Carbon Management Plan
2016 – 2021

Version number:	**4**
Owner:	**Estates Committee**
Approving Committee route:	**Estates Committee**
Status:	**Final**

Version Control

Version No.	Date	Changes Made
1	May 2016	Draft for presentation to College Estates Committee
2	Aug 2016	Amendments made to text to fully reflect changes made to target
3	Sept 2016	Update of projects now included in overall total
4	Oct 2016	Feedback from Estate Committee now incorporated

Contents

Foreword from West College Scotland

The environment in which West College Scotland currently functions presents us with several challenges and opportunities to tackle Climate Change duties as placed on Scottish Public Bodies by the Climate Change (Scotland) Act 2009. As we move forward, the College will address and pursue these responsibilities by sensitive consideration, in-depth attention, analysis and appreciation of the environmental impact of our activities. West College Scotland is committed to environmental sustainability and to the reduction of our carbon footprint through implementation of this Carbon Management Plan.

Our Carbon Management Plan for 2016 – 2021 makes a commitment to reduce carbon emissions, by recycling materials and implementing increased efficiency in the use of energy. New and existing College courses shall be encouraged to incorporate elements of sustainability. West College Scotland shall endeavour to implement and acquire support for sustainable development and as well as to action its Climate Change duties by liaising with local authority environmental forums in West Dunbartonshire, Inverclyde and Renfrewshire and beyond.

Examples of this approach include:

- Participate in the development of the CEEP Outline Business Case in order to seek future invest to save funding.
- Implement - where funding permits - the findings of the SFC College Energy Efficiency Pathfinder (CEEP) and procedures to minimise negative impacts for the environment.
- Ensuring that cognisance is taken of the environmental impacts where any future investment is made by the College in implementing the recommendations arising from estate wide condition surveys undertaken during 2015.
- Reviewing our strategy for waste/disposal minimisation so that everyone recognises and takes responsibility for their own use of products by increasing the amount we all reuse, recycle and recover.
- Continuing to promote an estate wide ecologically friendly ethos and promoting purchase of fair trade products and procurement of energy efficient star rated products where appropriate.
- Developing the curriculum to account of and support environmental education where relevant and appropriate.
- Participating in the Advanced Procurement Universities and Colleges Limited (APUC) environmentally friendly purchasing strategy.

The College is a member of the Environmental Association for the Universities and Colleges (EAUC) which supports, exchanges ideas, skills and experiences to enhance sustainable development in Scotland and in turn help to develop the ethos of the Universities and Colleges Commitment for Scotland (UCCfS). West College Scotland is passionate about taking positive action to reduce our environmental impact through tackling climate change. The College is committed to minimising carbon emissions from our campuses by exercising appropriate control and progressive management over our operations and actions as outlined in this Carbon Management Plan.

Audrey Cumberford
Principal

Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for the education sector – by getting your own house in order and leading the wider community by example. The Scottish and UK Governments and Committee on Climate Change have identified the public sector as key to delivering carbon reduction across Scotland and the UK in line with Climate Change Act targets, and the Carbon Trust's Public Sector Carbon Management programme is designed in response to this. It helps public bodies to save money on energy, whilst also reducing the risk of dangerous climate change.

West College Scotland worked with the Carbon Trust in 2015/16 in order to develop a Carbon Management Plan through to 2021. This Carbon Management Plan commits the College to a target of reducing CO_2 by 10% by 2021, and underpins the potential for the College to achieve cumulative financial savings.

There are those that can and those that do. Public bodies can contribute significantly to reducing CO_2 emissions. The Carbon Trust is very proud to support West College Scotland in their on-going implementation of carbon management.
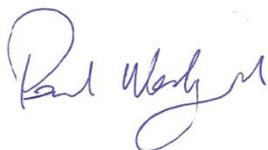
Paul Wedgwood
Head of Programmes, Scotland, Carbon Trust

Executive Summary

1. This Carbon Management Plan sets out our strategy and action plan from the 2014/15 baseline for reduction in carbon emissions to 2021. It identifies the tangible and intangible benefits of carbon management and describes the governance arrangements to keep the programme on track.

2. West College Scotland's aspirational target is to reduce carbon emissions from its activities by 10% in the next five years – identifying and decreasing our energy consumption not only reduces carbon emissions but also generates real cost savings by instigating and supporting the Key Programmes/Initiatives outlined in this plan as well as contributing directly to our goals of using our resources efficiently.

3. The delivery of this aspirational target is dependent upon the College being successful in obtaining further funding under the SFC College Energy Efficiency Pathfinder project. Should this funding be obtained and the projects delivered it is anticipated that the 10% target could well be exceeded.

In the year 2014/15, the College spent £1,071,011 on energy and emitted 5,303 tonnes of CO_2.

The carbon emissions from the Carbon Trust Baseline Carbon Footprint Tool identified the following breakdown of sources:

Scope 1 – 42% of total emissions i.e. 2,243 tonnes of CO_2 from natural gas and wood pellets for space and water heating, catering kitchens, classrooms etc.
Scope 2 – 54% of total emissions i.e. 2,870 tonnes of CO_2 from electricity for lighting, power for fans, pumps, workshops, air conditioning, computers etc.
Scope 3 – 4% of total emissions i.e. 190 tonnes of CO_2 from water services, waste and travel.

The Baseline Carbon Footprint Tool also identified the following breakdown of carbon related costs by scope.

Scope 1 – 25% of total cost i.e. £266,615
Scope 2 – 52% of total cost i.e. £552,564
Scope 3 – 24% of total cost i.e. £251,832

4. The College has set a realistic target to reduce our carbon emissions by 10% from a 2014/15 baseline to 2021. To achieve this, we have identified carbon reduction projects in the following areas:

- effective energy management and upgrading mechanical and electrical services;
- fabric and insulation;
- reducing waste and water usage;
- procurement of energy reducing equipment;
- renewables projects;
- upgrading fleet vehicles;
- reducing grey fleet and cross campus travel;
- promoting staff and student behaviour change; and
- energy awareness

These projects will require funding to be secured at appropriate levels in order to be progressed. We will also require to secure funding for invest-to-save sustainably resourced projects by replacing aged, dilapidated and poorly insulated buildings such as Barshaw, Inchinnan, Oakshaw and Renfrew buildings on Paisley campus as well as the Greenock Finnart Street building. If these buildings are not considered for rebuild, funding will still be required for major building fabric and single glazed metal windows upgrades prone to wind and water ingress.

5. The projects identified in this plan have the potential to reduce our emissions by 315 tonnes of CO_2 per annum and achieve 59% of our targeted reduction measured against the 2014/15 baseline. This means that we will need to identify more projects to make up a further 41%. To achieve this we will run opportunities identification workshops, commission surveys and reviews.

6. The total investment to implement low capital cost projects that the College would plan to do is estimated at £65,050. The identified projects will save approximately 315 tonnes of CO_2 and £49,400 per year with an overall payback period of 1.5 years. The payback period and total project costs will be further developed as future funding crystallises. The College would require securing additional funding of £2.1m from Scottish Funding Council in order to progress the range of other capital projects, emanating from the recent 2015 College Energy Efficiency Pathfinder (CEEP) Project carried out by Turner & Townsend and Ramboll. The College will look for funding from any external sources to fund any carbon saving initiatives. All projects will be assessed and presented as candidates for funding as required..

7. This plan will be implemented by College staff within an appropriate governance structure, with external support from the Carbon Trust, Scottish Funding Council, Scottish Futures Trust and other organisations being provided as required. Our approach will include a dedicated Sustainability Officer, members of the College Senior Management team, staff, student representatives and members of the wider community where required. The Project Sponsor is the Chair of the Estates Committee who will have strategic oversight relating to the implementation of this plan. Progress against this plan will be reviewed annually and a report will be provided to the Board of Management and made publicly available on our website.

8. West College Scotland has set a realistic target to reduce its annual Carbon Footprint to 4,773 tCO2e by the end of 2021 which equates to a 10% reduction from 2014/2015. Embedding carbon reduction into daily business and awareness raising initiatives will be key to achieving this.

9. Ultimately the College does not have specific funding approved by Scottish Funding Council in order to progress this plan, and there is no commitment that this will be provided. However we will initially look to secure such funding from the SFC on the basis of a College Energy Efficiency Pathfinder Outline Business Case prepared for the College by Turner & Townsend in order to support identified energy reducing projects.

Introduction

General

This Carbon Management Plan defines our carbon management programme of activity for the next 5 years. It sets the strategic context and the case for action, our current carbon emissions, a programme of proposed projects and actions to reduce our emissions, how much this will cost and save, as well as the governance arrangements to keep the programme on track. West College Scotland is committed to continue to reduce, reuse and recycle to decrease the environmental impact of the College's activities.

Background

A New College with a Long History

West College Scotland is ambitious and innovative. Created on 1 August 2013 by the merger of Clydebank College, Reid Kerr College in Paisley and James Watt College in Greenock, the College has over 20,000 students and 1,200 staff, making it one of the biggest educational institutions in Scotland. This large scale allows the college to provide greater choice to students, better facilities and enhanced services. The College plays a key role in supporting the local communities, providing courses to senior-phase school pupils in College, in school and online. The College also provides training for a huge range of business partners, from small - and medium -sized local companies to some of the biggest companies in the world.

In April 2015 an external review by Education Scotland awarded the West College Scotland the highest level of assurance for its teaching and learning activities.

West College Scotland Estate Strategy

One of the key priorities identified in the West College Scotland Estate Strategy 2016-2026 is the embedding of good practice and promotion of an environmentally sustainable College. This priority is also a key performance indicator identified in the Regional Outcome Agreement (ROA) with the SFC. The targets set in this plan are in line with ROA targets set for carbon reduction. Given that we operate and manage our estate directly, and that we anticipate on-going financial constraints being placed on the College there is an opportunity to look at our energy consumption with a view to reducing both carbon emissions and operating costs.

Plan Structure

This Carbon Management Plan details West College Scotland's approach to reducing carbon emissions over the next five years. The plan sets out a timetable for doing so and identifies the responsibilities and internal resources required to deliver the programme. The main objectives of the plan are:

- To continue to activate a whole College approach so that carbon management is adopted to be an essential and necessary function. Key stakeholders shall require ensuring that carbon reduction is fully integrated into the College's culture.
- To adopt targets for the measurable reduction of carbon emissions and to deliver these reductions.

To ensure that there is effective and on-going ownership of the programme, it is important to define a governance structure. The CMP shall be regularly reviewed, updated and amended throughout the five years. Information on the College's environmental performance and reduction of carbon emissions shall be reported and published on an annual basis.

The CMP is a programme to take action to reduce emissions of greenhouse gases from the College's activities and is essential to the achievement of the Scottish Government Climate Change Objectives which are split into two distinct areas:

- Climate Change Mitigation – Reducing greenhouse gas emissions to reduce climate change.
- Climate Change Adaptation – Preparing and managing the likely impact of climate change.

This plan is concerned with Climate Change Mitigation, which means reducing the emissions of greenhouse gases from the College's activities – in delivering education and as a manager of services, buildings and facilities. Climate change mitigation is necessary due to mainly human activities such as burning of fossil fuels which has resulted in the global average temperature rising by $0.6^{o}C$ over the last 115 years. The temperature rise has affected the UK climate with increased frequency of rain, wind, fewer frosts, rising sea levels and sporadic cold/hot spells resulting in stratospheric ozone depletion and environmental changes in areas such as desertification, flooding, biodiversity, farming, and air quality. Such bad weather disrupts peoples' livelihoods and transport.

The methodology employed in mobilising and implementing the WCS result driven Carbon Management Plan is illustrated in the five step process diagram below:

1 Mobilisation phase	2 Measure baseline & set targets	3 Identify, quantify & prioritise opportunities	4 Develop Implementation Plan	5 Implementation phase
• Identify the key barriers • Build & train the team • Set the scope • Define the headline business case	• Measure carbon emissions baseline • Calculate energy costs & forecast • Set & approve robust targets	• Identify carbon & cost saving projects • Quantify costs and savings • Prioritise actions	• Design a high impact, cost effective and deliverable strategy to ensure implementation	• Commence project implementation • Review performance measurement process • Embed carbon reduction into daily business

Our Low Carbon Vision and Target

West College Scotland's sustainability ethos means a commitment to reduce emissions of greenhouse gases. The aim is to increase implementation of low carbon technology and energy awareness by motivating staff and students to a common goal of reducing carbon emissions from buildings and activities by 10%, from a 2014/15 baseline of 5,303 tonnes CO_2, by the end of July 2021.

College Case and Drivers for Action for Reducing our Carbon Emissions

Climate change is globally recognised as the greatest environmental and economic threat faced by the planet, national governments and individuals. Our objective is to continue to operate and manage our College in the most environmentally sustainable manner. We endeavour to ensure that staff and students in all disciplines are aware of the consequences of their actions and are equipped to make informed decisions regarding environmental change.

The Plan endeavours to set and implement targets and timetables for reducing carbon emissions and improve our impact on the environment. The central themes contained within this Plan include:

- Upgrade Efficiency - by improving and implementing low energy building management systems, refurbishing inefficient buildings and replacing inefficient appliances.
- Build Better – assuring that all new buildings be constructed to high performance specification ensuring future sustainability and energy efficiency.
- Transfer to Clean Power – by procurement or generating electricity/heat from renewable sources.
- Implement Transport and Travel Alternatives – reducing use of carbon emitting fuels.
- Implement Green Purchasing – procurement of products that use less energy, last longer and have less impact on the environment.
- Institutional Conservation – create and promote a culture of conservation awareness across the college.

The themes listed above generate a number of challenges and opportunities and require an essential, active and effective communication plan. It should be noted that it is important for all staff and students to understand and uphold the continuous ethos of reducing carbon emissions to facilitate the CMP throughout the five year plan. The following objectives have been set out for this strategy:

- To raise awareness of the CMP.
- To acquire buy-in to the Plan from stakeholders.
- To keep staff and students informed of and involved in progressing and key milestones.
- To ensure there is an opportunity to contribute to the Plan through consultation and feedback.
- To champion a low carbon approach to the wider community by publicising successes.

A range of communication channels including the WCS staff and student intranet shall be used to promote the Plan. Channels used and overall effectiveness of the communication strategy will be reviewed regularly during this project to determine whether the objectives are being accomplished.

We have signed up to the College Energy Efficiency Pathfinder (previously the College Non-Domestic Energy Efficiency Programme) which drives us to recognise opportunities for energy efficiency and financial savings. Below we set out, in priority order, our main drivers for taking action to reduce our carbon emissions / energy consumption.

The Financial Case for Action:

There is also a financial case for action in seeking to reduce our carbon management footprint:

- Reducing the risk of future energy price increases, including target 1 reduction to cumulative savings of 6,057 tonnes CO_2, target 2 reduction to cumulative savings of 5,404 tonnes CO_2 and target reduction 3 to cumulative savings of 4,972 tonnes CO_2. Please refer to pages 25-28 for the detail analysis of the comparison between Business as Usual position and potential savings to be made if this plan is implemented.
- The efficient use of public funds, including your potential annual savings on energy costs

Legislative Pressures and Performance Targets:

Increasingly, legislation and public sector reporting requirements play an integral role in our operating environment and provide drivers and demands for reduction in our carbon footprint – these include:

- National Climate Change legislation and targets
- Mandatory Regional Outcome Agreement reporting requirements

Climate Change

- West College Scotland appreciates that Climate Change continues to have a considerable impact on the Scottish economy, Scotland's people and environment. WCS is determined to play its part in reducing carbon emissions.
- The local impact of climate change on our services and the community in our area also requires us to -lead by example.
- We have a require to undertake mandatory reporting and have agreed to seek a 10% reduction in our carbon management target as part of our Regional Outcome Agreement (ROA) with the Scottish Funding Council.

The following table provides an overview of our 2014/15 Co2 baseline, and the ongoing level of reductions we will seek to achieve over the lifetime of this Plan, culminating in a 10% reduction by 2021:

Measure	Indicative 14/15	Actual 14/15	Target 15/16	Target 16/17	Target 17/18	Target 18/19	Target 19/20	Target 20/21
Gross carbon footprint (tonnes)	5,303	5,303	5,224	5,146	5,043	4,942	4,843	4,773

Carbon Management Drivers

Ultimately, the main drivers in seeking to manage and reduce our carbon footprint include:

- National Targets
- Carbon Reduction Commitment (CRC)
- Climate Change Levy (CCL)
- Feed in Tariffs (FITs)
- Renewable Heat Incentive (RHI)
- Energy Performance Certificates (EPC)
- Zero Carbon Buildings
- Zero Waste Plan

A key policy driver for Zero Waste is the Waste (Scotland) Regulations which require us to reduce the carbon impact of waste. In 2011, the carbon impact of Scotland's waste was 13.9 $MtCO_2$ emissions. - Scotland saved 1.8 $MtCO_2$ emissions from recycling waste in 2011. By 2025, if current waste recycling policies are implemented, it is estimated by the Scottish Government that the carbon impact of waste in Scotland shall be reduced by a further 20% or 3$MtCO_2$ emissions.

The key points outlined in the Waste (Scotland) Regulations – and the approach being adopted by West College Scotland in relation to each of these - are as follows:

- All businesses to present key recyclable material for collection from 1 January 2014 - paper, card, glass, plastic, and metals. Within the local authority areas that West College Scotland is based, the following approaches are in place:

  - Clydebank – West Dunbartonshire Council – Dry recyclable materials (paper, cardboard, cans, plastic food containers and bottles) collected for recycling are delivered to the Council's Materials Recycling Facility. The materials are sorted by type prior to being sent for reprocessing.
  - Paisley – William Tracey Waste - All waste products are segregated and recycled. All waste is 100% diverted from landfill.
  - Greenock – Inverclyde Council - Dry recyclable materials (paper, cardboard, cans, plastic food containers and bottles) collected for recycling are delivered to the Council's Materials Recycling Facility at Ingliston Park in Greenock. The materials are sorted by type prior to being sent for reprocessing.

- Food waste businesses producing food waste to present it for separate collection from 1 January 2014

  - All West College Scotland sites are recycling food waste in line with the regulations.

- A ban on the use of macerators to discharge food waste into the public sewer from 1 January 2016

  - There are no macerators within West College Scotland catering kitchens.

- Local authorities to provide a basic recycling service to all households by 1 January 2014

  o In place within all local authority areas where WCS campuses are based

- Local authorities to offer a food waste recycling service in non-rural areas from 1 January 2016

  o This service is in place in all local authority areas where WCS campuses are located?

- A ban on material collected for recycling going to landfill or incineration

  o Recycled material collected from WCS campuses does not go to landfill or incineration.

- A ban on municipal biodegradable waste going to landfill by 1 January 2021

Emissions Baseline and Projections

The carbon emissions baseline is a record of our approximate carbon emissions in a chosen year. Targets and performance in reducing emissions are measured against this figure as a percentage of the baseline value. This section outlines what parts of our College's emissions are included in the baseline, what year we have chosen as our baseline and how we have calculated that baseline.

In order to produce an effective CMP, it is important to understand our carbon emissions i.e. how much they are, where they come from and who is responsible for them. This section provides an inventory and quantities of our greenhouse emissions in the year 2014/15. The resulting data will be used to monitor and measure modifications in emissions resulting the carbon saving initiatives identified in this Plan.

Scope and Data Sources

The globally accepted carbon accounting standard known as the Greenhouse Gas Protocol (GHG) defines direct and indirect emissions as follows:

- Direct GHG emissions from sources that are owned or controlled by the College.
- Indirect EHG emissions are emissions that are a consequence of the activities of the College, but occur at sources owned or controlled by another organisation.

The GHG Protocol further categorises these direct and in direct emissions into three broad scopes:

Scope 1: All direct GHG emissions such as gas, wood pellets.

Scope 2: Indirect GHG emissions from consumption of purchased electricity, heat or steam.

Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the College, electricity related activities not covered in scopes 1 and 2 such as outsourced activities, waste disposal and water consumption and treatment

The emission sources included in our baseline are listed below, divided into Scopes 1, 2 and 3 in accordance with the International Greenhouse Gas Protocol (GHG. The emissions volumes identified are approximate and limited by the accuracy and completeness of available data and utility providers.

Emissions sources included in baseline scope	Data sources and quality
Scope 1 – includes all direct emissions from sources directly controlled by the college – fuels consumed on-site and from owned vehicles	
Fuel use in buildings and estates	Meter readings; invoicing
Fleet transport emissions	Mileage sheets / claims
Scope 2 – Emissions from purchased energy produced off-site	
Electricity consumption in buildings and estates	Meter readings; invoicing
Scope 3 – All other emissions	
Business travel (public transport and staff own vehicle use)	Travel claim data / invoices
Commuting travel by staff	Travel claim data / invoices
Travel for visitors/students/patients	Mileage sheets / claims
Waste	Tonnage reports
Water consumption and sewerage/drainage	Meter readings / billing information

To calculate our carbon emissions we used GHG Conversion Factors sourced from the UK Department of Environmental, Food and Rural Affairs (DEFRA) and Department of Energy and Climate Change (DECC).

Website: *http://www.ukconversionfactorscarbonsmart.co.uk/*

Baseline

Academic year 2014/15 is our baseline year. In period 2014/15 West College Scotland spent £1,071,011 (across all three scope items measured) and emitted 5,303 tonnes of CO_2. These emissions are shown in the figures below.

Breakdown of carbon emissions by scope
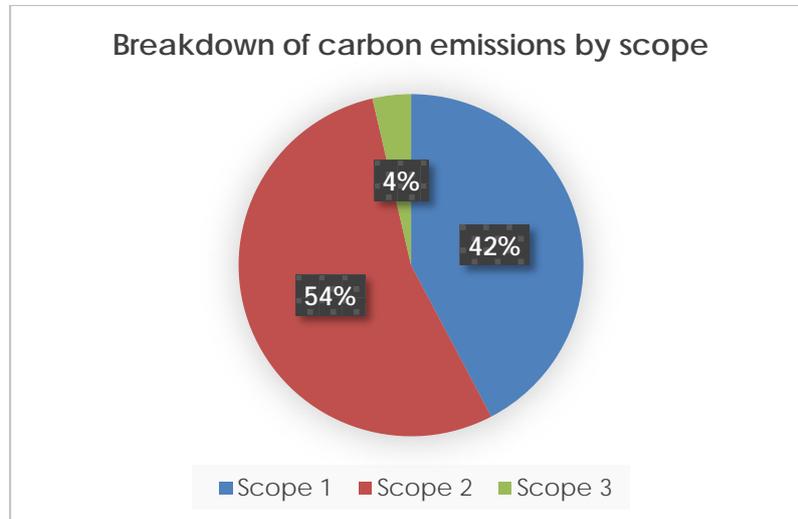
	CO2 (tonnes)	Sum of % CO2
Scope 1	2,243	42%
Scope 2	2,870	54%
Scope 3	191	4%
Grand Total	**5,303**	**100%**

Breakdown of carbon related costs by scope
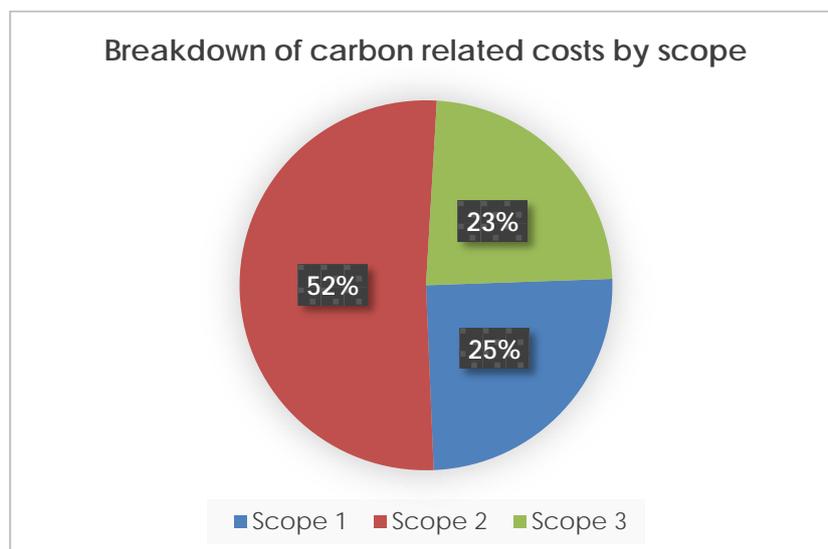
	Cost (£)	%of total cost
Scope 1	£ 266,615	25%
Scope 2	£ 552,564	52%
Scope 3	£ 251,832	24%
Grand Total	**£ 1,071,011**	**100%**

Breakdown of carbon emissions by scope

2.1% 1.6% 0.4%

95.9%

Energy ■ Transport ■ Waste ■ Water
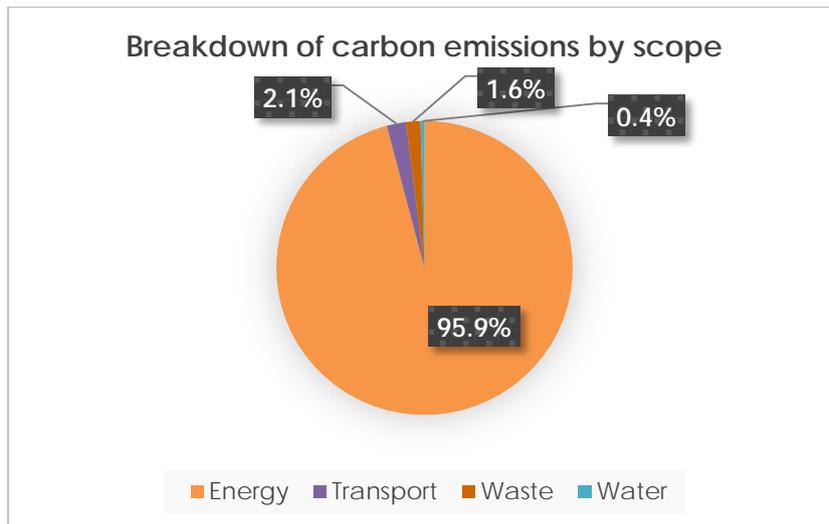
	CO2 (tonnes)	% of total CO2
Energy	5,086	96%
Transport	111	2%
Waste	83	1%
Water	23	1%
Grand Total	**5,303**	**100%**

It is clear from the above table that our buildings and associated costs of use of energy to operate them contribute 96% of our carbon footprint. It is therefore in this area where the priority has been identified in order to achieve a 10% reduction in CO_2 emissions.

Breakdown of carbon related costs by source

13.2%

75.0%

5.5%

6.2%

Energy ■ Transport ■ Waste ■ Water
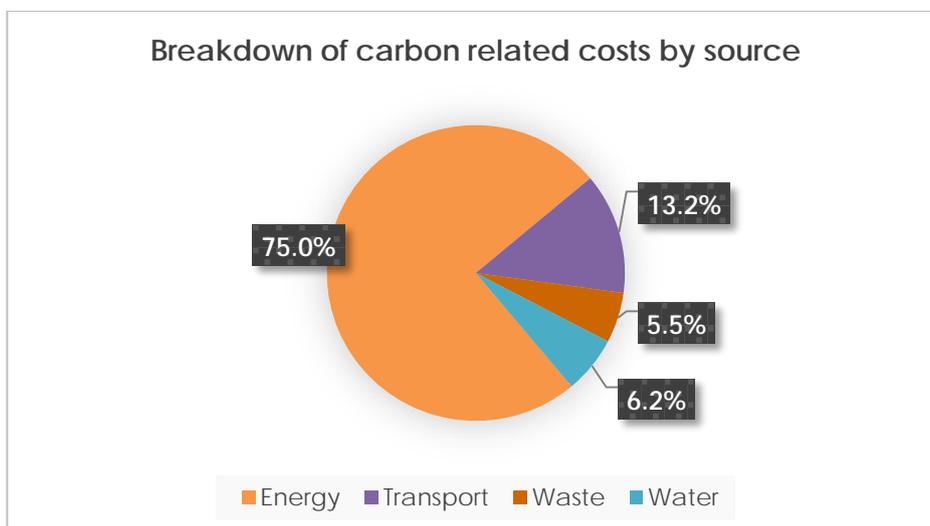
	Cost (£)	%of total cost
Energy	£ 803,700	75%
Transport	£ 141,732	13%
Waste	£ 58,946	6%
Water	£ 66,633	6%
Grand Total	**£ 1,071,011**	**100%**

Breakdown of building energy emissions by fuel type
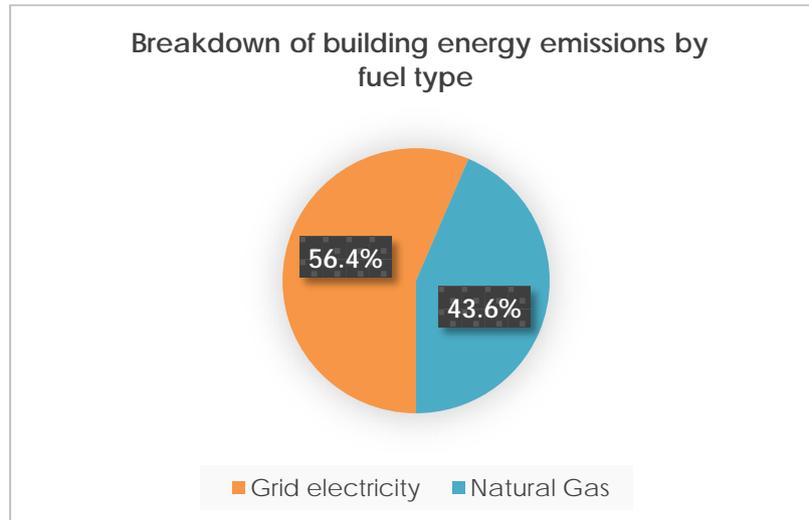
	CO2 (tonnes)	% of total energy CO2
Grid electricity	2,870	56%
Natural Gas	2,216	44%
Grand Total	**5,086**	**100%**

Breakdown of buliding energy costs by fuel type
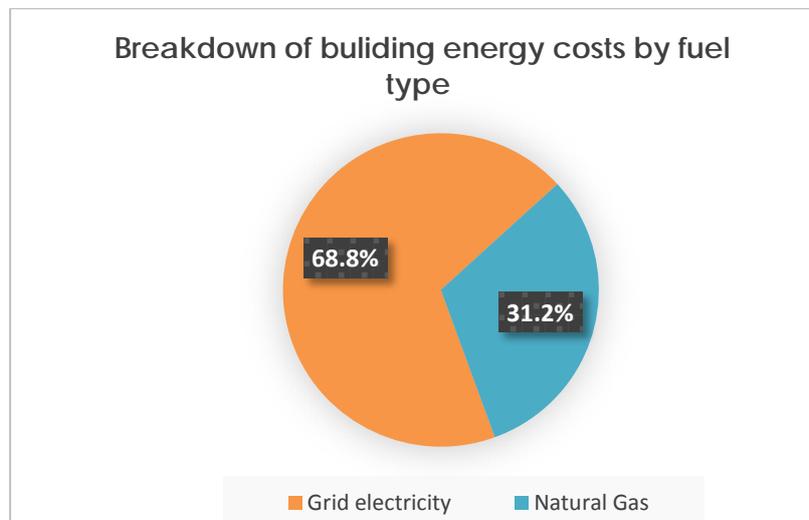
|	Cost (£)	% of energy cost
Grid electricity	£552,565	69%
Natural Gas	£251,135	31%
Grand Total	**£803,700**	**100%**

It is clear from the above two tables that our building energy costs are very high at £803,700 and measures require to be instigated to reduce consumption and CO_2 emissions.

Breakdown of building energy emissions by site
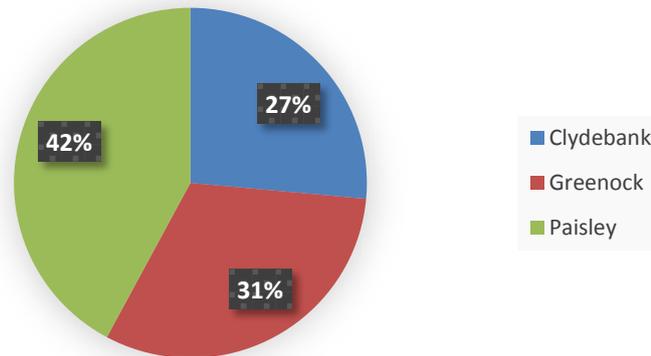
	CO2 (tonnes)	% of total energy CO2
Clydebank	1,345	27%
Greenock	1,597	31%
Paisley	2,144	42%
Grand Total	**5,086**	**100%**

Breakdown of buliding energy costs by site
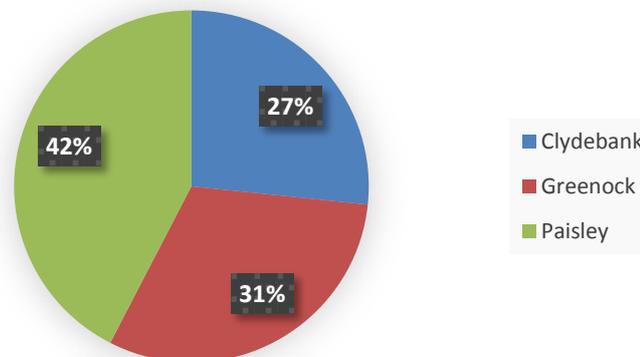
	Cost (£)		% of total energy cost
Clydebank	£	214,195	27%
Greenock	£	248,479	31%
Paisley	£	341,026	42%
Grand Total	**£**	**803,700**	**100%**

It is evident from the above two tables that building energy costs and emissions are the lowest for Clydebank at around 27%, with Greenock around 31% and Paisley at around 42%. Therefore, the priority is to refurbish and upgrade Greenock and Paisley campuses – or replace facilities if funding from SFC is made available - in order to achieve reductions in CO_2 emissions.

Breakdown of Transport emissions by journey type

24.0%

76.0%
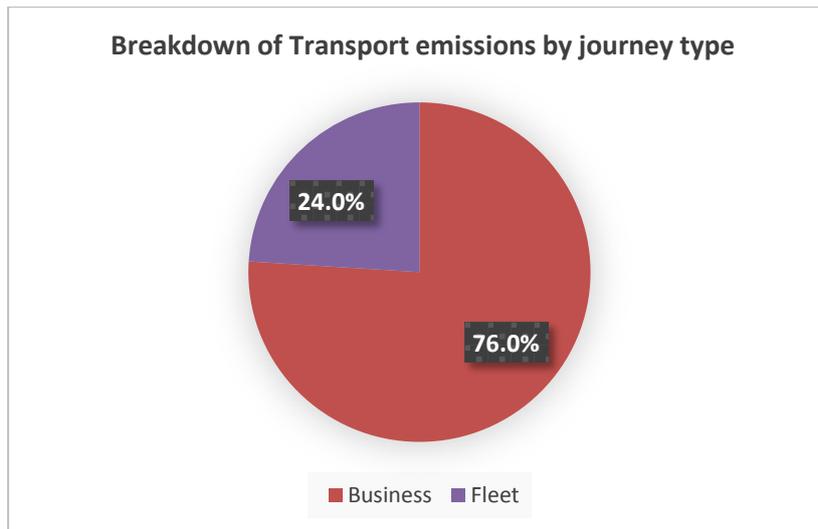
■ Business ■ Fleet

	CO2 (tonnes)	% of transport CO2 emissions
Business	84	76%
Fleet	27	24%
Grand Total	**111**	**100%**

**Breakdown of transport costs by journey type**

10.9%

89.1%
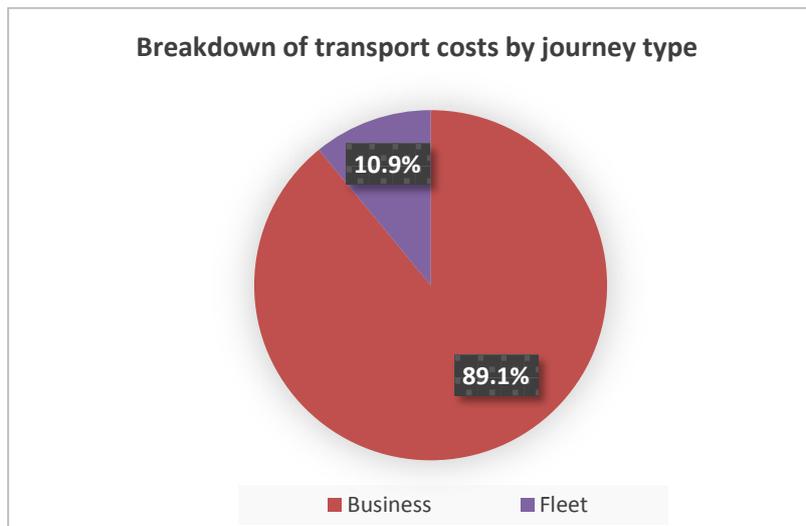
■ Business ■ Fleet

	Cost (£)	% of total transport cost
Business	£ 126,253	89%
Fleet	£ 15,479	11%
Grand Total	**£ 141,732**	**100%**

It is clear from the above two tables that business and cross campus travel contributes 76% of our transport carbon footprint and 89% of the total Transport cost of £141,732. It is therefore in this area where the priority has been identified in order to achieve reductions in CO_2 emissions by reducing especially cross campus car travel which accounts for 70% of the transport CO_2 emissions and 83% of transport costs.

Breakdown of transport emissions by vehicle type
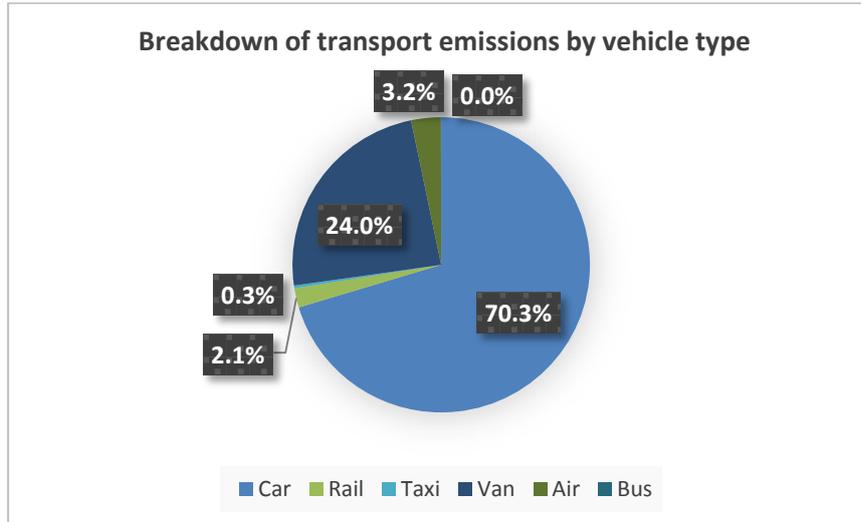
	CO2 (tonnes)	% of transport CO2 emissions
Car	78	70%
Rail	2	2%
Taxi	0	1%
Van	27	24%
Air	4	3%
Bus	0	0%
Grand Total	**111**	**100%**

Breakdown of transport costs by vehicle type
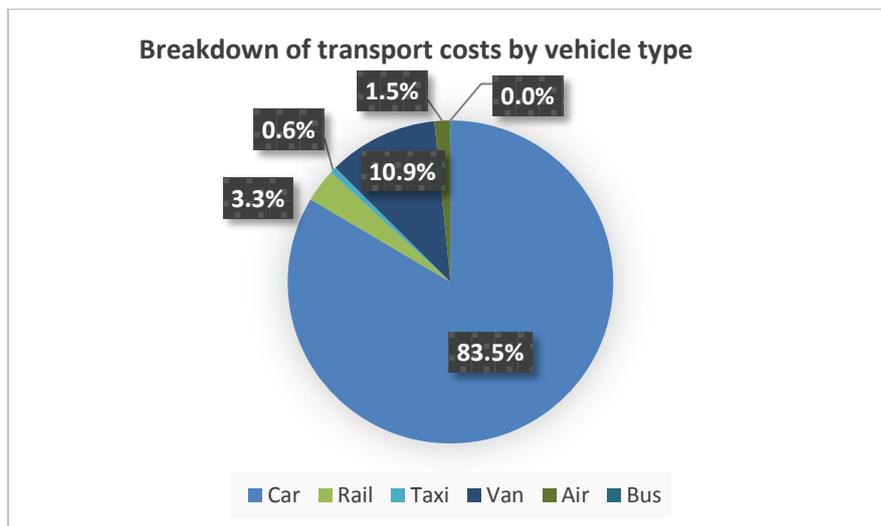
	Cost (£)	% of total transport cost
Car	£ 118,390	83%
Rail	£ 4,723	3%
Taxi	£ 906	1%
Van	£ 15,479	11%
Air	£ 2,165	2%
Bus	£ 68	0%
Grand Total	**£ 141,732**	**100%**

Breakdown of Waste Emissions by building type
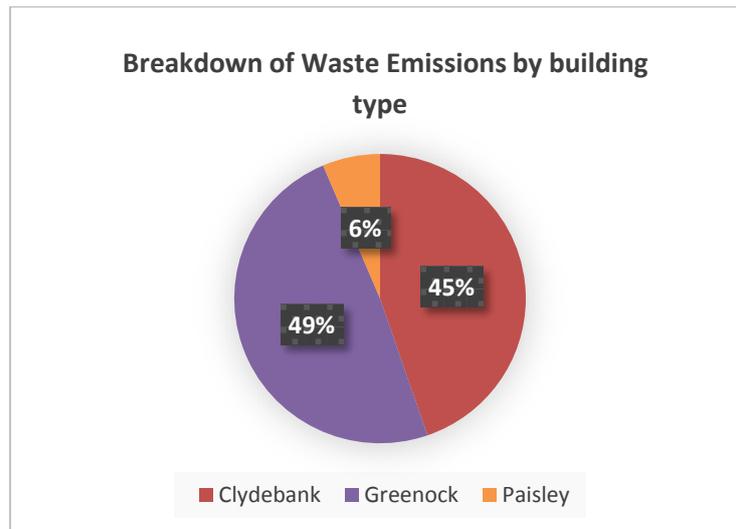
	CO2 (tonnes)	% of transport CO2 emissions
Clydebank	37	45%
Greenock	41	49%
Paisley	5	6%
Grand Total	**83**	**100%**

Breakdown of waste costs by buliding type
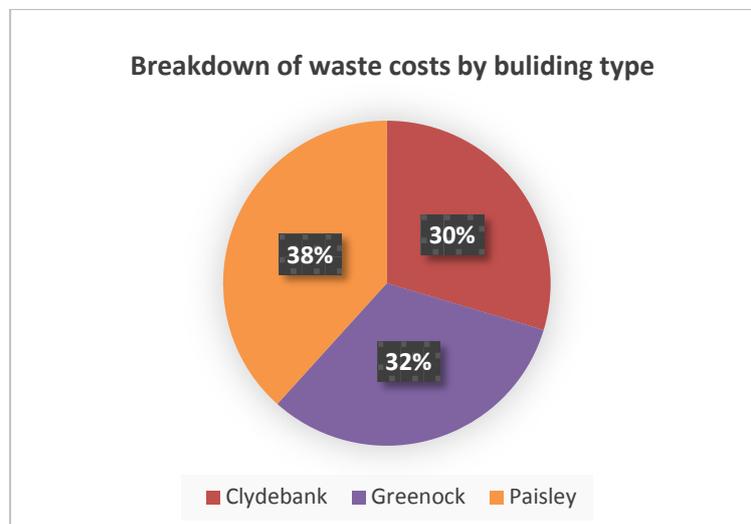
	Cost (£)	% of total waste cost
Clydebank	£ 17,477	30%
Greenock	£ 18,870	32%
Paisley	£ 22,599	38%
Grand Total	**£ 58,946**	**100%**

Breakdown of waste emissions by disposal method
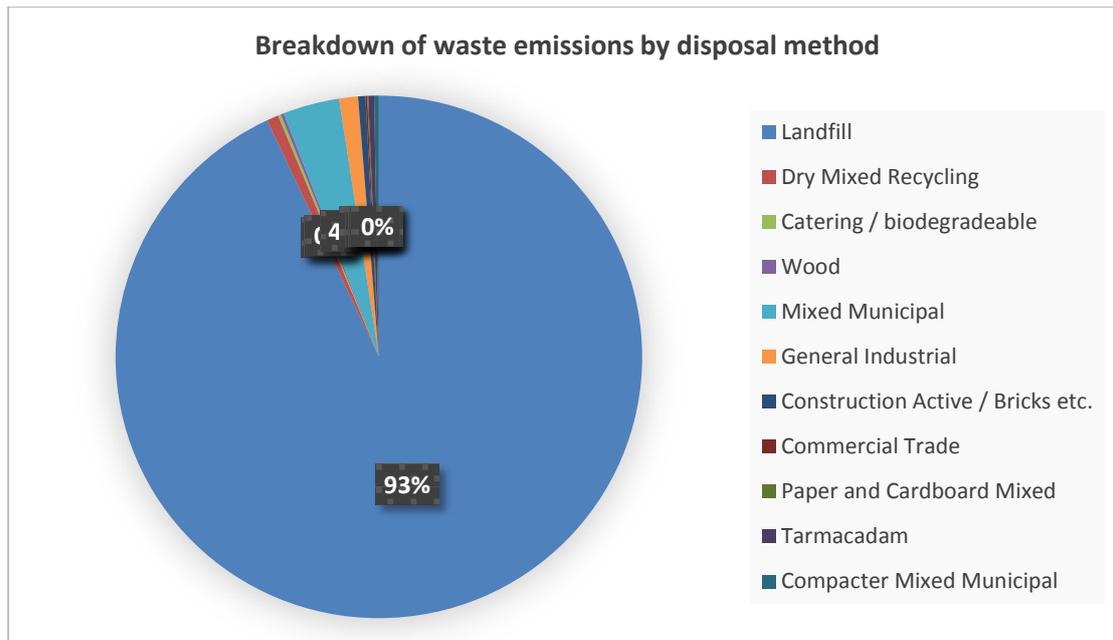
	CO2 (tonnes)	% of total waste emissions
Landfill	78	93.0%
Dry Mixed Recycling	1	0.7%
Catering / bio-degradable	0	0.2%
Wood	0	0.2%
Mixed Municipal	3	3.5%
General Industrial	1	1.2%
Construction Active / Bricks etc.	0	0.4%
Commercial Trade	0	0.1%
Paper and Cardboard Mixed	0	0.1%
Tarmacadam	0	0.4%
Compacter Mixed Municipal	0	0.3%
Grand Total	83	100.0%

At present, Clydebank campus waste is collected by West Dunbartonshire Council and provides limited breakdown of uplifts. Greenock campus waste provides breakdown of landfill and recyclables and specialist uplifts are carried out by specialist contractors for construction material including wood, food and glass. Paisley waste is served by William Tracey and data regarding types and tonnages of uplifted waste materials are provided clearly accounting for only 6% of the College waste carbon emissions as they provide a nearly full recycling service. It should be noted that a new waste contract shall be in place during 2016 with a common contractor appointed for all campuses.
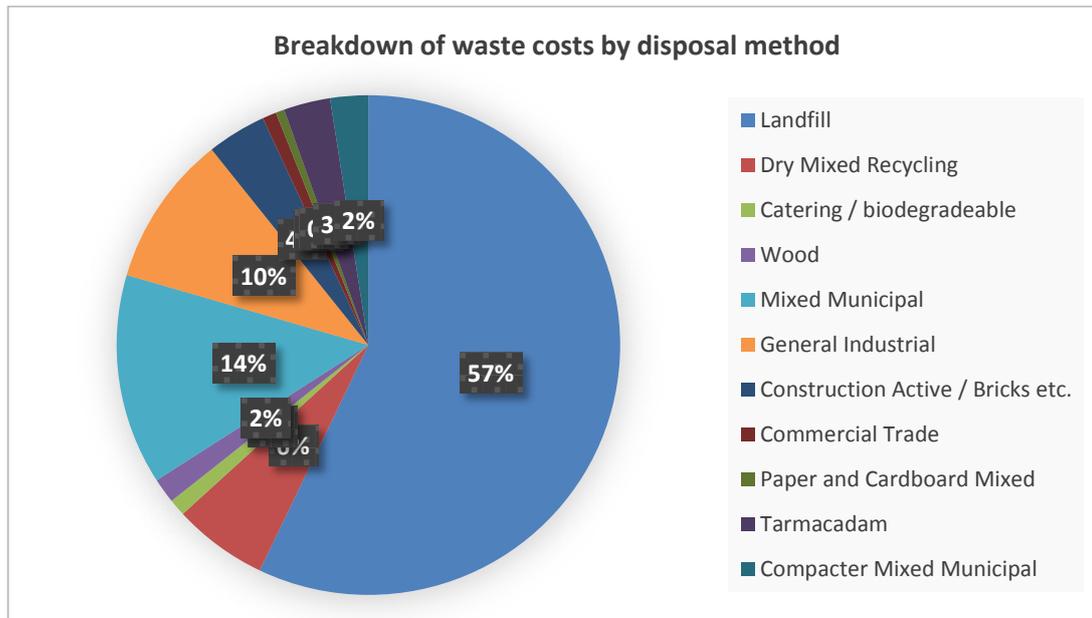
	Cost (£)	% of total waste cost
Landfill	£ 33,661	57.1%
Dry Mixed Recycling	£ 3,585	6.1%
Catering / bio-degradable	£ 645	1.1%
Wood	£ 955	1.6%
Mixed Municipal	£ 8,032	13.6%
General Industrial	£ 5,765	9.8%
Construction Active / Bricks etc.	£ 2,243	3.8%
Commercial Trade	£ 531	0.9%
Paper and Cardboard Mixed	£ 327	0.6%
Paper and Cardboard Mixed	£ 327	0.6%
Tarmacadam	£ 1,766	3.0%
Compacter Mixed Municipal	£ 1,437	2.4%
Grand Total	£ 58,946	100.0%

Projections and Target Savings (value at stake)

The potential cost of taking no action on carbon reduction, compared to achieving the target in this plan, would be a cumulative sum of £1,470,006 over the 5 year period to July 2021. With energy prices rising West College Scotland stands to lose financially through spending on energy bills unless we take action. If we compare the business-as-usual (BAU) scenario (that shows the calculated growth in energy costs if we do nothing to reduce consumption) against achieving our target (or reduced emissions scenario – RES) we can calculate the 'value at stake'. The capital costs of projects required to meet the target are not included in this analysis.

The Business as Usual position has been derived using the following assumptions:

|	
BAU Consumption	2.5%
Utility Price	4.0%
Transport Prices	2.5%
Waste Price	3.0%
Inflation	1.0%

The graph below models our potential target energy savings, against business as usual. This is based on an annual rise in energy prices of 2.5%. By achieving our target savings we could avoid paying an additional £398,541 in energy costs for the college year 2021, against business as usual. The graph also plots the possible outcomes if the College was to fall short of its intended reduction target of 10% (Target reduction 1).

Target Reduction 1: 10% - aspirational and realistic - target based on CEEP projects funded from Scottish Funding Council and/or proposed Clydebank district heating linkup and/or Salix invest- to-save finance.

Target Reduction 2: 7% - target based on funding from Scottish Funding Council for CEEP projects.

Target Reduction 3: 5% - target based on no additional funding available in the course of this plan.

Comparision of Carbon related costs with BAU increases and reduction targets
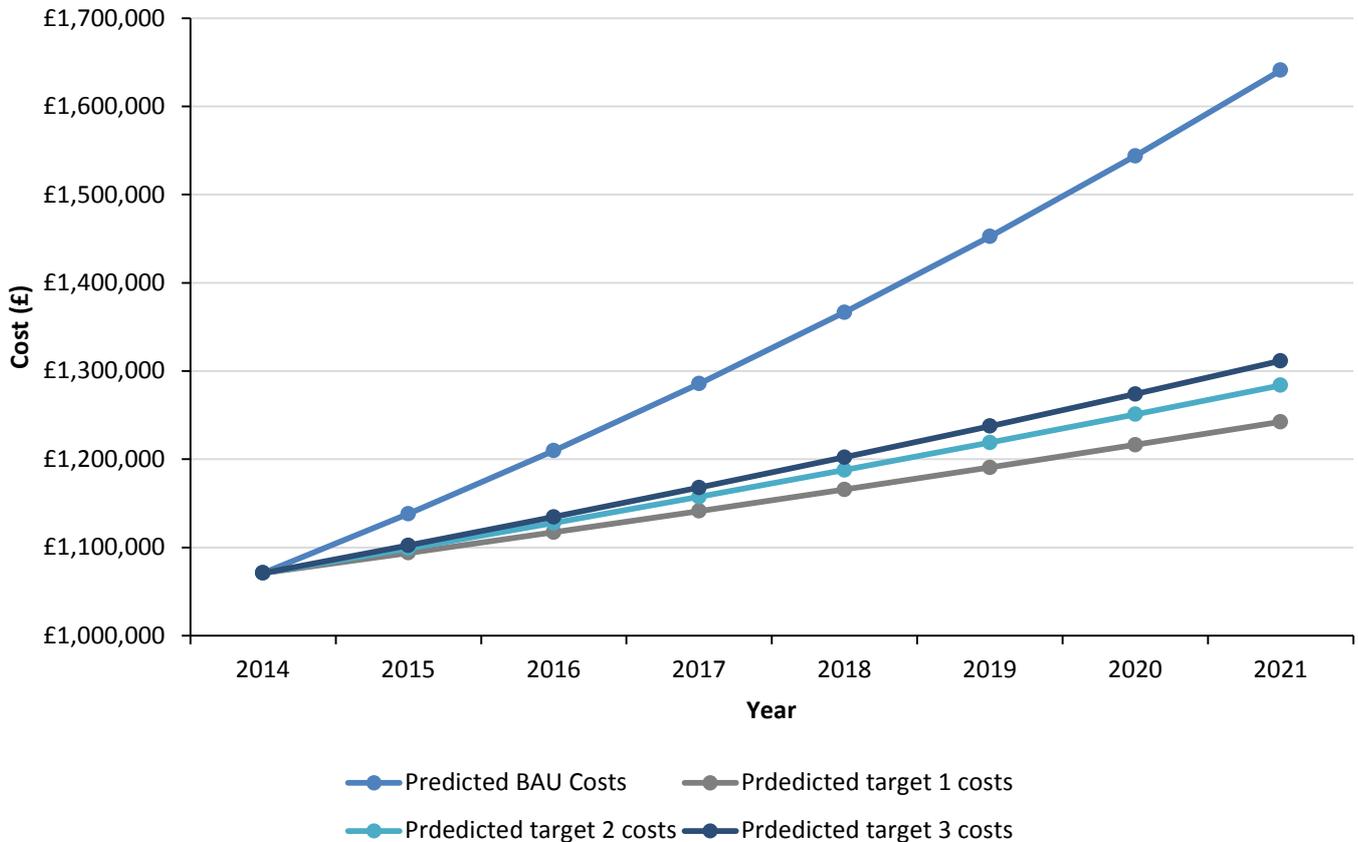
By achieving our 10% target savings we could have a cumulative cost savings of £1,470,006 by July 2021.

Annual Cost

Year	Business As Usual	Target Reduction 1 10%	Target Reduction 2 7%	Target Reduction 3 5%
2014	£ 1,071,011	£ 1,071,011	£ 1,071,011	£ 1,071,011
2015	£ 1,138,231	£ 1,093,880	£ 1,099,016	£ 1,102,362
2016	£ 1,209,706	£ 1,117,271	£ 1,127,787	£ 1,134,664
2017	£ 1,285,707	£ 1,141,195	£ 1,157,345	£ 1,167,947
2018	£ 1,366,521	£ 1,165,665	£ 1,187,712	£ 1,202,241
2019	£ 1,452,458	£ 1,190,694	£ 1,218,911	£ 1,237,578
2020	£ 1,543,842	£ 1,216,295	£ 1,250,965	£ 1,273,989
2021	£ 1,641,023	£ 1,242,482	£ 1,283,898	£ 1,311,509
Total	**£ 10,708,499**	**£ 9,238,493**		
Difference		£ 1,470,006		

The table below provides a summary of the financial impact of the proposed carbon reduction targets at the end of the 5 year period:

Summary Financial Value

	Target Reduction 1 10%	Target Reduction 2 7%	Target Reduction 3 5%
Final Year annual cost savings (£)	£ 398,541	£ 357,125	£ 329,514
Final Year Energy and Fuel Cost	£ 1,242,482	£ 1,283,898	£ 1,311,509
Final Year CRC	£ -	£ -	£ -
Cumulative cost savings to 2021 (£)	£ 1,470,006	£ 1,311,853	£ 1,207,198
Base Year Costs (£)	£ 1,071,011	£ 1,071,011	£ 1,071,011

Comparision of Emissions with predicted BAU increase and reduction targets
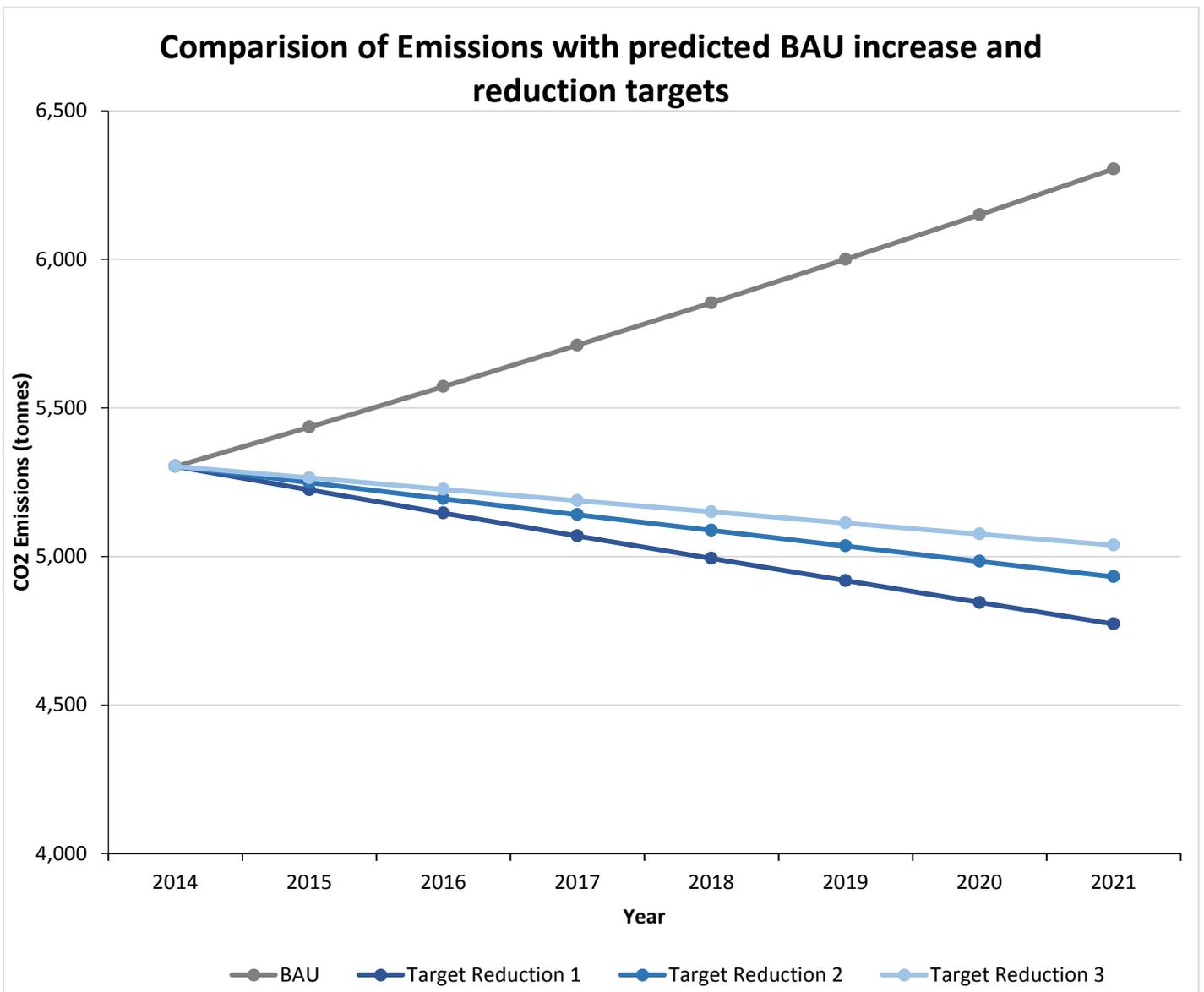
By achieving our target savings we could achieve cumulative carbon savings of 6,056 tCO2e by July 2021, against business as usual. The graph also plots the possible outcomes if the College was to fall short of its intended reduction target of 10% (Target reduction 1).

Annual Carbon Emissions (tCO2)

Year	BAU	Target Reduction 1 (10%)	Target Reduction 2 (7%)	Target Reduction 3 (5%)
2014	5,303	5,303	5,303	5,303
2015	5,436	5,224	5,249	5,265
2016	5,572	5,146	5,195	5,226
2017	5,711	5,069	5,141	5,188
2018	5,854	4,994	5,088	5,150
2019	6,000	4,919	5,036	5,113
2020	6,150	4,846	4,984	5,075
2021	6,304	4,773	4,932	5,038
Total	**46,330**	**40,274**		
Difference		6,056		

The table below provides a summary of the carbon impact of the proposed reduction targets at the end of the 5 year period:

Summary Carbon Value

	Target Reduction 1	Target Reduction 2	Target Reduction 3
Final Year annual tCO2 Savings	1,531	1,372	1,266
Cumulative tCO2 savings	6,056	5,404	4,972
Relative emissions reduction target	24%	22%	20%
Base Year Emissions	5,303	5,303	5,303
Final Year Emissions	4,773	4,932	5,038

Carbon Management Projects

We have identified projects that could save 315 tonnes of CO_2 and achieve 59% of our carbon emissions reduction target. The table below summarises what the College believes is achievable should a level of funding be made / come available:

Description	SavingCO$_2$ (Tonnes)	Investment £'000	Target Saving %
Existing projects (1)	N/A	N/A	
Projects requiring funding	315	65	59
CEEP	744	1,987	>100%
Subtotal	**1,059**	**2,052**	
District heating system (2)	500	0	
Total	**1,559**	**2,052**	

Note

(1)   Any saving made through existing projects has already been included in the baseline calculation
(2)   No initial upfront capital outlay as this will be recovered through the operating costs
(3)   The saving represents the potential % saved against the required total saving if a 10% reduction is achieved

In order to achieve emissions reductions and avoid financial exposure, the College is committed to identifying and implementing carbon saving projects. Achieving our emissions reduction target of 10% will require an absolute reduction of 530 tCO2e against the 2014/15 baseline carbon footprint.

In line with the variety of emissions sources that contribute to the College carbon footprint, the range of projects identified in this section span a number of locations and operational areas; in addition to traditional carbon saving initiatives such as low energy lighting interventions in other areas include ICT upgrades and fleet replacement.

The list of projects is dynamic; it is intended to be regularly updated in response to changing circumstances and emerging opportunities. As such, the information presented here is a summary of key projects; the full register, which includes data on carbon, costs and responsible staff member is held in the Carbon Footprint Forecast Tool and related documents. The register will be regularly reviewed and updated as a routine aspect of the Carbon Management Group meetings as laid out on page 41.

It should be noted that projects are only included in the register where carbon savings can be predicted with confidence and quantified with a sufficient degree of accuracy; there are various past, current and future College activities which are expected to contribute to the carbon reduction but for which detailed estimates have not been possible to obtain.

Existing Projects

Energy

- Windows sealed at Greenock Finnart Street campus to reduce wind/water ingress
- All windows and concrete joints sealed on Greenock Finnart campus – Newton Street façade to reduce wind/water ingress
- Building Management Systems upgrade at Greenock Finnart Street and Waterfront campuses
- Trial upgrade of ceiling fan coil units for individual space temperature control at Greenock Waterfront
- Trial installation of Circosense sensor to reduce gas consumption for hot water services at Clydebank
- Upgrade of existing Building Management Systems at our Paisley campus
- To insulate all pipework within the boiler house of the Oakshaw building at our Paisley campus
- To install 2 new heating pumps

Lighting

- Continue to replace old light fittings with modern energy efficient version where possible

Transport

- Review of College vehicles with view to low energy replacement or divestment

Waste

- Introduction of food waste recycling on all campuses

IT

- Print services contract is currently under review with aim to upgrade print devices and reduce total fleet
- Virtualisation programme initiated

Projects Requiring Funding

This section identifies projects that the College would plan to undertake and which will require to be funded from College resource. In undertaking any project, a consistent methodology and approach will be undertaken with regard to the assessment and authorisation, with a corporate template be utilised to define the cost and benefits of proposed projects (Appendix A presents an example of the template to be used).

Project	Lead	Cost		Annual Savings (yr. 1)		Pay back (yrs.)	% of Target
		Install £	Running £	Financial £ (Gross)	tCO$_2$e		
WCS campuses – reduce heating operating hours either overnight or at weekend	Head of Estates	0	0	2,500	14	0	2.6%
Form Focus Groups to promote energy awareness via intranet & posters	Head of Estates	0	2,000	2,000	28	1	5.3%
Buy portable clamp-on electricity meter to monitor electricity use to identify buildings for AMR installation	Head of Estates	1,000	2,000	5,000	28	1	5.3%
Greenock Waterfront - Energy saving additive trial to central heating system	Head of Estates	1,000	0	1,000	5	1	0.9%
Greenock Waterfront – Linking all ceiling fan coil units to BMS for individual space control	Head of Estates	10,500	0	3,000	14	4	2.6%
Greenock Waterfront – Roof/loft insulation upgrade	Head of Estates	5,500	3,000	2,250	11	4	2.1%
Greenock Finnart - upgrade BMS	Head of Estates	11,000	0	6,600	54	2	10.2%
Paisley – Replace 2 aged faulty heating pumps in Oakshaw Boiler House	Head of Estates	8,000	0	1,000	4	8	0.8%
Paisley – Re-locate and implement existing Zumbotel lighting control in Renfrew North	Head of Estates	5,000	0	2,500	12	2	2.3%
Paisley – Record and use Building Management System data for ICE Building for energy	Head of Estates	0	0	500	2	-	0.4%

Project	Lead	Cost		Annual Savings (yr. 1)		Pay back (yrs.)	% of Target
		Install £	Running £	Financial £ (Gross)	tCO$_2$ e		
monitoring							
Paisley – Automatic Meter Readers install gas sub meters to monitor and reduce energy usage	Head of Estates	3,000	1,000	3,500	25	1	4.7%
Paisley – Install insulation on all pipes in Oakshaw Boiler House	Head of Estates	10,000	0	1,000	4	10	0.8%
Paisley - Fit VCDs to 4 No AHU supply and extract fans in Renfrew North	Head of Estates	2,800	1,200	1,000	28	4	5.3%
Paisley – AMRs: Install electricity sub meters to monitor & reduce usage	Head of Estates	4,500	1,500	10,714	50	1	9.4%
Greenock F –AMRs: Install electricity sub meters to monitor usage	Head of Estates	2,250	750	6,334	29	0.5	5.5%
Greenock F –Install Hippo water savers for toilet cisterns in Greenock	Head of Estates	150	0	150	2	1	0.4%
Greenock W –Install Hippo water savers for toilet cisterns	Head of Estates	50	0	50	1	1	0.2%
Paisley - Install Hippo water savers for toilet cisterns	Head of Estates	300	0	300	4	1	0.8%
Totals		**65,050**	**11,450**	**49,400**	**315**	**1.5**	**59%**

College Energy Efficiency Pathfinder (CEEP) Project

Turner & Townsend were appointed in December 2015 to take forward the work of the College Energy Efficiency Pathfinder (CEEP) Programme. The Scottish Government has developed a Non-Domestic Energy Efficiency framework, which will comprise an energy performance contract and a framework of contractors to deliver energy efficiency services to public bodies in Scotland.

The CEEP outcome was to provide an outline business case for accessing the contractor framework to reduce the College's energy costs and carbon emissions by installing energy conservation measures and delivering energy conservation services. The outline business case demonstrates the opportunities that exist for colleges to improve their energy performance by implementing energy conservation measures which can be installed through the contractor framework.

The overall result of the work undertaken by Turner & Townsend is that for an investment of circa £7.0m (including VAT) the 6 pilot colleges could see an estimated 17% reduction in energy usage equivalent to an annual saving of £593k; and a resultant 3,500 tCO2 reduction. Of the six colleges in the pilot study West College Scotland and North East Scotland College were identified as being in need of the greatest investment.

For West College Scotland the CEEP identified 97 projects costing circa £1.9m which could potentially save £214,000 in energy costs and result in an annual CO_2 reduction of 744 tonnes. A number of the CEEP projects had already been identified by the College and are included under section 3.2. The remaining CEEP projects will be added to the College project register but will require further analysis to confirm final costs, energy and carbon savings. The table below provides a summary of the CEEP projects suggested by Turner & Townsend:

	No. of projects	Total Investment £'000	Potential Carbon Saving Tonnes	Potential energy cost saving £'000
Total CEEP projects	97	1,987	744	214
Total college identified projects	18	65	315	49
Total projects		2,052	1,059	263

SFC have advised that funding for the CEEP projects will be factored into the next Scottish Government Spending Review. The SFC cannot confirm the funding will be available until this review has taken place, which should be towards the end of 2016. The Scottish Government is currently tendering for a Project Support Unit (PSU) for the Low Carbon Infrastructure Transition Programme. It is anticipated the PSU will be in place by the end of 2016. SFC will then work with the PSU to access advice/guidance/technical support for the Colleges to take forward the Invitation to Mini Competition (ITMC) to access the NDEE Framework. The SFC anticipates the ITMC will begin in late 2016.

The successful bidder will be responsible for creating an Investment Grade Proposal (IGP) which will outline the specific projects happening at each college. The actual work, which is dependent on SFC funding being available, would intend to be taken forward during 2017/18. The SFC intends to use the time prior to the PSU coming into operation to have individual conversations with colleges about the project registers, ITMC and any further information required for that and the detail of the process.

District Heating Network

The College, in conjunction with West Dunbartonshire Council, have indicated a willingness to participate in the district heating network being developed by Dawn Developments for the Queens' Quay basin area of Clydebank.

District heating networks deliver heat from single or multiple energy sources to a number of buildings. Heat can come from a wide range of sources including low carbon sources such as recovered heat from industrial processes, renewable technologies such as heat pumps, biomass, solar thermal, and hydrogen from combined heat & power using traditional fossil fuels, energy from waste, anaerobic digestion or wood fuel, and from thermal storage heated by renewable technologies such as wind.

Ramboll Energy was appointed by Resource Efficient Scotland to undertake a Feasibility Study and Outline Business Case for the district heating network on a brownfield site by Clydeside Regeneration Limited adjacent to the River Clyde at Clydebank.

A District Heating Feasibility Study Report for Queen's Quay was prepared by Ramboll Energy during 2015 and after investigations and appraisals of 15 technologies it was concluded that there would be an intention to generate heat from the following sources:

- Gas Combined Heat & Power (Internal Combustion Engine) System
- Biomass Boiler System
- Water Source Heat Pump System using River Clyde at Queen's Quay
- Solar Thermal

The report concludes a potential project with reasonable returns on investment and with strategic social and environmental benefits. The following options were technically and financially modelled:

- Water source heat pump system and back-up & peaking gas boilers
- Water source heat pump system and solar thermal array and back-up & peaking gas boilers
- Gas CHP and peaking gas boilers
- Biomass boiler and back-up & peaking gas boilers

The second option - Water source heat pump system and solar thermal array and back-up and peaking gas boilers offers the greatest financial and environmental benefits over the project's 25 year life cycle and most feasible heat supply technology mix. It should be noted that the Water Source Heat Pump System offers the greatest carbon emission abatement potential and the gas CHP the lowest using the projected carbon emission factors envisaged by the Department of Energy and Climate Change (DECC).

The first phase of the Queen's Quay development was approved by West Dunbartonshire Council's Planning Committee on 24 March 2016. Contract agreements to supply the low carbon heat supply should reduce energy costs and emissions from existing and planned building stock, are presently being considered by a range of organisations including West College Scotland, West Dunbartonshire Council and the Golden Jubilee National Hospital.

If Clydebank campus connects to the district heating network, based on initial modelling, it is estimated that consumption and operating costs for heating could be reduced by 50% and also provide an annual saving of 500 tonnes of carbon emissions. Under the Carbon Reduction Commitment (CRC) Order May 2013 Energy Efficiency Scheme, heat supplied from a District Heating System is classified as Zero Carbon. This should provide an additional financial incentive to the College to connect to the system should the initial business case work prove conclusive.

Projected Achievement towards Target

The figure below shows how far our quantified projects take us towards our target. If all these quantified projects are implemented, we expect to save 59% of our total carbon emissions. If only the current fundable projects are implemented we will need to further identify 215 tonnes of emissions savings to fill the gap to our 10% target and make up for the business as usual upwards drift. The following mechanisms have been put in place to ensure a sustained project pipeline:

- Internal staffing resource identified to continue staff and student engagement
- Seminars and forums to be arranged to discuss potential energy saving projects
- Continued development of estate maintenance data collection and building system improvements

Target: 10% (530 tCO$_2$)	Potential Additional Saving (1,029 tCO$_2$)		
Existing Projects 0%	Fundable Projects 59% Reduction (315 tCO$_2$)	CEEP Projects (744 tCO$_2$)	District Heating System (500 tCO$_2$)
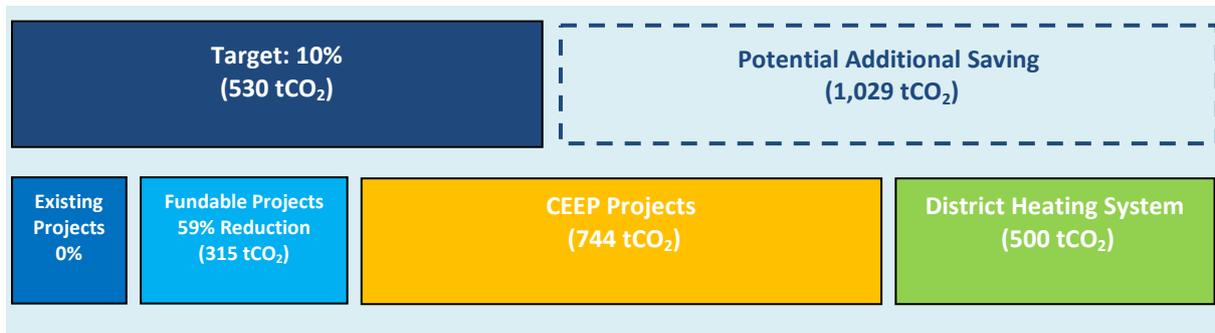
Carbon Management Plan Financing

The College estates maintenance budget for 2016/17 is £1.4m which represents a reduction of 23% on 2015/16 and a 43% cut since 2014/15. The College also has no indication of funding beyond July 2017. This presents a very real challenge to the implementation of this Plan. The projects identified on pages 32 and 33 will require significant investment in order to deliver the carbon reduction savings noted. This will require the College to prioritise estate maintenance funding towards these projects at a time when there is no indication of future funding. In addition to this the College estate is aging and requires significant investment following receipt of a building condition survey carried out in 2015. The SFC CCEP project timeline clearly shows limited investment in 2016/17 and the funding for these projects is not due to come on stream until 2017/18.

For the purposes of planning the College has assumed a level of investment of £100,000 per annum which will be prioritised to allow all of the projects identified to be progressed. As the table below indicates this level of funding does not match the requirements. Alternative sources of funding will also be sought and the advice of the Carbon Trust / EAUC will be critical in this regard.

It is clear that this shortfall in funding will require to be addressed with the SFC if to enable the College to achieve its carbon reduction targets. In section 3 we have described the projects we will implement to achieve our target. We have also identified the costs of these projects. This section summarises the funding required year by year, describes where it will come from and identifies any gaps where funding may not yet be secured.

Financial Costs and Sources of Funding

The capital cost of implementing the projects in this plan has been estimated at £0.06m for identified projects. It should be noted that there is potentially £1.9m for CEEP investment required should alternative funding not be sourced by the SFC. The College has allocated the following funding towards the provision of projects as follows:

	2016/17 £'000	2017/18 £'000	2018/19 £'000	2019/20 £'000	2020/21 £'000	Total £'000
Annual costs:						
Total annual installation cost	393	393	393	393	393	**1,965**
Total annual running cost	0	0	0	0	0	**0**
Total costs	393	393	393	393	393	**1,965**
Committed funding:						
Committed annual installation	100	100	100	100	100	**500**
Committed annual running	0	0	0	0	0	**0**
Total funded	**100**	**100**	**100**	**100**	**100**	**500**
Unallocated funding						
Unallocated annual installation	293	293	293	293	293	1,465
Unallocated annual running	0	0	0	0	0	0
Total unfunded	**293**	**293**	**293**	**293**	**293**	**1,465**

As outlined above, the College will require engaging with the SFC and other partners to identify alternative sources / additional funding to assist with the implementation of this plan.

Assumptions

Key assumptions underlying our financial projections are:

- Electricity cost of £0.0890/kWh in the baseline year and an annual increase of *4%* in the following years
- Gas cost of £0.0209/kWh in the baseline year and an annual increase of *4%* in the following years
- BAU consumption will increase by 2.5%
- Utility prices will increase by 4.0%
- Transport prices will increase by 2.5%
- Waste prices will increase by 3.0%
- Inflation will increase by 1% on an annual basis over the course of the 5 year plan.

External Funding

The College will investigate the availability of external funding and where possible make application for further funding beyond any additional resource made available by the SFC. The following funds will be reviewed to assess potential bids:

a) Central Energy Efficiency Fund (CEEF)

CEEF was launched by the Scottish Government in 2004 for all local authorities and health boards to initiate energy efficiency and renewable projects. Given the status of the College as a non-departmental government body the ability of the College to access these funds or its replacement will be taken forward.

b) Salix Fund / Invest to Save Schemes

This is a UK Government backed loan fund that aims to increase capital investment in energy efficiency and the College has previously made use of this type of funding. Given the current status of the College we will need to establish whether this type of funding can be used by the College.

c) Other sources of funding

Funds are sometimes announced at short notice to support projects that help to deliver the UK and Scottish Government's carbon reduction agenda e.g. electric vehicle charging points. Additionally other funding vehicles require to be investigated by the College to maximise the future investment possibilities e.g. joint ventures.

To ensure that such opportunities are kept abreast of and given due consideration, regular communication between the College and agencies such as EUAC, Carbon Trust and local Community Planning Partners will be essential. This will be taken forward via the Carbon Management Group meetings at which funding will be a standing item.

Embedding Carbon Management across the College

In addition to projects that directly deliver carbon saving, various enabling measures are in place to support current and future carbon reduction projects. The Carbon Management Maturity Matrix at Appendix B shows the different areas of embedding carbon management, our current level and what we plan to achieve during the next five years.   This section describes the main activities and changes that will help us achieve this.

Corporate Governance of Strategies, Policies and Processes

To ensure that carbon management becomes, and is maintained, as a college priority, it needs to be considered as part of all decision making. In particular we will:

- Look for senior endorsement and publication of the carbon management plan and carbon reduction target this will make the College's commitment clear and reinforces the need for action within the College
- Continue to report on the carbon reduction targets in our Regional Outcome Agreement
- Look to include carbon reduction in relevant policies including procurement, mileage rate, travel planning
- Look to include energy costs/carbon reduction in College strategic risk register if appropriate

Procurement

Procurement is a key influence on some of the activities that fall within the scope of this Plan. As such, commitment has been made in the College Procurement Strategy to sustainable procurement, and this translates into measures embedded within the procurement process to reduce carbon emissions associated with the purchase of goods and services – for example, a requirement for information on potential supplier's environmental policies at the tendering stage and the rationalisation of the delivery journey.

Corporate Asset Management Planning

Energy consumption in buildings accounts for the largest proportion of the College's carbon footprint. The College Estate Strategy 2016-2026 recognises the need to minimise carbon emissions.

Staff Travel Planning

This is an area that the College requires to review as no particular individual has within their remit travel planning including amending the travel to work patterns other than by private car. While the biggest impact of this will be in relation to commuting patterns it is expected that business travel patterns will also benefit with the aim being to reduce inter campus travel, business travel and the increased use of non-car based travel.

Staff Awareness Raising

Education is a crucial component of any agenda requiring behaviour change; staff buy-in, at all levels and in all areas of the College, will determine the success of this Plan, and achieving meaningful behaviour change requires participants to understand the importance of the carbon management agenda and be motivated to participate. The measures that will be taken to raise awareness will potentially include:

- Implementing an on-going behaviour change campaign
- Establishing a network of 'carbon champions' across the College to build engagement at the local level
- Inclusion of College's 'low carbon culture' in staff induction
- Monitoring of staff attitudes to carbon reduction though staff surveys

Programme Management of College Carbon Management Programme

In order to ensure effective ownership and implementation of the Carbon Management Plan, it is important to have a fully defined governance structure and a clear outline of the practical arrangements for delivery.

Board Sponsor

The Chair of the Estates Committee will champion the Carbon Management Plan and have oversight of the strategic direction of the project. This will ensure that the Carbon Management reduction commitment of the Board is given the status and priority required.

The Carbon Management Group (CMG)

The Carbon Management Group (CMG) will have the responsibility for the strategic direction and implementation of the CMP. The CMG will be convened by the Sustainability Officer and will meet at least 3 times per year, with one to one meetings and informal liaison taking place between members throughout the year.

To support the group's activities quarterly consumption / emission figures will be analysed in detail to identify trends and anomalies. While CMG membership will to an extent be fluid the following staff have been identified as key members:

- Director of Finance and Estates
- Head of Estates
- Sustainability Officer
- Representative from Estates Manager
- Health and Safety Manager
- Staff representatives
- Student representatives
- Marketing and communications representative

Input from elsewhere in the College will be gained through the ongoing communications that CMG members have with other key staff. Minutes of the meetings of the CMG will be reported to the SMT and then to the Estates Committee via the Chair of that Committee.

Monitoring and Reporting

This section describes actions we will take to improve the quality of our carbon emissions data and the data gathering process, and how we will measure and report on our progress. Robust data will provide us the basis to monitor and report on the results of our action and it will help to drive behaviour change.

Carbon data will be captured quarterly. We will capture and monitor building energy data along with capturing and monitoring fleet fuel data, waste data and travel information. Carbon data will be compiled for the purposes of reporting progress.

The following actions have been agreed with regards to further improving data and monitoring:

- Review of payroll system data to allow easier collation of intercampus and external travel patterns;
- Consideration of sub metering across all campuses to identify poorly performing buildings;
- Liaison with energy providers working towards the provision of electronic data half hourly where possible
- Template to be refined to allow easier reporting of data

We will report on progress of the carbon management plan to the CMG. This report will be used to report progress to the College Estates Committee.. The regular progress report will cover*:*

    (1) Action points from previous meetings

    (2) Update on carbon emissions

    (3) Update on legislative / reporting requirements

    (4) The progress of projects – use will be made of RAG reporting, allowing the reader to focus on helping the red projects

    (5) The top 5 risks / issues to the completion of the CMP

An annual report will be compiled, and this will provide an update on our progress in implementing the Carbon Management Plan. The report will be submitted to Board of Management and made publically available on the College website*.* The annual report will cover:

    (1) Action undertaken since the last annual report
    (2) Annual update on carbon emissions comparing to prior periods
    (3) Update on legislative / reporting requirements
    (4) The progress of projects – use will be made of RAG reporting, allowing the reader to focus on helping the red projects
    (5) The top 5 risks / issues to the completion of the CMP
    (6) Actions to be addressed in following year

Appendix A   Definition template for Projects

Project:	*Paisley - Oakshaw Boiler Room Upgrade*
Owner (person)	*Head of Estates*
Department	*Paisley campus*
Description	*Aged boilers, calorifier and associated equipment pumps, pressurisation, BMS controls*
Benefits	*Financial savings: ~ £ 20,000* *Payback period: ~15 years* *CO_2 emissions reduction: ~100 tonnes of CO_2* *8% of target – the percentage of CO_2 saving target this project will annually contribute* *Carbon trust*
Funding	*Project cost :circa £300,000* *Source of funding: Scottish Funding Council(SFC)/ Other source* *Business case to be carried out from SFC –College Energy Efficiency Pathfinder (CEEP) report issued May 2016*
Resources	• *External consultants to design and oversee project installation throughout*
Ensuring Success	• *Funding requires to be sourced as feasibility study carried out indicating success of project* • *Development of Estates Strategy will indicate whether investment in this building is to continue or to maintain status quo* • *Principal risks: There are no principle risks to the project on the assumption that the funding can be sourced*
Measuring Success	• *Installation of new boiler system and associated control systems* • *Improved heating controls rather than current all or nothing approach*
Timing	• *Milestones / key dates e.g.* o *TBC*
Notes	

Appendix B   **Carbon Management Maturity Matrix**

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
Current WCS Assessment **15 / 35 – 43%**	*3*	*3*	*4*	*1*	*1*	*2*	*1*
Projected Assessment In 5 years – 30 / 35 – 86%	*5*	*4*	*5*	*4*	*4*	*4*	*4*

5 **BEST**	• SMART Targets signed off by Cabinet & linked to their priorities
	• Carbon reduction target fully costed and underpinned by quantified projects
	• Action plan contains clear goals & regular progress reviews
		• CM is **full**-time responsibility of a **few** people
		• CM integrated in responsibilities of **senior** managers
		• **Chief Executive / Principal** support
		• Involvement of core operational staff in all Ministries
		• Part of **all** job descriptions
			• **Quarterly** or better collation of CO_2 scope 1 & 2 emissions
			• Systems being set up for scope 3
			• Data **externally** verified
			• M&T in place for:
			  o Buildings
			  o Waste
				• Key staff given formal CM:
				  o Induction and training
				  o Incentives
				  o Communications
				• CM matters **regularly** communicated to:
				  o Full internal and external community, including the public
				  o Key partners
					• **Granular & effective** financing mechanisms for CM projects
					• **Finance representation on CM Team**
					• **Whole life costing** embedded into procedures
					• **Ring-fenced fund** for carbon reduction initiatives
						• **Senior** purchasers consult & adhere to sustainable procurement policy
						• Sustainability integrated in **tendering & evaluation** criteria
						• Whole life costing
						• Collaborative procurement
							• Senior management review CM process
							• Core team regularly reviews CM progress and targets
							• CM Plan and progress reports publically available
							• Visible Cabinet level review

4	• SMART Targets **developed and quantified** but not implemented	• CM is **full**-time responsibility of an **individual**
		• CM integrated in to responsibilities of department **managers**, not all staff
			• **Annual** collation of CO_2 emissions for:
			  o Buildings
			  o Transport
			  o Waste
			• Data **internally** reviewed
				• All staff given CM:
				  o Induction
				  o Communications
				• CM communicated to:
				  o External community
				  o Key partners
					• Regular financing for CM projects
					• Cost estimate complete for most projects
					• **Some** external financing
						• Environmental demands incorporated in tendering
						• Familiarity with national and international best practice
						• **Whole life costing** for all major purchases
							• **Core** team **regularly** reviews CM progress:
							  o Actions
							  o Profile & targets
							  o New opportunities quantification

3	• **Draft** policy
	• **Reference** to Climate Change
	• Carbon target set but not quantified
		• CM is **part**-time responsibility of a **few** people
		• CM responsibility mainly with building managers only
			• **Collation** of CO_2 emissions for limited scope i.e. buildings only	• **Environmental / energy** group(s) give ad hoc:
				  o Training
				  o Communications
					• **Ad hoc** financing for CM projects
					• Limited task management
					• No allocated resource
						• **Whole life costing** occasionally employed
						• Some **pooling** of environmental expertise
							• CM Team review aspects including:
							  o Policies / Strategies
							  o Targets
							  o Action Plans

2	• No policy or target • Carbon reduction **aspiration**	• CM is **part**-time responsibility of an **individual** • No departmental champions	• **No CO_2** emissions data compiled • Energy data compiled on a regular basis	• Regular poster/awareness campaigns • **Staff** given ad hoc CM: o Communications	• General sense of investment needed to reach target • Limited task coordination **resources**	• **Green** criteria occasionally considered • Products considered in **isolation**	• Ad hoc reviews of CM actions & progress
1 **WORST**	• No policy • No climate or carbon reference	• No CM responsibility designation	• CO_2 emissions not measured • Estimated energy billing	• No communication or training	• No internal financing or funding for CM projects	• No Green consideration • No life cycle costing	• No CM monitoring

Appendix C   **Risk Register**

The risks associated with this plan have been categorised and scored in line with the College Risk Management Strategy. The Probability Impact score grid from this Strategy document is noted below for reference purposes:

Probability Impact Score Grid

		1 Negligible	2 Marginal	3 Critical	4 Catasrophic
Almost Certain	6	6	12	18	24
Very Likely	5	5	10	15	20
Likely	4	4	8	12	16
Possible	3	3	6	9	12
Very Unlikely	2	2	4	6	8
Remote Chance	1	1	2	3	4

No.	Description	Pre Mitigation			Mitigating actions	Post Mitigation		
		Probability	Impact	Score		Probability	Impact	Score
1	**Timing** If Carbon Management Plan is not completed on time and is not sustainable in its implementation and long term goals then projected carbon savings will not accrue within the expected timescale and could lead to failure of entire exercise	4	4	16	Liaise with SFC and other funders seeking to secure sufficient time and resource to support implementation of the plan. Liaise with SFC regarding impact on ROA targets.	3	4	12
2	**Negative Financial Implications** If finance is not made available as required and there is resistance to the implementation of major schemes then the expected scope for carbon reduction will be greatly minimised	5	3	15	Ensure projects identified are approved by Finance. Early engagement with SFC and other funders to identify sources of funding.	5	3	15
3	**Resistance to Cultural change** The need to change behaviours with regard to energy efficiency in the workplace needs to be embraced. If behaviours do not change then the overall reduction in CO_2e will be impacted on by 3-5% of the target.	4	2	8	Staff resource to engage early with staff, student and external groups Liaise / lobby staff, colleagues and departments through Awareness Campaigns.	3	2	6
4	**Legislative Changes** Future legislative changes are likely to enhance opportunities both for investment and also technical improvement of buildings and related energy efficiency. If such initiatives are delayed or not undertaken, there may be less leverage to deliver required projects and associated change.	4	2	8	Ensure that legal requirements are communicated early and are understood by all participants.	2	2	4

No.	Description	Pre Mitigation			Mitigating actions	Post Mitigation		
		Probability	Impact	Score		Probability	Impact	Score
5	**Estates Interface** Estates Department to incorporate exemplar design business decisions into any future works programmes to ensure that potential Carbon Plan savings are not compromised.	3	3	9	Ensure Estates Department embed the Sustainable Building Design document into all design for new build and major refurbishments	3	3	9
6	**Staff Resource** If the Carbon Plan Management is to be delivered effectively the key personnel involved must be fully engaged and retained on the project.	**3**	**3**	9	Ensure succession planning is in place. Ensure PDP's/Objectives reflect the Carbon Management Team needs.	2	3	6