



Climate Action Plan 2010 – 2020

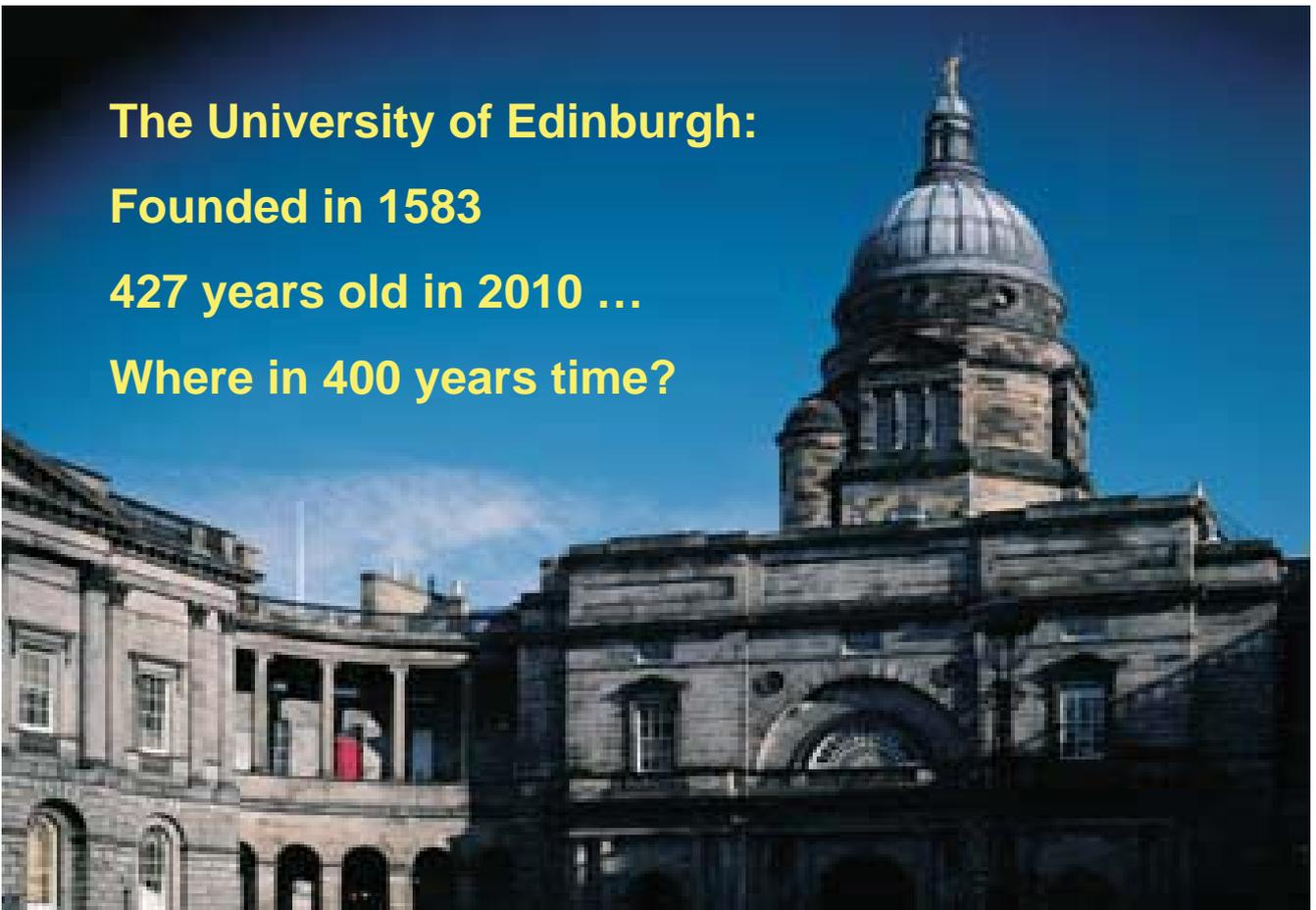
- adopted by the University Court of the University of Edinburgh 24 May 2010

The University of Edinburgh:

Founded in 1583

427 years old in 2010 ...

Where in 400 years time?



This Climate Action Plan is a work in progress. This version of the Plan takes the text Court formally adopted on 24th May and clarifies the overall target of 29% CO₂e savings by 2020 against a 2007 baseline year – as agreed by Sustainability & Environmental Advisory Group SEAG-Operations on 8 July. It will be further revised once the Scottish Government have consulted on the Duty on Public Bodies to be implementation from January 2011.

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- Owners:**
- *Mary Bownes, Vice-Principal - Research Training and Community Engagement, Convener of Sustainability & Environmental Advisory Group (SEAG) and*
 - *Nigel Paul, Director of Corporate Services, convener of SEAG Operations Group*

Approval route: *This Action Plan was circulated widely in draft form to Heads of College, Heads of Schools in January 2010. It was endorsed by SEAG, 3 February 2010 and all members of SEAG and SEAG Ops reviewed it during February.*

It was revised in the light of comments received and feedback from CMG 17th March. The Action Plan was adopted by University Court, 24 May 2010.

This Plan has been prepared to meet the University's obligation under the Universities and Colleges Climate Commitment for Scotland to which Court signed up in December 2008 – where an undertaking was made to prepare and publish a Climate Action Plan.

Status: *Version: 1.4 – as adopted by Court and mapped onto Carbon Trust format with targets as agreed at SEAG Ops Away Day 8th July 2010 and updated to recognise in Annex 1 the contribution by colleagues across the University in implementing the Action Plan.*

Date: *6th October 2010*

The University acknowledges the support of the Carbon Trust in Scotland in preparation of this Plan



NOTE. This is a slight re-framing of the first version submitted to be shared with other institutions and published in time for the anniversary of first signing of the Universities and Colleges Climate Commitment for Scotland held at Old College on 25 March 2010. It was formally adopted by the University Court on 24 May 2010 and has been revised further to reflect the Carbon Trust expectations. It will be subject to review as the Duty on Public Bodies and sector targets are clarified in 2010-11.

Introduction: Future proofing the University of Edinburgh

Climate change is one of the global challenges of our time. The University of Edinburgh accepts the moral, legal and practical responsibility to take effective action on climate change and welcomes the opportunity to show leadership in doing so. This includes action to reduce the carbon footprint of our direct operations as well as our indirect emissions.



There is a growing recognition across the world of the urgency of tackling a range of difficult, complex and inter-related issues such as human well-being; food, energy and water security; and climate change. The need of governments, businesses and others to understand and respond to these challenges creates significant opportunities for the University community.

The University's **Social Responsibility & Sustainability Strategy**¹ adopted by Court on 15th February 2010 sets out our ambitions in this area for the period 2010-2020 and includes an undertaking to publish an action plan and report on progress annually. This **Climate Action Plan** focuses specifically on the implications of climate change and peak oil for the University and our plans to reduce our emissions and adapt to a changing climate. It is, of necessity, a work in progress due to the rapidly changing national and international negotiations evolving with goalposts being constantly moved. We shall review our plan and report on progress annually.

The University is a founder signatory of the **Universities & Colleges Climate Commitment for Scotland** and the Universities UK **University Leaders' statement of intent on sustainable development**. We shall be required to reduce carbon emissions under the *Climate Change (Scotland) Act 2009* and we absolutely need to minimise the impact of rising energy costs on the work and life of the University.

Lastly we recognise with thanks the contribution made by many colleagues across the University [Annex 1] in implementing energy efficiency initiatives and developing our strategic approach to this important agenda. Our aim is to contribute intellectually to solutions required while undertaking practical measures ourselves.

Mary Bownes, Vice Principal and Professor of Developmental Biology, Convener of Sustainability and Environmental Advisory Group (SEAG)

Nigel Paul, Director of Corporate Services, Convener of Sustainability and Environmental Advisory Group – Operations Group (SEAG Ops)

Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for Universities and Colleges – it's all about getting your own house in order and leading by example.

The UK and the Scottish governments have identified the public sector as key to delivering carbon reduction across the UK in line with Kyoto commitments and the Public Sector Carbon Management programme was designed in response to this. It assists organisations in saving money on energy and putting it to good use in other areas, whilst making a positive contribution to the environment by lowering their carbon emissions.

The University of Edinburgh was selected in 2009, amidst strong competition, to take part in this ambitious programme. The University partnered with the Carbon Trust on this programme in order to realise vast carbon and cost savings.

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

Richard Rugg, Head of Public Sector, Carbon Trust



¹ Available along with other background policy papers at www.seag.estates.ed.ac.uk

Executive Summary: Our Climate Action Plan

Reducing our carbon footprint by 29% by 2020: contributing to local and global action on climate change

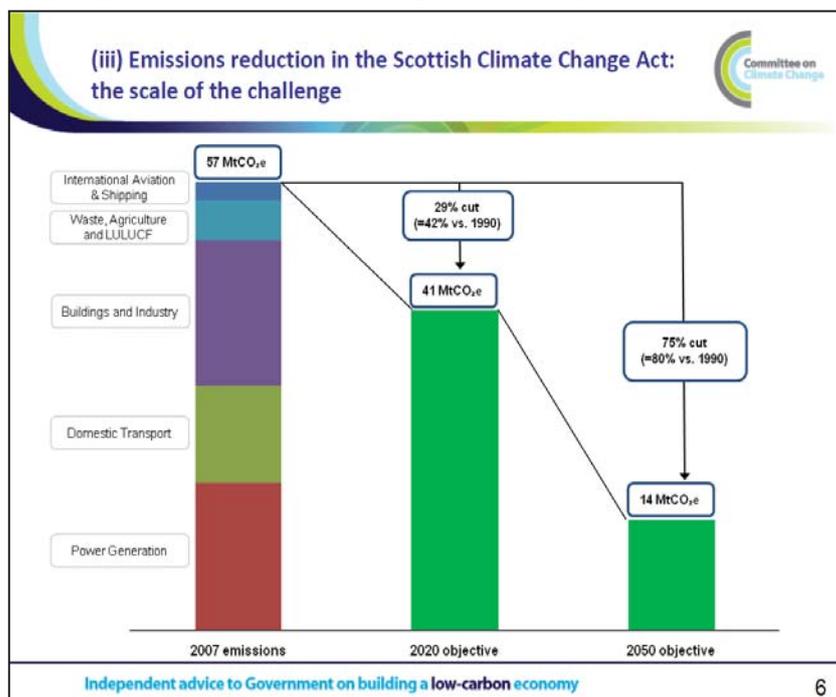
The University aims to achieve 29% carbon savings by 2020 against a 2007 baseline – with interim target of 20% savings by 2015. This reduction – of around 3% annually – will be our contribution towards the ambitious national targets enshrined in the Climate Change (Scotland) Act 2009 – against a 1990 baseline – of 42% reduction by 2020 and by 80% by 2050. This University target is informed by the Committee on Climate Change evidence submitted in February 2010 to Scottish Parliament² which recognised that 29% was ambitious but is achievable on a whole-Scotland basis.

The actions described in this plan will build on our 20-year history of effective energy management. Progress will be reviewed annually and ongoing investment and new organisational practices introduced once quick wins achieved.

We shall take a pro-active approach to reach our targets and have identified considerable opportunities to do so.

Diverse sources of emissions will be more or less amenable to reduction, and different measures to reduce emissions have different costs and paybacks. As a signatory of the 10:10 campaign, the University also aspires to cut annual emissions by 10% by end of 2010-11.

In achieving these targets, not only will our carbon emissions reduce, but the mix of energy sources we use will change. Some of these changes will be as a result of choices and investments we make, others will be the result of changes in the market and in energy infrastructure – for example, the Scottish Government's *Climate Change Delivery Plan* anticipates that electricity supply might be largely carbon neutral by 2030.



Achieving these targets rests not only on technical measures, but also using our existing estate and other assets – people, space and academic capacity more effectively. We aim to evolve a flexible, fit for purpose estate that provides the right conditions for world class teaching, research and knowledge exchange.

This **Climate Action Plan** responds to the legislative, political, economic, ethical and reputational drivers outlined in Annex 2 and identifies a range of activities and investments that are already underway and are currently planned. We recognise however not only that the success of many of these initiatives rests on the positive engagement of the University community of staff and students, but also that our academic capacity will be required to help identify opportunities and develop plans for further action.

We therefore encourage and support participation, including drawing on the expertise of academic colleagues and identifying appropriate opportunities for students, especially MSc students, to carry out relevant research to inform our work in this area. They will help us learn and share the lessons from implementing our **Climate Action Plan**. A short summary is at page 8 – open for further academic offerings. A list of participants from across the University involved in practical initiatives is at Annex 1.

The priorities for delivering this **Climate Action Plan** are those set out in our **Social Responsibility and Sustainability Strategy 2010** of which this plan is a major strand:

1. Ensure that the University's commitments and approach set out in the strategy are embedded promptly and appropriately in all strategies and policies that are currently under review or in development.
2. Support staff effectively as they put this strategy and accompanying implementation plan into place.
3. Communicate effectively, internally and externally, our current expertise, opportunities, activity and achievements related to social responsibility, sustainability and the global challenges – including progress in the implementation of this strategy itself.

² Scotland's path to a low-carbon economy - 24 February 2010 www.theccc.org.uk/reports/scottish-report

The University's CO₂e Emissions Baseline

Scope and Baseline

The University's carbon footprint for all its Scope 1 and Scope 2 activities in 2007 – the UK Committee on Climate Change baseline year for their recent report to Holyrood – is around 76,000 (tCO₂e). Including transport emissions, waste disposal and water consumption takes this total over 114,000 tCO₂e. More on the methodology at Annex 3.

This is associated with only direct operations of the University – others have estimated total impact from all activities of whole 37,000-strong University community to be nearer 335,000 tCO₂e.

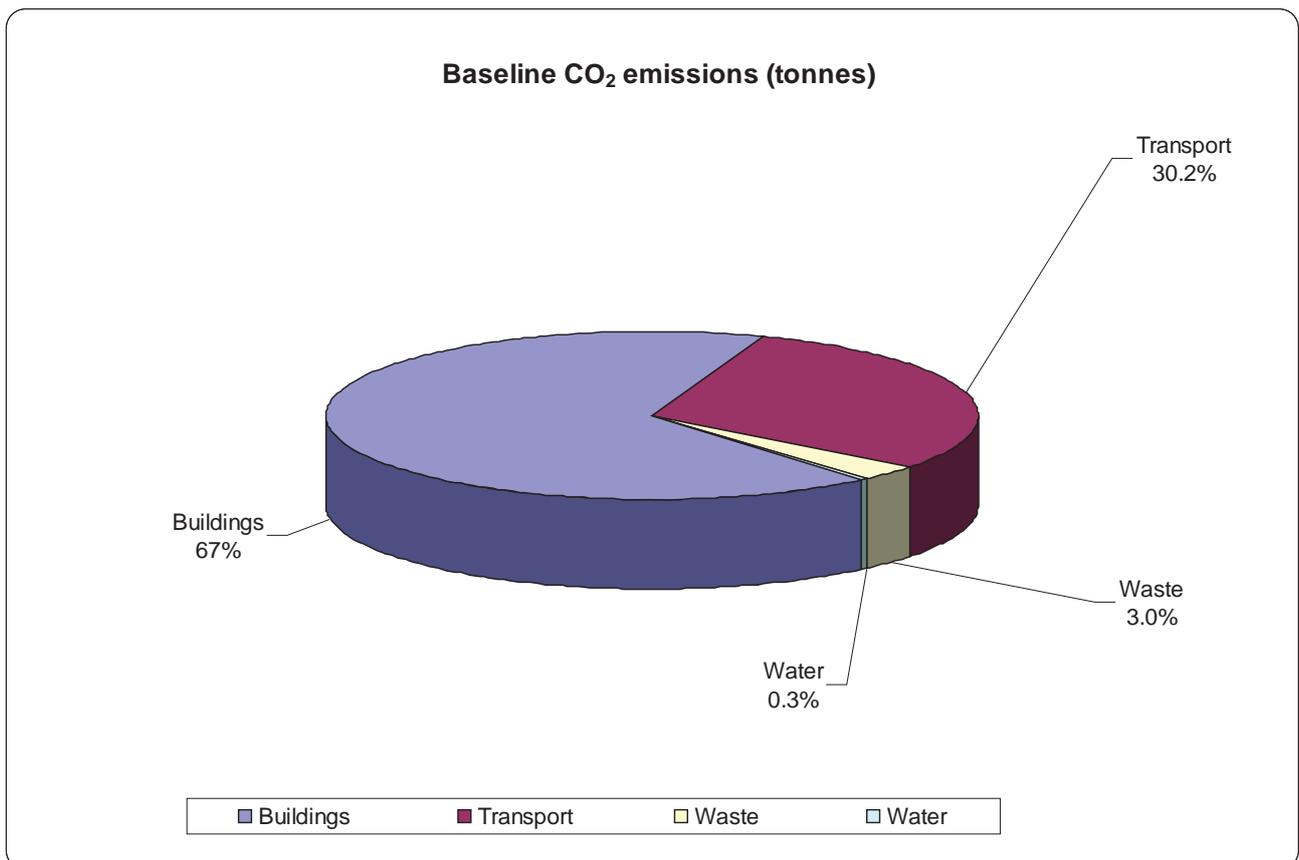
The International Energy Agency expects energy prices to rise significantly due to oil, gas and coal depletion and to fiscal measures in coming years.

The costs for providing comfortable, effective space for teaching, research and student accommodation – and for travel for study or business and other carbon intensive activities – will increase unless we invest both in technologies and in techniques to cut emissions.

The totals given below are subject to ongoing refinement as improved data comes forward and our understanding of especially our travel impact is improved.

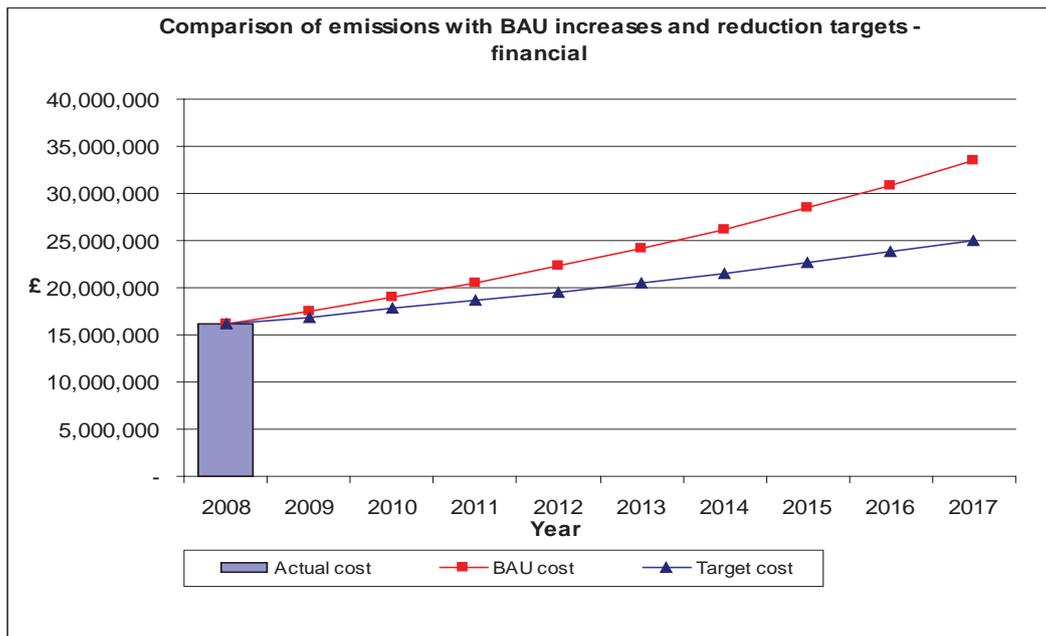
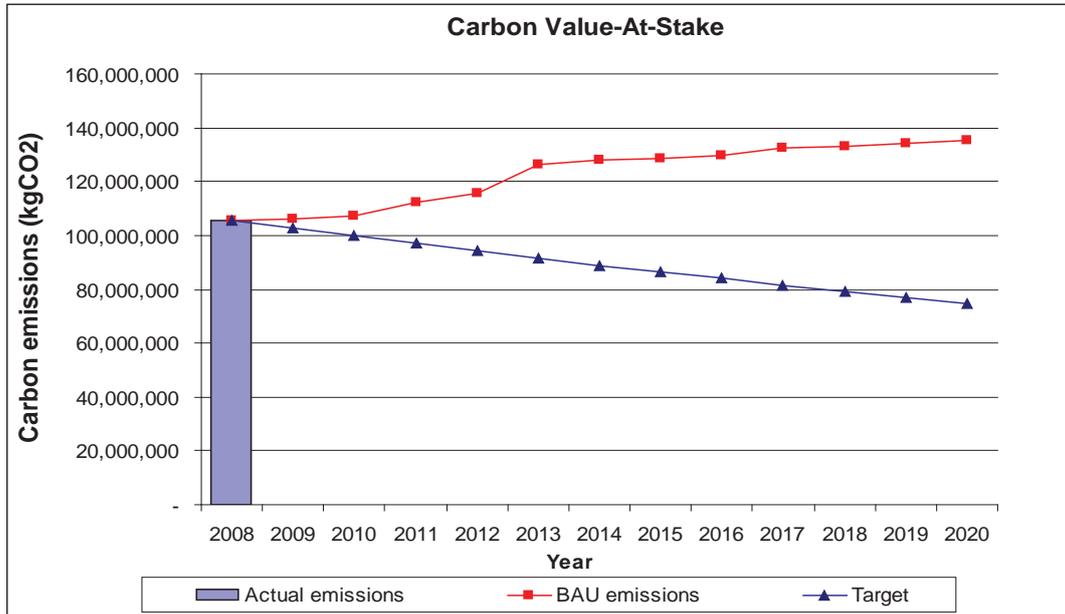
| | Total | Buildings | Transport | Waste & Water |
|---|-------------|-------------|-------------|---------------|
| Baseline CO₂ emissions (tonnes) | 114,000 | 76,000 | 34,300 | 3,700 |
| Baseline Cost (£) | £29,800,000 | £12,000,000 | £16,000,000 | £1,800,000 |

Summary table of emissions for baseline year 2007-08



CO₂e Projections and Value at Stake

The Business As Usual (BAU) annual increase in demand for all Stationary Sources³ is projected at 0.7% and for Fleet⁴ at 0.7%. Business As Usual increase in numbers Commuting, 1%. DEFRA's estimate of 8.3% annual unit cost increase has been used in calculating the Value at Stake.



We anticipate **our energy bills alone will double in real terms by 2020** without very significant action. Travel and other costs are also likely to increase in real terms. The difference between likely cost under the Business As Usual scenario and opportunities identified for reducing carbon emissions is the Value at Stake. With public spending – and University revenue – expected to be severely constrained for the foreseeable future, such increases could only be met by making savings elsewhere.

If we succeed however in reducing our energy demand – and our carbon footprint – we have the potential to demonstrate leadership and contain the costs of heating and lighting our estate and moving around.

This **Climate Action Plan** outlines the opportunity to minimise our climate change impacts on people and planet and to maximise the savings in face of increasing energy costs.

³ DTI/DBERR EP68

⁴ DTI/DBERR EP68

Our low carbon vision: Strategic themes, Objectives & Targets

Investing between £20 - £45million to cumulatively save £5 - £9million each year and up to 30,000 tCO₂e annually by 2020

We aim to meet our targets through a combination of measures including investment in new energy efficiency technologies; more effective space management; and supporting behavioural change across the University community.

We shall continue to contribute to wider societal action on mitigating and adapting to climate change through our teaching and learning, research and knowledge exchange – including sharing our experience of delivering these commitments.

The University's Estates Strategy 2010-20 – in addition to Climate Actions in Annex 4 – outlines exacting energy and sustainability standards to be achieved in developing and maintaining our estate to meet BREEAM for Higher Education standards. Annex 5 lays out the investment required and the gap in funding.

The planning framework to achieve our wider ambition in period to 2020 is set out below. Projects will come forward through existing and planned work programmes and be authorised through normal processes. External funding, such as SALIX revolving fund for energy efficiency projects, will be sought when available.

1. Energy efficiency projects:

Projects, from our currently approved and ongoing work programmes, with a total value of up to circa £10million, are anticipated to deliver annual savings of £3m and 8,000 tCO₂e.

Other projects planned for implementation in the period but subject to funding – with a total value of c£5million – are anticipated to deliver annual savings of £1.2m / 4,000tCO₂e. These include

- Energy and water saving projects,
- Switch and Save,
- Transition Edinburgh University,
- Green ICT
- Devolution of budgets and
- EUSA Impact Awards.

2. Energy infrastructure projects:

Projects with a total value of up to c £15million, subject to approved business plans and available funding is, anticipated to deliver annual savings of £3m and 10,500 tCO₂e. Potential projects might include

- George Sq Phase 2 CHP extension to Holyrood undertaken by UoEUSCo
- Conversion of King's Buildings Combined Heat & Power engine to biofuel primary fuel.

3. Sustainable estates development:

Depending on funding allocations contributions from planned capital projects over the period to a total value of c £15million could deliver annual savings of £2million and 7,500 tCO₂e. This includes aiming to achieve:

- BREEAM Excellent for new buildings and
- BREEAM Very Good for all major refurbishments

4. Waste reduction & recycling:

The University's waste management plan published in March 2010 sets 3% annual target for waste reduction. This will support a small related emissions reduction to 2020.

5. Sustainable travel planning:

Site specific travel plans and targets covering staff and student commuting will be established in 2010 following the completion of our travel survey. By 2011 the University will also develop and implement a business travel plan and reduce the carbon footprint of University vehicle fleet.

6. Responsible procurement of goods and services:

The University will deliver a Sustainable Procurement Plan in 2010 to identify opportunities for engaging with our supply chain to cut emissions.

This framework set us on track to achieve a 20% target reduction by 2015 subject to funding constraints. In addition to specific projects we shall develop a number of academic initiatives to engage with and draw on the expertise of the University community and to share experience with partner organisations locally and globally.

Annex 3 outlines the initial funding allocations and projected benefits in first five years of the Climate Action Plan. Please see Annex 6 for examples of further detailed project descriptions.

Academic engagement – Harnessing our talents

The University is committed – through signing the Universities & Colleges Climate Commitment for Scotland:

- To harness our academic talents and expand Scotland's ability – through our research capacity, knowledge exchange activity and the provision of skills, modules and courses – to create solutions to the challenges posed by climate change
- To demonstrate practical leadership in tackling climate change – by containing growing energy use and costs, protecting estates and buildings and promoting sustainability and social responsibility
- To engage our students, staff, alumni and local communities with the challenge of climate change.

In 2010-11 the University is undertaking a range of actions in implementing its Social Responsibility and Sustainability Strategy⁵ to further embed consideration of climate change and other social responsibility and sustainability issues in learning and teaching; research & knowledge exchange; and in the way we support and manage our people, services and infrastructure.

See specifically Transition Edinburgh University – the student and staff led project supported by the Scottish Government's Climate Challenge Fund. These actions build on our existing commitment and expertise in research and teaching. The list below is a partial list of relevant research and teaching. A comprehensive list is being prepared and academic colleagues are invited to notify Sustainability Adviser of new initiatives.

- Edinburgh Centre on Climate Change
- UK Biochar Research Centre
- Scottish Centre for Carbon Storage and
- Masters programmes: Carbon Management, Sustainable Energy Systems etc

Implementation – Working together to deliver results

This **Climate Action Plan** sets out our framework for action. It will be revised and updated annually. Successful delivery will in addition require active support of colleagues across the University as we evaluate and introduce new technologies and new ways of working – to maximise our capacity to shape the future and attract and develop the world's most promising students and outstanding staff.

The development and delivery of the **Climate Action Plan** is supervised by the Sustainability and Environment Advisory Group (Operations) convened by Nigel Paul, Director of Corporate Services. It provides technical guidance to Central Management Group via Sustainability and Environmental Advisory Group (SEAG) convened by Vice-Principal Mary Bownes who acts as Academic Sponsor.

Management and Governance of the Climate Action Plan

SEAG Ops – chaired by Director of Corporate Services as Project Sponsor – acts as the Strategic Board for the Climate Action Plan. Members include Director of Finance, Representatives of all three Colleges and two main Support Groups, Assistant Director of Estates & Buildings, E&B Management Accountant, and Energy Manager. The Sustainability Adviser and Engineering Operations Manager support the group as Project Leaders. The Group meet six times a year and reports up to Central Management Group via SEAG.

The Assistant Director of Estates & Buildings convenes a monthly progress meeting attended by Engineering Operations Manager, Energy Manager, and Estates Accountant – and where required the Sustainability Adviser – to ensure the Plan is implemented timeously. The recent years' activities have been widely supported by many staff across the University and they are recognised in Annex 1.

Progress on the Salix projects is logged and recorded and submitted to Salix Finance regularly to account for the £1.3million Revolving Fund via their Salix Energy Reporting System (SERS). Each of the four Premises Teams and the four Estates Development Managers in Estates submits project proposals for consideration in the Energy Efficiency Investment Programme and these are ranked and compiled by the monthly meeting for submission to SEAG Ops' endorsement. There is thus a rolling programme of at least £250,000 programme each year with frequent examples of more substantial projects being added into the Capital Programme.

Management Information, Monitoring, Reporting and Review – measuring the benefits

The University embarked on an extensive Metering, Monitoring and Targeting project in 2006 and invested nearly £500k on Automatic Meter Reading systems and a sophisticated data engine to manage the flow of high frequency communicating meter readings alongside fiscal meter readings and costs data supplied by gas, electricity and water suppliers. This enables a building by building report to be prepared and mapped onto the occupied areas allocated to Schools and Admin Units. This sophisticated system provides monthly reports against budgets set for each building which can take account of projected impact of investment decisions. Overall there will be a facility for communicating this information to occupiers of the estate and to monitor consumption against trends and potentially to devolve energy budgets down to School level.

⁵ Social Responsibility and Sustainability Strategy can be found at www.seag.estates.ed.ac.uk

Annex 1 Climate Champions – effecting change already

Implementation of the Climate Action Plan is led by colleagues in Estates & Buildings. Key staff are:

- Angus Currie, Director of Estates & Buildings, co-sponsor of this Plan and holder of energy budget
- Geoff Turnbull, Assistant Director of Estates & Buildings responsible for the Operations Division
- David Barratt, Engineering Operations Manager who supervises Energy Office and Controls Team
- Andrew Whitson, Energy Manager, leads the Energy Office team
- Shona Buchanan, Asst Energy Manager, Kerry-Ann Robertson, Utilities Asst Georgina Wood, Utilities Analyst.

Their work is supported by the wider Estates Operations Division with Premises Teams under Jim Brown, Rab Calder and John Williamson and by David Brook, Support Services Operations Manager overseeing cleaners, uniformed staff, transport and waste management. Graham Bell, Depute Director of Estates & Buildings is responsible for Estates Development Division which manages the major capital projects delivered by Cliff Barraclough, Jane Johnston, Alasdair McKim, Callum Robertson and Anna Stamp as Estates Development Managers.

The Switch and Save Energy Reduction Campaign was launched by the Principal and the Rector in 2006 and a network of Energy Coordinators contribute strongly to the programme. Current list of volunteers is:

| | | | |
|---------------------------|-------------------------------------|---|---|
| Central Area | Keith Milne | Reprographics Technician | Arts, Culture & Environment |
| | Nicola Davidson | School Administrator | Divinity |
| | Allan Wilson | Information Officer | Education |
| | Dr Francine Shields | School Administrator | History, Classics & Archaeology |
| | Kerry Wilson | Office Manager | International Office |
| | Jessica McCraw | Administrative Officer | Law |
| | Alan Whyte | Technical Staff | Literatures, Languages & Cultures |
| | John Glendinning | Technical Staff | Literatures, Languages & Cultures |
| | Elisa Henderson | Teaching Fellow | Business & Economics |
| | Ken Vogel | Buildings & Facilities Officer | Philosophy, Psychology & Language Studies |
| | Susan Hansen-Just | PA/Office Manager | Edinburgh Research & Innovation |
| | Shona Gillies | Student Recruitment Officer | Student Recruitment & Admissions |
| | Penny Scott | Admin Manager | Careers Service |
| | Carol Powers | Management Support Officer | Student & Academic Services |
| | Trish Cairney | Facilities Manager | Information Services Group |
| | Duncan Herd | Facilities Manager | School of Education |
| | Marion Judge | Administrator | Humanities & Social Sciences |
| | Colette Casher | PA to E&B Director | Estates & Buildings |
| | Valery Cowan | Chaplaincy Administrator | Chaplaincy Centre |
| | Colin Hunter | EUCLID | SASG |
| Linda Kerr | Administrative Officer | Registry | |
| Angie Robertson | Administrator | Student Counselling Services | |
| Alison Cairney | IS Corporate Team | IS (EUCS) - Main Library & 4 Buccleuch PI | |
| King's Buildings | Ron Brown | Deputy Lab Superintendent | Chemistry |
| | Bobby Hogg | Building Support Officer | School of Engineering |
| | Matthew Richardson | Computing Officer | School of Engineering |
| | Alister Hamilton | Senior Lecturer | School of Engineering |
| | Gordon Waugh | Physical Resources Manager | GeoSciences |
| | Gill Law | Graduate School Secretary | Mathematics |
| | Colin Thomson | Technical Services Manager | Physics |
| | David Brown | Building and Technical Manager | School of Biological Sciences |
| | George McMillan | Building & Technical Manager | SBS/Cell & Molecular Biology Institutes |
| | Graham Walker | Technical Officer | GeoSciences |
| | Adam Butler | Environmental Statistician | Biomathematics & Statistics Scotland |
| Eric Tittley | Hi Performance Computing Specialist | Royal Observatory | |
| Meds & Vets | Janet Philp | School Technical Manager | Biomedical Sciences |
| | Aileen Brown | Hospital Administrator | Hospital for Small Animals |
| | Charlie Marr | Building Superintendent | Biomedical and Clinical Lab Sciences? |
| | Brian Kelly | Site Facilities Manager | Veterinary Pathology |
| | Pamela Lennox | Administrative Secretary | Clinical Sciences & Community Health |
| | Paul McGuire | Snr Admin Officer | College of Medicine & Veterinary Medicine |
| | Deborah Allen | Deputy Site Facilities Manager | Royal (Dick) School of Veterinary Studies |
| | Dr Alex Peden | Research Fellow | National CJD Surveillance Unit |
| | Jan Bunyan | PA to Professor David Weller | General Practice |
| | Gordon Findlater | Senior Lecturer | Anatomy |
| Rosa Bisset | Section Administrator | Public Health Sciences | |
| Corporate Services | Sandra Kinnear | Energy & Sustainability Coordinator | Accommodation Services |
| | Helen Gilroy | Departmental Administrator | Health & Safety Dept. |
| | Charles Hill | Project, Programme & Planning Mgr | Corporate Services Group |
| | Janet Craig | Occupational Health Manager | Occupational Health Unit |
| | Stuart McLean | Printing Services Line Manager | Procurement & Printing |
| | Gael Campbell | Office Manager | Disability Office |
| | Cameron Ritchie | Operations Manager | Centre for Sport & Exercise |
| Jan Thomson | Head of Finance | Edinburgh University Press | |

Annex 2 Context and drivers for Action on Carbon Emissions

| Generic Category | Driver | Areas of Impact | Nature of Impact | Importance | Opportunities and / or Consequences |
|------------------|--|---|--|------------|--|
| Legislative | UK Carbon Reduction Commitment – Energy Efficiency Scheme | The University and all its associated activities | Significant financial and reputational impact | High | Carbon seen to have further economic value |
| Legislative | EU Energy Performance of Buildings Directive | Estates and Buildings | Our “public” buildings over 1,000sq.m display an Energy Performance Certificate | Medium | Higher visibility of carbon performance for all building users – displayed in foyer of 20 buildings |
| Legislative | Building Standards (Scotland) | Estates and Buildings | New thresholds set October 2010 for major capital projects | Medium | Added up-front cost means Whole Life Cost analysis is now a very high priority |
| Political | Climate Change (Scotland) Act 2009 | The University | Introduces a Duty on Public Bodies in January 2011 | High | Scottish Government expects public bodies to take a lead and contribute to 42% target by 2020 |
| Economic | Rising cost of utilities and volatility of energy market (plus rise in CCL charge) | The University | Utility prices unstable and rising – lead to budget pressure & less money to spend overall | High | Opportunities for lower utilities consumption & investment in low and zero carbon technologies to lessen exposure to market volatility |
| Ethics | Social Responsibility & Sustainability strategy 2010 | The University | Responsibility for publicly-funded body to do the right things and all things right | High | Taking a leading role in city, regional and national community, as well as in HE sector |
| Reputation | People and Planet Green League and Edinburgh Impact Awards | The University and Edinburgh University Students Assn | Environmental performance displayed in public rankings | Medium | Reductions in CO ₂ emissions, waste arisings & water usage will improve ranking |
| Reputation | Perception for prospective students, staff and the public | The University | Improved image to enhance recruitment of students & staff | Medium | Increased public awareness of the nine global challenges offers opportunity |
| Reputation | The University’s teaching and research | Practically all Schools and Research Gps | Improved image to enhance recruitment | Medium | Increasing priority allocated by research Councils to issue |

Annex 3 The University's carbon footprint – methodology

Emissions Baseline and Projections

Note that in the *Climate Action Plan* the generic term “carbon emissions” refers to the whole basket of six greenhouse gas emissions identified in the Kyoto Protocol. These are formally reported as carbon dioxide equivalent (CO₂e) and generally cited in tonnes.

The University's baseline emission calculation includes the CO₂e from four broad areas.

Energy and Water use in buildings

Waste sent to landfill

Travel (Students and Staff commuting, Business Travel and Students travel to study)

The baseline emissions are split into 2 categories:

Manageable emissions – This includes energy use in buildings, waste, water and staff and student business travel. The University, through changes to business practice, can directly control these emissions. Not yet included in the baseline is the assessed carbon emissions associated with the purchase and delivery of office products and services at the University. Other goods and services are not yet directly measurable as it requires the supplier to provide detailed information however the university is actively engaging with companies to improve the quality of data for future use.

Influence emissions – The Integrated Travel Policy exists to influence behavioural change amongst students and staff within the university and three-yearly staff and student travel surveys have been conducted in 2000, 2003, 2007 and 2010 to monitor impact of measures taken. These include subsidised bus routes, season ticket loans, pool cars / city car club, lift share and Bicycle+ cycle to work scheme and improved cycling facilities.

The University can influence these emissions but cannot directly manage them. Similarly the University influences staff practices at work i.e. using recycling facilities and using less energy by switching things off. Hopefully the awareness gained at work will extend beyond the boundaries of the campuses and back into staff and students' everyday lives.

CO₂e Emissions Factors

Estimating the emissions from each source was carried out by applying the appropriate CO₂ emissions factor to each fuel type. The emissions factors used in the calculations are the standard conversion factors supplied by the Carbon Trust.

- Electricity 0.057 kg/kWh
- Natural Gas 0.185 kg/kWh
- Car 0.13 – 0.30 kg/km (Dependant on fuel and vehicle type)
- Bus 0.0.11 kg/km
- Train 0.06 – 0.08 kg/km (Dependant on journey type)
- Air 0.11 – 0.19 kg/km (Dependant on journey type)

Methodology and data limitations

Data presented on CO₂ emissions relating to electricity, gas, water and waste was sub divided by campus as sub-metering within each campus is not currently adequate to allow further sub-divisions.

Electricity

Electricity data has been collated primarily using Half Hourly (HH) meter readings. Around 80% of the University's consumption is recorded by HH meter readings. Where the meter is Non-Half Hourly (NHH), estimates and manual readings were used.

Gas

Gas data was taken from invoices. Where there is an estimated reading, manual readings were taken to monitor bill accuracy.

Water

The data for water is taken from monthly meter readings and invoices produced by the University's water supplier.

Waste

Data is provided by the University's waste management companies.

Transport

Data on business travel using public transport or personal car use has been estimated from employee returns in the 2010 Staff Travel Survey along with data from travel companies and expenses claim forms.

Estimates of student travel to study from home locations was estimated using home address data and air or rail travel depending on location. See Transition Edinburgh University Footprints and Handprints report 2008.

Annex 4 Climate Action Projects: Initial list 2008-11 [detail at Annex 5]

| Building Name | Project Description | Fuel Type | tCO2 p.a. | Pay Back | Proj + Admin | Savings p.a. |
|----------------------|------------------------------------|-------------|--|----------|-------------------|-----------------|
| Geo Sq Theatre | Electric to CHP DH | Electricity | 328 | 3.3 | £227,065 | £65,288 |
| David Hume Tower | Lecture Th AHU's | Electricity | 259 | 3.6 | £148,516 | £36,052 |
| David Hume Tower | Refectory Heating | Electricity | 429 | 3.3 | £34,073 | £9,708 |
| 21/22 George Sq | Electric to CHP DH | Elec /Gas | 31 | 4.9 | £38,525 | £6,864 |
| 55 George Sq | Electric to CHP DH | Elec /Gas | 24 | | £29,900 | £5,304 |
| 56 George Sq | Electric to CHP DH | Elec /Gas | 30 | | £37,375 | £6,630 |
| 57 George Sq | Electric to CHP DH | Elec /Gas | 22 | | £27,025 | £4,914 |
| 58 George Sq | Electric to CHP DH | Elec /Gas | 15 | 4.9 | £18,975 | £3,354 |
| Ashworth 2 & 3 | Hi efficiency chiller | Electricity | 38 | 4.6 | £43,700 | £7,551 |
| Ashworth Extension | Cavity Wall Insulation | Insulation | 11 | 7 | £14,145 | £1,750 |
| Ashworth 2 - Level 4 | Double Glazing | Insulation | 11 | 7 | £13,800 | £1,708 |
| Informatics Forum | Dist CWS Cooling | Cooling | 64 | 4.2 | £46,000 | £10,800 |
| Appleton Tower | Dist CWS Cooling | Cooling | 54 | 4.5 | £40,250 | £10,800 |
| 59 George Sq | Electric to CHP DH | Elec /Gas | 31 | 4.9 | £39,100 | £6,942 |
| 60 George Sq | Electric to CHP DH | Elec /Gas | 24 | 4.8 | £29,900 | £5,382 |
| Commissioned | Drawdown & Repayment | | 1,370 | | £788,348 | £183,047 |
| 16 George Sq | Electric to CHP DH | Elec /Gas | 19 | 4.9 | £23,920 | £4,329 |
| 17 George Sq | Electric to CHP DH | Elec /Gas | 19 | 4.8 | £23,920 | £4,329 |
| 18 George Sq | Electric to CHP DH | Elec /Gas | 20 | 4.8 | £23,920 | £4,329 |
| 19 George Sq | Electric to CHP DH | Elec /Gas | 19 | 4.9 | £23,920 | £4,251 |
| 20 George Sq | Electric to CHP DH | Elec /Gas | 19 | 4.8 | £23,173 | £4,212 |
| Committed | Drawdown & Repayment | | 96 | | £118,853 | £21,450 |
| Committed | Current Rotating Fund Value | | £495k Salix+£495k Gov £247.5k Uni | | | |
| Charteris Land | Insulation | Insulation | 62 | 6.5 | £93,001 | £12,525 |
| Charteris Land | Heating | Gas | 38 | 5.5 | £55,000 | £8,618 |
| JCMB Insulation | Insulation | Insulation | | | £11,500 | |
| SCRM Chillers | High affiance chiller | Cooling | 170 | 4.7 | £152,950 | £28,529 |
| JB Decant Lab | Ins'n +Dbl glazing | Insulation | 2 | | £17,250 | £5,600 |
| JCMB Server Room | District CWS Cooling | Cooling | 54 | 3.7 | £46,000 | £10,800 |
| JCMB Main Chillers | District CWS Cooling | Cooling | 54 | 3.7 | £46,000 | £10,800 |
| QMRI - Savawatt | Power save | Elec | 54 | 2.2 | £17,250 | £6,971 |
| JMCPHR Savawatt | Power Save | Elec | 29 | 2.9 | £12,650 | £3,765 |
| 30 Buccleuch Place | Electric to CHP DH | Elec /Gas | | 4.9 | £25,300 | £4,454 |
| 31 Buccleuch Place | Electric to CHP DH | Elec /Gas | | 4.9 | £25,300 | £4,454 |
| 32 Buccleuch Place | Electric to CHP DH | Elec /Gas | | 4.9 | £25,300 | £4,454 |
| 33 Buccleuch Place | Electric to CHP DH | Elec /Gas | | 4.9 | £25,300 | £4,454 |
| Hugh Robson | Levels 1-4 Lighting | Elec | 32 | 3.0 | £16,100 | £4,713 |
| Pipeline | | drawdown | 495 | | £568,900 | £110,136 |
| Totals | | | 1,961 | | £1,476,101 | £314,633 |

Annex 5 Financial planning: Costs & Benefits accruing – first 5 years

Indicative indication of investments in Energy Efficiency & source of funding

| <i>figures in £ 1,000's</i> | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 |
|----------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Indicative planned spend: | | | | | | | |
| Projected capital spend | 2,400 | 1,900 | 800 | 850 | 950 | 4,350 | 5,400 |
| Annual revenue spend | 450 | 460 | 470 | 480 | 490 | 500 | 500 |
| Total costs | 2,850 | 2,360 | 1,270 | 1,330 | 1,440 | 4,850 | 5,900 |
| Committed funding: | | | | | | | |
| Committed annual capital | 2,400 | 1,900 | 500 | 750 | 550 | 250 | 300 |
| Committed revenue inc SALIX | 450 | 460 | 470 | 480 | 490 | 500 | 500 |
| Total funded | 2,850 | 2,360 | 970 | 1,230 | 1,040 | 750 | 800 |
| Uncommitted funding | | | | | | | |
| Unallocated annual capital | 0 | 0 | 300 | 100 | 400 | 4,100 | 5,100 |
| Unallocated revenue | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total not yet funded | 0 | 0 | 300 | 100 | 400 | 4,100 | 5,100 |

| <i>figures in 1,000's</i> | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 |
|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Annual cost saving | £390 | £400 | £410 | £420 | £430 | £440 | £450 |
| Annual CO₂ saving | 2,000 | 1,950 | 1,900 | 1,850 | 1,800 | 1,750 | 1,700 |
| % target | | 3% | 3% | 3% | 3% | 3% | 3% |

Annex 6 University's Strategic Context for the Climate Action Plan

Social Responsibility & Sustainability Strategy – 2010 Implementation Plan

Action 4.2 Implement the first phase of the climate action plan and devolve energy budgets to make evident consumption and raise awareness of carbon impact of activities

Lead Contact: Angus Currie, Director of Estates and Buildings

Contributing to the following objectives

- PSI 3 Manage our physical infrastructure and the procurement of goods and services in ways that maximise efficiency and effectiveness while minimising social, environmental and other risks.
- PSI 5 Establish efficient and effective systems to record, report and act on our main social and environmental impacts.
- P 1 Ensure that the University's commitments and approach set out in this strategy are embedded promptly and appropriately in all strategies and policies that are currently under review or in development.

Context

The University has signed up 10:10 – undertaking to try our best to reduce carbon emissions from the wider University community by 10% by 2010.

Tasks

- Finalise our Climate Commitment 2015 and 2020 carbon reduction targets by **March 2010**
- Approve a five year energy efficiency investment programme using the revolving fund by **May 2010**
- Finalise plans for the devolution of energy budgets to School and Department level by **August 2010**
- Introduce new monitoring methodology to meet with government reporting requirements by **Sept 2010**.

Related Actions and possible future tasks

Deliver Transition Edinburgh University project aiming to cut the emissions from the 37,000 students and staff by 10% in 2010 in response to the challenges of climate change and peak oil – and delivering the 10:10 campaign undertaking. Full Social Responsibility & Sustainability Strategy is at www.seag.estates.ed.ac.uk.

Annex 7 Example Definition of Projects *[more available on request]***Energy Efficiency Projects – Proposal & Business Case Approval****Salix Finance ‘Invest To Save’ Funding: Project Proposal & Business Case Approval****David Hume Tower Refectory**

| Client & Project Details | | | | |
|---|------------------------------------|----------------------|--------------------|---------------|
| Client Organisation | Edinburgh University | | | |
| Client Contact | Mr David Barratt | | | |
| Project Title | Heating –replace electric with gas | | | |
| Site Location | David Hume Tower Refectory | | | |
| Project Background (Provide background as to why this project will be beneficial) | | | | |
| An extension to a new district heating system to replace existing electric heating with LTHW fed from a highly efficient tri-generation plant to reduce operating costs and carbon emissions. | | | | |
| Description of Works (Describe project in sufficient detail for technical overview) | | | | |
| Existing storage/panel electric heating replaced with radiators/ TRV’s on a variable temperature LTHW heating circuit connected to the CHP serviced district heating system. | | | | |
| Project Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| Capital Cost (£) | Installation Cost (£) | Additional Costs (1) | Total Project Cost | |
| £32,450 | 0 | £1,622.50 | £34,072.50 | |
| Energy Consumption (Taken from Pre-Project and projected Post-Project Data) | | | | |
| Pre-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 183,600 | 13035.60 | Estimation | Electrical |
| Post-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 229,500 | 3327.75 | Estimation | Gas |
| Projected Savings Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| PBP (6) | kWh pa (2) | £ pa (3) | tCO2 pa (7) | £/tCO2LT (8) |
| 4.46 | -45,900 | 9707.85 | 48.74 | 79.43 |
| Derivation of Expected Energy, Revenue and CO2 Savings (Reference to source of saving calculation) | | | | |
| Based on Carbon Trust Criteria | | | | |
| Project Assessment & Timescale | | | | |
| An Assessment of Achievability (Considered view on how achievable the expected savings are) | | | | |
| Project Risks & Mitigation (Describe project risks & measures taken to minimise or avoid them) | | | | |
| 1) Potential presence of asbestos – building surveyed prior to work commencing. 2) Working in a partially occupied site – work undertaken during Easter break | | | | |
| Project Timetable (Describe project implementation timetable) | | | | |
| Work commence March 2007 – complete June 2007 | | | | |
| Previous Experience of Doing this Type of Project (Describe any previous experience that you may have with the proposed energy efficiency measure) | | | | |
| Extensive experience within the University for connecting variable temperature radiator circuits to CHP district heating. | | | | |
| Responsibilities (List those responsible for implementing the project) | | | | |
| Design, project procurement installation under the management of John Murdoch, Mech Design Engineer. | | | | |

Salix Finance 'Invest To Save' Funding: Project Proposal & Business Case Approval Charteris Land

| Client & Project Details | | | | |
|--|------------------------------|---------------------------------|-------------------------------|----------------------|
| Client Contact | Mr David Barratt | | | |
| Project Title | Insulation Upgrade | | | |
| Site Location | Charteris Land | | | |
| Project Background (Provide background as to why this project will be beneficial) | | | | |
| Charteris Land was constructed in the early 1970's, pre-cast concrete panels, low grade glazing and electric heating, generally low energy consideration. The building is to be extended and refurbished, thus providing an opportunity to carry out investment in energy savings measures. | | | | |
| Description of Works (Describe project in sufficient detail for technical overview) | | | | |
| Along with, separately funded major refurbishment, the internal faces of the concrete wall panels are to be insulated between wall panels. The typical U value for the 1970 walls was at best $1.0\text{W/m}^2\text{°K}$, given thermal bridging and air leakage a value of $2.0\text{W/m}^2\text{°K}$; the upgraded insulation and lining to current standards will achieve a U value of $0.2 - 0.3\text{W/m}^2\text{°K}$. | | | | |
| Project Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| Capital Cost (£) | Installation Cost (£) | Additional Costs (1) (£) | Total Project Cost (£) | |
| 52,522 | inc | 7,878.30 | 60,400.30 | |
| Energy Consumption (Taken from Pre-Project and projected Post-Project Data) | | | | |
| Pre-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 368,157 | 39,760.96 | Metered/Calculation | Electric |
| Post-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 300,010 | 32,401.08 | Calculation | Electric |
| Projected Savings Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| PBP (6) | kWh pa (2) | £ pa (3) | tCO2 pa (7) | £/tCO2LT (8) |
| 7.10 | 68,147 | 7,359.88 | 37.10 | 40.45 |
| Derivation of Expected Energy, Revenue and CO2 Savings (Reference to source of saving calculation) | | | | |
| Based on 2007 actual electric metered consumptions & degree day data for Pre project and Post project based on improved building 'U' value % heat loss. | | | | |
| Project Assessment & Timescale | | | | |
| An Assessment of Achievability (Considered view on how achievable the expected savings are) | | | | |
| This will form part of a major refurbishment, to be carried out by Contractors with a track record with the University, a high quality of installation work can be achieved - savings to be realistic and achievable. | | | | |
| Project Risks & Mitigation (Describe project risks & measures taken to minimise or avoid them) | | | | |
| The major risk on applying insulation to an existing structure is of poor quality installation due to restricted access; the building in this instance is being completely decanted. | | | | |
| Project Timetable (Describe project implementation timetable) | | | | |
| The overall project timetable is for the building to be decanted in September 2008 with completion due in July 2009. The detailed programme is monitored throughout the time scale by University lead design team. | | | | |
| Previous Experience of Doing this Type of Project | | | | |
| The University has an extensive port folio of buildings ranging in age from new build to 300 years; over that period the fabric of a large number of buildings has been upgraded to mitigate against poor insulation value and leakage losses. The work has been & continues to be managed by the University Estates & Building. | | | | |
| Responsibilities Part of major project under Project Manager Tom Angus | | | | |

Salix Finance 'Invest To Save' Funding: Project Proposal & Business Case Approval Charteris Land Conversion Electric Heating to Gas

| Client & Project Details | | | | |
|--|------------------------------------|--------------------------|---------------------|---------------|
| Client Contact | Mr David Barratt | | | |
| Project Title | Conversion Electric Heating to Gas | | | |
| Site Location | Charteris Land | | | |
| Project Background (Provide background as to why this project will be beneficial) | | | | |
| Charteris Land was constructed in the early 1970's, pre-cast concrete panels, low grade glazing and electric heating, generally low energy consideration. The building is to be extended and refurbished, thus providing an opportunity to carry out investment in energy savings measures. | | | | |
| Description of Works (Describe project in sufficient detail for technical overview) | | | | |
| <p>The extension and major refurbishment of the building offer an opportunity to change the heating medium for the building, from electric panels to a gas fired LPHW system. Two adjacent University owned buildings, Chessel's Land and St Mary's Land, are being decommissioned; these buildings incorporated gas fired heating and as such there is more than adequate gas supply available for the new installation.</p> <p>Within the planning of the new extension space has been created for a boiler room, and in that the building is being decanted for refurbishment it constitutes the ideal time to review the heating installation. The heat source is to be from two gas fired condensing boilers, each rated at 635kW providing LPHW distributed through steel pipework to panel radiators within the existing building. The boilers shall be on optimised control, with full control linked to the University's BEMS system with central monitoring at the Infirmary Street office.</p> <p>The boilers shall be Viessman, Vitocrossal 300 Gas Fired Condensing Boilers. These boilers are selected to provide high fuel efficiency. Details of the boilers are attached. The project planning surveys have established suitable zoning and distribution routes for the pipework and pipework fixing details allows for the fabric insulation that is planned to be undertaken. The boiler output caters for the total heat demand for the new extension and Basement to Sixth floor of the existing building. The calculations and costs have been adjusted to include only the Basement to Second Floor areas that are currently being incorporated onto the LPHW system at this stage; the new extension has likewise been discounted from the evaluation.</p> <p>The distribution of LPHW is in steel pipework to Stelrad Elite range steel panel radiators. All radiators are installed with the University spec Herts TRV which has a restricted range from 14 deg C to 22 Deg C.</p> | | | | |
| Project Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| Capital Cost (£) | Installation Cost (£) | Additional Costs (1) (£) | Total Cost (£) | |
| 47,826.09 | inc | 7,173.91 | 55,000 | |
| Energy Consumption (Taken from Pre-Project and projected Post-Project Data) | | | | |
| Pre-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 252,188 | 27,236.30 | Metered/Calculation | Electric |
| Post-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 133,660 | 14,435.28 | Calculation | Electric |
| | 139,450 | 4,183.50 | Calculation | Gas |
| Projected Savings Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| PBP (6) | kWh pa (2) | £ pa (3) | tCO2 pa (7) | £/tCO2LT (8) |
| 2.6 | -20,922 | 8,617.52 | 37.8 | 75.01 |
| Derivation of Expected Energy, Revenue and CO2 Savings (Reference to source of saving calculation) | | | | |
| Based on 2007 actual electric metered consumptions & degree day data for Pre project and Post project based change of fuel type electric to gas | | | | |
| Project Assessment & Timescale | | | | |
| An Assessment of Achievability (Considered view on how achievable the expected savings are) | | | | |

| | |
|--|--------------------|
| <p>The decant of the building has been completed and the construction of the extension, plant space has been allocated, is well advanced allowing completion/occupancy for the first semester of the 2009/10 academic year.</p> | |
| <p>Project Risks & Mitigation (Describe project risks & measures taken to minimise or avoid them)</p> | |
| <p>The timescale for carrying out the works is tight, but the contractor carrying out the works is familiar to the University, and has a record of achieving such timescales. The CO₂ savings are inherent in the change of fuel and therefore the risk is negligible. The financial risk is the possibility of a major increase in gas costs</p> | |
| <p>Project Timetable (Describe project implementation timetable)</p> | |
| <p>The building decanted September 2008 Project completion due in July 2009</p> | |
| <p>Previous Experience of Doing this Type of Project (Describe any previous experience that you may have with the proposed energy efficiency measure)</p> | |
| <p>The University has a number of buildings that were constructed during the 1960's & 70's which incorporated electric heating, a number of these have already been converted to either gas or connected to the University's central area CHP district heating scheme, e.g. George Square Theatre, DHT Lecture Theatres were both converted from electric heating to the Universities CHP district heating scheme.</p> | |
| <p>Responsibilities (List those responsible for implementing the project)</p> | |
| <p>Part of major project under Project Manager Tom Angus</p> | |
| <p>Notes (Give any other information relevant to the business case)</p> | |
| <p> </p> | |
| <p>Attachments (List any supporting documentation)</p> | |
| <p>NIFES Consultancy Group Updated Business Report release 2, January 2009</p> | |
| <p>Signed</p> <p>.....</p> <p>Name:</p> <p>Position:</p> | <p>Date</p> |

Notes

- Include any and all relevant – e.g. project management
- kWh pa – annual energy consumption in kWh
- £ pa – annual cost in pounds
- Derivation – e.g. estimate or meter readings
- Fuel type – e.g. Electricity, Gas, Oil
- PBP – payback period
- tCO₂ pa – annual tonnes of carbon dioxide
- £/tCO₂LT – pounds per tonnes of carbon dioxide lifetime

Salix Finance 'Invest To Save' Funding: Project Proposal & Business Case Approval Ashworth Building Chiller Enhancement

| Client & Project Details | | | | |
|--|------------------------------|---------------------------------|-------------------------------|--------------------------------|
| Client | University of Edinburgh | | | |
| Client Contact | David Barratt | | | |
| Project Title | Chiller Enhancement | | | |
| Site Location | Ashworth Building 2&3 | | | |
| Project Background (Provide background as to why this project will be beneficial) | | | | |
| The cooling installation at the Ashworth Building is to be replaced. The lower cost option is to utilise standard chillers or to use Turbo Chiller providing a more energy efficient solution [preferred]. | | | | |
| Description of Works (Describe project in sufficient detail for technical overview) | | | | |
| The Ashworth Building provides Laboratory facilities for biology based study and research, and with this a high degree of conditioned air supply is required. The area is currently undergoing refurbishment and the associated cooling plant is at the end of its useful life. The new chillers can either be based on machines incorporating High Efficiency Screw Compressors or TurboChill (using Magnetic Oil-Free Compressors) | | | | |
| Project Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| Capital Cost (£) | Installation Cost (£) | Additional Costs (1) (£) | Total Project Cost (£) | |
| 33,442 | N/A | 5,016 | 38,458.30 | |
| Energy Consumption (Taken from Pre-Project and projected Post-Project Data) | | | | |
| Pre-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 418,275 | 45,173 | Calculation | Electricity |
| Post-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 348,356 | 37,622 | Calculation | Electricity |
| Projected Savings Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| PBP (6) | kWh pa (2) | £ pa (3) | tCO₂ pa (7) | £/tCO₂LT (8) |
| 5.00 | 69,919 | 7,551.25 | 37.5 | 592.50 |
| Derivation of Expected Energy, Revenue and CO ₂ Savings (Reference to source of saving calculation) | | | | |
| Based on variable load conditions with match laboratory internal load conditions & weather data. Manufacturer load calculations. | | | | |
| Project Assessment & Timescale | | | | |
| An Assessment of Achievability (Considered view on how achievable the expected savings are) | | | | |
| Historic data showing laboratory occupancy, would indicate a high expectation of achieving savings | | | | |
| Project Risks & Mitigation (Describe project risks & measures taken to minimise or avoid them) | | | | |
| Capital cost addition is on purchase price of equipment and is therefore a known factor. Running costs savings are dependant on calculated consumption, in the event of the consumption being exceeded then the saving will be greater, if there is a reduction in consumption then the overall CO ₂ will be reduced. | | | | |
| Project Timetable (Describe project implementation timetable) | | | | |
| In line with refurbishment programme of Level 4. | | | | |

Salix Finance 'Invest to Save' Funding: Project Proposal & Business Case Approval 21 & 22 George Square – example of 9 such projects converting to CHP

| Client & Project Details | | | | |
|---|--|--------------------------|-------------------------|---------------------------|
| Client Organisation | University of Edinburgh | | | |
| Client Contact | Mr David Barratt | | | |
| Project Title | Conversion from Electric Heating to CHP | | | |
| Site Location | 21 & 22 George Square – example of 9 such projects converting to CHP | | | |
| Project Background (Provide background as to why this project will be beneficial) | | | | |
| <p>The University's development plan recognised the financial & CO₂ benefits of the investment in CHP technology for the buildings located in the central area. In carrying out the upgrade of the Adjacent Crystal Macmillan Building LPHW main connections were left future inclusion of 16-22 George Square. The existing heating within 16-22 George Square is electric panel/radiator heating of a domestic nature being switched on/off by the staff and students, i.e. minimum control. The group of buildings is programmed to undergo a refurbishment in the summer/winter and thus it provides a suitable time for the heating to be upgraded.</p> | | | | |
| Description of Works (Describe project in sufficient detail for technical overview) | | | | |
| Existing storage/panel electric heating replaced with radiators/ TRV's on a variable temperature LTHW heating circuit connected to the CHP serviced district heating system. | | | | |
| Project Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| Capital Cost (£) | Installation Cost (£) | Additional Costs (1) (£) | Total Project Cost (£) | |
| 33,500 | Incl. | 5,025.00 | 38,525.00 | |
| Energy Consumption (Taken from Pre-Project and projected Post-Project Data) | | | | |
| Pre-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 88,000 | 9,504.00 | Calc | Electricity |
| Post-Project | kWh pa (2) | £ pa (3) | Derivation (4) | Fuel Type (5) |
| | 88,000 | 2,640.00 | Calc | Gas |
| Projected Savings Cost Data (Taken from Project Compliance Checking Tool) | | | | |
| PBP (6) | kWh pa (2) | £ pa (3) | tCO ₂ pa (7) | £/tCO ₂ LT (8) |
| 4.90 | 0 | 6,864.00 | 31.00 | 545.60 |
| Derivation of Expected Energy, Revenue and CO₂ Savings (Reference to source of saving calculation) | | | | |
| <p>The energy & CO₂ savings are derived by calculation; there being no separate electric metering of the installations in 16-22 George Square data was collected on six similar buildings within the University stock and average energy figure derived, (spread sheet available).</p> <p>Revenue rates applied for electricity & gas are those standard within the University.</p> | | | | |
| Project Assessment & Timescale | | | | |
| An Assessment of Achievability (Considered view on how achievable the expected savings are) | | | | |
| In that the savings to be achieved are the direct result of a change of fuel the savings in Revenue and CO ₂ are both higher attainable. The new installation will have the benefit of both time schedule (optimised) and thermostatic control. | | | | |
| Project Risks & Mitigation (Describe project risks & measures taken to minimise or avoid them) | | | | |
| The risks involved are minimal in that the works are being carried out during a planned refurbishment period and access will be available to all areas. Provision is made in the existing CHP distribution network for the all the buildings on George Square and therefore lack of capacity is not an issue. | | | | |

| | |
|--|-------------|
| Project Timetable (Describe project implementation timetable) | |
| The project works are to take place over the summer recess period when the building will be fully decanted and access freely available. | |
| Previous Experience of Doing this Type of Project (Describe any previous experience that you may have with the proposed energy efficiency measure) | |
| The University has an extensive estate, which it has been managing for over 300 years, throughout which buildings both fabric and services have been maintained and upgraded on a continuous basis, keeping abreast of the best modern technology. | |
| Responsibilities (List those responsible for implementing the project) | |
| David Barratt / Ian Swan | |
| Notes (Give any other information relevant to the business case) | |
| | |
| Attachments (List any supporting documentation) | |
| Refer to filed spreadsheets for Energy and Budget calculations. | |
| Signed Name: Position: | Date |

Submission: Post copy to: Salix Finance, 25 Southampton Buildings, London, WC2A 1AL

Alternatively, scan a signed copy and email to admin@salixfinance.co.uk.

If you have any questions, please telephone 0203 043 8800.

Notes

- Include any and all relevant – e.g. project management
- kWh pa – annual energy consumption in kWh
- £ pa – annual cost in pounds
- Derivation – e.g. estimate or meter readings
- Fuel type – e.g. Electricity, Gas, Oil
- PBP – payback period
- tCO₂ pa – annual tonnes of carbon dioxide
- £/tCO₂LT – pounds per tonnes of carbon dioxide lifetime

For further information on the strategic approach please contact

- David Somervell, Sustainability Adviser, 0131 650 2073 David.Somervell@ed.ac.uk

and for more on the energy efficiency projects please contact

- David Barratt, Engineering Operations Manager, 0131 650 2484 David.Barratt@ed.ac.uk