

Robert Gordon University

Carbon Management Programme

Carbon Management Plan (CMP)



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Foreword by Professor Peter Robertson

The global challenge related to CO₂ atmospheric concentration has increased the demand for efficiency measures to reduce emissions and for a shift to low or non-carbon based systems for a sustainable future. This document outlines how Robert Gordon University will reduce its carbon emissions and embed carbon management as an integral part of all the University's activities.

As it is a priority for the University to fully understand its strengths and challenges in managing its carbon and its implications, The Robert Gordon University Carbon Management Programme is fully supported by the University's most senior management group, the Strategic Planning and Resources Group (SPARG). By serving as a well founded example, the Programme will support the University's mission of delivering professional education, which is about a lifelong and sustainable approach to working and living.

Professor Peter Robertson
Vice-Principal and Pro-Vice Chancellor (Research & Commercialisation)
Robert Gordon University

Foreword from the Carbon Trust

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

Robert Gordon University was selected in 2008, amidst strong competition, to take part in this ambitious programme. Robert Gordon University partnered with the Carbon Trust on this programme in order to realise vast carbon and cost savings. This Carbon Management Plan commits the organisation to a target of reducing CO₂ by 42% by 2020 and underpins potential financial savings to the organisation of around £1.6million.

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



Richard Rugg
Head of Public Sector, Carbon Trust



1 Management Summary

Legislative requirements will increase the demands on organisations to comply with long-term national plans to reduce CO₂ emissions by 42% by 2020¹. It is tempting to think of carbon management as a 'Green Cost', but a more considered and strategic approach quickly shows that "Business As Usual" (BAU) will cost the University over £2 million per year by 2018 and this figure will be around £3 million p.a. by 2020. The following figure shows the increasing value at stake from the year 2010 to 2019, which cumulatively amounts to over £11,000,000 by 2019. The starting figure of just over £2m is the University's existing energy expenditure for 2009/10.

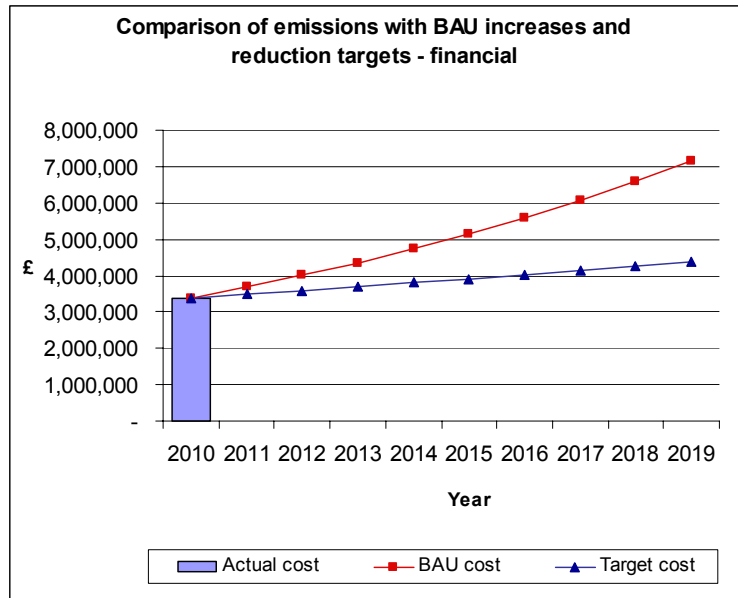


Figure 1: Comparison of cost of emissions under "Business as Usual" and "Carbon Reduction Commitment"

On the more immediate horizon, the University is committed to the Carbon Reduction Commitment (CRC), which comes into operation in 2010, and will require approximately £112,000 as an initial payment in April 2011 and the same in April 2012, based on our existing CO₂ footprint, making a total initial payment into CRC of £224,000. The CRC uses a league table system to assess the relative performance of organisations against a nominal value for CO₂ of £12 per tonne². After 2012, this value will be allowed to find a market value by encouraging trading of allowances. As range indicators, based on the data used in this report and a CO₂ value of £15/tonne, by 2014 adherence to this plan could see RGU recovering its initial £224,000 and a further £38,000. BAU would see very little recovery of the £224,000.

The mechanics of the first three to five years of the CRC are now understood but might yet be subject to change – a year is a long time in politics.

Between April 2010 and March 2011 the University must register with the scheme and ensure it measures its carbon footprint over the 12 months to March 2011. It will also be well advised to ensure it completes the two early action metrics upon which much of its initial performance will be assessed. These are the installation of relevant automatic half-hourly metering systems for power usage and the achieving of the Carbon Trust standard certification. The former is in the process of being completed and the successful finalisation, approval and submission of this plan will go a long way to achieving the latter.

In April 2011 the University must do two things. Firstly it must finalise its carbon footprint measure for the year then ended. Secondly it must decide what proportion of this footprint will be sufficient to cover our 2011/12 emissions. Based on this judgement the University must then purchase enough

¹ <http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/climatechangeact>

² <http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/EmissionsTrading/CRC>

allowances, at £12/tonne, to cover its expected footprint. In addition, all relevant information will be passed to the regulator.

Over the next 6 months the regulator will assess returns and situate each organisation within a league table or tables. It is not yet known who will be in what table, whether there will be one table or many etc – but league table position will be important. League table position in this first year will be dependent on 3 factors. Most importantly will be the early actions – success in these will contribute 50% of our league score. The other two factors will be the change in our absolute emissions and the change in our relative emissions growth, with the latter possibly being denominated by turnover. It seems likely that relative emissions in this first year might be derived by assessing allowances purchased for 2011/12 against known footprint for 2010/11. This suggests that a mechanism will be required, sooner or later, to equalise under and over-performance at the end of each year. It is easy to see that over-performers might be permitted to carry forward unused allowances. Under-performers might be obliged to buy additional allowances at a higher price. This is not yet clear.

Those nearer the bottom of the league table will receive a cash return equivalent to 90% of their original allowance purchase. Those in the middle of the table will receive a full refund and those nearer the top will receive 110% of their original outlay. Refunds will be effective by October 2011. It can be seen that the scheme is designed to be fiscally neutral.

For 2012/13 the whole process starts over again. However this time early actions are less important to league position and actual relative performance more important. In addition the refund structure changes from 90:100:110 to 80:100:120, but much of the rest of the timings and the mechanics are currently expected to stay the same.

In fact, this process repeats itself annually for 5 years. Eventually we reach a position, in 2015/16 when refunds are structured 50:100:150 and the early actions do not count at all.

One complication is expected to be the introduction of cap and trade around about the end of year 3. This means that over performers will be allowed to use market price to sell un-utilised allowances to underperformers. If, in addition, the regulator sees fit to limit available allowances this could mean underperformers buying allowances at prices considerably greater than £12/tonne.

This document outlines the strategy by which the Robert Gordon University can not only meet (and exceed) the requirements of the CRC, but can reduce costs, increase its environmental contribution, reduce CO₂ outputs and make itself more attractive to high quality staff and students from around the world.

Energy-related carbon is one of the most formidable challenges facing the senior management of companies and large organisations, incorporating both legislative and economic sanctions from UK and EU parliaments. Additionally, students are increasingly aware of sustainability related issues and expect their University to be equally aware and pro-active in its response to the difficulties faced.

An outcome of this project for the University will be a full understanding of its energy consumption and the resulting carbon footprint implications. Resulting from this understanding, the University will be in a position to improve its energy consumption and carbon management, on a continuous improvement model, from which the University will derive economic value and enhanced reputation. Current CO₂ outputs amount to 15,179 tonnes per annum, including staff commuting and student travel, or 12,609 tonnes per annum excluding staff commuting and student travel.

Robert Gordon University is an internationally recognised creator of innovative academic programmes and is well on the way to developing a campus to match its reputation. It has recently launched the Centre for Understanding Sustainable Practice (CUSP) and in recent years has initiated a number of Sustainability Working Groups responsible for Energy, Waste, Travel and Procurement. These groups have made substantial cost savings in energy, increased recycling of waste from 11% to 35% since 2007, and applied for Fair-Trade accreditation to the University.

In the next three years, Robert Gordon University is planning spend around £100 million on the first phase of a £175³ million campus Master Plan encompassing new and upgraded facilities, teaching accommodation and laboratories. These buildings will incorporate current best practice in energy use, energy management and sustainable development.

³ Estates, Robert Gordon University, March 2010

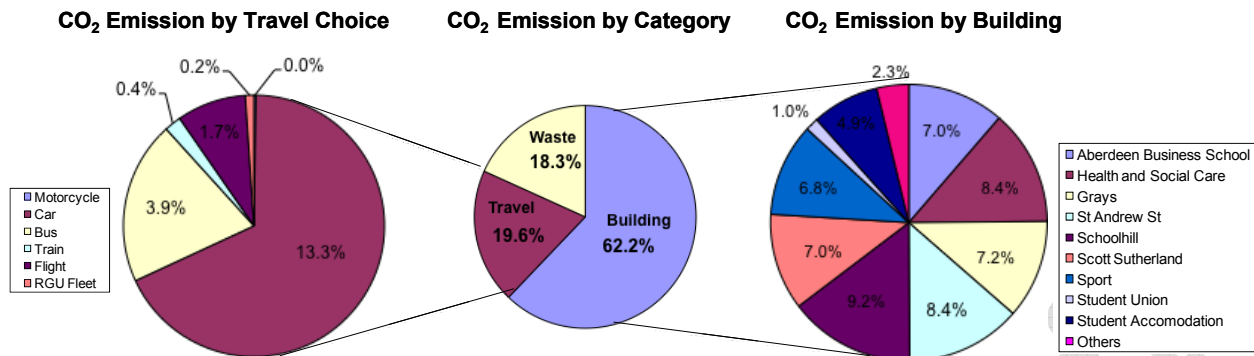


Figure 2: Summary charts of baseline emissions and sources, (total =15,179 tonnes p.a.)

For the purposes of the CRC, the baseline will exclude travel related emissions. However, since it is likely that these will be included at some point in the near future these emissions will remain as part of the emissions dataset in this carbon management plan.

2 Introduction

The Carbon Management Programme is designed to help the University to identify its strengths and challenges in managing the CO₂ generated by its institutional activities.

Looking ahead to 2011/12, the Carbon Reduction Commitment (CRC) will begin to feed in to the University's financial horizons with initial payments totalling around £224,000 according to the figures generated in the emissions baseline. It is an urgent priority for the University to fully understand its implications and proactively manage the process.

Legislative requirements put in place by the Scottish Parliament require a 42% cut in Scotland's CO₂ emissions by 2020 and, whilst there are, as yet, no equivalent individual/institutional legislative demands, public bodies must be seen to be playing their part and, where possible, demonstrate leadership.

The University has assembled a project team drawn from the executive, academic and student bodies examined its baseline CO₂ emissions from 2008 and drawn up an outline project plan for the delivery of this Carbon Management Plan. This document will be signed off at executive level prior to submission to the Carbon Trust in March 2010.

The University is not without success in this field and two projects are already demonstrating our commitment to sustainable development; The Centre for Understanding Sustainable Practice (**CUSP**) and the **Robert Gordon University Masterplan**

CUSP

The aim of CUSP is to educate and inspire people to embrace sustainable practice as a fundamental component of their daily lives.

It does so in the context of a new £0.5million Virtual Centre which brings together a broad range of cross-faculty academic expertise in Energy, Business, Architecture and Social subjects from Robert Gordon University. It will further broaden its foundations by forming links with the University of Aberdeen and others working in the field, covering land management, marine conservation and island communities.

Robert Gordon University Masterplan

The first phase (£100M) of a new £175M⁴ academic centre that will house a new learning resource centre and academic schools of Pharmacy and Life Sciences, Engineering and Computing is expected to commence on site in summer 2010 and to be completed in summer 2012. It is intended that the

⁴ Estates, Robert Gordon University, March 2010

project will make an early contribution to the University's carbon reduction commitment and will incorporate systems which will draw on renewable energy sources, Procurement will be approached on a sustainable basis.

3 Carbon Management Strategy

3.1 Context and drivers for Carbon Management

Short-term and rapid climate change is becoming increasingly accepted as an established process and anthropogenic emissions of CO₂ are heavily implicated in the scenario. The single largest anthropogenic factor in CO₂ emissions is our society's combustion of fossil fuels⁵ with little regard for efficiency or environmental cost. Even if one is reluctant to accept the anthropogenic origins of our current climate change concerns, there is an equally strong (if not stronger) case to be made for our technologically driven societies to use less energy and for what we do use to be drawn from sustainable sources. As fossil fuel resources dwindle (and they are doing), the price of energy will only rise, requiring organisations to use less energy in order to remain economically viable. Managing this process will take time and any organisation that engages early will be in an advantageous position in the coming decade.

Robert Gordon University is an internationally recognised creator of innovative academic programmes and is well on the way to developing a campus to match its reputation. It has recently launched the Centre for Understanding Sustainable Practice (CUSP) and in recent years has initiated a number of Sustainability Working Groups responsible for Energy, Waste, Travel and Procurement. These groups have made substantial cost savings in energy, increased recycling of waste from 11% to 35% since 2007, and brought Fair-Trade accreditation to the University.

By 2013, Robert Gordon University is planning to spend around £100 million on new and upgraded facilities, teaching accommodation and laboratories. These buildings will incorporate current best practice in energy use, energy management and sustainable development.

On the more immediate horizon, the University is committed to the Carbon Reduction Commitment (CRC) which comes into operation in 2010 and assumes a value of CO₂ at £12 per tonne. To take it one stage further however, if we are saving the target quantity of 6,375 tonnes per year (including travel) by 2020 and this is projected to save around £3 million by the same time, then the value of a tonne of CO₂ to the university will be approximately £500. It should be noted that, at present, the CRC does not include emissions due to travel. However, it is considered sensible to include these figures for management purposes and the perceived likelihood of travel-related emissions being included in future legislation.

3.2 Our low carbon vision

By 2015 the Robert Gordon University will be a leading example of carbon management in Scotland. The next phase of our move to Garthdee will be complete and the new building will generate 15% of its energy from renewable sources and 40% less heating related CO₂ than the buildings that currently form the city centre campus. Continual development will reduce the carbon footprint of the existing buildings at Garthdee and, combined with a commercially viable renewable energy generation strategy, the University will be saving 42% of its present CO₂ budget by 2020.

3.3 Strategic themes

- Buildings (existing and new) – resources consumption: water, electricity gas and oil (where applicable)
- Swimming pool and sports facilities (existing) - resources consumption: water, electricity gas and oil (where applicable)
- Vehicles – Analysis of the existing RGU fleet in terms of mileage, need, type and usage. Outline of forward plan for future needs and fuels

⁵ <http://actonco2.direct.gov.uk/actonco2/home/climate-change-the-facts.html>

- Staff travel - Analysis of current staff travel practices in terms of mode, distance, cost, need and an outline of alternatives.
- Development of multi-option carbon model and staff travel incentive plan
- Procurement – Analysis of sources, cost, carbon content. Also applicable to construction processes of new buildings
- Waste disposal – Analysis of waste creation, collection, separation, disposal. Again applicable to the new build activities
- Policy changes – required to deliver carbon reduction over an agreed time span

3.4 Targets and objectives

The Robert Gordon University will reduce its CO₂ output by 42% of its 2008 baseline figure by December 2020.

The 2008 CO₂ baseline figure was 15,179 tonnes, thus a 42% decrease represents 6,375 tonnes, suggesting that the organisation's CO₂ emission will be 8,804 tonnes by 2020. This is a challenging target requiring an annual reduction of 4.2% p.a. from 2010 emission for 10 years.

Whilst there is no legal requirement as yet for any individual organisation to show a reduction of 42% by 2020, the national strategy is legislatively committed to 42% overall by 2020. It follows that any organisations that have started early and understand their task will be much better placed than those who have not.

The immediate objective is to establish a Carbon Management Programme within Robert Gordon University by April 2010 that will:

- Develop a system to quantify, attribute and record all energy related activities at whatever level is appropriate and subsequently analyse for potential improvements. (June 2011)
- Identify and implement a range of projects to deliver the required CO₂ savings (see section 4)
- Commit the University to reducing its overall CO₂ emissions by 42% before 2020
- Design and operate a web-based staff travel management system that will allow proper analysis of the carbon and economic impacts of staff movements by November 2010. Initial discussions with The Carbon Trust suggest that this is a difficulty facing all UK Universities and that the work may be fundable as part of a broader work package.
- Lead by example and encourage our students, staff, suppliers and the community to make changes to reduce carbon emissions
- Raise the positive environmental profile of the organisation locally

4 Emissions Baseline and Projections

4.1 Baseline

The University produced a baseline figure of 15,179 tonnes of CO₂ from its buildings, travel and waste activities during the calendar year of 2008. Data sources and assumptions are listed below:

- Buildings energy – The data are recorded from fortnightly readings of gas and electricity meters, and quarterly readings of water meters.
- Travel – The University uses ATP Travel for much of its staff travel bookings and ATP Travel provide CO₂ figures for each journey. Rail and flight travel undertaken by staff and reclaimed as a monetary sum is assumed to approximate to 10p per mile and car travel is assumed to achieve 30mpg. Whilst travel related emissions are not yet part of the CRC commitment, the Carbon Management Plan will continue to record and monitor the data.
- Waste - Landfill waste is assumed to create 300m³ of gas per tonne, 50% of which is CO₂ and 50% of which is Methane (CH₄) having a CO₂ equivalence of 25:1. The landfill site that currently processes RGU's waste stream recovers the Methane for power generation and the CO₂ is calculated based on combustion of CH₄ rather than using the CO₂ equivalent figure for CH₄.

Table 1: Baseline emissions from waste

Waste tonnes	Assumption	CO ₂	CO ₂	Total CO ₂	Percentages
		emission from waste tonnes	emission from CH ₄ recovery tonnes	emission tonnes	% of total
404.4	landfill emits 300m ³ gas per tonne, 50% CO ₂ , 50% CH ₄	2,628.6	143.1	2,772	18.26%
Total		2,628.6	143.1	2,772	18.26%

Table 2: Baseline emissions from student travel, staff travel and University fleet

Travel Method	Travel Distance	Total CO ₂	Total CO ₂	Percentages
	km	Emission kg CO ₂	Emission tonnes CO ₂	% of total
University Business				
Motorcycle	1,609	170	0	
Car	283,824	69,345	69	
Train	556,815	46,956	47	
Flight	2,114,273	254,890	255	
University Commute				
Motorcycle	69,442	7,354	7	
Car	9,406,817	1,947,211	1,947	
Bus	5,322,631	599,216	599	
Train	250,708	15,093	15	
University Commute & Business Total				
Total Motorcycle		7,524	8	0.05%
Total Car		2,016,556	2,017	13.29%
Total Bus		599,216	599	3.95%
Total Train		62,049	62	0.41%
Total Flight		254,890	255	1.68%
RGU Fleet		31,565	32	0.21%
Total		2,971,800	2,972	19.58%

Table 3: Baseline emissions for existing buildings

Building	Area	Electricity	Gas	water	CO ₂	CO ₂	Percentages
	m ²	kWh	kWh	m ³	kg	Tonnes	% of total
ABS	12,500	1,378,204	1,689,159	4,250	1,069,510	1,070	7.05%
FOHSC	13,200	1,818,002	1,530,422	6,979	1,275,989	1,276	8.41%
Grays	5,995	611,704	3,919,051	5,097	1,090,840	1,091	7.19%
St Andrew St	12,031	1,776,276	1,636,175	3,263	1,272,596	1,273	8.38%
Schoolhill	14,711	1,797,948	2,186,828	6,688	1,392,444	1,392	9.17%
Scott Sutherland	6,808	578,998	3,890,800	234	1,065,832	1,066	7.02%
Sport	6,665	1,312,532	1,642,143	9,763	1,027,350	1,027	6.77%
Student Union	1,380	178,907	247,617	2,269	145,028	145	0.96%
Student Accomodation							
Woolmanhill 1-9	14,391	83,184	0	0	44,670	45	0.29%
Woolmanhill 10-19		6,026	0	0	3,236	3	0.02%
Woolmanhill 20-29		7,116	0	0	3,821	4	0.03%
Woolmanhill 30-39		73,249	0	0	39,335	39	0.26%
Woolmanhill 40-49		15,052	0	0	8,083	8	0.05%
Woolmanhill 50-59		60,720	0	0	32,606	33	0.21%
Woolmanhill 60-69		84,029	0	0	45,123	45	0.30%
Woolmanhill 70-79		57,813	0	0	31,046	31	0.20%
Woolmanhill 80-89		9,833	0	0	5,280	5	0.03%
Woolmanhill 90-99		9,603	0	0	5,157	5	0.03%
Woolmanhill 100-109		63,889	0	0	34,308	34	0.23%
Woolmanhill Main Store		39,770	0	0	21,356	21	0.14%
Woolmanhill Gas		0	2,411,540	0	467,839	468	3.08%
Others							
Boathouse	0	19,380	0	0	10,407	10	0.07%
CSB	1,676	183,354	384,942	304	173,263	173	1.14%
Fire Hydrant	0	0	0	15,311	6,186	6	0.04%
Gatehouse	686	68,490	66,090	788	49,919	50	0.33%
Information Centre	75	33,959	0	0	18,236	18	0.12%
Kaim Cottage	305	9,580	0	0	5,144	5	0.03%
Kaim House	413	37,019	0	101	19,920	20	0.13%
Riverside cabins		129,000	0	0	69,273	69	0.46%
Street lighting	0	2,260	0	0	1,214	1	0.01%
Total	90,836	11,576,881	12,371,618	55,047	9,435,010	9,435	62.16%

Electricity, gas, and water consumption for existing buildings contribute around 62% to the current baseline emissions, which is the largest, compared to travel (about 20%) and waste (about 18%).

Schoolhill, which houses the University's Engineering Department and Administration, has the highest emission among all the other buildings. It is followed by the Faculty of Health and Social Care (FOHSC) building and the St. Andrews Street buildings, both of which house data handling activities that are above and beyond their own academic functions. A very large portion of these are generated through electricity and gas utilisation. Only a small fraction comes from water use.

In the travel sector, car use emits the largest CO₂ (up to 13.3% of total emission) followed by bus (3.9% of total emission), and flight (1.7% of total emission). Staff and student commuting (2,569 tCO₂) are found to be a very much larger contributor to the baseline year's emission compared to travels for university businesses (371tCO₂).

4.2 Projections and Value at Stake

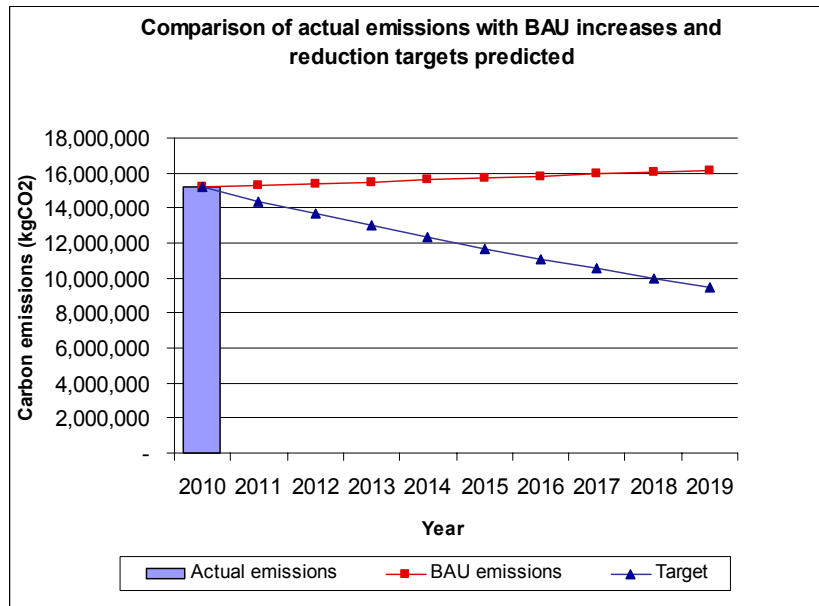


Figure 3: Emissions outputs, “Business as Usual” vs “Reduced Emission Scenario”

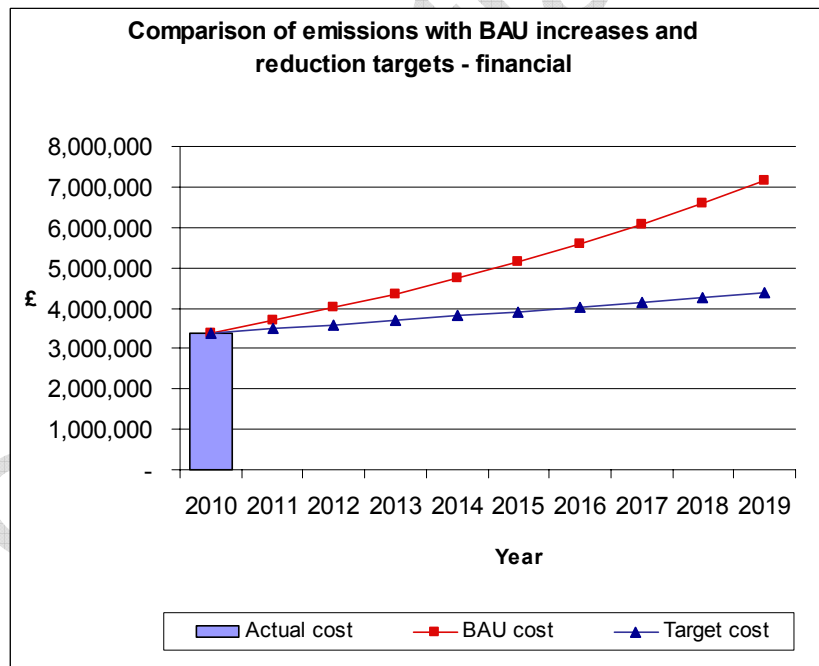


Figure 4: Potential cost of “Business as Usual” vs “Reduced Emission Scenario”

5 Carbon Management Projects

5.1 Existing projects

The University Estates department is constantly driving developmental projects to improve the delivery of services to staff and students. Many of these projects incorporate an element of carbon management, though historically, no significant effort has been made to separate out these elements. One of the challenges of this project is to make this separation possible.

Table 4: Existing projects

Project	Lead	Cost			Annual Saving		Pay back (year)	% of Target (4,237t)	Year
		Cap'l	Rev'ue	Res'ce	Fin	CO ₂			
"Turn IT off" campaign	AO	£200	£200	12 days	£74,800	671t	0	19.23	2010
"Turn it down 3 ^o n" campaign	AO	£0	£0	2 days	£135,000	832t	0	23.84	2010

5.2 Planned / funded projects

Table 5: Planned and funded projects

Project	Lead	Cost			Annual Saving		Pay back (year)	% of Target	Year
		Cap'l	Rev'ue	Res'ce	Fin	CO ₂			
On-Line travel forms	AO	£10,000	£5,000	30 days	£83,949	201t	0.1	5.75	2011
RGU Masterplan Phase 1	BW	£100,000,000	£180,000		£247,384	2825t		80.92	2012
Gray's School Refurbishment		£35,000	£35,000		-£31,641	26t		0.74	2011
Technical Building Separation	DW	£280,000	£280,000		-£276,821	57t		1.64	2011

5.3 Near horizon projects

This section covers projects that are planned and agreed, though not yet timetabled or funded.

Table 6: Near horizon projects

Project	Lead	Cost			Annual Saving		Pay back (year)	% of Target	Year
		Cap'l	Rev'ue	Res'ce	Fin	CO ₂			
Video Conferencing	LM	£20,000	£5,000	30	£83,949	201St	0.2	5.75	2011

5.4 Far horizon projects

These projects are waiting for additional feasibility studies to clarify potential costs, benefits and timescales.

Table 7: Far horizon projects

Project	Lead	Cost			Annual Saving		Pay back	% of Target	Year
		Cap'l	Rev'ue	Res'ce	Fin	CO ₂			
Other waste heat transfer	AO	£500,000	£20,000		£16,000	306t	31.3	8.75	2015
RGU Masterplan Phase 2	BW	£75,000,000	£126,000		£96,849	1735t		39.36	2020
Renewable power generation	AO	0	£50,000		£131,100	1611t	18.6	46.15	2017
Waste heat to pool	AO	£500,000				755t		18	2015

There are a number of appropriate opportunities identified for renewable power generation by the University. These include on-site solar thermal installations, off-site wind turbines, and waste to heat technology. However, the financial justification for these needs to be modelled in detail in order to identify the optimum commercial value and CO₂ minimization from each proposal. External grant funding or preferential tariff arrangements may become key factors in taking many of these potential projects further.

Table 8: Generation tariffs 1 April 2010 – 31 March 2013

Technology	Scale	Tariff level for new installations in period (p/kWh) [NB tariffs will be inflated annually]			Tariff lifetime (years)
		Year 1: 1.04.10- 31.03.11	Year 2: 1.04.11- 31.02.12	Year 3: 1.04.12- 31.03.12	
Anaerobic digestion	≤500kW	11.5	11.5	11.5	20
Anaerobic digestion	>500kW	9	9	9	20
Hydro	≤15 kW	19.9	19.9	19.9	20
Hydro	>15 - 100kW	17.8	17.8	17.8	20
Hydro	>100kW - 2MW	11.0	11.0	11.0	20
Hydro	>2kW - 5MW	4.5	4.5	4.5	20
MicroCHP pilot*	≤2 kW*	10*	10*	10*	10*
PV	≤4 kW (new build)	36.1	36.1	33.0	25
PV	≤4 kW (retrofit)	41.3	41.3	37.8	25
PV	>4-10kW	36.1	36.1	33.0	25
PV	>10 - 100kW	31.4	31.4	28.7	25
PV	>100kW - 5MW	29.3	29.3	26.8	25
PV	Standalone system	29.3	29.3	26.8	25
Wind	≤1.5kW	34.5	34.5	32.6	20
Wind	>1.5 - 15kW	26.7	26.7	25.5	20
Wind	>15 - 100kW	24.1	24.1	23.0	20
Wind	>100 - 500kW	18.8	18.8	18.8	20
Wind	>500kW - 1.5MW	9.4	9.4	9.4	20
Wind	>1.5MW - 5MW	4.5	4.5	4.5	20
Existing microgenerators transferred from the RO		9.0	9.0	9.0	to 2027

Source: Feed-in Tariffs: Government's Response to the Summer 2009 Consultation⁶

5.5 Projected achievement towards target

Accumulation of tables 4, 5, 6 & 7 will give an overview of progress toward target. The projects outlined will start saving CO₂ in the years stated. The following figure shows RGU's progress towards meeting its 42% reduction from its baseline emission by 2020.

⁶ http://www.decc.gov.uk/en/content/cms/consultations/elec_financial/elec_financial.aspx

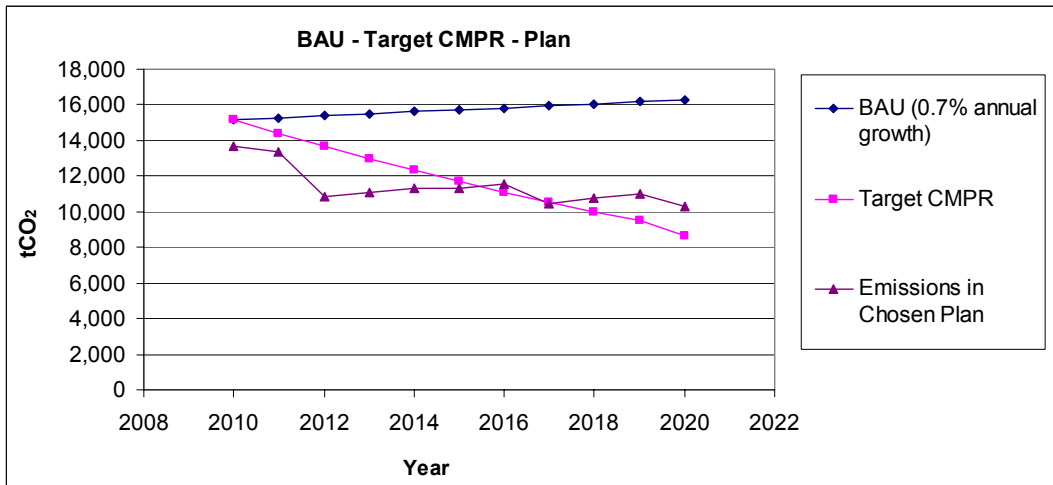


Figure 5: Projection of emission in chosen plan against target

The initial slope of the graph is created by the “Turn IT off” and “Turn it down 3^o” campaigns. Also, the University’s caterers Aramark, are considering ways in which they may be able to contribute to energy reduction measures, particularly in the use of electricity for internal catering activities. The CO₂ savings from the University Masterplan Development Phase 1 project boosts further steep decrease in carbon emission. In this first phase development, two of the University’s poorest energy rated building would be replaced with more energy efficient new buildings.

Thereafter, extra savings are achieved more steadily as a number of smaller projects are implemented. The renewable energy installation provides another steep decrease of emission starting in the year 2017. This takes the projection up to 2020 when Masterplan Development Phase 2 will start to have an effect towards the University carbon reduction.

6 Carbon Management Plan Financing

6.1 Assumptions

The following assumptions were used to calculate annual benefits and savings

- The cost of electricity is assumed to be 6p/kWh (Source: RGU Estates)
- The cost of gas is assumed to be 3p/kWh (Source: RGU Estates)
- The solar thermal device is assumed to generate electricity 5 hours a day during summer months and 3 hours a day during winter months for 60% sunny days annually.⁷

6.2 Benefits / savings – quantified and un-quantified

Quantified benefits:

Table 8 outlines the financial benefit and carbon savings achievable through carrying out the University's current Carbon Management Plan.

Table 8: Cost/Benefits

	2011	2012	2013	2014	2015
Annual cost saving	£203,856	£585,334	£548,503	£513,228	£529,175
Annual CO₂ saving	1930.43	4536.94	4404.79	4276.50	4415.47
% of target achieved	55%	130%	126%	122%	126%

Unquantified benefits:

As well as delivering carbon and financial savings, implementing the Plan will generate additional benefits, which are not financially quantified, including:

- Reduction of our reliance on the finite fossil fuels and ensuring our energy security
- A healthier environment for employees, students, and visitors
- Well founded basics of a systematic approach to understanding the University activities' environmental risks and impacts
- Increased attractiveness of University for prospective students and staff
- Improved utilities consumption data shown in HEFCE Estate Management Statistics
- Improved University's standing in benchmarking exercises such as the People & Planet Green League and the Business in the Community (BITC) Environment Index
- Early preparation for the Carbon Reduction Commitment
- Community leadership
- Delivery of one of the commitments in Scotland's Climate Change Declaration

6.3 Additional resources

The main additional resource, which has already been taken on is the new Energy/Carbon Analyst. Along with this, CUSP will also contribute its expertise towards the overall Carbon Management Program. The following table summarizes the human resources required to deliver individual projects and the overall strategy.

Table 9: Additional resources required

	2010/11	2011/12	2012/13	2013/14
Finance				0.5 FTE
Estates	1.0 FTE	1.0 FTE	1.0 FTE	1.0 FTE
CUSP				0.5 FTE

⁷ Twidell & Weir, "Renewable Energy Resources" Spon, 2000.

6.4 Financial costs and sources of funding

Table 10: Financial commitment required

	2010/11	2011/12	2012/13	2013/14	2014/15
Annual costs:					
Total annual capital cost	£270,531	£0	£450,971	£0	£2,058,624
Total annual revenue cost	£322,058	£495,485	£490,698	£485,957	£500,314
Total costs	£592,589	£495,485	£941,669	£485,957	£2,558,938
Committed funding:					
Committed annual capital	£200	£315,000	£100,000,000	£0	£0
Committed annual revenue	£200	£315,000	£495,200	£495,200	£495,200
Total funded	£400	£630,000	£100,180,000	£495,200	£495,200
Unallocated funding					
Unallocated annual capital					
Unallocated annual revenue					
Total unfunded					

7 Embedding Carbon Management in Robert Gordon University

The sustainability agenda at Robert Gordon University is led by the Sustainability Executive Group (SEG) together with four sub-groups that have been established to address specific aspects related to sustainability within the University:

1. Energy Sustainability Working Group
2. Waste Management Working Group
3. Green Travel Working Group
4. Fair Trade and Procurement Working Group

These groups are populated by a mix of academic and support staff and students. From the outset there has been a high level of commitment shown by the staff involved particularly the leaders of the sub-groups. Following the work of these sub-groups together with the main group a strategy policy has been developed, together with action plans for the sub-groups. These groups will be crucial in the implementation and embedding of the Carbon Management Plan within the University.

7.1 Corporate Strategy – embedding CO₂ saving across the organisation

The Carbon Management Plan will be reviewed and approved by the University's Strategic Planning and Resources Group and Board of Governors. Environmental Sustainability is already detailed in the University's "Clear Future" Strategy Document and in the annual University Implementation Plan. Furthermore specific details on sustainability targets are covered within action plans of the sustainability working groups. The embedding of the carbon management plan within the organisation will be overseen by the Sustainability Executive Group, guided through the work of the respective sub-groups. The Sustainability Executive Group will, informed by the sub-groups and support departments, set appropriate targets for the service areas and ensuring the targets are embedded in the appropriate implementation and action plans.

7.2 Responsibility

A system of carbon targets will be introduced and widely communicated and publicised. Heads of School and Department will be made aware of the carbon impacts of the University that are attributable to the floor area or headcount for which they are responsible and competitive targets will be used to incentivise proactive carbon control by management and staff.

7.3 Data Management

Data recording and management will largely fall to the Estates Dept where this function is presently fulfilled. Steps have been taken in recent months to significantly improve the data recording and the University will shortly move to an AMR system for its electricity meters. The data will be analysed and compared against targets set on a monthly basis. The University has a range of internal staff and student publications and it is expected that these will regularly feature the outputs from the CMP.

7.4 Communication and Training

CUSP is currently working on the communication, training and monitoring of carbon management throughout the University. However, this is an entirely new subject area; making staff and students aware of CO₂ issues is challenging, and there is no existing mechanism to piggy-back it with. The proposed new on-line ABS system will generate data and awareness across the University and the buy-in of Heads of School etc and the student body is critical in embedding the concept.

7.5 Policy Alignment

Sustainability policies are reviewed by the Sustainability Executive Group and reported to the Strategic Planning and Resources group. These policies are developed through the work of SEG sub-groups as detailed above. These include waste management, energy usage, fair trade and procurement and travel. The green travel policy has just been reviewed for implementation in 2010. As detailed above, the University is currently working on an extensive estates master plan project. The environmental aspects of this project are reviewed by the Estates Development Management Group, with appropriate consultation with the Sustainability Executive Group and appropriate sub-groups. The sustainable procurement policy will be reviewed by the fair trade and procurement sub-group together with the finance department by March 2010.

8 Programme Management

In order for the CMP to be successful it will be submitted to the University's most senior executive management group, the Strategic Planning and Resources Group (SPARG) for support and resourcing. Project owners will meet in order to synchronise and optimise carbon-related project activities. There will be a Programme Board (see below) that carries overall responsibility for delivery of the programme and a CMP management team that co-ordinates activities and informs the Board.

8.1 The Carbon Management Programme Board

The CMP Board functions will be carried out by the existing Sustainability Executive Group (SEG) which already consists of the Sponsor, Executive Sponsor and the Project Manager of the CMP together with the Director of Estates. SEG reports to SPARG.

The Project Manager will report on a weekly basis to the Project Sponsor to review progress and to maintain links with the senior management team. The SEG will meet on a monthly basis to formalise any actions requiring executive support and to provide/receive feedback on earlier actions as well as offering new material for consideration at executive/senior level. The CMP project will be a standing item on the SEG agenda and SEG outputs related to CMP will be distributed throughout the CMP team.

8.2 The Carbon Management Programme Team

The team will meet on a monthly basis, chaired by the Project Sponsor. Team members will be required to report on activity, progress, challenges etc in their theme area.

Role in Carbon Management programme	Name and position in the organisation	Contact details
Sponsor – Sets overall targets, monitors progress and removes obstacles	Professor Peter Robertson Vice-Principal and Pro Vice-Chancellor (Research and Commercialisation)	01224 263750 peter.robertson@rgu.ac.uk
Executive Sponsor – negotiates acceptance of the project at executive level	Mrs Pat Briggs Vice-Principal and Pro-Vice Chancellor (Planning and Resources)	01224 262016 p.briggs@rgu.ac.uk
Project Leader – Coordinates and manages the project activities, manages change and communicates technical detail.	Dr Alan Owen Director, CUSP	01224 262360 a.owen@rgu.ac.uk
Project Deputy – assists the project leader in all aspects of project management	Leuserina Garniati Research Assistant, CUSP	01224 262352 l.garniati@rgu.ac.uk
Finance Champion – assists with cost-benefit analysis and 'invest to save' forecasting	Mr Mike McCall Head of Finance	01224 262498 m.mccall@rgu.ac.uk
Team members – provide support for data sourcing at subject area level. Critique the CMP as progress is made and feedback to project lead	Professor David Gray Transport	01224 263146 david.gray@rgu.ac.uk
	Dr Laura Muir Waste Management	01224 26 3800 l.muir@rgu.ac.uk
	Mr Mike Berry Director of Estates	01224 263301 m.berry@rgu.ac.uk
	Bill Somerville Deputy Director of Estates	01224 263392 w.somerville@rgu.ac.uk
	Mr Stephen Keith Senior Procurement Adviser	01224 262059 s.keith@rgu.ac.uk
	Bryan McAlpine Financial Administrator (Estates)	01224 263313 b.mcalpine@rgu.ac.uk
	Jonathan Shackleton (Communications)	01224 262031 j.shackleton@rgu.ac.uk
	John Coulter (IT Services)	01224 262752 j.coulter@rgu.ac.uk
	Student Representative c/o Rachel Watson	01224 262295 union@rguunion.ac.uk

8.3 Succession planning for key roles

Given the long-term strategic nature of carbon management and the value involved, the need for a dedicated Carbon Manager/Project Lead post will be considered. This may be part time, at least initially. It is proposed that CUSP assists with the Carbon Project and that an existing member of staff in the Estates department takes on the lead role. At Sponsor level, it is proposed that the role of project sponsor is built into the job description of the VP for Research & Commercialisation. This will ensure continuity should the position change hands.

8.4 Ongoing stakeholder management

Individual or Group	Influence	Impact	Current Position	Future Position	interest and issues	information needs	Communication route
SPARG	H	M	CH	CH	cost budgets /	Outline understanding of the CM programme Case for Action – costs will continue to rise if we don't take action Programme will be governed to ensure effective use of scarce resources	AO/PR to arrange a briefing to SPARG when appropriate
GOVERNORS	H	L	CH	CH	Reputation Cost Long-term strategy	Outline understanding of the CM programme Case for Action – costs will continue to rise if we don't take action	PR to arrange a briefing to Board of Governors when appropriate
SMG	M	H	F	CH	cost budgets /	Outline understanding of the CM programme Case for Action – costs will continue to rise if we don't take action Programme will be governed to ensure effective use of scarce resources	PR to arrange a briefing when appropriate
STUDENTS	M	H	F	CH		Outline understanding of the CM programme	AO to arrange when SPARG is on board
STAFF	H	H	F	CH	cost budgets /	Outline understanding of the CM programme	AO to arrange when SPARG is on board
Aberdeen City & Shire Councils	M	L	CH	CH			AO to arrange when SPARG is on board

8.5 Project progress review

The cycle of existing and upcoming reporting demands e.g. financial year, People & Planet, CRC etc will themselves require summary reporting at different times of year. From this perspective, and for good strategic control, it is proposed that quarterly reporting may be the best approach

9 Appendix A: Carbon Management –Where are we now?

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

Green- in place

Pink- Minimum requirement, urgent attention needed

Blue – working towards

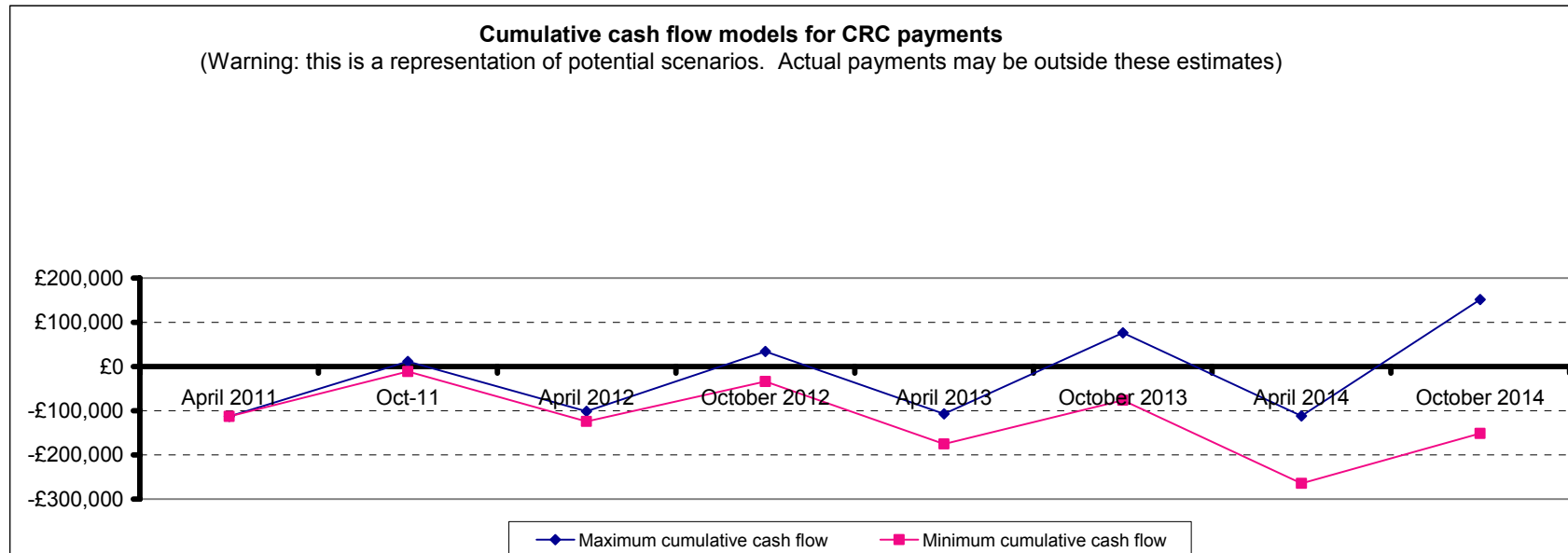
Yellow – Ideal



Variables

2013 carbon price	15	£/tCO2
2014 carbon price	20	£/tCO2

	Variable carbon price							
	April 2011	Oct-11	April 2012	October 2012	April 2013	October 2013	April 2014	October 2014
	Required payment for 2010/11 and forecast emissions for 2011/12	Revenue recycle from April 2011 sale	Required payment for 2012/13 forecast emissions	Revenue recycle from April 2012 sale	Required payment for 2013/14 forecast emissions	Revenue recycle from April 2013 sale	Required payment for 2014/15 forecast emissions	Revenue recycle from April 2014 sale
Top of league table cash flow	-£ 112,953	£124,249	-£ 112,953	£135,544	-£ 141,192	£183,549	-£ 188,255	£263,558
Maximum cumulative cash flow	-£112,953	£11,295	-£101,658	£33,886	-£107,306	£76,243	-£112,012	£151,546
Bottom of league table cash flow	-£ 112,953	£101,658	-£ 112,953	£90,363	-£ 141,192	£98,834	-£ 188,255	£112,953
Minimum cumulative cash flow	-£112,953	-£11,295	-£124,249	-£33,886	-£175,078	-£76,243	-£264,499	-£151,546





Confidential draft