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## Foreword from the Vice Chancellor and University Council

Liverpool Hope University is a unique institution, being the only ecumenical Christian University in Europe. As such, this University has a moral, ethical and social responsibility to consider, and be accountable for, the impacts of its activities on students, suppliers, employees, the local community and the wider stakeholder groups, as well as on the environment. Planning and working in a sustainable manner is therefore a central tenet of the mission and values of this University.

The University Council and Senior Managers fully endorse the Carbon Trust's Carbon Management Programme and are committed to reducing our carbon footprint in line with government and HEFCE targets. This represents a reduction of 19% (1,013 tonnes) from our 2009-2010 baseline (5,367 tonnes) by 2014-2015.

The Carbon Management Plan has also allowed us to identify and quantify the carbon emissions arising from our activities. Through this exercise, we have identified a number of abatement projects, awareness raising campaigns and feasibility studies that will help the University achieve its targets, and, at the same time, effect some £800,000 of savings over the project period.

The Carbon Management Plan has given clear insights into the issue of sustainability and has prompted the University to reconsider its capital investment, maintenance, procurement, waste/recycling management and energy utilization strategies for the future and forms the heart of the Sustainability Strategy, approved by Council in November 2010.

The University Council gives unanimous support to this initiative and will monitor with interest its progress from this point on.



Professor Gerald Pillay  
Vice Chancellor & Rector



Mgr John Devine  
Pro Chancellor & Chair of University  
Council

## Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for Universities and Colleges - it's all about getting your own house in order and leading by example. The UK government has identified the Higher Education sector as key to delivering carbon reduction across the UK in line with the Climate Change Act targets, and the Higher Education Carbon Management Programme is designed in response to this. It assists Higher Education institutions in saving money on energy and putting it to better use elsewhere, whilst making a positive contribution to the environment by lowering carbon emissions.

Liverpool Hope University partnered with the Carbon Trust on this ambitious programme in 2010 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 20% by 2012-2013 over a 2005-2006 baseline, with ongoing reductions thereafter, and underpins potential financial savings to the institution of around £100,000 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 Liverpool Hope University in their ongoing implementation of carbon management.



Richard Rugg  
Head of Public Sector, Carbon Trust

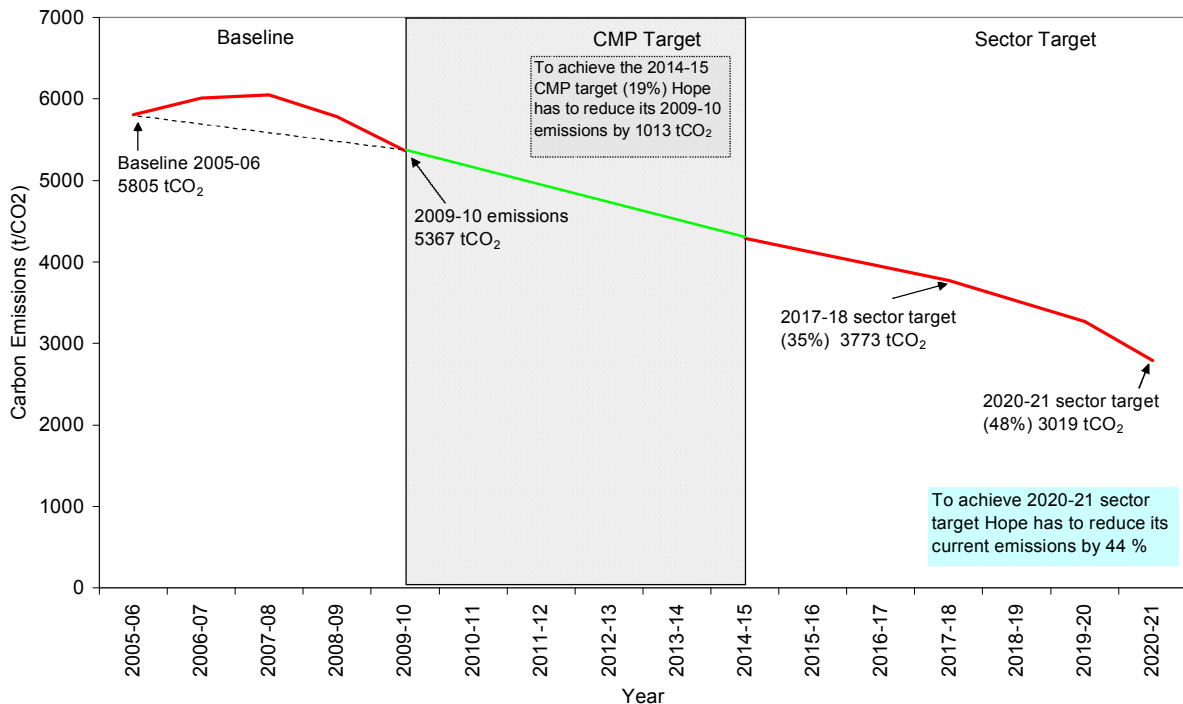
## Management Summary

Carbon Management, along with other sustainability issues, is a high profile subject and becoming increasingly more so at Liverpool Hope University. Global Climate Change is recognised as the greatest environmental challenge facing the world today, along with increasing concerns over the depletion of fossil fuel resources, energy security and rising energy prices. There is now wide ranging legislation, strategies, regulation and guidance throughout all sectors to minimise carbon emissions.

Liverpool Hope University has a social responsibility to consider the interests of society and be accountable for the impact of its activities on internal and external stakeholders and the environment. The University is committed to reducing its environmental impact and is investing monies to develop and implement carbon reduction projects.

Liverpool Hope University is an ecumenical Christian Foundation and gained University status in 2005 and research degree awarding powers in 2009. The University has approximately 900 staff and 6,500 students within an estate of over 250,000 m<sup>2</sup> and a building footprint (gross internal area) of over 70,000 m<sup>2</sup>. The University has two main campuses: Hope Park, within Childwall; and the Creative Campus in Everton; the University also has residential accommodation in Aigburth and a residential field centre in North Wales.

The University's carbon emissions are calculated from both non-residential and residential buildings and covers utilities consumption (gas, electricity and water); fuel used within University owned vehicles; refrigerants used within air conditioning units; and the tonnage of waste to landfill. The University's 2005-2006 baseline is 5,805 tonnes CO<sub>2</sub> equivalent and in 2009-2010 Hope had already reduced its carbon emissions to 5,367 tonnes, a saving of 7%. In future, the University will consider including business travel; staff, student, visitor and contractor commuting; procurement and resource consumption; and car and coach hire into its baseline.

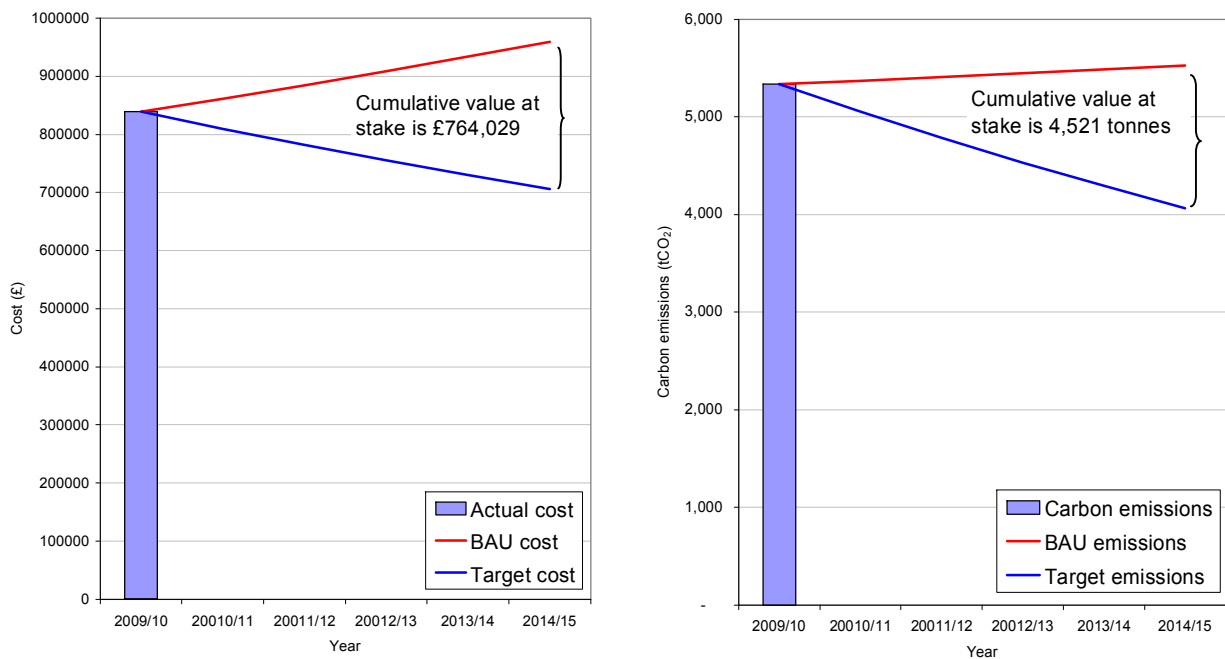


The target for Hope is to reduce its carbon emissions, from its 2005-2006 baseline, by:

- 20% by the end of 2012-2013;
- 35% by the end of 2017-2018;
- 48% by the end of 2020-2021

The reduction target for the Carbon Management Plan is 19% (1,013 tonnes) from its 2009-2010 baseline (5,367 tonnes) by 2014-2015.

To assess the benefit of the Carbon Management Plan the Value At Stake has to be taken into consideration i.e. the difference between the Business As Usual Scenario (a continual increase in price of 1.7% and an 0.7% increase in carbon emissions) and the Reduced Emissions Scenario (resulting from carbon reduction measures identified below). The cumulative financial value at stake between 2009-2010 and 2014-2015 is £765,000



Between 2005-2006 and 2009-2010, the University has carried out a number of projects to update old building stock, renew staff and student accommodation as part of the University's strategic development. These projects cost over £1 Million and reduced the 2005-2006 carbon footprint by 112 tonnes. There are also a number of Estates Development projects which have been approved for implementation during 2011 which include the refurbishment of the refectory kitchens, window replacements and refurbishments which will reduce carbon emissions by around 6 tonnes.

A number of abatement projects, awareness raising campaigns and feasibility studies have been identified to enable the University to reach its carbon reduction targets, for more details, see Appendix A. Hope appreciates that there needs to be a continuing programme of project identification and quantification to maintain the carbon reduction over time.

- **Abatement Projects** – will have an immediate and direct impact on reducing carbon emissions
  - Decentralise and update boilers
  - Replace heating controls

- Enable BMS control over the intranet and fine tune
  - Upgrade lighting and associated controls
  - Use of automated meter reading, monitoring and targeting
  - Installation of tamperproof Thermostatic Radiator Valves
  - Installation of water conservation technologies
  - Automatic PC shutdown in central work areas
  - Server room rationalisation
  - Increase recycling provision across the campus
  - Replace single with double glazing
  - Insulate Alexander Jones Building chapel roof
  - Insulate Lecture Theatre Complex pitched roof
  - Replace Lecture Theatre Complex flat roof
  - Insulation of pipes and valves
- **Awareness Raising** – will not directly reduce carbon emissions, but will have the effect of facilitating or causing the reduction of emissions through further actions, for example, policies and procedures
    - Sustainability Communications Plan
    - Environmental Management Systems: ISO 14001
- **Feasibility Studies** – will determine the scale, financial cost and carbon reduction of potential future projects
    - Voltage Optimisation
    - Installation of Variable Speed Drives
    - Space Management and building rationalisation
    - Replacement lighting in Sports Hall
    - Replace flat roof covering on Frances Mary Lescher
    - Cavity Wall insulation – Alexander Jones Building, Austin & Angela Halls and the Lecture Theatre Complex

These carbon reduction projects have been prioritised on a carbon saving, cost and payback basis for short-term (by the end of 2012-2013) and longer term projects (within the next five years). The short-term projects are estimated to cost around £162,000, save 671 tonnes CO<sub>2</sub> e with a first year gross saving of £100,505. The longer term projects will reduce carbon emissions by 587 tonnes CO<sub>2</sub> e and cost over £1,392,000, with gross savings in the first year of £93,375. The investment for these projects is divided between the University's sustainability budget, the Estates maintenance budget and other funding streams.

The Carbon Management Plan forms a major part of the University's overarching Sustainability Strategy (this also covers Property and Space Management; Travel; Academic Study; Community Engagement; Procurement and Awareness Raising). The Sustainable Development Steering Group, chaired by the Pro-Vice Chancellor for Resource Management and Planning, takes primary responsibility to ensure that the Strategy is communicated, disseminated, implemented, and reported.

# 1 Introduction

Liverpool Hope University is an ecumenical Christian Foundation and is one of the newest Universities, gaining University status in 2005 and research degree awarding powers in 2009. Liverpool Hope University, however, has a long tradition which stretches back over 160 years when the Church of England Diocese of Chester and Roman Catholic Sisters of Notre Dame established separate teacher education colleges for women.

The University has approximately 900 staff and 6,500 students within an estate of over 250,000 m<sup>2</sup> and a physical estate that comprises of buildings (including residential) with a gross internal area (GIA) of over 70,000 m<sup>2</sup>. There are two main campuses: Hope Park, located in Childwall on the outskirts of Liverpool (occupying an area of 150,400 m<sup>2</sup>) and the Creative Campus in Everton (occupying an area of 8,000m<sup>2</sup>). In addition, the University owns accommodation at Aigburth occupying a 17,500m<sup>2</sup> site and a residential field centre in North Wales (occupying an area of 78,110 m<sup>2</sup>). The utilities budget (electricity, gas and water) exceeded £1 million in 2009-2010, and, in the last two years, the University has invested over £20M in its teaching and research facilities, including two new buildings (The Capstone at the Creative Campus, occupying 2,011 m<sup>2</sup> (GIA) which opened in March 2010 and the EDEN (Education, Enterprise) building (GIA: 2,610 m<sup>2</sup>) which opened in September 2010. The University is also buying-back a hall of residence, Hopkins Hall, on its Creative Campus site (GIA: 4,477 m<sup>2</sup>), which it previously owned.

## 1.1 Carbon Management in the University Sector

Following the Climate Change Act (2008) the British Government adopted rigorous targets in respect of reducing carbon emissions and the University sector in particular is expected to be at the forefront of sustainable practice. To this end, the Higher Education Funding Council for England (HEFCE), in consultation with the University sector, has set targets for carbon reduction across the sector of:

83% by 2050-2051

48% by 2020-2021

35% by 2017-2018; and

20% by 2012-2013.

These targets have been adopted by the University and this document sets out the measures by which this will be achieved.

The University is part of the Higher Education Carbon Management (HECM) Programme and is currently producing an over-arching Sustainability Strategy, which will replace the existing Environmental and Energy Policies. The Sustainability Strategy will set out the University's approach to integrating the broad range of sustainability issues into its business model. These issues include education and awareness, cultural change, increased recycling, improved resource usage, more efficient transport planning, better energy use, reduced carbon emissions and greater biodiversity.

The Higher Education Carbon Management (HECM) Programme is a five-step process (see below) which has been designed and planned by the Carbon Trust to assist Higher Education (HE) institutions with quantifying and systematically reducing their carbon emissions through technical and change management. This Carbon Management Plan (CMP), the final deliverable of the Carbon Management Programme, details a range of measures and actions to reduce emissions across the University estate over the next five year period, from an established baseline, to an agreed target level, in line with best practice.



The reduction targets within the CMP are set to be achieved by 2014-2015 but the scope and timescale for reduction measures will extend beyond this date. This Plan is a working document as it is impossible to quantify the total carbon emissions that the University is responsible for or to foresee the change in the University's estate. It is likely that the plan will develop as measuring techniques improve and develop, targets will be reviewed and adjusted accordingly and the scope of projects adapted to fit in with the future development plans.



## 2 Carbon Management Strategy

Liverpool Hope University is embarking on carbon management at a time when climate change is becoming a high profile issue for every organisation against a background of changing legislation, economic instability, increased market forces and stakeholder concerns. The objective of the Carbon Management Programme is to minimise the risks and maximise the opportunities arising from carbon emissions and climate change. The successful adoption and implementation of the CMP will increase the awareness of the University to the potential impacts of climate change and provide a greater capacity to deal with these impacts.

The chapter highlights the main drivers for change, identifies the vision, specifies objectives and targets and confirms the strategy to be followed.

### 2.1 Context and drivers for Carbon Management

Carbon management, along with other sustainability issues, is a high profile subject and is becoming increasingly more so at Liverpool Hope University. There is now a wide range of UK legislation, strategies, regulation and guidance available throughout all sectors to minimise carbon emissions.

#### 2.1.1 Social Responsibility

First and foremost, the University has a moral, ethical and social responsibility to consider the interests of society and be accountable for the impact of its activities on students, suppliers, employees, communities and other stakeholders, as well as the environment.

#### 2.1.2 Global Climate Change

Climate change is the greatest environmental challenge facing the world today. Rising global temperatures will bring changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather. The man-made release of carbon dioxide and other greenhouse gases are seen to be the main influence on global climate. Internationally, the Kyoto Protocol is the only worldwide binding carbon dioxide (CO<sub>2</sub>) reduction target of 5% by 2008-2012 on a 1990-1991 baseline.

#### Sustainable Development

Sustainable Development is the “development which meets the needs of the present without compromising the ability of future generations to meet their own needs”. To achieve a sustainable University a holistic approach needs to be taken which considers the agenda’s of regional, national and global strategies.

#### 2.1.3 UK

##### 2.1.3.1 *Legislative*

#### Climate Change Act 2008

The UK became the first country in the world to have a legally binding long-term framework to cut greenhouse gas emissions with the adoption of the Climate Change Act, 2008 which requires at least an 80% reduction in greenhouse gas emissions by 2050-2051 and at least 34% by 2020-2021 through action in the UK and abroad. Both targets are against a 1990-1991 baseline.

Liverpool Hope University’s CMP should be considered in the wider context of these Government targets.

#### Energy Performance of Buildings Directive

Buildings are responsible for almost 50% of the UK's energy consumption and carbon emissions. The Energy Performance of Buildings Directive (EPBD) came into force in January 2003 to promote the improvement of the building’s energy performance. In response to the EPBD, the Government introduced Display Energy Certificates (DECs) where all public buildings over 1,000m<sup>2</sup> must display a DEC prominently at all times and renew them annually. The DECs are based on actual energy usage

and aim to increase transparency about the energy efficiency of public buildings. In the future, the Government is expected to extend the requirement for DEC's to smaller buildings.

Liverpool Hope University currently has 19 buildings which require a DEC and it is anticipated that these will reinforce the need for energy awareness amongst staff and students. Over time, the number of the different ratings has changed, dependent on both the utility use within the building and the consultant who produced the DEC's. NB, the two 'G' rated buildings are new builds and therefore do not have a full twelve month utility consumption to determine the rating.

**Table 2.1 DEC ratings of Liverpool Hope University's buildings**

Rating	Number of DEC's 2007-2008	Number of DEC's 2008-2009	Number of DEC's 2009-2010
A	0	0	0
B	5	1	1
C	1	4	5
D	6	5	6
E	4	7	4
F	1	0	1
G	0	0	2

**Building Regulations**

Building Regulations ensure that buildings are safe, healthy, accessible to all and sustainable; they set standards for design and construction which apply to new buildings and alternations to existing buildings. Recent amendments (2010) to Part F (ventilation), Part G (sanitation, hot water and water efficiency), Part J (heat producing appliances) and Part L (conservation of fuel and power) will enable the University to improve its efficiencies in new and refurbished existing buildings, though the increased ventilation rates required by Part F may increase energy consumption.

**Carbon Reduction Commitment**

The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme requires that all organisations who consume over 6,000 MWh of electricity on the half-hourly market during 2008 (Phase 1) buy carbon allowances annually based on all energy consumption from all buildings, to cover their carbon emissions. The Scheme is designed to strengthen financial and reputational incentives for making energy efficiency improvements.

Liverpool Hope University will participate in Phase 2 of the CRC. When participating in the scheme the University will be required to monitor, assess and manage emissions throughout the year and then report emissions and surrender sufficient allowances to cover these emissions, which will be shown on a league table. The introduction of the CRC is an increased financial burden on the University and it is essential that these costs are minimised through a reduction in carbon emissions. At present (March 2011) the Government is trying to simplify the scheme and the format has not yet been finalised.

**2.1.3.2 Economic**

**Rising Energy Prices**

During 2009-2010 the University's energy bill was over £950,000, of which around £42,000 is Climate Change Levy. Continuing volatility in the world's energy market and the depletion of fossil fuels is likely to increase the unit cost of energy and this may negate any savings made through the reduction in usage. The current energy budget will therefore need to remain at the same level.

## **2.1.4 Regional**

### **North West Climate Change Partnership**

The North West Climate Change Action Plan aims to stimulate and measure the progress of the North West towards a low-carbon economy, preparing it for the challenges of a changing climate and expected future energy demands, whilst protecting and enhancing quality of life and preserving the North West's rich environment. The Action Plan details prioritised actions which need to be delivered within the context of the North West Sustainable Energy Strategy (the regional strategy which responds to the energy challenges that lie ahead) and the Regional Economic Strategy (the regional strategy to grow and support the Northwest economy).

Within Liverpool, the Merseyside Climate Change Partnership centres around transformational actions in energy generation, smart networks, low carbon transport and a low carbon built environment; and Low Carbon Liverpool focuses on building the low carbon economy and future proofing the city for future climate and fuel price uncertainty.

## **2.1.5 Institutional**

### **HEFCE**

In 2008, HEFCE updated its 2005 strategic statement and action plan on sustainable development in higher education. The statement of policy sets out HEFCE's vision for how the HE sector can make a substantial contribution to the challenge of sustainable development through the skills and knowledge that its graduates learn, its research and exchange of knowledge, and its own strategies and operations.

HEFCE released the 'Carbon Reduction Target and Strategy for Higher Education in England' statement of policy in January 2010, which sets the HE sector stringent carbon reduction targets. The Strategy aims to focus efforts in areas that offer the greatest carbon reduction return and identify issues that need further action. HEFCE have linked performance against carbon management plans i.e. carbon reduction and future capital allocations, requiring an absolute reduction of 48% by 2020-2021 on a 2005-2006 baseline. Additional reduction targets have been set by HEFCE, in agreement with the University sector, with a target of 20% by 2012-2013 and 35% by 2017-2018 from a 2005-2006 baseline.

### **Estate Management Statistics**

Estate Management Statistics (EMS) provide the HE sector with standardised, reliable and useful property information to help managers understand current performance, promote sharing of best practice and drive improvements. This data will enable the University to monitor and assess its environmental performance and enable better strategy and decision making.

### **Universities That Count**

The Universities That Count (UTC) is an Environmental and Social Responsibility Index. The Index is a voluntary, sector-led benchmark of responsible practice, based on Business in the Community's (BITC) Companies that Count Programme. HEFCE is using participation with UTC as evidence of good environmental performance in its Capital Investment Framework (CIF) funding disclosure. This Index compares environmental performance between Liverpool Hope University, the University sector and the Business Community and allows the University to measure, manage and report on their contribution to sustainable development, to gauge performance improvement and share information.

### **Internal Strategies and Policies**

The CMP is the key driver for ensuring the University reduces its carbon emissions and subsequent contribution to climate change; but it is vital that overarching sustainability issues are not forgotten. The objective of the Corporate Plan is to develop the estate sustainably and has existing environmental, energy and travel policies which will be incorporated into our Sustainability Strategy and associated action and implementation plans, of which carbon reduction will be one of the major themes.

Environmental sustainability is embedded within the University's Mission and Values and will form a major part of the Corporate Plan (2011-2015) which is currently being formulated. Potential

environmental, economic and social impacts are considered in the decision making processes, policies and strategies.

### **Estates Strategy**

The most recent CIF2 return indicates a significant improvement in the condition of non-residential buildings (A and B category to 91%) and in functional suitability (to 93%) which reflects the £20M investment over the last two years. At the same time, space utilisation has improved from 33% (2005-2006) to 38%. However, there is still much to be done in order to reduce carbon consumption: particularly in respect of retrofit of older building stock to improve DEC ratings. The Sustainability Strategy defines clearly how this will be achieved within the life of the Corporate Plan (2011-2015). These improvements in the estate will lead to a direct reduction in energy consumption and a concomitant reduction in utility expenditure and carbon emissions.

## **2.2 Strategic Themes**

The key strategic themes that will ensure that the University continues to improve energy efficiency and reduce its contribution to global climate change are:

- **Leadership and Management**

The CMP is being approved by the University's Vice Chancellor and is sponsored by the Pro Vice Chancellor for Resource Management and Planning, thereby committing the University to completing the proposed carbon reduction projects. The CMP is being managed internally through the Sustainable Development Steering Group (SDSG). Sustainability is a standing item at Senior Management Team (SMT) meetings and at Estates Strategic Planning Group Meetings (which formally reports to the Finance & Purposes Committee, a sub-committee of the University Council).

- **Legislative compliance**

Liverpool Hope University is committed to legislative compliance in all its operations

- **Procurement**

To further develop the application of life-cycle costing principles as they relate to capital estates and equipment projects.

To reduce the environmental impact of the products and services which the University purchases by developing a Sustainable Procurement Policy and by working in partnership with those key suppliers who demonstrably support sustainable practices.

- **Energy and Water Efficiency**

To facilitate new initiatives focussing on energy consumption, and to review and improve, where possible, water conservation, waste minimisation and travel and transport initiatives.

- **Monitoring and targeting**

To more effectively monitor, analyse and control energy use on a building by building basis to enable business cases to be put forward for energy reduction projects. More accurate monitoring of energy usage also ensures that robust data is available to fulfil our legal obligations.

- **Awareness**

To promote carbon management and sustainability issues to all members of the Liverpool Hope University community and for carbon management to become standard practice; and working with the student community to integrate carbon management into their responsibilities.

Identification of the main drivers for participating in the Carbon Management Programme has provided the University with the ability to pull together a number of initiatives and ideas to draw up a robust plan of action for the next five years. This is particularly useful because of the magnitude of initiatives that could be followed and the desire to engage with the wider community.

## 2.3 Targets and objectives

Liverpool Hope University's key carbon reduction targets are to:

reduce the CO<sub>2</sub> emissions from its activities against 2005-2006 baseline figures by:

- 20% by the end of 2012-2013
- 35% by the end of 2017-2018
- 48% by the end of 2020-2021

**The Carbon Management Plan reduction target is 19%  
by 2014-2015 from a 2009-2010 baseline**

Further objectives include:

- Identify and understand the impact of the University's carbon emissions, particularly electricity and gas consumption, and additionally emissions from the wider contribution of fuel transport, waste and water.
- To establish baselines from the collated data and set long-term targeting and monitoring programme in line with the aims and objectives of the forthcoming Sustainability Strategy.
- To increase awareness amongst University staff and students as to their carbon emission contribution, and encourage collective responsibility and action amongst staff and students.
- Embed carbon management into all of the University's processes and practices.
- To produce and adopt at a senior level, a plan for reducing carbon emission after the five year CMP, coinciding with the renewal of the Corporate Plan, consistent with currently identified good practice. The plan would include the implementation of awareness programmes, energy conservation and efficiency measures, and the use of low carbon technologies and renewable energy.

### 3 Emissions Baseline and Projections

Calculating an emissions baseline is the first step in enabling the University to quantify its carbon footprint and to gain a better understanding of its overall carbon contribution. This section details the sources that have been included and how the emissions baseline has been calculated. The baseline will be used to measure the University's emission reduction performance as carbon-saving initiatives are implemented during future years.

The University's carbon footprint covers gas, electricity and water consumption from both residential and non-residential buildings, the fuel used with university owned vehicles, refrigerant used within air conditioning units and the tonnage of waste sent to landfill. In 2005-2006 the University's footprint was 5,805 tonnes and this has decreased 7% to 5,367 tonnes in the CMP baseline year (2009-2010).

#### 3.1 Scope

The scope of the University's baseline emission calculations covers both non-residential and residential buildings and includes carbon produced from the following sources:

- Utility consumption (gas, electricity and water)
- Fleet transport (University owned vehicles)
- Refrigerants (R407c gas)
- Waste to landfill tonnage (not including skips or construction waste)

Various sources of emissions have not been considered at this point in the project, but will be considered in the future:

- Business travel (car, train and air)
- Staff and student commuting (including international students)
- Visitor, contractor and supplier commuting
- Procurement and resource consumption other than utilities
- Car and coach hire

#### 3.2 Baseline

The University's carbon emissions will be calculated using data from a 2005-2006 baseline year (1<sup>st</sup> August 2005 to 31<sup>st</sup> July 2006), in line with HEFCE requirements; and 2009-2010 (1<sup>st</sup> August 2009 to 31<sup>st</sup> July 2010) as this is the most recent full year where reliable and complete data is available. The University's financial year also runs concurrently with the academic year from the 1<sup>st</sup> August to 31<sup>st</sup> July so resource implication and financial savings will be reported concurrently.

The utilities data (gas, electricity and water consumption) is taken from invoices, which have been verified by meter readings. The refrigerant gas consumption data are taken from the University's HVAC service engineers log books. The fuel used within University owned vehicles is taken from invoices from the fuel cards which are used. The tonnage of waste going to landfill has been calculated using actual weights from our waste compactor and estimated weights from waste contractor invoices: 1) between August 2005 and September 2009 using a weight of 0.042 tonnes per 1,100L eurobin; and 2) between October 2009 and September 2010 using a weight of 0.045 tonnes per eurobin; and 3) from October 2010 using actual weights. This waste is then broken down into its components i.e. landfill, metals, glass, plastics etc by using guideline percentages from the energy from waste company the waste goes to (Orchid Environmental Ltd). The conversion factors used are shown in Table 3.1.

The carbon emission baseline figures from 2005-2006 to 2009-2010 are shown in Table 3.2 and the breakdown of emissions by the different sources are shown in Figures 3.1a and 3.1b. Figure 3.2 summarises the Carbon emissions against the targets set.

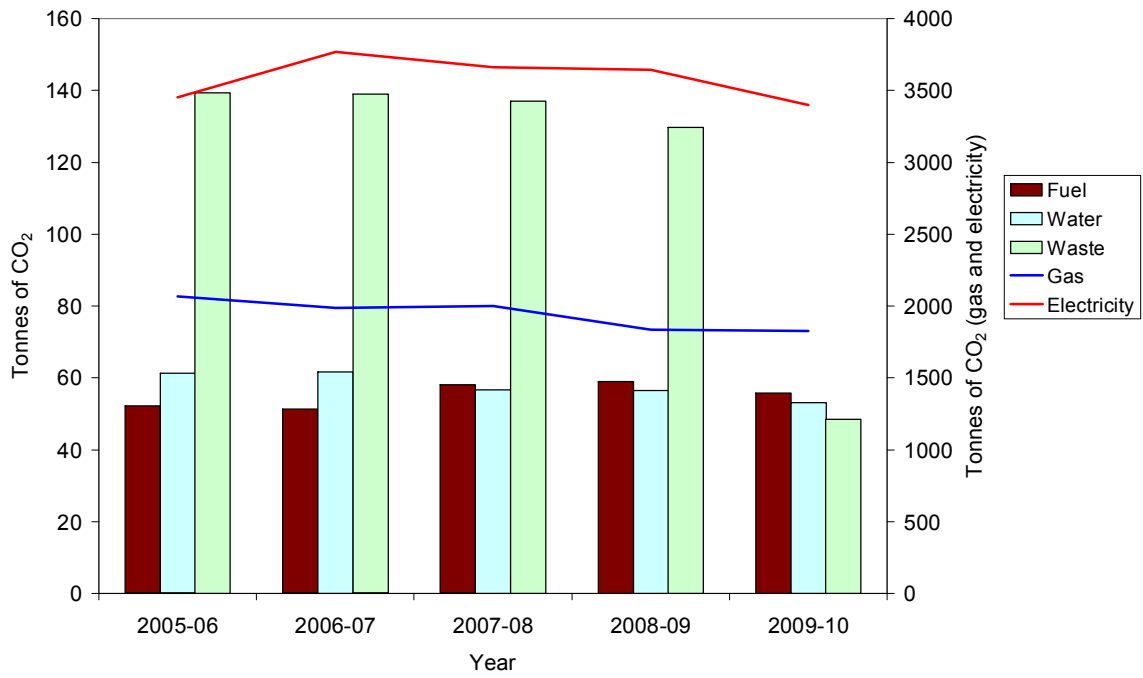
**Table 3.1 Summary table of emissions for baseline calculations**

Factors from 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting

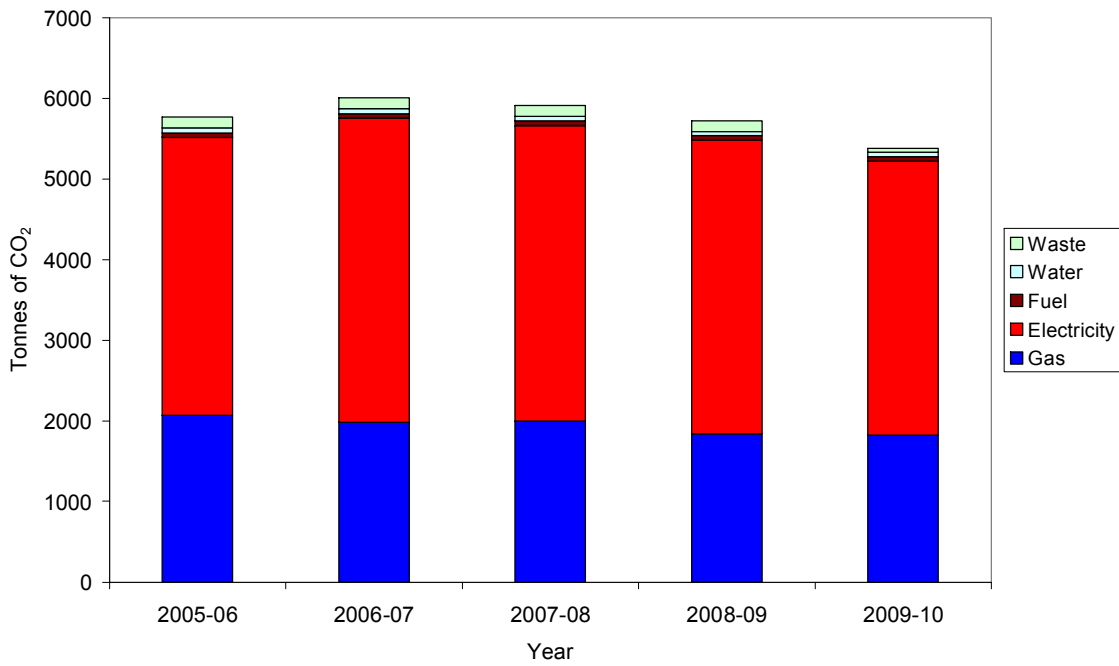
Source	CO <sub>2</sub> conversion factor		Notes
Utilities	Gas	0.18396 kgCO <sub>2</sub> eq/kWh	Gas Gross CV basis, total GHG Electricity consumed, total GHG
	Electricity		
	2005-2006	0.53022 kgCO <sub>2</sub> eq/kWh	
	2006-2007	0.55892 kgCO <sub>2</sub> eq/kWh	
	2007-2008 onwards	0.54667 kgCO <sub>2</sub> eq/kWh	
Refrigerants	R407c	1,526,000 kgCO <sub>2</sub> eq/tonne	
Fuel	Petrol	2.3307 kgCO <sub>2</sub> eq/L	Total GHG
	Diesel	2.6694 kgCO <sub>2</sub> eq/L	Total GHG
Water	Water	0.97 kgCO <sub>2</sub> eq/m <sup>3</sup>	0.276 water supply plus 0.693 water treatment
Landfill	Waste	0.585 kgCO <sub>2</sub> eq/tonne	

**Table 3.2. Summary of carbon emissions from the 2005-2006 baseline year**

Source		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Gas	Tonnes CO <sub>2</sub> eq	2,067	1,984	1,998	1,834	1,810
Electricity	Tonnes CO <sub>2</sub> eq	3,451	3,770	3,660	3,643	3,399
Refrigerants	Tonnes CO <sub>2</sub> eq	34	0	143	64	0
Petrol	Tonnes CO <sub>2</sub> eq	0	0	2.5	3.9	3.6
Diesel	Tonnes CO <sub>2</sub> eq	52	51	56	55	53
Water	Tonnes CO <sub>2</sub> eq	61	62	57	57	53
Landfill	Tonnes CO <sub>2</sub> eq	139	139	137	130	49
<b>Total</b>	<b>Tonnes CO<sub>2</sub> eq</b>	<b>5,805</b>	<b>6,007</b>	<b>6,053</b>	<b>5,787</b>	<b>5,367</b>



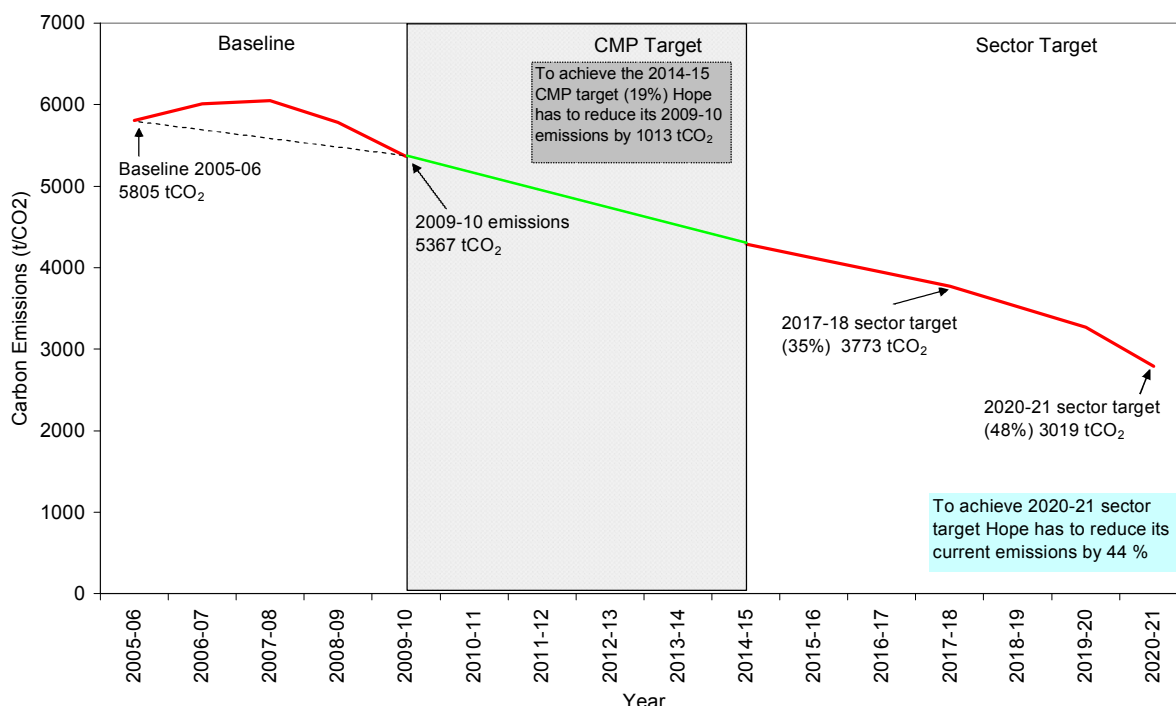
**Figure 3.1a. Breakdown of the carbon emissions from 2005-2006 into emissions sources**  
 NB, gas and electricity CO<sub>2</sub> tonnage is displayed on the right hand axis



**Figure 3.1b Cumulative breakdown of Carbon Emissions from 2005-2006**



Figure 3.1a and 3.1b indicate a reduction in carbon emissions over the last three years largely because of lower gas consumption and a reduced tonnage going to landfill. Since 2005-2006, the University's carbon emissions have decreased by 7% from 5,805 tonnes to 5,367 tonnes. A summary of the carbon emissions and the targets emissions which the University has set are shown in Figure 3.2.

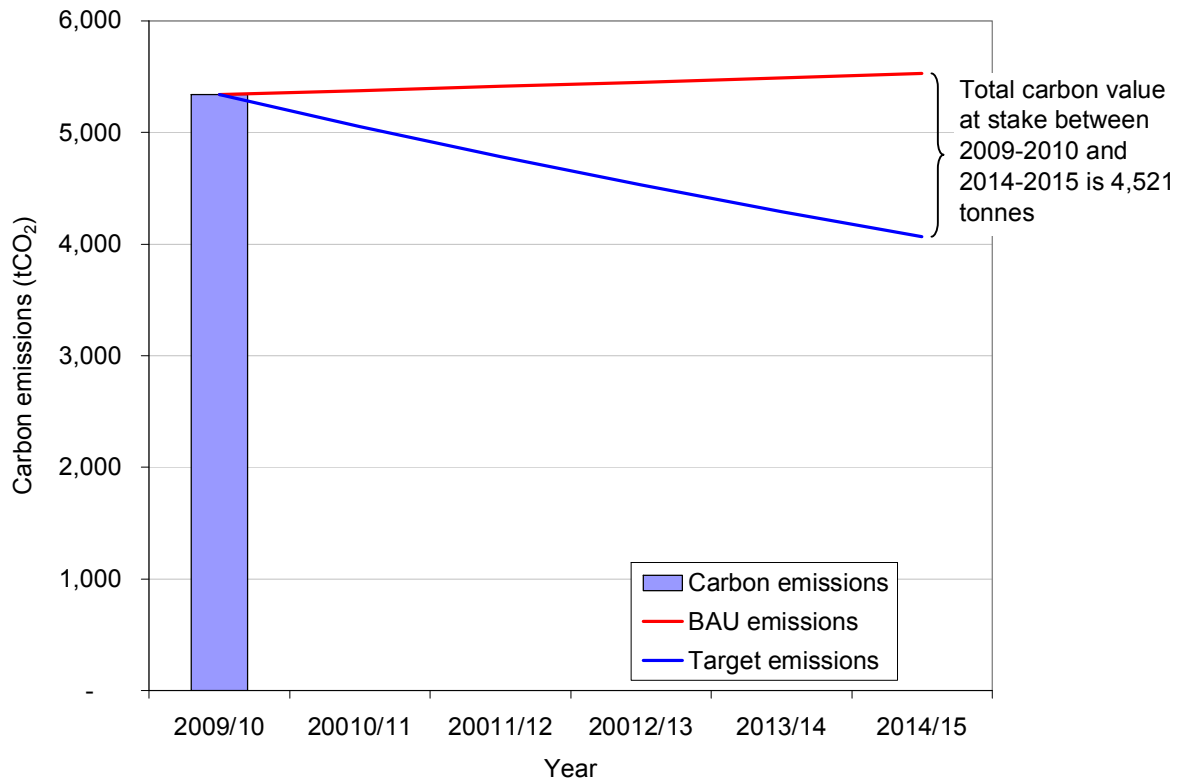


**Figure 3.2. Summary of the carbon emissions and targets**

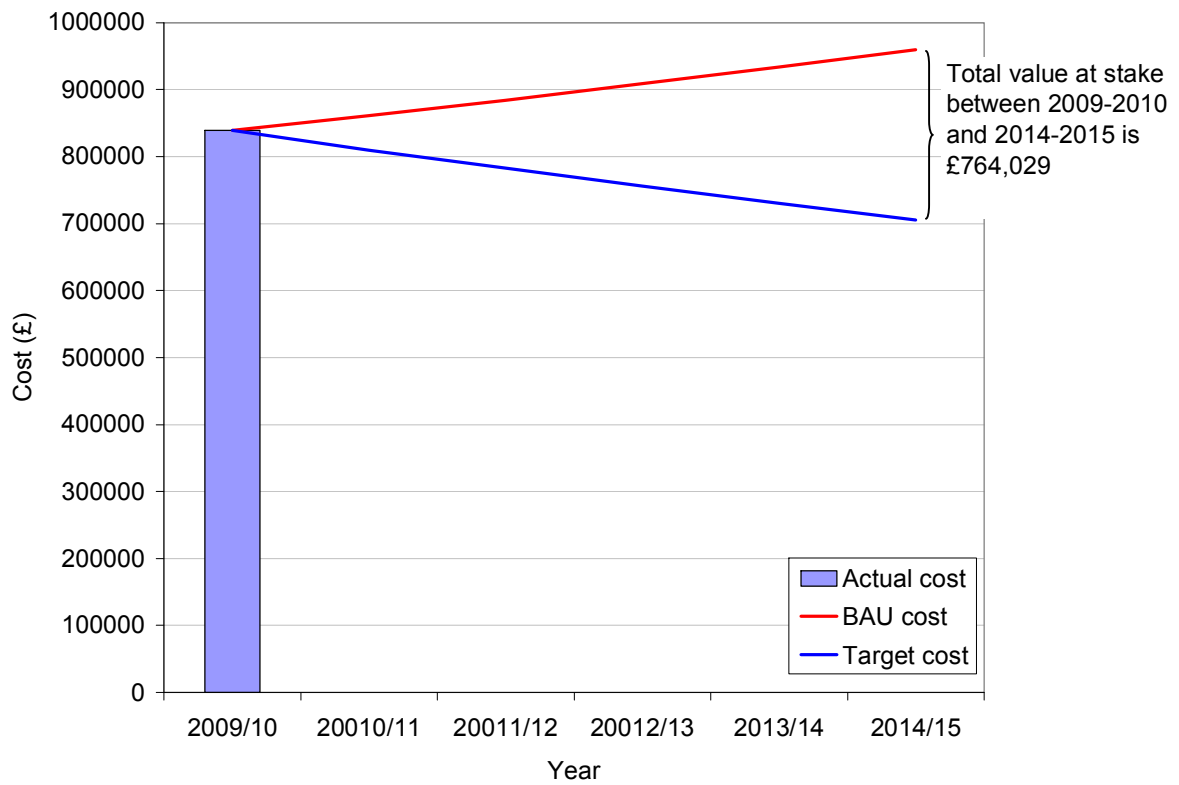
### 3.3 Projections and Value at Stake

Over the five year life of this project, the estimated projection of emissions is shown in Figure 3.4 and the estimated projection of costs is shown in Figure 3.5. The projected carbon emissions and costs are based on the 2009-2010 footprint and the default data within the Carbon Trust's baseline tool. The business as usual scenario (BAU) is based on the estimated emission increases which would occur without additional carbon management investment and actions and is conservatively estimated at 0.7% per annum. The target emissions are based on a decrease in emissions of 4.7% per annum based upon a 19% reduction between 2009-2010 and 2014-2015. The financial value-at-stake 'business as usual' scenario is based on an increase in price of 1.7% per annum for electricity and gas, 10.7% increase for transport costs and a 1.6% increase in the price of refrigerants, water and waste. These forecasts do not take into account the construction and operation of new buildings (for example, Capstone opened in April 2010 and the Centre of Excellence in Education, Innovation and Enterprise opened in October 2010) which is expected to increase the baseline by around 140 tonnes CO<sub>2</sub>; the demolition of any buildings (for example, 62% of a DEC rated E building was demolished in September 2010); or the buy-back of a hall of residence, Hopkins Hall (GIA: 4,477 m<sup>2</sup>), on its Creative Campus in early 2011, which it previously owned.

The value-at-stake is the cost difference between a BAU scenario and full implementation of the CMP; i.e. taking no action to reduce the carbon emissions produced by the University and the full carbon and cost savings of adopting a carbon management approach and implementing emission reduction initiatives to achieve our target of a 19% reduction in emissions by 2014-2015. Between 2009-2010 and 2014-2015, the cumulative value at stake carbon emissions is 4,521 tonnes and financial value at stake is £764,029.



**Figure 3.3 Projected carbon emissions on a business as usual and target emissions baseline.**



**Figure 3.4 Projected financial costs on a business as usual and target emissions baseline.**

## 4 Carbon Management Projects

To attain the reduction in carbon emissions detailed in Chapter 2.2 and to embed Carbon Management into the University's day to day operations, a systematic programme of initiatives must be implemented. The following chapter details the projects and initiatives that will be, or have been, implemented. The list of projects within this CMP is by no means exhaustive, and further carbon abatement projects will be identified through feasibility studies and other potential carbon saving opportunities that may arise through new technologies and government initiatives.

### 4.1 Past actions and achievements

The University has had successive Estates Strategic Planning over the years and much has been done to reduce carbon emissions and to upgrade facilities. Since the baseline in 2005-2006 the University has undertaken a number of projects to update old building stock, renew staff and student accommodation and construct new builds as part of the University's strategic development.

- The University has increased its condition A and B buildings from 79% to 91% and increased its functional suitability from 78% to 93% from 2005-2006 to 2008-2009.
- All refurbishment projects update areas to at least building regulation standards
- New buildings (Capstone and the Centre for Excellence in Education, Innovation and Enterprise) gained a BREEAM rating of 'Very Good'
- All weekend and evening teaching has been moved to one building
- Introduced paperless meetings
- Included sustainability issues within staff and student inductions

**Table 4.1 Past Actions and achievements**

Project	Costs (£)	Start Year	Carbon tonnes
Demolish and replace three student accommodation blocks		2005-2006	Limited
New waste and recycling contract and increased recycling provision across campus		2009-2010	45.1
Remove telephony from student halls	0	2009-2010	10
Boiler replacement – Alexander Jones Building Assuming 15% increase in efficiency	52,888	2010-2011	11.5
Replace defective heating calorifiers – Austin & Angela Halls Assuming 20% increase in efficiency	49,014	2010-2011	15.3
Replace 9 old servers (Dell 2650) with 4 new (Dell Poweredge R515)	22,257	2010-2011	9.4
Upgrade central work area computers	287,875	2010-2011	21.0
Thermographic surveys – Alexander Jones Building, Angela Hall, and Lecture Theatre Complex. No direct savings will be made, but it will highlight defects for remediation	10,634	2010-2011	0

These past projects have reduced the University's carbon emissions by 112 tonnes:

Electricity – 72,980 kWh (40 tonnes)

Gas – 145,714 kWh (27 tonnes)

Waste – 101 tonnes (45 tonnes)

## 4.2 Planned Estates Development Projects

During the initial five year CMP, there are a number of refurbishments and new builds planned to develop the estate. These projects, scheduled for Summer 2011, have been approved for implementation and have funding in place.

**Table 4.2 Planned Estates Development Projects**

Project	Project cost	Start Year	t CO <sub>2</sub> e saved	Notes
Green Lane Kitchen refurbishment	~£400,000	2010-2011	3.6	Assume a 10% reduction in gas consumption
Convert Students Union into a lounge style bar / combined conference facility	Bar/Lounge Area £250,000 – 300,000 Breakout/kitchen £300,000 – 350,000	2010-2011	limited	
Convert Keswick/Derwent Bridge link to new conference accommodation	~£400,000	2010-2011	limited	
Window replacements – Derwent, Chaplaincy and Keswick	~£192,000	2010-2011	2.0	Assumptions made from comparison with other buildings
Green Lane Annex – refurbish ground floor into rooms	~£185,000	2010-2011	limited	

## 4.3 Summary of projects

The following table is a summary of the opportunities that is hoped will reduce carbon emissions. This list is not exhaustive and this part of the document (and associated annexes) will be continually revised and updated to take account of new opportunities and challenges. The projects have been separated into three types:

**(A) Abatement projects** – projects that will lead to measurable carbon reductions

**(E) Awareness raising projects** – projects that will not in themselves reduce carbon emissions, but will facilitate or cause carbon reductions through further actions

**(F) Feasibility projects** – projects that will determine the size and scale of potential carbon reduction projects.

Full details of the projects can be found in Appendix A.

**Table 4.3 Summary of Projects**

<b>Category</b>	<b>Action Ref</b>	<b>Project</b>
Energy Management	A001 A B C	Decentralise & update boilers <ul style="list-style-type: none"> <li>- Green Lane Annexe</li> <li>- Angela and Austin Halls</li> <li>- Stand Park Annexe and Stand Park Building</li> </ul>
	A002	Replace heating system in St Julies Halls in Aigburth
	A003	Review heating controls
	A004	Enable BMS control over intranet & fine tune
	A005	Upgrade lighting & associated controls
	A006	Lamp replacement - Replace T8s with LEDs
	A007	Use of automated meter reading, monitoring & targeting
	A008	Installation of tamperproof Thermostatic Radiators Valves
	A009	Install water conservation technologies
	A010	Automatic PC shutdown in central work areas
	A011	Server room rationalisation
	A012	Increase recycling provisions across the campus
	A013	Replace single with double glazing in Angela & Austin Halls & Alexander Jones Building
	A014	Insulate Alexander Jones Building chapel roof
	A015	Insulate Lecture Theatre Complex pitched roof
	A016	Replace Lecture Theatre Complex flat roof
	A017	Insulation of valves & pipes in plant rooms at Hope Park and Cornerstone
	<b>Action Ref</b>	<b>Awareness Raising</b>
	E001	Communications plan <ul style="list-style-type: none"> <li>- develop &amp; promote website</li> <li>- develop internal blog for comments</li> <li>- provide training, checklists &amp; other supporting documentation</li> <li>- improve visibility of carbon emissions from each building</li> <li>- Sustainability Champions</li> <li>- Green Impact Awards</li> </ul>
	E002	ISO14001 Environmental Management Systems

	Action Ref	Feasibility
	F001	Voltage Optimisation
	F002	Installation of Variable Speed Drives
	F003	Space Management & Building Rationalisation
	F004	Replacement Lighting in sports hall
	F005	Replace flat roof covering in Frances Mary Lescher
	F006	Cavity wall insulation – Alexander Jones Building, Angela & Austin Halls & the Lecture Theatre Complex

#### 4.4 Planned / funded projects

The following is a list of potential projects that the University is considering implementing before the end of 2012-2013. The predicted financial costings and carbon savings identified below come from a range of sources, including University retained M&E consultants, specialist environmental advisers and other specialists in the field. These planned projects collectively deliver 66% of the 2009-2010 reduction target (1,013 tonnes). Table 4.3 summarises the projects which identified to be implemented within the short term, full details of the project plans can be found in Appendix A.

**Table 4.4 Planned short term projects**

Action Ref	Abatement	Lead	Cost (£)	Start Year	t CO <sub>2</sub> e saved	£ Gross savings (Year 1)	Notes
A001A	Decentralise and update Green Lane Annex boilers	Alan Smith	4,420	2011-2012	3	393	Does not include gas installation costs, water treatment or mains electrical works
A003	Review heating and BMS controls	Alan Smith	0	2011-2012	28	4,092	Assume heating is 50% of utility & 1% saving; electricity – assume 50% of utility & 2% saving
A004	Enable BMS control over the intranet	Alan Smith	3,450	2012-2013	4	648	Assume heating is 50% of utility & 1% saving; elec – assume 50% of utility & 1% saving
A005	Upgrade lighting and associated controls	Alan Smith	30,185	2011-2012	64	10,540	Assume lighting is 50% of utility & 10 % saving
A006	Lamp replacement	Alan Smith	49,481	2012-2013	46	7,536	
A008	Installation of TRVs	Alan Smith	29,830	2012-2013	46	6,707	Assuming 8% reduction by turning down temperature by 1°C
A009	Install water conservation technologies	Alan Smith	10,750	2013-2014	12	188	Assume 50 m <sup>3</sup> saved per yr, per tap & replacing 250
A010	Automatic PC shutdown	Mike Beecroft	10,000	2011-2012	27	4,469	Assume annual reduction of 124 kWh per PC
A011	Server room rationalisation	Mike Beecroft	0	2011-2012	46	7,577	Allows a 9.6 kW air con unit to be switched off
A012	Increase recycling provision across the University	Suzanne Hartley	5,000	2011-2012	2	7	
A017	Insulation of valves and pipes in plant room	Alan Smith	8,595	2011-2012	31	1,170	From Kimptons report
<b>Action Ref</b>	<b>Awareness Raising</b>						
E001	Communications Plan	Suzanne Hartley	10,250	2011-2012	157	24,842	Assume a 3% reduction in gas and electricity consumption
<b>Action Ref</b>	<b>Feasibility</b>						
F003	Space Management and Building Rationalisation	Suzanne Hartley	£limited, only the cost of room moves.	2011-2012	208	32,336	Assume a 95% reduction in consumption for Green Lane Building and Alexander Jones Building
	<b>TOTALS</b>		<b>161,961</b>		<b>671</b>	<b>100,505</b>	

## 4.5 Medium to long term projects

The projects found in Table 4.4 have been identified as potential future projects. The significant cost of these projects means that further investigative works would be required before a commitment to proceed with these projects can be achieved. The cost and carbon emission reductions are, at present, only indicative and require actual costings before implementation of the projects. Full details of the project plans can be found in Appendix A.

**Table 4.5 Medium to long term projects**

Action Ref	Abatement	Lead	Cost (£)	Start Year	t CO <sub>2</sub> e saved	£ Gross savings (Year 1)	Notes
A001 B&C	Decentralise & update boilers - Angela & Austin Halls - Stand Park Building & Stand Park Annex	Alan Smith	33,530	B: 2013-2014 C: 2012-2013	23	B: 2,255 C: 1,235	From Kimpton's report. Does not include gas installation costs, water treatment or mains electrical works
A002	Replace heating system in St Julies Halls in Aigburth	Alan Smith	~450,000	2014-2015	67	9,884	Assuming a 20% efficiency gain
A007	Automatic Meter Reading, monitoring and targeting	Alan Smith	~100,000	2013-2014	76	12,054	Assume overall saving of 2.5%
A013	Replace single with double glazing with cavity wall closures - Angela & Austin Halls - Alexander Jones Building	David Kerry	493,366	2013-2014	8	1,170	Emissions savings from thermographic survey
A014	Insulate the Alexander Jones Building chapel roof	James Ellison, David Kerry	TBC	2013-2014	1	120	Emissions savings from thermographic survey
A015	Insulate the Lecture Theatre Complex pitched roof	James Ellison, David Kerry	TBC	2013-2014	3	382	Emissions savings from thermographic survey
A016	Replace the Lecture Theatre Complex flat roof	James Ellison, David Kerry	37,410	2014-2015	4	551	Costings from roofing report; emissions savings from thermographic survey



Action Ref	Awareness Raising	Lead	Cost (£)	Start Year	t CO <sub>2</sub> e saved	£ Gross savings (Year 1)	Notes
E002	ISO 14001 Environmental Management Systems	Suzanne Hartley	8,000	2013-2014	35	5,351	Assuming a 1% reduction in gas & electricity consumption
Action Ref	Feasibility	Lead	Cost (£)	Start Year	t CO <sub>2</sub> e saved	£ Gross savings (Year 1)	Notes
F001	Voltage Optimisation	Alan Smith	230,000	2013-2014	307	50,865	Feasibility study underway
F002	Installation of variable speed drives	Alan Smith	TBC	2014-2015	8	1,358	Awaiting costs
F004	Replacement Lighting in sports hall	Alan Smith	TBC	2012-2013	7	1,188	Feasibility study underway
F005	Replace flat roof covering on the Frances Mary Lescher Building	James Ellison, David Kerry	40,000	2014-2015	4	551	Feasibility study underway
F006	Cavity Wall insulation – Alexander Jones Building, Angela & Austin Halls, and the Lecture Theatre Complex	James Ellison, David Kerry	TBC	2014-2015	44	6,411	Emissions savings from thermographic survey
	<b>TOTALS</b>		<b>&gt;1,392,306</b>		<b>&gt;587</b>	<b>&gt;93,375</b>	

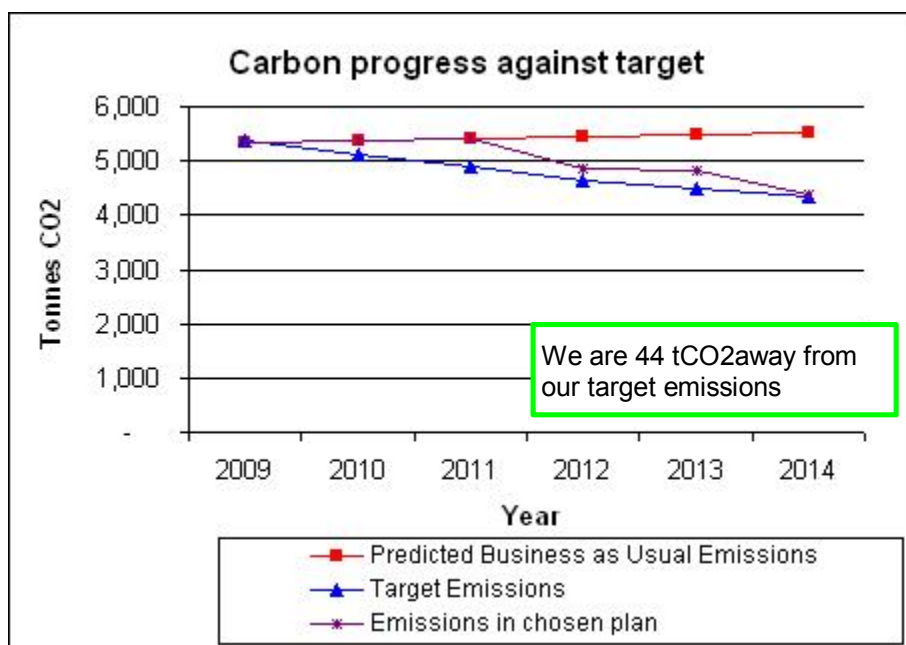
#### 4.6 Projected achievement towards target

The identified projects cover 136% of the reduction target i.e. a reduction of 1,377 tonnes from the 2009-2010 baseline (5,367 tonnes), see Table 4.6. However, Figure 4.1 shows that as the efficiency of the projects degrades over time, further projects will have to be identified and implemented over the next five years to reach the targeted reductions.

Further projects and initiatives will need to be identified and implemented in the near future to ensure that the University reaches its reduction targets set by HEFCE and an absolute reduction in emissions by 2020-2021.

**Table 4.6 Project costs and carbon savings**

Project	Cost (£)	Gas savings (kWh)	Electricity savings (kWh)	Other	% of 2009-2010 reduction target (1159 tonnes)
Past actions and achievements	422,668	145,714 (27 t CO <sub>2</sub> e)	73,980 (40 t CO <sub>2</sub> e)	101 tonnes waste (45 t CO <sub>2</sub> e)	11%
Planned Estates Development	1,827,000	19,649 (4 t CO <sub>2</sub> e)	3,726 (2 t CO <sub>2</sub> e)		0.6%
Planned Short term projects	161,961	1,468,356 (270 t CO <sub>2</sub> e)	711,237 (389 t CO <sub>2</sub> e)	5 tonnes waste (0.002 t CO <sub>2</sub> e) 12,500 m <sup>3</sup> water (12 t CO <sub>2</sub> e)	63%
Medium to Long term projects	>1,392,306	1,056,773 (194 t CO <sub>2</sub> e)	719,555 (393 t CO <sub>2</sub> e)		61%
<b>Total</b>		<b>2,690,492</b> <b>(495 t CO<sub>2</sub>e)</b>	<b>1,508,498</b> <b>(825 t CO<sub>2</sub>e)</b>	<b>(57 t CO<sub>2</sub>e)</b>	



**Figure 4.1 Carbon reduction against the 2014-2015 reduction target**

## 5 Carbon Management Plan Financing

The investment required to implement the short and long-term carbon reduction projects can be seen in Table 5.1 as well as the carbon and costs savings.

**Table 5.1 Investment required**

	Cost (£)	t CO <sub>2</sub> e saved	£ Gross savings (Year 1)
Planned Short term projects	161,961	671	100,505
Medium to Long term projects	>1,392,306	>587	93,375

### 5.1 Assumptions

The key assumptions made in calculating the benefits and savings are as follows:

- Electricity average price over next five years 9 p/kWh
- Gas average price over next five years 4 p/kWh

### 5.2 Benefits / Savings – quantified and un-quantified

**Table 5.2 Cost and CO<sub>2</sub> savings**

	2011-2012	2012-2013	2013-2014	2014-2015
Annual cost saving	Minimal	£92,289	£107,329	£179,085
Annual CO <sub>2</sub> saving (t)	118	581.8	101.3	444.5
Cumulative CO <sub>2</sub> saving (t)	118	699.8	801.1	1,245.6
% of target achieved cumulative	12%	69%	79%	123%

NB, percentage is measuring against 2009-2010 reduction target of 1013 tonnes

There are a number of benefits expected as a result of the Carbon Management Programme which are intangible and for which therefore it is not possible to place a monetary value. These include:

- University reputation
- Improved staff and student recruitment and retention
- Decreased financial risk in connection with volatile energy markets
- Improved staff and student health and well being

### 5.3 Additional resources

In order to underline the importance that the University places on the successful implementation of the CMP a full time Sustainability Manager has been appointed by the University. The services of a self-employed consultant have also been utilised to provide support during the investigation phase and a number of specialist firms such as thermal imaging consultants have been employed to provide additional information for carbon reduction projects.

## 5.4 Financial costs and sources of funding

The HE sector is now entering a period of unprecedented financial upheaval as the method of funding HE radically changes.

The University is confident that it can adapt and thrive and it will continue to aim to deliver an annual surplus of 5% of income each year. However it recognises that the next five years will be a challenging period with potentially only limited levels of cash reserves available to invest in infrastructure and minimal grant funding available from HEFCE. The University also recognises that the implementation of the Carbon management projects will require significant investment. Therefore the University will need to maximise its utilisation of existing resources and seek other funding sources wherever possible in order to fund the programme.

Each year the University sets aside a significant amount of its reserves in order to undertake major refurbishment work across the campus over the summer period. Despite the changes to the funding regime it is expected that between £1 million to £1.5 million will be made available over each of the next five years as a minimum for infrastructure refurbishments. There is also a budget within estates for planned maintenance and a separate sustainability capital budget has been established in 2010-2011 for £100,000. The University has agreed that for 2011-2012 onwards 15% of the depreciation charge for the previous year will be set aside for sustainability developments. This will be in the region of £350,000 per annum. The University has also applied for a SALIX loan and will explore all available options to obtain funding for the Carbon Management projects.

The University takes its commitment to the CMP seriously and will ensure that the funding for the Carbon reduction projects is given priority. Therefore, if unsuccessful in obtaining funding from external sources, the University will undertake to fund the Carbon Management Programme from its own resources. The funding of these projects will now be taken into account when analysing how much can be spent each year on capital work and the University accepts that if capital funds are restricted in the short term it may result in other capital projects being delayed while the CMP is undertaken. Table 5.2 provides an illustration of how the University resources could be used to fund the various capital requirements.

It should be noted that this is a minimum position as it is hoped that a greater level of funds would be available to invest each year than the £1.5 million identified below in Table 5.3.

**Table 5.3 Funding of capital requirements**

	2010-2011 £	2011-2012 £	2012-2013 £	2013-2014 £	2014-2015 £
<b>PLANNED WORK</b>					
Summer works	1,827,000	1,607,069	1,183,204	1,352,870	1,189,690
Total annual capital cost	422,668	117,931	539,296	369,630	527,410
Total annual revenue cost	0	0	2,500	2,500	7,900
<b>TOTAL COSTS</b>	<b>2,249,668</b>	<b>1,725,000</b>	<b>1,725,000</b>	<b>1,725,000</b>	<b>1,725,000</b>
<b>FUNDING SOURCES</b>					
Capital budget	1,924,668	1,250,000	1,250,000	1,250,000	1,250,000
Estates Maintenance budget	125,000	125,000	125,000	125,000	125,000
Sustainability budget	100,000	350,000	350,000	350,000	350,000
<b>AVAILABLE BUDGET</b>	<b>2,249,668</b>	<b>1,725,000</b>	<b>1,725,000</b>	<b>1,725,000</b>	<b>1,725,000</b>

## 6 Actions to Embed Carbon Management into Liverpool Hope

Using the Carbon Trust's Carbon Management Embedding Matrix, it is clear that Carbon Management had a relatively low level of embedding (see Figure 6.1) at the start of the project.

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
5 <b>BEST</b>	SMART Targets signed off Action plan contains clear goals & regular progress reviews Strategy launched internally & to community	CM is full-time responsibility of a few people CM integrated in responsibilities of senior managers VC support Part of all job descriptions	Quarterly collation of CO2 emissions for all sources Data externally verified M&T in place for: • Buildings • Waste	All staff & students given formalised CM: • Induction • Training Plan • Communications CM matters regularly communicated to: • External community • Key partners	<b>Granular &amp; effective</b> financing mechanisms for CM projects Finance representation on CM Team Robust task management mechanism Ring-fenced fund for carbon reduction initiatives	Senior purchasers consult & adhere to ICLEI's Procura+ manual & principles Sustainability comprehensively integrated in tendering 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 developed but not implemented	CM is full-time responsibility of an individual CM integrated in to responsibilities of department managers, not all staff	Annual collation of CO2 emissions for: • Buildings • Transport • waste Data internally reviewed	All staff & students given CM: • Induction • Communications CM communicated to: • External community • Key partners	Regular financing for CM projects Some external financing Sufficient task management mechanism	Environmental demands incorporated in tendering Familiarity with Procura+ Joint procuring between HEIs or with LAs.	Core team regularly reviews CM progress: • Actions Profile & Targets • New opportunities quantification
3	Draft policy Climate Change reference ✓	CM is part-time responsibility of a few people CM responsibility of department champions	Collation of CO2 emissions for limited scope i.e. buildings only ✓	Environmental / energy group(s) give ad hoc: • Training • Communications	Ad hoc financing for CM projects Limited task management No allocated resource	Whole life costing occasionally employed Some pooling of environmental expertise	CM team review aspects including: • Policies / Strategies • Targets • Action Plans
2	No policy Climate Change aspiration	CM is part-time responsibility of an individual No departmental champions ✓	No CO2 emissions data compiled Energy data compiled on a regular basis	Regular poster/awareness campaigns Staff given ad hoc CM: • Communications	Ad hoc financing for CM related projects Limited task coordination resources ✓	Green criteria occasionally considered Products considered in isolation	Ad hoc reviews of CM actions progress
1 <b>Worst</b>	No policy No Climate Change reference	No CM responsibility designation	Not compiled: CO2 emissions Estimated billing	No communication or training ✓	No internal financing or funding for CM related projects	No Green consideration No life cycle costing ✓	No CM monitoring ✓

Figure 6.1 Carbon Trust's Carbon Management Embedding Matrix – Start of Project Analysis

The University's Environmental Policy was approved in 2008\* and covered some elements of climate change. The Policy was not specific with regards to carbon emissions, as consumption was only just being started to be collated for buildings only. Also, up until 2008 the University had no individual with responsibility for carbon management planning, until a part time Environmental Officer was appointed, therefore there had been no training or communication in carbon management matters, limited or ad hoc green procurement (although Hope has been a Fairtrade University since 2006) and limited carbon management monitoring.

There was clearly much to be done to raise the profile and importance of Carbon Management Planning across the University, and the CMP is intended to address this. However, since the appointment of a full time Sustainability Manager and the involvement of the Carbon Trust, the University is making good progress in ascending the levels across the Matrix, with many elements of level 4 having been achieved.

\* This has been subsequently superseded by the Sustainability Strategy (2010)

### 6.1 Policy – embedding CO<sub>2</sub> saving at Liverpool Hope

#### 6.1.1 Corporate Strategy & Corporate Plan

Sustainability featured in the previous Corporate Plan (2007-2011) but was confined in context essentially to the Estate ...“The University will ensure that the Estate is developed sustainably in line with the University's strategy of academic repositioning”. The Corporate Plan is currently being reviewed (for adoption at the March 2011 meeting of University Council), and sustainability and carbon management are likely to feature more prominently in this next version.

### 6.1.2 Carbon Management Plan (CMP)

Whilst the CMP will comprise a separate document (for CMP and HEFCE purposes) its policies, practices and targets will also be assimilated within the over-arching Sustainability Strategy and these in turn will be monitored and managed through the decision making groups outlined in this Section 7 of this plan.

### 6.1.3 Sustainability Strategy

The Sustainability Strategy succeeded the Environmental Policy (July 2008) to become the over-arching policy document that deals with sustainable practices at Liverpool Hope. It includes Carbon Management (covering Energy and Water Efficiency, Property and Space Management, IT and Recycling), Travel, Academic Study, Community Engagement, Procurement, Awareness Raising, together with Biodiversity and Greenspace Management. This strategic document establishes the policies and practices, as well as the targets, reporting mechanisms and governance structures.

Responsibility resides with...	PVC (Resource Management & Planning)
Compliance and Legal issues reside with...	University Secretary
Initial scrutiny...	Senior Management Team
Final scrutiny...	Finance & General Purposes
Approved by ...	Governing Council
Monitored by...	Senior Management Team
Review date...	Summer 2012

### 6.1.4 Procurement Policy

The University has a full time Procurement Manager (who is also a member of the SDSG) working within the Finance Directorate (and Chairs the Procurement Group) to ensure sustainable procurement. The Procurement Policy document is underpinned by the five principles of sustainable practice given within the Government's Flexible Framework (2008). The Policy document is under cyclic review and follows the approval route below. Given the wider application of the Procurement Policy, it is reviewed by the SMT. Senior Management Team comprises the Vice Chancellor with the Rectorate members, together with the Directors and Heads of the major functional units across the University. This group also receives monthly variance reports pertaining to these functional areas.

Responsibility resides with...	The Director of Finance
Compliance and Legal issues reside with...	University Secretary
Initial scrutiny...	Senior Management Team
Final scrutiny...	Finance & General Purposes
Approved by ...	Governing Council
Monitored by...	Senior Management Team
Review date...	Summer 2012

### 6.1.5 Capital Projects

Capital Projects are formulated by discussion at the Estates Strategy Group. These proposals are then presented to Finance & General Purposes and approval in principle via University Council. At this stage the proposals are further developed.

The Sustainability Manager has oversight of BREEAM with a brief to achieve an 'Excellent' standard in all future capital buildings. The Procurement Manager will be responsible for oversight of the tendering and procurement process and the Head of Estates will then lead and manage the construction works and ensure contractors are familiar with our Sustainability Strategy and practices.

Agreed in principle by...	Estates Strategy Group
Compliance and Legal issues...	University Secretary
Scrutinised by...	Finance & General Purposes
Approved by ...	Governing Council

Tendered via...	Procurement Officer
Monitored by...	Senior Management Team
Final Report to...	Estates Strategy Group

### 6.1.6 Business Travel and Essential Car User's Allowance

Travel Plan, Car Parking and related Business Use policies are developed within the over-arching Sustainability Strategy. Where there are specific staff related or equality issues, then these are dealt with by the Staffing Committee (a sub-committee of University Council). This is usually a strategic policy area which is normally subject to annual review at a strategic level, although Business Travel will be monitored by the SMT reporting to Finance & General Purposes Committee.

Responsibility resides with...	PVC (Resource Management & Planning)
Compliance and Legal issues reside with...	University Secretary
Initial scrutiny...	Senior Management Team
Final scrutiny...	Finance & General Purposes
Approved by ...	Governing Council
Monitored by...	Senior Management Team
Review date...	Summer 2014

## 6.2 Ensuring Carbon Management is everyone's business

The Sustainability Development Steering Group (SDSG) takes primary responsibility to ensure that the Sustainability Strategy is communicated, disseminated, implemented, monitored and reported. The importance of sustainability will be communicated and emphasized during various awareness raising actions (see below).

There are clear reporting lines and governance of sustainability (see Section 7) for which individuals have specific responsibility. Given that sustainability and, in particular, carbon management will be more prominent within the next Corporate Plan, it is envisaged that the University carbon reduction targets will be disaggregated down and presented as KPIs for Deans and other Senior Managers (Directors of Estates, IT, Finance, Library, Catering etc) as part of the performance management process.

## 6.3 Data Management

The Planning Support Office is responsible for co-ordinating all University MIS data which is currently reported to SMT on a monthly basis. At the same time, the University is in the process of developing a dashboard system of live information which will also feature EMIS data. It is intended that this information will be provided at a number of levels, from top level Carbon reduction data, to comparative data of energy utilisation per building, per hour, per day, per month, etc. The University aims to have this in place for the beginning of the new student year (September 2011).

The University has appointed an EMIS Manager (with responsibility for space audits and room utilisation) who works within the Estates department to develop further the Micad property and space management software and ensure an integrated information service. The University is in the process of increasing the number of smart meters to gain a better understanding of energy consumption in individual buildings and the University has just concluded a thermal imaging survey of individual buildings to help prioritise remedial action in energy inefficient locations.

The EMIS Manager, together with the Sustainability Manager will take responsibility for analysing the data to identify new carbon management projects and to report to the University, staff, students, and wider stakeholders (via the University intranet) on the progress of the sustainability initiatives.



## **6.4 Raising Awareness**

Flowing from the CMP is the intent to embed the culture and thinking of sustainability into staff, students, suppliers, contractors and all key stakeholders of the University. This will involve an integrated communications strategy that is currently being formulated by the Director of Marketing, Sustainability Manager, President of the SU and the Director of Personnel. The Integrated Communications Strategy is to be complete and in operation by Summer 2011.

Specific awareness projects have been identified to engage the University community and wider stakeholders and are already being implemented (e.g. Cyclescheme, SU Freshers' focus, etc).

All staff offices and communal spaces already have a 'Living Sustainably at Hope' tips pinned in a prominent place, and staff received a desk-card with 6 questions:

"Have you....

- Switched off your lights?"
- Turned off your monitor?"
- Switched off your computer?"
- Switched off your printer, photocopier, scanner etc?"
- Unplugged your mobile and laptop chargers?"
- Shut the windows and doors when the heating or air conditioning is on?"

Sustainability will feature in applicant packs for new staff and the induction process already contains a briefing by the PVC Resource Management & Planning on this issue. New students will also receive information in their pre-registration packs and an introduction to the initiatives on offer when they arrive. All staff and students are made aware of the travel plan, particularly as they relate to transfer between the Hope campuses and with the Hall of Residence. This is to be in place for the start of the new student year in September 2011.

It is envisaged that both new staff and students will understand the University's position on sustainability on first contact and will be expected to assist in delivery of the University targets.

At the start of each academic year the PVC Resource Management & Planning give talks to all staff grades, both academic and support to raise awareness of sustainability. A similar presentation is given to the Chair and Deputy Chair of the University Council as a major agenda item and was discussed in detail at the Finance & General Purposes sub-committee, which occurs annually in June/July.

Sustainability will become a central tenet of University thinking and will be embedded at committee, faculty and individual level.

## **6.5 Monitoring and Evaluation – keeping track of progress**

The University has appointed a full time Sustainability Manager within the Estates function. This person acts as the project manager for the CMP and is responsible for sustainability projects across the University, including oversight of space utilisation. This officer presents the monthly report to SMT using data provided by the Planning Support Office which is the central repository for all statistical data.

Sustainability is a standing item on the SMT agenda: the SMT meet monthly to discuss reports from functional units. They monitor and review all aspects of sustainability including progress with the CMP, space utilisation (including classroom audits), Estates Management Statistics, IT initiatives and capital projects.

Relevant reports from SMT will be presented to Finance & General Purposes for further consideration and then to University Council for approval where appropriate.

## 7 Programme Management of the CM Programme

The University accepts that good governance of the CMP will include:

- senior, strategic ownership of the carbon reduction target
- the bringing together the diverse projects across the organisation
- an overview of the Programme, that encourages successful delivery, by identification of blockages, and their removal
- project owners coming together to ensure coherence and co-ordination of carbon reduction activity.

### 7.1 Strategic Ownership and Oversight

The governance of the CMP, as well as strategic ownership of the carbon reduction targets, rests with the Sustainable Development Steering Group (SDSG). The SDSG meets a minimum of once per term and is chaired by the PVC for Resource Management & Planning. The SDSG comprises the Sustainability Manager, representatives from the academic faculties, the Director of IT, Director of Finance, Director of Marketing, Manager of the Student Success Zone, Procurement Manager, Head of Estates, Head of Catering and president of the Student Union. This group has responsibility for the development of the CMP and oversight of the Sustainability Strategy including its promotion and raising its awareness with both staff and students.

The Terms of Reference for which are:

- To develop the Sustainability Strategy for the University (to be completed by Summer 2011).
- To propose targets and KPIs in relation to sustainability (including carbon reduction).
- To monitor and report progress of sustainability targets and KPIs (operationally to the SMT, and strategically to the Estates Strategy Group).
- To consider specific funding initiatives in relation to sustainability projects.
- To champion sustainable initiatives and inculcate a culture of sustainable development across the University.
- To publicise the University's performance in sustainable development to staff, students and wider stakeholder bodies.
- Remove obstructions to progress and monitoring high level risks

Core membership of the SDSG is given in Table 7.1.

### 7.2 Sustainability Strategy (including Carbon Management)

The PVC Resource Management & Planning is responsible for the development of the Sustainability Strategy and incorporating all policy documents that relate to it (see also 6.1.3). Any compliance issues which emerge as a result of the Sustainability Strategy (or related policies) are the responsibility of the University Secretary who will report back to the SDSG. The University Secretary will also prompt a cycle of continuous review of the Sustainability Strategy. Once completed, the documentation will be presented to the Estates Strategy Group for initial scrutiny. This Group comprises the Vice Chancellor, PVCs, Director of Finance and the Head of Estates. The document is then scrutinised by Finance & General Purposes (a sub-committee of University Council) before final approval by University Council.

The Vice-Chancellor was a member of the UUK Sustainability in Higher Education working party and is a committed champion of the sustainability agenda.

The University has signed up to the Universities UK and Guild HE 'A University Leaders' Statement on sustainable development and is integrating the HEFCE's Strategic Statement and Action Plan 'Sustainable development in higher education' into its existing strategy and management. The Carbon Management Programme provides an opportunity to quantify progress made in sustainable development and also provides a tangible objective.

**Table 7.1 The Sustainable Development Steering Group: Core Membership**

<b>Role</b>	<b>Name and position in the HEI</b>	<b>Contact details</b>
Project Sponsor	<i>Dr. Ian Vandewalle Pro Vice Chancellor (Resource Management and Planning)</i>	<i>PA: blackmoj@hope.ac.uk</i>
Project Leader	<i>Dr. Suzanne Hartley Sustainability Manager</i>	<i>0151 291 3248 hartles@hope.ac.uk</i>
Deputy Project Leader	<i>Alan Smith Building Services Manager</i>	<i>smitha3@hope.ac.uk</i>
Carbon Management Team members	<i>Sue Beecroft Director of Finance</i>	<i>beecros@hope.ac.uk</i>
	<i>Mike Beecroft Director of IT Services</i>	<i>beecrom@hope.ac.uk</i>
	<i>John McCarthy Director of Marketing, Recruitment and External Relations</i>	<i>mccartj@hope.ac.uk</i>
	<i>Ged Hall Student Success Zone Manager</i>	<i>hallg@hope.ac.uk</i>
	<i>Sheila Smith Procurement Manager</i>	<i>smiths1@hope.ac.uk</i>
	<i>James Ellison Head of Estates/Building Surveyor</i>	<i>ellisoj@hope.ac.uk</i>
	<i>David Kerry Contracts Manager</i>	<i>kerryd@hope.ac.uk</i>
	<i>Clive Ferry Student Union President</i>	<i>pres@hope.ac.uk</i>
	<i>Andy Catterall (when required) Director of Personnel</i>	<i>catterall@hope.ac.uk</i>

### **7.3 Continuity planning and risk management**

The role of the Project Leader is covered by the Building Services Manager (as Deputy Project Leader) and by the Contracts Manager if the Building Services Manager is not able to undertake this role at any time.

The role of Project Sponsor is covered by the Director of Finance or by the Head of Estates if the Director of Finance is not able to undertake this role at any time.

The major risks in delivery the CMP are given in Table 7.2 where:

**Impact:** is the subjective evaluation of the scale of the impact of the risk, should it happen - High (H), Medium (M) or Low (L).

**Probability:** is the subjective evaluation of how likely the risk is to occur - High (H), Medium (M) or Low (L), or I if it is a current issue.

**Mitigation:** identifies who will take what action, by when, to manage the risk.

**Table 7.2 Major risks and issues of delivering the CMP**

	Description	Impact	Probability	Mitigating actions
1	There is insufficient funding for the Programme	H	M	<ul style="list-style-type: none"> <li>Value at Stake (VAS) calculations are known and the case for action made. Details of cost avoidance and necessary preparation for legislation also known.</li> <li>Estates Strategy Group and Finance &amp; General Purposes Committee fully briefed</li> </ul>
2	Insufficient capacity or technical competence in the Estates Department	H	M	<ul style="list-style-type: none"> <li>Advise Project Sponsor and SMT at an early stage.</li> <li>Engage specific consultancy advice</li> <li>Present business case for increasing staffing</li> </ul>
3	The Project Lead has insufficient time, resulting in tasks slipping and the project not being completed on schedule	H	L	<ul style="list-style-type: none"> <li>University Council engaged from the outset</li> <li>Estates Strategy Group, SDSG and SMT proactively engaged.</li> <li>PL and PS meet regularly to monitor progress</li> </ul>
4	Key parts of the organisation do not actively participate in the programme	M	M	<ul style="list-style-type: none"> <li>PL and PS engage formally with Heads of organisation</li> <li>PL seeks experience of similar functions from alumni</li> <li>Engage with internal communications at an early stage</li> <li>Promote launches and Sustainable Developments</li> <li>Engage the SU and student body</li> </ul>

## 7.4 Ongoing stakeholder management

Table 7.3 details the key stakeholders, their interests or involvement and the means by which progress will be communicated.

**Table 7.3 Key Stakeholders in the Carbon Management Planning Process**

Individual or Group	Influence	Impact	Their interest or issues	Means of Communication
University Council	H	L	Strategic direction of the University	Committee reports Annual report
Senior Management Team	H	L	Costs/Budgets Compliance Future strategic goals Reputation/profile of the University	Monthly Report at SMT Committee reports
Deans and Heads of Departments	H	M	Academic profiles Impact on academic programmes	Academic Leaders committee reports Arrange meetings with Deans and Heads of Departments. Faculty Board

			Employment security Working environment	meetings
Finance	H	M	Financial planning Financial pressures Procurement Strategic input	Member of the SDSG Committee reports
Local Authorities and associated agencies	H	L	Local Area Agreements Funding Travel Plans Planning Permission	Direct Meetings Information returns
Staff	M	H	Working Environment Job security Cost and ease of travel	Departmental meetings Intranet and University newspaper Promotional material Induction: Annual staff address
Students	M	H	Customer Expectations Growing Environmental Awareness	Annual Environment Days Intranet and University newspaper Promotional material
Community	L	L	Travel Congestion Home Environment Corporate image	Press release University newspaper

**Influence:** the level of influence on the successful outcome of the Programme - High (H), Medium (M) or Low (L)

**Impact:** the level of impact that the Project will have on the person or group - High (H), Medium (M) or Low (L)

## 7.5 Annual progress review to Senior Management Team

The annual review of the CMP will be in the form of a published document of progress against the Plan.

This review will:

- Quantify the financial savings
- Quantify the percentage CO<sub>2</sub> savings against the agreed University target

It will also

- Qualify the intangible benefits to the staff, students and wider community.

The Report will be presented to Finance & General Purposes via the SDSG and SMT by Dr. Ian Vandewalle (Pro Vice Chancellor for Resource Management and Planning and CMP Sponsor).

## Appendix A: Definition of Projects

<b>Project:</b>	<b>Decentralise and update boilers</b>
<b>Reference:</b>	A001
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Update boilers across campus (A: Green Lane Annex; B: Angela and Austin Halls; and C) Stand Park Annex and Stand Park Building) and decentralise them from the main boiler plant to allow better control of the heating and allow measurement of consumption.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced</b> A: 2.7 tonnes    B: 15.4 tonnes    C: 8.4 tonnes</li> <li>• <b>Payback period</b> A: 11.3 years    B: 9.3 years    C: 16.9 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> A: £4,420    B: £20,880    C: £12,650</li> </ul> <p>These costs do not include mains gas and electrical installation and any water treatment which may be required.</p> <ul style="list-style-type: none"> <li>• <b>Operational costs:</b> the new boilers would be placed under the existing maintenance contract.</li> <li>• <b>Source of funding:</b> Maintenance Budget, if available</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Installation by specialist contractors</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Plant rooms to be accessible</li> <li>• Timely arrival of equipment</li> <li>• Installed at a time to limit disruption</li> <li>• Risks: complete survey needs to be completed to determine whether any additional works are required such as asbestos removal</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Better heating control for the building</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates <ul style="list-style-type: none"> <li>○ start and completion dates: A: 2011-2012 B: 2013-2014 C: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Replace heating system – St Julies (Aigburth Campus)</b>
<b>Reference:</b>	A002
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Replace aged and inefficient heating and hot water boilers with new high energy efficiency boilers
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 67 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the plan (45.5 years)</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~£450,000 (estimated, but includes asbestos removal and other associated costs)</li> <li>• <b>Operational costs:</b> the new boilers would be placed under the existing maintenance contract.</li> <li>• <b>Source of funding:</b> TBC Dependent on lease/maintenance contracts</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Asbestos removal and disposal by specialist contractors</li> <li>• Installation by specialist contractors</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Plant rooms to be accessible</li> <li>• Timely arrival of equipment</li> <li>• Installed at a time to limit disruption</li> <li>• Risks: complete survey needs to be completed to determine whether any additional asbestos removal is required or any other associated works</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Better heating control for the building</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates <ul style="list-style-type: none"> <li>○ start and completion date: 2015-2016</li> </ul> </li> </ul>
<b>Notes</b>	The costs are only indicative. A refurbishment and demolition asbestos and boiler survey is required before costs can be confirmed. The carbon reductions are based on a 20% efficiency gain.

<b>Project:</b>	<b>Review heating controls</b>
<b>Reference:</b>	A003
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	An engineer to conduct a detailed audit of the heating and BMS settings/controls to progressively adjust them to the desired settings to reduce the unnecessary use of energy and reduce CO <sub>2</sub> emissions. A full review of temperature set points, time schedules, optimiser settings and compensation slopes etc.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 27.9 tonnes</li> <li>• <b>Payback period:</b> limited costs, so no payback period</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~0</li> <li>• <b>Source of funding:</b> within the Estates department</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• BMS engineer</li> <li>• Resources within the Estates Department</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Estates to be informed of any changes to the building use</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	Assuming heating is 50% of gas and review will achieve a 2.5% saving



<b>Project:</b>	<b>Enable BMS control over the intranet and fine tune</b>
<b>Reference:</b>	A004
<b>Owner (person)</b>	Suzanne Hartley/Alan Smith
<b>Department</b>	Estates
<b>Description</b>	To connect the three BMS (Capstone, Gateway and EDEN) to a central computer with the Estates Department. This will allow greater control over the building services, for example, heating and air conditioning, and enable sub-meters to be read remotely.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 4 tonnes</li> <li>• <b>Payback period:</b> 5.5 years</li> <li>•</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £3,450 for software and training</li> <li>• <b>Operational costs:</b> unknown</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• IT to install intranet points in the required locations</li> <li>• Specialist BMS contractor</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Intranet points to be in place before BMS works are implemented</li> <li>• Estates to be informed when the building is being used</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in electricity and gas consumption</li> <li>• Estates to be informed of any changes to the building use</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	Assuming heating is 50% of gas and review will achieve a 5% savings; and BMs controlled electricity is 50% of utility and a 2% saving can be achieved

<b>Project:</b>	<b>Upgrade lighting and associated controls</b>
<b>Reference:</b>	A005
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Install combined sensors for presence detection and daylight measurement to switch off the lights in vacated areas, or inhibit lights from coming on when there is sufficiency natural light. The first phase will concentrate on corridors, bathrooms, and common areas. The work will commence in sequence on buildings that most urgently require the fittings, either to reduce the consumption of electricity or because the controls are required for the convenience of the occupier
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 64 tonnes</li> <li>• <b>Payback period:</b> 2.9 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> 30,185</li> <li>• <b>Operational costs:</b> cost of lamps and contractor to fit</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• External contractors to fit the lighting controls</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Areas accessible for installation Timely arrival of equipment</li> <li>• In depth survey completed before project implementation to reduce risks</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Measured reduction in electricity consumption</li> <li>• Reduction in number of calls regarding lights left on</li> <li>• Positive feedback from building users</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Lamp replacement - Replace T8s with LEDs</b>
<b>Reference:</b>	A006
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Campus wide - replace any remaining T8s lamps with LED T8s. LEDs are rated for about 50,000 hours of constant use, compared with around 5,000 for a standard T8.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 45.7 tonnes</li> <li>• <b>Payback period:</b> 6.6 years</li> <li>• Contains no mercury, reduced heat output, emits no UL light</li> <li>• Longer lifespan, so reduced maintenance costs</li> <li>• Instant start technology</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £49,481</li> <li>• <b>Operational costs:</b> cost of replacing lamps</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• External contractors to change the fittings and lamps</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Areas accessible for installation</li> <li>• Timely arrival of equipment</li> <li>• In depth survey completed before project implementation to reduce risks</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Measured reduction in electricity consumption</li> <li>• Positive feedback from building users</li> <li>• Increased lifespan of the lamps</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	The project costs do not include installation

<b>Project:</b>	<b>Use of automated meter reading, monitoring and targeting</b>
<b>Reference:</b>	A007
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Provide automatic meter reading for a building or site, the first phase would be the installation of Electricity AMR. This will assist with the analysis of energy used within the buildings and provide accurate consumption data to enable better management of the buildings. This will also assist in providing reports and communicating to both staff and students. The meters will be targeted, initially, at those buildings with a footprint over 1000m <sup>2</sup> .
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 75.5 tonnes</li> <li>• <b>Payback period:</b> 8 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~£100,000</li> <li>• <b>Operational costs:</b> TBC</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• AMR procured via the OGC Buying Agency Framework</li> <li>• Specialist contractor to install meters and software</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Scheduling and shut down of plant is required in order to install the meters</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Detailed consumption data</li> <li>• Calculation of baseload</li> <li>• Accurate DECs</li> <li>• Ability to show building user consumption patterns</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and date: 2013-2014</li> <li>○ completion date: 2014-2015</li> </ul> </li> </ul>
<b>Notes</b>	Assuming a 2.5% reduction in gas and electricity consumption

<b>Project:</b>	<b>Installation of tamperproof Thermostatic Radiator Values</b>
<b>Reference:</b>	A008
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Installation of tamperproof Thermostatic Radiator Values (TRVs) to the appropriate radiators to allow better occupant control of the heating. To prevent overheating and assist in controlling space temperatures. TRVs should provide improved comfort conditions and reduce gas consumption.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 45.7 tonnes</li> <li>• <b>Payback period:</b> 4.4 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £29,830</li> <li>• <b>Operational costs:</b> TBC</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• External contractors to complete installation</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Completed during the holidays to minimise disruption as the heating system has to be drained down</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Reduction in number of complaints about heating – Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Install water conservation techniques – push taps</b>
<b>Reference:</b>	A009
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	The University has successfully reduced its water consumption from 2006-2007 onwards throughout the estate. It is important to be vigilant for water leaks and increasing the sub-meters to support this. Low and waterless urinals, cistern hippos and the replacement of taps with spring return taps or aerated taps will be trialled across campus and rolled out if feasible
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 12.1 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the plan (57.2 years)</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £10,750</li> <li>• <b>Operational costs:</b> unknown</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee this project</li> <li>• External contractor to provide the required plumbing</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in water consumption by non-dripping taps</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2013-2014</li> </ul> </li> </ul>
<b>Notes</b>	Assuming 250 taps replaced and 50m <sup>3</sup> saved per year

<b>Project:</b>	<b>Automatic PC shutdown</b>
<b>Reference:</b>	A010
<b>Owner (person)</b>	Mike Beecroft
<b>Department</b>	Estates
<b>Description</b>	The University has approximately 2,800 computers on campus (excluding student owned computers in halls of residence) of which around 800 are in central work areas. The project will ensure that computers, especially in central work areas are shut down when the buildings are not occupied. Evenings and weekend account for around 70% of the week, so there is a potential to reduce energy consumption. Installation of software to turn off the monitor and base units when not required and low power mode when idle. Manual power management also needs to be implemented to achieve significant savings with users turning off their computers and base units with ongoing education and reinforcement.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 27.1 tonnes</li> <li>• <b>Payback period:</b> 4.1 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £10,000</li> <li>• <b>Operational costs:</b> £2,000</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Installation of software package by IT</li> <li>• Timely arrival of software</li> <li>• Communications regarding switching off computers</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Installation of software onto appropriate PCs</li> <li>• Timely communications to remind users to switch off their computers</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Computers switched off when the buildings are not occupied</li> <li>• Reduction of electricity consumption</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ Start and completion date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Server room rationalisation</b>
<b>Reference:</b>	A011
<b>Owner (person)</b>	Mike Beecroft
<b>Department</b>	IT
<b>Description</b>	Decommissioning of one server room in the library, allowing the air conditioning to be turned off
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 46 tonnes</li> <li>• <b>Payback period:</b> limited costs, so no payback period</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> limited costs as project is within ITS.</li> <li>• <b>Source of funding:</b> within the IT department</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• To be overseen by IT</li> <li>• May require consultancy from TALIS</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Implementing an alternative method of backing up TALIS</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Service continues to operate successfully post move</li> <li>• Air conditioning can be switched off or removed.</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	



<b>Project:</b>	<b>Increase recycling provisions across campus</b>
<b>Reference:</b>	A012
<b>Owner (person)</b>	Suzanne Hartley
<b>Department</b>	Estates
<b>Description</b>	Increase the number of recycling bins for paper, plastic and cans around campus to reduce the tonnage of waste going to landfill.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 2.4 tonnes</li> <li>• <b>Payback period:</b> does not payback within lifetime of the plan</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~£5,000</li> <li>• <b>Source of funding:</b> Waste and Recycling Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Communication of what can and can not go into the bins</li> <li>• Communication of bin locations</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction of tonnage in landfill</li> <li>• Increasing tonnage of recycling</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Replace single with double glazing</b>
<b>Reference:</b>	A013
<b>Owner (person)</b>	David Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	The replacement of single, metal framed windows in Angela Halls, Austin Halls & the Alexander Jones Building to double glazed with associated cavity wall closures to minimise heat loss
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 8 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the plan</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £493,366</li> <li>• <b>Source of funding:</b> Capital funding, if available /Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Timely arrival of materials and scaffolding</li> <li>• Correct fitting of windows and cavity wall closures</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	Does not include price of scaffolding required

<b>Project:</b>	<b>Insulate AJB Chapel roof</b>
<b>Reference:</b>	A014
<b>Owner (person)</b>	David Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	Replace existing insulation with that required by current building regulations and if possible increase the depth further.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 0.8 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the project</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> Contractors currently pricing</li> <li>• <b>Source of funding:</b> Capital funding, if available/Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Complete survey completed to determine the status of the insulation and whether any additional works are required</li> <li>• Ability to gain access to the roof space</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2013-2014</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	LTC pitched roof
<b>Reference:</b>	A015
<b>Owner (person)</b>	David Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	Replace existing insulation with that required by current building regulations and if possible increase the depth further.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 2.6 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the project</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> Contractors currently pricing</li> <li>• <b>Source of funding:</b> Capital funding, if available/Sustainability budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Complete survey completed to determine the status of the insulation and whether any additional works are required</li> <li>• Ability to gain access to the roof space</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2013-2014</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Replace LTC flat roof</b>
<b>Reference:</b>	A016
<b>Owner (person)</b>	David Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	Replace existing insulation with that required by current building regulations and if possible increase the depth further.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 3.8 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the plan (68 years)</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £37,410</li> <li>• <b>Source of funding:</b> Capital funding, if available</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Complete survey completed to determine the status of the insulation and whether any additional works are required</li> <li>• Ability to gain access to the roof space</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Building occupancy satisfaction</li> <li>• No leaks</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2014-2015</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Insulation of pipes &amp; valves</b>
<b>Reference:</b>	A017
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Insulation jackets can be used to insulate heating and hot water service valves and flanges as necessary. In general the pipes within the plant rooms are insulated as are some of the valves and flanges, however, there are some without insulation. Considerable energy savings may be made by fitting insulation jackets.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 31.3 tonnes</li> <li>• <b>Payback period:</b> 1.9 years</li> <li>• In some locations insulation jackets may be fitted to cooling system valves and flanges to reduce the load on electrically powered chillers units.</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £8,595</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> <li>• Contractor to fit the insulation</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Timely arrival of materials</li> <li>• Access to plant rooms</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupant satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2011-2012</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Sustainability Communications Plan</b>
<b>Reference:</b>	E001
<b>Owner (person)</b>	Suzanne Hartley & Marketing
<b>Department</b>	Estates / Marketing
<b>Description</b>	Creation of a dedicated sustainability communications campaign (including energy and environmental awareness and education) targeted at both staff and students. This will involve input from the Marketing Department, Estates, Students Union and members of the Sustainable Development Steering Group
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 156.7 tonnes</li> <li>• <b>Payback period:</b> 0.42 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £10,250</li> <li>• <b>Operational costs:</b> £500</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Consultant to deliver the relevant training</li> <li>• Delivered within University resources</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Creating and maintaining enthusiasm</li> <li>• Continual and timely delivery of materials (website, booklets, posters etc)</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Better informed staff and students</li> <li>• Creation of an enthusiastic community</li> <li>• Reduction in Carbon emissions</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start date: Summer 2011 onwards</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Environmental Management Systems: ISO 14001</b>
<b>Reference:</b>	E002
<b>Owner (person)</b>	Suzanne Hartley
<b>Department</b>	Estates
<b>Description</b>	The implementation of an Environmental Management System will allow the University to provide a systematic way of managing both the positive and negative impacts that the University has on the environment.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 34.5 tonnes</li> <li>• <b>Payback period:</b> 1.5 years</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> £8,000</li> <li>• <b>Operational costs:</b> periodic reviews (unknown costs)</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates will oversee the project with co-operation from other members of staff to provide the required information</li> <li>• External contractor required to audit the EMS</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Successful change management ensuring buy-in from staff and students</li> <li>• Continued support from senior management</li> <li>• Gaining the required information from other members of staff</li> <li>• Robust auditing system</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Embed sustainability into the Corporate Plan, policies and practices</li> <li>• Risks are appropriately measured and managed</li> <li>• Action and implementation plan is adhered to</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start date: 2013-2014 onwards</li> </ul> </li> </ul>
<b>Notes</b>	



<b>Project:</b>	<b>Voltage Optimisation</b>
<b>Reference:</b>	F001
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	<p>Electricity distribution companies tend to supply electricity at slightly higher voltages than the regulated norm of 230V but within the limits stipulated by OFGEM. As a consequence there will be an unnecessary increase in power associated with electrical equipment. A feasibility study is carried out by a specialist contractor to install PowaSava on the following distribution boards:</p> <p>1) Hilda Constance Allen, 2) Alexander Jones Building, 3) Frances Mary Lescher, 4) Cornerstone, and 5) Aigburth</p>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 1) 108.7 tonnes, 2) 5.2 tonnes, 3) 128.1 tonnes, 4) 43.4 tonnes, and 5) 21.7 tonnes</li> <li>• <b>Payback period:</b> 1) 2.4 years, 2) 13.8 years, 3) 2.1 years, 4) 3.4 years, and 5) TBC</li> <li>• Reduces energy consumption and costs</li> <li>• Extends the life of electrical equipment</li> <li>• Provides improved stability to the electrical infrastructure</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~£230,000</li> <li>• <b>Operational costs:</b> £900 per installation</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Specialist contractor to carry out survey and install optimisers</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Correct switch boards are identified</li> <li>• Funding is agreed to install voltage optimisation</li> <li>• Risks: projected annual savings not realised therefore increased payback</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in electricity consumption</li> <li>• Building occupant satisfaction</li> <li>• No adverse effect on the electrical equipment</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2013-2014</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Installation of Variable Speed Drives</b>
<b>Reference:</b>	F002
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Installation of VSDs for mechanical ventilation systems and circulation pumps is to be considered. VSDs can reduce the consumption of unnecessary energy by monitoring the amount of electricity required
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 8.2 tonnes</li> <li>• <b>Payback period:</b> TBC</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> contractors currently pricing</li> <li>• <b>Operational costs:</b> unknown</li> <li>• <b>Source of funding:</b> dependent on viability</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Specialist contractor to undertake feasibility study and install equipment</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Specialist contractor installation team to be available</li> <li>• Equipment fitted to the appropriate supply</li> <li>• Voltage monitoring is undertaken</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction In voltage and reduction in electricity consumption</li> <li>• No disruption to users</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2014-2015</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Space Management and Building Rationalisation</b>
<b>Reference:</b>	F003
<b>Owner (person)</b>	Suzanne Hartley/Khaled Rahman
<b>Department</b>	Estates
<b>Description</b>	An analysis of the space used within the University and whether low occupancy buildings can be 'mothballed', for example, 1) Green Lane Building and 2) Alexander Jones Building. Ensuring all evening and weekend teaching is in one building.
<b>"Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> <ul style="list-style-type: none"> <li>1) 90 tonnes and 2) 118 tonnes</li> </ul> </li> <li>• <b>Payback period:</b> limited costs, so no payback period</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> limited (only cost of room moves)</li> <li>• <b>Source of funding:</b> within the Estates department</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• No additional resources are required, the project can be carried out within Estates</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Staff and students are given notice of the moves</li> <li>• All non-essential electrical equipment turned off before closure</li> <li>• Senior Management buy-in and support</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction of both gas and electricity consumed</li> <li>•</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start date: Summer 2011 onwards</li> </ul> </li> </ul>
<b>Notes</b>	

<b>Project:</b>	<b>Replacement Lighting – Sports Hall</b>
<b>Reference:</b>	F004
<b>Owner (person)</b>	Alan Smith
<b>Department</b>	Estates
<b>Description</b>	Replace the existing lighting with a more energy efficient lamp with a higher lux level
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 7.2 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the project</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> TBC</li> <li>• <b>Operational costs:</b> lamp replacements</li> <li>• <b>Source of funding:</b> Sustainability Budget</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Projected can be completed within estates</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Work needs to be completed at a time when disruption is limited</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction of electricity consumption</li> <li>• Checks before and after installation</li> <li>• Building occupant satisfaction i.e. lighting levels are not reduced</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2012-2013</li> </ul> </li> </ul>
<b>Notes</b>	Assuming lighting is 60% of the utility and savings of 10% can be made

<b>Project:</b>	<b>Replace flat roof covering – Frances Mary Lescher</b>
<b>Reference:</b>	F005
<b>Owner (person)</b>	Dave Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	Replace roof covering with required insulation and reseal the roof detailing.
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 3.8 tonnes</li> <li>• <b>Payback period:</b> does not payback within the lifetime of the plan (72.6 years)</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> ~£40,000</li> <li>• <b>Source of funding:</b> Capital funding, if available</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• External contractors to survey roof covering to determine the insulation and type of roof covering required.</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Complete survey completed to determine the status of the insulation/roof covering and whether any additional works are required</li> <li>• Access to the roof</li> <li>• Completed at a time where disruption is going to be limited. Timing is dependent on availability of the building and the ease of operation</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction of gas consumption</li> <li>• Checks before and after installation</li> <li>• Building occupancy satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2014-2015</li> </ul> </li> </ul>
<b>Notes</b>	

## Appendix A: Definition of Projects

<b>Project:</b>	<b>Cavity Wall Insulation</b>
<b>Reference:</b>	F006
<b>Owner (person)</b>	David Kerry/James Ellison
<b>Department</b>	Estates
<b>Description</b>	Install cavity wall insulation to all relevant buildings. Initially this will be in the buildings surveyed with thermographic imaging and then potentially rolled out across campus into the relevant buildings
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• <b>CO<sub>2</sub> emissions reduced:</b> 43.7 tonnes</li> <li>• <b>Payback period:</b> TBC</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>• <b>Project cost:</b> unknown</li> <li>• <b>Source of funding:</b> Capital funding, if available</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Estates to oversee the project</li> <li>• Contractor to install the cavity wall insulation and make good</li> </ul>
<b>Ensuring Success</b>	<ul style="list-style-type: none"> <li>• Access to the cavity wall spaces</li> <li>• Sufficient time to install the insulation</li> <li>• Ensuring the buildings are not occupied at the time</li> </ul>
<b>Measuring Success</b>	<ul style="list-style-type: none"> <li>• Reduction in gas consumption</li> <li>• Building occupancy satisfaction</li> </ul>
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Milestones / key dates e.g. <ul style="list-style-type: none"> <li>○ start and completion date: 2014-2015</li> </ul> </li> </ul>
<b>Notes</b>	