

Annual Environmental Report 2013/2014



One University – shaping our future

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Statement

Professor William Stephens
Chair of Board for Energy & Environment



As an exclusively postgraduate university Cranfield prides itself on being a global leader for education and transformational research in technology and management. A core part of this mission and our Corporate Plan is the development of a sustainable estate to ensure the University practices what we teach.

Cranfield University has achieved a number of its environmental targets in the past 12 months and made good progress against others as outlined in this 2013/14 annual report. Our Key Performance Indicators are summarised below with detailed explanations of progress for individual targets outlined on the following pages.

A key achievement of which the University is extremely proud is being awarded, once again, a Highly Commended Green Gown Award, this year in the Continuous Improvement: Institutional Change category. This was in recognition of the last 5 years of progress Cranfield has made to reduce its environmental impacts. A special thank you must be mentioned to our staff and students who have been instrumental in supporting and contributing to the on-going improvements we have made in 2013/14. We are also grateful to the on-going support and guidance from contractors, partners and others who have helped us to meet our continual improvement aims.

Key performance indicators

Issue	Description	Progress	Target	By when
Carbon	Scope 1&2 emissions ¹	20%	50% reduction	2020
Waste	Total weight produced	0%	10% reduction	2020
Recycling	Segregated on-site	42%	75% of total waste	2020
Travel	Single occupancy car use	3%	10% reduction	2017
Water	Consumption volume	27%	10% reduction	2015
Community	'Green' Volunteers	5%	10% of staff & students	2015
Discharges	Effluent permit levels	55%	50% below permit levels	2020

¹ Scope 1 emissions are direct emissions from owned or controlled sources relating to energy and fuel use. Scope 2 emissions are indirect emissions from the generation of purchased energy.

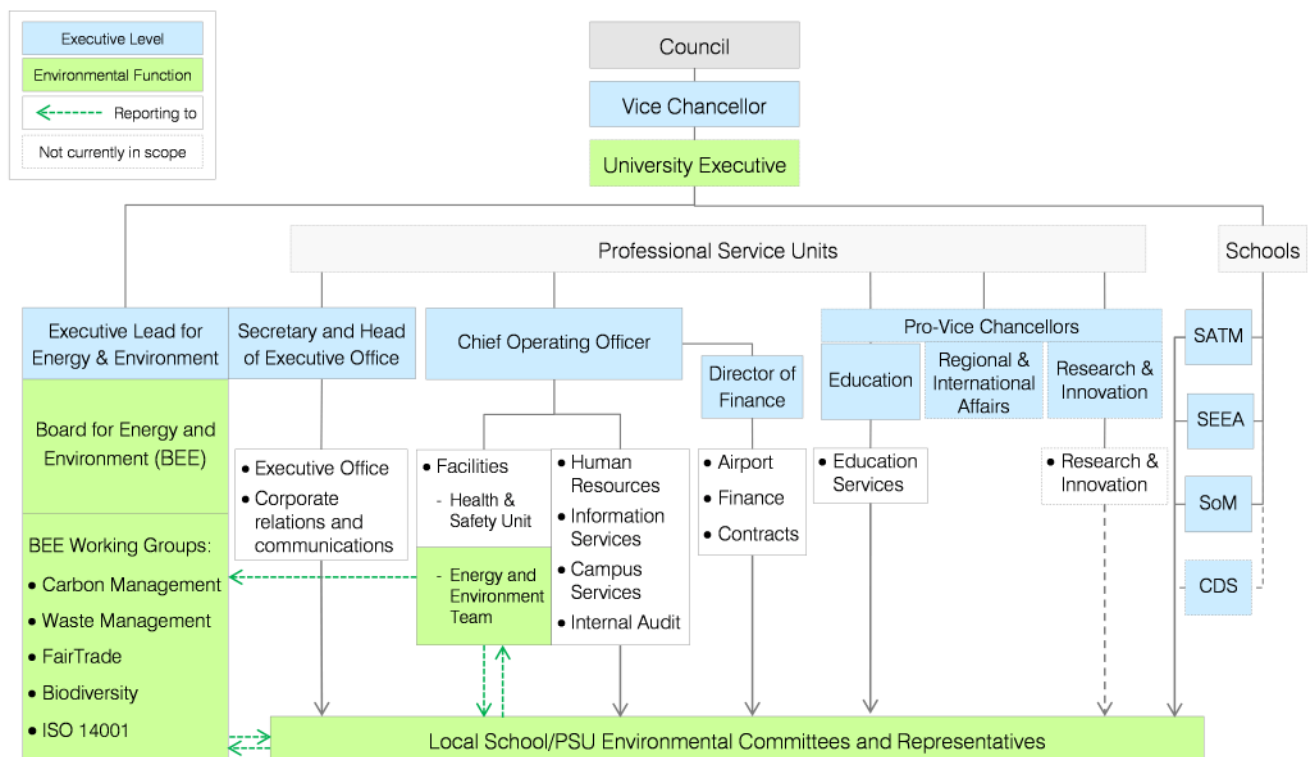
Environmental Objectives

Issue	Objectives	Why
Carbon & Energy	Reduce absolute Scope 1 & 2 carbon emissions by 30% in 2015/16 and 50% in 2020/21 from a 2005 baseline	Supports '5' of Plan 415i - reduces operating costs & meet HEFCE sector target
Waste & Recycling	Reduce absolute total waste by 5% in 2017/18 and 10% in 2020/21 against a 2010 baseline Increase segregated waste reused or recycled to 50% of waste produced in 2015/16 and 75% in 2020/21	Supports '5' and 'i' of Plan 415i - reduces operating costs & demonstrates best practice to staff & students
ISO 14001	Achieve certification for all Schools and Services on the Cranfield Campus in 2013 – <i>awarded in October 2013</i>	Supports 'i' of Plan 415i - demonstrates best practice to staff & students
Travel	Reduce staff commuting in a single occupancy car by 10% in 2017/18 from a 2012 baseline	Supports '10' of Plan 415i - reduces road congestion
Water, Emissions & Discharges	Reduce Cranfield Campus water consumption by 10% in 2015/16 from a 2009 baseline To reduce pollutant load exiting our sewage works by 30% in 2017 and 50% in 2020/21 below permissible discharge consent levels	Supports '5' of Plan 415i - reduces operating costs & demonstrates best practice to staff & students
Fairtrade & Sustainable Procurement	In line with the HEFCE Sustainable Development Strategy achieve level two, or above, across all five themes of the Government Sustainable Procurement Action Plan in 2015/16 Achieve Fairtrade University status in 2014 – <i>certificate awarded in September 2013</i>	Supports '10' and 'i' of Plan 415i - reduces operating costs & demonstrates best practice to staff & students
Sustainable Buildings & Infrastructure	Achieve BREEAM Excellent for new buildings and all major refurbishments from 2012/13	Supports '10' and 'i' of Plan 415i - reduces operating costs & demonstrates best practice to staff & students
Biodiversity	Produce a Biodiversity Action Plan for the Cranfield Campus in 2014 Increase farmland bird species on University grounds by 10% by end of 2015/16 academic year from 2013 baseline Increase area set aside on University grounds for conservation by 50% by 2015/16 academic year from 2013 baseline.	Supports '10' and '5' of Plan 415i - reduces operating costs & improves wellbeing of staff & students
Community Involvement	To ensure environmental awareness training is delivered to all staff and students from 2013 To encourage environmental volunteering with 10% of staff and students participating in 2015/16 To develop a plan to strengthen links with the local community on environmental issues	Supports '10' of Plan 415i – encourages collaborative working and ensures base level of knowledge amongst staff & students

Quality Assurance

Governance

The Board for Energy & Environment (BEE) was established in 2011 to report to the Cranfield Executive and Council on energy and environmental issues. The priority aim of the Board is to ensure Cranfield University demonstrates a leading capability in environmental performance by providing oversight and direction. The Board consists of senior managers from across the University and is chaired by a member of the Executive. The Board has established a number of working groups, whose members are drawn from operational and academic staff and students, to progress key environmental targets. A dedicated Energy & Environment Team facilitates the delivery of the energy and environment objectives and reports progress to the Board on a regular basis. The Board also has the ambition of ensuring a close relationship between BEE’s environmental activities across the University and the teaching, learning and research taking place within the Schools on environmental best practise. During 2013/14 Cranfield University has been moving across to a new Governance structure as outlined below:



(Contact details for key environmental representatives are provided on page 16.)

Scope of Reporting

The environmental objectives on page 4 encompass activities taking place on the Cranfield Campus including subsidiary companies and tenants based on site (see Note 1 on page 15). The University’s operation at COTEC is included and also historically Silsoe Campus. Unfortunately reporting for Shrivenham Campus, where we are a tenant, is not included at this stage as no data is available (See Note 1, page 15 for further details).

ISO 14001

Cranfield has established an Environmental Management System that provides a framework for managing and reducing Cranfield's environmental impacts, establishes programmes to help achieve our environmental objectives and tracks the reporting of environmental incidents as part of our continual improvement process. Cranfield was proud to achieve campus-wide certification of this management system to ISO14001:2004 in October 2013 when the School of Engineering (now the School of Aerospace, Transport and Manufacturing), Cranfield Airport and Cranfield Press were brought in scope with the previously certified Schools and Service Departments.

Thirty environmental incidents were reported in 2013/14; these included:

- Two incidents related to inappropriate waste storage or disposal,
- Six small scale spills/leaks, mainly due to laboratory or workshop equipment failure ,
- Nine reports of nuisance odours, predominantly associated with aviation activities,
- Eight unapproved discharges to drains, all contained before release to the Brook,
- One larger scale fuel/oil spill identified in Chicheley Brook which was traced back through the campus storm drains. Containment booms were positioned in the Brook and multiple clean-up operations took place to safely remove the oil material from the watercourse,
- Two minor non-compliances were raised by the Environment Agency with regards to the operation of the Sewage Treatment Works when slight failures in sampling against in environmental permit conditions occurred. These were not raised as formal enforcement notices due to the marginality of the non-compliance. Improvements to the monitoring equipment were made during the year to prevent such occurrences in the future.

We are however in a climate of continual improvement, which is the foundation of ISO14001, so encourage the reporting of all environmental incidents and near-misses to learn and advance.

Other reporting

In line with HESA requirements the University submits environmental data as part of the annual Estate Management Reporting statistics. This data specifically attempts to exclude tenant data and therefore can differ slightly from figures which appear in this report. As part of the CRC Energy Efficiency scheme requirements the University provides energy data to the Environment Agency on an annual basis; the scope of CRC reporting is slightly different to that of this report and HESA statistics. The data submitted to HESA is also used by the Green League to which supplementary information is requested. In support of the sector concerns over the changes to the Green League methodology Cranfield chose to not voluntarily participate in the 2014 Green League. Instead a more detailed overview of Cranfield's environmental credentials will supplement this report, being made available on the University website in December 2014.

Base year recalculation policy

Base year figures are reviewed from time to time ensure like for like reporting. In 2013 the University sold Sudbury House Hotel prompting a recalculation of the base-year carbon emissions data and subsequent years to remove reference to this asset. (See Note 2, page 15 for details.)

Carbon and Energy



Reduce absolute Scope 1 & 2 carbon emissions by 30% in 2015 and 50% in 2020 from a 2005 baseline

- Milder winter
- Grid emissions went up 11% in 2013/2014
- District heating development
- Energy efficiency investment



In 2007/8 Cranfield's carbon emissions peaked at over 20,000 tonnes and a detailed carbon management plan was developed to start proactively reducing these with a 50% reduction target in emissions set to achieve by 2020.

Carbon	2005/06*	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14
'000 tCO ₂ e	18,468	18,050	20,787	19,727	17,807	16,286	14,620	15,745	14,858

(*HEFCE require the University to set a carbon reduction target against a 2005/06 baseline year. See Note 4, on page 15 for further details.)

A milder winter helped reduce emission but this was offset by a big increase in the national electricity grid emission factor. Nevertheless, a saving of 6% was made on the previous year and the overall saving is now 20%.

Key Achievements:

- Biomass boiler tendered and selected to be installed in October 2014.
- New energy recharging system introduced with improved monitoring and targeting.
- £151,000 spent on SALIX energy projects (96% of available funds).
- Energy strategy developed as part of Campus Masterplan.



Plans for 2014/2015:

- In April 2013 we secured a HEFCE loan to invest in a 1 MW Biomass Boiler. This project will be developed for operation in 2014/2015
- Further development of energy monitoring and targeting
- Student house gas brought under University management
- Continued investment in energy efficiency via Salix loans
- More campaigns to improve energy efficient behaviour
- Progress large energy projects (Solar PV and District Heating)

Water, Emissions and Discharges



Reduce Cranfield Campus water consumption by 10% in 2015 from a 2009 baseline

To reduce pollutant load exiting our sewage works by 30% in 2017 and 50% in 2020 below permissible discharge consent levels

- Automatic metering of water consumption extended to more buildings
- Investment in infrastructure and monitoring controls at the Sewage Works to prevent effluent discharge above permit levels by activating automatic recirculation pumps
- Supported MSc thesis project investigating phosphate discharges from the Sewage Works



The saving in consumption is now 26.8%. Having reached beyond the 10% water reduction target by 2013 and greatly improved our average sewage works discharge concentration the Board for Energy & Environment agreed to review and set new stretching water and discharge targets for 2014/15.

Indicators	2009/10	2010/11	2011/12	2012/13	2013/14
Water use m ³	184,860	168,013	156,265	160,521	135,366
Discharges (average % below consent)	25	31	46	43	55

(See Note 5, on page 15 for further details.)

The University Sewage Treatment Works encompasses a cutting edge research facility used by staff and students on campus. This year the Energy & Environment Team supported an MSc research student to investigate the contribution of the University to phosphate discharged into the Chicheley Brook and the effects of phosphate on the local microbial population.

Plans for 2014/2015:

- Continued investment in Sewage Works infrastructure and signage to better promote this unique teaching and research facility
- Extend automatic metering of water consumption to teaching facilities and offices



Waste and Recycling



Reduce absolute total waste by 5% in 2017 and 10% in 2020 against a 2010 baseline

Increase segregated waste for reuse or recycling to 50% of waste in 2015 and 75% in 2020

- Clearer signage and information
- Simplified recycling options
- Improved recycling bins
- CSA Recycling Centre opened
- WARPit reuse trial
- Pilot collection of housing waste with campus bins



Cranfield segregates over 20 different waste streams on campus for off-site reuse, recycling or remanufacture. Further to this any general waste collected from campus is sorted at a Materials Recovery Facility resulting in an overall 70% recycling rate of waste produced from the Cranfield campus. Whilst overall waste increased in 2013/14 this is in part due to a large increase in quantities of hazardous waste sent for disposal, likely as part of the OHSAS 18001 implementation across campus and a large scale clean-up operation in the Brook.

Waste Indicators	2010/11	2011/12	2012/13	2013/14
Total waste (tonnes)	1159	1130	1134	1206
Segregated on site to recycle (tonnes)	317	397	423	509
Total recycled overall (tonnes)	492	796	803	865

(See Note 6, on page 15 for further details.)



Plans for 2014/2015:

- More recycling bins across office areas to support zero desk-bin policy
- Link in food waste disposal with on-site AD research facility
- Further improve data capture for non-contracted waste options
- Refurbishment of waste yard on campus to include capture of bin weight data for individual buildings
- Roll-out campus collection service to shared houses and Martell House

Travel



Reduce staff commuting in a single occupancy car by 10% in 2017 from 2012 baseline

- New bus service successfully implemented with more staff and students using it
- New cycle path installed connecting the south of the campus with the village.
- Further cycle hoops installed
- Car share workshops held and cycle training arranged
- Travel surveys undertaken in autumn and spring
- Improved data capture of staff travel mileage



The priority target in the Travel Plan is to reduce single occupancy car use by 10% over the next five years. A travel survey in Spring 2012 identified that 76% of staff journeys to work are by car on their own, a further 14% car share but only 3% use a bus and 4% cycle. A repeat of this survey in Spring 2014 showed a reduction in single occupant car journeys to 73% and an increase in bus journeys from 3% to 7%.

Objective	2006/07	2011/12	2013/14
Single occ. car use	86%	76%	73%

To reduce car use and increase options for students the focus continues to be on improving the frequency and capacity of the bus service and improvements for the safety of staff and students walking or cycling from Cranfield village.

Plans for 2014/2015:

- Increase frequency of UNO bus services
- Improve / increase facilities for cyclists on campus
- Incorporate scope 3 travel emissions targets within Carbon Management Plan



Fairtrade and Sustainable Procurement



In line with the HEFCE Sustainable Development Strategy achieve level two, or above, across all five themes of the Government Sustainable Procurement Action Plan in 2015

Achieve Fairtrade University status in 2014

- Fairtrade University status awarded to Cranfield in October 2013
- More events held during Fairtrade fortnight 2014 including a popular chocolate fountain
- Scope 3 emissions calculated for procurement spend
- Applying sustainability scoring criteria for larger capital projects



The Fairtrade Working Group helped the University to achieve Fair Trade Status for the University earlier than expected. Their focus now is on improving and maintaining that status by continuing to promote and develop opportunities for Fair Trade products on campus.

Due to a lack of demonstrable benefits and a focus on other work there has been no substantive progress to achieve level two of the Government Sustainable Procurement Action Plan. Instead a key focus of the Procurement team has been to incorporate sustainability scoring criteria within the tender process for larger capital projects. The Projects Team have also worked with the Energy & Environment Team to develop an environmental questionnaire which contractors must complete as part of approval process prior to works commencing on site. Tools from the Southern Universities Procurement Consortium have also enabled the calculation of scope 3 emissions for procurement spend at the University.



Plans for 2014/2015:

- Identify new sustainable procurement target
- Extend Fairtrade products available on campus
- Investigate suitability of adopting Soil Association Catering Mark
- Incorporate scope 3 procurement emission targets within carbon management plan

Biodiversity



Produce a Biodiversity Action Plan for the Cranfield Campus in 2015

Increase farmland bird species on University grounds by 10% by end of 2015/16 academic year from 2013 baseline

Increase area set aside on University grounds for conservation by 50% by 2015/16 academic year from 2013 baseline.

- New biodiversity targets set
- Conservation areas extended
- Bioblitz event held with Bedfordshire Natural History society
- More bird boxes and new bat boxes
- Popular biodiversity walks
- Student project on GIS campus data



Grassland management on campus has in the past been based on keeping the grass as short as possible all across the site. This has prevented natural wild flowers and grasses to grow and provide food and shelter for bees, butterflies and birds. Opportunities are now being taken to change the management regime in key areas (designated as conservation areas). This is to encourage local flowers such as the Bee Orchid. Wild flower mixes have also been sown as part of a research project² and for amenity. The current plan is to increase the area set aside for conservation by 50% by 2015/16 and to monitor farmland bird species.

Biodiversity indicators	2012/13	2013/14
No. Farmland bird species	13	13
Campus conservation areas (m ²)	1320	1470

Plans for 2014/2015:

- Formalise 'Living Lab' opportunities on campus
- Develop GIS mapping of campus



² Urban BESS is part of a national project focusing on Biodiversity, Ecosystem Services and Sustainability. This research is funded by NERC and undertaken by Essex, Sheffield and Cranfield Universities.

Community Involvement



To ensure environmental awareness training is delivered to all staff and students in 2013

To encourage environmental volunteering with 10% of staff and students participating in 2015

To develop a plan to strengthen links with the local community on environmental issues

- Challenging carbon contest
- Student switch-off success
- Bigger & better Green Moveout
- Green Gown Awards recognition
- Successful Clean-Up event



Cranfield were delighted to be awarded a ‘Highly Commended’ Green Gown Award in the Continuous Improvement: Institutional Change category in November. A big part of this achievement is due to the commitment of staff and students in supporting ‘Cranfield Green’ events. As a thank-you the Energy & Environment Team held a Champions Awards ceremony as part of this year’s Green Week which also took place in November.

Community Indicators	2012/13	2013/14
Number of Champions/Volunteers	275	238
Percentage of Staff and Students	6.5	5.3

During Green Week a number of tours and exhibits were held with a different environmental theme each day to encourage staff and students from all disciplines to get involved. The number of Green Champions fell this year due to the lower number of students participating in the Student Switch Off campaign compared to previous years. A concerted effort to work more closely with the CSA in 2013/14 will be made to reverse this decline in champion engagement.



Plans for 2014/2015:

- Closer working with CSA Green Team
- E-Learning Environmental Awareness module available
- Focused champion engagement events to support behaviour change
- Green Week

Sustainable Buildings and Infrastructure



Achieve BREEAM Excellent for new buildings and all major refurbishments from 2013

- Campus Masterplan developed
- Approval for AIR Centre
- Standards for new fittings and infrastructure developed
- Refurbishment of houses and flats
- Environmental Questionnaire now part of contractor appointment

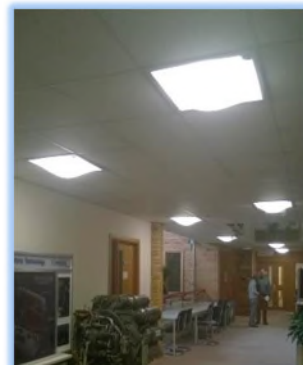


There has been further investment in energy efficient lighting using the Salix revolving fund. Salix SEELS funding was also secured for the District Heating, further improving the control and operation of the heating network. The biomass boiler project was tendered and a turnkey supplier selected.

HEFCE funding has been secured to support the development of a new research facility, the Aerospace Integration Research Centre, with Airbus and Rolls-Royce co-investment partners of the project. This facility will be constructed to a high sustainability standard with the intention to achieve BREEAM Excellent in line with our Environmental Objectives for all new buildings on campus.

Plans for 2014/2015:

- Development of ZeroCarbon standard for new buildings to go beyond BREEAM Excellent
- Further development of District Heating scheme



Notes:

1. **Objectives:** Baseline and target years refers to the academic year August to July (for example for the Carbon target the baseline year 2005 is academic year 2005/2006 and the 50% target is to be achieved in year 2020 which is academic year 2020/2021).
2. **Scope:** Tenants are included because it is often not possible to distinguish what is and is not a direct impact of the University as opposed to an impact of others operating on site. Examples include waste, car travel, some aspects of energy and water consumption and sewage discharges. As measurements and monitoring on site improve then this may become easier to distinguish, however there remains another reason for including tenants. In many cases the University is providing utility and other services to the tenants and therefore in a position as landlord and service provider to influence their behaviour and assist in the reduction of their environmental impacts, whilst at the same time having an interest in minimising the risks these bring to the University. The converse applies to the University's other Campus at Shrivenham. Here the University is a tenant on an MOD site where there is not information available on the energy, water use or waste. Therefore it is not possible at this stage to include this Campus within the targets. However when information becomes available this will be reviewed
3. **Base Year Recalculation Policy:** Cranfield University will ensure that its Greenhouse Gas (GHG) reporting is up to date, accurate and consistent with current Government guidance. In particular when there are structural changes which have a significant effect on the baseline and the reported progress towards targets then the baseline and if necessary data for years in between will be recalculated.
Base year recalculation: It is important that progress is measured on a like for like basis. This means that any changes in calculation methodologies just be applied to the previous figures as well as current figures.
Structural changes will include: mergers, acquisitions, and divestments; outsourcing and insourcing of relevant activities; changes in calculation methods or improvements in the accuracy of factors, such as emission; factors, or activity data that result in a significant impact on the base year figures; discovery of significant errors, or a number of cumulative errors that is collectively significant .
The recalculation will be triggered and reported if the structural changes would result in a change of greater than 2% in the total baseline figure. At the same time any errors in the current year reporting greater than 2% will be amended and relevant reports updated or notes attached explaining amendments.
4. **Changes to carbon data:** Our carbon footprint has been restated for all years in order to account for material changes to the conversion factors provided by Defra for company reporting purposes. They do not compare directly with previous figures reported in the University Financial Statement. See also our baseline recalculation policy above. Note the figures include emissions for tenants on Cranfield Campus, Silsoe Campus, COTEC and subsidiary companies including Sudbury House Hotel. The figures also include Martell House which was acquired in 2011 and the baseline has been recalculated accordingly. They exclude Shrivenham Campus.
5. **Water consumption and discharges figures:** These are for Cranfield Campus including tenants. COTEC and Shrivenham data is not included. Discharges are taken as the average of the three consent targets.
6. **Waste Figures** These are for Cranfield Campus and include some if not all tenant waste. Note that the key performance indicator for recycling is waste segregated on site. However the waste contractor further segregates waste at their depot. This pushes up our overall recycling performance and it is this figure which is reported in the HESA Estates Management Reporting. We are working more closely with local charities and organisations. Examples include collecting reusable goods from students as they leave the University and passing these on to a local homeless charity, Emmaus, to resell; students volunteering to plant trees in the community forest and the University working closely with the local Parish and Unitary Councils.
7. **Academic Expertise:** Wherever possible the University is making use of the academic expertise and facilities to enhance its response to environmental improvement. At the same time the estate is offering opportunities for research and teaching. Examples of this include energy audits carried out by SoE students and SAS laboratories sampling local discharges. The new Combined Heat and Power (CHP) unit is regularly use as a real life demonstration for teaching.

Key Contacts:

BEE Working Groups:

- Biodiversity Chair: Professor Jim Harris
- Carbon Management Chair: Mr Gareth Ellis
- FairTrade Chair: Mr Ian Sibbald
- ISO 14001 Chair: Mrs Alice Golightly
- Waste Management Chair: Dr Philip Longhurst

If you have any queries on any other topics outlined within this report or would like to provide us with feedback on anything in this report please contact the Energy & Environment Team via green@cranfield.ac.uk

For further formation please look for our environmental pages on the University website: <http://www.cranfield.ac.uk/about/governance/corporate-responsibility/> or the internal website: <https://intranet.cranfield.ac.uk/EnergyEnvironment/Pages/default.aspx>