Carbon Management Programme

Annual Report
2010-2011

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Canterbury Christ Church University

Carbon Management Annual Report 2010-11

Executive Summary

The first year of the Canterbury Christ Church University Carbon Management plan has proven very successful.

Carbon emissions from electricity, gas and fuel in University vehicles were down 6% compared with their baseline, exceeding the planned reduction and running just ahead of the 2016 target line for a 35% reduction.

Electricity & gas emission reductions coming from operational changes and individual action have added to the predicted decrease. Investments of £324K were made on physical infrastructure changes. The University has committed to a further £500K of investment in 2011-12.

Costs of all business related travel have been collated and from this a baseline for the related emissions established. Trials are underway with a "one stop" travel booking service to bring greater control over travel emissions.

A Waste Management working group has been established who are now actively working on procedures and practical measures to increase the University's recycling rate.

The Green Impact engagement programme involved 12 teams, over 80 team members and engagement from more than 600 staff. Each team worked through an externally audited workbook to start to embed sustainable behaviours across all Campuses.

The Student Switch off campaign ran in four residential locations, two showing a measurable improvement. Both programmes will be run again for a further two years.

The environmental champions' network has been strengthened, with a communications toolkit and master classes for engagement techniques having been developed with the specialist agency Futerra.

The operational role of the Building Wardens has been expanded to act as local promoters of reduced of energy use in their buildings.

The introduction of car parking charges has had an apparent effect on commuting behaviours. The baseline for emissions from staff and student commuting is to be established in 2011-12.

The Carbon Management Plan itself was published in February 2011 and formed a key element in the formulation of the Christ Church Strategic Plan 2010-15. The carbon reduction targets are now embedded within the overarching targets of the University's strategic plan. The activity of the carbon management team is also key in supporting other Strategic Plan initiatives such as the campus network review, space utilisation and the Futures Initiative.

Scope 1 & 2 emissions

Utility Use

Scope 1 emissions come from direct sources, which for the University means gas burned in boilers and fuel burned in owned vehicles. Scope 2 emissions are from the use of grid electricity.

Through the actions made by the University in the first year of the Carbon Management Plan these were down by vehicles were down 6% compared with their baseline. This exceeded the reduction predicted in the plan and so reductions are running just ahead of the 2016 target line for a 35% reduction.

The reductions made in Scope 1 & 2 carbon emissions compared with the 2009/10 baseline are shown in the table below.

2009/10Scope 1 & 2 Baseline	**9,407 tCO_2e**
2010/11 Planned Emissions	9,063 tCO_2e
2010/11 Actual Emissions	**8,857 tCO_2e**
Reduction from baseline	**6%**

The University committed £128K in 2009/10 and £324K in 2010/11 on funding infrastructure changes which have helped reduce consumption of electricity and gas in 2010/11. The predicted effect of these changes was 409 tCO_2e.

The actual overall reduction of 559 tCO_2e is due not only to the changes made but also due to alterations to building management systems, operational changes and not least by personal action from staff & students in engaging with the "switch off "and "turn it down" messages.

There have been also been increased consumption pressures from the full occupation of Rochester House, its integral data centre as well as an increased number of student residences, which makes the overall absolute reduction even more impressive.

In 2009/10 the University invested £19K in the installation of further Automated Meter Reading which means that 80% of the University's electricity and 56% of its gas supply is now being logged every half hour. At the end of the installation programme, during the last quarter of the year a series of "Operation & Optimisation" meetings have taken place, beginning with the campus network and Augustine House. These have looked at the consumption of utility versus the operation hours of the building and the Building Management System settings, altering start up, close down and operating temperatures and making significant savings in utilities use.

This programme will continue in 2011-12 with North Holmes Road and other Canterbury sites. A sub metering project allowing consumption by building at the North Holmes Road to be identified has been completed which will allow a greater degree of analysis in the coming year. The role of the Building Wardens has been expanded to include energy monitoring so their experience will be valuable in reviewing the Canterbury sites.

The table overleaf summarises the overall approximate net effect of the increased consumption influences and the changes and actions made.

Overall impacts of actions to reduce Scope 1 & 2 emissions	tCO_2
New data centre installed at Rochester House	282
New houses at Sergeants Parade and other head leased houses	66
Boiler controls malfunction at Salomons	52
Fuel for Salomons shuttle bus plus Fuel card payments not captured in 2009/10 data	9
Installation of Voltage Optimisation at Aug House, Hall Place, Old Sessions	-203
New Transformer installed at North Holmes Campus	-160
Cavity wall and Loft insulation in various buildings at North Holmes Campus	-26
Lighting controls and upgrades across estate	-139
E-cubes installed on numerous fridges and freezers across estate	-5
Dynamic Burner Management Units installed on boilers across the estate	-42
Loft Insulation installed at Salomons locations	-5
Ground source heat pumps switching on at Augustine House	-75
LEDs installed at Rowan Williams Court in Medway	-4
Double glazing fitted at Ramsey on North Holmes Road campus	-30
LED bollards installed at Broadstairs campus	-5
AMR installation, Optimisation meetings and BMS fine tuning across the estate	-182
Green Impact, Student Switch off and staff awareness campaigns	-82
Net Scope 1 & 2 reduction for 2010-11	-550

Energy Policy

In May 2011 the SMT approved a revised Energy Policy which maintains the commitment to create reasonable internal comfort conditions whilst setting winter set points of 21°C, confirming the University's policy generally not to cool buildings and giving a minimum summer set point 23°C where cooling is fitted. As each additional degree for heating or cooling amounts for an approximately 8% increase in utility use this is an important step to controlling carbon emissions.

Scope 3 emissions

Scope 3 emissions are those which come as a consequence of University activities but over which is does not have direct control. Christ Church will be measuring the baseline for Scope 3 emissions in the 2011-12 year. It is clear that a similar level of effort needs to be focused into reducing Scope 3 emissions as has proven successful in reducing those from electricity & gas.

The scale of Scope 3 emissions and costs in comparison to Scope 1 & 2 are summarised in the summary tables and graphs at the end of this report. The in year status against the various sources of emissions is as follows.

Water

The effective monopoly position held by the water companies allows them to operate billing based on estimates for a period spanning more than one year. For 2010/11 a status based on daily usage from 18 months billing has been used to create the projection over the year. 2010/11 consumption is therefore estimated at 117,698m^3 creating 48 tCO_2e. In year billing data only was used in 2009/10 to calculate usage which was probably therefore understated.

In 2011/12 greater effort is to be placed on gathering meter reads to give accurate consumption figures and the consideration of AMR for the main water meters

Steps are being taken to eliminate bottled water which has much higher carbon emissions. A Vivreau machine has been purchased which is now supplying still and carbonated water in reusable bottles for hospitality at Canterbury. To improve staff and student access to filtered mains water in 2011/12 £26K is being invested to increase the number of chilled filtered water fountains, the first phase of a two year programme to eliminate the £18K per annum the University spends on bulk bottled water

Waste

Christ Church has clear aspirations to improve waste management performance. The staff involved with managing the waste streams are enthusiastic to not only ensure legal compliance but also to improve on-site practices to achieve improvements in performance. Through the University's main waste contract with Viridor, a recycling rate of approximately 29% was been achieved, up 2% from 2009/10, with the remaining 71% of waste being disposed as general waste to landfill. However with increases in staff & student numbers the total volume of waste increased in year, meaning that 715 tonnes of waste went to landfill creating emissions of 319 tCO_2e.

A full audit has been conducted in year using external consultants Revise, identifying a number of lesser volume waste streams over and above the main Viridor contract. An action plan from this audit is being created, leading to a retender for the waste management contract in 2012. The University is looking to significantly increase its recycling rate across all campuses, looking to reduce the volume to landfill to 50% by 2015

Business Travel

Through improved data capture the Finance Department for 2010/11 have recorded staff business travel recorded through the expenses and finance system recording a total cost of £915K and producing 780 tCO_2e. A further £969K of cost and 1085 tCO_2 were incurred from direct student business travel for placements. The use of shuttle buses and coach travel accounted for a further 274 tonnes at a cost of £244K.. A framework for bus travel is being tendered as a consortium with University of Kent and Canterbury College, with an obligation for providers to record distances travelled as well as cost.

These figures have been created in part using carbon emission factors based on £ value. These contain a degree of over compensation where distances travelled by mode are not available. The University should now move towards improved data recording to capture where ever possible distance travelled. A pilot is being conducted with the International Office for a "one stop" travel booking service, with the service provider collating data.

Staff & Student Commuting

Carbon emissions figures for staff and student commuting still cannot be determined with a confidence level which allows them to be quoted externally. The approximate values calculated however mean that they are material in comparison with other sources. They are also important in helping to understand the benefits of the campus network.

HEFCE are implementing an obligation to quote commuting emissions in the Estates Management Statistics along with other Scope 3 emissions. Following review by the Sustainability Strategic Management Group it is considered reasonable to pass on of this obligation to students and staff.

The embedding of questions on commuting habits into staff records will be a project for implementation by Computer Information Services for 2011-12. A review will be conducted on the collection of student commuting data by survey or within registration data. For 2011-12 questions on travel habits will also form part of the planned NUSSL Sustainability Research package which can be mapped to the entire student and staff population.

The introduction of car parking charges has had an apparent affect on commuting behaviours, but without data these cannot be fully qualified. Take up of the subsidised bus passes, season ticket loans and reduced park and ride fees have been lower than expected. There has been reasonable interest in the cycle loan scheme although changes in taxation now make this less attractive.

Procurement

The commitment has been made to scope the scale of the University's procurement footprint during the plan period. The current lack of coherent data led to procurement emissions being excluded from the baseline of the Carbon Management Plan.

The Sustainable Procurement working group has been set up with an initial task to develop a Sustainable Procurement policy and an action plan for the attainment of Level 3 of the Flexible Framework. Initial analysis of the commodities likely to have the greatest carbon and sustainability impact has been conducted. This allows a targeted approach with certain departments and faculties to first measuring the procurement baseline and then developing best practice for future purchasing decisions. This work will span 2012 to 2014

Scope 3 Target confirmation

An aspirational target of a 20% reduction in Scope 3 emissions by 2020 from a 2011-12 baseline was set in the Carbon Management Plan. Completing the work summarised above should allow a firm baseline to be drawn for 2011-12 for all Scope 3 emissions sources other than procurement. After the development of specific action plans firm targets will be confirmed with the Senior Management Team and Estates Committee on behalf of the Governing body.

Sustainability Culture & Communication

Through the work of a dedicated committee and an active body of Sustainability Champions great steps are being taken towards the embedding a culture of positive action towards Environmental Responsibility and Sustainability within both students and staff at Christ Church

Green Impact

The first year of this initiative involved 12 teams, over 80 team members and engagement from more than 600 staff. Through a dedicated workbook these teams assessed the status of the environment and work habits against a wide range of environmental criteria. After assessment by auditors recruited from the student body Bronze, Silver and Gold awards were made at the end of the year. The programme was welcomed by all participants and will continue and expand over the coming two years

Student Switch Off

This initiative is run nationally by the NUS and was championed locally by the Accommodation Office. At the Fresher's fair interested students were enrolled in a competition for the greatest reduction in energy use between the Lanfranc, Pin Hill, Parham Road and Northwood Court residences. Three out of the four achieved lower use with prizes given to the groups as a result. This too will be repeated in the coming year. Learning from the experiences of trying to engage students the Accommodation Office will be recruiting Student Environmental Wardens in the first term of 2011-12

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Using the specialist environmental communication agency Futerra through a series of workshops a toolkit for use in sustainability communications has been developed and rolled out to the Sustainability Champions through a series of masterclasses. The central theme of Transformation links the University's primary purpose, the Education for Sustainable Development activity and the Environmental Responsibility direction within the strategic plan. Using the tool kit empowers local teams to create their own messaging on sustainability issues whilst keeping a coherent theme and direction common across all Christ Church campuses.

As well as the continuation of these initiatives for 2011 -12 emphases will be placed on the local feedback of energy use to building and green impact teams, a review of the drivers behind the staff business travel and student placement travel, the impacts on staff and students of achieving greater space utilisation and the scoping of projects for reduction in all Scope 3 emissions.

Financial Impact

Carbon Management Costs and Benefits

In 2010-11 Christ Church invested £324K in initiatives and projects to reduce carbon into projects, the bulk of which was funded from Salix four year interest free loans. The financial payback on this investment was projected at 3.3 years and the carbon reductions expected have been met or exceeded. At current prices the cost avoided in utility spend in 2010-11 through these savings was £96K .

Building on this early success the University has allocated £500K for the delivery of further projects in 2011-12. In the Carbon Management Plan the projected spend for the coming year was £682K and a bid to HEFCE's Revolving Green Fund (RGF) will be made in October to meet or exceed the shortfall.

A control procedure has been put in place to ensure that management review of the carbon and cost metrics is being made using the Carbon Trust project tools before sign off. This process also promotes a balance between short and longer payback projects, whilst ensuring that reduction in carbon is maximised for the expenditure. This is to ensure that projects which have sub five year paybacks can be promoted to applications for RGF and Salix funding where available, whilst the University invests beyond the "low hanging fruit" for carbon savings with a slower rate of return.

The success of the Carbon Management Plan has also led to the strengthening of the internal sustainability & environment team. The Carbon Reduction Engineer post has been made permanent, having clearly been self funding. A Sustainability Engagement Officer has been recruited and the part time Green Impact Assistant role renewed. In a related move a new post has been created to lead the Futures Initiative to embed sustainable development within the curriculum.

Rising Utility Costs

When last tendered in 2010 electricity prices were fixed for two years and gas for three years. With rising market costs the utility companies having recently announced price rises in the order of 18% per unit. 2011-12 budgets had assumed an effective 13% increase accounting for 6% reduced consumption and a 7% net cost increase for electricity. Cost rises above this will generate budget pressures which will need to be offset elsewhere.

2011-12 Key Activities

Key activities for the Carbon Management Plan for the coming year include the following

Reduction Projects

Delivery of further reduction projects against the approved £500K of capital funds to focus on lighting replacement and/or controls, draught stripping and insulation projects across all campuses and residences. The potential for voltage optimisation by transformer replacement at Medway will be reviewed. A bid to HEFCEs revolving green fund will be made for sub 5 year payback projects.

Renewable Energy

Feasibility studies will be completed and recommendations as appropriate for in year or subsequent year spend for: Solar Photovoltaic panels at appropriate locations, Solar Hot Water for Lanfranc, Combined Heat & Power at North Holmes campus and Biomass at Salomons .

Operation & Optimisation

Active management of building energy controls to best match them to occupation and use has been shown to deliver great rewards at low/no cost. By engaging with the Building Wardens with feedback on energy use on an hourly, daily and annual basis the impact of changes can be measured and fed back to building occupants.

Vehicle Fleet

Development of a 5-7 year replacement programme for the existing small fleet of University vehicles with the best combination of lower emissions vehicles.

Waste

Recommendations from a recent Waste Audit will be implemented by the Waste reduction working group in a move to improve our recycling rate above the current 29%.

Environmental Research Project

The University has engaged NUSSL to run a comprehensive survey and research project to truly gauge the attitudes to the environment of Christ Church students and staff which will act as a bedrock for future engagement activity. This will also survey current travel modes to help inform further actions for the Travel Plan.

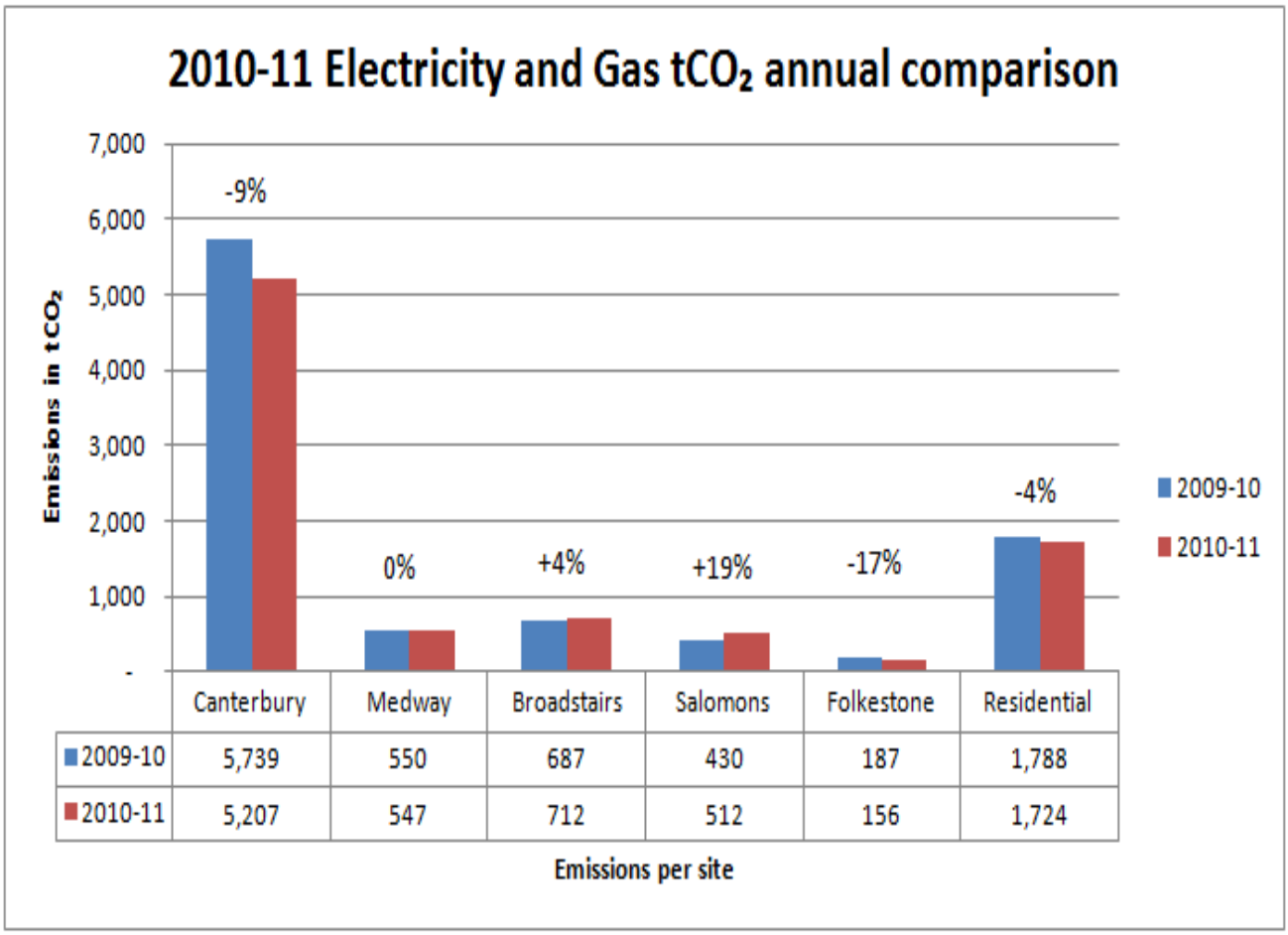
Green Impact

Recruitment of further staff teams across all departments and faculties to help inform their environmental behaviours at work. Sustainability Champions will be empowered and encouraged to create local sustainability messaging with their teams.

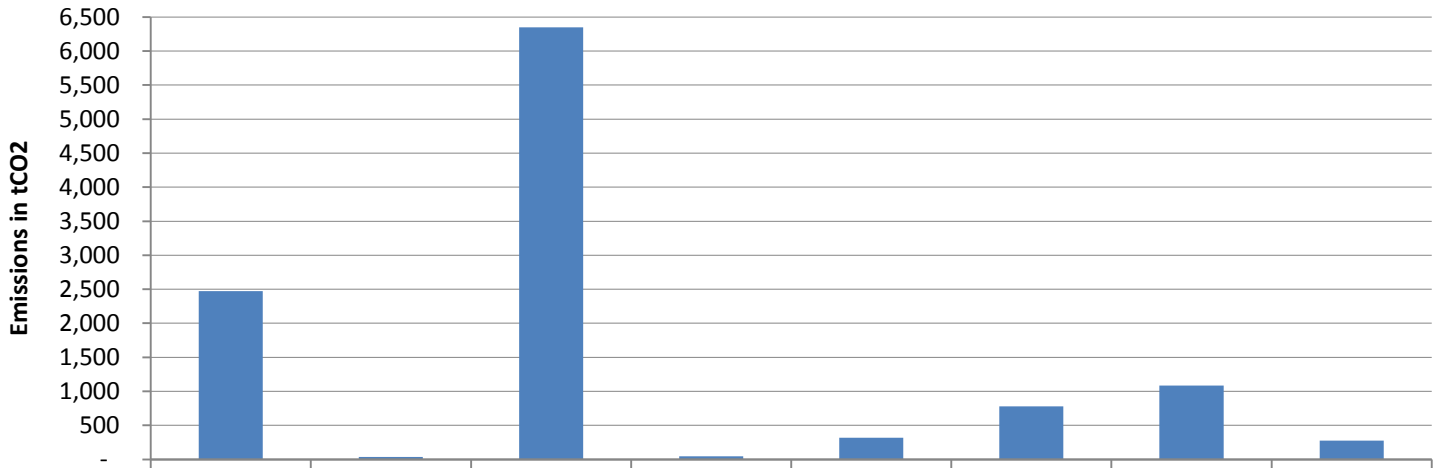
Student Switch Off

As well as running the Switch Off competition again the Accommodation Office will be recruiting and rewarding Student Environmental Wardens in residences to act as local champions on all environmental issues.

2010-11 Carbon Footprint data



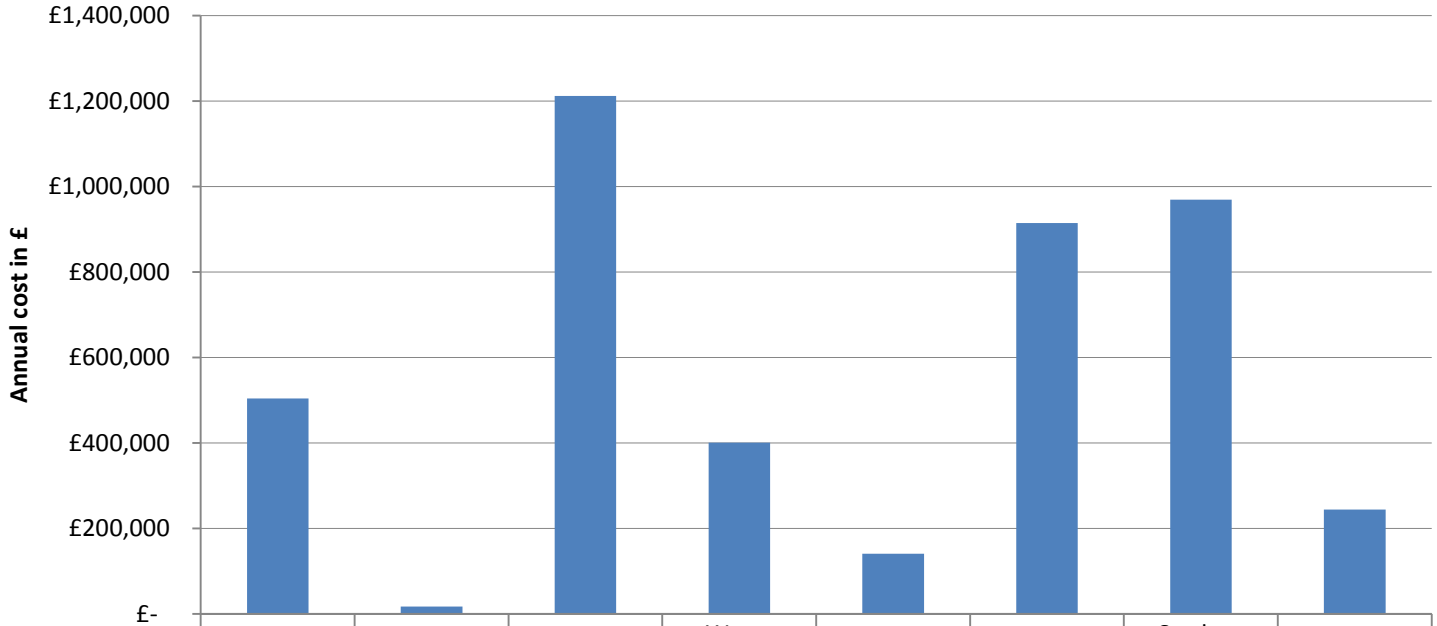
2010-11 Scope 1,2,3 annual emission comparison



	Gas	CCCU Vehicles	Elec	Water Consumption	Waste to landfill	Business travel	Student placement travel	Coach Hire
Scope 1,2,3	2,474	37	6346	48	319	780	1,085	274

Emission breakdown

2010-11 Scope 1,2 and 3 annual cost



	Gas	CCCU Vehicles	Electricity	Water Consumption	Waste to Landfill	Business Travel	Student placement travel	Coach Hire
Scope 1,2,3	£504,361	£17,662	£1,211,436	£401,016	£140,993	£914,579	£969,186	£244,623

Cost breakdown

Breakdown of measured Carbon Emissions for 2010-11

Scope	Emission Source	Data type	2010/11 usage	Units	Cost 2010/11	tCO_2e/ unit	Tonnes CO_2e	% change from 2009/10
1	Gas	Meter readings	13,356,474	kWh	£504,361	0.18523	2474	-9.5%
1	CCCU Vehicles	Invoice data	14,011	litres	£17,662	2.6720/ 2.3220	37	39.0%
2	Electricity	Meter readings	11,638,676	kWh	£1,211,436	0.54522	6346	-4.5%
3a	Water Consumption	Water Bills	117,698	m^3	£401,016	0.404	48	N/R
3a	Waste to landfill	Viridor records	715	tonnes	£140,993	447	319	11.2%
3a	Business Travel - Car	Expenses	1,385,612	miles	£551,237	0.3955	548	3.3%
3a	Business Travel - Motorcycle	Expenses	2160	miles	£547	0.1908	0.4	N/R
3a	Business Travel - Bus	Expenses	225	Claims	£2,082	1.12kg/£	2.3	N/R
3a	Business Travel - Taxi	Expenses	849	Claims	£22,228	£2.33/km 0.2149 $kgCO_2/km$	2.1	N/R
3a	Business Travel - Train	Expenses	3595	Claims	£228,001	£0.121/km 0.0565 $kgCO_2/km$	107	N/R
3a	Business Travel - Ferry	Expenses	11	Claims	£1,040	4.05kg/£	4.2	N/R
3a	Business Travel - Air	Expenses	280	Claims	£109,444	1082kg/LH 207kg/SH 161	116	N/R
3a	Student - placement travel	Expenses	3895	Claims	£969,186	1.12kg/£	1085	N/R
3a	Coach Hire	Purchase ledger	358	Invoices	£244,623	1.12kg/£	274	N/R
					£4,403,856		11,363	