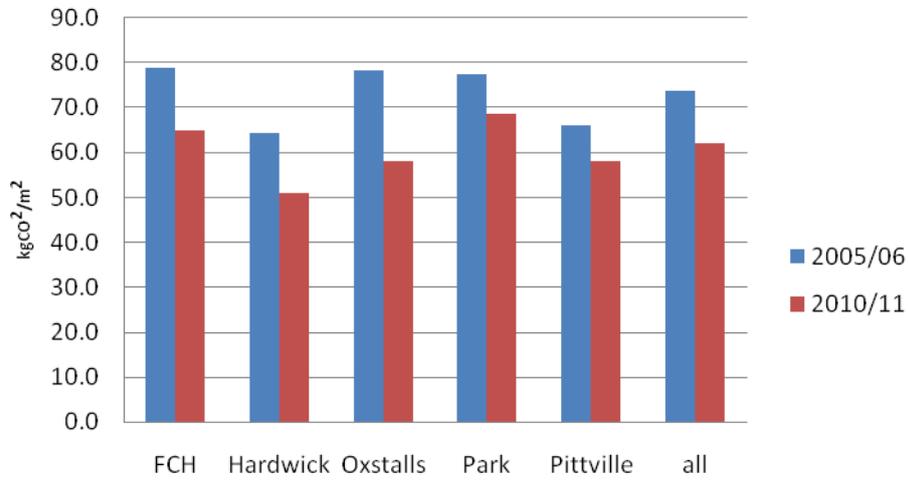
Figure 3 shows the total scope 1 and 2 emissions (gas, oil and electricity) by campus for the baseline year and 2010/11:



**Fig.3: Scope 1 & 2 emissions by campus**

To give a better idea of the ‘efficiency’ of each campus, figure 4 shows the emissions of CO<sub>2</sub> per square metre. As can be seen, although the gross emissions from Oxstalls increased (figure 3) with the expansion of the campus over the years, the emissions per square metre have actually decreased (figure 4). The figure for the University as a whole on an emissions per m<sup>2</sup> basis has shown an improvement of 16% to date over the baseline year (62.1 down from 73.9 kgsCO<sub>2</sub>/m<sup>2</sup>).

<sup>1</sup> aM&T includes automatic data collection of gas, electricity and water use, database collation, analysis and presentation. This allows the user to ensure energy use is in line with targets.



**Fig.4: Energy emissions/m<sup>2</sup> (kgCO<sub>2</sub>/m<sup>2</sup>)**

### 3.4 Scope 3 Emissions Baseline and Targets

This section sets out the baseline data available, the emissions reduction targets set and progress to date for 'indirect' scope 3 emissions related to university activities. The areas covered are:

- Waste
- Water Use and Treatment
- Transport
- Procurement

#### 3.4.1 Waste

##### Baseline

Data on the CO<sub>2</sub>e emissions arising from waste produced and disposed of by the university is available on an annual basis since 2005/06. Information on tonnes of waste produced is provided by the waste contractor, using an agreed estimated weight system for all waste and recycled materials and the associated CO<sub>2</sub>e emissions are calculated using defra CO<sub>2</sub> emissions factors for waste disposal.

The CO<sub>2</sub> emissions from waste are split between waste going to landfill and waste that is recycled.

The total CO<sub>2</sub>e emissions from waste disposal for the baseline year of 2005/06 were 185.8 tonnes CO<sub>2</sub>e. These emissions are split between waste disposed at landfill (183.9 tCO<sub>2</sub>e) and waste recycled (1.9 tCO<sub>2</sub>e).

##### Targets

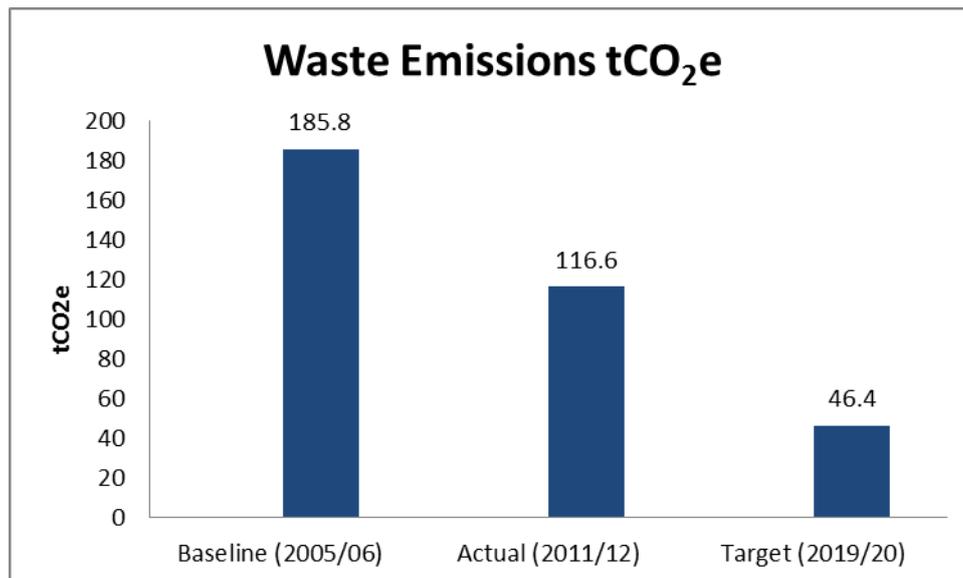
The University has set out targets for the reduction in waste production and the increase in the amount of waste recycled in the Waste Management Strategy (2010 update). These targets include a 25% reduction in waste arising by 2020, an 81% reduction in waste going to landfill by 2020 and an increase in the recycling rate to 75% of all waste arising by 2020.

In working towards the delivery of these targets the university will aim to reduce the CO<sub>2</sub>e emissions related to waste by 75% by the year 2019/20 against a 2005/06 baseline. This is equal to a 5.3% reduction in waste related CO<sub>2</sub>e emissions per annum between 2005/06 and 2019/20.

The total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 139 tonnes CO<sub>2</sub>e per annum in 2020.

##### Progress to date

CO<sub>2</sub>e emissions from waste disposal in the year 2011/12 were 116.6 tCO<sub>2</sub>e demonstrating a 37% reduction against the baseline putting the university on track to meet the 2020 CO<sub>2</sub>e reduction target.



### 3.4.2 Water Use and Treatment

#### Baseline

Total CO<sub>2</sub> emissions resulting from the supply of mains water to the university sites and the treatment of waste water are available for the financial year 2010/11. This year will be used as the baseline year and the total CO<sub>2</sub> emissions during that year were **52.00 tonnes** of CO<sub>2</sub>e.

The data is based on the water supply figures provided by Severn Trent Water and the associated CO<sub>2</sub> emissions are calculated using defra CO<sub>2</sub> emissions factors for water supply and treatment.

Data on water consumption and treatment is available prior to 2010/11 but due to metering errors on behalf of the supply company does not represent the full amount of water consumed and treated.

#### Targets

The University will aim to reduce the CO<sub>2</sub>e emissions related to water use and disposal by **20% by 2020** based on a baseline year of 2010/11. This is equal to a 2.2% reduction in water related CO<sub>2</sub>e emissions per annum between 2010/11 and 2019/20.

The total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 10 tonnes CO<sub>2</sub>e per annum in 2020.

#### Progress to date

CO<sub>2</sub>e emissions from water consumption and treatment in the year 2011/12 were 48.78 tCO<sub>2</sub>e demonstrating a 6.2% reduction against the baseline putting the university on track to meet the 2020 CO<sub>2</sub>e reduction target.

	Baseline 2010/11	Actual 2011/12
Water Supply Volume - m <sup>3</sup>	49,398	46,345
Water Supply - tCO <sub>2</sub>	17.00	15.95
Sewerage - tCO <sub>2</sub>	35.00	32.84

<b>Total - tCO<sub>2</sub></b>	<b>52.00</b>	<b>48.78</b>

### 3.4.3 Transport

CO<sub>2</sub>e emissions from transport can be broken down into the following categories:

- Business travel by students and staff that is paid for by the University
- Staff commute to work
- Student commute to place of study
- Intercampus travel
- Student travel to and from university at start and end of term

#### 3.4.3.1 Business Travel

959 tonnes of CO<sub>2</sub>e were emitted from air travel (long haul, short haul and domestic) undertaken by students and staff during 2012. This is based on journey information supplied to the insurance department.

24 tonnes of CO<sub>2</sub>e were emitted from rail travel undertaken by students and staff during 2012. This is based on expenditure information provided by the procurement department.

The total CO<sub>2</sub>e baseline for business travel is 983 tCO<sub>2</sub>e.

#### Targets

The university aims to reduce CO<sub>2</sub>e emissions from business travel by 15% by 2019/20 based on a 2011/12 baseline.

This is equal to a 1.88% reduction in business travel related CO<sub>2</sub>e emissions per annum between 2011/12 and 2019/20.

The total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 147 tonnes CO<sub>2</sub>e per annum in 2020.

#### Progress to date

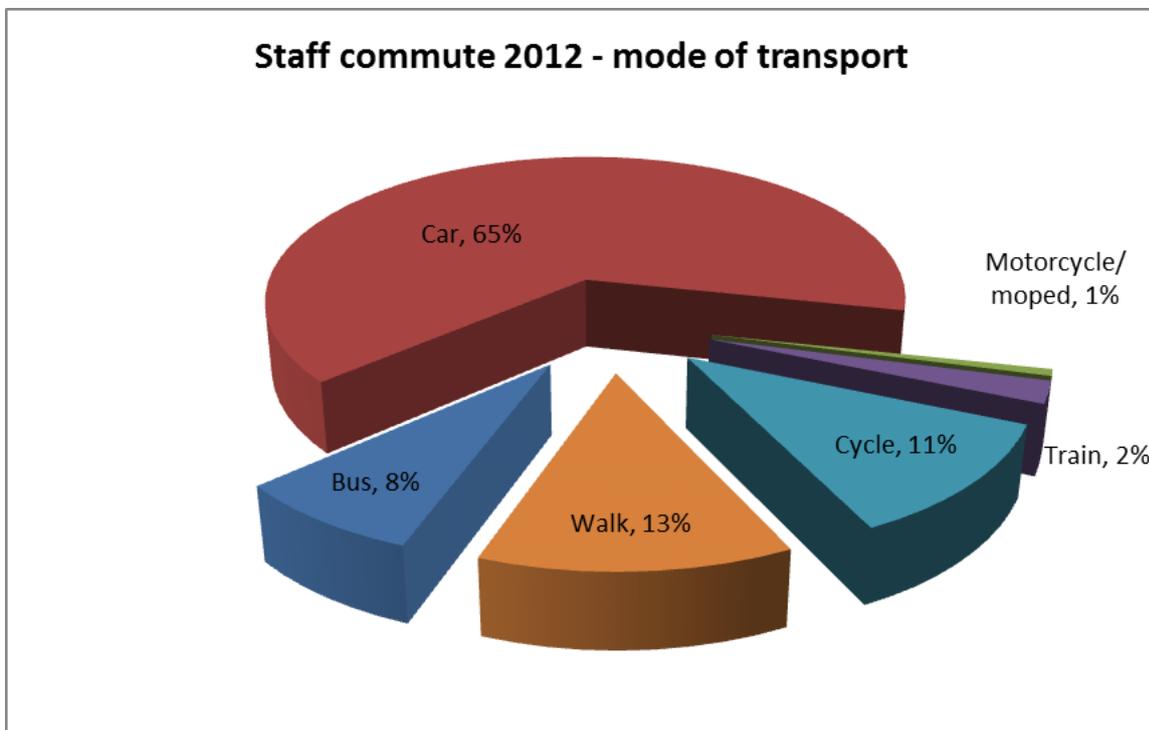
The university has committed to improving the monitoring and reporting of CO<sub>2</sub> emissions from all types of business travel including air travel, rail travel, coach and bus travel, other public transport, car hire, personal vehicle use and taxi hire. A new centralised system of expenses claim processing is currently being implemented and the university aims to report on all business travel emissions by the end of 2013/14.

### 3.4.3.2 Staff Commute

Staff travel surveys have been carried out in 2003, 2007, 2011 and 2012 with questions requesting information on how staff travel from home to their place of work on a regular basis.

The 2012 survey received 476 responses (approx. 55% of staff), has been used as the baseline as it contains the greatest level of detail and has the results broken down so that the CO<sub>2</sub>e emissions can be calculated.

Total CO<sub>2</sub>e emissions from staff commuting in 2012 were 931 tCO<sub>2</sub>e and the mode of travel (car, bus, motorcycle, train, cycle and walk) was broken down as shown below.



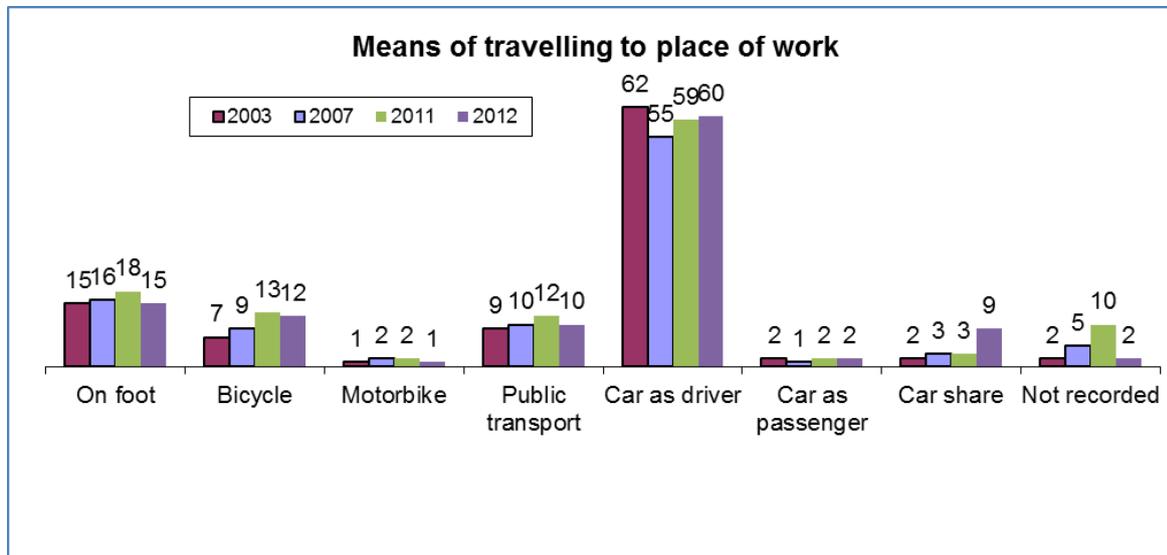
#### Targets

The university will aim to reduce CO<sub>2</sub>e emissions from staff commuting by 15% by 2020 against the 2011/12 baseline – the total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 140 tonnes CO<sub>2</sub>e per annum.

#### Progress to date

The staff travel surveys over the period 2003 – 2012 show a strong preference for car based commuting (50-60% of total journeys) with steady levels of cycling, walking and public transport. A rise in numbers car sharing was recorded in the 2012 travel survey as a result of promotional activity delivered under the Sustainable Transport Action Plan.

The staff travel survey has been refined and will be carried out annually and future surveys will include additional questions on intercampus travel and number of days worked per week.



### 3.4.3.3 Student Commute

#### Baseline

A student commuting travel survey was carried out in 2010. Respondents were asked to declare the postcode of their term time residence, which campus they travelled to on a regular basis and the mode of transport most frequently used.

115 responses were received and this data has been used to calculate an emissions baseline of 4,184 tCO<sub>2</sub>e in 2010/11.

#### Targets

The university will aim to reduce CO<sub>2</sub>e emissions from student commuting by 15% by 2020 against the 2010/11 baseline – the total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 628 tonnes CO<sub>2</sub>e per annum.

#### Progress to date

The student travel survey questionnaire has been refined and will be carried out annually and future surveys will include additional questions on intercampus travel and number of days per week that the journeys are made.

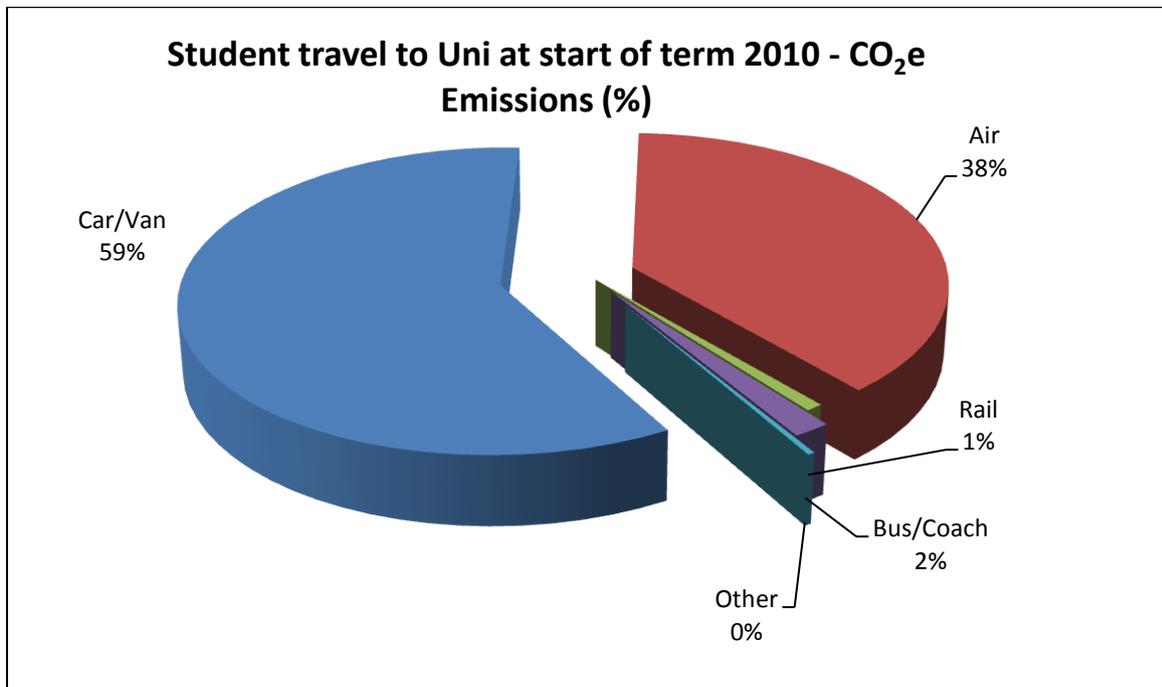
### 3.4.3.4 Student Travel Home to University

In 2010 a student travel survey was conducted that asked questions about how students travelled from their home to their university accommodation at the start and end of each term by travel mode and distance.

The results from the survey were analysed and split into total single journey km's travelled by each travel mode including – car/van, air, rail, bus/coach and taxi. Respondents were able to break their journey up into as many as 5 legs and indicate where different modes were used.

Using the defra passenger transport conversion tables the CO<sub>2</sub>e emissions from the journeys were calculated and the figures were scaled up to account for the total student population and the estimated number of home to university trips made each year.

The survey results showed that these journeys result in emissions of 2,051 tonnes CO<sub>2</sub> for 2009/10 and travel mode is broken down as shown below.



### Targets

The University will aim to reduce the CO<sub>2</sub>e emissions from student travel from home to university by 15% by 2019/20 against a 2010/11 baseline.

This is equal to a 1.6% reduction in CO<sub>2</sub>e emissions from student travel from home to university per annum between 2010/11 and 2019/20.

The total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 308 tCO<sub>2</sub>e per annum in 2020.

### Progress to date

A second student travel survey is planned for October 2013 which will ask specific questions on home to university travel and the results from this survey will be compared to the baseline figures.

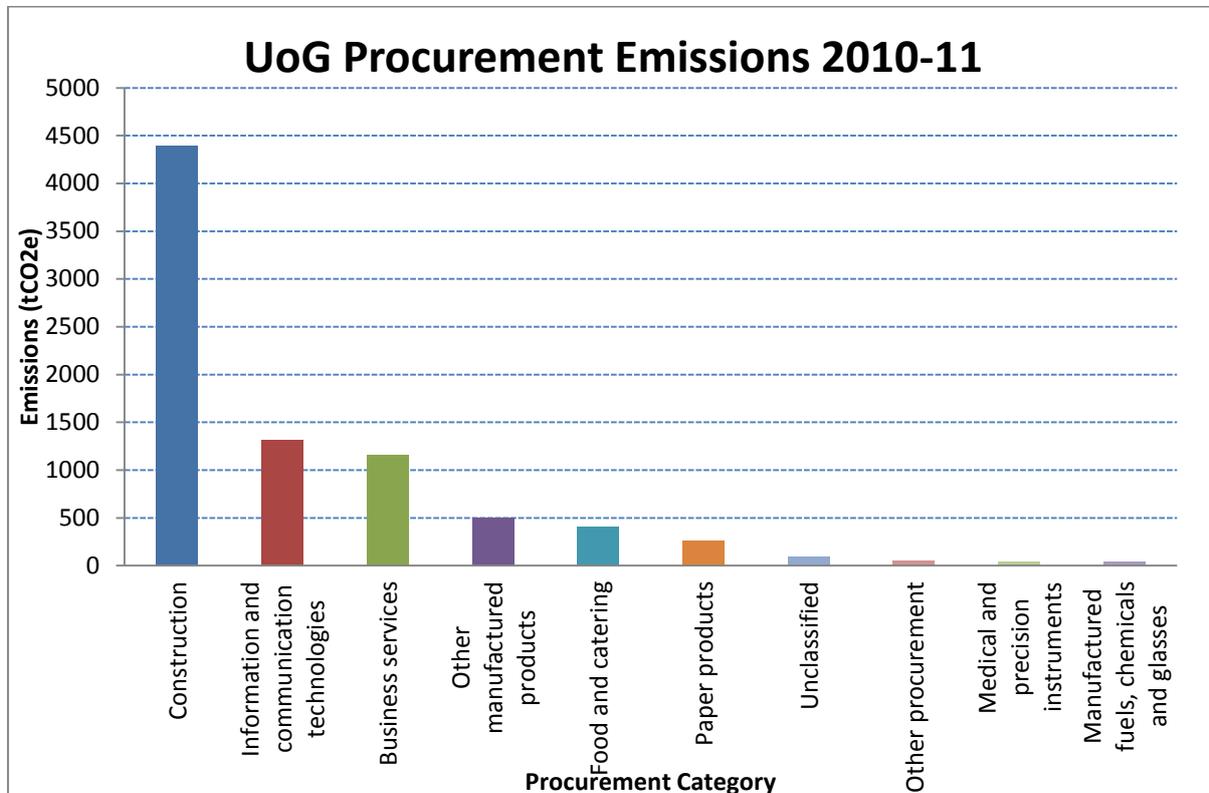
### 3.4.4 Procurement

#### Baseline

Baseline data for CO<sub>2</sub>e emissions from procurement activities has been calculated for 2010/11 based on the university procurement expenditure.

The baseline has been calculated using the HEFCE procurement emissions tool and defra carbon emission factors. Emissions related to waste and water have been removed as these are reported separately.

Procurement activities in 2010-11 resulted in a total emissions of 8,257 tonnes of CO<sub>2</sub>e distributed in the categories shown below.



### Targets

The University will aim to reduce the CO<sub>2</sub>e emissions related to procurement by 12% by 2019/20 based on a baseline year of 2010/11. This is equal to a 1.33% reduction in procurement CO<sub>2</sub>e emissions per annum between 2010/11 and 2019/20.

The total CO<sub>2</sub>e emissions reduction achieved by hitting this target will be 991 tonnes CO<sub>2</sub>e per annum by 2020.

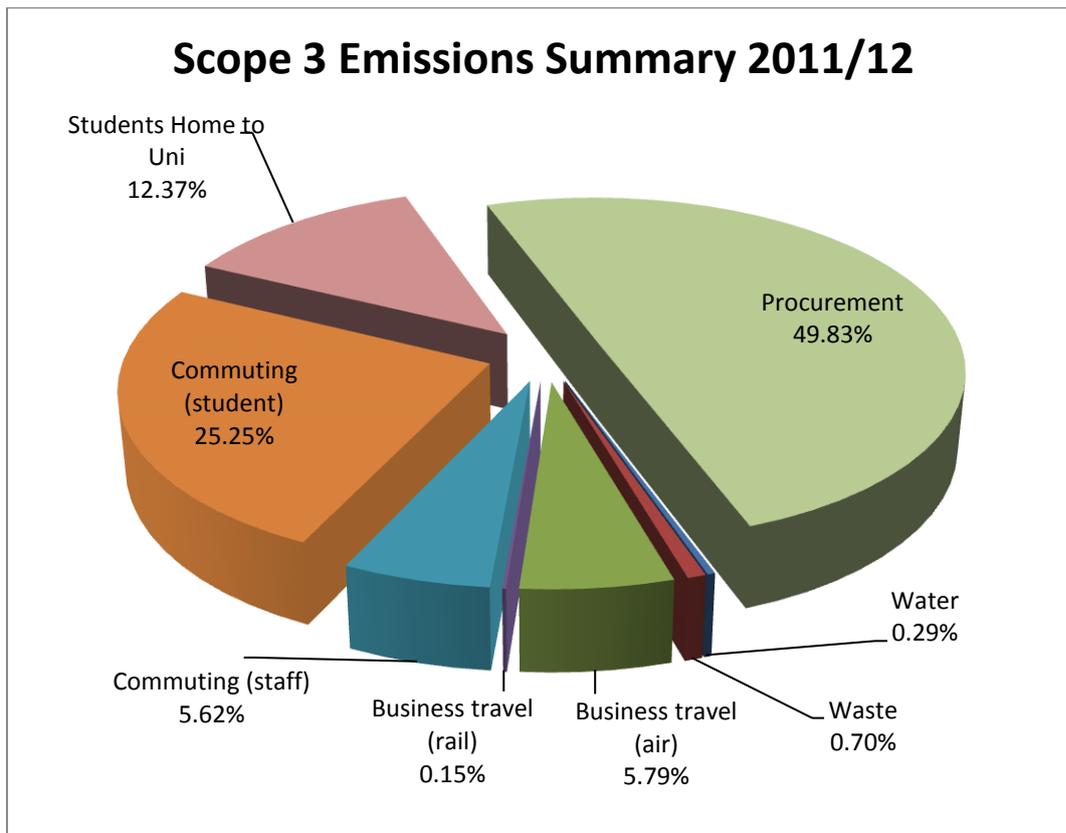
### Progress to date

Setting a target for the absolute reduction of emissions from procurement activities by a set date is problematic due to the fact the current methodology links the emissions directly to university spend on goods and services. Therefore if any single year includes significant spend on one-off projects (such as 'construction' in the 2010/11 baseline presented above) then comparison of that year to any other year where no construction projects took place is potentially misleading.

### 3.4.5 Scope 3 Emissions Summary

The total emissions from scope 3 sources for which data is available are estimated at 16,571 tCO<sub>2</sub>e in 2011/12.

The figure below presents a breakdown of these scope 3 emissions by source in 2011/12:



If all of the targets set out in the section above are met then scope 3 emissions will be reduced by a total of 2,291 tonnes CO<sub>2</sub>e by 2019/20 – a saving of 13.8% against 2011/12 emissions.

#### Note on Scope 3 Baseline and Targets

The scope 3 carbon emissions baseline and targets set out in this Carbon Management Plan are based on the data available at time of publication. The monitoring and recording of scope 3 emissions data is a difficult process that is new to HEI's and will take time and experience to perfect. As such the baseline and target presented in this document are subject to change and will be reviewed, along with the methodology for the collection of the scope 3 emissions data at 2 year intervals through to 2020.

The University of Gloucestershire Carbon Strategy contains a specific target to 'put in place systems and mechanisms that will improve the quality and scope of (scope 3) emissions reported'.

## 4. Carbon Management Projects

Over the next two years there will be significant operational change as a result of the rationalisation of campuses and facilities as described in the estates strategy.

The following table shows an overview of the main changes that have occurred. The Maintenance Investment Plan will drive improvements to energy efficiency measures such as improved thermal properties, lighting and building heating controls which will be carried out to meet stringent energy and carbon performance criteria detailed in the Sustainable Construction Policy.

### Strategic Development Plan Outline

Development	Description	Comments
Maintenance Investment Plan	Covers the period 2011-2020 and developed from condition surveys of the estate.	Will be the main driver for energy efficiency measures such as improved thermal properties, lighting and building heating controls as buildings are refurbished. Requires a systematic approach to building refurbishment to achieve reductions in carbon emissions and operational costs.
Sale of the London Campus	The London Campus, which accommodated residential and teaching facilities, was sold in early 2010.  This reduced the total Gross Internal Area by about 3,894m <sup>2</sup> (5.6%) and scope 1 and 2 carbon emissions by around 159 tCO <sub>2</sub> pa (3.3%).	This facility was not be replaced therefore associated emissions were deducted from the baseline and as a result not deemed to contribute to the target emissions reduction in accordance with Defra guidance.
Closure of Pittville Studios	Pittville Studios closed at the end of financial year 2010/11, although the residences remain. The academic accommodation represented around 11,300 m <sup>2</sup> (16.4%) of Gross Internal Area and reduced scope 1 and 2 emissions by approximately 453 tCO <sub>2</sub> pa (9%)  The teaching areas were replaced by refurbishing other areas of the remaining campuses.	As all the activities that took place at Pittville were migrated to the remaining three campuses, with no reduction in student numbers this reflects a saving through improved space efficiency (in accordance with Defra guidance) and has been included in the projected savings in serial 8.

Projects on the following pages shown as implemented, part-implemented, or pending are estimated to produce total carbon savings of 1,540 tonnes by 2014. This is equivalent to 32% of the University's baseline CO<sub>2</sub> emissions and should enable us to reach our objective of a 30% reduction in CO<sub>2</sub> emissions by that date if they are all implemented. Projects identified after 2014 are estimated to produce another 4% saving.

Projects marked with an \* were assessed using the Carbon Trust's HE Carbon Management - Rapid Assessment of Potential (RAP) tool in 2010. These are based on estimates from other Universities that have already been through the Carbon Trust program and should be viewed as a guide only.

Note: The Carbon Trust use the following terms when asking for an annual update on progress and this scheme has been followed in the tables below.

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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#### 4.1 Projects implemented, superseded or abandoned

Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
1	2010/11	Voltage Optimisation	Nigel Wichall	Estates	Implemented	£123k	£32.7K	189	3.0	3.9
2	2010/11	Lighting audit - to examine scope to expand high frequency lighting/ photocell or occupancy controls	Nigel Wichall	Estates	Part-implemented	£10k*				
3	2010/11	Improve lighting controls - following audit, see Srl.2, to extend absence detection and daylight sensing	Nigel Wichall	Estates	Superseded - will be done when individual buildings are refurbished. See individual entries below	£10K*	£4K*	24*	2.4	0.5
4	2010/11	Lighting refurbishment - following audit, see Srl. 2, to replace all lighting with modern T12/ T5 light fittings	Nigel Wichall	Estates	Superseded Will be done when individual buildings are refurbished. See individual entries below	£45K*	£6.3K	38*	7	0.8
5	2010/11	PC Cluster Power Management	Clive Fenton	ICT	N/K	£6.3k*	£5K *	22*	1.2 *	0.5*

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
6	2010/11	Awareness Campaign - to articulate to staff and students the University's sustainability objectives, including carbon reduction targets	Not decided	?	Abandoned - lack of resources and budget	£26k	£16k	98	1.6	2.0
7	2010/11	Rationalise printers in favour of shared multi-function devices with default is duplex printing	Clive Fenton	ICT	Implemented over 2010/11	£20k	£5.5K*	33	3.6	0.7*
8	2010/11	Relocation of Pittville Studios for better utilisation of space and energy	Nigel Wichall	Estates	Implemented August 2011	£5.3M	£1.62M	453	4.0	9.3
9	2010/11	Automatic Monitoring & Targeting (aM&T) - better metering and understanding of energy consumption will improve energy efficiency and identify areas of wasteful usage	Nigel Wichall	Estates	Implemented Feb 2012	£65k		304*	0.8*	6.2*
10	2010/11	Central power down management of PCs/ switch off campaign	Clive Fenton	ICT	Implemented	£10k*	£0.9k*	5*	3.5	0.1

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
11	2010/11	Better space utilisation to improve energy efficiency	Nigel Wichall	Estates	Superseded – see Srl.8	N/K	N/K	N/K	N/K	
12	2010/11	Improve uptake of video conferencing	Clive Fenton	ICT	N/K					
13	2010/11	Install solar water heating in halls of residence – select a hall to pilot solar water heating to gauge effectiveness of system	Nigel Wichall	Estates	Abandoned – a feasibility study carried out on Challinor Hall and found not to be cost effective even with RHI	£19.5k	£353	2	13.9	0.0
14	2010/11	Replace gas district heating system at FCH with biomass boiler	Nigel Wichall	Estates	Abandoned – payback period too long even with Renewable Heat Incentive (RHI)	£588k	£42k	286	14	5.9
15	2010/11	Replace gas part-district heating system at Park with small biomass boiler	Nigel Wichall	Estates	Abandoned – payback period too long even with Renewable Heat Incentive (RHI)	£173k	£12k	123	6.7	2.5
16	2010/11	Replace gas part-district heating system at Park with full scale biomass district heating	Nigel Wichall	Estates	Abandoned – payback period too long even with Renewable Heat Incentive (RHI)	£944k	£68k	479	13.9	9.8

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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## 4.2 Projects planned 2011/12 to 2013/14

Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
17	2011/12	Heating pipework audit at Park	Nigel Wichall	Estates	Pending	£2.3k	£0.8k*	5*	3	0.1
18	2011/12	Pipe work Insulation Project – following audit, see Srl.17, to upgrade and replace existing insulation where appropriate	Nigel Wichall	Estates	Follow-on pending action	£66k*	£23k*	140*	2.9*	2.9
19	2011/12	Review BMS controls – to ensure time programs suit current occupancy levels; that all controls/ sensors are functioning correctly; policy on set points clarified	Nigel Wichall	Estates	Pending	£6.5k*	£7k*	43*	1.1	0.9
20	2011/12	Future Controls Development phase 1 – to implement, following identification of specific areas: (1) Heating button extension (2) Migrate standalone heating controls to BMS	Nigel Wichall	Estates	Pending	£265k*	£84k*	51*	3.2	1.0

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
21	2011/12	Audit AC energy usage in server rooms - to monitor data centre energy consumption and investigate free air solutions. UPS and AC is already in place in Park main server room	Clive Fenton	ICT	Part implemented - energy use in Park main server room now has aM&T	£0				
22	2011/12	Invest in thin client technology.	Clive Fenton	ICT	N/K	£17K*	£5K*	28*	3.6	0.6
23	2011/12	Install heat exchanger in Park server room	Clive Fenton	ICT	N/K	£20K	N/K	N/K	N/K	N/K
24	2011/12	Install energy efficient UPS in server room	Clive Fenton	ICT	Pending	£12k	£2.9k	12	4.9	0.2
25	2011/12	Refurbishment of sports facilities at the Folley	Nigel Wichall	Estates	Pending	tbc	tbc	2	tbc	0.0
26	2011/12	Roof & cavity wall insulation and new windows in Park Refectory	Nigel Wichall	Estates	Pending	tbc	tbc	4	tbc	0.1
27	2012/13	Replace Park Campus oil-fired heating boiler with gas	Nigel Wichall	Estates	Pending	£58k	£11.7k	63	4.9	1.3
28	2012/13	Control improvements to new Park Campus gas heating system	Nigel Wichall	Estates	Follow-on pending action on Srl.24	£18.4k	£740	4	25	0.1

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
29	2012/13	Replace FCH main gas boiler with new condensing boiler and upgrade heating system	Nigel Wichall	Estates	Pending	£35.7k	£3.2k	17	11	0.3
30	2012/13	Control improvements to new FCH gas heating system	Nigel Wichall	Estates	Follow-on pending action on Srl.26	£23k	£2.3k	12	10	0.2
31	2012/13	Building fabric audit - to produce a schedule of measures (cavity wall insulation, draught proofing etc) to improve energy efficiency when buildings are refurbished	Nigel Wichall	Estates	Pending	£18k*	£5k*	31*	3.6	0.6
32	2012/13	Install intelliswitches and monitoring software on network to switch off inactive network devices	Clive Fenton	ICT	N/K	£20k	N/K	N/K	N/K	N/K
33	2012/13	Controls Remedial Works Project - following review of BMS controls, see Srl.19	Nigel Wichall	Estates	Superseded - will be done as and when individual plant/buildings are refurbished	£250k*	£74K*	456*	3.4*	9.3
34	2012/13	Introduce virtual network - to reduce energy costs in server rooms	Clive Fenton	ICT	N/K	N/K	N/K	N/K	N/K	N/K

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
35	2012/13	Future Controls Development phase 2 - implement, following a feasibility study: (1) using ID cards to activate central resources/ record and recharge (2) linking room booking system software to BMS	Nigel Wichall	Estates	Superseded - will be done as and when individual plant/buildings are refurbished	£140k	N/K	N/K	N/K	N/K
36	2012/13	Major refurbishment of Challinor HoR Phase 1	Nigel Wichall	Estates	Pending	tbc	tbc	17	tbc	0.3
37	2012/13	Refurbishment of FCH Quad	Nigel Wichall	Estates	Pending	tbc	tbc	13	tbc	0.3
38	2012/13	Refurbishment of Pallas Villa at Park	Nigel Wichall	Estates	Pending	tbc	tbc	7	tbc	0.1
39	2013/14	Student Travel Survey	Kierson Wise	Sustainability	Pending	N/A	N/K	N/K	N/K	N/K
40	2013/14	Staff Travel Survey	Kierson Wise	Sustainability	Pending	N/A	N/K	N/K	N/K	N/K
41	2013/14	Standardisation of business travel data collection and reporting	Kierson Wise	Sustainability	Pending	N/A	N/K	N/K	N/K	N/K
42	2013/14	Improvements to reporting system for procurement emissions	Kierson Wise	Sustainability	Pending	N/A	N/K	N/K	N/K	N/K
43	2013/14	Major refurbishment of Challinor HoR Phase 2	Nigel Wichall	Estates	Pending	tbc	tbc	20	tbc	0.4

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
44	2013/14	On site power generation - Install kinetic plates at site entrances to generate electricity	Nigel Wichall	Estates	Pending	£100K	N/K	N/K	N/K	N/K
45	2013/14	Refurbishment of The Lodge at FCH	Nigel Wichall	Estates	Pending	tbc	tbc	1	tbc	0.0
46	2013/14	Refurbishment of Hardwick Halls of Residence	Nigel Wichall	Estates	Pending	tbc	tbc	27	tbc	0.6
47	2013/14	Refurbishment of Reynolds & Waterworth Buildings at Park	Nigel Wichall	Estates	Pending	tbc	tbc	37	tbc	0.8

### 4.3 Projects planned 2014/15 to 2019/20

Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
44	2014/15	Refurbishment of Bodley Building at FCH	Nigel Wichall	Estates	Pending	tbc	tbc	9	tbc	0.2
45	2014/15	Roof insulation at FCH Chapel	Nigel Wichall	Estates	Pending	tbc	tbc	3	tbc	0.1
47	2014/15	Refurbishment of FCH Hospitality Building	Nigel Wichall	Estates	Pending	tbc	tbc	23	tbc	0.5
48	2014/15	Refurbishment of Hardwick Admin Building	Nigel Wichall	Estates	Pending	tbc	tbc	8	tbc	0.2
49	2014/15	Refurbishment of Bedford & Owen Buildings	Nigel Wichall	Estates	Pending	tbc	tbc	18	tbc	0.4

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
50	2014/15	Refurbishment of Dunholme Villa	Nigel Wichall	Estates	Pending	tbc	tbc	6	tbc	0.1
51	2014/15	Refurbishment of heating infrastructure in Pallas Villa	Nigel Wichall	Estates	Pending	tbc	tbc	7	tbc	0.1
52	2014/15	Improvements to Park halls of Residence electrical and heating infrastructure	Nigel Wichall	Estates	Pending	tbc	tbc	13	tbc	0.3
53	2015/16	Partial refurbishment of FCH Teaching Centre	Nigel Wichall	Estates	Pending	tbc	tbc	10	tbc	0.2
54	2015/16	Refurbishment of Oxstalls Sports Science Building	Nigel Wichall	Estates	Pending	tbc	tbc	24	tbc	0.5
55	2015/16	Refurbishment of Broadlands Villa Park	Nigel Wichall	Estates	Pending	tbc	tbc	7	tbc	0.1
56	2016/17	Partial refurbishment of FCH Teaching Centre	Nigel Wichall	Estates	Pending	tbc	tbc	10	tbc	0.2
57	2016/17	Partial refurbishment of Fullwood Lodge Park	Nigel Wichall	Estates	Pending	tbc	tbc	1	tbc	0.0
58	2017/18	Refurbishment of FCH Clegg Building	Nigel Wichall	Estates	Pending	tbc	tbc	13	tbc	0.3
59	2017/18	Refurbishment of Cornerways at Park	Nigel Wichall	Estates	Pending	tbc	tbc	3	tbc	0.1
60	2017/18	Partial refurbishment to Refectory and Monk Building at Park	Nigel Wichall	Estates	Pending	tbc	tbc	4	tbc	0.1
61	2018/19	Refurbishment of Fullwood House Park	Nigel Wichall	Estates	Pending	tbc	tbc	8	tbc	0.2

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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Srl.	Year	Project	Lead	Dept.	Status	Cost	Financial savings/year	Tonnes CO2 saved/year	Payback (years)	% of Baseline
62	2019/20	Refurbishment of Elwes Building at Park	Nigel Wichall	Estates	Pending	tbc	tbc	43	tbc	0.9

Key	Implemented	Part-implemented	Pending	Follow-on pending action	Superseded	Abandoned	Not Known
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## 5. Implementation Plan – financing

### 5.1 Internal Financing

The projects listed are planned to be funded in the time periods scheduled in section 4. The University maintenance investment plan (within estates strategy) describes the sequential planned refurbishment activity per building and typically the projects described in section 4 will be delivered as part of the wider maintenance framework.

The University's Carbon Strategy (2010-2020) which was approved by the Policy, Planning and Resources Committee (now the Executive Planning and Resources Committee) in February 2010, makes three recommendations regarding financing:

- 1 To establish a ring fenced "low carbon" budget financed by achieved energy and cost savings, to assist with funding of projects and technology that will assist the University to meet its low carbon aims – this to be in place by July 2010.
- 2 To consider life cycle carbon and cost impacts in strategic decision making on University building and refurbishment programmes, renewables and procurement of energy-using products such as ICT – this to be in place by July 2010.
- 3 To assess the feasibility for integration of carbon management into the university Project Proposal process (PIMMS) – this to be in place by December 2012.

### External Financing

There is the potential of external financing for carbon management projects, some of which the University has successfully applied for. Project P2 above (voltage optimisation) has been funded by a 100% interest-free loan under the Salix Energy Efficiency Loan Scheme. A biomass district heating scheme at Francis Close Hall received a £100,000 grant under the Government's Bio energy Capital Grant Scheme in 2009, unfortunately the project did not go ahead.

## 6. Actions to Embed Carbon Management in the University

### 6.1 Corporate Strategy

This Carbon Management Plan is endorsed at the most senior level, with very strong support from the University Council.

#### 6.1.1 Strategic Plan

The University's Strategic Plan for 2012-17 sets out an ambition to improve the University's sustainability performance and meet carbon reduction commitments. There is also an ambition to improve our carbon emissions in transport, waste, food, and procurement.

#### 6.1.2 Sustainability Strategy

The University's Sustainability Strategy – *Promising Futures revisited* – also sets out a vision

original needs updating ### which includes “modelling sustainability in its administration, operations and procurement procedures as well as corporate decision-making”. This articulates the need for a carbon management plan across the University as well as an understanding of the carbon implications of strategic decisions.####

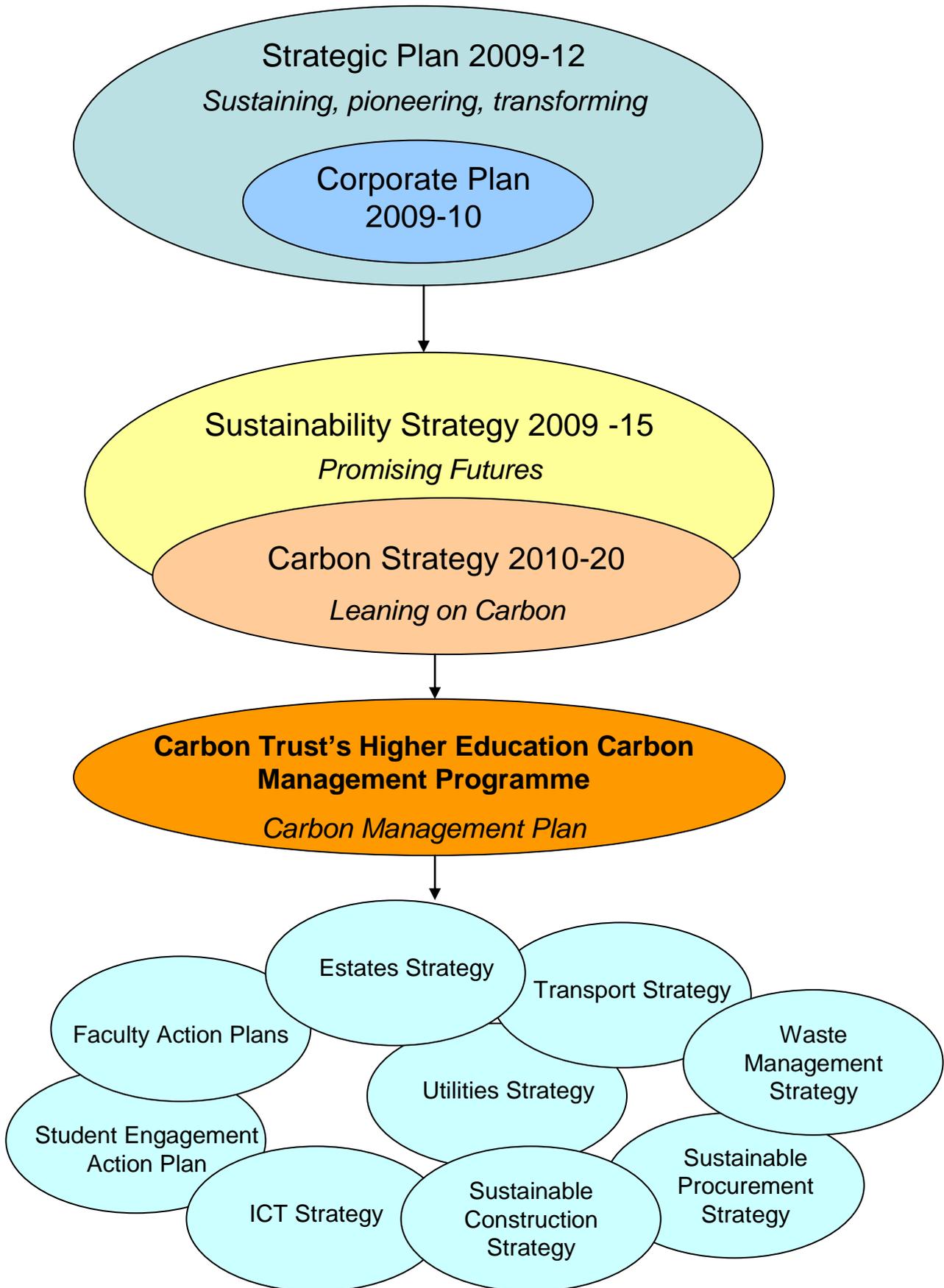
#### 6.1.3 Carbon Strategy

The Carbon Strategy, which is aligned to *Promising Futures*, sets out in more detail the University's priorities and approaches to achieving an interim carbon reduction by 2020, consistent with HEFCE and UK Government timelines. It is an overarching strategy that directly feeds into other University strategies including transport, procurement, ICT, waste and construction.

It complements this Carbon Management Plan and importantly, it goes beyond this, setting out the University's goals in the longer term, including the scope of greenhouse gas emissions considered, targets for their reduction and public reporting.

#### 6.1.4 Relationship to other plans and strategies

The relationship between other University plans and strategies and the Strategic Plan, the Sustainability Strategy, and the Carbon Strategy is summarised below. Going forward, these other strategies and plans need to be reviewed regularly to ensure that they are aligned to the overall aims of the Strategic Plan, the Sustainability Strategy and the Carbon Strategy.



## 6.2 Curriculum, Learning and Research

With regards to the curriculum, learning and research the University's Sustainability Strategy looks to:

1. Embed sustainability across core course offerings: initially in professional courses and help staff promote and publish these developments.
2. Seek funding to establish new research streams and support research networking opportunities
3. Develop a work placement and professional exchange program for students.
4. Set up a Regional Centre of Expertise in Sustainability and establish its program of public engagement activities.
5. Develop a sustainability partnership program for FE Colleges in the area of sustainability.
6. Participate in international and high profile sustainability research programs.
7. Develop faculty responses and campus action plans for sustainability which are reviewed and reported on an annual basis.
8. Include sustainability as a standing agenda item across committees.
9. Establish carbon management expertise on campus and develop a carbon management plan.
10. Develop sustainability WebPages which showcases our ambitions, activities and achievements across the University.
11. Develop a system for tracking the implementation of the Sustainability Strategy
12. Commencing in 2011, to release an annual public sustainability report.

## 6.3 Responsibility

The responsibility for oversight of the Carbon Management Plan at the strategic level lies with the University Council.

Responsibility for the implementation of the Plan at the executive level lies with Jim Durrant, Chief Operating Officer and Mike Cogger, Faculty Dean (Applied Sciences).

The Director of Estates, along with the Director of Sustainability, has operational responsibility for delivering the CO<sub>2</sub> reduction targets, working with Faculty Deans and relevant heads of departments, all of whom have responsibilities for the projects allocated to them and for achieving the targets which lie within their remit.

The Plan Sponsors are supported by a Carbon Management Project Team which has been established with the responsibility for:

1. Identifying historical carbon emission levels associated with the consumption of energy, the production and removal of waste. At a future date emissions from business travel may also be included, as currently there is no robust system in place for measuring these emissions.
2. Identifying a business-as-usual scenario with regards to future carbon emission levels should the University to continue down its current path.
3. Identification of projects that will assist the University in reaching its carbon reduction targets, and to include: projects, costing, lifecycle and potential emissions reduction levels.
4. Obtaining necessary finance, both internal and external, for potential projects and behavioural change procedures.
5. Implementation of carbon reduction projects.

6. Communication of the program to staff and students, including projects and behavioural change procedures and their corresponding effects on the University's long term carbon reduction goals.
7. Communicating emission reduction successes to senior management, staff and the student population.

The Carbon Management Project Team will work with the Faculty Deans and heads of various departments who will take responsibility for pushing the carbon reduction program forward in their areas, reporting issues, identifying future potential projects and assisting with the cultural change.

Notwithstanding these specific managerial responsibilities, carbon management within the University is the responsibility of every individual who works and studies at the University. For this reason, it is critical to achieve the successful engagement and education of staff and students in the implementation of the Plan.

## 6.4 Data Management

The Building Management System (BMS) covers all of the Oxstalls campus, the CeAL building at Francis Close Hall (FCH), Dunholme and part of the Elwes building at Park. There is an aspiration to extent the scope of the BMS and a proposal is included in the list of potential projects for the Carbon Management Plan.

One of the current projects (E1) being looked at is the collection and management of data for utilities. Currently there is a lack of useful data from suppliers and no system to collect and display this data. The Director of Estates and the Estates Management Team are looking at various options to address this and assessing systems for sub-metering utilities. Once a suitable system has been identified, purchased and installed (planned for 2010/ 11), data from these meters will be used to give real time data on energy consumption.

Waste data is supplied by the University's waste contractor and is based on an agreed estimated waste calculation. This data is supplied to the University on a monthly basis and analysed by the Health, Safety and Environment team. One of the projects being considered is a pay by weight system to give a more accurate picture on waste to landfill.

The Estates Management Team and the Environmental Officer will be responsible for monitoring these data streams and producing energy, waste and carbon reports and presenting this data to the Carbon Management Project Team on a quarterly basis so they can identify any areas for improvements. Presentation of the data could include tables which benchmark building against building, department against department and could be used in campus wide incentive programs to reduce consumption.

Monthly consumption data will also be communicated to staff and students through the University WebPages giving comparisons to the previous year or month and communicating ways in which consumption could be further reduced.

As part of the communications strategy, it is proposed that a carbon reduction competition will be run annually to get students thinking about how to reduce their environmental impacts and how to reduce the impacts of the University as a whole

## 6.5 Communication, Campaigning and Training

### 6.5.1 Communication

To achieve its objectives the University should carry out a communication campaign through its normal planned Student Engagement and Faculty Action Planning process, details of which are provided below. The overall objective should be to articulate to students and staff the University's sustainability objectives, including its target carbon reduction targets. This communication should also extend to our suppliers, for example, we work closely with our caterers who source as much local produce as possible to reduce transport of food and drink supplies to University campuses. University activities will be summarised internally and externally on the Sustainability webpages <http://insight.glos.ac.uk/sustainability/Pages/default.aspx>

Specific timetabled activities include:

1. Faculty Action Plans:
  - to engage each faculty in the University's sustainability agenda;
  - to seek input from faculty members on sustainability actions and targets for the academic year 2010/11 and understand any barriers to sustainability that exist;
  - to breakdown "silos" between academic and corporate functions and obtain common ownership of delivery against sustainability targets;
  - to provide the basis to report back sustainability performance to Faculty staff beyond the FAP workshops.
2. Campus Visibility Project:
  - to raise awareness of energy saving initiatives on all campuses by increasing their visibility;
  - to encourage staff and students to act more sustainably on campus.
3. New Year Clear Project:
  - To make recycling part of Halls of Residence students' New Year's Resolution.
4. Joint Students' Union and Sustainability Team Events Programme:
  - to raise awareness among students & staff of a range of sustainability issues linked to key dates.

## 6.5.2 Communication Campaign

Method	Objective	Description	Target	Involvement	Cost
Web presence	Awareness raising	All staff and student sustainability activities are promoted on the University and Students' Union web-sites. There is a Staff home-page, a Current student's home-page, and Sustainability Team web-pages as well as a separate Students' Union web-site with a Sustainability section. All these web-pages are regularly up-dated.	Staff and students	Sustainability team, Student services, Marketing and external relations, Students Union	£0
Press releases	Awareness raising	Press releases will be published and distributed to media on local and national levels.	Staff, current students, prospective students and families, local communities, HE sector, national and local government	Sustainability team, Student services, Marketing and external relations, Students Union	£0
Prospectus	Awareness raising	Annual prospectus	Prospective students, parents, other institutions and schools	Student services, Marketing and external relations	£0
SPACE (Students' Union newsletter)	Awareness raising	Students' Union Environmental Executive and other students are writing a 'green' issue of SPACE to be published in March 2010, building on the 8-page pull-out from March 2009 with articles on the environment spread	Students and some staff	Student Union	£0

		throughout the issue.			
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Method	Objective	Description	Target	Involvement	Cost
Branding (Students' Union t-shirts)	Awareness raising	Students' Union Environmental Executive has produced some fair-trade t-shirts with the Student's Union Environmental logo on.	Students and staff	Student Union	£0
Tone Radio	Awareness raising	Students' Union Environmental Executive is organising for some Students' Union 'green' advertisements to be broadcast by the student-led Tone Radio during their shows.	Students	Student Union	£0
Campus Visibility Project / Going Green in Halls Campaign	To raise awareness of energy saving initiatives on all campuses by increasing their visibility To encourage staff and students to act more sustainably on campus	Sustainability team will be carrying out a sticker and poster campaign across all campuses focusing on saving Energy Waste and Water and using free stickers from the Carbon Trust, WRAP and Severn Trent Water. SU team will be carrying out a sticker and poster campaign in all Halls of Residence called: 'Going Green in Halls' campaign. The SU team and Sustainability Team are co-ordinating their campaigns and pooling resources.	Staff and students	Campus Managers Head Porters Cleaners SU Team Sustainability Team Accommodation Team Sustainability Team	£800

Method	Objective	Description	Target	Involvement	Cost
New Year Clear Project	To make recycling part of Halls of Residence students' New Years Resolution	Poster campaign on recycling and waste in Halls of Residence on all campuses carried out by the Residential Activities Team and aimed at students living in Halls	Students living in Halls of Residence	Accommodation Team Residential Activities Team	£800
Joint Events - SU and Sustainability Team	To raise awareness among students and staff of a range of sustainability issues	Blackout Event @ Oxstalls: 9 <sup>th</sup> March (with 'green maps' of Cheltenham & Gloucester with 'green' travel routes marked) Fairtrade Fortnight: Feb 22 <sup>nd</sup> - March 7 <sup>th</sup> WWF Earth Hour: 27 <sup>th</sup> March Earth Day 40 <sup>th</sup> Anniversary: 22 <sup>nd</sup> April World Environment Day: 5 <sup>th</sup> June Fresher's Fayre: 16 <sup>th</sup> September National Carbon Footprint Day: 2 <sup>nd</sup> Oct	Staff and students	SU Environmental Executive Sustainability Team	£1000
Faculty Action Plans (FAPs)	To engage each faculty in the University's sustainability agenda To seek input from faculty members on sustainability actions and targets for the academic year 2010/11 and understand any barriers to sustainability that exist	Planning for FAPs has commenced and will culminate in a workshop in each Faculty during the Summer term. The process for the FAPS is as follows: Development of brief and information sheets, to collect information on what each faculty is doing. Meeting with Faculty Deans to obtain high level buy in and agree planning stages. Population of proforma information sheets to provide a summary of	Staff, current students, prospective students and families, Board of Governors, media, local communities	Sustainability, Faculty Deans, Heads of Departments, Estates, ICT, Finance & Planning	£800

Method	Objective	Description	Target	Involvement	Cost
	<p>To breakdown “silos” between academic and corporate functions and obtain common ownership of delivery against sustainability targets</p> <p>To provide the basis to report back sustainability performance to Faculty staff beyond the FAP workshops.</p>	<p>activities at the University and Faculty level, for use at the workshops.</p> <p>Event planning, including venue, date, break out rooms, advertising etc.</p> <p>FAP Workshops including presentations and break out sessions.</p> <p>Production of a Faculty Report for each Faculty, based on the outputs from the workshop, for consultation and agreement.</p> <p>Development of systems for collecting and reporting data and comparison against adopted targets.</p>			

### 6.5.3 Campaigning

It is intended that an executive summary of the CMP will be produced for distribution within the University and for marketing purposes including web based communications.

#### **Staff Induction**

The Sustainability Team will make new staff aware of the University's Sustainability Policy, Carbon Strategy and Environment Strategy during staff induction days.

#### **The Staff Handbook**

This is updated online by the University's Human Resources Department and will be including information on sustainability issues and energy saving for staff members.

#### **Staff Survey**

The inclusion of specific energy saving and sustainability questions will be considered for the next Staff Survey. This is usually produced bi-annually.

#### **Student Induction Programmes**

The Students' Union Environmental Executive will be delivering some 'green' training for the Students' Union volunteer helpers called 'Superstars' in September 2010, and also some 'green' training for the Accommodation Team's Residential Assistants who work with students in the Halls of Residence.

#### **Halls of Residence student accommodation**

There are plans for the University Accommodation Team to produce a 'Housekeeping Guide' for students living in Halls which will include sustainability tips, and guidance for the end of year waste collection. It is planned for this Guide to be ready for students starting the new academic year in September 2010.

### 6.5.4 Training

The University will further develop training and awareness raising activities for students and staff with respect to its commitments on carbon reduction. It is envisaged to include:

1. Covering the University's Carbon Strategy and Carbon Management Plan in staff induction sessions, including provision of tips on how to reduce energy usage, waste and water reduction.
2. Providing targeted awareness raising/training to key staff e.g. cleaners on energy efficiency.
3. Lunchtime seminars to staff providing information on how to optimally use heating and lighting in teaching areas.
4. Identification of specific training needs arising from the Faculty Action Planning process.

## 6.7 Policy Alignment

The following table shows who is responsible for ensuring that the Carbon Strategy and this Carbon Management Plan are properly aligned with other University policies and plans:

Policy	Review date	Responsibility
Procurement Strategy	Annually	Director of Finance and Planning
Sustainability Strategy	Annually	Director of Sustainability
Transport Strategy	Annually	Director of Estates
Carbon Management Plan	Annually	Director of Estates and Director of Sustainability
ICT Plan	Annually	Head of ICT Services
Utilities Strategy	Annually	Director of Estates
Waste Management Strategy	Annually	Director of Estates

The above strategies and the Carbon Management Plan are reviewed annually as part of the management review carried out as part of the requirements of ISO14001.

## 7. Program Management of the Carbon Management Plan

In order for the Carbon Management Plan to succeed, clear and appropriate management structures need to be in place from the outset, including clear ownership and allocation of responsibilities.

### 7.1 Strategic ownership and oversight

The key central responsibilities are as follows:

**University Council** – High profile support to help gain buy-in across the University at all levels, and ensuring the appropriate level of funding is made available to implement the Program.

**University Council Champion** – Karen Morgan is the Champion for Sustainability and Environmental Social Responsibility (ESR) on the University Council and will be kept informed of the Sustainability and ESR agenda and will raise such issues in Council debates.

**Faculty Dean (Applied Sciences)** – Responsible for Sustainability. The Faculty Dean, together with the Chief Operating Officer, has executive responsibility for delivering a sustainable University and has executive oversight of Carbon Management Plan

**Chief Operating Officer** – Responsible for ensuring that all projects are subject to rigorous business case analysis before approval by the Executive Planning and Resources Committee (EPRC).

**Director of Estates** – The Plan Sponsor with responsibility for reducing the University's carbon impact in the overall development, refurbishment and management of the University's Estate. Jointly, with the Director of Sustainability, has responsibility for reporting progress on implementing the Carbon Management Plan to the EPRC and Council.

**Director of Sustainability** – The Plan Sponsor (Academic) with responsibility for producing the Sustainability Strategy (which includes the Carbon Strategy) and jointly with the Director of Estates, for reporting progress on implementing the Carbon Management Plan to the EPRC and Council.

## 7.2 The Carbon Management Team – delivering the projects

In order for the Carbon Management Plan (CMP) to succeed it will require input from a number of departments and individuals across the University. The plan as a whole will be overseen by a limited number of key staff and a representative from the Student Union, in the form of a Low Carbon Sub-Committee (LCSC). This sub-committee will report to the Sustainable Development Committee (SDC), which will review the CMP and make recommendations to the PPRC. The LCSC will include representation from the Estates Department, Finance & Planning, ICT Services, the Student Union, Accommodation Services and Sustainability and will be able to authorise expenditure from the Low Carbon Budget up to an amount to be defined. Above this funding level the LCSC will need to present a business case to the PPRC for authorization.

The following tables show the composition of the Carbon Management Team and the proposed Low Carbon Sub-committee:

Name	Position	Email	Phone
<b>Carbon Management Team</b>			
Nigel Wichall	Plan Sponsor, Director of Estates	<a href="mailto:nwichall@glos.ac.uk">nwichall@glos.ac.uk</a>	5059
Daniella Tilbury	Plan Sponsor (Academic), Director of Sustainability	<a href="mailto:dtilbury@glos.ac.uk">dtilbury@glos.ac.uk</a>	4690
Kierson Wise	Associate Director (Carbon)	<a href="mailto:kwise@glos.ac.uk">kwise@glos.ac.uk</a>	4107
Rachel Jones	Press & Public Relations Officer	<a href="mailto:rjones@glos.ac.uk">rjones@glos.ac.uk</a>	4516
Cathy Green	Sustainability Officer (Student & Staff Voluntary Activities)	<a href="mailto:cgreen@glos.ac.uk">cgreen@glos.ac.uk</a>	5419
<i>vacant</i>	SU Environment Executive		
Martin Foster	Health, Safety and Environment Adviser	<a href="mailto:mfooster@glos.ac.uk">mfooster@glos.ac.uk</a>	5051

Name	Position	Email	Phone
<b>Low Carbon Sub Committee (suggested members)</b>			
Martin Foster	Health, Safety and Environment Adviser	<a href="mailto:mfooster@glos.ac.uk">mfooster@glos.ac.uk</a>	5051
Andy Simpson	Head of Facilities	<a href="mailto:asimpson@glos.ac.uk">asimpson@glos.ac.uk</a>	4189
Sarah Wightman	Procurement and Contracts Manager	<a href="mailto:swightman@glos.ac.uk">swightman@glos.ac.uk</a>	4178
Clive Fenton	ITC Manager	<a href="mailto:cfenton@glos.ac.uk">cfenton@glos.ac.uk</a>	4197
Steve Davis	Manager (Anticipated Maintenance)	<a href="mailto:stephendavis@glos.ac.uk">stephendavis@glos.ac.uk</a>	4460
<i>Kierson Wise</i>	Associate Director of Sustainability (Carbon)	<a href="mailto:kwise@glos.ac.uk">kwise@glos.ac.uk</a>	4107
Stewart Dove	Director of Student Support	<a href="mailto:stewartd@glos.ac.uk">stewartd@glos.ac.uk</a>	4536
	Student Union		

Other staff will be co-opted to the Low Carbon Sub Committee as required as specific projects come and go.

The Low Carbon Sub-Committee will assist the Carbon Management Team in overseeing the implementation of the Carbon Management Plan and in monitoring and reporting progress and internal and external communication.

The Low Carbon Sub-Committee will meet as necessary to:

- review and update the Carbon Management Plan;
- monitor and report progress on implementing projects;
- monitor annual campus emissions;
- maintain an opportunities database (see section 4);
- communicate updates and increase awareness internally and externally;
- engage with Low Carbon Champions on awareness-raising initiatives.

### **7.3 Succession planning for key roles**

In order to maintain the momentum of the CMP, the succession of key roles should be considered.

All Carbon Management Plan information and files such as footprint calculations, tables, charts, energy data and mileage data will be kept on the shared ESHANDS drive to ensure that no data will be lost in the event of a change of personnel.

The Carbon Management Plan is owned by the Carbon Management Team and is the responsibility of the Director of Estates, as Plan Sponsor, and the Director of Sustainability as Plan Sponsor (Academic). Commitment to the Plan from the University Council ensures that if any key members of the team leave the plan will continue to be implemented.

## 7.4 Ongoing stakeholder management

There are key people and groups in the University who will need to be kept informed of progress in implementing the Carbon Management Plan and the following table details how they should be engaged and get the information they require.

Stakeholder	Key Interests and Issues	Their information needs or messages	Means of Communication
University Council	<ul style="list-style-type: none"> <li>• Carbon management</li> <li>• Corporate image</li> <li>• Environmental and Social Responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates and progress reports on the Plans performance</li> </ul>	<ul style="list-style-type: none"> <li>• Reports and verbal updates</li> <li>• Sustainability webpages</li> <li>• Staff News</li> </ul>
The Campus Manager	<ul style="list-style-type: none"> <li>• Reduction in waste</li> <li>• Increasing recycling</li> <li>• Procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the wider Plan</li> <li>• Ideas for innovation</li> <li>• Regular updates and progress reports on their performance</li> </ul>	<ul style="list-style-type: none"> <li>• One to one meetings when required</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
Catering Staff	<ul style="list-style-type: none"> <li>• Ensuring local produce procurement</li> <li>• Diverting organics from landfill</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the wider Plan</li> <li>• Awareness of the potential influence they have on the Plan's success</li> <li>• Regular updates and progress reports on their performance</li> <li>• Ideas for innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Catering Team meetings</li> <li>• Two way regular communication between catering teams and Campus Management to identify areas where impacts could be lessened</li> <li>• Regular updates (via a progress report) to be sent to catering staff.</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>

Stakeholder	Key Interests and Issues	Their information needs or messages	Means of Communication
Cleaning Staff	<ul style="list-style-type: none"> <li>• Have a great deal of knowledge regarding lights and heating being left on and windows left open etc.</li> <li>• Deal with waste, recycling champions.</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the wider Plan</li> <li>• Awareness of the potential influence they have on the Plan's success</li> <li>• Regular updates and progress reports on their performance</li> <li>• Ideas for innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Presentations to cleaning staff to highlight the impact they can have.</li> <li>• Two way regular communication between cleaning staff and the Campus Manager to identify areas where lights, air-con and heating etc are being left on out of hours.</li> <li>• Regular updates (via a progress report) to be sent to cleaning staff.</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
Student Recruitment and Marketing	<ul style="list-style-type: none"> <li>• Produce regular, University wide publications (as detailed in the communications plan) that can be used to inform a wide audience of the Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the Plan for publication and responding to media enquiries</li> <li>• Feedback on effectiveness of communications strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Regular meetings with Low Carbon Sub Committee to discuss potential publications.</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
Faculty Deans and Heads of Department	<ul style="list-style-type: none"> <li>• Carbon management</li> <li>• Energy awareness</li> <li>• Budgetary responsibility</li> <li>• Corporate image</li> <li>• Welfare/Education requirements of students.</li> <li>• Environmental and Social Responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the Plan</li> <li>• Awareness of the potential influence they have on the project's success</li> </ul>	<ul style="list-style-type: none"> <li>• Senior Management Group quarterly meetings</li> <li>• Executive Planning and Resources Committee Meetings</li> <li>• One to one meetings, when required</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
Estates Department	<ul style="list-style-type: none"> <li>• Carbon / energy</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the wider Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Estates team meetings</li> </ul>

Stakeholder	Key Interests and Issues	Their information needs or messages	Means of Communication
	<ul style="list-style-type: none"> <li>management, awareness and reduction</li> <li>Budgetary responsibility</li> <li>Building Maintenance</li> <li>New Builds and Refurbishment</li> <li>Waste management</li> </ul>	<ul style="list-style-type: none"> <li>Awareness of the influence they have on the Plan's success</li> <li>Carbon Management in Design Briefs for new build and refurbishment projects.</li> <li>Regular updates and progress reports on their performance</li> <li>Ideas for innovation</li> </ul>	<ul style="list-style-type: none"> <li>One to one meetings, when required</li> <li>Regular updates and progress reports on their performance</li> <li>Sustainability webpages</li> <li>Staff News</li> <li>Posters and Leaflets</li> </ul>
Finance & Planning	<ul style="list-style-type: none"> <li>Costs of potential projects.</li> <li>Potential savings associated with projects.</li> <li>Budget availability for projects</li> <li>Overall financial management</li> </ul>	<ul style="list-style-type: none"> <li>Opportunities for and conditions on external funding</li> <li>Cost benefit analysis of carbon reduction projects</li> <li>Time frame of any future projects</li> <li>Budget bids</li> </ul>	<ul style="list-style-type: none"> <li>University Management Group Meetings.</li> <li>EPRC Meetings.</li> <li>One to one meetings, when required.</li> <li>Sustainability webpages</li> <li>Staff News</li> <li>Posters and Leaflets</li> </ul>
Carbon Management Plan Team	<ul style="list-style-type: none"> <li>Carbon management.</li> <li>Energy awareness / reduction.</li> <li>Waste reduction and recycling.</li> </ul>	<ul style="list-style-type: none"> <li>Full data on all aspects of the Plan</li> <li>Regular updates and progress reports</li> </ul>	<ul style="list-style-type: none"> <li>Carbon Management Plan meetings with relevant team members</li> <li>University Management Group Meetings</li> <li>One to one meetings when required</li> <li>Sustainability webpages</li> <li>Staff News</li> <li>Posters and Leaflets</li> </ul>
ITC Services	<ul style="list-style-type: none"> <li>Carbon Management</li> <li>IT Energy consumption.</li> <li>Purchasing and disposal of</li> </ul>	<ul style="list-style-type: none"> <li>Regular updates on the wider Plan</li> <li>Awareness of the influence they have on the Plan's success</li> <li>Regular updates and progress reports on their performance</li> </ul>	<ul style="list-style-type: none"> <li>Low Carbon Sub Committee meetings</li> <li>One to one meetings when required.</li> <li>Sustainability webpages</li> <li>Staff News</li> <li>Posters and Leaflets</li> </ul>

Stakeholder	Key Interests and Issues	Their information needs or messages	Means of Communication
	equipment		
Security	<ul style="list-style-type: none"> <li>• Have a great deal of knowledge regarding lights and heating being left on and windows left open etc</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the wider Plan</li> <li>• Awareness of the influence they have on the Plan's success</li> <li>• Regular updates and progress reports on what has been done as a result of their reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Security team meetings</li> <li>• Two way regular email communication between security staff and the Head of Facilities to identify areas where lights, air-con and heating etc are being left on out of hours</li> <li>• Regular updates (via a progress report) to be sent to security staff</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
All Admin and Support Staff	<ul style="list-style-type: none"> <li>• Carbon Management</li> <li>• Working environment</li> <li>• Environmental impact of the University</li> <li>• Carbon emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the Plan</li> <li>• Awareness of the potential for their participation in the Program</li> </ul>	<ul style="list-style-type: none"> <li>• Team Meetings</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>
Students	<ul style="list-style-type: none"> <li>• Climate Change.</li> <li>• Environmental impact of the University</li> <li>• Course/Project Works</li> <li>• Social responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the Plan</li> <li>• Awareness of their participation in the Plan</li> <li>• Awareness of the potential influence they have on the Plan's success</li> </ul>	<ul style="list-style-type: none"> <li>• Through the Students Union</li> <li>• Competitions and Incentives</li> <li>• Student publications (What's on)</li> <li>• Student newspaper</li> <li>• Sustainability webpages</li> <li>• Posters and Leaflets</li> </ul>

Stakeholder	Key Interests and Issues	Their information needs or messages	Means of Communication
Students Union	<ul style="list-style-type: none"> <li>• Carbon Management</li> <li>• Climate Change.</li> <li>• Environmental impact of the University</li> <li>• Environmental impact of the Students Union</li> <li>• Course/Project Works.</li> <li>• Social responsibility.</li> <li>• Student members welfare</li> <li>• Sound-Impact awards</li> </ul>	<ul style="list-style-type: none"> <li>• Regular updates on the Plan</li> <li>• Awareness of the potential influence they have on the Plan's success</li> <li>• Awareness of the potential for their participation in the Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Regular meetings.</li> <li>• One to one meetings when required</li> <li>• Sustainability webpages</li> <li>• Staff News</li> <li>• Posters and Leaflets</li> </ul>

## 7.5 Annual Progress review

There will be an annual review of progress on the implementation of the Carbon Management Plan. This will take place after the carbon footprint data collection process has taken place for the previous financial year, and will be made to the Sustainable Development Committee at its first meeting of the calendar year.

The report will cover:

- Progress with projects
- Unplanned projects
- Proposals for new projects
- Progress on cultural change
- Electricity Consumption data (KWh and tonnes of CO<sub>2</sub>)
- Gas Consumption data (KWh and tonnes of CO<sub>2</sub>)
- Water Consumption (M<sup>2</sup> and tonnes of CO<sub>2</sub>)
- Waste Sent to Landfill (Tonnes and tonnes of CO<sub>2</sub>)
- Recycling rate (Tonnes CO<sub>2</sub> avoided)
- Business travel data (at a later date)
- Air miles data
- Fleet Travel
- Total reduction in carbon emissions
- CO<sub>2</sub> savings against target
- Financial commentary and cost savings

The report will be prepared for initial consideration by the Carbon Management Team before submission to the Sustainable Development Committee and then to EPRC. A summary will be submitted to University Council and key points published in specific publications such as the University Financial report. The Sustainability webpages will carry the full report.

The Carbon Management Team will be responsible for assessing performance against targets and evaluating project outcomes and ensuring these are included in the annual report. It will also propose any changes to Carbon Management Plan for approval by EPRC.

As and when new or more accurate data is available, the baseline emissions will be updated and expanded. The availability of new data sources provides the option of expanding the baseline emissions to incorporate the new focus area, which will allow the scope for carbon reduction projects to be broadened. For example, when a new transport survey has been completed, commuting data from staff and students will be included.

### Reporting to the Carbon Trust

Reporting to the Carbon Trust will be done annually and will be based on the Carbon Trust Periodical Reporting Template.

## Appendix A: Carbon Management Matrix – Embedding

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
5	SMART Targets signed off Action plan contains clear goals & regular progress reviews Strategy launched internally & to community	CM is <b>full-time</b> responsibility of a <b>few</b> people CM integrated in responsibilities of <b>senior</b> managers VC support Part of <b>all</b> job descriptions	<b>Quarterly</b> collation of CO2 emissions for all sources Data <b>externally</b> verified M&T in place for: Buildings Waste	All staff & students given formalised CM: <ul style="list-style-type: none"> <li>• Induction</li> <li>• Training Plan</li> <li>• Communications</li> </ul> CM matters regularly communicated to: External community Key partners	<b>Granular &amp; effective</b> financing mechanisms for CM projects. Finance representation on CM Team <b>Robust</b> task management mechanism <b>Ring-fenced fund</b> for carbon reduction initiatives	<b>Senior</b> purchasers consult & adhere to ICLEI's <b>Procura+</b> manual & principles Sustainability comprehensively integrated in <b>tendering</b> criteria Whole life costing Area-wide procurement	Senior management review CM process Core team regularly reviews CM progress Published externally on website Visible board level review
4	SMART Targets <b>developed but not</b> implemented	CM is <b>full-time</b> responsibility of an <b>individual</b> CM integrated in to responsibilities of department <b>managers</b> , not all staff	<b>Annual</b> collation of CO2 emissions for: Buildings Transport waste Data <b>internally</b> reviewed	All staff & students given CM: Induction Communications CM communicated to: External community Key partners	Regular financing for CM projects <b>Some</b> external financing <b>Sufficient</b> task management mechanism	Environmental demands incorporated in tendering Familiarity with <b>Procura+</b> <b>Joint procuring</b> between HEIs	<b>Core</b> team <b>regularly</b> reviews CM progress: Actions Profile & Targets New opportunities quantification
3	<b>Draft</b> policy Climate Change <b>reference</b>	CM is <b>part-time</b> responsibility of a <b>few</b> people CM responsibility of department champions	<b>Collation</b> of CO2 emissions for limited scope i.e. buildings only	<b>Environmental / energy</b> group(s) give ad hoc: Training Communications	<b>Ad hoc</b> financing for CM projects Limited task management No allocated resource	<b>Whole life</b> costing occasionally used Some <b>pooling</b> of environmental expertise	CM team review aspects including: Policies / Strategies Targets Action Plans
2	No policy Climate Change <b>aspiration</b>	CM is <b>part-time</b> responsibility of an <b>individual</b> No departmental champions	<b>No CO2</b> emissions data compiled Energy data compiled on a regular basis	Regular poster/ awareness campaigns <b>Staff &amp; students</b> given ad hoc CM Communications	Ad hoc financing for CM <b>related</b> projects Limited task coordination <b>resources</b>	<b>Green</b> criteria occasionally considered Products considered in <b>isolation</b>	Ad hoc reviews of CM actions progress
1	No policy	No CM responsibility	Not compiled:	No communication	No internal	No Green	No CM monitoring

	No Climate Change reference	designation	CO2 emissions Estimated billing	or training	financing or funding for CM related projects	consideration No life cycle costing	
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## Appendix B: Definition of Projects

### ESTATES PROJECTS

Project	Lead	Comments	Estimated Cost	Estimated Start	Estimated Finish	Status
Complete review of all BMS controls. (E1 / Appendix B2)	Nigel Wichall	Ensure time programs suit current occupancy and all controls / sensors are functioning correctly. Set points policy needs clarification. Used to be 19 degrees everywhere but difficult to maintain.	£6.5K	2011	2011	
Pipe work Insulation Project. (N2 / Appendix )	Nigel Wichall	Pending audit, upgrade and replace existing pipe insulation. Where appropriate.	£66K	2012	2012	
Controls Remedial Works Project (P1 / Appendix B6)	Nigel Wichall	Pending audit	£250K	2012	2013	
Lighting Controls (N3 / Appendix B1)	Nigel Wichall	Pending audit, roll out absence detection \ daylight linking	£10K	2011	2011	
Lighting Refurbishment (N4 / Appendix B8))	Nigel Wichall	Pending audit, replace all lighting with modern T12 / T5 light fittings	£45K	2011	2011	
Lighting audit -. (P3 / Appendix B8)	Nigel Wichall	There is still scope to expand high frequency lighting / photocell or occupancy controls Areas once identified may be required for refurbishment before any change is made.	£10K	2010	2010	
Building fabric audit (P2 / Appendix B7)	Nigel Wichall	Produce schedule of buildings that are likely remain in view of forthcoming development plans. Focus on short term measures (cavity wall insulation, draught proofing)	Audit £8K Works £100K	2011	2013	
Install solar water heating in halls of residence.	Nigel Wichall	Select one halls of residence to pilot solar water heating to gauge effectiveness of system.	£75K	2011	2011	

Project	Lead	Comments	Estimated Cost	Estimated Start	Estimated Finish	Status
(ML8)						
Automatic meter reading - enable energy monitoring at building level (E1 / Appendix B2)	Nigel Wichall	We need better metering and the subsequent understanding of where energy is consumed on site.	£65K	2010	2010	
Disposal of Pittville campus to remove surplus accommodation	Nigel Wichall	Project works currently progressing in line with key terms adopted within the June 2010 business plan.	£5.3M	2010	2011	
Future Controls Development phase 1 (N5)	Nigel Wichall	Identify specific areas and obtain budgetary cost for project approval (1) Heating button extension (2) Migrate standalone heating controls to BMS	£40K £75K £150K	2011 2011 2012	2011 2011 2012	
Future Controls Development phase 2 (ML3)	Nigel Wichall	Feasibility study (1) ID cards to activate central resources / record and recharge (2) Link room booking system software to BMS	£40K £50K £50K	2011 2013 2013	2011 2013 2013	
On site power generation (ML8)	Nigel Wichall	Kinetic plates at site entrances to generate electricity.	£100K	2013	2014	

## ICT PROJECTS

Project	Lead	Comments	Estimated Cost	Estimated Start	Estimated Finish
Investigate air conditioning energy costs in the University data centres (ML2)	Clive Fenton	Monitor data centre energy consumption and investigate free air solutions. Monitoring already in place in one data centre	£20K	2011	2012
Install of	Clive Fenton	Use of new firmware and monitoring software for	£20K	2012	2013

Project	Lead	Comments	Estimated Cost	Estimated Start	Estimated Finish
intelliswitches on the network with monitoring software. (P5)		switching off inactive network devices			

Project	Lead	Comments	Estimated Cost	Estimated Start	Estimated Finish
Virtualise the IT network and therefore reduce energy costs in server rooms. (E2)	Clive Fenton	In progress as part of the server replacement policy	£100K	2010	21013
Central power down management of PCs \ switch off campaign. (P6 / Appendix B4)	Clive Fenton	Activity monitoring software already in place on trial and process to contact members of staff / students to encourage inactive users to switch. Plans to distribute across the whole of the University	£10K	2009	2011
Rationalise printers in favour of shared multi-function devices. (E3 / Appendix B5)	Clive Fenton	Project underway - CF - status update New centralised print management system now deployed reducing systems from three to one Multi-functional devices deployed across whole campus- restricting use of machines through swipe card (impacts on waste as well as energy) Defaults to duplex printing. Next steps to set rules for print quotas.'	£20K	2010	2011

## Appendix B1 – Lighting Controls

Project:	<b>Lighting: Introduce Lighting Controls</b>
Reference:	<b>N3</b>
Owner (person)	Nigel Wichall
Department	Estates
Description	<p>Lighting Controls</p> <p>Daylight and occupancy sensors will be incorporated into existing lighting controls to reduce the responsibility of the individual for turning off lights when not needed. This should also replace conventional light switches in cases where corridor lighting is required instantly for security reasons, or where centralised lighting controls currently exist in buildings that prevent the individual from taking control of local room lighting. Issues affecting the sequence of buildings receiving the installations include the availability of the building for works, and the ease of the operation.</p>
Benefits	<ul style="list-style-type: none"> <li>• Financial savings: £4K</li> <li>• Payback period: 2.4 years</li> <li>• CO2 Emissions reduction: 24 tonnes of CO2</li> </ul>
Funding	<ul style="list-style-type: none"> <li>• Project Cost: £10K</li> <li>• Source of funding: To be confirmed</li> </ul>
Resources	<ul style="list-style-type: none"> <li>• Estates will oversee the project. Considerable man hours will be needed due to the dispersed nature of the projects in buildings across campus, thus the demand for staff time is likely to be reasonably high.</li> </ul>
Ensuring Success	<ul style="list-style-type: none"> <li>• The principal success factor will be a measured reduction in the kWh energy consumption of the buildings following installation of the controls. This will be fully auditable once the metering network across campuses has been installed. Success will also be measured by the response of building occupants to the new installations. In particular there should be fewer complaints about wasteful lighting.</li> </ul>
Measuring Success	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets.</li> <li>• Positive feedback from building occupants, and reduction in complaints regarding wasteful lighting in rooms and corridors.</li> </ul>
Timing	<ul style="list-style-type: none"> <li>• To be confirmed once source of funding has been identified</li> </ul>
Notes	

## Appendix B2 – Automated Meter Reading

Project: Reference:	<b>Automated Meter Reading, Monitoring and Targeting System E1</b>
Owner (person)	Nigel Wichall
Department	Estates
Description	A sub-metering and automated meter reading, monitoring and targeting system is being installed to allow energy data to be collected and centralised. This would allow unusual consumption patterns to be rapidly identified. There are several options for data collection, part of such a system including drive-by data loggers, existing networked cabling, or radio frequency signalling. A number of areas and specific meters have been identified and work will commence in 2010.
Benefits	Estimated Financial savings: £26K Estimated Payback period: 1 year Estimated CO2 Emissions reduction: 304 tonnes of CO2
Funding	Project Cost: £65K Operational Costs: To be confirmed Source of funding: Capital Budget
Resources	The project will be overseen by Estates
Ensuring Success	The principle success factor will be the ability to read and monitor electricity, gas and water meters. This will subsequently allow data for individual buildings to be collated and targets set.
Measuring Success	Installation of system Quarterly data reports User satisfaction with the methods for data collection Reduction in consumption with no reduction of services
Timing	To be completed during 2011/12
Notes	

## Appendix B3 – Voltage Optimisation

Project:	<b>Optimisation of Supply Voltage</b>
Reference:	<b>P3</b>
Owner (person)	Nigel Wichall
Department	Facilities Services
Description	Reducing the supply voltage at transformer level to increase efficiency of energy use across all campuses. This would be done at sub-station level directly on the transformers by altering the tap changes on the transformers. The level of allowable reduction and the potential savings/effects are being evaluated.
Benefits	Financial savings: 32.7K Payback period: 3 years CO2 Emissions reduction: 189 tonnes of CO2
Funding	Project cost - £122.7K Operational costs - Reduced maintenance costs and extended equipment life should be achieved due to reduced operating temperatures and operating closer to their design characteristics. Source of funding – Salix interest free loan
Resources	Estates will oversee the project
Ensuring Success	Success will be measured by achieving the savings indicated above.
Measuring Success	Reduction in kWh against baseline and in line with targets
Timing	To be completed by year end 2010
Notes	

## Appendix B4 – Automated PC Shut Down

<b>Project:</b>	<b>Automated PC Shut down in Central Work Areas</b>
<b>Reference:</b>	P8
<b>Owner (person)</b>	Clive Fenton
<b>Department</b>	ICT
<b>Description</b>	There are approximately 2000 computers on all campuses (excluding student-owned PCs/laptops in halls of residences). Of these, some 1000 are staff office PCs, and 1000 are student work-area PCs in central work areas and departmental computer rooms. All work area PC monitors are flat screen, and automatically power-down after a period of time of not being in use.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £0.9K</li> <li>• Payback period: 3.5 years</li> <li>• CO2 Emissions reduction: 5.2 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: £10K</li> <li>• Source of funding: Capital Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• ICT will oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The principle success factor is turning off PCs when not in use.</li> <li>• The principle risks are requiring all PCs to remain turned on in order to remotely update the hard drives and being unable to turn off enough PCs to make the savings planned for.</li> <li>• Main means of risk mitigation is ensuring support for the project from ICT staff and recognition of the carbon and financial savings to be made.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets</li> <li>• Computer user satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be completed by end of 2010</li> </ul>
<b>Notes</b>	

## Appendix B5 – Printer Rationalisation

<b>Project:</b>	<b>Rationalise printers in favour of Multi-Function Devices (MFD)</b>
<b>Reference:</b>	E3
<b>Owner (person)</b>	Clive Fenton
<b>Department</b>	ICT
<b>Description</b>	The University currently provides 56 photocopiers. They are located in academic and support areas, in addition to Learning Centres on all sites. The project is to replace individual and departmental printers with MFD's. This will save both energy and toner costs as well as paper volumes.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £5.5K</li> <li>• Payback period: 3.5 years</li> <li>• CO2 Emissions reduction: 33 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: £20K</li> <li>• Source of funding: Capital Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• ICT will oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The principle success factor is the reduction in the number of printers at the University.</li> <li>• Another success factor will be the savings in both energy and paper with no discernable reduction in service</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets</li> <li>• Main means of measuring success will be the publication of the saving made.</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be completed by end of 2010</li> </ul>
<b>Notes</b>	

## Appendix B6 – Review of Building Controls

<b>Project:</b>	<b>Review of BMS Controls and Settings</b>
<b>Reference:</b>	P2
<b>Owner (person)</b>	Nigel Wichall
<b>Department</b>	Estates
<b>Description</b>	Carry out a review of all BMS settings to ensure time controls are functioning correctly. Also a full systems wide sensor recalibration and functionality test to ensure optimum settings and best energy consumption.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £7K</li> <li>• Payback period: 1 year</li> <li>• CO2 Emissions reduction: 44 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: £6.5K</li> <li>• Source of funding: Capital Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The principle success factor will be a reduction in energy consumption with no discernable changes to temperature and comfort levels by staff and students..</li> <li>• Main risk will be the perception of staff and students to the changes. This should be managed will a full information program prior to any significant changes to set points and occupation times.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets</li> <li>• Staff and student satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be completed by end of 2010</li> </ul>
<b>Notes</b>	

## Appendix B7 – Building Fabric Audit

<b>Project:</b>	<b>Building Fabric Audit</b>
<b>Reference:</b>	P4
<b>Owner (person)</b>	Nigel Wichall
<b>Department</b>	Estates
<b>Description</b>	Carry out a complete building fabric audit to determine where improvements can be made, such as better insulation and double glazing and better draft proofing measures
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £5K</li> <li>• Payback period: 3.6 years</li> <li>• Annual CO2 Emissions reduction: 31 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: £18K</li> <li>• Source of funding: To be confirmed</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The key success factor will be a reduction in gas consumption.</li> <li>• The buildings being tackled will be the oldest at the University. The investment of money must be assessed within the planned life span and use of each building.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be confirmed once source of funding has been identified</li> </ul>
<b>Notes</b>	

## Appendix B8 – Lighting Audit

<b>Project:</b>	<b>Lighting Audit</b>
<b>Reference:</b>	P5
<b>Owner (person)</b>	Nigel Wichall
<b>Department</b>	Estates
<b>Description</b>	There is still scope to expand high frequency lighting and to expand the use of photocell and occupancy controls to areas of the University. The audit will identify these areas and a program of upgrades will be finalised. Work will commence in sequence on buildings that most urgently require the fittings, either because this will substantially reduce electricity consumption or because the controls are needed for convenience to the occupiers. Other issues affecting the sequence of buildings receiving the installations include the availability of the building for works, and the ease of the operation.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £ 21.5K</li> <li>• Payback period: 3.5</li> <li>• Annual CO2 Emissions reduction: 128 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: Estimated at £133K</li> <li>• Source of funding: To be confirmed</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee the project. Considerable man hours will be needed due to the number of building within the estates portfolio. Thus the demand for staff time is likely to be reasonably high.</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The principal success factor will be a measured reduction in the kWh energy consumption of the buildings following installation of the controls. This will be fully auditable through the metering network across campus. Success will also be measured by the response of building occupants to the new installations. In particular there should be fewer complaints about wasteful lighting.</li> <li>• It is possible that installations may be slowed down by unexpected complications to the process, (e.g. problems with electrical infrastructure). This will require more man hours and may interrupt overall project scheduling and achievement of targets. Ultimately this may also disrupt the building occupants which will have further repercussions for campus operations.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets.</li> <li>• Positive feedback from building occupants, and reduction in complaints regarding wasteful lighting in rooms and corridors.</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be confirmed once source of funding has been identified</li> </ul>
<b>Notes</b>	

## Appendix B9 – Heating Audit

<b>Project:</b>	<b>Heating Audit: Park campus</b>
<b>Reference:</b>	P6
<b>Owner (person)</b>	Nigel Wichall
<b>Department</b>	Estates
<b>Description</b>	Carry out an audit of the pipework within the plantrooms at Park Campus to determine the extent and condition of the heating pipework insulation
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £ 0.8K</li> <li>• Payback period: 3 years</li> <li>• Annual CO2 Emissions reduction: 5 tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project Cost: Estimated at £2.3K</li> <li>• Source of funding: To be confirmed</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee the project.</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The principal success factor will be a measured reduction in the kWh energy consumption at Park following the insulation upgrade. This will be fully auditable through the energy consumption data.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in kWh against baseline and in line with targets.</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• To be confirmed once source of funding has been identified</li> </ul>
<b>Notes</b>	

## Appendix B10 – Awareness Campaign

<b>Project:</b>	<b>Awareness Campaign</b>
<b>Reference:</b>	P9
<b>Owner (person)</b>	Daniella Tilbury
<b>Department</b>	Sustainability
<b>Description</b>	<p>The University will be carrying out a communication campaign via its planned Student Engagement and Faculty Action Planning process. The overall objective is to articulate to students and staff the University’s sustainability objectives, including its target carbon reduction.</p> <p>This communication extends to our suppliers, for example, we work closely with our caterers who source as much local produce as possible to reduce transport of food and drink supplies to University campuses. University activities will be summarised internally and externally on the Sustainability webpages.</p> <p>A number of other specific projects such as, a faculty action plan, a campus visibility project, a joint SU and Sustainability team project, will also be used</p>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Annual financial savings: £29K</li> <li>• Payback period: 0.9 years</li> <li>• Annual CO2 Emissions reduction: 177tonnes of CO2</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Project cost £26.5K</li> <li>• Source of funding: Sustainability capital budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Sustainability team will oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• The key success factor will be the audience reached with the campaign, and the response of this audience to the project actions. Timing will also be important, as the campaign should reinforce the visible progress occurring on campus, and should target new students during their induction week to get maximum attention.</li> <li>• The awareness campaign must be carefully planned in order to get interest and attention from its target audience, and for this attention to convert to positive action around campus. The risk is that any publicity measures will fall flat and be perceived as irrelevant to the individual or be ignored.</li> <li>• Main Means of Risk Mitigation: Careful planning of actions to ensure target audience is reached and the desired response is achieved. Wide involvement from University departments and support from senior management.</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Measured reduction in kWh energy consumption</li> <li>• Perceived reduction in ‘wasteful’ energy consumption across campuses.</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• 2010 onwards</li> </ul>
<b>Notes</b>	