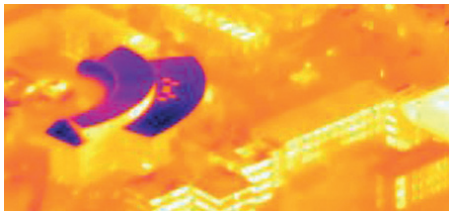
clean&green 35%

University of Reading

Carbon Management Plan (CMP)





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CARBON TRUST

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Foreword from the Vice Chancellor

The University's Carbon Management Programme commits us to a 35% reduction by 2015/16 in our CO_2e emissions across all our activities.

This commitment underpins in a practical way many of Reading's research themes around climate change, sustainable buildings and renewable energy and shows us to be leading in the most positive way possible– by example. I am pleased to endorse this challenging target and to see the University playing its part in reducing the amount of carbon it emits.

A great deal of work has been undertaken by our Energy Team and our Carbon Management Steering Group in identifying how our carbon footprint is made up and the scope and potential for reduction. The benefits of this programme will be felt not just in terms of global CO_2e impact but on reduced energy costs – a direct and significant benefit to the University.

Embedding carbon management into the workings of the University is a strategic process and this plan is only the beginning of the journey. Students, staff and stakeholders alike will play a vital role in the University's drive to reduce carbon emissions and work toward a sustainable future.

Professor Gordon Marshall,
Vice Chancellor, University of Reading

University of Reading

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 HE 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.

The University of Reading 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_2 by 35% by 2015 and underpins potential net financial savings to the institution of around £2.6 million by that date.

There are those that can and those that do. Universities can contribute significantly to reducing CO_2 emissions. The Carbon Trust is very proud to support the University of Reading in their ongoing implementation of carbon management.

Richard Rugg,
Head of Public Sector, Carbon Trust

Executive Summary

1. This Carbon Management Plan (CMP) is a 5 year action plan which contributes significantly towards reducing the University of Reading's carbon dioxide emissions of 35% by 2016 (2015/16 academic year). The University has set a further stretching target to reduce carbon dioxide emissions of 45% by 2020[1]. The plan was formulated in 2010/11 using a baseline year of 2008/09. In January 2010, HEFCE committed the HEI sector to a target reduction of 43% by 2020 against a 2005 baseline. This plan will contribute to meeting this target.

2. The Plan has been created by a University Project Team and Board, established for the purpose, in close collaboration with the Carbon Trust as part of its Higher Education Carbon Management Programme 6. The Team has been sponsored by the Deputy Vice Chancellor and the Director of Estates and Facilities Management. The plan is supported by Professor Gordon Marshall (Vice-Chancellor, University of Reading) and Richard Rugg (Head of Public Sector, The Carbon Trust).

3. The drivers which elevate context into action are:

- Being seen to **act in a responsible manner** to mitigate our own environmental impact.
- Embedding a carbon management culture by **raising awareness** to staff, students and the wider community at both an individual and a strategic level.
- Identifying the **monetary savings** to be made as a result of the programme.
- **Enhancing the reputation** of the University of Reading as one of the leading universities for climate change research and mitigation, as measured by the number of student applications and Green League position.

4. The remit of the CMP is restricted largely to reducing scope 1 and scope 2 emissions, namely, those generated directly from sources controlled by the University, and those generated by purchased electricity, respectively. The Plan includes: academic, residential and Student Union buildings, investment properties, farms, fleet vehicles, aspects of academic and business travel, waste disposal, water and IT delivery and usage. [Scope 3 emissions, largely related to procurement and commuter travel will be researched with a view to continual expansion of the scope of the CMP over time]. In total the University of Reading spend over £4.9M per year on gas and electricity and over £2.5M in business travel.

[1] This translates to 13.1% reduction in carbon emissions in real terms on energy for residential and non residential property by 2020 against the 2005 reported previous emissions to HEFCE (see Appendix B for more detail)

Table 1: Breakdown of 2008/09 baseline data

Source	Tonnes CO_2e	Percentage
Liquid fuels	1,544	3.4
Gaseous fuels	14,837	32.4
Fleet	138	0.3
Grid Electricity	25,747	56.2
Business travel	2,855	6.2
Waste and water	703	1.5
Total	**45,824**	**100**

5. Projects designed to reduce carbon emissions fall into 4 categories:

- existing funded projects
- planned projects for which funding is approved
- near-term projects for which funds need to be identified
- medium-to-long term projects not yet planned in detail for which funds also need to be identified.

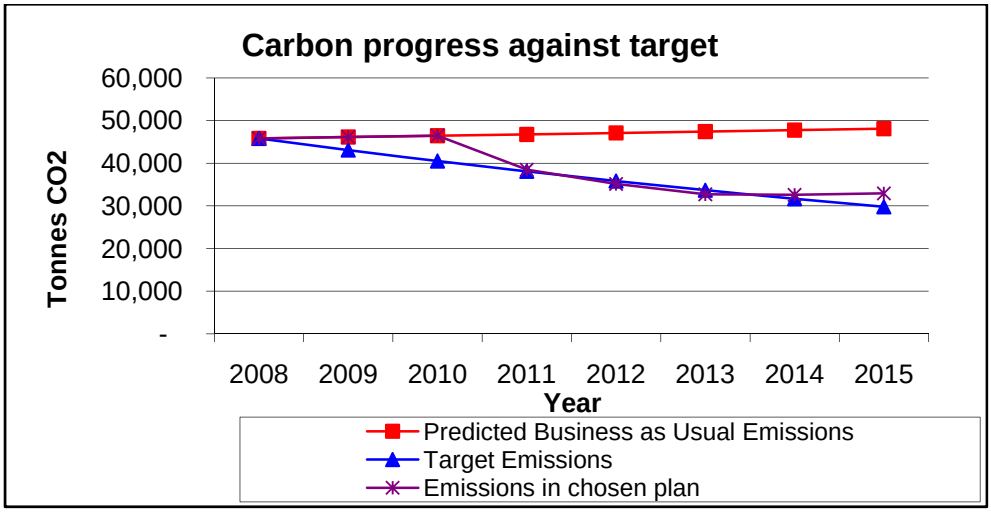
The summary details are given in the table below

Table 2: Project funding

Project	Cost		Annual savings (year 1)		% of target
	Capital	Revenue	Financial (Gross)	tCO_2e	
Completed projects (since 2008/09 baseline)	£471,188	£39,440	£373,557	3,480	21.6%
Planned / funded projects	£251,750	£150,000	£773,971	6,377	39.59%
Near term projects (to be funded)	£645,737	£0	£139,309	1,206	7.48%
Medium to long term projects (to be funded)	£2,075,000	£0	£242,278	2404	14.98%
Total	**£3,443,673**	**£189,440**	**£1,529,115**	**13,467**	**84%**

6. As indicated in the graph below, over the 7-year period, successful completion of all projects described in the plan will reduce carbon emissions by 29% of the 2008-09 baseline, which amounts to 84% of the University's target. Further planning will be required to maintain the trajectory of reductions beyond 2014 to meet this stretching target.

Chart 1: Carbon progress against target



7. The CMP is expected to deliver significant financial savings over the next five years, as well as meeting the 35% overall emissions target. Meeting the 35% target should lead to a cumulative projected saving of £18.5m over business as usual. This amount represents the difference between the "do nothing" scenario, under which our energy costs increase, and a scenario under which we achieve our 35% target. By the end of 2015/16, the total financial savings in reduced energy costs delivered by the projects identified to date will be **£6.2m** for an overall expenditure on new projects of **£3.6m**, giving a net financial saving of **£2.6m**. These savings do not include the amounts saved on the Carbon Reduction Commitment (CRC).

8. Alongside implementation of the full spectrum of projects, it will be necessary to embed the University's low carbon vision within all levels of operational management. To that end, the CMP includes a communication and training strategy which will be pursued in parallel with project management.

9. The governance of the programme, as well as the strategic ownership of the carbon reduction target, rests with the Carbon Management Project Board, composed of appropriate members of senior staff from both academic departments and the Facilities Management Directorate. The members of the Environment and Sustainability Committee will also have oversight of the programme to monitor progress and assist in the implementation and communication of the projects

10. The University of Reading must reduce its carbon emissions. The target reductions described in this CMP, whilst challenging, can and must be met. In summary, climate change and its consequences will dominate science, economics, sociology and politics both in adaptation to observable changes and in mitigation to reduce the long term threat. The University must develop, agree and implement appropriate policies and strategies to reduce its carbon emissions to support the local, national and international targets for reduced carbon emissions.

1. Introduction

The University of Reading is ranked as one of the UK's 20 most research-intensive universities and as one of the top 200 universities in the world. We enjoy a world-class reputation for teaching, research and enterprise. Established as an extension college of Christ Church College, Oxford in 1892, we received a Royal Charter in 1926, the only university to do so between the two world wars. Important achievements include being the first university to win the Queen's Award for Export Achievement (1989) and receiving the Queen's Anniversary Prize for Higher Education three times (1998, 2006 and 2009).

The University currently occupies 4 campuses: Bulmershe Court, Greenlands, London Road and Whiteknights. The main Whiteknights campus is set in 130 hectares of beautiful parkland.

The University has 17,500 full and part-time students and nearly 4000 staff.

In May 2010, the University of Reading joined in Phase 6 of the Higher Education Carbon Management Programme (HECMP). We have for many years realised the importance of energy, waste and carbon management and their respective effects on the world's finite resources. This has been coupled with the desire to improve the environment, health and wellbeing of our students, staff and both the local and global community. In order to ensure that the set standards will be met and exceeded, with regards to energy, waste and carbon management, the University of Reading is fully committed to HECMP, run by the Carbon Trust.

The purpose of this document is to:

- Highlight the drivers for change that are currently impacting on the University.
- Identify base level consumption and emission figures from which future improvements can be measured.
- Identify a business as usual scenario in which consumption and emissions will be estimated assuming that the University continued at its current consumption rate and no further action, above and beyond that which is currently being carried out, was taken.
- Indentify a programme of works aimed at reducing consumption.
- Identify the value of potential monetary savings to be made as a result of the programme and investment required.

The programme followed the five step approach over a ten month period culminating in this Carbon Management Plan (CMP). Despite this specific time period, the University regards this programme as ongoing which will continue until carbon management is embedded into the University and will evolve throughout its lifetime. Projects identified within the scope of this programme are not exhaustive and further projects will be required to reduce further our carbon emissions.

Our aims throughout the programme and beyond are to:

- Be seen to **act in a responsible manner** to mitigate our own environmental impact.
- Embed a carbon management culture by **raising awareness** of staff, students and the wider community at both an individual and a strategic level.
- Identify the **monetary savings** to be made as a result of the programme.
- **Enhance the reputation** of the University of Reading as one of the leading universities for climate change research and mitigation, as measured by student applications numbers and Green League position.

'The University of Reading is delighted to be involved in focusing on ways of reducing our carbon footprint. We are a leading university involved in intensive research into climate models and we have a strong sense of environmental responsibility, so it is important for us to be seen to put into practice the lessons we learn from our academic research.'

Colin Robbins, Director of Estates and Facilities Management

Project Sponsor

Carbon management has been a continuous initiative for the University of Reading. Many good practice examples are included within the report and three major initiatives are highlighted here:-

- EcoCampus – This is a programme to produce an Environmental Management Standard through the Higher Education Institution (HEI) sector. The University recently achieved the Bronze Award and is currently working towards the Silver Award for early 2011. By the end of 2011 it is intended that we will have achieved the Gold Award with the Platinum Award by 2012. The Platinum Award is aligned with ISO14001.
- Green Week - Last year saw the launch of the University 'Green Week'. This was a new venture and following the success of 2009 and now 2010 it is intended to run this event annually. The aim is to raise carbon management awareness to staff, students, the community and visitors. The event is launched by the Vice Chancellor on the Monday with events such as supplier exhibition of sustainability, a community event and a public lecture around climate change issues to name but a few.
- Behavioural; Change – In 2009 we launched a pilot project to involve individuals with an aim of changing people's attitudes. Three areas were chosen to give the widest choice;

  Carrington Building, Student Services – This is a three storey administration building which is one of our most energy efficient with small electrical equipment, computers and a Ground Source Heat Pump (GSHP). The building is used during

normal office hours. By splitting the building into eight distinct areas and with the addition of minute electrical metering, we have been able to show detailed trends and reduce the out of hours consumption by 25%. Communication has been key to the projects success and with the Building Manager, daily reports are produced and actions taken to reduce consumption. This project won the national Office Depot award for Innovation in 2010.

Greenow and McCrombie Halls of Residence – Detailed metering has been installed into blocks of flats. As both buildings are identical a controlled study has been carried out to highlight differences. In one block, the use of electronic social network groups has been used to keep students informed of their impact in their hall showing usage against previous usage. The Residential Manager has been vital in providing access to the students through this media. Although savings have been identified and the results are promising, this has not yet been reported as further study is continuing.

RUSU, Students Union Building – A further study is underway in the Student Union building using a visual display screen to give real time energy data available on a touch screen in the Union building. This work also continues into 2010/11 with close liaison with the NUS Officers.

These are just three of the projects undertaken and ongoing throughout the University. The aim is to extend the Behavioural Change pilot and roll this out across the University. Schools and Departments have shown an interest in our work and are actively looking for similar projects in their Departments/Directorates.

2. Carbon Management Strategy

Climate change is one of the greatest challenges facing the world. Universities have a major role to play in tackling it.

Our researchers are not only investigating the potential impact of climate change, they are also working with industry and the public sector to develop innovative solutions to the challenges it creates. Our students and graduates are shaping and leading the debate and the responses to it at every level of society. As a sector, we can be leaders in our response at all levels.

2.1 Context and drivers for Carbon Management

There is no doubt about the seriousness of the issue. The UN Intergovernmental Panel on Climate Change has concluded that climate change is unequivocal and that human activities make a very significant contribution. The 2006 Stern Review showed how the benefits of strong early action greatly outweigh the costs of inaction. The overwhelming view of scientists is that unless we make deep inroads into our carbon emissions, we are likely to see adverse climate change with severe impacts on coastal communities, food supplies and the number of species in the world.

Many drivers have contributed to the University of Reading decision to participate in the HECMP, the primary reason being a desire to follow a recognised scheme that will assist in the goal of reducing the impact it has on the environment through the energy it consumes and the waste it produces, as well as many other legislative, regulatory, financial, socio-political and ethical drivers. The following list will highlight a number of these drivers. It should be noted that this list is by not exhaustive and should be regarded as a living document. There are many other factors that will continue to have an impact upon the University's end goal of reducing its carbon emissions.

- **Ethical** – As a Higher Education Institution (HEI) the University of Reading is in the position where its actions not only have an impact upon the institution but also on the wider community. It is therefore essential that in terms of energy, waste and carbon management we lead by example to reduce our direct impact upon the environment. Additionally to reduce any financial cost associated with energy consumption and waste production, and to instil 'good practice' behaviour into both staff and students.
- **Raising Awareness** – The HECMP will play a central role in the ability to educate our staff and student population on issues regarding energy and waste management in order that we can reach our long term carbon reduction goals.
- **Green league** – In the 2010 'Green league' table, prepared by the student group "People and Planet", the University was placed 72 out of a total of 133 institutions. Whilst this is a significant improvement over the previous year, it is well behind where we want to be.
- **Climate Change Levy** (CCL) – There has been a steady increase in CCL cost since its introduction to electricity and gas consumption. This has placed a further financial burden associated with energy use. Therefore, a reduction in overall consumption and investment into low carbon technologies will result in reduced expenditure on utilities and reduce carbon emissions. The University currently purchases 100% 'green' electricity at a premium rather than purchase 'brown' electricity.

- **Capital funding** - For HEIs this is linked to carbon performance: HEFCE's 2008 and 2009 grant letters from the Secretary of State demand the establishment of a link between performance on carbon reduction and future capital allocations, leading to the requirement for HEIs to set their own carbon reduction targets for 2020[2], and establish carbon reduction plans.
- **Carbon Reduction Commitment** (CRC) **-** The CRC is a scheme for organisations whose total electricity consumption is greater than 6,000MWh or expenditure of approximately £500k. The University of Reading falls within the CRC scheme and **all** electricity and fuel emissions are covered. The organisation consumes in excess 6,000 MWh, therefore it is required to register as a participant of the scheme. From 2010 CRC participants will be taxed on their carbon emissions. CRC will have a significant cost implication on the University of Reading, expected to be in the region of £500k in the first year. The scheme is currently under the Government Review and final details have not yet been agreed.
- **Volatility of the energy markets –** Over recent years there has been a great deal of volatility within the oil, gas and electricity markets and despite expectations that the markets will start to stabilise there is still little sign of this. In order to manage this risk effectively and efficiently it is essential to ensure that all energy use is minimised to reduce the possible exposure to price fluctuations. HECMP aims to formalise a strategy to reduce carbon emissions and therefore will minimise energy consumption thus reducing exposure to price fluctuations within the energy markets.
- **Building Regulations –** Part L of the 2010 building regulations sets out requirements with regards to heat losses and gains, energy efficiency with regards to effective control of the building and its plant and ensuring that the building's owners are aware of the energy required by the building and building services in order to ensure that power consumption is limited to that which is necessary to efficiently run and manage the building. With these regulations in place for both new builds as well as refurbishments it will clearly have an impact on the carbon management of the University.
- **EU Energy Performance of Buildings Directive EPBD –** came into force from 4th January 2006. The EPBD sets out to '*promote the improvement of the energy performance of buildings within the EU through cost effective measures*' and '*to promote the convergence of building standards towards those of Member States which already have ambitious levels*'. Certification requires that all new buildings, rental property and property for sale, from the 1st of October 2008 have an Energy Performance Certificate (EPC) and that all existing publicly accessible buildings in the public sector over 1,000m^2, show a Display Energy Certificate (DEC) in a prominent place, clearly visible to the public. This is currently under review and is likely to be revised to buildings over 500m^2 or even possibly 250m^2.

In summary, climate change and its consequences will dominate science, economics, sociology and politics both in adaptation to observable changes and in mitigation to reduce the long term threat. The University must develop, agree and implement appropriate policies and strategies to reduce its carbon emissions to support the local, national and international targets for reduced carbon emissions.

[2] Carbon reduction target and strategy for England, HEFCE, January 2010

2.2 Strategic themes

Mission Statement

We are one of the United Kingdom's leading research intensive universities, a major contributor to the knowledge economy, and internationally recognised for our excellence in teaching.

Our mission is to educate talented people well, to conduct outstanding research, and to promote the responsible application of new knowledge.

We will achieve our mission by committing the maximum possible resources to support areas of established academic strength, of emerging excellence, and of comparative advantage. We seek to provide our staff and students with whatever they need in order to attain the highest standards of scholarship.

In order to achieve the University's vision, objectives and targets it is clear that there will be a number of key priorities that must be met. This in turn will require investment in resource time and financial investment, as well as the need for behavioural and structural change throughout the University in order for the programme to succeed. A few of these key points and priorities will include;

- Communications: Ensure that information regarding the HECMP, its aims and successes are regularly published throughout the University in order to ensure a constant level of understanding and awareness see Communication and Training.
- Reporting: To keep senior management and finance informed as to the requirements that will be needed in order to ensure the programme's success see Reporting and Evaluation
- Responsibility: To instil the idea that carbon and energy management is the responsibility of every individual within the University of Reading and not just that of the Facilities Management Directorate.
- Education: Education for staff and students to ensure that they are fully aware of any behaviours that will facilitate the success of the programme, as well as to dispel any energy related myths, such as leaving a fluorescent light on is more energy efficient than turning it off; possibly through awareness campaigns and competition
- Behavioural change management: To build on our experience and knowledge gained through our behavioural change pilot study carried out in 2009/10 through additional granular metering and feedback to end users.
- Building fabric: To review current insulation standards throughout the Campus and improve levels as necessary.
- Building engineering services: To continue upgrading and improvements to the existing Building Management System control. Move further towards energy efficient high frequency lighting with suitable controls including, solar sensors, movement detectors and time switch control where appropriate. Keeping abreast of new technologies and innovation to ensure best value and carbon efficiency throughout all maintenance, major and minor works projects.
- Information Technology: To further engage in green ICT programmes such as automatic shut down of computers, free cooling and server virtualisation.

2.3 Targets and objectives

The University of Reading will reduce the CO_2e emissions from its activities by 45% from the 2008/09 baseline, by July 2020. We have set an intermediate milestone to reduce emissions by 35% by July 2016

This translates to 13.1% reduction in carbon emissions in real terms on energy for residential and non residential property by 2020 against the 2005 reported previous emissions to HEFCE (see Appendix B for more detail)

3. Emissions Baseline and Projections

Establishing an emissions baseline is essential to managing our Carbon Footprint as it not only defines the scale of the task, but identifies the sources of emissions. Understanding this is crucial to creating a strategy that focuses action where it will be most effective. The baseline year for the CMP has been chosen as 2008/09:

In the CMP baseline year of 2008/09, the University of Reading's total emissions were 45,824 tonnes CO_2e

3.1 Current Scope

In line with current HEFCE requirements the University of Reading has measured its scope 1, 2 and some scope 3 emissions from 2009/10:

Table 3: Present scope of emissions

Scope 1 Emissions	Scope 2 Emissions	Scope 3 Emissions
Liquid fuels	Grid electricity	Business travel
Gaseous fuels		Waste
Vehicle fleet		Water

Scope 1 - emissions are direct emissions that occur from sources owned or controlled by the organisation, for example emissions from combustion in owned or controlled boilers/ furnaces/ vehicles;

Scope 2 - accounts for emissions from the generation of purchased electricity consumed by the organisation;

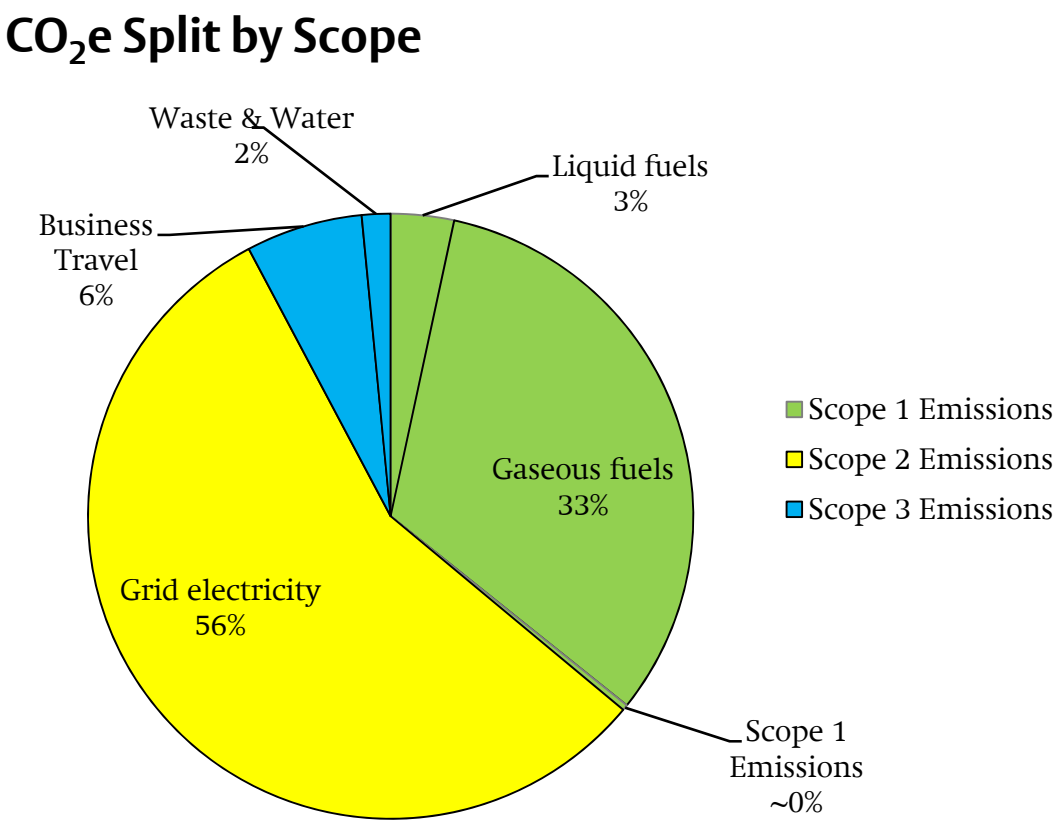
Scope 3 - covers all other indirect emissions that are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation – for example, commuting and procurement.

Historic refrigerant use data is not available and has not been including in emission calculations up to and including 2008/09. Refrigerant gas emissions will be included in carbon foot printing calculations starting from the 2010/11 academic year. Currently the maintenance team record quantities of such gases used to top up University systems, in accordance with legislation. Although this data has not previously been available, it is now being recorded electronically and will be reported on a monthly basis for inclusion in reports.

Breakdown of the Scope

The following chart shows the composition of the University of Reading's carbon footprint. The footprint breaks down into constituent scopes, by colour. Each coloured section is then further separated into the individual sources. From this chart, it quickly becomes clear that gas and electricity are our main sources of carbon, but that scope 2 emissions dominate the chart.

Chart 2: Breakdown of baseline 2008/09 CO_2e emissions by scope

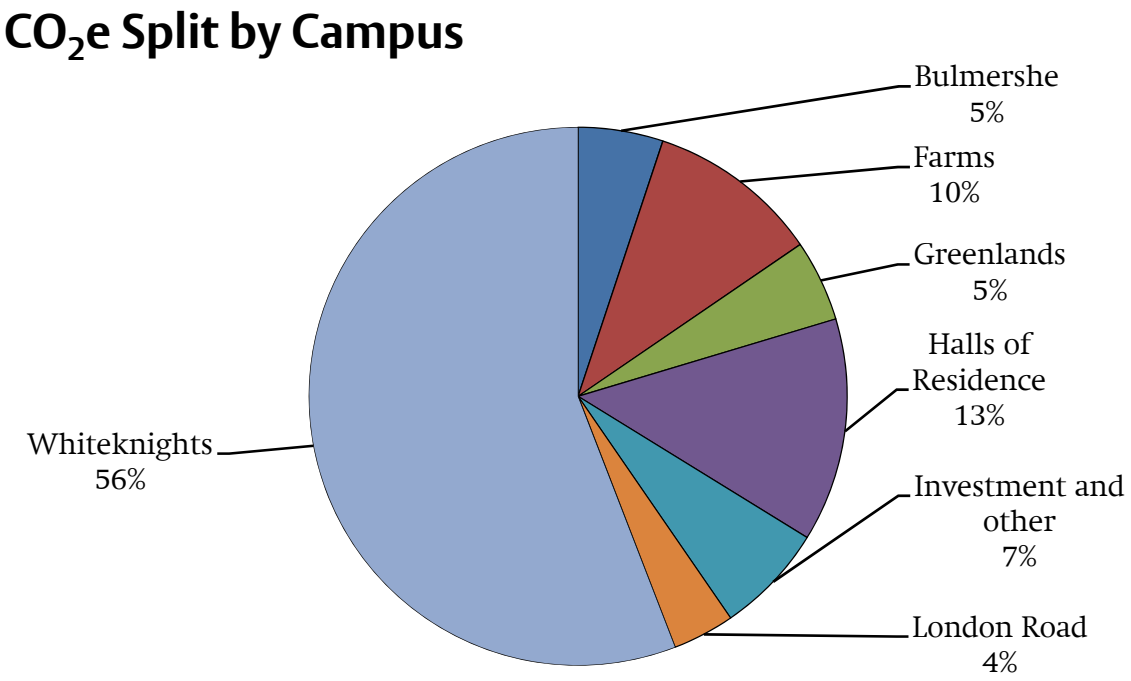


In addition to viewing the composition of our emissions from a source perspective, it is also useful to understand how different campuses and constituent parts around the University contribute to our total carbon footprint. The following chart breaks down University wide utility related emissions into distinct organisational categories: Whiteknights Campus; Bulmershe Campus; London Road Campus; Greenlands Campus; halls of residence (including onsite halls); farms and investment properties.

Chart 3 clearly demonstrates that carbon emissions from the University estate are dominated by the Whiteknights Campus. It is interesting to note that many of the Investment and Halls of Residence properties are also located on the Whiteknights campus, but have not been listed as such due to their alternative grouping. If emission sources were categorised on a purely geographical basis, the proportion of emissions from

the Whiteknights campus would increase further. This skew is due to the high density of research intensive buildings, in addition to the high concentration of staff on site.

Chart 3: Breakdown of baseline 2008/09 CO_2e emissions by campus



For ease of comparison, emissions associated with these activities have been normalised to CO_2e, a carbon equivalent value. Many gaseous emissions such as methane, nitrous oxides and refrigeration gases have a global warming potential (GWP), some far higher the carbon dioxide (CO_2). Therefore we use CO_2e as it normalises all gaseous emissions with a GWP.

This detailed data collection methodology has been applied to data for academic years since 2008/09. Academic years fit well with requirements to report Estate Management Statistics (EMS) to HEFCE. However this is not ideal in terms of the Carbon Reduction Commitment (CRC) reporting which is measured in calendar years. Therefore we aim to collect data on a monthly or quarterly basis to allow more flexible reporting.

The scope of utility data reported in the CMP includes all sites whose utilities are paid for by the University, including investment and commercial properties as matched by the utility monitoring and targeting (M&T) system scope and CRC. This includes more data than the HEFCE EMS, which only reports the non-residential and residential estates. This has significantly increased the reported value of our Carbon Footprint. For more information on the relationship between HEFCE EMS data and M&T data, please refer to Appendix B.

3.2 Baseline

In order to set targets in line with HEFCE's strategy the University of Reading has adopted the previously reported 2005/06 figure. For the academic year 2205/06 the University of Reading's previously reported Carbon Footprint was 28,998 tonnes CO_2e for Scope 1 and 2 emissions.

However for the purposes of the CMP, a new total emission baseline has been established. The University of Reading's carbon footprint for scope 1, 2 and 3 emissions during the academic year 2008/09 was 45,824 tonnes CO_2e, as outlined in Table 4 below. In total we spend over £4.9M per year on gas and electricity and over £2.5M in business travel.

Table 4: Breakdown of 2008/09 baseline data

Source	Tonnes CO_2e	Cost (£)
Liquid fuels	1,544	144,802
Gaseous fuels	14,837	1,588,913
Fleet	138	63,133
Grid Electricity	25,747	3,349,078
Business Travel	2,855	2,559,553
Waste and Water	703	1,036,480
Total	**45,824**	**8,741,959**

3.3 Changes to Scope

The University of Reading is a dynamic organisation. Since 2005, significant changes to the structure of the campus have taken place. These include but are not limited to:

Acquisition

- Henley Management College campus in 2008

New buildings:

- 2005/06 - Museum of English and Rural life, including document archive (411 tCO_2e/ annum[3])
- 2007/08 - Carrington Student Services (108 tCO_2e/annum[2])
- 2008/09 - Hopkins Life Sciences (540 tCO_2e/ annum[2])
- 2009/10 - Henley Business School (Whiteknights Campus) (314 tCO_2e/ annum[2])
- 2010/11 - Stenton and Mackinder Halls (1437 tCO_2e/ annum[4])
- 2010/11 - Enterprise Hub (157 tCO_2e/ annum[3])

[3] Consumption data taken from DEC certificate, carbon coefficient taken from Baseline tool

[4] Consumption estimate provided by construction contractor

- 2011/12 - Minghella Film, Theatre and Television (186 tCO_2e/ annum[3])
- 2012/13 - Phase 2 Halls of Residence Development (1696 tCO_2e/ annum[5])

Extensive upgrades and refurbishment throughout the estate

- Installation of new technology:
- Blade super computer (1518 tCO_2e/ annum[6])
- Neuro Science fMRI scanner
- Microscopy laboratory
- Chemical Analysis Laboratory

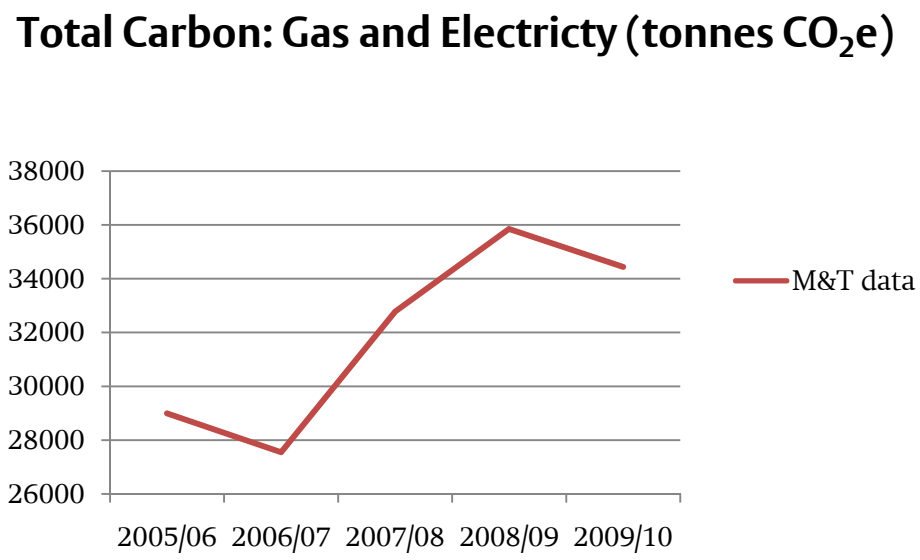
Removed Buildings:

- 2010/11: Bridges and Childs Halls of Residence (2172 tCO_2e/ annum[7])
- 2011/12: Sibly Halls of Residence (721 tCO_2e/ annum[2])
- 2012/13: Bulmershe Halls of Residence (794 tCO_2e/ annum[2])

As a direct result of this modernisation and expansion our scope 1 & 2 carbon emissions have seen a dramatic increase over time, as highlighted in Chart 4: Historic Scope 1 & 2 Emissions. As a research intensive university there is a high risk of conflict between carbon reduction and the potential for new high energy intensive research projects.

Noted that the scope 1 and 2 emissions exclude business travel, waste and water which is why this shows only 36,000 t CO2e as opposed to the 45,800 reported for the whole University.

Chart 4: Historic scope 1 & 2 emissions



[5] Estimate extrapolated from Stenton And MacKinder development

[6] Based on estimated usage

[7] M&T usage

HEFCE have started "to undertake work to assess what is required in order to monitor and report scope 3 emissions, including the measurement of a baseline of carbon emissions from procurement by December 2012 and setting target(s) for scope 3 emissions by December 2013."[8] HEFCE ITT, 11/10/2010,
http://www.hefce.ac.uk/itt/carbon_emissions.DOC

In conjunction with its School of Construction Management and Engineering, the University of Reading is compiling a plan to increase the range of scope 3 emissions to be included in our carbon footprint. This may include data such as staff and student commuting, procurement decisions and food miles associated with onsite catering.

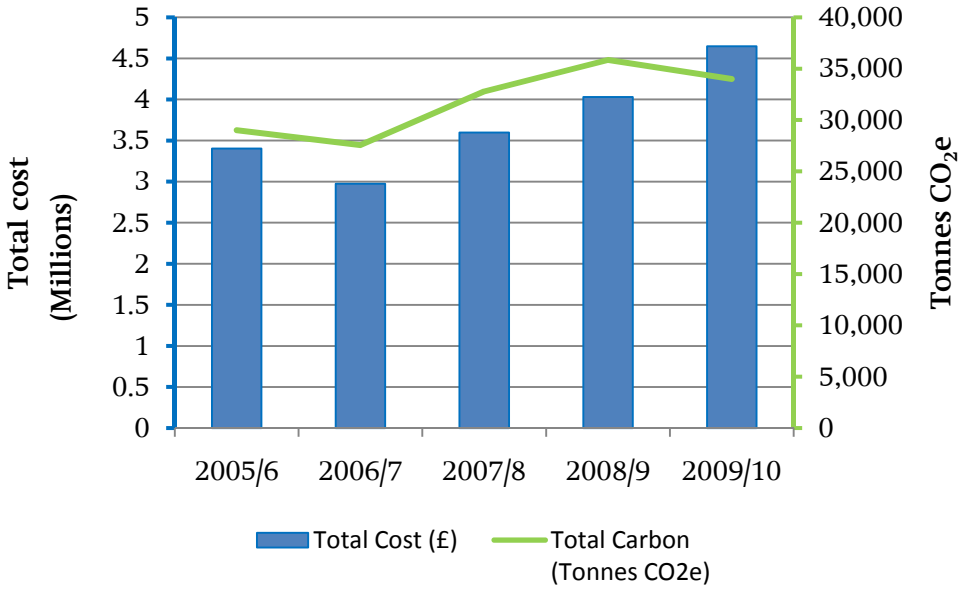
In addition to the increase in types of scope 3 emissions reported, we also aim to reinforce our scope 1 emissions. From 2010/11, the University of Reading will include refrigerants (fugitive emissions from air conditioning).

3.4 Value at Stake

To ensure realistic targets are set and to predict the impact of different projects in the CMP, a model has been developed to project the University of Reading's carbon footprint over the next 10 years. As the cost of utilities is a major driver, the following section examines the savings the University of Reading will realise if the carbon reduction targets are met and compares this to the financial impacts of not implementing the CMP.

Before looking ahead it is helpful to examine where we have come from. Utility markets are volatile, but the general trend is of increasing costs as illustrated by the graph below. As an example, the University of Reading electricity costs have risen from 5.4p/kWh in 2003/4 to 8.4p/kWh in 2010/11. This represents an increase of 55% over 8 years.

Chart 5: Historic utility costs and consumption

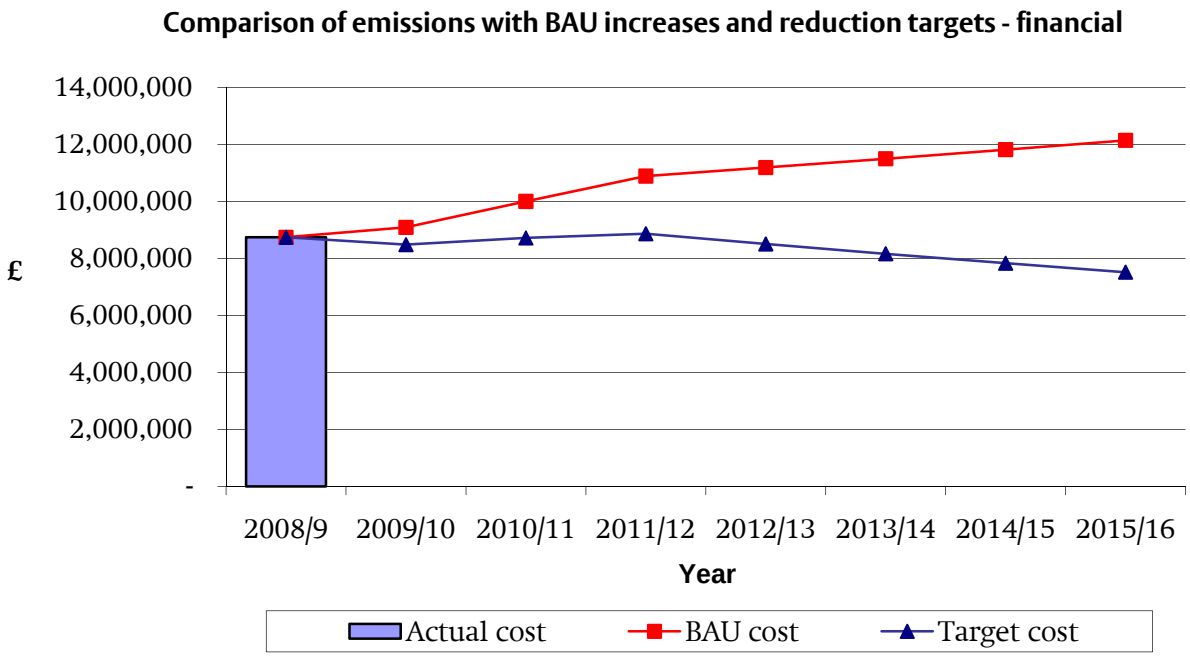


[8] Source: HEFCE ITT, 11/10/2010, http://www.hefce.ac.uk/itt/carbon_emissions.DOC

As can be seen from Chart 5, despite the reduction in consumption of gas and electricity between 2008/09 and 2009/10, we have still faced increasing costs. This shows that even though we are reducing our consumption, our costs are increasing at a greater rate. This focuses attention more clearly on the utility budgets and emphasises the financial importance of reducing our consumption, hence carbon footprint. We can see that there is a clear business case for reducing our emissions.

It is important to understand how this relationship will develop over time. Will increasing costs outweigh our efforts to reduce emissions, or will the reduced emissions lead to a multiplier effect on our cost savings? The following chart demonstrates the value at stake, or opportunity cost of meeting our carbon reduction targets of 35% by 2015/16.

Chart 6: Value at stake



The value at stake represented in the chart above can be seen between the red and blue lines. The upper, red line represents our costs if we were to continue along a business as usual model. This would assume that all existing carbon reduction programmes stay in place but no more work is done. The blue line represents the expected expenditure if the targets set out within this document are met. Both lines account for the changes to the estate detailed earlier in this chapter. The CRC is also taken into account and is represented by the steep climb to the 2011/12 point on the chart. The value at stake demonstrates that reducing our carbon by 35% by 2015/16, we stand to save £18.5 million over the 7 years.

The cumulative value at stake of reducing our carbon by 35% by 2015/16 is £18.5 million over 7 years.

3.5 Summary of Carbon Emissions and Targets

The University of Reading has been set stretching carbon reduction targets alongside those included with in the CMP, including those associated with CIF2 (HEFCE Capital Investment Framework). The following section explains the relationship between the CMP baseline and CMP targets. For further details on the relationship between CIF targets and CMP data, including the differences in scope, please refer to Appendix B.

In addition to the 35% carbon reduction target that has been set at the University of Reading a 45% reduction has also been agreed for 2020. Table 5 outlines our key milestones.

Table 5: Carbon reduction milestones:

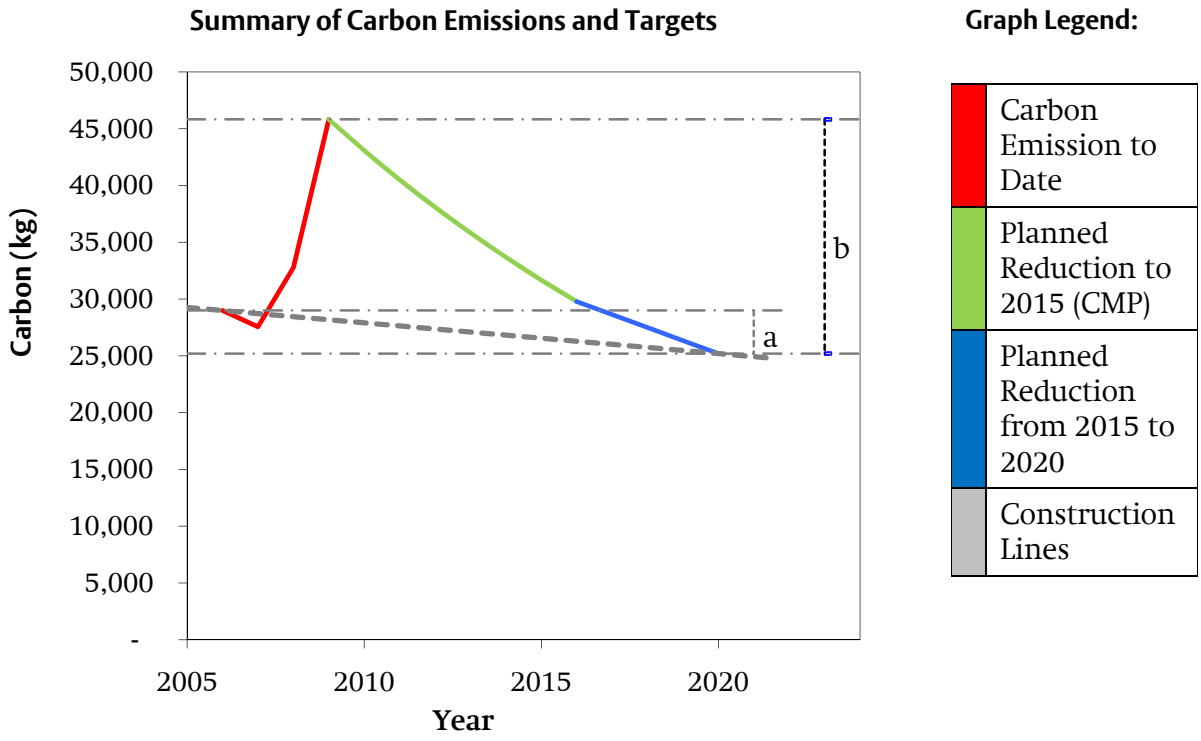
Year	Tonnes CO_2e	Significance
2005/06	28,998	2005/06 EMS p, used for CIF2 reduction targets. Scope 1 & 2
2008/09	45,824	CMP baseline. Scope 1, 2 & some scope 3
2015/16	29,786	35% target on CMP baseline. Scope 1 ,2 & 3
2019/20	25,203	45% target on CMP baseline. Scope 1 ,2 & 3

Achieving the 45% University of Reading reduction target by 2020 will result in the a reduction in reported carbon emissions of 13.1% when compared against the 2005/06 EMS return, used for CIF2 reduction targets.

The data in Table 5 is represented graphically in Chart 7: Summary of Carbon Emissions and Targets. The following points summarise the chart:

- The red line of the chart is our carbon emissions to date. The dramatic increase in emissions is due to the increase in scope, highlighted in Appendix B and earlier in this section.
- The green line shows the reductions that must be made in order for us to meet the 35% target for 2015/16 academic year.
- The blue line shows how we will move from the 2015/16 position to the final target reduction of 45% against 2008/09 by 2020.
- ‘a’ represents an absolute reduction of 13.1% in carbon emissions against 2005/06 EMS return, used for CIF2 reduction targets, for further detail, including clarification on the scopes used, please refer to Appendix B.
- ‘b’ represents the reduction that must be made from the total emissions baseline to achieve an absolute reduction of 45% by 2019/20.

Chart 7: Summary of carbon emissions and targets:



The carbon emissions to date line increases significantly as explained previously due to the University of Reading using a wider scope than the original Estates Management Statistics (EMS). The EMS as explained in Appendix B excludes much of the University portfolio such as investment properties (7%) additional carbon along with business travel (6%) and waste/water (2%). Despite this we feel that we have a challenging task ahead of us to achieve the targets that have been set. However, investment in carbon cutting technology and practices is currently increasing at the University and the plans set out in this document clearly demonstrate how this target will be achieved.

4. Carbon Management Projects

The plan reflects the need to prioritise the identified and costed opportunities. This has been done on the basis of internally agreed criteria, in particular cost (and affordability) and impact (energy and carbon savings). The results are a prioritised list of interventions that clearly demonstrates the cost and impact of each intervention.

Below are listed projects identified during the HECMP management process from the University Infrastructure Plans, Estate Strategy, experience and knowledge of the Project Team members and existing survey reports. The list is not exhaustive and will be added to through the life time of the CMP.

The table below gives a summary of the projects and the funding requirements. It can be seen that many projects have been completed prior to the formulation of the CMP which have been captured to show the significant savings achievements to date.

Table 6: Project funding

Project	Cost		Annual savings (year 1)		% of target
	Capital	Revenue	Financial (Gross)	tCO_2e	
Completed projects (since 2008/09 baseline)	£471,188	£39,440	£373,557	3,480	21.6%
Planned / funded projects	£251,750	£150,000	£773,971	6,377	39.59%
Near term projects (to be funded)	£645,737	£0	£139,309	1,206	7.48%
Medium to long term projects (to be funded)	£2,075,000	£0	£242,278	2404	14.98%
Total	**£3,443,673**	**£189,440**	**£1,529,115**	**13,467**	**84%**

4.1 Completed projects (Since 2008/09 baseline)

One of the highlights of the work carried out by the University of Reading is the work on behavioural change.

The University of Reading won the 'Office Depot Award for Green Innovation 2010' in association with the Degrees Cooler program. The project changed building user behaviour by providing improved data on energy performance of the building. Savings of over 25% in lighting and small electrical item electricity consumption can be directly attributed to this work. The University partnered with Carnego Systems to deliver this innovative project. This project is now being rolled out across campus as part of our Higher Education Carbon Management Plan target of a 35% reduction in our carbon by 2015/16 against a 2008/09 baseline.

Once a building is occupied, the potential to save energy relies heavily on building users. The University of Reading recognises the importance of working with staff and students to

change traditional practices to promote sustainable behaviour. We chose to use the Carrington Building as this was designed as our most efficient building. It incorporates ground source heat pumps, flexible office space and better than building standards insulation. Since good practice was already embodied in the building, we felt that the users would be receptive to further sustainable practices.

Sustainable savings of over 25% have been obtained on a day to day basis. Out of hours usage has been reduced by up to 40% whilst safeguarding staff productivity in this busy centre. The projects user-behaviour approach differs in two key respects to anything similar. Firstly, it has a solid theoretical basis devised through close collaboration with leading behavioural scientists to use information to achieve long-term changes in the behaviour of building users. Secondly, it relies on unusually granular data to reveal trends that would otherwise remain hidden. For further information, please contact eest@reading.ac.uk, or contact Tom Yearley on 0118 378 4472

In 2010 the University Reading obtained £200k SALIX Loan Funding to carry out some basic pipe work and valve insulation, BMS control upgrades, supply and install variable speed drives and lighting controls. A further £140k Salix Loan has just been approved for some further pipe work and valve insulation and BMS control upgrades. As with most projects, this is a never ending task and obtaining additional funding now to make savings immediately is vital to meeting our 35% target and beyond.

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	NPV (£)	% of Target	Year
			Capital	Revenue	Financial (Gross)	tCO_2e				
UoR 01	Insulation to pipe work and valves	NF	£68,208		£41,250	459.9	1.7	£611,654	2.85%	2010
UoR 02	Lighting control Carrington and Sports Park	NF	£67,550		£12,400	94.9	5.4	£35,576	0.59%	2010
UoR 03	Variable speed drives URS, Library and Palmer	NF	£29,758		£6,240	47.8	4.8	£22,138	0.30%	2010
UoR 04	BMS Installation Greenlands Campus	CB	£20,935		£4,070	45.4	5.1	£12,914	0.28%	2010
UoR 05	LED Lighting Greenow and McCrombie	NF	£12,911		£2,400	18.4	5.4	£7,049	0.11%	2010
UoR 06	Behavioural Change Whiteknights and Palmer Buildings (TCT)	TY	£12,000		£3,301	25.3	3.6	£15,453	0.16%	2010
UoR 07	Behavioural Change Carrington, Greenow, McCrombie and RUSU	TY	£15,826	£1,440	£5,200	39.8	4.2	£15,444	0.25%	2010
UoR 08	Green Impact	TY	£7,500		£7,700	58.9	1.0	£56,538	0.37%	2010
UoR 09	Greenlands Boiler replacement	ME	£200,000		£31,394	335.2	6.4	£246,183	2.08%	2010
UoR 10	Awareness raising campaign	TY	£0	£38,000	£38,000	290.8	0.0	£0	1.81%	2010
UoR 11	Student Switch Off (1st Year)	TY	£7,500	£0	£7,821	59.9	1.0	£7,358	0.37%	2011
UoR 12	Free Cooling Maths IT room	NF	£29,000		£12,463	95.4	2.3	£74,654	0.59%	2010
UoR 13	Closure Bridges Hall	ME	£0	£0	£102,235	973.0	0.0	£1,684,986	6.04%	2010
UoR 14	Closure Childs Hall	ME	£0	£0	£99,083	935.3	0.0	£1,633,040	5.80%	2010

UoR 15	Refurbishment HUMSS	ME	TBA		£0				0.00%	2010
UoR 16	Security Room	NF	TBA		£0				0.00%	2010
Total			£471,188	£39,440	£373,557	3,480	1.37	£4,422,987	21.6%	

4.2 Planned / funded projects

A number of audits and surveys have been carried out over the past few years and there have been numerous energy savings measures that have already been put in place as a result of this.

The following list includes projects identified for which capital and revenue funding has been allocated. Some of these are 'quick win' projects and others longer term. It is important to firstly pick up some of the 'quick wins' so that funding can be available for re-investment. It is also important that some of the more challenging projects are tackled early if we are to meet our ultimate targets. We do not wish to leave all of the more challenging projects, whether for financial or strategic reasons, to the latter stages of the plan. There needs to be a mix of projects and this plan reflects that.

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	NPV	% of Target	Year
			Capital	Revenue	Financial (Gross)	tCO_2e				
UoR 17	Switch off Blade super computer	MC	£0	£0	£145,065	1110.3	0.0	£2,390,891	6.89%	2011
UoR 18	Student Switch Off (2nd Year)	TY	£7,500	£0	£7,700	58.9	1.0	£7,128	0.37%	2011
UoR 22	Awareness raising campaign	TY	£0	£50,000	£57,494	440.0	0.0	£20,995	2.73%	2011
UoR 23	Closure Bulmershe Campus	ME	£0	£0	£77,944	708.8	0.0	£1,284,631	4.40%	2012
UoR 24	Switch off computers overnight and at weekends	MC	TBA	£0	£216,000	1653.2	0.0	1,796,387	10.26%	2012
UoR 25	Closure Sibly Hall	ME	£0	£0	£76,180	699.1	0.0	£1,255,569	4.34%	2012
UoR 27	Awareness raising campaign	TY	£0	£50,000	£57,494	440.0	0.0	£20,995	2.73%	2013
UoR 28	Awareness raising campaign	TY	£0	£50,000	£57,494	440.0	0.0	£20995	2.73%	2015
UoR 29	Insulation to pipework and valves	NF	£55,000	£0	£30,000	334.5	1.8	£439,445	2.08%	2012
UoR 26	Fume cupboards STC	DG	£61,500	£0	£13,662	152.3	4.5	£52,121	0.95%	2012
UoR 19	BMS fine tuning to align with operational times	CB	£22,250	£0	£6,374	71.1	3.5	£30,760	0.44%	2011
UoR 20	Upgrade BMS and install expanded coverage Greenlands	CB	£45,500	£0	£14,344	159.9	3.2	£73,793	0.99%	2011
UoR 46	Lighting control Chemistry and Food Bio	NF	£60,000	£0	£14,220	108.8	4.2	£58,262	0.68%	2011
Total			£251,750	£150,000	£773,971	6,377	51.9	£7,451,972	39.59%	

Workshops, open to all staff and students, were held to identify further measures that could reduce carbon emissions across the campuses. The tables below show the shortlisted emissions reduction opportunities realised from these workshops, and through an Opportunities Assessment carried out by the Carbon Trust:

4.3 Near term projects (to be funded)

This list includes some of the more challenging projects where funding has yet to be allocated or further feasibility is required to give a more detailed analysis.

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	NPV	% of Target	Year
			Capital	Revenue	Financial (Gross)	tCO_2e				
UoR 21	IT Management Software	MC	£800	£0	£256	2.0	3.1	£1,329	0.01%	2011
UoR 30	Free Cooling	NF	£4,500	£0	£1,067	8.2	4.2	£4,374	0.05%	2012
UoR 31	Optimiser control of cooling in Data Centre	CB	£2,500	£0	£500	5.6	5.0	£1,658	0.03%	2012
UoR 32	Heating controls and systems and BMS	CB	£141,437	£0	£30,000	334.5	4.7	£108,601	2.08%	2013
UoR 33	Virtualisation/thin computer	MC	£19,500	£0	£4,267	32.7	4.6	£15,987	0.20%	2014
UoR 34	Heating zoning	NF	£48,000	£0	£9,519	106.1	5.0	£31,166	0.66%	2014
UoR 35	Lighting upgrade to T5 high frequency	ME	£400,000	£0	£81,237	621.8	4.9	£275,616	3.86%	2014
UoR 45	Free Cooling Agriculture	NF	£29,000		£12,463	95.4	2.3	£74,654	0.59%	2015
Total			£645,737	£0	£139,309	1,206	4.6%	£512,845	7.48%	

4.4 Medium to long term projects (to be funded)

The following lists projects which deal with longer term 'planned maintenance', use of third party suppliers, long term payback and legislative changes which require to be addressed. These projects although not yet funded, are high on the priority for the University if long term savings are to be maintained.

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	NPV	% of Target	Year
			Capital	Revenue	Financial (Gross)	tCO_2e				
UoR 41	Boiler replacement programme	ME	£240,000	£0	£40,534	451.9	5.9	£336,086	2.80%	2015
UoR 36	Reduce total of non-residential area by 15%	JP	£800,000	£0	£75,660	694.4	10.6	£275,310	4.33%	2014
UoR 37	Reduce number of building used out of hours	JP	£0		£2,742	25.6	0.0	£22,804	0.16%	2012
UoR 38	Reduce heating season by one week either end of season	JP	TBA		£0				0.00%	
UoR 39	Double Glazing in Whiteknights House	ME	£660,000	£0	£16,500	184.0	no pay back	£-388,055	1.15%	2015
UoR 40	Roof Insulation	ME	TBA		£0				0.00%	
UoR 42	CHP/District Heating Energy Centre	ME	TBA		£0				0.00%	
UoR 43	Fume Cupboards controls	NF	£300,000	£0	£66,000	735.8	4.5	£248,896	4.59%	2015
UoR 44	Solar PV roof Project	NF	£0	£0	£19,512	149.3	0.0	£321,593	0.93%	2011
UoR 47	Upgrading of Air Conditioning	NF	75,000		£21,330	263.3	3.5	£102,393	1.02%	2011
Total			£2,075,000	£0	£242,278	2404	8.6	£919,027	14.98%	

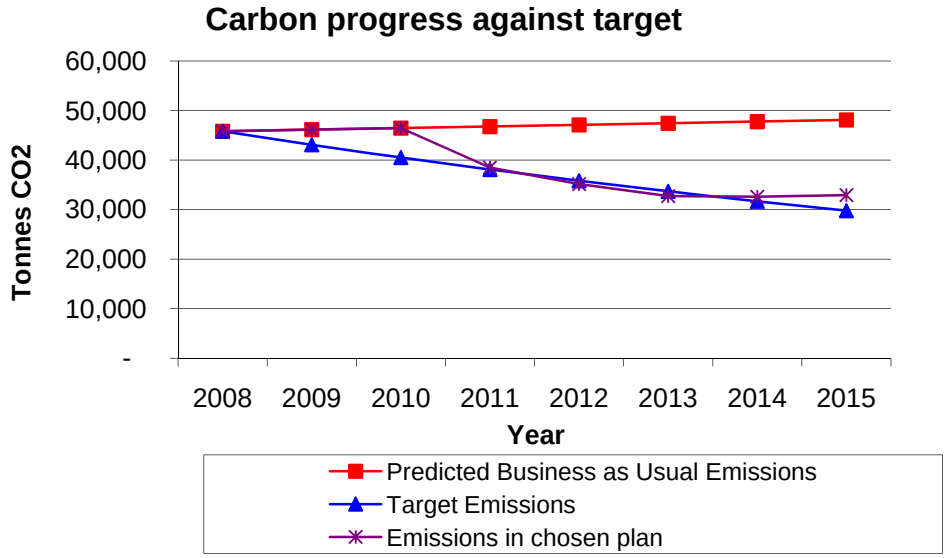
The rational employed in choosing projects has been to identify 'quick wins' with a high financial impact first. However, the need for a quick financial benefit has been weighed against the need to include some of the less easy projects or more costly projects with a longer term view. The need for the mix was identified early to ensure that not all the 'low lying fruit' is picked early and only the 'too difficult' projects left far off in the future.

4.5 Projected achievement towards target

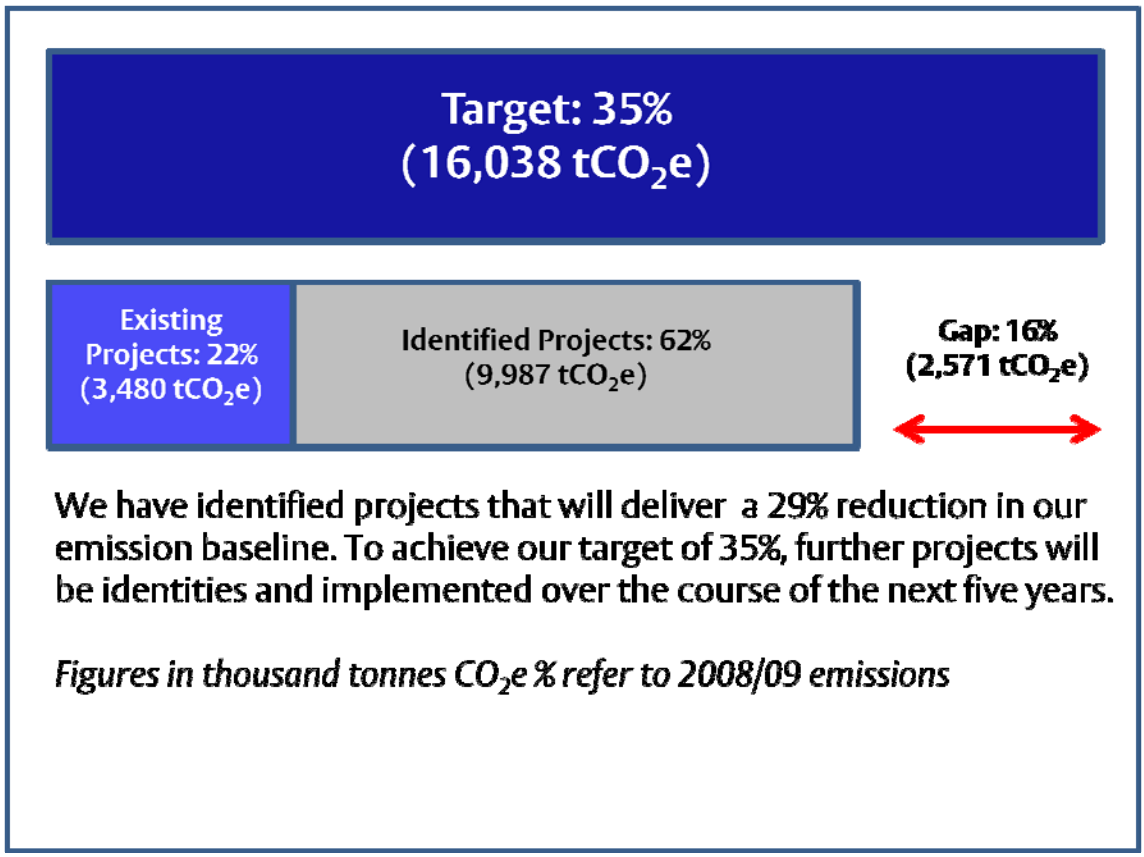
The table below shows the total carbon savings from the projects in tonnes of CO_2e anticipated towards the 35% carbon reduction (16,038 tonnes) by the end of the 2015/16 academic year.

If compared to the Business As Usual scenario, the total aggregated emissions savings between 2008/09 to 2015/16 by implementing all identified projects is predicted to be 13,463 tonnes of CO_2e.

Chart 8: Carbon progress against target



Projects identified in this plan so far realise approximately 84% of the University of Reading carbon reduction target. The University of Reading is confident that through further internal and external energy audits and the increases in potential for renewable energy projects, carbon reduction projects will successfully be identified to fulfil this target fully by 2015/16.



We have identified projects that will deliver a 29% reduction in our emission baseline. To achieve our target of 35%, further projects will be identities and implemented over the course of the next five years.

Figures in thousand tonnes CO_2e % refer to 2008/09 emissions

5. Carbon Management Plan Financing

Introduction

The University of Reading's CMP is expected to deliver significant financial savings over the next five years 2010/11 to 2015/16, as well as meeting the 35% overall emissions target. Meeting the 35% target should lead to an overall saving of £18.5m compared to business as usual scenario (BAU).

By the end of 2015/16, the total financial savings in reduced energy costs delivered by the projects outlined above in section 4 will be £6.2m for an overall expenditure on new projects of £3.6m, giving a net financial saving of £2.6m. (These savings do not include the amounts saved on the CRC). By 2016 these projects alone will reach 84% of the University's target.

The University has also made a commitment to a £113m capital expenditure programme over the next five years, and within this are a number of projects which will be included in the carbon management programme in the period to 2016 – most notably the new Heating Plant. The University of Reading however recognises funds from the Government for earmarked capital streams are not expected to be at the levels enjoyed by the sector throughout the last decade. The University therefore will seek to use its existing funding streams – for example, the significant allocations it sets aside for the maintenance of its estate – in a prudent and imaginative manner, directing such necessary spending into technologies and solutions which can provide cost-effective means of permanently reducing carbon emissions. Where savings are made a proportion of these savings will be made available for additional investment.

The University recognises, primarily, the role of behavioural change in making lasting reductions, and has already put in place staff resource for the Energy Manager in order to help maximise awareness of the need for all staff to act, rather than rely on a few flagship capital programmes. The Energy Manager is the project lead at the University for the CMP.

5.1 Assumptions

The following financial / pricing assumptions have been made relating to the projects being planned, and in working out their potential financial benefits.

- Electricity price assumed for the 2008/09 baseline: 7.11p/kWh
- Gas price assumed for the 2008/09 baseline: 1.97p kWh
- Oil: 2.59p/KWh

Where specific contracts are not already in place, annual increase in price is assumed to be 1.7% per year on year for the period of the plan to 2015/16. As noted above, the Carbon Reduction Commitment (CRC) will have a significant cost implication on the University of Reading, expected to be in the region of £500k in the first year, and within the BAU model, this is factored into 2011/2012. This has been accounted for in the reduced emissions scenario but the impact is reduced as carbon emissions are also reduced.

It is assumed that adequate staffing within the Energy Management team is available for the duration of the Programme Plan.

A combination of NPV and payback period has been used to prioritise projects; the latter is especially valuable when planning to feed savings back into a notional fund used for future projects.

5.2 Benefits / savings – quantified and un-quantified

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Annual cost saving	365,736	638,522	1,056,617	1,144,111	1,314,794	1,507,794	1,507,785
Annual CO_2e saving	3,420	5,580	9,168	9,942	11,397	13,304	13,304
% of target achieved	21%	35%	57%	62%	71%	83%	83%

Assume target = 35% of baseline 45,824 tonnes = 16,038 tonnes
Percentage of target achieved = actual achieved to date/target

As noted above, the value at stake figure is significantly higher than these savings, due to the impact of the CRC savings, which are not presented in the savings generated by the projects list.

Unquantified benefits:

- International reputation of the University (already in the top 200 Universities ranking) will be enhanced. The already established 'green' subjects of Meterology and Agriculture can only be helped by achieving a challenging carbon reduction target
- Increased attractiveness to students; recruitment materials can include our progress towards a reduction target
- Permanent behavioural change amongst students and staff that they will carry beyond the confines of the University, to their own domestic homes and future workplaces, thereby aiding the UK's long-term emissions reduction targets
- Compliance with other requirements, such as the CIF2 scheme, thereby safeguarding possible income streams from these sources.

5.3 Additional resources

As above, the key resources that are required are:

- Staff resource to ensure that projects can be continually identified
- Staff ensuring that any funding opportunities are identified in as timely a manner as possible
- Constant awareness-raising campaigns are maintained
- Senior management time is always available to prioritise the carbon reduction agenda

These resources are not necessarily incremental financial costs, but require an adequately resourced core team around the Energy Manager and a cultural investment by the University. This will involve willingness for staff across the University to devote time outside of their normal duties to the Carbon Management agenda.

5.4 Financial costs and sources of funding

Figures in £ 1000's	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Annual Costs:							
Total annual capital cost	464	219	124	141	1,267	1,229	-
Total annual revenue cost	39	50	-	50	-	50	-
Total costs	503	269	124	191	1,267	1,279	-
Committed funding:							
Committed annual capital	464	140	-	-	-	-	-
Committed annual revenue	39	50	-	-	-	-	-
Total funded	503	194	-	-	-	-	-
Unallocated funding							
Unallocated annual capital	-	79	124	141	1,267	1,229	-
Unallocated annual revenue	-	-	-	50	-	50	-
Total unfunded	-	79	124	191	1,267	1,279	-

For 2009/10, all funding was from recurrent budgets, and from a loan from Salix.

For 2010/11, all funding (including under the heading of capital) is to be met from recurrent capital budgets reallocated for this purpose and from a further loan from Salix.

From 2011/12, the University will look at all bids for capital funding within its normal capital projects appraisal process. They will have to meet the same criteria for investment as other bids.

The University is also committed to using, where appropriate, any funding sources which may become available; these include Salix funding or other low-interest loans, or any other governmental or non-governmental income streams which may emerge over the period of the Carbon Management Plan.

The Energy Manger will be responsible for co-ordinating any process by which these funds are secured. Identifying potential funding sources will be the responsibility of the Project Team, working with the University's Finance department.

The Project Team will monitor the risk that funding sources cannot be identified for future works and report back to the Project Board. The University recognises that the absence of funding for the programme is a risk towards attaining the target, and the University's annual budget-setting process will take into account the importance of this target of 35% alongside the University's other business priorities.

6. Actions to Embed Carbon Management in Your Organisation

The following actions will lead to or facilitate future emissions reduction and will help to embed carbon management into the University policies, procedures, objectives and actions. The Carbon Management Embedding Matrix has been included at Appendix A, and highlights different actions that will result in varying degrees of embedding of carbon management. The sections below detail the University's current positions within this matrix, and where we expect to be once enabling actions have been completed.

6.1 Policy – embedding CO_2e saving across your organisation

The Carbon Management Plan is endorsed by Professor Gordon Marshall, Vice Chancellor and Professor Tony Downes Deputy Vice Chancellor.

The Carbon Management Plan and the CO_2e reduction target are also to be published and made available on the intranet and internet for access by all interested stakeholders. This will ensure that the University's commitment is clear, and reinforces the need for action within the organisation. The CMP will be embedded in the next 3 year Estate Strategy covering the period from 2014 which is due to be published in 2011/12.

The Carbon Management Plan and set CO_2e targets will also be included in Corporate Plans, Estates Strategies, and other high level plans as they come up for review. The Deputy Vice Chancellor will issue an instruction through the line management structure to reinforce the importance of carbon consciousness in everyday business.

6.2 Responsibility – making it clear that saving CO_2e is everyone's job

All Heads of Schools and Heads of Directorate are to be encouraged to include carbon management and energy efficiency within their directorate business plans and School activities (reference to Appendix 02, 03, 07 and 08).

The Carbon Management Plan and set CO_2e targets will also be included in Corporate Plans, Estates Strategies, and other high level plans.

The Deputy Vice Chancellor will issue an instruction through the line management structure to reinforce the importance of carbon consciousness in everyday business.

It is vital to communicate to all staff and students how they can reduce CO2e throughout the University. Therefore resourcing has increased since 2208/09. We have expanded the Energy Management staffing to include a dedicated Energy Manager, Energy Officer, Carbon Data Analyst and Energy Administrator within the University.

It is important to note that the carbon footprint associated with construction waste and travel is expected to grow as our data collection in these areas improves. This will also be the case with data associated with refrigeration gas emissions and food.

It is everyone's responsibility and the following gives an overview of what needs to be done:

Message strategy

- To raise awareness of the University's commitment to the HECM Plan among staff and students, and to have a positive impact upon individual staff behaviour in terms of energy consumption.
- To launch the project/campaign during Green Week in November and to ensure that regular communication follows, up to the point of the University completing the Project to identify how it will make these savings – March 2011. At this point, specific goals need to be communicated and regular communication throughout the remaining five years of the project.
- To engage with the University's Communications team to benefit from their expertise in communications techniques.

Key messages

- The University has ambitious aims for improving environmental and energy management throughout the University and our estates in order to reduce the environmental impact of our operations.
- The University's senior management has committed the University to reducing its carbon footprint by 35% by 2015/16 (based on 2208/09 baseline).
- All staff will have to play a part in contributing to that saving through the Carbon Management Plan
- The University spends over £5 million on its annual energy bill and uses the equivalent of 45,824 tonnes of CO_2e. With energy prices constantly increasing and funding cuts for HEIs, we need to reduce our consumption, cost and carbon.

Audiences

- The University's 4000 staff, spread across four campuses, is the core audience, in particular those responsible for building management and major areas of energy consumption.
- Sponsors of new projects that will impact on energy consumption. However, at least 10% of the University's energy consumption derives from individual's behaviour so changing the culture of energy consumption will have a positive long-term benefit on the University's energy consumption.
- Students – in the way in which they consume energy on campus, through halls of residence in particular
- Local community and stakeholders – to demonstrate our leadership in this field
- Prospective students – to attract environmentally conscious students to apply to the university
- Education stakeholders – to demonstrate that sustainability is a core part of the University's activity and to ensure related funding is forthcoming

6.3 Data Management

Data collection will take place annually and will be compiled by the Energy Manager, Energy Officer and the Carbon Data Analyst. This will be communicated annually to staff and students, making reference to targets and previous performance, through the Annual

Environmental and Sustainability Report. All data is currently recorded on a monthly basis. By measuring the difference various initiatives have had on carbon emissions, the benefits can also be measured.

6.4 Communication and Training

To build engagement and raise the profile of sustainability across the University, a team of Environmental Champions has been recruited from amongst the staff and students. These environmental ambassadors are leading the University's involvement in the Green Impact Scheme "Degrees Cooler". This scheme is run by EEST and awards made at the annual Green Week

Training

The University's staff induction programme includes environmental awareness and a programme of basic environmental training is currently being developed.

Training is provided to the Environmental Champions via lunchtime seminars and to building managers via briefing meetings.

EEST offer training to specific groups of staff such as the cleaning team, security and porters, as well as academic departments. This has included: information regarding the need to recycle and emphasising their role in reducing energy consumption out of hours.

Website

Up to date information on all aspects of sustainability can be accessed at:
www.reading.ac.uk/cleanandgreen

6.5 Finance and Investment

Finance and Investment detail has previously been covered in detail at Section 5.

6.6 Procurement – engaging suppliers

The University has a detailed code of practice for sustainable procurement: the University's Guide to Sustainable Procurement

The Procurement department constantly tries to ensure that when possible, the University buys 'green'. Not only through ensuring University suppliers have green credentials but also in the way we work. Purchase to Pay is the first stage of our e-procurement programme which means orders are e-mailed to suppliers, cutting down on 1000's of paper orders (and copies) each year and stopping the need for our orders to be transported via Royal Mail in vans up and down the country.

An e-tendering system is used cutting out the need for any paper between the University and the supplier and once again cutting out the transport needs for the tender to be delivered to the University by post.

As part of the tender process, suppliers must provide:

- A copy of their Environmental Policy
- Examples of environmental good practice

- Details of any court cases brought against them

The University works with suppliers to ensure they are as 'green' as possible.

Waste - the University's contractor for waste management was one of the first waste companies in the country to have a fully calibrated pay-by-weight vehicle which is dedicated to the University contract service. This means we will know exactly what waste we have produced and whether we can recycle more, and just as important, we will only pay for collection of actual waste - in the past we may have been charged for collection of a bin even if empty.

When disposing of our PCs through a contracted waste disposal company only 1% of the PC goes to landfill, 99% is recycled.

Junk mail - Procurement is trying to reduce the amount of junk mail it gets especially from non-contracted suppliers. They contact each supplier when a piece of mail is received, explaining that in future they should refrain from sending such items, and instead either register as a supplier on our website or, if they have to send mail, to use email. Previously, dozens of letters and catalogues were received each day and as a result of this policy this is slowly reducing.

Procurement also work with suppliers to ensure that deliveries to campus are cut down. Where possible orders placed by the University are consolidated into a minimal number of deliveries.

6.7 Monitoring and Evaluation – keeping track of progress

Following acceptance of the CMP and during the subsequent years in which the carbon reduction projects will be put into operation, there will be regular updates on the Programme targets and evaluation of the Programme status. This will:-

- ensure that carbon management is being implemented effectively
- enable management to be improved and optimised where appropriate
- provide data that can be used to update the emissions targets and Programme scheduling.

Procedures for reviewing performance see Section 7

Procedures for updating plan and targets see Section 7

Procedures for reporting achievements see Section 7

7. Programme Management of the CM Programme

The governance of the programme, as well as the strategic ownership of the carbon reduction target, will continue to rest with the Carbon Management Project Board, composed of appropriate members of senior staff from both academic departments and the Facilities Management Directorate.

The members of the Environment and Sustainability Committee will also have oversight of the programme to encourage delivery by the identification and removal of blockages. The members can also ensure the coherence and coordination of the carbon reduction activity.

This section sets out all those people:

- who need to be directly involved in the project (i.e. the Carbon Management Project Team),
- who will have governance, management oversight or make decisions relating to the project (i.e. the Project Sponsor, Carbon Management Programme Board and Environment and Sustainability Committee at senior levels) and
- other individuals or groups, less directly involved, but who are important to a successful outcome.

7.1 The Programme Board – strategic ownership and oversight

Role	Name and position in the HEI	Contact details
Sponsor (Chair)	Professor Tony Downes Deputy Vice-Chancellor	0118 378 8597 t.a.downes@reading.ac.uk
Sponsor	Colin Robbins Director Estates and Facilities Management	0118 378 8277 c.robbins@reading.ac.uk
	Professor Christopher Hilson Head of Law School	0118 378 7501 c.j.hilson@reading.ac.uk
	Simon Mealor Capital Accountant	0118 378 6135 s.e.mealor@reading.ac.uk
	Hannah Cooper Student Representative	0787 060 1782 hannahcooper40@hotmail.com
Co-Lead	Denise Shearman Head of Campus Services	0118 378 6246 d.a.shearman@reading.ac.uk

Lead	Nigel Hodgson Energy Manager	0118 378 5075 n.hodgson@reading.ac.uk
	Louise Sharman Project Board and Team Secretary	0118 378 6554 l.v.sharman@reading.ac.uk

- The Project Lead will meet at least quarterly with the Project Sponsors to discuss progress.
- The Carbon Management Programme Board will meet quarterly following the Project Team to discuss any issues raised at the earliest opportunity.
- The Environment and Sustainability Committee meets termly and receives reports from the Carbon Management Project Board

Terms of reference of the Board Members: -

The Programme Board will:

- Bring together a number of initiatives contributing to a single aim.
- Provide regular, strategic oversight and monitoring of progress against plan.
- Raise 'blockages' to a level where they could be removed.
- Manage the expectations of key stakeholders.

The Programme Board terms of reference:

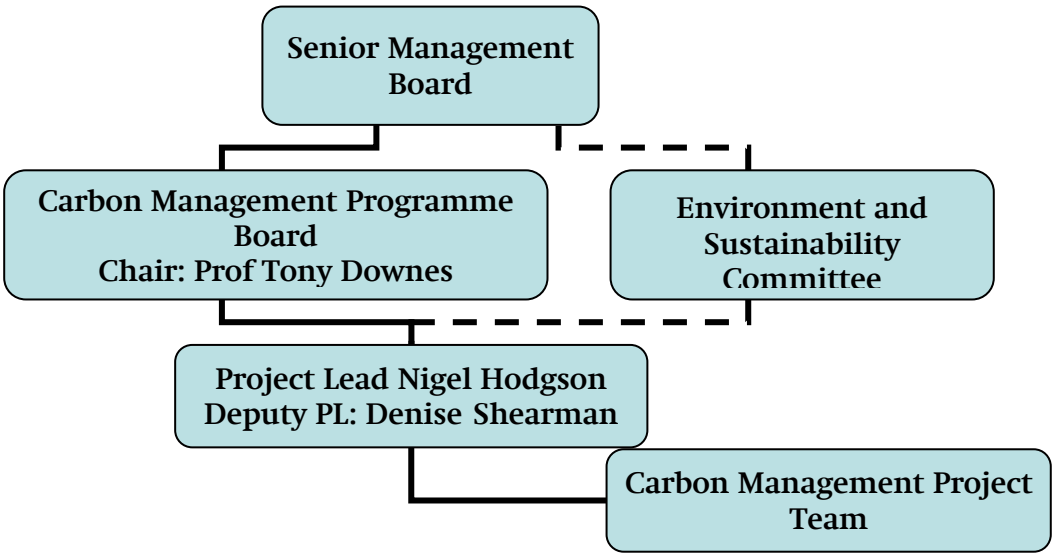
- To champion and provide strategic leadership on Carbon Management
- To set and review strategic direction and targets
- Own the scope of the Carbon Management Programme and prioritise carbon reduction projects
- Monitor progress towards objectives and targets
- Remove obstacles to successful completion of Carbon Management projects
- Ensure there was a framework to co-ordinate projects
- Develop a communications strategy

The Board noted that key reasons for programmes failing:

- Lack of senior management support/availability
- Lack of resource
- Lack of financial buy-in to invest to save projects
- No succession planning
- Lack of wider engagement
- Poor spread of projects

Initially programme governance and monitoring will be undertaken by the Project Board which will continue to meet quarterly. The Carbon Management Project Board will look to

embedding governance into the University existing structures and the Environmental and Sustainability Committees.



7.2 The Carbon Management Team – delivering the projects

With any project there will be a number of risks that can affect its success. The main risks are those associated with the loss of a key team member, team members becoming overloaded or diverted to other priority activities at key stages of the project, failure to engage with key decision makers or to secure vital funding for projects.

To mitigate these risks as far as possible, key members of the Carbon Management Team have been selected from those already having carbon management as an integral part of their existing role and/or who have a particular interest in this area. The Carbon Management Team has drawn from a wide cross functional section of the University who have a specific remit to feedback to their respective department, school or faculty to facilitate communication and actions with regard to the programme. The Project Management Team is included below: -

The Carbon Management Project Team - those who will deliver the Programme

The Project Lead will chair – quarterly meetings of the Carbon Management Project Team to review progress on activities and projects, identifying any problems that need to be raised with the Programme Board.

Role	Name and position in the HEI	Contact details
Project Leader	Nigel Hodgson Energy Manager	0118 378 5075 n.hodgson@reading.ac.uk
Co-Project Leader	Denise Shearman Head of Campus Services	0118 378 6246 d.a.shearman@reading.ac.uk
Carbon Management Team members	Iain Akhurst Director of Sports and Recreation	0118 378 8799 i.a.akhurst@reading.ac.uk
	Colin Barwick BMS Manager	0118 378 8283 c.d.barwick@reading.ac.uk
	Alan Brand Director of Hotel & Estate Services	0149 141 8713 a.brand@henley.com
	Alex Brannen Media Relations Manager	0118 378 8005 a.brannen@reading.ac.uk
	Mark Cockshoot IT Services	0118 378 4531 c.m.cockshoot@reading.ac.uk
	Hannah Cooper Student Representative	0787 060 1782 hannahcooper40@hotmail.com
	Ian Cruickshank Environment & Sustainability Manager	0118 378 6927 i.j.t.cruickshank@reading.ac.uk
	Deborah Doyle PA to Director of Student Services	0118 378 4256 d.doyle@reading.ac.uk
	Peter Duncan Residential & Commercial Services	0118 378 8281 p.j.duncan@reading.ac.uk
	Richard Ellis Dean Faculty of Life Sciences	0118 378 8488 r.h.ellis@reading.ac.uk
	Mike Evans Project Management, Feasibility & Design	0118 378 6682 m.r.evans@reading.ac.uk
	Neale Farwell Project Manager	0118 378 9313 n.p.farwell@reading.ac.uk

	Nigel Frankland Head of Estates Management	0118 378 2570 n.d.frankland@reading.ac.uk
	David Gillham Director Research & Enterprise Centre	0118 378 8978 d.j.gillham@reading.ac.uk
	Trevor Hawkins Project Manager	0118 378 7285 t.a.hawkins@reading.ac.uk
	Jenny Honeybill Environment & Sustainability Co-ordinator	0118 378 6968 j.c.honeybill@reading.ac.uk
	Lisa Jeffries Head of Procurement	0118 378 8304 l.m.jefferies@reading.ac.uk
	James Lamburn Farm Manager	0118 976 1722 j.lamburn@reading.ac.uk
	Ian May Maintenance Manager	0118 378 6382 i.r.may@reading.ac.uk
	Simon Mealor Capital Accountant	0118 378 6135 s.e.mellor@reading.ac.uk
	Janis Pich Deputy Director FMD Estate Services	0118 378 6044 j.l.pich@reading.ac.uk
	Carol A. Prior Student Services Helpdesk Team Leader	0118 378 8020 c.a.prior@reading.ac.uk
	Kelly Silk Campaigns Officer RUSU	0118 378 4146 k.r.silk@reading.ac.uk
	Richard Sillcox RUSU Chief Executive	0118 378 4143 r.j.sillcock@reading.ac.uk
	Andy Smart Purchasing & Contracts Manager	0118 378 8308 a.m.smart@reading.ac.uk
	Andrew Tooley Contracts Manager	0118 378 6258 a.tooley@reading.ac.uk
	Alan Twyford Senior HR Partner	0118 378 8755 a.j.twyford@reading.ac.uk

	Matthew White Catering & Commercial Services Manager	0118 378 6114 m.j.white@reading.ac.uk
	Tom Yearley Energy Co-ordinator	0118 378 4472 t.yearley@reading.ac.uk
	Moira Simpson H&SS	0118 378 8889 m.e.simpson@reading.ac.uk
	Nes Cazimolgu VP Democracy and Campaigns RUSU	0118 378 4134 vp.democracyandcampaigns@rusu.co.uk
	Louise Sharman Project Board and Team Secretary	0118 378 6554 l.v.sharman@reading.ac.uk
	Jon Barrett Carbon Data Analyst	0118 378 6998 j.a.barret@reading.ac.uk

Further individuals may be co-opted onto the Project Management Team as for their particular skills or knowledge as necessary.

7.3 Continuity planning for key roles

The Project Sponsor role will be covered by either the Deputy Vice Chancellor (Professor Tony Downes) or the Director of Estates and Facilities Management (Colin Robbins, who will ensure continuity of the key roles).

The Project Leader role will be covered by the Deputy Project leader.

The Carbon Trust operates to provide long term assistance to deliver carbon savings through the implementation of this carbon management plan. If at any time, key staff change in role or responsibilities and new staff become responsible for elements of this plan, then the University will brief and inform new staff in the carbon management process and keep them up to date with carbon management developments within the HE sector.

7.4 Ongoing stakeholder management

The key stakeholders in the Carbon Management Plan are identified in appendix A and will be reviewed annually by the Project Board.

7.5 Annual progress review to Senior Management Team

A formal review will be undertaken by the Environment and Sustainability Committee in June of each year, in order to review the progress against the plan for that academic year.

Initial template for reporting and reviewing will be completed by the Project Lead and Deputy and will include:

- Reporting the cost and all benefits from the Programme
- Identifying financial savings, either cashable or returned to Revolving fund
- Quantifying CO_2e savings against the target
- Detailing any unquantifiable benefits, such as influencing the student body/local community
- Reporting to the Senior Management Board via the Environment and Sustainability Committee.
- Addressing the coming year's plan regarding projects and funding
- Reporting progress on the Carbon Management Matrix

These will where possible be presented graphically. Examples are included at Appendix D and will be modifies throughout the term of the programme.

7.6 Reporting and Performance Monitoring

Procedures for reviewing performance

The Carbon Management Board meetings – the Programme status will be reported to each meeting by the Project Lead or Deputy who will be responsible for compiling and presenting the report. Performance will be reviewed and management direction agreed by the Project Board as to the way forward.

Environment and Sustainability Committee meetings – update termly to review projects and monitor progress.

Project Team quarterly meetings – the Programme status will be presented to the Project Team for feedback on the specific focus areas to which they are connected. New project ideas and opportunities can also be highlighted on these occasions.

Project sub-groups – the Energy Manager will have regular review and reporting meetings as required – reporting on project details, revise project list and action reports to enable more accurate predictions and accounting for future projects of a similar nature.

Procedures for updating plan and targets

Ongoing amendments to baseline – as and when new or more accurate data is available with which to amend the baseline emissions scenario, this will be updated.

Environment and Sustainability Committee – as and when new issues become significant for the management of the Programme, these will be highlighted during Committee meetings.

Internal agendas – ongoing dialogue with Estates and Facilities Management staff involved with new builds, utility consumption, and campus maintenance offers news on updates to building regulations and scheduling of projects. A reporting structure will be key to ensuring that management of the projects is progressing on schedule, or if alterations to the schedule are needed. All parties should be involved in the scheduling process and made aware of responsibilities, changes to the Plan and specific issues arising.

Procedures for reporting achievements

Environment and Sustainability Committee – all Programme updates will be reported to the Environment and Sustainability Committee at each termly meeting.

Website – the Carbon Management Programme currently occupies web pages within the Clean and Green area of FMD pages, and they are frequently updated. In the future these web pages will include an interactive campus map showing energy consumption and targets.

Exhibition Stand – the Programme will be publicised through the use of informative exhibition boards that will be sited in Departments on a rotating basis.

Energy awareness campaign – the Programme has allocated resources to continuing the current energy awareness campaigns on an annual basis. The campaign will also be an opportunity to draw attention to the achievements made by the Programme so far, in order to reinforce the dual effort required from the University and its populace in meeting the reduction targets.

7.7: Key stakeholder groups or individuals

At this stage we focus on the key individuals and groups we need to work with to establish the programme and achieve the objectives of the project.

Stakeholders	**Influence** H = High M = Medium L = Low	**Impact** H = High M = Medium L = Low	**Key issues**	**Means of Communication**
Academic Staff	H	H	Academic results, workload, resources, working environment, lighting, heating, space standards	Committee Meetings, Bulletin, Sustainability Matters, Environmental Champions
Academic Services Directorate	H	H	ITS, Library, Museums and Collections Service, Faculty Offices (HBS, FAH/FoSS, FLS/FOS), Admissions, Exams, Graduation, Quality Support, Planning Support, CDOTL, CSTD, Central Room Bookings and Timetabling, Progress South Central.	Committee Meetings, Bulletin, Sustainability Matters
Carbon Management Board	H	H	Carbon Management, remove barriers, feedback, communication, financial, reputation, resource provision	Team Meetings, email, Degrees of Carbon, Webinar
Carbon Management Project Team	H	H	Carbon Management, project identification, application, implementation, co-ordination, support, communication	Team Meetings, email, Degrees of Carbon, Webinar
Catering	M	L	Financial, energy consumption, waste, procurement, reputation, health, Fairtrade	Bulletin, Sustainability Matters, Travelwise, 24/7
Cleaning	H	H	University environment, awareness, cleaning materials, waste streams, recycling	Sustainability Matters, Travelwise, 24/7, Campus Services Newsletter, Awareness Training
Community Forum	L	L	Corporate image, travel plans, wind farms, reputation	Community events
Council	H	H	Strategic overview	Board Paper, Annual Report
Deans	H	H	Academic results, workload, resources, working environment, lighting, heating, space standards	Board Paper, Committee meetings, Bulletin

Estates	H	H	University environment - infrastructure, building portfolio	Bulletin, Sustainability Matters, Travelwise, 24/7
European Union	H	L	Global environmental issues, legislation	Website
Finance	H	H	Budget setting, forecasting, investment, cost and savings, monitoring, external funding	Departmental communications
Government	H	H	Global perspective, public awareness, impacts, future environment, legislation	Website, Messages in key documents, local and national press
Heads of School	H	H	Academic results, workload, resources, working environment, lighting, heating, space standards	Committee Meetings, Bulletin, Sustainability Matters, Travelwise, 24/7
Higher Education Funding Council for England	H	L	Teaching and learning, academic achievement, financial, reputation, Government policy, university performance	Website, Messages in key documents, annual reports, EMS, local and national press
Maintenance	H	H	University environment - lighting, heating, cooling, plant and machinery	Bulletin, Sustainability Matters, Travelwise, 24/7
Media and Communications	L	H	Corporate image, reputation,	Website, Messages in key documents, reports, EMS, local and national press
Procurement	H	H	Ethical procurement, reputation, budgeting, supplier management	Procurement news, Bulletin, local and national press
Reading Borough Council	M	M	Public awareness, local issues, planning, reputation, future environment	Face to face meetings, Website, planning applications
Reading Buses	M	L	Profitability, reputation, service provision	Website, messages in key documents, annual reports, local and national press
Residential Services	H	H	Student and customer environment, reputation, cost, waste, catering, household services	Departmental newsletter, 24/7, Bulletin, Awareness Training
Security	H	H	University environment, safety and security, lighting,	Sustainability Matters, Travelwise, 24/8, Campus Services Newsletter, Awareness Training
Students	M	H	Academic results, university and global environment, travel, facilities	Green Meetings, Sustainability Matters, Travelwise, Website, Face-to-face, Spark

Students Union	H	H	Represent student view - financial, academic achievement, university and global environment, reputation, Fairtrade	Green Meetings, Sustainability Matters, Travelwise, Website, Face-to-face, Spark
Suppliers	L	H	Financial, reputation	Regular Supplier meetings, Supplier exhibitions
VC and Directorate	H	H	Strategic - reputation, cost, compliance, investment	Board Paper, Annual Report, SMB
Wokingham Borough Council	M	M	Public awareness, local issues, planning, reputation, future environment	Face to face meetings, Website, planning applications

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)

Appendix A: Carbon Management Matrix

The blue line is where the University scored itself 5 July 2010
The red line is the target set for academic year 2015/16

The red dotted line is where the University rated itself 20 December 2010

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
5 **BEST**	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	**Granular & effective** 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 CO_2 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 **Worst**	No policy **No** Climate Change reference	No CM responsibility designation	Not compiled: CO_2 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

Appendix B: The decision to use M&T data instead of EMS data:

For historic carbon management exercises, the University of Reading has used Estates Management Statistics (EMS) data. In order to provide a more complete and accurate carbon footprint, we will use Utility Monitoring and Targeting (M&T) data from this point forward. The use of this more complete dataset increases our reported carbon footprint. The following appendix provides an explanation for this decision.

Annual EMS data is submitted to the Higher Education Statistics Agency (HESA). HESA has been established to undertake data collection and analysis about higher education in order to make possible the provision of consistent information throughout the UK. It enables the universities, colleges and the Funding Councils, including the Higher Education Funding Council for England (HEFCE), to meet their obligations under relevant legislation.

EMS data is limited by the following exclusions[9]:

- Corridors and other circulation areas of a permanent nature (e.g. fire corridors, smoke lobbies, etc.)
- Internal open-sided balconies or similar
- Internal structural walls, walls enclosing excluded areas, columns, piers, chimney breasts, vertical ducts and other projections
- Stairways and stairwells (and voids over)
- Entrance lobbies (where the function is solely or primarily for entry/circulation)
- Foyers (where the function is solely or primarily for entry/circulation)
- Atria with clear height above, measured at base level only (where the function is solely or primarily for entry/circulation)
- Permanent lift lobbies, permanent lift rooms, liftwells and lifts (and voids over)
- Lavatories and toilet lobbies
- Cloakrooms
- Cleaners' stores
- Cleaners' cupboards (as defined in the RICS definition)
- Covered areas e.g. plant rooms, tank rooms, fuel stores which are housed in a structure of a permanent nature, whether or not above main-roof level.
- Loading bays
- Ducts
- Permanent and continuous air-conditioning, heating or cooling apparatus (as defined in the RICS definition)
- Boiler houses
- Calorifier chambers
- Fuel stores.

[9] Ref: http://www.hesa.ac.uk/index.php/content/view/1871/233/#q35

- Areas under the control of service or other external authorities including meter cupboards and statutory service supply points (as defined under the RICS definition)
- Areas with headroom of less than 1.5m (as defined under the RICS definition).

Therefore a more comprehensive set of data is required to provide more complete carbon reporting. For this purpose, the University of Reading has chosen to use M&T data, which includes all utility consumption that is paid for directly by the University. This includes usage that is recharged to tenants and other clients. The M&T data is also used for Carbon Reduction Commitment (CRC), European Union Emission Trading Scheme (EUETS) and other legal compliance requirements.

The following table outlines Scope 1 and scope 2 emissions derived from historic reported EMS data and historic M&T data. The difference between these two datasets can be explained by the omission outlined earlier of investment and commercial properties.

Table 7: Historic EMS statistics vs. M&T system data

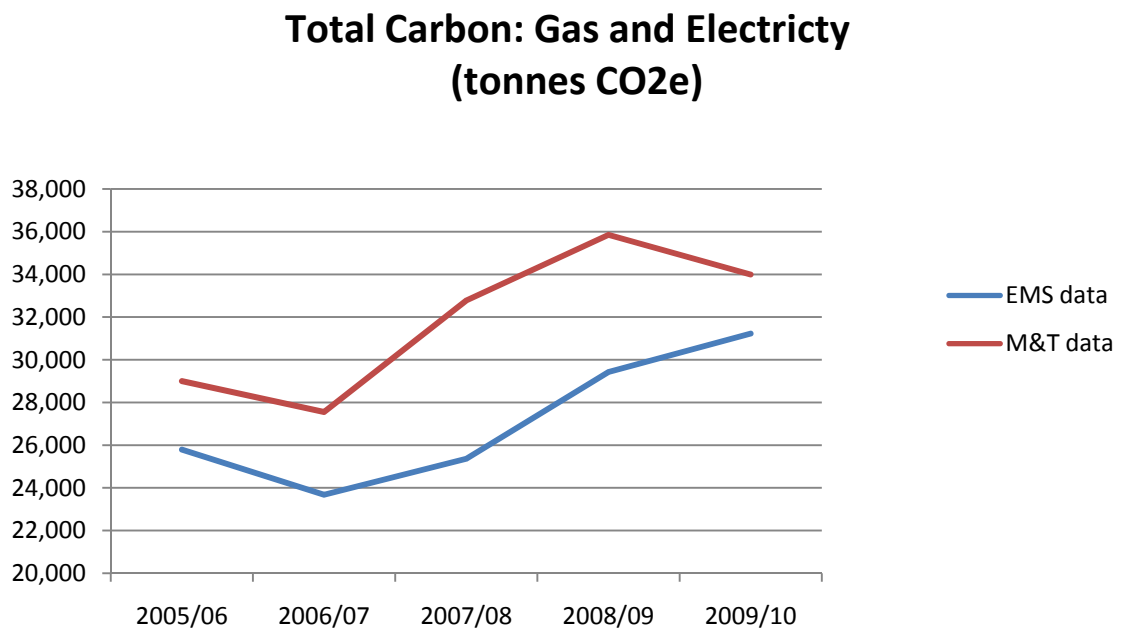
Period	Historic EMS data (tonnes CO_2e)	M&T data[10] (tonnes CO_2e)
2005/06	25,794	28,998
2006/07	23,679	27,553
2007/08	25,369	32,779
2008/09	29,431	35,853
2009/10	31,266	34,440

To reinforce this data, a graphic representation can be seen in Chart 8. This demonstrates the difference between M&T data and EMS data. The key points to note include:

- Correlation of >0.8 suggests some consistency of data sets.
- EMS data consistently below M&T data.
- M&T data includes electricity, gas and oil use.
- The conversion factors for EMS do however tend to change annually, whereas a fixed conversion rate has been used for M&T

[10] CO_2e for Gas and Electricity using 2009/10 conversion factors

Chart 9: Historic EMS statistics vs. M&T system data



The previous chart provides consumption patterns for historic electricity, gas and oil data at the University of Reading. This dates back over the past 5 years to the 2005/06 dataset, which is used by HEFCE to calculate the CIF targets. It is encouraging that this chart shows a reduction in carbon emissions associated with electricity, gas and oil consumption since 2008/09. This reduction coincides with the forming of the Environment, Energy and Sustainability Team (EEST).

The HEFCE sector targets for carbon emission reductions in scopes 1 and 2 are 34 per cent by 2020 and 80 per cent by 2050 against a 1990 previously reported emissions.

Appendix C01: UoR17 JS21 Computer replacement

Project: **Reference:**	Blade Super Computer UoR17
Owner (person)	Mark Cockshoot
Department	ITS
Description	The existing JS21 computer is to be replaced with a modern energy efficient equivalent.
Benefits	• Financial savings: £ 145,065 • Payback period: 0.0 years • CO_2e Emissions reduction: 1,110 tonnes of CO_2e • 6.89% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - TBA • Operational costs, e.g. annual maintenance or running costs - TBA • Source of funding: internal, external, investment criteria to be met etc.- TBA • How /when decision on funding will be made - TBA
Resources	• Additional equipment to be provided as a replacement. Awaiting confirmation of the new equipment and loading from ITS/Procurement
Ensuring Success	• Existing JS21 switched off • New equipment installed • Timescale to be agreed
Measuring Success	• As above • Measurement provided to new equipment and monitored
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA o interim deliverable / decision points TBA
Notes	Existing equipment consumption and costing provided by ITS and Energy Management New equipment to be advised by ITS and Procurement

Appendix C02: UoR18 Student switch off

Project: **Reference:**	Student Switch Off UoR18
Owner (person)	Tom Yearley/Peter Duncan
Department	Campus Services/Residential Services
Description	The Student Switch Off is a national campaign, run in partnership with NUS, that uses Facebook and sponsorship from student focused organisations to get halls of residence within Universities to compete against each other to save energy.
Benefits	• Financial savings: £ 7,700 • Payback period: 1.0 years • CO_2e Emissions reduction: 59 tonnes of CO_2e • 0.37% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project £7,500 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc.- TBA • How /when decision on funding will be made - TBA
Resources	• EEST time • EEST: £3,250 • Residential: £3,250
Ensuring Success	• The number of students involved in the project is reviewed monthly. • Ongoing awareness and recruitment campaigns are held if numbers/ participation levels drop • Data is checked on a monthly basis to ensure reductions are on target
Measuring Success	• Reductions are compared against 2008/09 baseline, enabling comparison of success from year to year • Saving are normalised against student occupation numbers
Timing	• Milestones / key dates e.g. o Monthly review (end of each month of full occupancy) o start date: 31st August 2010 o completion date (when it will deliver savings): 31st October 2010 o End of Project: 30th June
Notes	During 2009/10 the SSO helped to reduce electricity usage in halls of residence by an average of 7.4%. The energy saved prevented over 53 tonnes of CO_2e from entering the atmosphere. This is equivalent to the energy needed to: • Power a an energy saving light bulb for 757 years • Make 3.1 million cups of tea • Fly from London to Manchester 597 times

Appendix C03: UoR22 Awareness 2011

Project: **Reference:**	Awareness Raising Campaign 2011 UoR22
Owner (person)	Tom Yearley
Department	Campus Services
Description	The University of Reading recognises the importance of enhancing the return on technical projects through integration with behavioural change methodologies. Therefore a focus is placed on helping building and technology users understand how they can contribute to the efficient operation of their buildings and other equipment. Various media and techniques are used to convey this information, including: increased availability of utility monitoring data through projects including Carnego; annual University wide Green Week, Environmental Champion scheme; training and discussion with individuals and teams around the University.
Benefits	• Financial savings: £ 57,494 • Payback period: 1.0 years • CO_2e Emissions reduction: 440 tonnes of CO_2e • 2.73% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project -£50,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Internal revenue budget B2515157 • How /when decision on funding will be made - Ongoing payback and carbon saving
Resources	• EEST time required to run projects and meet stakeholders • Budget to facilitate projects, including Green Week materials, Carnego running and project costs, training facilities, environmental champion rewards, affiliation to external bodies (Green Impact, etc) • Support form external stakeholders
Ensuring Success	• Projects are reviewed at least annually to check progress is made • Number of environmental champions
Measuring Success	• Ask an individual for their opinion of what being green means at UoR. • Number of signed up environmental champions • Green Impact scores • Number of buildings where utility use data is publically available • Number and scores of Display Energy Certificates
Timing	• Green Week 7-12/11/2011 • Green Impact Awards closing date 23rd Feb • Environmental Training Q1 2011
Notes	The University of Reading believes that behavioural change and environmental communications is essential in assisting users to maximise the potential efficiency of the buildings and equipment. We aim to deliver upon this belief by delivering a coordinated behavioural change program on an ongoing basis.

Appendix C04: UoR23 Bulmershe closure

Project: **Reference:**	Closure of Bulmershe Campus UoR23
Owner (person)	Nigel Frankland
Department	Estates Management
Description	Refurbishment of the London Road Campus will enable the Bulmershe Campus to close.
Benefits	• Financial savings: £ 77,944 • Payback period: 0.0 years • CO_2e Emissions reduction: 709 tonnes of CO_2e • 4.4% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - TBA • Operational costs, e.g. annual maintenance or running costs - TBA • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources required
Ensuring Success	• Successful transfer of staff and courses from Bulmershe to London Road • Vacant property utilities switched off
Measuring Success	• Zero usage of energy at Bulmershe Campus (not Student Accomodation) • Successful completion of transfer by December 2011
Timing	• Milestones / key dates e.g. o start date: July 2010 o completion date (when it will deliver savings): 31/12/2011
Notes	Utility consumption and cost provided from utility supplier invoices.

Appendix C05: UoR24 Automatic computer switch off

Project: **Reference:**	Switch Off computers overnight and at weekends UoR24
Owner (person)	Mark Cockshoot
Department	ITS
Description	Provision of automatic shut-down of IT equipment across Campus between 22:00-06:00 daily and at weekends.
Benefits	• Financial savings: £ 216,000 • Payback period: 0.0 years • CO_2e Emissions reduction: 1653 tonnes of CO_2e • 10.3% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - TBA • Operational costs, e.g. annual maintenance or running costs - TBA • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• Deliverable using existing resources.
Ensuring Success	• University policy ratified • Staff made aware and communicated with to provide option to 'opt out' • Suitable IT software/hardware provided and installed
Measuring Success	• Number of networked machines left on standby over the night/weekend period reduced. • New equipment set up to shut-down automatically once installed.
Timing	• Milestones / key dates e.g. o start date: 2011 o completion date (when it will deliver savings): 2012
Notes	Trial data provided from trial carried out on the Palmer IT Laboratories during 2010

Appendix C06: UoR25 Sibly closure

Project: **Reference:**	Sibly Hall Closure UoR25
Owner (person)	Nigel Frankland
Department	Estates Management
Description	Plans to vacate the Sibly Hall of residence and decant into the new Halls of Residence consolidated onto the Whiteknights Campus site.
Benefits	• Financial savings: £ 76,180 • Payback period: 0.0 years • CO_2e Emissions reduction: 699 tonnes of CO_2e • 4.34% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - TBA • Operational costs, e.g. annual maintenance or running costs - TBA • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources required
Ensuring Success	• Successful completion of Phase two of Halls building programme. • Transfer of students and staff to the new accommodation • Vacant property utilities switched off in preparation for sale of land.
Measuring Success	• Zero usage of energy at Sibly Hall • Successful completion of transfer by October 2012
Timing	• Milestones / key dates e.g. o start date: 2011 o completion date (when it will deliver savings): 2012
Notes	Utility consumption and cost provided from utility supplier invoices.

Appendix C07: UoR27 Awareness 2012

Project: **Reference:**	Awareness Raising Campaign 2012 UoR27
Owner (person)	Tom Yearley
Department	Campus Services
Description	The University of Reading recognises the importance of enhancing the return on technical projects through integration with behavioural change methodologies. Therefore a focus is placed on helping building and technology users understand how they can contribute to the efficient operation of their buildings and other equipment. Various media and techniques are used to convey this information, including: increased availability of utility monitoring data through projects including Carnego; annual University wide Green Week, Environmental Champion scheme; training and discussion with individuals and teams around the University.
Benefits	• Financial savings: £ 57,494 • Payback period: 1.0 years • CO_2e Emissions reduction: 440 tonnes of CO_2e • 2.73% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project -£50,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Internal revenue budget B2515157 • How /when decision on funding will be made - Ongoing payback and carbon saving
Resources	• EEST time required to run projects and meet stakeholders • Budget to facilitate projects, including Green Week materials, Carnego running and project costs, training facilities, environmental champion rewards, affiliation to external bodies (Green Impact, etc) • Support form external stakeholders
Ensuring Success	• Projects are reviewed at least annually to check progress is made • Number of environmental champions
Measuring Success	• Ask an individual for their opinion of what being green means at UoR. • Number of signed up environmental champions • Green Impact scores • Number of buildings where utility use data is publically available • Number and scores of Display Energy Certificates
Timing	• Green Week Nov 2012 • Green Impact Awards closing date Feb 2012 • Environmental Training ongoing
Notes	The University of Reading believes that behavioural change and environmental communications is essential in assisting users to maximise the potential efficiency of the buildings and equipment. We aim to deliver upon this belief by delivering a coordinated behavioural change program on an ongoing basis.

Appendix C08: UoR28 Awareness 2013

Project: **Reference:**	Awareness Raising 2013 UoR28
Owner (person)	Tom Yearley
Department	Campus Services
Description	The University of Reading recognises the importance of enhancing the return on technical projects through integration with behavioural change methodologies. Therefore a focus is placed on helping building and technology users understand how they can contribute to the efficient operation of their buildings and other equipment. Various media and techniques are used to convey this information, including: increased availability of utility monitoring data through projects including Carnego; annual University wide Green Week, Environmental Champion scheme; training and discussion with individuals and teams around the University.
Benefits	• Financial savings: £ 57,494 • Payback period: 1.0 years • CO_2e Emissions reduction: 440 tonnes of CO_2e • 2.73% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project -£50,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Internal revenue budget B2515157 • How /when decision on funding will be made - Ongoing payback and carbon saving
Resources	• EEST time required to run projects and meet stakeholders • Budget to facilitate projects, including Green Week materials, Carnego running and project costs, training facilities, environmental champion rewards, affiliation to external bodies (Green Impact, etc) • Support form external stakeholders
Ensuring Success	• Projects are reviewed at least annually to check progress is made • Number of environmental champions
Measuring Success	• Ask an individual for their opinion of what being green means at UoR • Number of signed up environmental champions • Green Impact scores • Number of buildings where utility use data is publically available • Number and scores of Display Energy Certificates
Timing	• Green Week Nov 2013 • Green Impact Awards closing date Feb 2013 • Environmental Training ongoing
Notes	The University of Reading believes that behavioural change and environmental communications is essential in assisting users to maximise the potential efficiency of the buildings and equipment. We aim to deliver upon this belief by delivering a coordinated behavioural change program on an ongoing basis.

Appendix C09: UoR29 Pipe work insulation

Project: **Reference:**	Insulation to pipe work and valves UoR29
Owner (person)	Neal Farwell – Steve Slatter
Department	Facilities Management – Minor Projects
Description	To supply and install removable insulation covers to the pipe work and valves within the following plant room: Meteorology, Palmer, Students Union, Food Biology, Engineering, Sedimentology, Engineering, Geology, Geography, Library Basement and Roof, Black Horse House, CEDARS, Whiteknights House, Harry Pitt, Chemistry, Psychology GU1 and URS.
Benefits	• Financial savings: £ 30,000 • Payback period: 1.8 years • CO_2eEmissions reduction: 335 tonnes of CO_2e • 2.08% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• £55,000 • Operational costs e.g. annual maintenance or running costs £0 • SALIX Loan - Internal B2515157 • Payback
Resources	• No additional resources required
Ensuring Success	• Insulation covers supplied and fitted • Further projects identified for future savings
Measuring Success	• Metrics for displaying performance or achievement • Timings when success will be measured / evaluated
Timing	• Milestones / key dates e.g. o start date: 01/01/2011 o completion date (when it will deliver savings): 28/02/2011
Notes	Information provided by external contractor survey carried out in 2010.

Appendix C10: UoR26 STC fume cupboards

Project: **Reference:**	Fume cupboards – STC UoR 26
Owner (person)	David Gillham
Department	Science and Technology
Description	Installation of variable speed drives and dampers to existing fume cupboards throughout the STC building
Benefits	• Financial savings: £ 13,662 • Payback period: 4.5 years • CO_2e Emissions reduction: 152.3 tonnes of CO_2e • 0.95% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost £61,500 • Operational costs, e.g. annual maintenance or running costs £0 • Internal Science and Technology budgets • Payback
Resources	• No additional resources required
Ensuring Success	• Project completed to time and within budget
Measuring Success	• Heating and electrical consumption reduced • Fewer fume cupboards running at 100% 24 hours per day
Timing	• Milestones / key dates e.g. o start date: Dec 2010 o completion date (when it will deliver savings): Mar 2011
Notes	Report provided by external consultancy

Appendix C11: UoR19 BMS fine tuning

Project: **Reference:**	BMS fine tuning to align with operational times UoR19
Owner (person)	Colin Barwick
Department	Facilities Management - Maintenance
Description	Have requested Central Room Booking to supply Lecture Theatre booking times to allow ventilation to be switched off when not required. Program to switch off plenum systems during the summer where windows provide adequate natural ventilation, following consultation with Building Managers. Install air quality sensors and analogue control of fresh air/recirc dampers to allow ventilation systems to be controlled more efficiently.
Benefits	• Financial savings: £ 6,374 • Payback period: 3.5 years • CO_2e Emissions reduction: 71.1] tonnes of CO_2e • 0.44% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £22,250 • Operational costs, e.g. annual maintenance or running costs £0 • Source of funding: internal • How /when decision on funding will be made - Payback
Resources	• Additional time schedules and programming by BMS Dept. • Funding required for installation of air quality sensors and analogue dampers/actuators.
Ensuring Success	• Agreement of Building Managers to switch ventilation systems off. • Principal risks: Customer complaints.
Measuring Success	• Average reduction in run hours used to calculate energy savings. • Savings per item of plant can be calculated as changes are implemented.
Timing	• Milestones / key dates e.g. o start date: 01/07/2010 o Spreadsheet showing progress and average savings.
Notes	Fan motor ratings used to calculate energy savings from reduced run times. Reduction in plenum heating based on degree days and average fresh air flow rates.

Appendix C12: UoR20 Greenlands BMS

Project: **Reference:**	Upgrade BMS and install expanded coverage at Greenlands UoR20
Owner (person)	Colin Barwick
Department	Facilities Management - Maintenance
Description	Install BMS panels in North House, IoD and Main Building to control HVAC plant.
Benefits	• Financial savings: £ 14,344 • Payback period: 3.2 years • CO_2e Emissions reduction: 159] tonnes of CO_2e • 0.99% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £45,500 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. – External SALIX loan. • How /when decision on funding will be made – Payback 2011
Resources	• Installation by external contractor, programming by BMS staff.
Ensuring Success	• SALIX funded project to be completed before March 2011.
Measuring Success	• Heating either on 24hrs or controlled via basic time-clocks. • Heating times and parameters will be controlled to meet occupancy requirements.
Timing	• Milestones / key dates e.g. o start date: 24 Jan 2011 o completion date (when it will deliver savings): 1 March 2011
Notes	Installation of BMS controls will allow heating systems to be switched off or to frost protection out of hours. Heating systems will only be enabled when required to maintain occupancy comfort levels. Alarms and logging will permit monitoring of HVAC systems by staff in FMD and at Greenlands.

Appendix C13: UoR21 IT management software

Project: **Reference:**	IT Management Software UoR21
Owner (person)	Mark Cockshoot
Department	ITS
Description	A project to look into open source access to Higher education dynamic energy monitoring.
Benefits	• Financial savings: £ 14,220 • Payback period: 4.2 years • CO_2e Emissions reduction: 108.8 tonnes of CO_2e • 0.68% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project – £60,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: JISC funding of £45,000 bid and £20,000 from existing resources. • How /when decision on funding will be made - TBA
Resources	• Additional staff resource required for the duration of the project
Ensuring Success	• Open sourcing software available • Data analysis and alignment available • Staff resource approved and allocated for project management • Communication strategy • Behavioural change opportunities identified and implemented
Measuring Success	• Open access through web site • Display available at building level
Timing	• Milestones / key dates e.g. o start date: August 2011 o completion date (when it will deliver savings): July 2011
Notes	Identified through ITS and Energy Management discussions Previous behavioural change pilot carried out in Carrington, Greenow, McCombie and RUSU 2010

Appendix C14: UoR30 Free cooling – telephone exchange

Project: **Reference:**	Free Cooling UoR30
Owner (person)	Neal Farwell – Dave Young
Department	Facilities Management – Minor Projects
Description	Replace existing mechanical cooling to telephone exchange with 'free' cooling option.
Benefits	• Financial savings: £ 1,067 • Payback period: 4.2 years • CO_2e Emissions reduction: 8.2 tonnes of CO_2e • 0.05% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £4,500 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. -TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Feasibility to be carried out and found favourable • Funding available • Staff resource in Project Management available
Measuring Success	• Reduced electrical load
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP tool assessment Example costs based on previous project difference between conventional cooling and 'free' cooling option in Maths IT room.

Appendix C15: UoR31 Data centre cooling control

Project: **Reference:**	Optimiser control of cooling in Data Centre UoR31
Owner (person)	Colin Barwick
Department	Facilities Management - Maintenance
Description	TBA
Benefits	• Financial savings: £500 • Payback period: 5.0 years • CO_2e Emissions reduction: 5.6 tonnes of CO_2e • 0.03% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £2,500 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal • How /when decision on funding will be made - TBA
Resources	• TBA
Ensuring Success	• TBA
Measuring Success	• TBA
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	TBA

Appendix C16: UoR32 Heating controls

Project: **Reference:**	Heating controls and systems and BMS UoR32
Owner (person)	Colin Barwick
Department	Facilities Management - Maintenance
Description	Re-commission building BMS / HVAC controls
Benefits	• Financial savings: £30,000 • Payback period: 4.7 years • CO_2e Emissions reduction: 334.5 tonnes of CO_2e • 2.08% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £141,437 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. – TBA • How /when decision on funding will be made - TBA
Resources	• Additional resource (e.g. people) requirements for delivery and where they will come from – External contractors, HVAC and Controls engineers.
Ensuring Success	• Funding required • Periodic re-commissioning of existing installations is required to ensure the full benefits of the system are maintained.
Measuring Success	• Metrics for displaying performance or achievement • Timings when success will be measured / evaluated
Timing	• Milestones / key dates e.g. - TBA o start date: - TBA o completion date (when it will deliver savings): TBA
Notes	Many of the University's BMS systems where installed over twenty years ago. The use, layout and equipment within these building have in many cases changed over the years.

Appendix C17: UoR33 Virtualisation/thin computer

Project: **Reference:**	Virtualisation/thin computer UoR33
Owner (person)	Mark Cockshoot
Department	ITS
Description	To increase the virtualisation of the computer network at the University
Benefits	• Financial savings: £ 4,627 • Payback period: 4.6 years • CO_2e Emissions reduction: 32.7 tonnes of CO_2e • 0.20% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £19,500 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc - TBA. • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• TBA
Measuring Success	• TBA
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP tool

Appendix C18: UoR34 Zoning of heating

Project: **Reference:**	Heating zoning UoR34
Owner (person)	Neale Farwell
Department	Facilities Management – Minor Projects
Description	To improve the heating controls and zoning.
Benefits	• Financial savings: £ 9,519 • Payback period: 5.0 years • CO_2e Emissions reduction: 106.1 tonnes of CO_2e • 0.66% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £48,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. TBA • How /when decision on funding will be made -TBA
Resources	• No additional resources anticipated
Ensuring Success	• Feasibility report to be undertaken • TBA
Measuring Success	• Reduced heating • Greater control over working environment
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP Tool

Appendix C19: UoR35 Replacement lighting to T5 high frequency

Project: **Reference:**	Lighting upgrade to T5 high frequency UoR35
Owner (person)	Mike Evans
Department	Facilities Management – Major Projects
Description	Planned maintenance programme to replace existing older switch start and T12 or T8 fluorescent fittings with high frequency T5 fittings. Provide suitable lighting control such as solar sensing, movement sensing and time switch control where appropriate.
Benefits	• Financial savings: £ 81,237 • Payback period: 4.9 years • CO_2e Emissions reduction: 621.8 tonnes of CO_2e • 4.90% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £400,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• TBA
Ensuring Success	• Finances being made available • Feasibility study • Resource planning
Measuring Success	• Reduced electrical consumption • Greater control of lighting
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP Tool and Project cost estimated at £180 per fitting.

Appendix C20: UoR45 Free cooling - Agriculture

Project: **Reference:**	Free Cooling Agriculture UoR45
Owner (person)	Neal Farwell – Dave Young
Department	Facilities Management – Minor Projects
Description	A Replace existing mechanical cooling to telephone exchange with 'free' cooling option.
Benefits	• Financial savings: £ 12,463 • Payback period: 2.3 years • CO_2e Emissions reduction: 95.4 tonnes of CO_2e • 0.59% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £29,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Feasibility to be carried out and found favourable • Funding available • Staff resource in Project Management available
Measuring Success	• Reduced electrical load
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP tool assessment Example costs based on previous project difference between conventional cooling and 'free' cooling option in Maths IT room.

Appendix C21: UoR46 Chemistry/Food Bio lighting control

Project: **Reference:**	Lighting control Chemistry and Food Bio UoR46
Owner (person)	Neale Farwell – Steven Slatter
Department	Facilities Management – Major Projects
Description	Install the following lighting control to corridors and conference/meeting rooms: Solar sensors Passive Infrared Time switches as appropriate.
Benefits	• Financial savings: £ 40,534 • Payback period: 5.9 years • CO_2e Emissions reduction: 451.9 tonnes of CO_2e • 2.80% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £240,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resource anticipated
Ensuring Success	• Feasibility carried out • Tender prices obtained • Funding available for the project
Measuring Success	• Reduced electrical consumption • Fewer lights left on out of hours and when not required
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	Initial RAP tool Advice from Project Manager and supplier/installer costs previously

Appendix C22: UoR41 Boiler replacement programme

Project: **Reference:**	Boiler replacement programme UoR41
Owner (person)	Mike Evans – Steve Boon
Department	Facilities Management – Major Projects
Description	Replacement programme for older inefficient boiler plant.
Benefits	• Financial savings: £ 40,534 • Payback period: 5.9 years • CO_2e Emissions reduction: 451.9 tonnes of CO_2e • 2.80% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project – 240,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc - TBA. • How /when decision on funding will be made - TBA
Resources	• Additional resource (e.g. people) requirements for delivery and where they will come from • If this project will be delivered using current resources, say so
Ensuring Success	• Maintenance and replacement programme to be produced • Feasibility costs to be obtained • Funding to be available
Measuring Success	• Reduced fossil fuel usage
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	RAP tool

Appendix C23: UoR36 Reduce non-residential area

Project: **Reference:**	Reduce total of non-residential area by 15% UoR36
Owner (person)	Janis Pich – David Wallace
Department	Facilities Management
Description	As part of the University drive to reduce carbon, consumption and cost and improve benchmark figures, there is a move to reduce space standards in non-academic/teaching areas
Benefits	• Financial savings: £ 75,660 • Payback period: 10.6 years • CO_2e Emissions reduction: 694.4 tonnes of CO_2e • 4.33% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £800,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• TBA
Ensuring Success	• Feasibility to be carried out • Senior Management agreement
Measuring Success	• Reduced carbon/m2 • Reduced cost • Improved Estate Management Statistics
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	Estimated at 5% of total usage

Appendix C24: UoR37 Reduce out of hours building use

Project: **Reference:**	Reduce number of building used out of hours UoR37
Owner (person)	Janis Pich
Department	Facilities Management
Description	Identify one building to be allocated as the main bookable classroom building. This building to be accessible for evening books and reduce the number of individual room booked around Campus.
Benefits	• Financial savings: £ 2,742 • Payback period: 0.0 years • CO_2e Emissions reduction: 25.6 tonnes of CO_2e • 0.16% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - TBA • Operational costs, e.g. annual maintenance or running costs - TBA • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Feasibility and identification of suitable building • Funding available to refurbish to bookable classroom standards • Senior Management approval
Measuring Success	• Reduced heating and lighting cost and carbon • Management improvement in both security and portering
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	Cost based on reduced use of one of the major buildings opened currently for limited use. (CEM)

Appendix C25: UoR38 Reduce heating season

Project: **Reference:**	Reduce heating season by one week either end of season UoR38
Owner (person)	Janis Pich
Department	Facilities Management
Description	TBA
Benefits	• Financial savings: £TBA • Payback period: TBA years • CO_2e Emissions reduction: TBA tonnes of CO_2e • TBA% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £TBA • Operational costs, e.g. annual maintenance or running costs - £TBA • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made -TBA
Resources	• TBA
Ensuring Success	• TBA
Measuring Success	• TBA
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA o interim deliverable / decision points You could also lay these out as a milestone chart for clarity Break the timescale down into a handful of milestone points so progress can be measured
Notes	TBA

Appendix C26: UoR39 Double glaze Whiteknights House

Project: **Reference:**	Double Glazing in Whiteknights House UoR39
Owner (person)	Mike Evans
Department	Facilities Management – Major Projects
Description	A short description of the project, no more than a paragraph
Benefits	• Financial savings: £ 16,500 • Payback period: 40 years • CO_2e Emissions reduction: 184.0 tonnes of CO_2e • 1.15% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £660,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Funding being available
Measuring Success	• Reduced fossil fuel usage • Improved staff comfort
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	Previous quotation provided and anticipated energy savings calculated

Appendix C27: UoR40 Roof insulation

Project: **Reference:**	Roof Insulation UoR40
Owner (person)	Mike Evans
Department	Facilities Management – Major Projects
Description	Full condition surveys required for all major buildings owned by the University.
Benefits	• Financial savings: £ TBA • Payback period: TBA years • CO_2e Emissions reduction: TBA tonnes of CO_2e • TBA% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £TBA • Operational costs, e.g. annual maintenance or running costs - £TBA • Source of funding: internal, external, investment criteria to be met etc.- TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Thermal image survey of Campus to be carried out • Funding available for remedial works
Measuring Success	• Reduced fossil fuel usage measured • Comfort levels improved
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	No data available at the time of this report.

Appendix C28: UoR42 Energy centre

Project: **Reference:**	CHP/District Heating Energy Centre UoR42
Owner (person)	Mike Evans
Department	Facilities Management – Major Projects
Description	The existing steam boiler plant and distribution main are in need of replacement due to their life. The aim is to replace the steam system with a new Medium Temperature system with distribution main. As part of the scheme a 1MW combined heat and power engine will be installed to provide baseload heating and electricity to reduce consumption from the grid.
Benefits	• Financial savings: £ TBA • Payback period: TBA years • CO_2e Emissions reduction: TBA tonnes of CO_2e • TBA% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £TBA • Operational costs, e.g. annual maintenance or running costs - £TBA • Source of funding: internal, external, investment criteria to be met etc.- TBA • How /when decision on funding will be made - TBA
Resources	• TBA
Ensuring Success	• TBA
Measuring Success	• TBA
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA o interim deliverable / decision points
Notes	TBA

Appendix C29: UoR43 Fume cupboard control

Project: **Reference:**	Fume Cupboards controls UoR 43
Owner (person)	Neale Farwell
Department	Facilities Management – Minor Projects
Description	Fume cupboards are considered a major energy drain and as such greater control and management is required. A study is being undertaken with other Universities to identify savings and potential for future design. Costs here are based on a report carried out for one of the University buildings and currently being installed (UoR26)
Benefits	• Financial savings: £ 66,000 • Payback period: 4.5 years • CO_2e Emissions reduction: 735.8 tonnes of CO_2e • 4.59% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project – £300,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Funding source available • Feasibility report produced
Measuring Success	• TBA
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA
Notes	Feasibility report used for data from the STC building

Appendix C30: UoR44 Solar PV project

Project: **Reference:**	Solar PV roof Project UoR 44
Owner (person)	Neale Farwell
Department	Facilities Management – Minor Projects
Description	Working with a third party supplier to install solar panels to existing roof space.
Benefits	• Financial savings: £ 19,512 • Payback period: 0.0 years • CO_2e Emissions reduction: 149.3 tonnes of CO_2e • 0.93% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £0 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. External • How /when decision on funding will be made - TBA
Resources	• TBA
Ensuring Success	• TBA
Measuring Success	• Reduced electricity used from the national grid
Timing	• Milestones / key dates e.g. o start date: TBA o completion date (when it will deliver savings): TBA o interim deliverable / decision points
Notes	Idea out to tender at the date of this report

Appendix C31: UoR47 Air conditioning R22 replacement

Project: **Reference:**	Upgrading of Air Conditioning UoR 47
Owner (person)	Neale Farwell – Richard Turner
Department	Facilities Management – Minor Projects
Description	A short description of the project, no more than a paragraph
Benefits	• Financial savings: £ 21,330 • Payback period: 3.5 years • CO_2e Emissions reduction: 263.3 tonnes of CO_2e • 1.02% of target – the percentage of your CO_2e saving target will this project annually contribute
Funding	• Project cost, e.g. the initial cost of implementing the project - £75,000 • Operational costs, e.g. annual maintenance or running costs - £0 • Source of funding: internal, external, investment criteria to be met etc. - TBA • How /when decision on funding will be made - TBA
Resources	• No additional resources anticipated
Ensuring Success	• Funding available
Measuring Success	• Reduced electrical consumption • Reduced harmful R22 gases
Timing	• Milestones / key dates e.g. o start date: **TBA** o completion date (when it will deliver savings): TBA o interim deliverable / decision points
Notes	TBA awaiting figures from Projects Team

Appendix D: Reporting Template

The following template will form the basis of quarterly reports submitted to the HECMP Project Board.

D.1 Project Status

Already complete / implemented	Green
Action Plan implemented and **ON TRACK** to meet requirement by target date	Amber
No Action Plan or **NOT ON TRACK** to meet requirement by target date	Red

Project No	Title	Owner	R A G	Date	% of Target
UoR 01	Insulation to pipe work and valves	Neale Farwell		2009/10	2.85%
UoR 02	Lighting control Carrington and Sports Park	Neale Farwell		2009/10	0.59%
UoR 03	Variable speed drives URS, Library and Palmer	Neale Farwell		2009/10	0.30%
UoR 04	BMS Installation Greenlands Campus	Colin Barwick		2009/10	0.28%
UoR 05	LED Lighting Greenow and McCrombie	Neale Farwell		2009/10	0.11%
UoR 06	Behavioural Change Whiteknights and Palmer Buildings (TCT)	Tom Yearley		2009/10	0.16%
UoR 07	Behavioural Change Carrington, Greenow, McCrombie and RUSU	Tom Yearley		2009/10	0.25%
UoR 08	Green Impact	Tom Yearley		2009/10	0.37%
UoR 09	Greenlands Boiler replacement	Mike Evans		2009/10	2.08%
UoR 10	Awareness raising campaign	Tom Yearley		2009/10	1.81%
UoR 11	Student Switch Off (1st Year)	Tom Yearley		2009/10	0.37%
UoR 12	Free Cooling Maths IT room	Neale Farwell		2009/10	0.59%
UoR 13	Closure Bridges Hall	Mike Evans		2009/10	6.04%
UoR 14	Closure Childs Hall	Mike Evans		2009/10	5.80%
UoR 15	Refurbishment HUMSS	Mike Evans		2009/10	0.00%
UoR 16	Security Room	Neale Farwell		2009/10	0.00%
UoR 17	Switch off Blade super computer	Mark Cockshoot		2010/11	6.89%
UoR 18	Student Switch Off (2nd Year)	Tom Yearley		2010/11	0.37%
UoR 22	Awareness raising campaign	Tom Yearley		2010/11	2.73%

UoR 23	Closure Bulmershe Campus	Mike Evans		2011/12	4.40%
UoR 24	Switch off computers overnight and at weekends	Mark Cockshoot		2011/12	10.26%
UoR 25	Closure Sibly Hall	Mike Evans		2011/12	4.34%
UoR 27	Awareness raising campaign 2013	Tom Yearley		2012/13	2.73%
UoR 28	Awareness raising campaign 2015	Tom Yearley		2014/15	2.73%
UoR 29	Insulation to pipework and valves	Neale Farwell		2010/11	2.08%
UoR 26	Fume cupboards STC	David Gilham		2010/11	0.95%
UoR 19	BMS fine tuning to align with operational times	Colin Barwick		2010/11	0.44%
UoR 20	Upgrade BMS and install expanded coverage Greenlands	Colin Barwick		2010/11	0.99%
UoR 46	Lighting control Chemistry and Food Bio	Neale Farwell		2010/11	0.68%
UoR 21	IT Management Software	Mark Cockshoot		2011/12	0.01%
UoR 30	Free Cooling	Neale Farwell		2012/13	0.05%
UoR 31	Optimiser control of cooling in Data Centre	Colin Barwick		2012/13	0.03%
UoR 32	Heating controls and systems and BMS	Colin Barwick		2013/14	2.08%
UoR 33	Virtualisation/thin computer	Mark Cockshoot		2014/15	0.20%
UoR 34	Heating zoning	Neale Farwell		2014/15	0.66%
UoR 35	Lighting upgrade to T5 high frequency	Mike Evans		2014/15	3.86%
UoR 45	Free Cooling Agriculture	Neale Farwell		2015/16	0.59%
UoR 41	Boiler replacement program	Mike Evans		2015/16	2.80%
UoR 36	Reduce total of non-residential area by 15%	Janis Pich		2014/15	4.33%
UoR 37	Reduce number of building used out of hours	Janis Pich		2012/13	0.16%
UoR 38	Reduce heating season by one week either end of season	Janis Pich		TBA	0.00%
UoR 39	Double Glazing in Whiteknights House	Mike Evans		2015/16	1.15%
UoR 40	Roof Insulation	Mike Evans		TBA	0.00%
UoR 42	CHP/District Heating Energy Centre	Mike Evans		TBA	0.00%
UoR 43	Fume Cupboards controls	Neale Farwell		2015/16	4.59%
UoR 44	Solar PV roof Project	Neale Farwell		2011/12	0.93%
UoR 47	Upgrading of Air Conditioning	Neale Farwell		2011/12	1.02%

D.2 Carbon Management Matrix Status

The blue line is where the University scored itself 5 July 2010

The red line is the target set for academic year 2015/16

The red dotted line is where the University rated itself 20 December 2010

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
5 **BEST**	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	**Granular & effective** 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 CO_2 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 **Worst**	No policy **No** Climate Change reference	No CM responsibility designation	Not compiled: CO_2 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

The Red dotted line would be used as an ongoing measure of where we have come from and what needs to be carried forward to achieve level 5 in all areas.

Each column on the Carbon Management Matrix will be allocated to a member of the Project Team to ensure continuity. The process will be managed by the Project Lead and issues and barriers escalated up to the Project Board.

Carbon Management Plan

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