

University of Stirling Carbon Management Programme

Carbon Management Plan (CMP)



Date: 27 March 2009

Version number: 1

**Owners: Karen Plouviez, Director of Estates & Campus Services, Project Sponsor
Andrew Duncan, Director of Property Management, Deputy Project Sponsor
David Jordan, Energy Management Engineer, Project Leader
David Duckett, Safety Advisor, Deputy Project Leader**

Approval status: Pending

Contents

Foreword from the Vice Chancellor and the Director of Estates and Campus Services	3
Foreword from the Carbon Trust	4
Executive Summary	5
1. Introduction	6
2. Carbon Management Strategy	7
2.1 Context and drivers for Carbon Management	7
2.2 Our low carbon vision	7
2.3 Strategic themes	8
2.4 Targets and objectives	8
3. Emissions Baseline and Projections	10
3.1 Scope	10
3.2 Baseline	11
3.3 Projections and Value at Stake	12
4. Carbon Management Projects	15
4.1 Project financial summary	15
4.2 Projected achievement towards target	16
5. Carbon Management Plan Financing	17
5.1 Assumptions	17
5.2 Benefits / savings – quantified and un-quantified	17
5.3 Financial costs and sources of funding	18
6. Actions to Embed Carbon Management in Your Organisation	19
6.1 Corporate Strategy – embedding CO ₂ saving across your organisation	19
6.2 Responsibility – being clear that saving CO ₂ is everyone’s job	19
6.3 Data Management – measuring the difference, measuring the benefit	20
6.4 Communication and Training – ensuring everyone is aware	20
6.5 Policy Alignment – saving CO ₂ across your operations	211
7. Programme Management of the CM Programme	22
7.1 Ongoing stakeholder management	23
7.2 Annual progress review	24
Appendix A: Carbon Management Matrix - Embedding	25
Appendix B: Definition of Projects	26
Appendix C: Existing Projects	27
Appendix D: Planned /Funded Projects	28
Appendix E: Near Term Projects	30
Appendix F: Medium to Long Term Projects	311

Foreword from the Vice Chancellor and the Director of Estates and Campus Services

Few organisations can now fail to appreciate the financial, social and political imperatives of taking actions today that contribute towards a sustainable future. The University of Stirling's Estate Strategy 2007 to 2017 and Strategic Plan Overview 2008 to 2012 both identify sustainability as one of the institution's key strategic messages and an institutional strength rather than a compliance burden. The University has already taken action on many aspects of sustainability, including cutting energy consumption and emissions, increasing recycling and minimising waste going to landfill, encouraging active travel by means other than the car, and ensuring that sustainable development and procurement are embedded in our practices. However, participation in the Carbon Management Programme has given us the opportunity to bring these activities together into a coherent programme, to spread the word about carbon reduction, and to create processes and drive that will ensure that this is just the first step in a journey towards continuous improvement.

The programme has identified a set of projects which will take the University some considerable way towards the target it set itself at the outset in relation to the reduction in carbon emissions (20% in 5 years). Work is in hand to ensure that these projects are implemented and that new ideas continue to be identified and evaluated so that the push towards carbon reduction is a sustained one.

Carbon reduction, like good safety or risk management, needs to be embedded in an organisation's culture if it is to be really successful. For that reason, considerable effort has been put into communication during the Programme to explain how every individual has a part to play and that some of the simplest actions can make a significant difference. We are aware that the first reductions in carbon emissions are the easiest and that further reductions will be harder and require the University to do things differently. However, we are committed to this journey!



(Karen Plouviez, Project Sponsor, discussing the Carbon Management Plan with Professor Christine Hallett, Principal and Vice Chancellor)



Karen Plouviez
Director of Estates & Campus Services
Project Sponsor



Professor Christine Hallett
Principal & Vice Chancellor

Foreword from the Carbon Trust

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

The University of Stirling was selected in 2008, amidst strong competition, to take part in this ambitious programme. The University of Stirling partnered with the Carbon Trust on this programme in order to realise vast carbon and cost savings. This Carbon Management Plan commits the organisation to a target of reducing CO₂ by 20% by 2012/13 and underpins potential financial savings to the organisation of around £4.6 million.

There are those that can and those that do. Public sector organisations can contribute significantly to reducing CO₂ emissions. The Carbon Trust is very proud to support the University of Stirling in their ongoing implementation of carbon management.

A handwritten signature in black ink, appearing to read "Richard Rugg".

Richard Rugg
Head of Public Sector, Carbon Trust



Executive Summary

This Carbon Management Plan sets the strategy and framework for the University of Stirling's ongoing commitment to the management and reduction of its carbon emissions. Specifically, it identifies the University's carbon baseline, sets a target for reducing this baseline within a defined period, lists an initial set of carbon reduction projects, and identifies sources of funding for taking these projects forward. The key facts and strategies within the plan are summarised below.

- The University aims to reduce its CO₂ emissions by 20% by 2012/13 based on its 2007/08 baseline.
- The University's baseline CO₂ emissions were 16,651 tonnes in 2007/08, taking into account building services, fleet travel, waste and water.
- Failure to take action would result in the University's utility costs rising from £4.2 million in 2007/08 to £7.6 million by 2012/13. These costs would only rise to £5.8 million by 2012/13 if we reach our 20% reduction target, saving a cumulative total of £4.6 million over the five year period.
- Similarly, if no action is taken our CO₂ emissions would rise from 16.6 thousand tonnes in 2007/08 to 17.2 thousand tonnes by 2012/13. If the University achieves its target reduction of 20% then CO₂ emissions would fall to 13.2 thousand tonnes, saving a cumulative total of 12.0 thousand tonnes over the five year period.
- Over 50 energy saving projects have been identified including physical improvements to the estate and practical initiatives which will encourage cultural change. It is anticipated that the implementation of these projects will achieve 75% of our target reduction.
- The initial investment over the first three years of the plan is estimated to be circa £1.39m from a mixture of capital and revenue funding streams.
- The implementation of this Carbon Management Plan will be overseen by a team drawn from the group which oversaw the production of the plan, and progress will be reported on an annual basis to the University's Finance and Infrastructure Committee.

1. Introduction

The University of Stirling recognises the environmental impacts arising from energy consumption and waste and is committed to tackling climate change by embedding sustainability at the core of its business practices. The University is therefore working towards placing sustainability and carbon reduction at the heart of its policies, strategies, plans and projects. Examples where this has been applied include the Estate Strategy, Sustainability Policy, Campus Active Travel Initiative and a range of practical energy saving projects as part of general maintenance, capital projects and dedicated energy projects.

The University of Stirling's participation in the Carbon Trust's Carbon Management Programme commenced in May 2008 and this Carbon Management Plan is the key output from this process. The plan uses the reports and analyses carried out during the previous steps of the programme to establish a strategy and framework for achieving the University's stated objective of reducing its CO₂ emissions from the operation of its estate by 20% by 2013 based on its 2007/08 baseline. The five main steps of the Carbon Management Programme may be summarised as follows:

- The preparation of a project plan to define the key stages of the process and resources required to deliver the Carbon Management Plan.
- Quantification of the University's carbon baseline, forecasting future emissions, and the setting of targets for improvement.
- The identification and quantification of projects to achieve the target of 20 % reduction in CO₂ emissions.
- The production of a Carbon Management Plan which sets the framework for the University's carbon management and reduction strategy.
- Implementation of the Carbon Management Plan including delivery of the carbon saving projects identified in the plan.

The University has already undertaken a number energy saving projects including the major recladding and insulation of its main academic building, renewal of the boiler system to Pathfoot building, insulation of plantrooms across the campus, and a range of works to its building management systems to improve the control of heating and lighting. Building on the improvements already achieved through these projects, the successful implementation of this Carbon Management Plan will provide the University with the opportunity to mitigate the effects of rising fuel prices and to limit the projected increase in its energy costs to £5.8 million by 2012/13 from £4.2 million in 2007/08. Using conservative assumptions, failure to take action will result in energy costs rising to more than £7.6 million by 2012/13. The actions set out in this Carbon Management Plan propose an ongoing investment programme starting in 2008/09 and running until 2010/11, a period of three years and mid way through the reduction target period. It is recognised that these projects will not in themselves achieve the University's target of a 20% reduction in CO₂, however they will set the scene for the investment programme and demonstrate that intervention leads to improvement. It is envisaged that the Carbon Management team will identify further projects as the implementation phase proceeds to ultimately achieve and hopefully exceed the overall target.

The Plan also highlights the significant implications of doing nothing including increased utilities costs, increased emissions, and both the potential loss of reputation and the inability to demonstrate responsible governance. It is anticipated that one of the greatest challenges will be implementing behavioral change, ranging from positive individual actions through to ensuring carbon management is embedded within all of the University's policies and strategies.

2. Carbon Management Strategy

This section sets out the University's Carbon Management Strategy over the next 5 years. Given the global imperative to address climate change and key drivers such as legislative, political, financial and reputational issues, the University is putting sustainability at the heart of its activities through the strategic themes developed under the Carbon Management Programme.

2.1 Context and drivers for Carbon Management

The potential impact of global warming due to the continued rise in greenhouse gas emissions is well documented and it is recognised as one of the main threats to the planet. Countries around the world united in action in 1997 to tackle climate change through the Kyoto Protocol - the only global international agreement on climate change. The Kyoto Protocol entered into force in February 2005. It committed the signatories to reducing their combined emissions of the six main greenhouse gases by 5.2 per cent below 1990 levels over the period 2008-2012. The UK share of the collective Kyoto target, assumed by the European Union is an emissions reduction of 12.5 per cent. The Scottish Climate Change Bill which is currently progressing through the Scottish Parliament will introduce an ambitious target to reduce emissions by 80 per cent by 2050.

In addition, a number of other legislative requirements have been introduced to promote energy efficiency and carbon reduction including:

- The Energy Performance of Buildings Directive (EPBD) which requires organisations to display energy certificates which rate the performance of their buildings.
- The Carbon Reduction Commitment (CRC) regulations which will require organisations to monitor and report on their energy and emissions footprint on an annual basis with the aim of reducing these over time.

In addition to these legislative requirements there are also key political, financial and reputational drivers which require to be considered including:

- The efficient use of scarce funds.
- Universities and Colleges Climate Commitment for Scotland (UCCCfS) which provides a pledge to reduce carbon emissions and report annually on progress.
- The annual People and Planet Green league which ranks Universities on their environmental performance.
- The need to demonstrate that the organisation is acting in a socially responsible manner.
- The University's own Estate Strategy and Strategic Plan Overview which both identify sustainability as one of the institution's key strategic messages and an institutional strength rather than a compliance burden.

2.2 Our low carbon vision

The University's Sustainability Policy states that the organisation 'is committed to integrating sustainable development into everyday practice by minimising environmental impact wherever possible, maximising economic performance and supporting beneficial social and community opportunities'. A key strand of achieving this policy objective is the aspiration to reduce its CO₂ emissions by 20% by 2013 based on its 2007/08 baseline. The achievement of this aspiration will cut the University's carbon footprint by 4 thousand tonnes annually, save £4.6 million in costs over five years, and clearly demonstrate real commitment to sustainability and corporate social responsibility.

2.3 Strategic themes

During the process of developing this Carbon Management Plan, a number of key strategic themes have emerged which will guide the University towards achieving its vision to reduce carbon emissions. These may be summarised as:

- The requirement to embed carbon management and reduction within all of the University's strategies, policies and practices to ensure that it is recognised as a corporate rather than an estates priority.
- The requirement to continue and accelerate existing and proposed energy saving projects.
- The need for behavioural change across the organisation as the carbon reduction target cannot be achieved by physical works alone.
- The need to ensure that sufficient resources are available from the University's Capital Plan and recurrent budgets, and through external sources such as Salix, to implement the projects that will deliver the maximum carbon return.
- Regular and ongoing communication of the University's Carbon Management strategy will be required across the organisation to maintain commitment and momentum.
- The forging of strategic partnerships both within and outside the organisation to assist with achieving the vision e.g. SUSA, Carbon Trust, Salix, Stirling Going Carbon Neutral.

2.4 Targets and objectives

The University of Stirling will reduce the CO₂ emissions associated with its activities by 20% by the end of the 2012/3 academic year based on our 2007/8 baseline.

The key targets and objectives formed through the Carbon Management Programme encompass those set out in the 2.2 Low Carbon Vision and the 2.3 Strategic Themes. At the outset of the programme it was agreed that an inspirational yet achievable carbon reduction target was set and that the objectives, listed below, should be broad, far reaching, and be inclusive of both staff and students.

The University aims to:

- ensure investment in energy saving projects which have a worthy economic payback or provide other carbon associated benefits
- introduce strategies for sustainable procurement and development
- develop a communications strategy to inform staff and students of the University's energy and water consumption and progress towards CO₂ reduction
- encourage staff and student involvement in the identification of opportunities and, where appropriate, implementation of action
- develop a culture to lead by example and encourage staff, students and the wider community to make changes to reduce carbon emissions
- raise the University's environmental profile within the HE/FE sector and the wider community and embed sustainability within the University brand
- bring together existing and future Carbon Management projects into a consistently managed and coherent programme by April 2009 with management oversight from the Core group
- raise the profile of the Carbon Management within the University community



The first building blocks in achieving the University's 20% carbon reduction target are to implement the majority of the projects identified in this Plan, both practical and strategic, within the three year period up to 2010/11. In parallel with this we will be identifying additional projects which will help meet, if not surpass, our 5 year target through practical initiatives and cultural change. Long term, the University aims to demonstrate a commitment to Carbon Management by investigating renewable technology, seeking to achieve the highest possible BREEAM rating for all existing and any new buildings and to effect change in attitude and behaviour.

3. Emissions Baseline and Projections

The emissions baseline in this section provides the datum level from which the University's 20% reduction in CO₂ target was set. Projections from this baseline forecast the financial and CO₂ emission outcome of taking no action against the potential savings from implementing the projects identified in this Plan.

3.1 Scope

The scope of this Carbon Management Plan covers the University's Stirling Campus and local off-campus residences as detailed below. Sites not included are the Western Island Campus in the Isle of Lewis as this is managed by NHS Western Isles and the Highland Campus based in Inverness which is managed by Highlands and Islands Enterprise.

Buildings

All associated CO₂ emissions with respect to energy from on-campus buildings and off-campus residences are included in the baseline with the exception of the consumption of electricity in Airthrey Castle Yard as residents organise their own energy supplies. There is currently no intention to include this site due to the difficulties in obtaining data and the negligible impact it would have on the baseline.

Travel

Only fleet transport is included in the baseline. Fuel consumption data was extrapolated from costs to provide emission values. By 2010, fuel consumption will be recorded on a regular basis to provide more accurate data.

An absence of suitable data meant that CO₂ emissions of business/ commuting travel were excluded from the baseline. There exists a diverse range of ways in which staff and students organise travel and currently no mechanism to comprehensively record the information exists. This area requires further investigation so that method of travel and fuel consumption can be captured and monitored in future years.

Waste

General waste which represents unsegregated waste in tonnes sent to landfill is included in the baseline. Recycled waste such as paper, metal, glass and plastics have been omitted due to lack of data and as Defra do not provide a CO₂ conversion factor. Recycled waste will be recorded more stringently in future and added to the baseline if the appropriate conversion factors are made available.

Water

All water consumed on-campus and in residences off-campus has been included in the baseline.

3.2 Baseline

The baseline was produced from data spanning the 2007-8 academic year taking into account the consumption of electricity, gas, oil, water and fleet transport fuel. Data quality is deemed to be very good as it was obtained predominantly from the University's sub meters which are accurate to within 1%. Fleet fuel consumption was extrapolated from cost data although, in future, will be based on recorded consumption. The emission factors ^[3.2.1] used to calculate the baseline are the latest from Defra which were updated in June 07 and shown in Table 3.2.1.

Energy type/Waste/Water	Unit used	Factor (kg CO ₂ /unit used)
Electricity (grid)	kWhr	0.523
Natural gas	kWhr	0.185
Gas oil	kWhr	0.251
Burning oil	kWhr	0.245
Diesel	litres	2.63
Waste (Landfill)	tonnes	447
Water	m ³	0.404

Table 3.2.1 – CO₂ Factors

It is worth noting that the electricity consumption of John Forty's Court, Union St and Lyon Crescent is likely to be higher than normal. This increase can be attributed to students consuming 'free' electricity during a submeter replacement programme. It is unlikely that this will significantly influence the baseline as the duration and availability of unsubmetered supplies was low.

It is also worth noting that 1.5 tonnes of CO₂ per annum is emitted per capita across the University. While this figure may not compare favourably with other Universities, it must be highlighted that Stirling Campus hosts a swimming pool, a theatre, the Stirling Management Centre and shops as well as capturing the emissions from a number of large scale residences on and off campus.

	Total	Buildings and street lights	Transport	Waste and Water
Baseline CO₂ emissions (tonnes)	16,651	16,331	31	289
Baseline Cost (£)	£4,238,568	£3,776,888	£ 10,585	£451,095

Table 3.2.2 – Summary of Emissions for Baseline Year 2007/8

^{3.2.1} <http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf-annex> 3

Examining the breakdown of emissions in Figure 3.2.1, it is evident that the 29% majority of CO₂ emissions are associated with the district heating mains which services the campus excluding Pathfoot and a number of smaller areas such as Airthrey Castle, Alexander Court and Gardens & Grounds. The chart also highlights that Pathfoot, which includes Pathfoot main building and the Aquaria, is very energy intensive accounting for 21% of the total University's emissions.

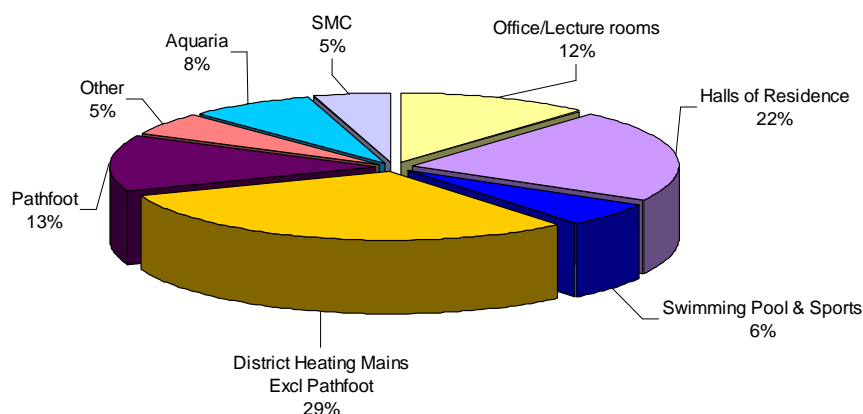


Figure 3.2.1 Summary of Emissions for Baseline Year 2007/8

3.3 Projections and Value at Stake

Projections in terms of CO₂ and costs over the 5 year period for 2007/8 to 2012/13 have been produced in order to assess the implications and impact of the carbon reduction initiatives identified under the Carbon Management Programme. Using the CO₂ baseline in section 3.2 as the starting point, the projections compare the trends of failing to act or deliver on CO₂ reduction and the Business as Usual scenario (BAU), with the outcome of implementing the CO₂ reduction projects identified in section 4.

The assumptions made in relation to the BAU scenario are that:

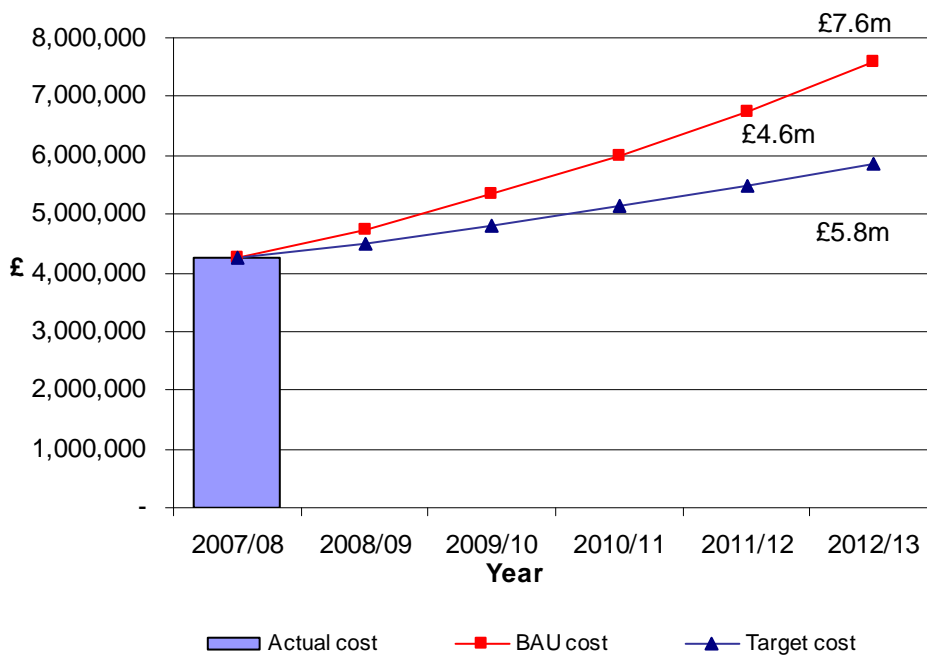
- electricity costs will increase by 15% per annum while liquid fuels, gas, water and waste are forecast to increase by 6% taking into account inflation and rising energy prices.
- in terms of emissions, it is forecast that CO₂ in relation to building stock, water, waste and fleet transport will all rise by 0.7% per annum.^{3.3.1}

For the University, the anticipated increase in emission levels is partly attributed to the expansion of the University which in 2008 saw the extension to the Stirling Management Centre and the construction of the Falkirk Football Academy building. It is expected that further additions and extensions will follow in the coming years. Other contributory factors are the proliferation of IT equipment and the associated increase in cooling loads and the growth of personal 'gadgets'.

3.3.1 DBERR/EP86

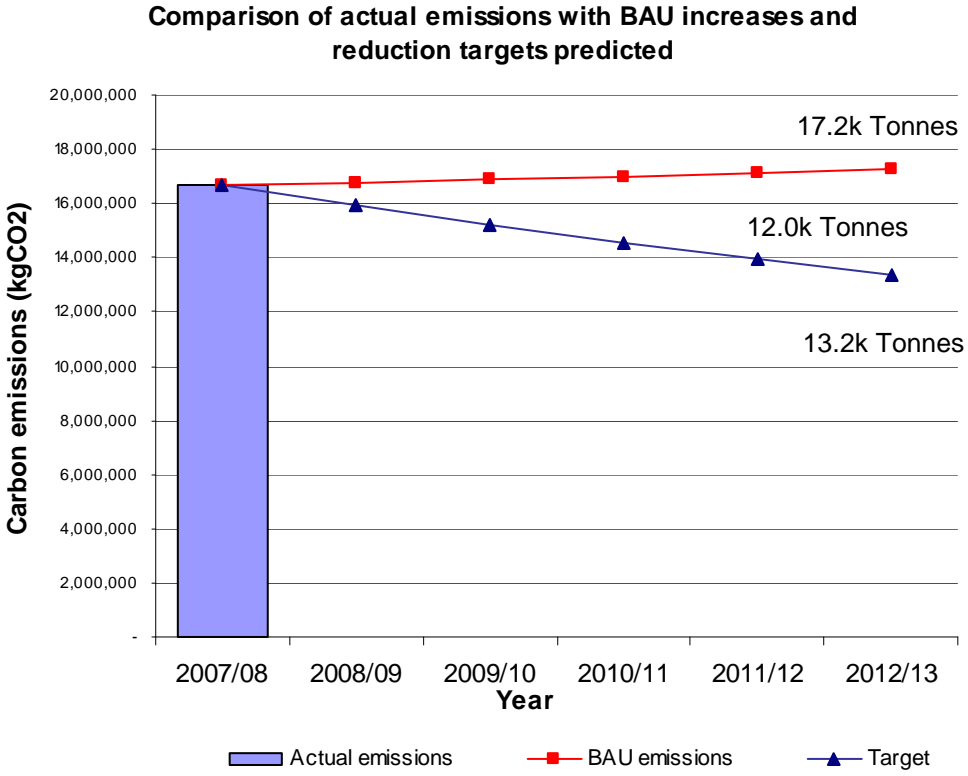
The Value at Stake as depicted in graphs 3.3.1 and 3.3.2 provides the forecast for costs and CO₂ emissions for the University's target period. If no measures were taken to reduce consumption, it is expected that the 2007/8 baseline would rise from 16.6k to 17.2k tonnes in five years and that the associated utility cost would rise from our current £4.2 million spend to £7.6 million. However if the 20% reduction target by 2012 was met, our annual emissions would fall to 13.2k tonnes while costs, still rising, would amount to £5.8 million. The difference between not doing anything and achieving our target over the next five years, in other words the value at stake, amounts to 12k tonnes CO₂ or expressed in monetary terms, £4.6 million.

Comparison of emissions with BAU increases and reduction targets - financial



Graph 3.3.1 Cost Value at Stake*

*The first year's figures were based on 2007/8 consumption at current energy costs



Graph 3.3.2 CO₂ Value at Stake

4. Carbon Management Projects

Projects, whether known before or identified during the programme, are summarised under the following categories with associated costs and savings provided in Table 4.1.1.

- Existing Projects are those which have either been completed and have already started delivering savings or are currently underway and expected to deliver savings this year.
- Planned/ funded projects are those which will be implemented and have funding.
- Near Term Projects are planned projects but as yet without funding.
- Medium to Long Term Projects require further investigation to establish their viability and are subject to funding.

Appendices C, D and E provide a list of all the projects divided into the categories described above. Further details were produced for each project in a Project Definition report, a sample of which is provided in Appendix B.

4.1 Project financial summary

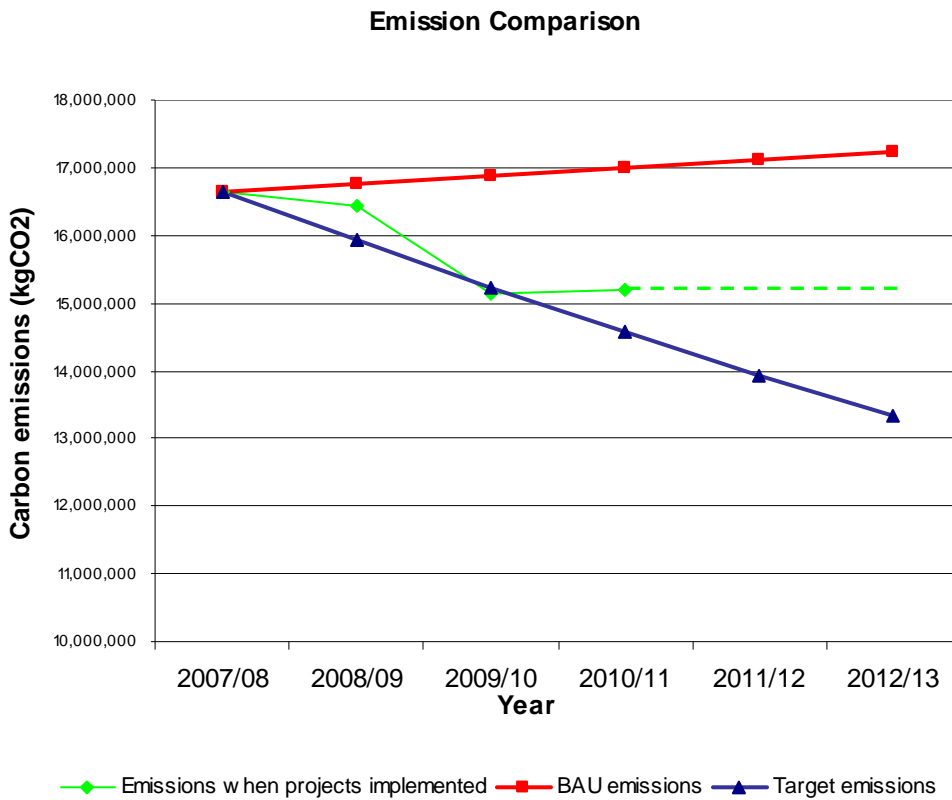
The majority of funding required for the projects identified in the Carbon Management Plan is attributed to the single library double glazing project which at £750k accounts for over half the overall funding and will be sourced from the Library Refurbishment Project budget. A further £270k will come from Salix on the projects which fulfil their funding criteria on payback and £/tonne CO₂ spend. The table 4.1.1 provides a summary of expenditure and savings over the four categories of project.

Project Category	Cost		Annual Saving		% of Target
	Capital	Revenue	Fin	CO ₂ tonnes	
Existing Projects	£106,898	£1,000	£88,289	389	16.13
Planned/Funded Projects	£1,205,232	£1,000	£362,314	1,429	59.27
Near Term Projects	£78,000	Undetermined	Undetermined	Undetermined	Undetermined
Medium to Long Term Projects	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Total	£1,390,130	£2,000	£450,603	1,818	75.40

Table 4.1.1. Project Costs, Savings and % of Target

4.2 Projected achievement towards target

The carbon saving opportunities within this plan currently amount to 75% of the 20% reduction target as shown in graph 4.2.1. The University aims to meet and hopefully exceed the target as more projects are identified and brought forward for implementation.



Graph 4.2.1 Projected Achievement Towards Target

5. Carbon Management Plan Financing

The University is committed to funding the requirements of the Carbon Management Programme. A number of funding sources have already been identified as detailed in section 5.3 below. Additional sources will be sought where required but the majority of the funding will be from the University's own reserves.

5.1 Assumptions

Assumptions made for calculating the costs and savings were based on the fuel and water unit costs below.

- Electricity (grid) -£0.13/ kWhr
- Natural Gas- £0.04 /kWhr
- Gas oil- £0.06 /kWhr
- Kerosene £0.05/ kWhr
- Water- £1.70 /m³
- Assumption 2
- Assumption 3, etc.

Where projects were difficult to quantify such as project UOS 027 which is to engage with cleaners and porters to switch lights off and shut windows, a broad brush approach was taken with savings estimated based on the percentage of total consumption. Other projects were based on what was considered to be reasonable assumptions such as the time lights were left on. As projects are more deeply assessed and/or implemented, a more accurate picture will emerge of the true overall savings and costs.

5.2 Benefits / savings – quantified and un-quantified

The table 5.2.1 highlights the CO₂ and cost savings which it is anticipated will be achieved through the implementation of the projects identified in the plan. In addition to these quantifiable savings there are a number of other benefits which flow from the preparation and implementation of the plan including:

- Raising awareness of carbon management and energy saving issues across the University community.
- Bringing about a change in culture whereby carbon management is considered as a matter of course across all strategic and operational areas of the University.
- Demonstrating that the University is operating in socially responsible manner.

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Annual cost saving	£78,746	£434,720	£450,603	TBC	TBC	TBC
Annual CO₂ saving	343	1,741	1,818	TBC	TBC	TBC
% of target achieved	14.2%	72.2%	75.4%	TBC	TBC	TBC

Table 5.2.1 CO₂ and Cost Savings

5.3 Financial costs and sources of funding

The table below summarises the various sources of funding for the projects identified in this plan. In addition to the one-off project costs, there will be a requirement for ongoing revenue costs of £2k per annum which will be funded from the E&CS Recurrent budget.

Funding Sources	Total	2008/9	2009/10	2010/11
E&CS Recurrent Budget				
- Property Management	£69,129	£65,316	£3,813	-
- Residences	£1,000	£1,000	-	-
- Commercial Operations	-	-	-	-
IS Recurrent Budget	£3,600	-	£3,600	-
Capital Plan:				
- Estates	£212,355	£1,000	£201,355	£10,000
- Library Refurbishment	£750,000	-	-	£750,000
- Murray Hall Refurbishment	£6,264	-	£6,264	-
Salix	£269,781	£11,287	£258,494	-
Total	£1,312,129	£78,603	£473,526	£760,000
Near Term Projects				
- Funding to be agreed	£78,000	-	£78,000	-
Grand Total	£1,390,129	£78,603	£551,526	£760,000

Table 5.3.1 Funding Sources

6. Actions to Embed Carbon Management in Your Organisation

Embedding the principles of carbon management at the heart of the University's policies, strategies and projects is key to ensuring the success of the carbon management programme.

Using the Carbon Trust's Carbon Management Matrix tool the project team has identified its current position and highlighted actions for improvement, summarized below:

- Integrate Carbon Management into the responsibilities of Heads of Department
- Regularly update the Principals Executive Group and FIC
- Establish a 'Champions' network within departments
- Establish a communications strategy

6.1 Corporate Strategy – embedding CO₂ saving across your organisation

Our published Strategic Plan overview document for 2008 to 2012 <http://www.external.stir.ac.uk/documents/strategic.pdf> approved by the University Court, (our governing body) indicates our commitment to:

- reduce our carbon emissions through participation in the CMP
- consider environmental performance in all development and maintenance projects
- extend our commitment over the planning period to 2012 to our procurement policy and procedures and our approach to waste minimisation.

Our carbon management project is sponsored by the Director of Estates and Campus Services who is a member of the University senior management team. The project team includes champions for all parts of the university community: academics, computing staff, operational and corporate planning staff, our finance team, students, and transport and communications staff.

In the 2009-10 corporate planning process, we will consider at which levels of planning and strategy to embed and publish the CO₂ saving target and other targets for individual services areas that may be contained in our implementation plan.

6.2 Responsibility – being clear that saving CO₂ is everyone's job

The project team aims to:

- ensure that Carbon Management is integrated into the responsibilities of department heads
- regularly update the Principals Executive Group and FIC on the progress of Carbon management against agreed targets
- fully engage with staff and students through a 'Champion' network within departments and the Students Union.

The project team will achieve this by:

- establishing a communications strategy to ensure the regular communication on the progress of the CMP.
- establishing, and keeping up to date, a web page to allow easy access to CMP information
- attending department and student meetings to gain involvement within departments and to set up a network of Champions.
- promote inter department/ inter hall competitions to encourage awareness of CMP and participation in energy saving initiatives

6.3 Data Management – measuring the difference, measuring the benefit

Data on energy performance will be coordinated and collated annually by the University Energy Management Engineer and will include energy information on buildings, street lighting, and waste. A process for collating energy information on transport will also be implemented within two years.

The project team will decide on how best to communicate important information on energy/ CO₂ performance to the University community e.g. information on the success of energy specific campaigns. Information on energy performance will be communicated to staff and students on a regular (quarterly) basis using the CMP web page. Specific information resulting from, for example, the student inter-hall competition, will be communicated using a poster campaign in each Hall of Residence.

6.4 Communication and Training – ensuring everyone is aware

The project team has prepared a communications strategy which includes:

- Creating and updating a University web page for Carbon Management
- Poster campaigns, in particular to remind staff to turn off electrical equipment during holiday periods
- University Portal messages to draw attention specific news about CMP and events/ progress
- Articles for newsletters and student papers
- Updating the University 'Environment' induction booklet to include the CMP and key messages on how to save energy
- Designing a web carbon saving checklist to enable staff and students to evaluate their contribution to energy saving.
- Establishing a dedicated email account for Carbon Management enquiries

A review of the effectiveness of the communications strategy will take place annually.



6.5 Policy Alignment – saving CO₂ across your operations

The University of Stirling's Estate Strategy published 2007 to 2017 and Strategic Plan Overview 2008 to 2012 identifies sustainability as one of the institution's key strategic messages and an institutional strength rather than a compliance burden. The University has already taken action on many aspects of sustainability, including cutting energy consumption and emissions, increasing recycling and minimising waste going to landfill, encouraging active travel by means other than the car, and ensuring that sustainable development and procurement are embedded in our practices. However, participation in the Carbon Management Programme has given us the opportunity to bring these activities together into a coherent programme, to spread the word about carbon reduction, and to create processes and drive that will ensure that this is just the first step in a journey towards continuous improvement.

7. Programme Management of the CM Programme

The University has senior level commitment to carbon reduction expressed in its Strategic Plan Overview 2008 to 2012 and its Estate Strategy 2007 to 2017. The work on the Carbon Management Programme has been guided by four individuals acting as a 'core' team - the Project Sponsor and Project Manager and the deputies for these two roles. These individuals, who are the owners of this Plan, also have direct responsibilities for sustainability and carbon management as part of their everyday roles.

This 'core' team has been supported by a Steering Group with members drawn from all areas of the University including the student community. This group has been actively involved with the identification and evaluation of projects that will deliver reductions in carbon emissions. Thought is now being given to the subset of this group that will oversee the implementation of our CM Plan.

Progress on carbon management is reported to the Finance and Infrastructure Committee (FIC) four times a year as part of the report from the Estates & Campus Services Department. FIC is a formal committee of University Court, the institution's governing body. Court also receives reports of progress in relation to the strategic priorities laid down in the Strategic Plan Overview.

7.1 Ongoing stakeholder management

Communication plays a key role in informing ,sustaining interest and motivating and as such is a crucial means of maintaining engagement with stakeholders. Table 7.4.1 provides details on how key stakeholders will be informed of the University's progress on Carbon Management.

Individual or Group	Interest or Issues	Message or Information	How	When	Who
Principal	Reputation Financial Strategic	Updates on University's Carbon Management performance	Kept informed and made aware of her peers' involvement in other organisations	As and when relevant information becomes available	Director of Estates and Campus Services
Director of Finance	Financial	Financial benefits and costs	Reporting on progress of Carbon Management through reports to Service Directors Group	As and when relevant information becomes available	Director of Estates and Campus Services and Finance Champion
Academic Champions	Strategic Financial Reputation	Convince ACs of the merits of embedding Carbon Management into policy, procedures and culture	Direct Involvement	Through quarterly meetings	Health and Safety Advisor
Students	Reputation Financial	Inform, involve and engage	Through regular updates on the Carbon Management portal page, Brig, global emails and SUSA	As and when required	Various information streams and SUSA
Director of IS	Reputation Financial	How IS can collaborate in Carbon Reduction	Reporting on progress of Carbon Management through reports to Service Directors Group	Through quarterly meetings completion	Through Computing Champion
Wider Staff	Reputation	Inform and engage	Through regular updates on the Carbon Management portal page, Estates and Campus Services Newsletter, Hearsay and global emails	Continuously	Various information streams
Procurement	Financial	Direct involvement	Through Carbon Management meetings	Through quarterly meetings completion of CMP	Through Procurement Champion
Wider Community	Financial Social Environmental	Updates on University's Carbon Management performance	Through updates on the University Home page, and published material including the EMS Estate Strategy People and Planet League table	As and when relevant information becomes available	Various information streams and External Relations

Table 7.4.1 Stakeholder Communications

7.2 Annual progress review

The data collected will be analysed by using targeting and monitoring systems to optimise savings. Such reductions will be monitored on a macro level to assess the effectiveness and performance of implemented projects. An annual summary will be produced by the Energy Management Engineer which will be reported to the Finance and Infrastructure Committee (FIC) and used for the purposes of reporting under the Universities & Colleges Climate Commitment for Scotland (UCCCfS).

Savings made from projects funded through Salix will be recorded on SERS software and returned to the fund to make available funds for future projects.

While difficult to quantify, benefits achieved through cultural change, initiatives will be assessed through communication streams such as the Carbon Management mailbox and Maintenance and Defects reports.



Appendix A: Carbon Management Matrix - Embedding

	CORPORATE STRATEGY	PROGRAMME MANAGEMENT	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	POLICY ALIGNMENT *
BEST 5	<ul style="list-style-type: none"> Top level target allocated across organisation CO₂ reduction targets in Directorate Business Plans 	<ul style="list-style-type: none"> Senior Management Team/Committee/Court review progress against targets on quarterly basis Quarterly diagnostic reports provided to Directorates Progress against target published externally 	<ul style="list-style-type: none"> CM integrated in responsibilities of senior managers CM part of all job descriptions Central CO₂ reduction advice available Green Champions leading local action groups 	<ul style="list-style-type: none"> Quarterly collation of CO₂ emissions for all sources Data externally verified M&T in place for: <ul style="list-style-type: none"> buildings street lighting waste transport 	<ul style="list-style-type: none"> All staff given formalised CO₂ reduction: <ul style="list-style-type: none"> induction and training communications Joint CM communications with key partners Staff awareness tested through surveys 	<ul style="list-style-type: none"> Finance committed for 2+ yrs of Programme External funding being routinely obtained Ring-fenced fund for carbon reduction initiatives 	<ul style="list-style-type: none"> CO₂ friendly operating procedure in place Central team provide advice and review, when requested Barriers to CO₂ reduction routinely considered and removed
4	<ul style="list-style-type: none"> CO₂ reduction commitment in Corporate Strategy Top level targets set for CO₂ reduction Climate Change Strategy reviewed annually 	<ul style="list-style-type: none"> Sponsor reviews progress and removes blockages through regular Programme Boards Progress against targets routinely reported to Senior Mgt Team 	<ul style="list-style-type: none"> CM integrated in to responsibilities of department heads Senior Management Team/Committee/Court regularly updated Staff engaged through Green Champion network 	<ul style="list-style-type: none"> Annual collation of CO₂ emissions for: <ul style="list-style-type: none"> buildings street lighting transport waste Data internally reviewed 	<ul style="list-style-type: none"> All staff given CO₂ reduction: <ul style="list-style-type: none"> induction communications CM matters communicated to external community 	<ul style="list-style-type: none"> Coordinated financing for CO₂ reduction projects via Programme Board Finances committed 1yr ahead Some external financing 	<ul style="list-style-type: none"> Comprehensive review of policies complete Lower level policies reviewed locally Unpopular changes being considered
3	<ul style="list-style-type: none"> CO₂ reduction vision clearly stated and published Climate Change Strategy endorsed by Cabinet and publicised with staff 	<ul style="list-style-type: none"> Core team regularly review CM progress: <ul style="list-style-type: none"> actions profile & targets new opportunities 	<ul style="list-style-type: none"> An individual provides full time focus for CO₂ reduction and coordination across the organisation Senior Sponsor actively engaged 	<ul style="list-style-type: none"> Collation of CO₂ emissions for limited scope i.e. buildings only 	<ul style="list-style-type: none"> Environmental / energy group(s) given ad hoc: <ul style="list-style-type: none"> training communications 	<ul style="list-style-type: none"> A view of the cost of CO₂ reduction is developing, but finance remains ad-hoc Some centralised resource allocated Finance representation on CM Team 	<ul style="list-style-type: none"> All high level and some mid level policies reviewed, irregularly Substantial changes made, showing CO₂ savings
2	<ul style="list-style-type: none"> Draft Climate Change Policy Climate Change references in other strategies 	<ul style="list-style-type: none"> Ad hoc reviews of CM actions progress 	<ul style="list-style-type: none"> CO₂ reduction a part-time responsibility of a few department champions 	<ul style="list-style-type: none"> No CO₂ emissions data compiled Energy data compiled on a regular basis 	<ul style="list-style-type: none"> Regular awareness campaigns Staff given CM information on ad-hoc basis 	<ul style="list-style-type: none"> Ad hoc financing for CO₂ reduction projects 	<ul style="list-style-type: none"> Partial review of key, high level policies Some financial quick wins made
1 Worst	<ul style="list-style-type: none"> No policy No Climate Change reference 	<ul style="list-style-type: none"> No CM monitoring 	<ul style="list-style-type: none"> No recognised CO₂ reduction responsibility 	<ul style="list-style-type: none"> No CO₂ emissions data compiled Estimated billing 	<ul style="list-style-type: none"> No communication or training 	<ul style="list-style-type: none"> No specific funding for CO₂ reduction projects 	<ul style="list-style-type: none"> No alignment of policies for CO₂ reduction

* Major operational policies and procedures, e.g. Capital Projects, Procurement, HR, Business Travel

Appendix B: Definition of Projects

This template has been used to define each of the projects within our programme.

Project:	A short name for the project
Reference:	<p><i>It would help the Carbon Trust if you also use the following reference:</i> ABC-[three letter abbreviation for your organisation]-[sequence number, e.g. 001] <i>but you may choose to use a unique reference of your own.</i></p>
Owner (person)	<i>Name of the person responsible for delivering the project</i>
Department	<i>Which part of the organisation the project sits within</i>
Description	<i>A short description of the project, no more than a paragraph</i>
Benefits	<ul style="list-style-type: none"> • <i>Financial savings: £ [x]</i> • <i>Payback period: [x] years</i> • <i>CO₂ Emissions reduction: [x] tonnes of CO₂</i> • <i>% of target – the percentage of your CO₂ saving target will this project annually contribute</i>
Funding	<ul style="list-style-type: none"> • <i>Project cost, e.g. the initial cost of implementing the project</i> • <i>Operational costs, e.g. annual maintenance or running costs</i> • <i>Source of funding: internal, external, investment criteria to be met etc.</i> • <i>Say how /when decision on funding will be made</i>
Resources	<ul style="list-style-type: none"> • <i>Additional resource (e.g. people) requirements to enable delivery and where these will come from</i> • <i>If this project will be delivered within current resources, say so</i>
Ensuring Success	<ul style="list-style-type: none"> • <i>Key success factors, or things that will need to happen for this project to succeed</i> • <i>Principal risks: technical, financial (e.g. what happens if the project is insufficiently resourced), etc.</i>
Measuring Success	<ul style="list-style-type: none"> • <i>Metrics for displaying performance or achievement</i> • <i>When success will be measured / evaluated</i>
Timing	<ul style="list-style-type: none"> • <i>Milestones / key dates e.g.</i> <ul style="list-style-type: none"> ○ <i>start date: dd/mm/yyyy</i> ○ <i>completion date (when it will deliver savings): dd/mm/yyyy</i> ○ <i>interim deliverable / decision points</i> <p><i>[you could also lay these out as a milestone chart for ease and clarity]</i></p>
Notes	

Appendix C: Existing Projects

Ref	Project	Lead	Cost		Annual Saving		Pay back Years	% of Target	Year
			Capital	Revenue	£ per annum	CO ₂ Tonnes per annum			
UOS E01	Boiler and Burner Replacement – Pathfoot	Gordon Dodds	£47,382	£0	£24,385	121	1.94	5.03%	2008/9
UOS E02	Variable Speed Drives – Pathfoot Boilers	Gordon Dodds	£9,332	£0	£1,879	8	12.39	0.31%	2008/9
UOS E03	Insulation of Pathfoot Boiler House	Gordon Dodds	£6,523	£0	£489	2	12.40	0.10%	2008/9
UOS 013	Draught proofing of Pathfoot Building	David Jordan	£28,294	£0	£9,543	46	2.96	1.92%	2008/9
UOS 015	Controls for Pathfoot Satellite Boilers	Eric Dalglish	£4,312	£0	£1,854	9	2.32	0.38%	2008/9
UOS 023	Cycle to work scheme/Cycle facilities/Map out shower and bicycle racks	Michael Chambers	£1,000	£0	£2,905	17	0.91	0.71%	2008/9
UOS 025	Communications - Calander.10 quick wins/Awareness campaign	David Duckett	£2,000	£1,000	£1,300	5	On going	0.22%	2008/9
UOS 027	Engage staff (Cleaners, Porters etc) to switch off lights, close windows & blinds	Bill Mason	£0	£0	£1,300	5	N/A	0.22%	2008/9
UOS 031	Lighting Controls in Atrium	Lewis Mathews	£80	£0	£511	2	0.15	0.09%	2008/9
UOS 052	Fit insulation to Cottrell Plant Room valves	David Jordan	£6,975	£0	£2,387	2	2.32	0.49%	2008/9
UOS 053	Replace tungsten lamps in Residences with CFLs	David Jordan	£1,000	£0	£41,736	172	0.02	6.90%	2008/9
Totals			£106,898	£1,000	£88,289	389		16.13%	

Appendix D: Planned /Funded Projects

Ref	Project	Lead	Cost		Annual Saving		Payback Years	% of Target	Year
			Capital	Revenue	£ per annum	CO ₂ Tonnes per annum			
UOS 001	Address areas of overheating	Prop Man	£0	£0	£3,203	16	N/A	0.66%	2009/10
UOS 002	Configure Deadband control/Air con	Lewis Matthews	£400	£400	£248	3	1.61	0.11%	2009/10
UOS 003	Populate fewer heating zones to reduce consumption	David Jordan	£0	£0	£16,724	83	N/A	3.45%	2009/10
UOS 004	Shut down of Lab PCs	Graham Millar	£1,800	£0	£13,370	55	0.13	2.23%	2009/10
UOS 005	Increase server room efficiencies build new server room	Graham Millar	£0	£0	Undetermined	Undetermined	Undetermined	Undetermined	2011/12
UOS 006	Close early unused PC labs/library	Graham Millar	£1,800	£0	£32,577	135	0.06	5.44%	2009/10
UOS 007	Local energy/green champions	David Duckett	£0	£0	Undetermined	Undetermined	Undetermined	Undetermined	2009/10
UOS 008A	Lighting controls in seminar room	Lewis Matthews	£7,500	£0	£6,367	26	1.18	1.06%	2009/10
UOS 008B	Lighting controls in Cottrell toilets	David Jordan	£2,500	£0	£1,879	8	1.33	0.31%	2009/10
UOS 009	Water Saving Measures - Residences	David Jordan	£80,537	£0	£53,927	115	0.57	4.78%	2009/10
UOS 011	Install improved heating controls	Lewis Matthews	£10,000	£0	£11,160	55	0.90	2.30%	2010/11
UOS 012	Fit pool cover	Ian Graham	£3,200	£600	£32,189	141	5.74	5.74	2009/10
UOS 014	Draught proofing of Cottrell courtyards	Guy Hickman	£5,525	£0	£1,321	7	4.18	0.27	2009/10
UOS 017	Fit timers on vending machines	Ian Gwynne	£413	£0	£1,384	6	0.30	0.23	2009/10

Ref	Project	Lead	Cost		Annual Saving		Payback Years	% of Target	Year
			Capital	Revenue	£ per annum	CO ₂ Tonnes per annum			
UOS 018	Employ sustainability Officer/carbon reduction responsibilities	Karen Plouviez	£0	£0	£1,384	6		0.23%	2009/10
UOS 019	Hold Inter-hall competition	SUSA	£0	£0	£12,944	53	N/A	2.17%	2009/10
UOS 020	Hold Inter Pathfoot - Cottrell Competition	Prop Man	£0	£0	£20,279	84	0	3.38	2009/10
UOS 024	Increase use of recycled paper	Colin Elliot	£0	£0	£1,094	3	0	0.10%	2009/10
UOS 026	Make carbon reduction integral to Staff and Student Induction programme	HR	£0	£0	£1,300	5	N/A	0.22%	2009/10
UOS 028	Communicate process of fault reporting to wider University population	Prop Man	£2,000	£0	£4,000	17	0.50	1.33	2009/10
UOS 029	Survey Aquaculture with view to implementing any carbon reduction opportunities identified	Prop Man	£0	£0	£12,840	53	N/A	2.14%	2009/10
UOS 030	Replace lamps in Pool area with Leds	Ian Graham	£10,759	£0	£10,172	42	1.06	1.70%	2009/10
UOS 032	Install Solar Water Heater Collectors at Pool	Lewis Matthews	£6,000	£0	£353	2	16.98	0.07%	2009/10
UOS 033	Use Loch as heat sink/source of cooling/heating	Prop Man	£90,000	£0	£8,000	33	11.25	1.34%	2009/10
UOS 034	Removal of portable electrical heaters	HOD	£0	£0	£30,713	127	N/A	5.13%	2009/10
UOS 035	Removal of Electric Hand dryers	Prop Man	£1,200	£0	£3,994	16	0.30	0.67%	2009/10
UOS 036	Promote use of manual doors and review electric door sensor settings	Bradley McLaren	£0	£0	£524	2	N/A	0.09%	2009/10
UOS 038	Lag cold water pipes	Eric Dalgleish	£1,000	£0	£465	2	2.15	0.10%	2009/10
UOS 040	Double glaze the library	Prop Man	£750,000	£0	£4,723	22	Does not payback	0.93%	2010/11
UOS 043	Conduct Energy Survey to establish areas of high energy consumption	David Jordan	£0	£0	£16,720	72	N/A	2.94%	2009/10

Ref	Project	Lead	Cost		Annual Saving		Payback Years	% of Target	Year
			Capital	Revenue	£ per annum	CO ₂ Tonnes per annum			
UOS 045	Engage with Psychology dept over staff and student cultural change	E & CS	£0	£0	Undetermined	Undetermined	Undetermined	Undetermined	2009/10
UOS 049	Install more efficient street lighting	Gordon Dodds	£64,500	£0	£5,460	23	11.81	0.91%	2009/10
UOS 050A	Install lighting controls in Halls of Residence	David Jordan	£75,716	£0	£18,976	78	3.17	3.17%	2009/10
UOS 050B	Install Lighting controls in Murray	Ian Whyte	£6,264	£0	£1,567	6	3.99	0.26%	2009/10
UOS 051	Replace Residences tungsten desk lamps with Leds	Mandi Clark	£75,000	£0	£26,945	111	2.78	4.50%	2009/10
UOS 054	Lighting Cottrell 3 & 4 W Corridors	David Jordan	£280	£0	£1,057	4	0.26	0.18%	2009/10
UOS 055	Lighting Controls in 2V2/3 corridors	Lewis Matthews	£280	£0	£1,057	4	0.26	0.18%	2009/10
UOS 057	Insulate hot water pipes in SUSA offices	Douglas Gray	£1,200	£0	£209	1	5.74	0.12%	2009/10
UOS 058	Install energy efficient lighting in SUSA shop	David Jordan	£1,160	£0	£291	1	3.98	0.05%	2009/10
UOS 059	Install individual timers to heaters in Spittal Hill Chalets	David Jordan	£6,198	£0	£2,898	12	2.14	0.18%	2009/10
Totals			£1,205,232	£1,000	£362,314	1429		59.27%	

Appendix E: Near Term Projects

Ref	Project	Lead	Cost		Annual Saving		Pay back	% of Target	Year
			Capital	Revenue	£ per annum	CO ₂ tonnes per annum			
UOS 022	Rationalisation of printers	Margaret Angel	£78,000	TBC	TBC	TBC	TBC	TBC	TBC

Appendix F: Medium to Long Term Projects

Ref	Project	Lead	Cost		Annual Saving		Payback	% of Target	Year
			Capital	Revenue	Fin	CO ₂			
UOS 010	Biomass/Waste boiler - Gardens and Greenhouses	David Jordan	TBC		TBC		TBC	TBC	TBC
UOS 056	Install mains water coolers	David Jordan	TBC		TBC		TBC	TBC	TBC