



Scottish Borders Campus Carbon Management Plan

Carbon Management Plan (CMP)

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Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for all public bodies - it's all about getting your own house in order and leading by example. The Scottish and UK Governments have identified the public sector as key to delivering carbon reduction across Scotland and the UK in line with world-leading Scottish and UK Climate Change legislation.

The Carbon Trust's 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.

Scottish Borders Campus was selected to take part in this ambitious programme. Scottish Borders Campus partnered with the Carbon Trust in order to realise substantial carbon and cost savings. This Carbon Management Plan commits the organisation to a target of reducing CO₂ by 25% by 2015 and underpins potential financial savings to the organisation of over £100,000 per annum.

There are those that can and those that do. Public bodies can contribute significantly to reducing CO₂ emissions. The Carbon Trust is proud to support Scottish Borders Campus in the on-going implementation of its carbon management plan.

A handwritten signature in blue ink, appearing to read "Paul Wedgwood".

Paul Wedgwood
Manager, Carbon Trust in Scotland

Warren McIntyre
Low Carbon Collaborations Manager



Foreword from Chair of Sustainability Committee and Joint Chair of Campus Management Committee

Scottish Borders Campus serves as a home to the main business of Borders College and to Heriot-Watt University's School of Textiles and Design. In our occupancy of the Campus, the institutions recognise that our position as businesses, employers, and providers of education and training present not only challenges, but also opportunities, in the way that our activities impact on the environment.

The institutions at the Campus have committed to a policy of reducing adverse impact on the environment and embedding sustainability in our business functions and in the curriculum. This "whole Campus" approach sees specific actions identified within our business support services, the development of student programmes in sustainable technologies and also the inclusion of a sustainable ethos across all our full-time provision. The Carbon Management Plan is central to all aspects of this policy, driving the input actions and measuring outcomes.

A handwritten signature in black ink, appearing to read "Pete Smith".

Pete Smith

Director of Finance and Resources.

Executive Summary

Reducing our impact on the environment is a key priority for the Scottish Government; the introduction of the Climate Change (Scotland) Act 2009 includes a national target reduction of 42% by 2020. The Act places duties on institutions to reduce greenhouse gas emissions and graduate to a low carbon economy which will increase sustainable economic growth. Scottish Borders Campus is continually developing targets and opportunities to ensure we are engaged and supportive of this important national target.

Borders College and Heriot-Watt University have placed sustainability as a key strategic objective within their respective corporate plans and jointly have already embarked on a variety of sustainable initiatives including recycling, energy awareness, travel policies and travel reduction strategies, implementing energy efficient products and services and energy efficiency with estates development over the past 3 years of the co-location.

The Carbon Management Plan (CMP) sets out both the carbon and financial benefits of adopting a proactive and structured approach to carbon management. It quantifies the Campus base line CO₂ emissions as 1550 tonnes per annum calculated from gas, electricity, transport and waste costs generated in 2010. A target reduction of 25% in CO₂ over the next 5 years has been set.

By adopting the Carbon Trust's Opportunities for Savings Report and conducting a review of departmental activities we have identified additional projects to reduce our emissions by 21% over the next 5 years, saving 326 tonnes of CO₂ per annum. Implementing the CMP will also realise ongoing cash savings of over £78,000 annually with an average payback for capital investments of 8.5 years. Whilst reducing our CO₂ emissions, implementing the CMP will also help to bridge the gap between current energy costs and the future predicted rise in energy over the next 5 years which is expected to be an approximate increase of £84,000 by 2015.

Included within the CMP are 17 quantified projects as detailed in Section 4.0 and Appendix A. Out of the 17 projects, 7 have been fully implemented, including reducing the college car and minibus fleet, replacing internal and external lighting with LED equivalents and increasing server room temperatures, collectively saving £24,000 per annum and 55 Tonnes of CO₂.

The concept of the CMP and financing the implementation of individual projects has achieved approval from the Campus Management Committee. Approving the utilisation of Campus sinking funds where appropriate, financing projects from current FM budgets and attracting external income streams such as the Renewable Heat



Incentive (RHI) will provide a variety of financial sources to ensure a successful implementation. The recently introduced RHI is a government backed scheme designed to encourage the installation of renewable heating systems providing financial incentives over the next 20 years, based on current proposals, RHI income for a Biomass system installed on Campus may exceed £17,000 per annum over a 20 year period.

The ongoing progress and success of the CMP will be managed by the Sustainability Committee whose main role is to implement and monitor its effectiveness as detailed in Section 5.0.

By implementing the CMP the Campus will ultimately benefit financially; however, the education of our staff and learners on the importance and benefits of acting in a sustainable, energy efficient and responsible manner provides significant unrealised future benefits for the organisations and wider community.

The main focus of the CMP is to reduce the environmental impact of our day to day business and reduce our carbon emissions through improving our corporate performance. By implementing the projects identified within the CMP we will take a significant step towards achieving our strategic and financial objectives.

Scottish Borders Campus will reduce its CO₂ emissions by 25% by 2015.



1.0 Introduction

Scottish Borders Campus

Scottish Borders Campus was opened in April 2009 and formed part of an ambitious estates strategy which saw ownership of the majority of the site transfer from Heriot-Watt University to Borders College, with extensive refurbishment and new build creating the current footprint which is occupied by Borders College and Heriot-Watt University's School of Textiles and Design. The Campus, located at Netherdale in Galashiels, is spread over 3 buildings: Main Building, High Mill and Technical Training Centre. Both institutions offer a wide range of courses in various subject areas including construction, sports, hair and beauty, business management and textiles and design. While Borders College students are drawn almost exclusively from the 1800 square miles that comprise the Scottish Borders, the School of Textiles and Design attracts students from across the world to study in Scotland.

The main purpose of the CMP is to drive the reduction of our carbon footprint by identifying opportunities to improve efficiency and reduce waste across our estate and activities within the 5 year period of the Plan. Sustainability issues are currently managed by the Sustainability Committee which has already achieved some significant progress in its short lifespan: reducing waste, significantly increasing recycling, reducing our transport fleet and conducting a review of student transport arrangements. In order to identify future energy saving opportunities an energy assessment was undertaken by Energy Management Solutions on behalf of the Carbon Trust. The outputs of this assessment form a significant part of the recommendations within the CMP.



2.0 Carbon Management Strategy

Scottish Borders Campus is committed to improving our corporate performance to ensure the future sustainability of the environment and our organisations.

The College's Corporate Plan 2010-13 contains Estates and Resources ambitions under section 4.6 *'to utilise our resources efficiently and effectively to support the delivery of our curriculum, we will achieve this by managing our estates to minimise adverse impact on the environment and embed sustainability in our day-to-day businesses.'*

The University has committed to reduce its impact on the environment and states *"We shall operate our facilities in a responsible way with concern for the environment and for the communities in which we operate"* within its Environmental Policy. This contains 6 key objectives in how to achieve each objective including 'Develop knowledge of the environmental impact of its activities, seeking to move towards long-term principles of sustainability'.

Committing to the Carbon Management Plan will further cement our position as responsible organisations in helping to tackle increasing carbon emissions and global warming; we will also demonstrate to our staff and learners the important benefits of carbon reduction and ensure this ethos is embedded across both organisations.

2.1 Context and Drivers for Carbon Management

The increasing CO₂ levels are having a detrimental impact on the environment in relation to climate change; this impacts both institutions locally and nationally. Both institutions value our rural location and in order to protect our environment for future generations actions are required to tackle rising CO₂ emissions.

Both institutions will continually review and monitor our environmental performance in all our activities, the implementation of the CMP will allow the Campus to evaluate our current performance and assess and prioritise projects to ensure significant carbon savings can be made whilst providing medium to long term financial return on any investments. The previous and predicted future rise in energy costs provides a major motivation to promote and modify wasteful energy behaviours and implement suitable and sufficient safeguards to minimise the impact of increased operational costs.

By becoming more efficient we will: -

- Reduce the impact of energy cost increase against significant budgetary pressures.
- Reduce our energy consumption.
- Reduce our CO₂ emissions.
- Reduce our impact on Climate change.
- Increase staff and learners' awareness of climate change issues and help alter wasteful behaviour.
- Improve our plant and equipment's operational effectiveness and life cycle.
- Comply with national and sector-specific initiatives such as Climate Change Declaration and UCCCFS.

2.2 Our Low Carbon Vision

Scottish Borders Campus has a major role and significant influence within the Borders area, predominantly with the younger generation. We have a responsibility to lead and guide climate change and carbon reduction at a local level. We have the opportunity to influence behaviour and help preserve the environment and support the aspirations of future generations. We can achieve this by demonstrating our commitment to all by implementing the carbon reduction measures contained within the CMP, driving behavioural change, reducing our carbon footprint and improving the financial stability of both institutions.

2.3 Strategic Aims

The key strategic aims for Scottish Borders Campus are: -

- To manage our estates to minimise adverse impact on the environment and embed sustainability in our day-to-day business.
- To evaluate our current plant and equipment to ensure efficient operation/procurement and establish longer term financial benefits.
- To embed environmental sustainability into the curriculum.
- To reduce our energy consumption.
- To use energy more efficiently.
- To influence and modify wasteful behaviour across staff and student body within both institutions.

2.4 Targets and Objectives

The main objective is to implement the recommendations contained within the Assessment of Energy Report completed by Energy Management Solutions in April 2011 and identify, quantify and present other carbon reduction measures to reduce our carbon footprint by 25% by 2015, based on 2010 baseline figures.

3.0 Emissions Baseline and Projections

3.1 Scope

In order to establish a baseline required for the CMP a review of utilities, waste and fuel costs was completed for year 2010. The sources of emissions were calculated from conducting a review of the following sources: -

- Gas and electricity utilities usage from the Main Building, Technical Training Centre and High Mill was calculated at 4,272,780 kWhrs based on 2010 utilities bills; this equates to 1322 tonnes of our CO₂ emissions.
- General waste production was calculated from 2010 landfill contracts at 277 tonnes which produced 124 tonnes of CO₂.
- Fuel costs in relation to the College vehicle fleet and business travel was calculated from vehicle mileage logs and expenses submissions during 2010 at 38,750 litres of fuel, producing 104 tonnes of CO₂.

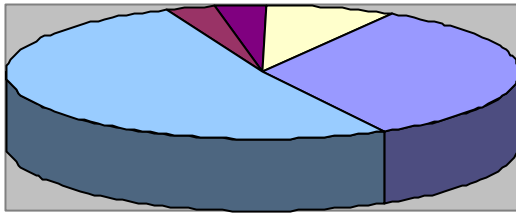
Sources of emissions not included at this time but may be included during the course of the plan include: -

- University Fleet costs.
- University staff Business travel.
- Water Consumption across the Campus.
- College owned premises out with Scottish Borders Campus.

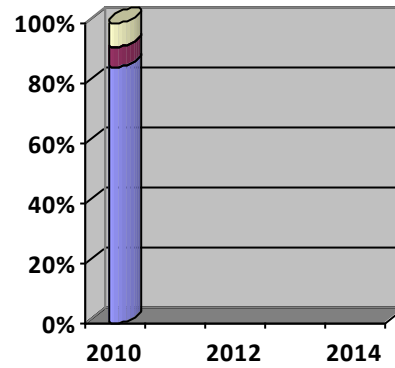
3.2 The Campus Baseline 2010

The Campus baseline is calculated from a combination of Gas and Electricity usage, waste generation and fuel costs over academic year 2010. Total carbon emissions were calculated at 1550 tonnes of CO₂ per annum.

Total CO₂ Emissions from Buildings, Transport and Waste

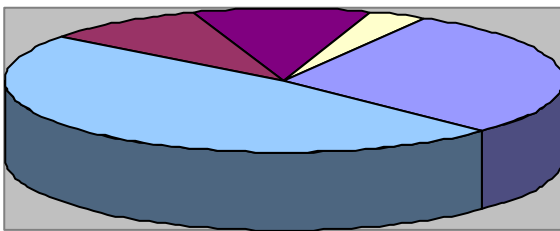


Gas 33%	Electricity 52%
Fleet Transport 3%	Business Transport 4%
Landfill Waste 8%	

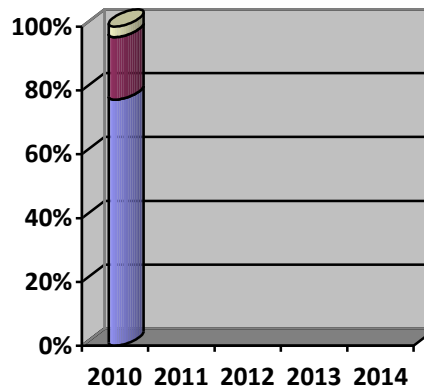


Waste
Transport
Buildings

Total Cost of CO₂ Emissions from Buildings, Transport and Waste



Gas 29%	Electricity 48%
Fleet Transport 9%	Business Transport 10%
Landfill Waste 3%	



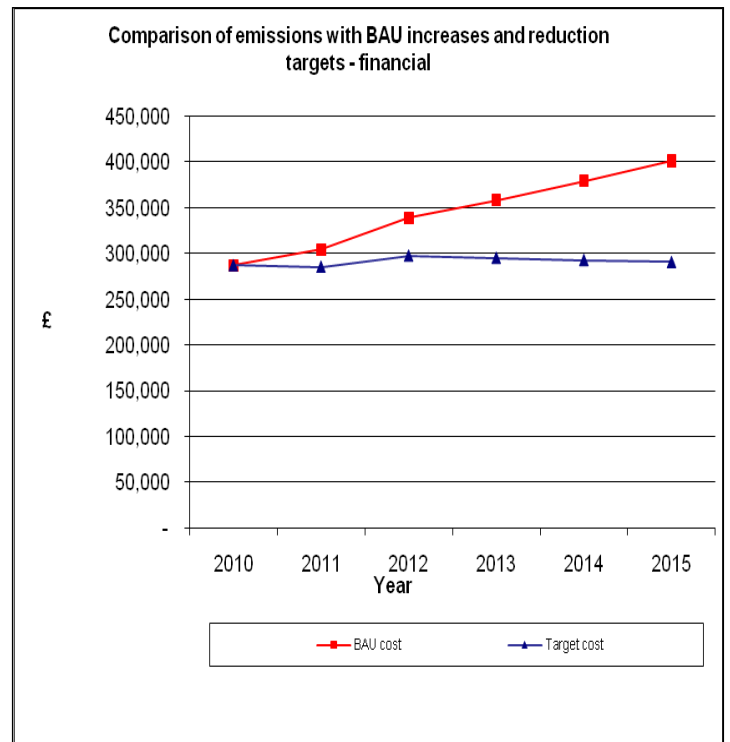
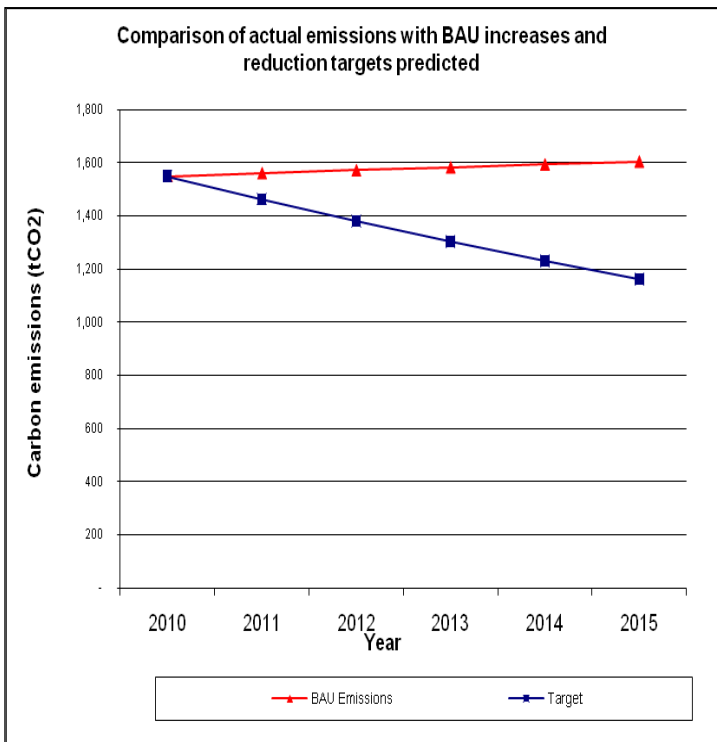
Waste
Transport
Buildings

	Total	Buildings	Transport	Waste
Baseline CO₂ emissions (tonnes)	1,550	1,322	104	124
Baseline Cost (£)	£286,944	£ 221,062	£ 56,188	£9,695

3.3 Projections and Value at Stake

The baseline CO₂ emission figures and costs for 2010 have been plotted on the graphs below, assuming minimal increase in CO₂ emissions for the duration of the CMP. Graph 1 shows the 'Business as Usual' (BAU) in red against the targeted reductions over the period of the CMP.

Costs over the period of the CMP have been plotted (graph 2) showing a year on year increase in energy costs of 5.8% as predicted by the Department of Energy and Climate Change. In other words, if we were to do nothing, our CO₂ levels are unlikely to increase significantly over the duration of the CMP; however, the costs associated with this in relation to energy would rise significantly from £287,000 in 2010 to £371,000 in 2015. Doing nothing is not a sensible, moral or financially prudent option. Reducing our CO₂ emissions will help to offset the costs of rising fuel costs.



4.1 Completed projects

Ref	Project Description	Owner	Cost		Annual Savings (yr 1)		Pay back (yrs)	Progress Status %	% of CO ₂ Target	Implementation Year
			Capital	Op cost	Financial (Gross)	tCO ₂ Savings				
3	Increase Server Room temp	C Nicholls	£0	£0	£267	1.6	0.0	100%	0.4%	2011
5	Replace Halogen Bulbs in Board room/ Salon and Offices with LED equivalent	R Hewitt	£0	£360	£293	1.7	1.2	100%	0.4%	2011
10	Replace External Lighting with LED	R Hewitt	£0	£3,776	£2,607	15.3	1.4	100%	3.9%	2012
11	Reduce Car fleet from 12 to 9	P Smith	£0	£0	£4,591	8.5	0.0	100%	2.2%	2010
12	Reduce Minibus Fleet from 10 to 8	P Smith	£0	£0	£4,167	7.7	0.0	100%	2.0%	2011
13	Replace Lighting within BC restaurant	R Hewitt	£0	£2,300	£642	3.8	3.6	100%	1.0%	2011
14	Replace Bulbs Within High Mill Studio with LED equivalent	R Hewitt	£0	£828	£1,294	7.6	0.6	100%	2.0%	2011
17	Remove Hawick-Peebles bus route transferring students onto Public transport	C Nairn	£0	£0	£13,461	24.8	0.0	100%	6.4%	2010
18	Install 50 KW Solar PV system on Campus Roof	R Hewitt	£64000	£0	£10,384	26.5	7	100%	6.1%	2012
19	Reduce amount of Physical servers from 60 to 24	C Nichols	£0		£10,444	63.3		100%	16.3%	2012
9	Insulate ceiling above ceiling mounted radiators in TTC	R Hewitt	£0	£2,025	£198	0.8	10.2	100%	0.2%	2013
21	Supply Bio fuel for Campus van	R Hewitt	£0	£800	£723	1.6	1	100%	0.4%	2013
22	Purchase two electric vehicles	R Hewitt	£31,032	£576	£6688	5.7	4.6	100%	1.5%	2014
		Totals	£95,032	£9865	£55,759	168.9	Av 2.3	Av 100%	42.8%	

4.2 Planned / funded projects

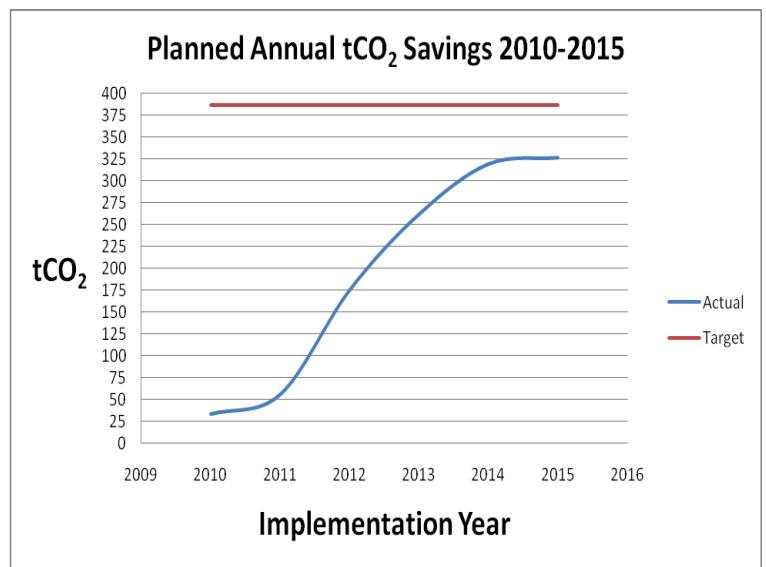
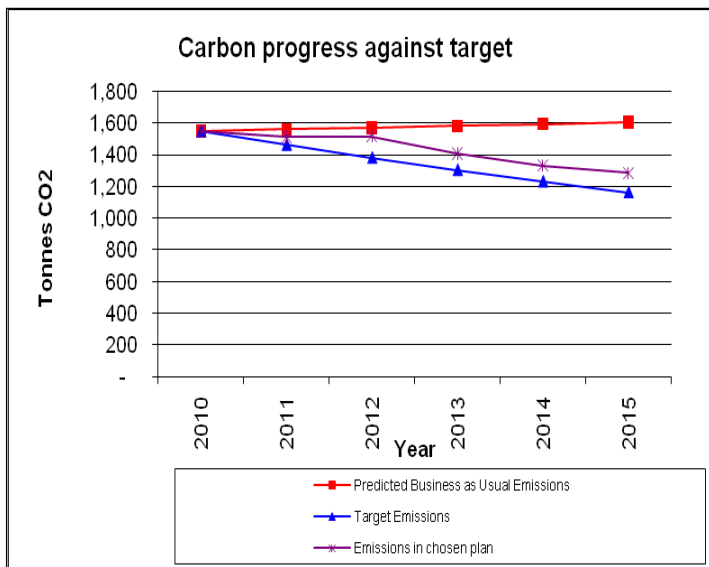
Ref	Project Description	Owner	Cost		Annual Savings (yr 1)		Pay back (yrs)	Progress Status %	% of CO ₂ Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO ₂ Savings				
1	Implement an Energy management programme, incorporating policy, training, awareness & performance measurement	P Smith	£0	£0	£6,901	38.9	0.0	25%	10.0%	2013
4	Insulate pipe work & Fittings in all plant rooms	R Hewitt	£0	£1,040	£439	1.8	2.4	20%	0.5%	2013
15	Replace Fluorescent Strip Lights in High Mill with LED equivalent	R Hewitt	£22,867	£0	£3861	26.2	5.9	10%	6.8%	2014
		Totals	£22,867	£1040	£11,198	66.9	Av 2.7	Av 18%	17.3%	

4.3 Near term projects

Ref	Project Description	Owner	Cost		Annual Savings (yr 1)		Pay back (yrs)	Progress Status %	% of CO ₂ Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO ₂ Savings				
2	Implement a Metering, Monitoring & Targeting programme, incorporating sub metering of Electricity & Gas & MMT software.	R Hewitt	£20,600	£0	£11,707	62.4	1.8	25%	16.1%	2015
6	Install Biomass Boiler (whole site) inc High Mill and Union Boiler replacement	R Hewitt	£490,944	£64,356 Net 20yr income £1.17m	£41,394	275	11.8	25%	71%	2015
		Totals	£511,544	£17,787	£71,030	337.4	Av 9.4	Av 17.5%	96.5%	

4.4 Projected Achievement towards Target

To date we have identified projects which when fully implemented will achieve 84% of our 387 tonne target totalling an annual reduction of 326 tonnes of CO₂. The charts below highlight the financial and CO₂ targets and our progress towards achieving this. Moreover, the completion of these projects would mitigate the significant rise in fuel costs expected over the next few years by approx £78,000 per annum.



5.0 Implementation

As highlighted in section 4, to date 7 of the 17 projects have been implemented. These 'quick wins' highlight the progress the CMP has already made, with cost savings in excess of £24k and 55.6 tonnes of CO₂ annually being realised with a minimal financial outlay of only £3.5k.

Whilst these 'quick wins' have been completed, the balance of the projects still to be implemented will require significantly more financial commitment and time to complete. Overall annual savings of £78,808 have been identified with a total financial outlay of £412,679 or 5.2 year average payback; however, in order to fully realise the financial benefits of the CMP, it is worth noting the potential income from the Renewable Heat Incentive (RHI) of £355,740 projected over a 20year period.

The CMP will continue to realise significant CO₂ and financial saving well beyond the 5 year implementation period. It is expected that these benefits will last a further 15-20 years.

The following assumptions have been made in calculating the financial viability of each targeted project. Fuel costs are based on Defra/DECC 2010 table: -

- Gas cost factor of 0.04/kWhr
- Electricity cost factor of 0.09/kWhr
- Diesel £1.45 per litre
- Biomass costings and RHI income stream based on 2011 Carbon Trust Energy saving opportunities report
- A full feasibility study into installation of Biomass system and replacement boilers within High Mill and Union will be completed to determine final Installation costs and accurate RHI income data

Financing

5.1.1 Benefits/Savings – Quantified and Un-Quantified

Unquantified Benefits:

While it is accepted that implementing a Carbon Management Plan will provide financial and carbon saving opportunities for both institutions, there are wider benefits to be considered. Sustainability is a key driver within local and national government

and continues to see an increased focus on sustainable governance requirements from Government, Education Scotland and the Scottish Funding Council.

Driving towards a sustainable Campus will encourage staff, visitors and learners to adopt the ethos of sustainability within their working/study life on Campus and be able to apply this benefit throughout their educational and working life.

Delivering on the CMP helps to meet the current and anticipated future financial challenges with increased regulation and penalties for underperforming organisations.

As the main HE and FE provider within the Borders region our reputation as caring, responsible and proactive institutions helping to lead the way with innovative ideas and utilising emerging technologies will only be enhanced by the CMP.

5.1.2 Financial Costs and Sources of Funding

The tables below show the costs and carbon savings, income streams, capital and operating costs, unallocated funding and the budgets each expenditure is derived from.

	2010	2011	2012	2013	2014	2015
Annual cost saving	£0	£23,129	£24,715	£56,951	*£76,287	*£89,191
Annual CO₂ saving In Tonnes	0	46	56	198	285	350
% of target achieved	0%	12%	14%	51%	74%	90%

*Income for 2014 & 2015 includes £17,787 expected from Renewable Heat Incentive and £6896 from FITs

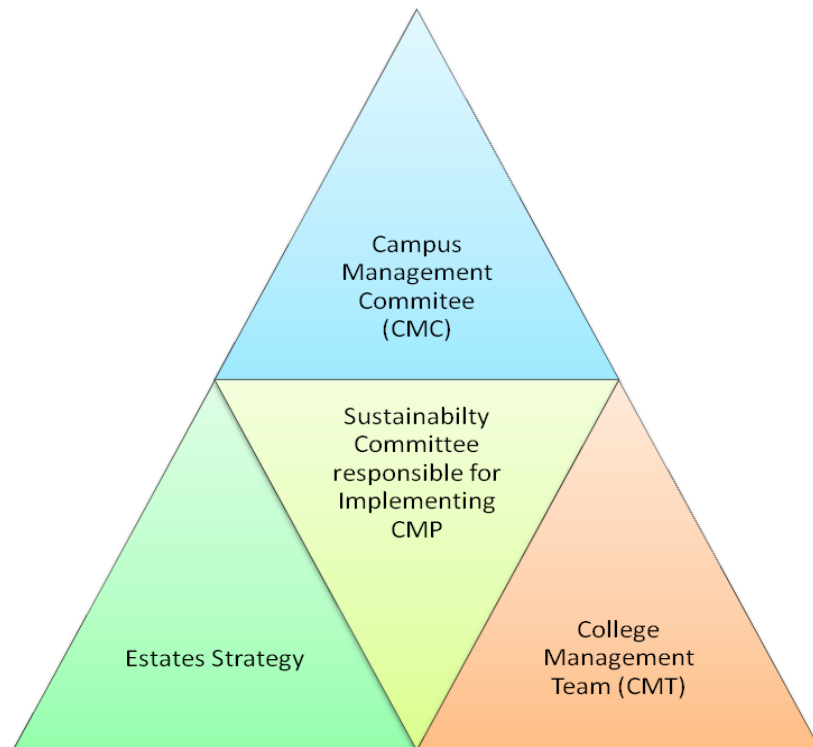
figures in £ 1000's	2010	2011	2012	2013	2014	2015
Annual costs:						
Total annual capital cost	£0	£0	£0	£0	£0	£0
Total annual operating cost	£0	£3,488	£6,841	£0	£0	£0
Total costs	£0	£3,488	£6,841	£0	£0	£0
Committed funding:						
Committed annual capital	£0	£0	£85,281	£250,000	£65,000	£0
Committed annual revenue	£0	£0	£0	£0	£0	£0
Total funded	£0	£0	£85,281	£250,000	£65,000	£0
Unallocated funding						
Unallocated annual capital	£0	£0	£0	£0	£0	£66,250
Unallocated annual revenue	£0	£0	£0	£0	£0	£0
Total unfunded	£0	£0	£0	£0	£0	£66,250

- 2011-2012 operating costs already funded from Campus FM budget.
- 2012-2015 committed funding from utilisation of campus sinking funds subject to costing and feasibility studies.
- 2015 unallocated funding to be revised by Campus Management Committee annually, agreement subject to procurement reduction costs and final funding allocation from CMC.

Governance for Implementation

5.1.3 Embedding Carbon Management

The Sustainability Committee is charged with and committed to implementing the Carbon Management Plan. The Committee meets quarterly and has representatives from all sections of the Campus including students and staff from both institutions. The Committee will provide progression updates to the Campus Management Committee, Estates Strategy and College Management Team.



The above reporting structure ensures the Sustainability Committee communicates the implementation plans effectively across both organisations.

5.1.4 Data Management – Measuring the Difference, Measuring the Benefit

In advance of developing the CMP, significant progress has been achieved with developing systems designed to measure and monitor the plan's effectiveness. Plotting of weekly data utilising an online software package provides valuable data which is used to measure against targets and highlight progress made by converting kWhrs used into real cost/CO₂ reductions and reported quarterly to the Sustainability Committee and annually through annual progress report to all detailed in 5.1.3.

Resource Commitment

5.1.5 Implementing the Initiatives

The Sustainability Committee is chaired by the College's Director of Finance and Resources, who is a member of the College Senior Management Team (SMT), and Joint Chair of the Campus Management Committee. The Sustainability Committee is responsible for implementing and monitoring the CMP by allocating individual roles and actions and ensuring these are completed successfully within agreed timescales.

5.1.6 Maintaining Quality Over Time

Regular reports to the Sustainability and Campus Management Committees on CMP progress will ensure continuity and focus on implementation as well as identifying, quantifying and prioritising new opportunities to achieve our overall 25% reduction target.

5.1.7 Programme Management of the CM Programme

The importance of good programme governance is vital for the success of the CMP achieving its objectives. Ensuring the drive and enthusiasm is maintained over the implementation period and beyond, by developing a cohesive approach involving all areas and departments of the Campus, requires commitment and buy in from the top down.

5.1.8 The Sustainability Committee – Strategic Ownership and Oversight

The Sustainability Committee's main role is to implement and monitor the effectiveness of the CMP. Meeting quarterly, the Committee consists of members of the College Management Team (CMT), departmental representatives and students. It covers areas such as sustainable procurement, energy management, construction, waste management, and embedding sustainability within teaching and learning. A quarterly progress report completed by the Campus Facilities Manager will be submitted using a simple Red Amber Green (RAG) status on each project. The report will also be submitted quarterly to CMC with a summary report to CMT.

5.1.9 The Carbon Management Team – Delivering the Projects

The team empowered to deliver the majority of the projects identified within the CMP consists of P Smith – Director of Finance and Resources, R Hewitt – Facilities Manager, P Elliot – Assistant Facilities Manager and various sub contractors engaged for their expertise. The current members all form part of the College's Finance and Resources team and as such have the authority and budget control to decide upon the day-to-day aspects of implementing projects subject to the financial controls agreed through the CMC. A structure of weekly meetings is already in place which will be adapted to accommodate the CMP requirements.

5.1.10 Succession planning for key roles

The Director of Finance and Resources is a member of the College's Senior Management Team and, acting as Executive Sponsor for the Plan, reports to both the SMT and wider College Management Team. At a senior management level, the College has embedded a collective responsibility ensuring that, in the absence of one member, all duties and responsibilities can be met. Thus, in the absence of the Director of Finance and Resources, immediate executive responsibility would pass to another member of SMT, while operational decision-making would continue to rest with the Facilities Manager. In the absence of the Facilities Manager, the Assistant Facilities Manager would take on short-term responsibilities for the CMP until the Facilities Manager was replaced.

Implementation Plan

The CMP will be submitted to the Sustainability Committee in June 2012 and Campus Management Committee on 15th June 2012. These will also form the dates for annual reviews of the plan in future years. Key internal milestones and timelines will be determined by each project and will be subject to Committee approval at quarterly intervals. Each project timeline will be monitored via Microsoft Project software and funding reviews completed prior to the start of next academic year.

Appendix A: Definition of Projects

Project:	SBC-001		
Reference:			
Owner (person)	Pete Smith		
Department	Sustainability Committee Chair		
Description	<p>Implement an Energy Management Programme, incorporating policy, training, awareness & performance measurement. A simple Energy Policy has been incorporated within the Sustainability Policy. This should be further developed, including some key overall consumption targets. It is also necessary to develop a structured approach to energy awareness, and this should be instigated by incorporating energy awareness wherever possible within the Campus's training programmes.</p> <p>Potential energy savings throughout the site will be highlighted through the creation of a formal framework for increasing awareness managed by the Sustainability Committee. Energy awareness education to the staff and students needs to be carried out on a regular basis. Staff and students should be consulted to provide their opinions on whether there are any energy efficiency issues with either the process equipment or the building services. Also, the usage and monitoring of control systems, such as the heating, A/C and lighting controls should be included.</p>		
Benefits	By implementing the above the following benefits will be realised		
	Financial Savings PA	Payback Period	CO ₂ reduction PA
	£6,901	0.0yrs	38.9 tonnes
			% of CO ₂ Target
			10%
Funding	No funding required		
Resources	Staff time to implement through sustainability Committee		
Ensuring Success	A member of staff should be given responsibility for management of energy. The Campus should now consider the creation of a formal action plan for achieving further energy savings. The recommendations made in this report could be used as the basis of the action plan and as a platform for further investigation.		
Measuring Success	Conduct pre and post evaluations of utilities usage over time and during periods of active campaigning.		
Timing	6-12 Months		
Notes			

Project: Reference:	SBC-002										
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Implement a Metering, Monitoring & Targeting programme, incorporating sub-metering of electricity and gas & MMT software.</p> <p>The introduction of sub metering at strategic points across the campus allows us to measure and monitor key parts of the Campus and identify opportunities to reduce energy wastage and improve efficiency. Sub-metering should be installed on the gas supply to each plant room and kitchen. It is recommended that the electrical supply to each plant room (supplying pumps & controls) is also sub-metered, along with each air handling unit (AHU) and the main server room. It is also recommended that the existing gas and electric sub-meters in the Technical Training Centre, the fiscal gas meter for the site, and the fiscal electric meter in the High Mill, have automatic meter reading (AMR) installed. This is achieved by ordering Automatic Meter Reading from the main energy provider or from an independent AMR provider</p> <p>The sub-metered data will be analysed alongside the existing site-level electrical half hourly consumption data (HHD), and HHD from the other gas and electric fiscal meters. This analysis will be used to identify energy saving opportunities, particularly those relating to the timing of equipment being turned on/off. The analysis should also be used to track the progress of energy saving interventions. This would form part of an ongoing metering and monitoring energy management exercise.</p>										
Benefits	<p>By implementing the above the following benefits will be realised</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">£11,707</td> <td style="text-align: center;">1.8yrs</td> <td style="text-align: center;">62.4 tonnes</td> <td style="text-align: center;">16.1%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£11,707	1.8yrs	62.4 tonnes	16.1%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£11,707	1.8yrs	62.4 tonnes	16.1%								
Funding	To be funded by Campus Management Committee, to be submitted to CMC for final approval and implementation monitored by Sustainability Committee.										
Resources	The additional data provided by sub-metering will not provide a saving unless adequately analysed and appropriate measures suggested and implemented. Consideration by Sustainability Committee to assign or appoint someone to the role of energy manager, ensuring they have the necessary training to analyse the HHD.										
Ensuring Success											
Measuring Success	Metering implementation and quantifiable data available for analysis										
Timing	6-12 Months										
Notes											

Project:	SBC-003 (Completed)										
Reference:											
Owner (person)	Carlyn Nicholls										
Department	ICT										
Description	Increase Server Room temperature. By increasing the set-point temperature, reduced cooling will be required in the Server Room. This will reduce electricity consumption, and hence costs and carbon emissions. The cooling set point within server rooms was 17°C; adjustments were made to increase this to a set point of 23°C without any adverse effect on operating efficiency of equipment.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£267</td> <td>0.0yrs</td> <td>1.6 tonnes</td> <td>0.4%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£267	0.0yrs	1.6 tonnes	0.4%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£267	0.0yrs	1.6 tonnes	0.4%								
Funding	No funding required										
Resources	No resources required										
Ensuring Success	Maintain temp at 23°C										
Measuring Success	Reduction in energy consumption										
Timing	Completed										
Notes											

Project:	SBC-004										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Insulate pipe work and fittings in all plant rooms. Some sections of hot water pipe work, and most fittings (such as valves, flanges, elbows and tees) are un-insulated. Un-insulated or poorly insulated hot water pipe work and fittings increase the gas consumption of space heating boilers and water heaters. By insulating any bare sections of pipe work and fittings, the energy, and hence carbon and cost savings, could be made.</p>										
Benefits	<table border="1"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£1,040</td> <td>2.4yrs</td> <td>1.8 tonnes</td> <td>0.5%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£1,040	2.4yrs	1.8 tonnes	0.5%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£1,040	2.4yrs	1.8 tonnes	0.5%								
Funding	Future FM budget										
Resources	FM time to complete										
Ensuring Success	All exposed pipe work should be insulated										
Measuring Success	Reduction in gas consumption within TTC										
Timing	0-3 Months										
Notes											

Project:	SBC-005 (Completed)										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Replace halogen bulbs with LED equivalents. High-efficiency LED lighting provides a similar amount of light to halogen, whilst consuming around 90% less electricity. In addition, LED lamps have a much longer quoted lifetime than halogens, reducing the long-term costs due to replacing faulty lamps. A lighting replacement programme will result in electricity consumption reduction, with associated cost and carbon savings.</p> <p>There are a number of halogen lights around the Campus. In salons, board room and some offices, the following lighting was identified for replacement: 38-off 50W low voltage (MR16) halogen lights with 5W high-brightness LEDs.</p> <p>Halogen lamps and the existing control gear for the MR16 low voltage lamps were replaced by a suitable LED-specific control. This will allow the LEDs to operate with maximum light output whilst retaining maximum lifetime and reliability.</p>										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£293</td> <td>1.2yrs</td> <td>1.7 tonnes</td> <td>0.4%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£293	1.2yrs	1.7 tonnes	0.4%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£293	1.2yrs	1.7 tonnes	0.4%								
Funding	From within current FM budget										
Resources	Fitting time only										
Ensuring Success	Project completed										
Measuring Success	Ongoing reduction in operating and maintenance costs by measuring life span of units										
Timing	Completed										
Notes											

Project:	SBC-006										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Installing a Biomass boiler of around 400kW thermal output adjacent to the Main Plant Room would supplement the existing gas boilers. The boiler plant would be controlled to prioritise operation of the biomass boiler (when sufficient thermal demand exists).</p> <p>This will either need the construction of a boiler house or a container mounted system could be considered. Detailed analysis of the exact size of the boiler and the appropriate storage requirement will be needed before confirming which option is the most appropriate.</p> <p>The fuel choice options of woodchips and wood pellets would need to be considered. There are a number of local woodchip suppliers who should be able to supply a suitable quality of wood chip fuel and there are also a number of local and nationwide wood pellet providers that supply to this area. Wood chips are likely to be the cheaper option but require more maintenance to ensure they operate reliably. Wood pellets have a more uniform size and are of a more consistent quality but are therefore more expensive. For the purposes of this report we have assumed that a wood chip system is installed.</p>										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£19,336(Gross)</td> <td>10.3yrs</td> <td>86.7 tonnes</td> <td>22.3%</td> </tr> </tbody> </table> <p>The current gas boilers in the plant room are estimated to have seasonal (i.e. annual average) efficiencies of around 88%. Although biomass boilers may achieve seasonal efficiencies of 85%, the lower carbon intensity and fuel price will offer both carbon and cost savings.</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£19,336(Gross)	10.3yrs	86.7 tonnes	22.3%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£19,336(Gross)	10.3yrs	86.7 tonnes	22.3%								
Funding	<p>A 400kW boiler would cost in the region of £200k to install however once installed this type of system would be eligible for the Renewable Heat Incentive (RHI). The legislation for this financial support has recently been agreed and applications are now being accepted nationally. Net RHI income has been calculated at £17,787 per annum guaranteed over 20 year period (£355,740 total). Utilisation of the Campus sinking fund with RHI income used as repayments will repay installation costs over a 10 year period with the balance of RHI period as an income stream.</p>										
Resources	Project management of installation through FM department										
Ensuring Success	Project must be financially resourced to identify and install suitable boiler. Areas suitable for the installation of this type of system have been identified, however further feasibility studies would be required.										
Measuring Success	Annual payment of RHI measured against annual operation of boiler requiring calculations of energy savings in carbon reduction and energy produced.										
Timing	12-18 months from approval										
Notes											

Project:	SBC-007										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Replace High Mill boilers. The existing boiler plant in the High Mill is in excess of 20 years old and would benefit from being replaced with modern high-efficiency gas condensing boilers, incorporating improved controls. These controls will include optimum start, stop and weather compensation which adjusts the boiler's timing and operating temperatures in line with external temperatures to optimise boiler efficiency. The boilers on-site have much lower efficiencies (assumed seasonal: ~65%) than modern equivalents which have seasonal (i.e. annual average) efficiencies of around 90%. Improved controls will further optimise the efficiencies of the boilers, especially at times of low load due to milder weather.</p>										
Benefits	<p>By replacing the existing boilers, gas consumption would be significantly reduced, resulting in cost and carbon savings.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">£4,950</td> <td style="text-align: center;">8.1yrs</td> <td style="text-align: center;">20.8 tonnes</td> <td style="text-align: center;">5.4%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£4,950	8.1yrs	20.8 tonnes	5.4%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£4,950	8.1yrs	20.8 tonnes	5.4%								
Funding	<p>Installation costs of around £40k would be required to replace the boilers. Whilst this will not have the benefit of the RHI the payback period is reduced to 8.1 years with a life expectancy of 15-20 years. Utilisation of the sinking fund should be considered to finance the installation with amendments to the life cycle model being made to reflect this; alternatively ongoing quantified savings from years 8-16 could be reinvested back into the sinking fund.</p>										
Resources	Project management of installation through FM department										
Ensuring Success	Funding of appropriate boilers is vital										
Measuring Success	Post sub-metering of High Mill gas, operational readings of current systems would be taken pre and post installation to confirm savings.										
Timing	6-12 Months from approval										
Notes											

Project:	SBC-008										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Replacement of Union boilers. The current boiler plant in the old Union Plant Room is approx 20 years old and should be replaced with modern high-efficiency gas condensing boilers, incorporating improved controls. These controls will include optimum start stop and weather compensation; these adjust the boiler's timing and operating temperatures in line with external temperatures to optimise boiler efficiency. The boilers on-site have much lower efficiencies (assumed seasonal: ~65%) than modern equivalents which have seasonal (i.e. annual average) efficiencies of around 90%. Improved controls will further optimise the efficiencies of the boilers, especially at times of low load due to milder weather.</p>										
Benefits	<p>By replacing the existing boilers, gas consumption would be significantly reduced, resulting in cost and carbon savings.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">£1,733</td> <td style="text-align: center;">14.4yrs</td> <td style="text-align: center;">7.3 tonnes</td> <td style="text-align: center;">1.9%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£1,733	14.4yrs	7.3 tonnes	1.9%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£1,733	14.4yrs	7.3 tonnes	1.9%								
Funding	<p>Installation costs of around £25k would be required to replace the boilers; whilst this will not have the benefit of the RHI, the boilers will have a life expectancy of 15-20 years. Utilisation of the sinking fund should be considered to finance the installation with amendments to the life cycle model being made to reflect this; alternatively ongoing quantified savings from future year's energy savings could be reinvested back into the sinking fund.</p>										
Resources	Project management of installation through FM department										
Ensuring Success	Funding of appropriate boilers is vital										
Measuring Success	Post sub-metering of Union Gas, operational readings of current systems would be taken pre and post installation to confirm savings.										
Timing	6-12 Months from approval										
Notes											

Project:	SBC-009										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Insulate ceiling above ceiling-mounted radiators in Technical Training Centre. There are 4 ceiling-mounted radiator panels in each of the two classrooms in the Technical Training Centre. Above the ceilings there is a sloping roof void, with an average height of approximately 1.2m. At present, this roof void is heated by the exposed upper surface of the radiator panel. Insulation should be fitted above the ceilings of both classrooms (covering the entire ceiling area). This will limit heat transfer from the radiators to the roof void (i.e. minimise the heating of an unoccupied space), and reduce the heat loss to the external from the classrooms below.</p>										
Benefits	<p>By insulating above the ceilings, gas consumption would be significantly reduced, resulting in cost and carbon savings.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">£198</td> <td style="text-align: center;">10.2 Yrs</td> <td style="text-align: center;">0.8 Tonnes</td> <td style="text-align: center;">0.2%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£198	10.2 Yrs	0.8 Tonnes	0.2%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£198	10.2 Yrs	0.8 Tonnes	0.2%								
Funding	Funding requirement £2,025, to be met by current FM budget										
Resources	FM time to complete installation										
Ensuring Success	<p>Assessment required to establish that the structure of the existing ceiling can support the weight of the insulation.</p> <p>Obtain quotations for supply and installation of insulation and supporting materials.</p>										
Measuring Success	Completion of insulation and void temperature readings taken to establish insulation success.										
Timing	3-6 Months										
Notes											

Project:	SBC-010 (Part Complete)										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	<p>Replace 64 X 150 watt external security lights with 30 watt LED equivalents. Major improvements in LED technology and the reduction in procurement costs provide a more energy and cost efficient system than higher rated halogen equivalents. To date, we have installed 12 units across the campus for trial purposes with minimal drop in lighting levels. Life expectancy of LED units significantly out-performs halogen equivalents, operating up to 5 times longer. Calculations are based on units working on average 10hours per day for 365 days per year, controlled by a seasonal timer.</p>										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£2,607</td> <td>1.4yrs</td> <td>15.3 tonnes</td> <td>3.9%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£2,607	1.4yrs	15.3 tonnes	3.9%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£2,607	1.4yrs	15.3 tonnes	3.9%								
Funding	Capital funding has been sourced through 2011/12 & 2012/12 FM budget, Cost to install 64 Units, £3,776 . Installation is planned to be completed in 2012/13 financial year.										
Resources	FM internal resources to install units.										
Ensuring Success	To date 20 units purchased within 11/12 budget, balance to be installed in 12/13										
Measuring Success	Full installation and measurement of usage/life span of units.										
Timing	6-9 Months (Part Complete)										
Notes											

Project:	SBC-011											
Reference:												
Owner (person)	Pete Smith (Completed)											
Department	Facilities											
Description	Reduce BC car fleet from 12 vehicles to 9 without increasing mileage covered, also rationalise the fleet engine sizes down to 1.4 diesels max with 110 CO ₂ (g/km) and consolidate models to provide consistent results.											
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£4,591</td> <td>0.0yrs</td> <td>8.5 tonnes</td> <td>2.2%</td> </tr> </tbody> </table>				Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£4,591	0.0yrs	8.5 tonnes	2.2%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target									
£4,591	0.0yrs	8.5 tonnes	2.2%									
Funding	No additional funding required as fleet leasing was consolidated to provide single lease agreements.											
Resources	No additional resources required											
Ensuring Success	Cost and carbon savings in annual running costs identified.											
Measuring Success	Annual mileage measured against previous year to identify fuel and carbon savings.											
Timing	Completed											
Notes												

Project:	SBC-012											
Reference:												
Owner (person)	Pete Smith (Completed)											
Department	Facilities											
Description	Reduce minibus fleet from 10 to 8 without increasing mileage covered.											
Benefits	<table border="1"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£4,167</td> <td>0.0 yrs</td> <td>15.3 tonnes</td> <td>3.9%</td> </tr> </tbody> </table>				Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£4,167	0.0 yrs	15.3 tonnes	3.9%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target									
£4,167	0.0 yrs	15.3 tonnes	3.9%									
Funding	No funding required											
Resources	No additional resources required											
Ensuring Success	Implementation of minibus monitoring procedure											
Measuring Success	Monitoring of fleet to ensure average mileage has not increased thus reducing our CO ₂ emissions.											
Timing	Completed											
Notes												

Project:	SBC-013 (Completed)										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	Replace lighting in BC restaurant with LED down lighters. Restaurant consisted of 68 X 60 watt fittings operating on average 1800 hours per year, using 7344 kWhrs of electricity PA which equated to annual running costs of £660. Replacing these units with 27 X 9 watt dimmable LEDs reduces the kWhrs down to 437 PA.										
Benefits	<table border="1"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£621</td> <td>3.6yrs</td> <td>3.8 tonnes</td> <td>1.0%</td> </tr> </tbody> </table> <p>Due to higher life expectancy of LEDs, additional cost savings will be made of approx £1,020 due to reduced bulb replacement.</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£621	3.6yrs	3.8 tonnes	1.0%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£621	3.6yrs	3.8 tonnes	1.0%								
Funding	Capital funding has been sourced through 2011/12 FM budget. Cost to install 27 Units, £2,300 .										
Resources	FM internal resources to install units.										
Ensuring Success	Complete										
Measuring Success	Measuring of current bulb life to establish savings.										
Timing	Completed										
Notes											

Project:	SBC-014 (Completed)										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	Replace 72 X 75 Watt halogen spot lights within High Mill studio with LED equivalent, saving 13,911 kWhrs PA based on average running times.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£1,294</td> <td>0.6 yrs</td> <td>7.6 tonnes</td> <td>2.0%</td> </tr> </tbody> </table> <p>Due to higher life expectancy of LEDs additional cost savings will be made of approx £1,440 due to reduced bulb replacement.</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£1,294	0.6 yrs	7.6 tonnes	2.0%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£1,294	0.6 yrs	7.6 tonnes	2.0%								
Funding	Capital funding has been sourced through 2011/12 FM budget. Cost to install 72 LED Bulbs, £828 .										
Resources	FM internal resources to install units.										
Ensuring Success	Complete										
Measuring Success	Measuring of current bulb life to establish savings.										
Timing	Completed										
Notes											

Project:	SBC-015										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	The High Mill studios are currently fitted with 162 twin 75 watt strip lights, operating approx 2800 hours per year. Replacing these with 22 watt LED strip lights would produce savings of 48,082 kWhrs PA.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£4,327</td> <td>9.1 yrs</td> <td>26.2 tonnes</td> <td>10%</td> </tr> </tbody> </table> <p>Due to higher life expectancy of LEDs, additional cost savings will be made due to reduced bulb replacement. We currently have 2 x 22 watt LED units on trial.</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£4,327	9.1 yrs	26.2 tonnes	10%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£4,327	9.1 yrs	26.2 tonnes	10%								
Funding	Current costs of installing these units are excessive (£40,500) due to inflated unit costs as a result of recently introduced technology. However, costs over the life span of the CMP are expected to reduce significantly, increasing the viability of installation. Funding at this stage has not been allocated. Once costs have fallen, discussions at Campus Management Committee on how this will be funded will take place.										
Resources	FM time to manage project										
Ensuring Success	Success of this project relies on the ongoing cost reduction in supply of materials and commitment from CMC to fund project at appropriate time.										
Measuring Success	Ongoing reduction in high energy consuming strip lights will present significant operational and carbon savings.										
Timing	Dependant on reduction of unit costs.										
Notes											

Project:	SBC-016										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	Textile workshops currently have 210 x 54 watt double fluorescent strip lights operating approx 2800 hrs PA. Replacing these with a single 22 watt LED equivalent would produce annual savings of 18,814 kWhrs.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£1,750</td> <td>15.0</td> <td>10.3</td> <td>2.6%</td> </tr> </tbody> </table> <p>Due to higher life expectancy of LEDs additional cost savings will be made due to reduced bulb replacement. We currently have 2 x 22 watt LED units on trial.</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£1,750	15.0	10.3	2.6%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£1,750	15.0	10.3	2.6%								
Funding	Current costs of installing these units are excessive (£26,260) due to inflated unit costs as a result of recently introduced technology. However, costs over the life span of the CMP are expected to reduce significantly, increasing the viability of installation. Funding at this stage has not been allocated. Once costs have fallen, discussions at Campus Management Committee on how this will be funded will take place.										
Resources	FM time to manage project										
Ensuring Success	Success of this project relies on the ongoing cost reduction in supply of materials and commitment from CMC to fund project at appropriate time.										
Measuring Success	Ongoing reduction in high energy consuming strip lights will present significant operational and carbon savings.										
Timing	Dependant on reduction of unit costs.										
Notes											

Project:	SBC-017 (Completed)										
Reference:											
Owner (person)	C Nairn										
Department	Facilities										
Description	During a 2010 review of Campus transport arrangements and renegotiation with local transport providers we were able to remove two pre arranged routes by redirecting students onto existing public transport services. This saved in excess of 43,000 transport miles per annum with no additional financial outlay incurred.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£13,461</td> <td>0.0 yrs</td> <td>24.8 tonnes</td> <td>6.4%</td> </tr> </tbody> </table>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£13,461	0.0 yrs	24.8 tonnes	6.4%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£13,461	0.0 yrs	24.8 tonnes	6.4%								
Funding	None required										
Resources	Time for student transport to conduct internal review.										
Ensuring Success	Complete										
Measuring Success	Reduction in transport miles										
Timing	Completed										
Notes											

Project:	SBC-018 (Completed)										
Reference:											
Owner (person)	Robert Hewitt										
Department	Facilities										
Description	Complete 50kw Solar PV installation on Campus roof. Installation to coincide with current FIT rates for 20yr period.										
Benefits	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td>£10,384</td> <td>7 yrs</td> <td>26.5 tonnes</td> <td>6.1%</td> </tr> </tbody> </table> <p style="text-align: center;">Net benefit over 20ys £207,691. (Electricity Reduction + FIT0s - Cap ex) £134,449 + 137,923 - £64,681</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£10,384	7 yrs	26.5 tonnes	6.1%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£10,384	7 yrs	26.5 tonnes	6.1%								
Funding	Following meeting with HWU estates team, agreement to use Campus sinking fund provided initial income stream from FITs is reinvested until capital outlay has been replenished. Circa 7 years.										
Resources	Capital outlay of £64,681 (ex vat) required after completion of Tender exercise.										
Ensuring Success	Implementation of Tier 1 product within Current FIT rates to ensure best rate of return										
Measuring Success	Annual FIT return and electricity generation to establish accuracy of predicted returns.										
Timing	To be installed by 31 st October 2012.										
Notes											

Project:	SBC-019 (Completed)										
Reference:											
Owner (person)	Carlyn Nichols										
Department	ICT										
Description	Reduce amount of Physical servers from 60 to 24										
Benefits	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Financial Savings PA</th> <th>Payback Period</th> <th>CO₂ reduction PA</th> <th>% of CO₂ Target</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">£10,444</td> <td></td> <td style="text-align: center;">63.3 tonnes</td> <td style="text-align: center;">16.3%</td> </tr> </tbody> </table> <p>Each DL380 Server output rated at 460 watts, units run 24hrs/day x 365 days/year @ 460 watt output = 4029 KWhrs.</p> <p>4029 x 36 units = 145,065 kwh/year reduction. Average unit cost used within CMP £0.09/kwh = £13,055 CO2 saving = 145,065 @ .5452/kg (Carbon Trust energy conversion rate) = 79,089 kg CO2, or 79.1 tonnes</p> <p>Operating @ 80% efficiency to allow for down time will still save £10,444 PA and show a reduction in CO2 of 63.3 Tonnes</p>			Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target	£10,444		63.3 tonnes	16.3%
Financial Savings PA	Payback Period	CO ₂ reduction PA	% of CO ₂ Target								
£10,444		63.3 tonnes	16.3%								
Funding	ICT Budget										
Resources	ICT Budget										
Ensuring Success											
Measuring Success											
Timing											
Notes											