University of Surrey

Carbon Management Plan

2010 - 2020

August 2010

Contents

5.0 Timeline to meet Interim and HEFCE targets

5.1 Programme & contribution to target from RGF & SEELS projects

5.2 Programme & contribution to target from Energy Supply Strategy Projects

5.3 Programme & contribution to target from Building & System Efficiency Projects

5.4 Programme & contribution to target from behavioural change & awareness raising programmes

6) Implementation of Programmes

6.1 Financial Resources

6.2 Other Resources

7) Programme Governance & Reporting

7.1 University Governing Body

7.2 Footprint Report & other CRC reports

7.3 University Annual Report

8) Appendices:

Appendix I RGF project List
Appendix II SEELS Project List
Appendix III Carbon Management Awareness Raising
Appendix IV HEFCE template for Carbon Management Plan

1.0 Introduction

The University has five principle drivers for developing and implementing an effective Carbon Management Plan:

1) To meet the requirements of current legislation, (Carbon Reduction Commitment Energy Efficiency Scheme CRC) targets set by the Government and the funding councils.

2) Undertake a cultural change in our operations that is sustainable and embed within all aspects of our business energy and carbon reduction behaviours and initiatives.

3) To reduce our costs of energy, reduce risks and prepare the University Managing Price Volatility and putting in place robust process for managing the procurement of utilities.

4) To improve the internal environment & comfort for all building occupants and ensure that plant and systems are suitable for current and future needs.

5) Improving the reputation and brand of the University, to prospective students, organisations placing research contracts and our staff, consistent with the University 10:100:10 vision.

2.0 Background – Higher Education Carbon Management Plan & Drivers for Carbon Reduction

2.1 Government National Targets 2020 & 2050

The Climate Change Act 2008 aims to improve carbon management and help the transition towards a low-carbon economy in the UK. It sets the world's first legally binding reduction targets for greenhouse gas emissions of at least 34% by 2020 and at least 80% by 2050, against a 1990 baseline.

2.2 HEFCE Targets

HEFCE published a statement of policy in January 2010 – A Carbon Reduction Target & Strategy for Higher Education in England (January 2010/01).
This document commits the HE sector to play its part in meeting national targets for carbon reduction. The sector has agreed that it should commit to a reduction in scope 1 and 2 emissions of 34% by 2020 and 80% by 2050 against a 1990 baseline.
HEFCE requires institutions to set their own targets for 2020 scope 1 and 2 emissions against a 2005 baseline. This year is being used for reporting against UK targets as the data is considered more robust. This will provide consistency across the sector against which progress can be monitored and reported.
HEFCE had already signalled to institutions a more demanding approach to carbon reduction and the need for carbon plans. In the 2008 and 2009 grant letters the Secretary of State asked HEFCE to establish a link between performance against carbon plans – in effect, carbon reduction – and future capital allowances. This has been achieved by adapting the Capital Investment Framework, now termed CIF2.

The Capital Investment Framework (CIF2) proposes adapting the framework as follows:

- Expanding the metrics to include carbon management

- Amending the strategic questions to include a more specific and demanding requirement in relation to carbon

- Requiring institutions to report on progress in implementing the carbon plans, and on the results achieved

HEFCE is not specifying how carbon management plans should be developed or what they should contain. However, there are a number of key elements that HEFCE requires to be present in an institution's carbon management plan to satisfy the requirements of CIF2 (see appendix IV). CIF2 has now been published with submissions in autumn 2010.

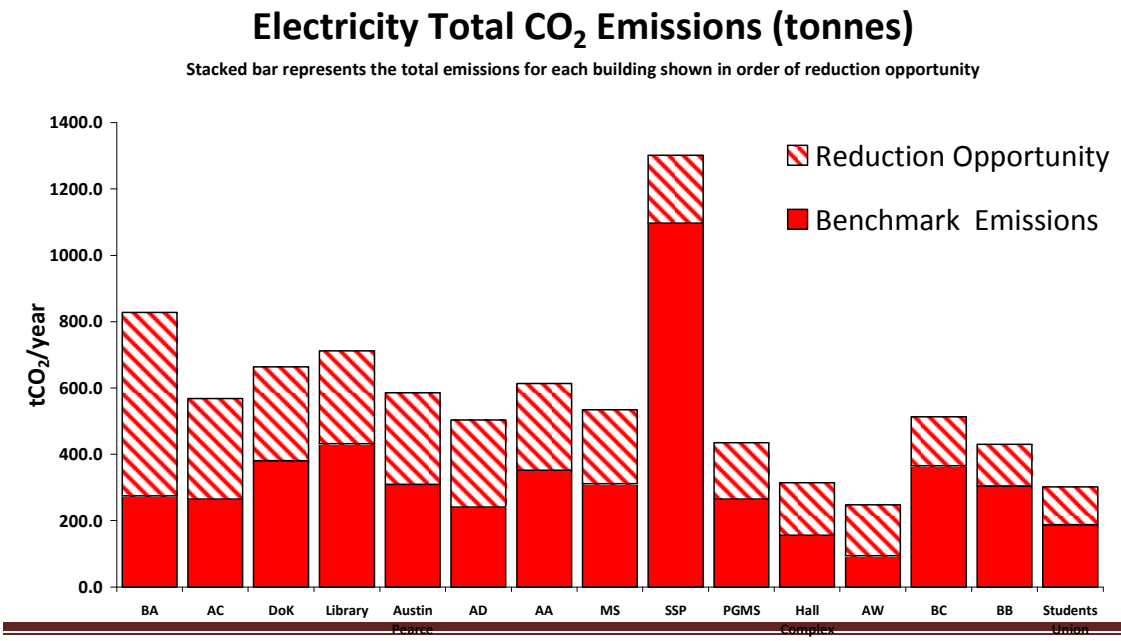
2.3 Legislation – Impact of the Carbon Reduction Commitment (CRC)

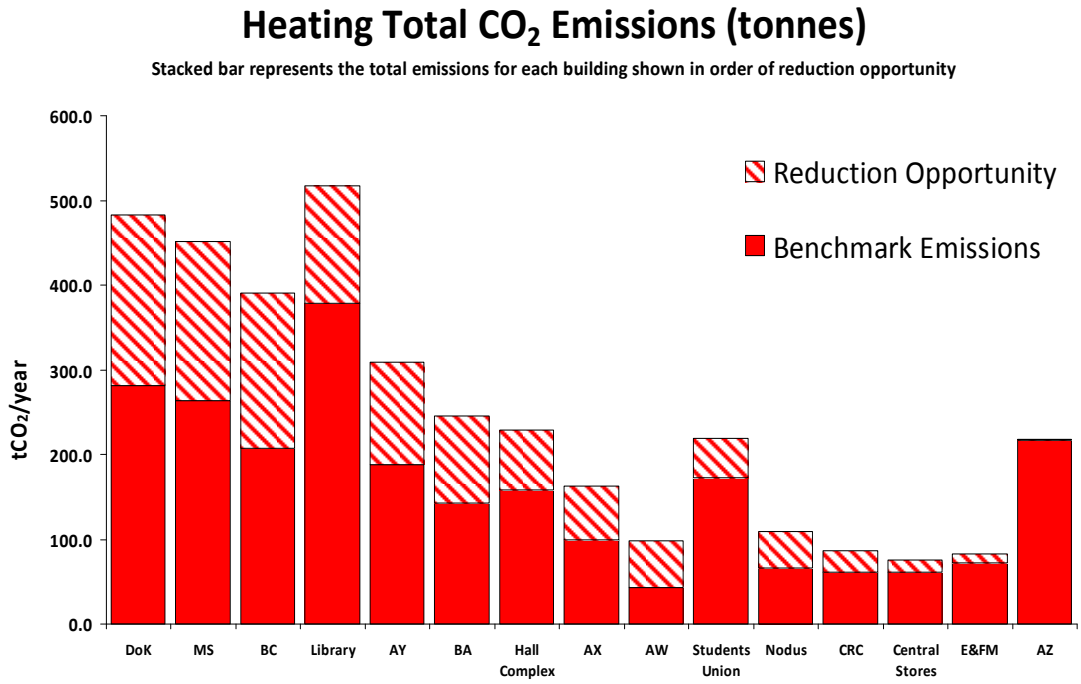
The CRC regulations have been developed by DEFRA & DECC over the last 4 years. The scheme is designed to incentivise better management of energy. The scheme started in April 2010, In this year the University will need to report electricity use and register with the regulator, the Environment Agency. In April 2011,the University will need to purchase allowances for emissions in the period April 2011 to March 2012. Produce a footprint report and annual report, and will be ranked against 5,000 other organisations in a published league table.
The money spent on allowances will be returned in October 2011, with a bonus or penalty. The bonus or penalty will depend on how well the University manages its obligations in the scheme and the performance in the league table.

In the introductory phase the cost of an allowance (1 tonne of CO_2) is fixed at £12/tonne. The cost for the University in April 2011 will be around £300K. The recycling payment with bonus or penalty will be made in October 2011. In the first year of the scheme the University will pay for allowances in the 2010-11 financial year and receive the recycling payment in 2011-12.

2.4 Reduced Consumption, Emission & Cost

The charts below give a high level indication of the scope of savings available at building level. This will be further enhanced by the application of low carbon energy supply infrastructure.





2.5 Reputational Drivers

The University's overall mission is to be top ten in the UK and top 100 in the world over the 10 year period from 2017-2017.
The University considers environmental probity to be a key distinguishing parameter for the higher education sector. The University's customers, students and research funders shall place

3.0 University Carbon Emissions

3.1 Definition of Scope 1, 2 & 3 Emissions

Consultant SQW were commissioned by HEFCE to measure the carbon footprint of the higher education sector in England to provide a better understanding of emissions and establish a baseline against which progress can be measured.
The World Resources Institute (WRI) developed a classification of emission sources around three 'scopes':

Scope 1 refers to direct emissions that occur from sources that are owned or controlled by the organisation, for example emissions from combustion in owned or controlled boilers, furnaces, vehicles.

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

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

3.2 University Carbon Emissions

3.2.1 1990 Baseline

The Government targets set out in section 2.1 relate to reductions against a 1990 level baseline. SQW reviewed energy-related data from the 'Hull Statistics', which primarily cover the institutions that were Universities prior to 1992. Figures for 23 institutions were available for 1990 (the 1990-91 academic year) and a further 19 institutions have provided data for adjacent years (1989, 1992 or 1993). The accuracy of this data cannot be verified.

For Surrey the total carbon emission was 16,349 tonnes CO_2 in the 1990-91 academic year. Our own records for this period are limited and difficult to verify.

3.2.2 2005-06 Baseline

SQW also produced 2005-06 baselines for individual institutions. A key source of data for the 2005 baselines has been EMS which provides figures on a wide range of indicators including energy consumption and emissions by different categories. Data for 2005-06, referred to hereafter as '2005', and adjacent years are available by way of institutional returns. For 2005, the energy related indicators are **88% complete**. The main indicators used from EMS are:

D38A C1 Energy consumption for the whole estate (including residences) with the following sub-categories in kWh:

- Oil
- Gas
- Electricity
- Coal
- D4 Total FTE students
- D5 Total FTE staff
- D1 Total HEI income.

For Surrey the absolute 2005-06 baseline as derived from the EMS data is **23,580 tonnes CO_2**

SQW also produced relative carbon emissions per total FTE of students and staff combined, and for £ of total income in line with CIF2 requirements. These were calculated for 2005 only as there were insufficient data to do the same for 1990. For Surrey the relative emissions are:

- **1,829 kg CO_2 / total staff & student FTE**
- **0.1389 kg CO_2 / £ income**

(above figures based on 12,891 staff & student FTE and income of £169,775,000)

3.2.3 Current Emissions (2009-10)

In 2007, the University developed a carbon management plan under the Carbon Trust's Higher Education Carbon Management programme. The implementation plan set out a strategy for reducing the University's carbon emissions by 25% in the ten year period to 2017.
Some progress has been made towards this target, incrementally at 2.5% per annum. However, to achieve the proposed Government/HEFCE targets for 2020 and 2050 the existing targets will need to be substantially improved / increased. The table below illustrates the impact of the HEFCE strategy, which is based on a 2005-06 baseline.

Year	University CO_2 Emission (tCO_2)	HEFCE Target (from 2005-06)	Resulting Emission (tCO_2)	Effective reduction from current emission level
2005-06	24,385			
2006-07				
2007-08				
2008-09				
2009-10	23,952			
2010-11				
2011-12				
2012-13		10%	21,947	8.4%
2013-14				
2014-15				
2015-16		25%	18,289	23.6%
2016-17				
2017-18		30%	17,070	28.7%
2018-19				
2019-20				
2020-21		34%	16,094	32.8%

3.2.4 University target for 2020

Over the ten year period from 2010 to 2020, the University must reduce it's scope 1 & 2 CO_2 emission by 33% or 8,291 tonnes to 16,094 tonnes. An average annual reduction of 3.3%.

It is proposed that the University adopt this revised target, which is in-line with the HEFCE strategy. Any future development will be treated separately. The current HEFCE strategy does not include a growth metric and to aid clarity any emissions associated with new space will be monitored separately. This is necessary, otherwise the implication is that all new space is carbon neutral.

HEFCE have also committed to undertake work to assess what is required in order to monitor and report scope 3 emissions, including the measurement of a baseline of carbon emissions from procurement by December 2012 and setting targets for scope 3 emissions by December 2013.

HEFCE also believe it is important to have milestones in order to monitor progress against the sector level target. The milestones have been set in line with the five-year national carbon budgets and are a 1% increase by 2012 and 18% reduction by 2017 against 1990 levels. These take account of sector growth since 1990 and are equivalent to a reduction of 20% by 2012 and 35% by 2017 with a target of 48% by 2020 against a 2005 baseline.
The baseline will also include transport emissions (estimated at around 1,250 tonnes in 2007) and subsequently audited in 2010 at 1,413 tonnes
Eventually a methodology for the inclusion of emissions associated with procurement will also need to factored into the University's overall footprint.

4.0 Carbon Reduction Opportunities

Key areas where carbon reductions could occur

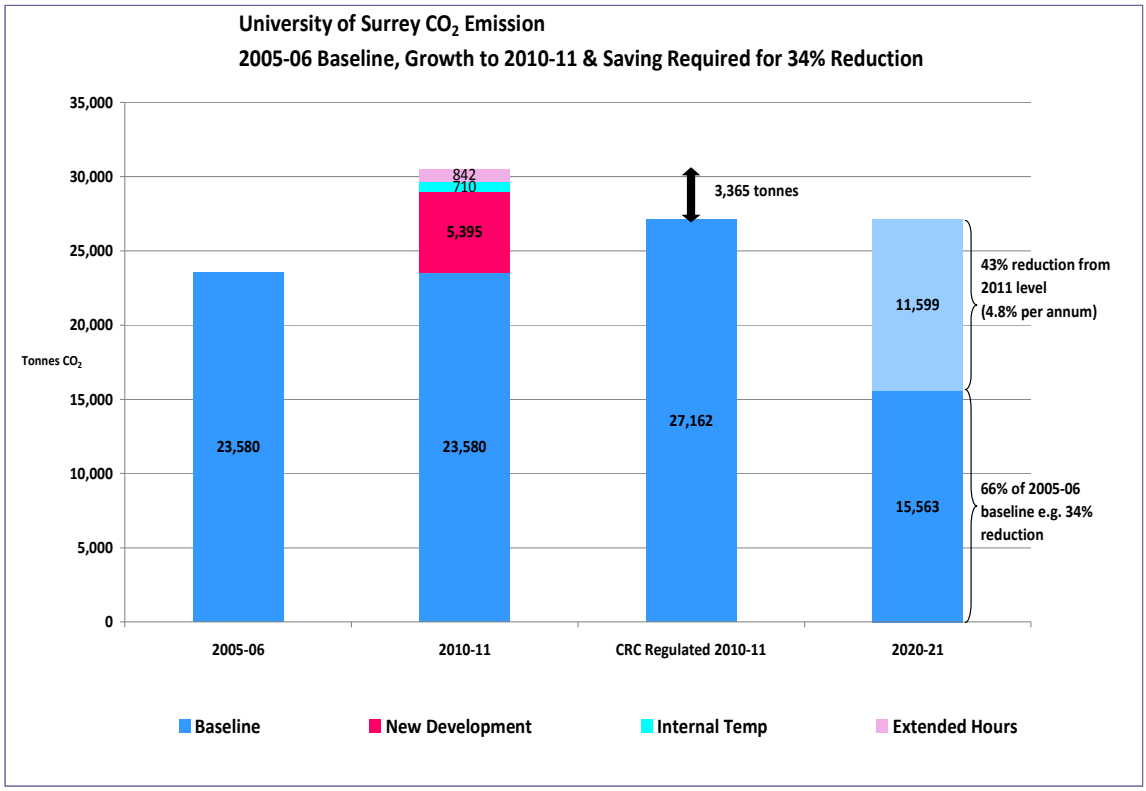
The SQW report indicates the 6 most viable interventions in terms of scale of impact and cost effectiveness:

- Lights and electric appliances (including ICT)
- Building energy & space management
- Building fabric upgrade
- Efficient energy supply (CHP, tri-generation, district heating)
- Renewable energy
- Behavioural change and new ways of working

Partnership Working – Institutions should seek opportunities to work effectively in partnership to enable solutions that share learning and would not have been possible if working alone. For example, projects such as CHP & district heating. Carbon Management plans should be developed in consultation with staff & students.

4.1 Progress towards HECM Target (25% by 2017)

The programme for significant reduction projects will dictate the likelihood of achieving phased target reductions towards 2020.
Our 2005-06 Baseline was 23,580 tonnes. 34% reduction from this level implies annual emissions of 15,563 tonnes. This is equivalent to an annual reduction of 11,599 tonnes, from our CRC regulated return for 2010-11 of 27,162 tonnes
Therefore a reduction of 11,599 tonnes over 9 year period from 2011 to 2020 equates to 4.7% per annum.
The chart below illustrates the figures quoted above:



4.2 Quantified carbon reduction potential from Revolving Green Fund (RGF) projects

The Revolving Green Fund (RGF) is a partnership between HEFCE and Salix Finance. The fund provides recoverable grants to higher education institutions for projects that reduce their greenhouse gas emissions. Institutions are required to contribute a minimum of 25% of the value of their fund and repay the grant through the savings made. The Institutional Small Projects (ISP) fund uses Salix's traditional model where institutions receive ring–fenced money from the fund to be spent on carbon-saving projects. A key principal is that financial savings from funded projects are repaid into the ring-fenced fund held by the institution for re-investment in further projects. Once the original project investment is repaid to the fund, the institution is free to keep ongoing savings. The institution does not have to to repay the money loaned while it continues to re-invest savings in eligible projects. Projects are generally compliant where the capital investment is repaid within 5 years at an abated cost of carbon of less than £100/tonne CO_2

Surrey has an ISP fund of **£721,644** covering 13 projects. The savings generated through these carbon reduction projects are:

- **£131,497 per annum**
- **826.4 tonnes CO_2 per annum**

The initial project stream will contribute around **10%** towards our reduction target of 8,291 tonnes CO_2.
A schedule of all ISP RGF projects is included in appendix I

4.3 Quantified carbon reduction potential from Salix Energy Efficiency Loan (SEELS) Projects

The Salix Energy Efficiency Loan Schemes (SEELS) provides funding for carbon reduction projects on the basis of a 4 year interest free loan. Each project must satisfy the RGF criteria of a simple 5 year payback and an abated cost of carbon at £100/tonne CO_2
The University submitted an application for around 70 projects and received a provisional loan agreement for all projects with a total capital value of **£1,195,443**.

The savings generated through these projects are:

- **£255,468 per annum**
- **1,832.2 tonnes CO_2 per annum**

The SEELS projects will contribute around **22%** towards our reduction target of 8,291 tonnes CO_2.
A schedule of all SEELS projects is included in appendix II
The Combination of RGF & SEELS projects should account for just under one third of our reduction target.

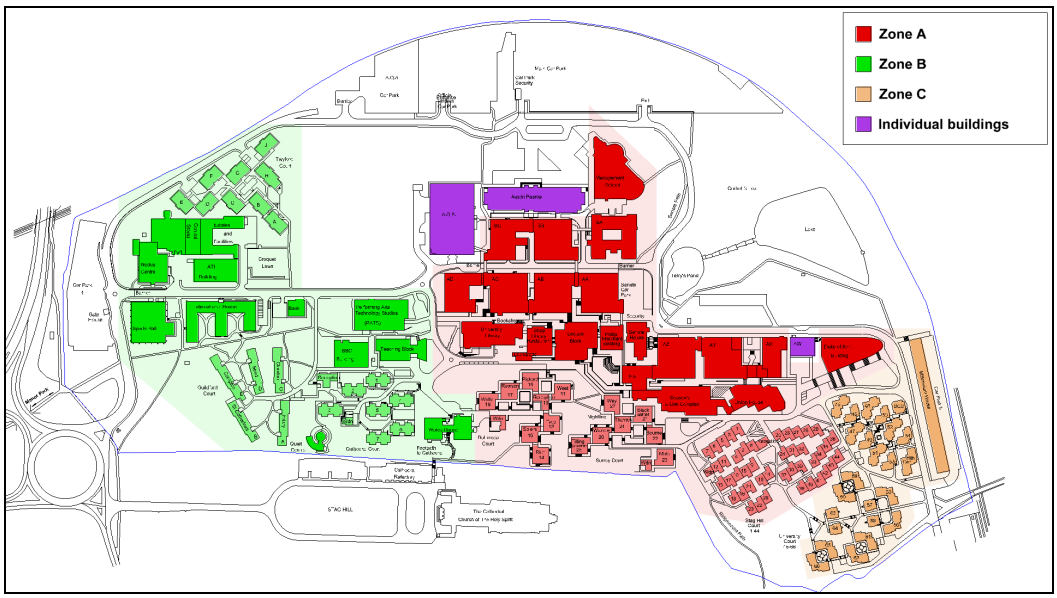
4.4 Quantified carbon reduction potential from Energy Supply Strategy

Following further discussion with AECOM, the Energy Supply Strategy engineering consultant, it is proposed to develop detailed feasibility studies for 3 main schemes, including:

i) Wind Generation Scheme at Manor Park
ii) Biomass CHP/Heat network for the West End of the Stag Hill Campus (Zone B)
iii) Biomass Heat network for the Manor Park Campus

We do not intend to develop schemes for a biomass heat network for zone C (University Court and Millennium House) at this stage. The practical issues of replacing many individual flat boilers and the long term lease arrangements for Millennium House will significantly impact the viability of this scheme. In addition, converting the existing CHP/Stag Hill heat network to biomass is unlikely to be viable in the short term, mainly linked to fuel storage and space for biomass CHP and current constraints.

We are currently preparing an invitation for a fee tender to consulting engineers for the three schemes above, this will help inform both the project scope and budget. Subject to project value, It is likely that we will need to obtain competitive fee proposals.



The key conclusions & recommendations of the study are summarised below

Summary of Conclusions & Recommendations

The key variables that will affect the carbon emissions associated with buildings across the site include:

- Improved space utilisation
- Behavioural change by students and staff
- Improved energy efficiency of existing buildings
- Adoption of 'energy networks' (e.g. district heating)
- Adoption of low and zero carbon energy systems including micro-generation and off-site energy generation.

The preferred strategy to meet the HEFCE targets to 2020 is:

- Implement a behavioural change programme for staff and students
- Improve the energy efficiency of existing buildings through improved insulation and reduced air leakage
- **Develop a biomass CHP heat network that feeds all buildings in Zone B by 2015**
- Develop a biomass heat network that feeds all buildings in zone C by 2017
- **Develop a biomass heat network on the Manor Park residential site by 2019**

- Upgrade the existing gas CHP heat network to biomass CHP by 2020
- **Install 4MW of wind turbines by 2017**

Action Plan

- Follow up to recommendations relating to potential energy efficiency improvements including review of other buildings within the campus, development of a programme of works and assessment of capital cost and grant funding opportunities.
- Integrate the findings of this study into a Carbon Management Plan. The plan should be signed off by the University's governing body (in line with the requirements of the HEFCE Capital Investment Framework Consultation, Dec 2009)
- It is recommended that pressure testing is carried out on select buildings and building zones to identify areas of high air leakage. This, coupled with the use of thermal imaging equipment, would allow for an effective approach to fabric improvements.
- Undertake further detailed review of heat network opportunities including connection potential to existing buildings.
- Develop initial cost plan for proposed options and review potential grant funding options including HEFCE/Salix 'Transformational' and 'ISP' grants
- Undertake further evaluation of wind generation options including wind speed monitoring, connection costs, access constraints and discussion with 3rd parties regarding Merchant Wind opportunities (e.g. through Ecotricity)
- Review of existing electrical infrastructure capacity and resilience including impact of future distributed energy generation (e.g. CHP, Wind) on network capacity and upgrade.
- Develop an 'emissions inventory' identifying carbon emissions for each building / group of buildings within the University's ownership based on sub meter readings. Sub meters should be installed for monitoring electrical, heat and cooling demands.
- Identify specific reduction targets for each building based on the opportunities identified from energy efficiency upgrades and connection to low carbon / renewable infrastructure.
- Identify and engage with key stakeholders at the university who have a direct impact upon campus energy use. Undertake a review of energy reduction behavioural opportunities and implement a behavioural change programme.
- Investigate becoming certified against the Carbon Trust Standard as a way to manage the measurement, management and reduction of carbon in support of the University's CRC requirements. Assign responsibility for this process and appoint a Carbon Trust accredited consultancy to assist with certification. Engage with the Carbon Trust to investigate the carbon management services available to the university
- Investigate the potential for energy saving opportunities from the Leadership, Governance and Management Fund (LGM)

- Due to the changing nature of carbon emissions targets both at national level and through bodies such as HEFCE, the University should consider undertaking periodic reviews of their carbon reduction targets and the associated energy strategies.

4.4.1 Biomass Heat Network at Manor Park

AECOM have been commissioned to develop an Energy Supply Strategy for Manor Park.
The option study will consider fuel substitution for existing boilers serving residential and non residential accommodation. In addition, on–site power and heat generation, Combined Heat & Power (CHP) shall be considered either fuelled with natural gas or using of low carbon fuel, principally Biomass woodchip.

4.4.2 Biomass CHP/Heat Network at Stag Hill (West Zone)

A brief has been developed to engage a consultant on the review of the Stag Hill campus Similar to the Manor Park exercise this will review the opportunity to expand the district heating network and replace the ageing gas fired CHP plant. This will also present the opportunity to introduce low carbon fuel for both power and heat generation.

4.4.3 Wind Generation Project at Blackwell Farm

The University has previously conducted a feasibility study for Wind Power at Blackwell Farm. This study was undertaken by Partners for Renewables (PFR) part of Carbon Trust Enterprises Ltd (CTEL). The study concluded to develop a wind scheme of 2 and 6 turbines (between 2 to 2.5MW capacity per machine).
The University has developed this review further with engineering and planning consultant input. This project will introduce significant environmental issues and will be reviewed again prior to commissioning a detailed Environmental Impact Assessment (EIA)

4.4.4 Building & System Efficiency Improvements

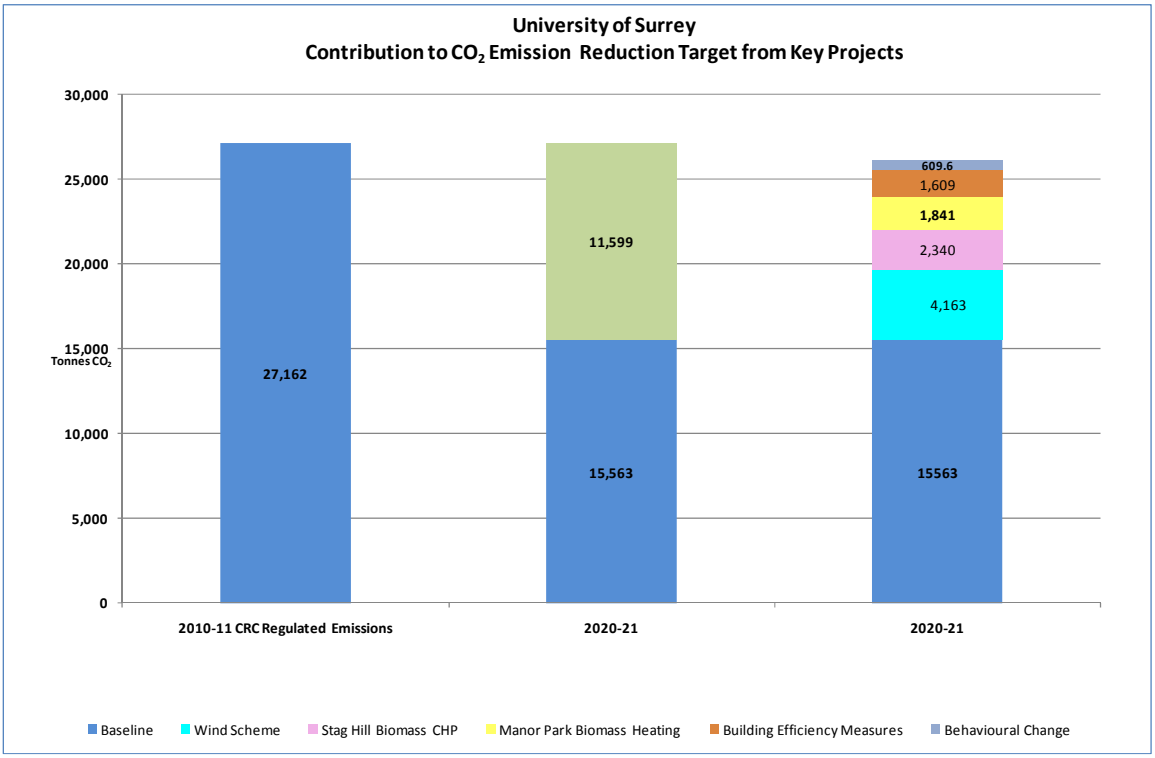
The charts below provide a visual indication of the opportunity at Stag Hill. The principal / philosophy of 'continuous commissioning' will be applied to all major buildings. This approach identifies the

4.5 Quantified carbon reduction potential from behavioural change & awareness raising programmes

Stakeholder Management

The University has defined Key Stakeholders as those individuals in the organisation who can influence and motivate staff & students within their respective area of responsibility to ensure the programme objectives are successfully delivered. They are generally senior members of staff responsible for significant teams and budgets, but may also be individuals with specialist knowledge. The support and commitment of the key stakeholders is critical to the success of the programme. The members of the project core team are key stakeholders, with specific responsibility for delivery of the programme, including:

- Provision of data and expertise relating to sources of emissions for monitoring progress in future years.
- Identification of emissions reduction opportunities including project life cycle assessments and conformity with University financial procedures.
- Contributing to the development of University policy for energy, transport, waste and procurement.
- Communication strategy for Carbon Management, including evaluation of behavioural change.
- The degree to which the University Carbon Management Strategy is integrated within the University core activities of teaching and research



Purpose of the Communication Strategy

The communication strategy is key to engaging all staff and students in the programme and maintaining the momentum into the future. It is vital that all stakeholders understand the need to improve our carbon management and how critical this will be for the future of the University. Staff and students must be given a clear signal from the senior management team that the University is committed to this issue for the long term and must also understand their personal responsibility.
This section of the plan builds upon the stakeholder analysis carried out as part of the initial project plan. The channel audit conducted when the CM plan was written examined existing communication channels for their effectiveness and identified potential new channels. The communication channel audit is included as Appendix VI

Strategic Objectives of the Communication Strategy

The Strategic objectives of Carbon Management are:

- To reduce the consumption of utilities
- To reduce the environmental impact of emissions associated with the consumption of fossil fuels and waste production
- To reduce the costs associated with the procurement of utilities and disposal of waste
- To understand, and quantify the potential to reduce consumption and waste
- To develop a prioritised list of investment opportunities to deliver the savings
- To promote the University internally and externally as an organisation that cares about these issues
- To demonstrate to staff, students and the wider community that the University has in place a progressive and comprehensive programme to manage its impact upon the environment

- To integrate the objectives of carbon management into the procurement and development of new buildings and refurbishment projects
- To embed the principles of carbon management into the culture of the University

To assist in achieving these, the objectives of the Communication Strategy are:

- Establish a clear shared understanding of the Programme's vision and goals
- Generate enthusiasm for carbon management and therefore help the programme secure the necessary resources
- Keep the programme in touch with changing academic, estates, student and other needs
- Enable early recognition of risks and issues so that the programme plans can be adapted where appropriate
- Ensure accurate information and guidance are provided at the right time
- Ensure that decisions are based on accurate information
- Improve readiness for change amongst staff that may be impacted by the carbon management programme, through changes to working practices

Approach to Stakeholder Communication

- Communication will be face to face where possible, particularly for critical messages and where stakeholders are highly impacted or where their seniority makes their involvement critical. Project leaders and other core team members to work closely with the project co-sponsors to make this happen following the holiday period and at the start of next semester.
- The programme will use existing communication channels where possible, but will establish new, specific channels where necessary. Feedback and input from marketing will be important to identify effective channels, a good example is the attachment to payslips for staff, guaranteeing each member of staff receives the communication (12 opportunities each year)
- Feedback mechanisms will be incorporated into all communication to enable the programme to evaluate the success of the communication and understand stakeholder response.

Challenges

- Achieving and maintaining visibility of the programme with the imminent restructuring of the University
- Development of suitable copy in time for written articles for all communication channels
- Establishment of an appropriate budget to fund communication activities
- Availability of key marketing and communication staff to adequately resource the communication plan

Communications Plan

The Communications plan is shown in Appendix VII. It provides a summary of the proposed communications actions for each stakeholder group, Identifying timescales and individuals responsible for specific actions.

5.0 Timeline to meet interim and 2020 targets

5.1 Programme & contribution to target from RGF & SEELS

The main initiatives to reduce carbon have been funded through the Revolving Green Fund (RGF). The RGF is a partnership between HEFCE and Salix Finance and the Salix Energy Efficiency Loan (SEELS) Projects. These funds provided £721,644 covering 13 projects and £1,195,443. covering 70 projects respectively these are recoverable loans which have to be paid back over approx 5 years. The salix savings generated through these carbon reduction projects are, £131,497 per annum / 826.4 tonnes CO_2 per annum and the SEELS projects are projected to deliver £255,468 per annum / 1,832.2 tonnes CO_2 per annum. The Combination of RGF & SEELS initiatives should account for just under one third of our reduction target 2,658 tonnes CO_2 of 8,291 tonnes CO_2.

Energy Supply Strategy

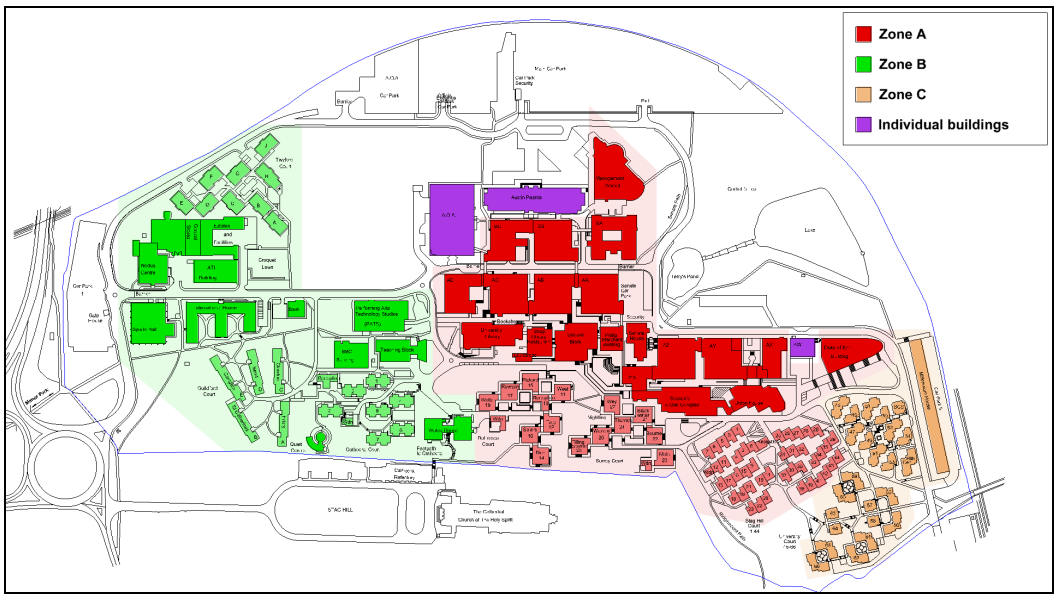
5.2 Programme & contribution to target from Energy Supply Strategy Projects

The University Energy Supply Strategy, proposes to develop 3 main capital schemes, including:

i) Wind Generation Scheme at Manor Park/Blackwell Farm.
ii) Biomass CHP/Heat network for the West End of the Stag Hill Campus (Zone B)
iii) Biomass Heat network for the Manor Park Campus
iv) Continuation of minor improvement schemes
v) Cultural change and ownership initiatives

Converting the existing CHP/Stag Hill heat network to biomass is unlikely to be viable in the short term, mainly due to to fuel storage and space for biomass CHP and current constraints.

We are currently preparing an invitation for a fee tender to consulting engineers for the three schemes above (4 i to 4 iii), this will help inform both the project scope and budget.



Wind Generation Project at Blackwell Farm

The University has previously conducted a feasibility study for Wind Power at Blackwell Farm. The proposal is to develop further the installation of 2 x 2MW wind turbines at Blackwell Farm and informal meetings with the local planners took place in September.

The potential savings generated by the wind scheme are:

- £925,065 per annum (including income from Feed in Tarrifs)
- 4,162.8 tonnes CO_2 per annum

The wind scheme will contribute around 50% towards our reduction target of 8,291 tonnes CO_2. The two Biomass schemes are being considered in detail to assess viability, access and long term sustainability. A series of projects are embedded within the Carbon Management plan which include Building & System Efficiency Improvements and in particular behavioural change & awareness raising Programmes.

The support and commitment of the key stakeholders is critical to the success of the programme. The members of the project core team are key stakeholders, with specific responsibility for delivery of the programme, including:

- Provision of data and expertise relating to sources of emissions for monitoring progress in future years.
- Identification of emissions reduction opportunities including project life cycle assessments and conformity with University financial procedures.
- Contributing to the development of University policy for energy, transport, waste and procurement.
- Communication strategy for Carbon Management, including evaluation of behavioural change.
- The degree to which the University Carbon Management Strategy is integrated within the University core activities of teaching and research

Summary of carbon reduction projects & contribution to target

The table below illustrates the possible contribution to the University target reduction in CO_2 emission (target reduction 8,291 tonnes CO_2) from each of the key projects,

Project	Annual Saving Tonnes CO_2	% of Target	Annual Cost Saving	Capital Cost £1,000's	Simple Payback
RGF Projects	826.4	9.9%	£131,497	£721.6	5.4
SEELS Projects	1,833.2	22.1%	£255,468	£1,195.4	4.7
Wind Scheme	4,162.8	50.2%	£925,065	£6,000	6.5
Biomass Network Stag Hill	2,340.1	28.2%	£468,020	£3,559	5.0
Biomass Network M Park	1,804.5	21.7%	£584,875	£2,339.5	4.0
Building Eff Improvements	1,609.4	19.4%	£531,600	£7,974	15.0
Behavioural Change	609.6	7.4%	£102,500	£240	2.4
Totals	**13,186**	**159%**	**£2,999,025**	**£22,030**	**7.4**

5.3 Programme & contribution to target from Building & System Efficiency Projects

The Building and system efficiency projects have started. Four key buildings have been audited and the potential savings are above the original estimates contained in the AECOM. The University will adopt the precautionary principle and retain the original estimates until the corrective work on these four buildings has been completed.

5.4 Programme & contribution to target from Behavioural Change & Awareness raising Programmes

The staff and student behavioural change and awareness campaigns to date have largely been informational. With the University's metering system now providing half hourly data for all utilities, we can develop more inter-active campaigns including the student inter-court competitions and faculty inter-department competitions.
For students, the timing of such programmes is critical to the academic year. There is a very short window of opportunity to influence behaviour from the start of the year in October to the end of the summer semester in June (9 months maximum). It is imperative that all programmes are complete and ready for implementation at the start of the academic year.

6.0 Implementation of Programmes

6.1 Financial Resources

The overall programme will require funding of around £22M. The recycling
Carbon management is a key strategic issue, so it is considered vital that governors should be informed and involved in decision-making on the institutions approach to reducing its emissions. HEFCE require the carbon management plan to be signed off by the University governing body.

The University has integrated sustainability and Carbon Management into the Capital and Long Term Maintenance (LTM) programmes, whilst maintaining a separate auditable trail for identification of specific emission reduction projects and the beneficial impact upon revenue costs. The aim shall be to maintain transparency and re-allocation of savings to fund further carbon reduction projects.

6.2 Other Resources

There are many separate projects and activities under the plan, these are being managed by the University Sustainability and Environmental Manager. Existing resources are being used as far as is possible but further resources will be required to support cultural change initiatives. The element of cultural change will be ongoing and will require continual engagement. This will ultimately be self funding through lower energy expenditure.

7.0 Programme Governance & Reporting

7.1 University Governing Body

The Committee of University Chairs' 'Guide for Members of Higher Education Governing Bodies in the UK' (HEFCE 2009/14) states that: 'The governing body is responsible for oversight of the

strategic management of the institution's land and buildings with the aim of providing an environment that will facilitate high-quality teaching and learning and research'. Carbon management is a key strategic issue, so it is considered vital for governors who should be informed and involved in decision-making on the institutions approach to reducing its emissions.
HEFCE require the carbon management plan to be signed off by the University governing body.

The University Corporate Services Director Greg Melly shall direct the programme and determine the strategy for financing projects and monitoring and reporting progress towards the stated target reduction in emissions.
The University will integrate Carbon Management into the Capital and Long Term Maintenance (LTM) programmes, whilst maintaining a separate auditable trail for identification of specific emission reduction projects and the beneficial impact upon revenue costs. The aim shall be to maintain transparency and re-allocation of savings to fund further carbon reduction projects.

The Corporate Services Director is chairman of the Estates Committee and periodic reports shall be made through this group to the Executive Board. When necessary, specific investment decisions shall be referred to the University Finance Committee and Resources Management Group (RMG).

7.2 Carbon Footprint & other CRC Reports

The University has registered for the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. The CRC is a cap & trade scheme targeting carbon emissions from high energy users in the UK. The scheme requires several periodic reports including:

- An organisation level footprint report
- Building footprint reports
- Evidence Pack
- An Annual Report

The CRC reports shall supplement the periodic carbon management plan reports and the annual report

7.3 Progress Reports & Annual Report

The University will receive quarterly reports on progress with the plan. The University Executive Board & Council shall receive an annual report. The annual report shall be published with the University Annual Report and be publicly available.

8.0 **Appendices**:

Appendix I	RGF Project List
Appendix II	SEELS Project List
Appendix III	Carbon Management Awareness Campaign
Appendix IV	HEFCE template for Carbon Management Plan

Appendix I RGF Project List

Salix Finance:
Project Compliance Tool:

Example Project Start Date	Site	Site Life (Yrs)	Description	Cost	Fuel Type	p/KWH	Technology Type	kWhs pa	Fin Savings	PBP	kg/kWh	tCO2 pa	PF	tCO2 LT	£/tCO2 LT	Compliant
Nov-08	*Civic Centre*	*30*	*Cavity Wall Insulation*	*£50,000*	*Gas*	*3.25*	*Cavity wall insulation*	*396,000*	*£6,660*	*4.50*	*0.19*	*54.76*	*30.00*	*1,642.80*	*18.26*	*Compliant*

ClientProjects Start Date	Site	Site Life (Yrs)	Description	Cost	Fuel Type	p/KWH	Technology Type	kWhs pa	Fin Savings	PBP	kg/kWh	tCO2 pa	PF	tCO2 LT	£/tCO2 LT	Compliant
12/01/2009	Senate House	60	Heating Distribution Pumps & Controls	£42,347	Gas	3.25	Heating - distribution improvements	311,376	£10,139	4.18	0.19	57.72	18.00	1,038.88	40.76	Compliant
12/01/2009	Philip Marchant	60	Heating Distribution Pumps & Controls	£22,674	Gas	3.25	Heating - distribution improvements	167,376	£5,453	4.15	0.19	31.08	18.00	559.36	40.54	Compliant
02/06/2009	Wates House	60	Condensing boiler installation & HWS heating plan	£49,403	Gas	3.25	Boilers - replacement condensing	333,336	£10,833	4.56	0.19	61.67	16.70	1,029.84	47.98	Compliant
03/03/2009	Seasons & Oaks Suite	60	HWS PHE & Controls	£22,471	Gas	3.25	Hot Water - distribution improvements	144,104	£4,683	4.80	0.19	26.66	18.00	479.87	46.83	Compliant
03/03/2009	ning Arts Technology Studios	60	Condensing boiler installation & HWS heating plan	£23,807	Gas	3.25	Boilers - replacement condensing	147,384	£4,790	4.97	0.19	27.27	16.70	455.34	52.28	Compliant
02/04/2009	ning Arts Technology Studios	60	Control system upgrade from Honeywell to Trenc	£27,534	Gas	7.50	BEMS - bureau remotely managed	165,807	£12,436	2.21	0.19	30.67	9.00	276.07	99.74	Compliant
27/04/2009	Central Boilerhouse	60	e belt driven pumps with DD VSD primary & zone	£116,735	Gas	5.50	Variable speed drives	435,400	£23,947	4.87	0.19	80.55	15.84	1,275.90	91.49	Compliant
10/02/2009	Stag Hill Campus	60	n of pipework and ductwork in plantrooms & servi	£35,000	Gas	3.25	Heating pipework insulation (internal)	305,450	£9,927	3.53	0.19	56.51	22.50	1,271.44	27.53	Compliant
04/05/2009	Stag Hill Campus	60	Replace T12 switch start luminaires with HF T5	£23,500	Electricity	10.50	T5 lighting including changing the fitting	51,250	£5,381	4.37	0.54	27.52	20.00	550.43	42.69	Compliant
23/06/2009	Stag Hill Library	60	ade lighting and controls in Library & Mullens buil	£35,549	Electricity	10.50	T5 lighting including changing the fitting	83,025	£8,718	4.08	0.54	44.58	20.00	891.69	39.87	Compliant
17/08/2009	Stag Hill Buildings AA, AB & A	60	g system enhancements for thermal storage & free	£102,460	Electricity	10.50	Free cooling	213,840	£22,453	4.56	0.54	114.83	60.00	6,889.92	14.87	Compliant
22/06/2009	Building BB	60	Heating non storage calorifier and controls	£52,761	Gas	3.25	Heating - distribution improvements	363,916	£11,827	4.46	0.19	67.32	18.00	1,211.84	43.54	Compliant

Definitions:

Fin Savings	Financial Savings
tCO2 pa	Tonnes CO2 saving per annum
PF	Persistence factor
tCO2 LT	Tonnes CO2 savings life time
£/tCO2 LT	Pounds per tone CO2 saving life time

Appendix II SEELS Project List (part)

Organisation:	University of Surrey	**Salix Energy Efficiency Loan Scheme**		Version: v 22
Post code:	GU2 7XH	**Project Compliance Tool**		
Submission Date:	21/12/2009	It is in your interest to ensure that all inputs are as accurate as possible and projects are compliant with all Scheme criteria.		

Example Project

Start Date	Completion Date	Site	Site Life (Years)	Description	Cost	Energy Type	p/kWh	Technology Type	Annual energy	Financial Savings	Payback	kg/kWh	tCO2 pa	PF	tCO2 LT	£/tCO2 LT	Compliancy Test
Jun-09	*Sep-09*	*Civic Centre*	*20*	*Cavity Wall Insulation*	*£20,000*	*Gas*	*2.25*	*Cavity wall insulation*	*296,000*	*£6,660*	*4.50*	*0.19*	*54.76*	*60.00*	*3,286*	[illegible]	*Compliant*

Projects

Start Date	Completion Date	Site	Site Life (Years)	Description	Cost	Energy Type	p/kWh	Technology Type	Annual energy	Financial Savings	Payback	kg/kWh	tCO2 pa	PF	tCO2 LT	£/tCO2 LT	Compliancy Test
28/06/2010	17/09/2010	Hazel Farm (11 houses)	20	Roof Insulation	£11,116	Gas	2.25	Loft insulation	99,880	£2,247	4.95	0.19	18.48	27.00	499	£22.28	Compliant
28/06/2010	17/09/2010	Hazel Farm (11 houses)	20	KUB Lighting	£29,469	Electricity	8.90	T5 lighting including changing the fitting	67,870	£6,040	4.88	0.54	36.45	20.00	729	£40.43	Compliant
28/06/2010	17/09/2010	Hazel Farm (11 houses)	20	Bedroom Lighting	£16,479	Electricity	8.90	T5 lighting including changing the fitting	39,270	£3,495	4.72	0.54	21.09	20.00	422	£39.07	Compliant
28/06/2010	17/09/2010	Hazel Farm (11 houses)	20	Circulation Space Lighting	£19,129	Electricity	8.90	T5 lighting including changing the fitting	43,780	£3,896	4.91	0.54	23.51	20.00	470	£40.68	Compliant
28/06/2010	17/09/2010	Hazel Farm (11 houses)	20	HWS Flow restrictors	£4,653	Gas	2.25	Hot Water - distribution improvements	42,666	£960	4.85	0.19	7.89	18.00	142	£32.75	Compliant
28/06/2010	17/09/2010	Stag Hill Court (5 houses)	60	KUB Lighting	£13,513	Electricity	7.80	T5 lighting including changing the fitting	34,750	£2,711	4.99	0.54	18.66	20.00	373	£36.21	Compliant
28/06/2010	17/09/2010	Stag Hill Court (5 houses)	60	Bedroom Lighting	£7,638	Electricity	7.80	T5 lighting including changing the fitting	21,880	£1,707	4.48	0.54	11.75	20.00	235	£32.50	Compliant
28/06/2010	17/09/2010	Stag Hill Court (5 houses)	60	Circulation Space Lighting	£11,045	Electricity	7.80	T5 lighting including changing the fitting	28,750	£2,243	4.93	0.54	15.44	20.00	309	£35.77	Compliant
28/06/2010	17/09/2010	Stag Hill Court (5 houses)	60	External Lighting	£13,983	Electricity	7.80	Street lighting including changing the fitting	37,066	£2,891	4.84	0.54	19.90	13.20	263	£53.22	Compliant
28/06/2010	17/09/2010	Stag Hill Court (5 houses)	60	HWS Flow restrictors	£3,995	Gas	2.25	Hot Water - distribution improvements	35,750	£804	4.97	0.19	6.61	18.00	119	£33.56	Compliant
28/06/2010	10/09/2010	Twyford Court (9 Courts)	60	Roof Insulation	£18,506	Gas	2.25	Loft insulation	167,500	£3,769	4.91	0.19	30.99	27.00	837	£22.12	Compliant
28/06/2010	10/09/2010	Twyford Court (Courts D,E & F)	60	Bedroom Lighting	£44,415	Electricity	7.80	T5 lighting including changing the fitting	120,500	£9,399	4.73	0.54	64.71	20.00	1,294	£34.32	Compliant
28/06/2010	10/09/2010	Twyford Court (Courts D,E & F)	60	Circulation Space Lighting	£23,794	Electricity	7.80	T5 lighting including changing the fitting	65,500	£5,109	4.66	0.54	35.17	20.00	703	£33.82	Compliant
Totals					**£217,733**				**805,162**	**£45,271**			**310.65**		**6,395**		

Definitions:

Financial Savings	Annual financial savings from project (-kWh x p/kWh)
Payback Period	Technical payback period (years)
tCO2 pa	Tonnes CO2 saving per annum
PF	Persistence factor (years)
tCO2 LT	Tonnes CO2 savings life time
£/tCO2 LT	Pounds per tonne CO2 saving life time

Compliancy Test Results (column U):

"Compliant"	Project is compliant with all the Scheme criteria
"Start Date"	Project is non-compliant regarding Start Date
"Completion Date"	Project is non-compliant regarding completion within 9 months of Start Date
"Asset Lifetime"	Project is non-compliant regarding Payback Period exceeding Site Life
"Non-compliant"	Project is non-compliant regarding Payback Period or £/tCO2 LT

Appendix III Carbon Management Awareness Campaign

Appendix IV HEFCE template for Carbon Management Plan

HEFCE is not specifying how carbon management plans should be developed or what they should contain. However, there are a number of key elements that HEFCE requires to be present in an institution's carbon management plan to satisfy the requirements of CIF2.

CIF2 will be published in summer 2010 with submissions in autumn 2010.

These are:

a. A carbon management policy or strategy – this could be part of a wider environmental/sustainability policy.

b. A carbon baseline for 2005 that covers all scope 1 and 2 emissions. This year is being used as a baseline because it is used for reporting against UK targets, and the SQW report demonstrated that robust data for scope 1 and 2 is available for that year at institutional level. This will provide consistency across the sector against which progress can be monitored and reported. Institutions are encouraged to measure a baseline for scope 3 emissions and in the longer term we will expect these to be included.

c. Carbon reduction targets. These must:

- cover scope 1 and 2 emissions, although institutions may choose to set additional targets for wider aspects
- be set against a 2005 baseline. Institutions may chose to set their reductions in context by setting additional targets against an alternative baseline year
- be set to 2020, because this is the timescale for interim government targets. This will provide consistency across the sector against which progress can be monitored and reported. Institutions may also set interim milestones
- be publicly available.

d. An implementation plan to achieve absolute carbon emission reductions across scopes 1, 2 and 3 including timescales and resources. These may cover capital projects and actions to embed carbon management within the institution, for example, through corporate strategy, communication and training.

e. Clear responsibilities for carbon management.

f. A commitment to monitor progress towards targets regularly and to report publicly annually.

g. The carbon management plan and targets must be signed off by the governing body.