Cranfield UNIVERSITY

Annual Environmental Report 2012/2013

Board for Energy & Environment
March 2014

Contents

Statement

Professor William Stephens
Chair of Board for Energy & Environment

Cranfield's mission is to be an exclusively postgraduate university that is a global leader for education and transformational research in technology and management. Sustainability is therefore at the heart of everything we do. This includes how we manage our estate and involves all our staff and students.

This report provides an overview of the many environmental improvements delivered across the Cranfield University estate in 2012/2013 and highlights progress across our key environmental objectives including carbon, water, waste, travel, biodiversity, buildings, community involvement and procurement along with plans for next year.

The University is committed to the continuous improvement of its environmental performance. For many of these objectives we have included key performance indicators with measurable targets summarised at the foot of this page.

Improving our environmental performance also provides other benefits to the University and to our staff and students. For example improving the efficiency of our heating systems will also often provide better thermal comfort; installing new efficient lights reduces maintenance costs and improves lighting levels; introducing conservation areas not only encourages butterflies and song birds but also enhances the work experience for people and improves their wellbeing.

The wide range of improvements highlighted in this report would not have been possible without the support and contribution of many staff and students. Our thanks to them and also to the contractors, partners and others who have helped us to make the progress we have.

Key performance indicators

Issue	Description	Baseline year	Progress against baseline	Target		By when
Carbon	Scope 1&2	2005	14%	50%	reduction	2020
Waste	Total	2010	2%	10%	reduction	2020
Recycling	Segregated	2010	37%	75%	overall	2020
Travel	Car use	2012	0%	10%	reduction	2017
Water	Consumption	2009	13%	10%	reduction	2015
Community	Volunteers	2012	6%	10%	overall	2015
Discharges	Sewage	2012	43%	50%	reduction	2020

Environmental Objectives

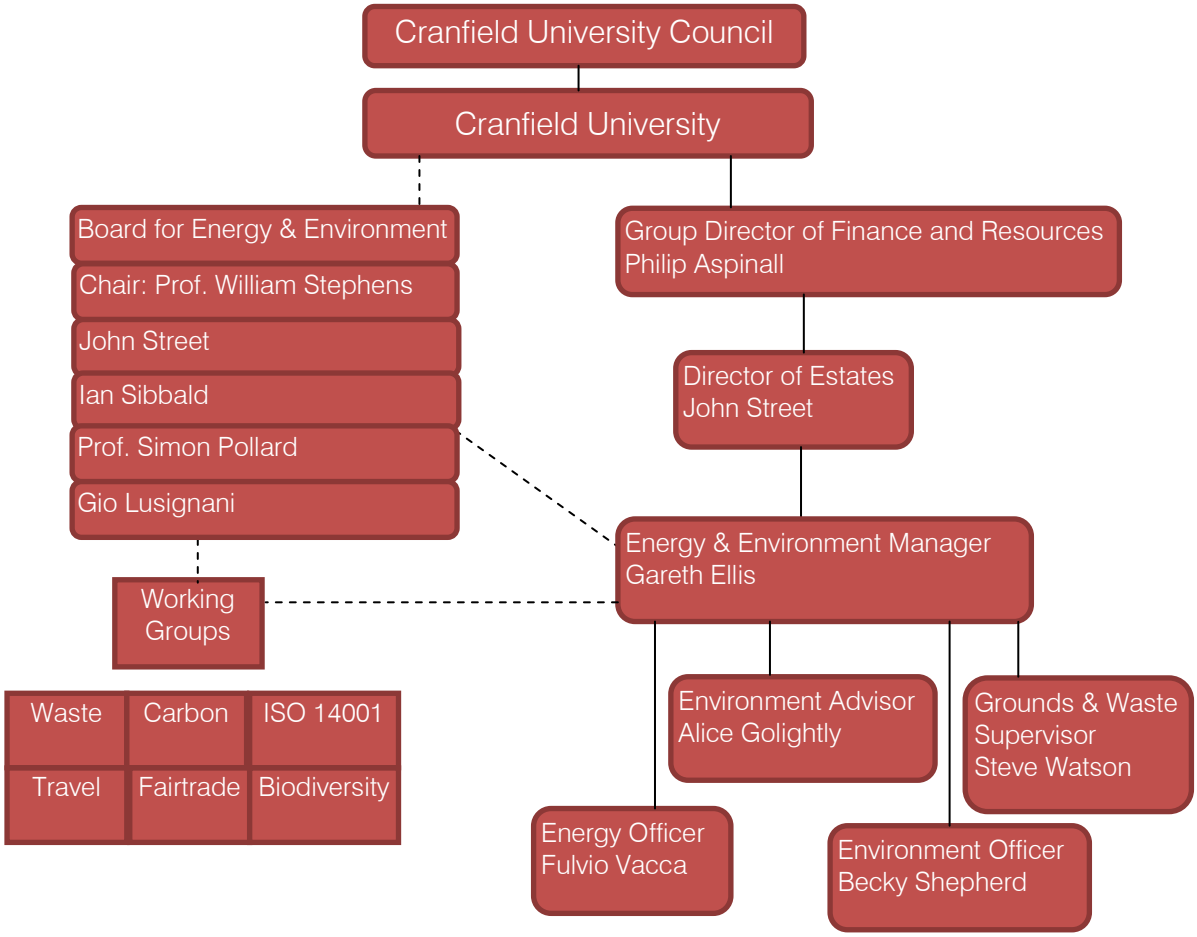
Issue	Objectives
Carbon & Energy	Reduce absolute Scope 1 & 2 carbon emissions by 30% in 2015 and 50% in 2020 from a 2005 baseline
Waste	Reduce absolute total waste by 5% in 2018 and 10% in 2020 against a 2010 baseline
	Increase segregated waste reused or recycled to 50% of waste in 2015 and 75% in 2020
ISO 14001	Achieve certification for all Schools and Services on the Cranfield Campus in 2013
Travel	Reduce staff commuting in a single occupancy car by 10% in 2017 from a 2012 baseline
Water, Emissions & 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
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
	Achieve Fairtrade University status in 2014
Sustainable Buildings & Infrastructure	Achieve BREEAM Excellent for new buildings and all major refurbishments in 2013
Biodiversity	Produce a Biodiversity Action Plan for the Cranfield Campus in 2015
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

* Year refers to 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)

Quality Assurance

Governance

The Board for Energy & Environment 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.



Energy & Environment Team

Student Green team

- Staff in each building are encouraged to set up Green Teams
- Each School and Service Department has an ISO 14001 Committee

Scope of Reporting

The targets encompass activities on the Cranfield Campus including subsidiary companies and tenants on site *(see Note 1 on page 15).* The University's operation at COTEC is included and also historically Silsoe Campus and Sudbury House Hotel (for Carbon only). 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.)*

ISO14001

The University's Environmental Management System provides a means of identifying, prioritising and dealing with key environmental issues as a part of a process of continuous improvement (these are set out on page 4). Certification of this system to ISO 14001 was further extended across the Campus in 2012/2013 with SoM, Residential Services and Service Departments joining Estates, SAS and Health. ISO 14001 provides a framework for internal and external audit. It also provides a system for the management of Campus environmental issues, monitors the progress towards important objectives and the reporting of incidents.

45 environmental incidents were reported; these were all minor including:

- 25 reports of nuisance odours predominantly from the Airport;
- one Jet A1 fuel spill contained on the apron near B83;
- four emissions / spills occurred associated with machinery/equipment failure:
  - three spills were associated with leaks from vehicles onto external tarmac/concrete areas and two from waste handling.
  - four issues involving discharges to drains involving contractors and five instances of inappropriate chemical storage /waste disposal / fly-tipping and one instance of an aircraft crash which resulted in negligible pollution fuel or fire foam.
- corrective actions to raise awareness, improve training of spill response and locations for airside spill kits were undertaken.
- no Enforcement Notices have been received in this Academic Year with regards to the operation of the Sewage Treatment Works.

Base year recalculation policy

Base year figures are reviewed from time to time ensure like for like reporting. *(See Note 2, page 15 for details.)*

Other reporting

The University provides environmental data to HESA as part of annual Estate Management Reporting. This data specifically attempts to exclude tenant data and therefore can differ slightly from figures which appear in this report. This data also appears in the Green League to which supplementary information on policies and other aspects are supplied. Energy data is also supplied to the Environment Agency as part of the CRC Energy Efficiency scheme requirement; again the scope is slightly different to that of this report and the HESA statistics.

Carbon and Energy

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

- Severe winter (22% colder)
- Emissions went up in 2012/2013
- District heating development
- Energy efficiency investment
- Carbon contests

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

	2005/06	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
'000 tCO^2e	18.9	18.8	20.4	20.2	18.4	17.3	14.9	16.2

(See Note 3, on page15 for further details.)

A harsh winter combined with alterations to District Heating (DH) affecting the CHP performance combined to result in an increase in emissions this year after a particularly successful year in 2011. However we are expecting to see those savings return in 2013 and are still on target to achieve a 50% saving by 2020.

A comprehensive campaign involving capital projects and behaviour change initiatives has been underway since this 2009. Big investments in a CHP plant and DH scheme across Campus have been supported by efficiencies in lighting, IT (PC power management, working group printers and datacentre) and building upgrades along with space utilisation improvements, including the closure of our Silsoe Campus. In 2012 we invested £778k through Salix (energy efficient projects loan scheme) (including their Salix Energy Efficiency Loan (SEEL) scheme) and a further £556k through other funding. We held a carbon contest in December 2012 and also entered the Halls of Residence in the national Student Switch competition.

Plans for 2013/2014:

- 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
- Major review of energy monitoring and targeting
- Continued investment in energy efficiency via Salix loans
- More campaigns to improve energy efficient behaviour
- Development of energy strategy beyond 2020

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
- Improved monitoring and control of sewage system

Having invested in new water mains around the campus in 2010 to combat leaks from ageing infrastructure it was clear that further action was required to reduce what appears to be a relatively high consumption. A new project to install automatic monitoring on existing water metering was entered into in collaboration with Elster Meters and SoE. This has extended so far to the main zonal meters across campus and also individual buildings on the residential site. This has provided valuable feedback to identify leaks and also provide information on usage patterns.

	2009/10	2010/11	2011/12	2012/13
m3	184,860	168,013	156,265	160,521
Discharges (% less than consent)	25%	31%	46%	43%

(See Note 4, on page 15 for further details.)

The University has its own sewage works which discharges into the local water course. A new system to monitor ammonia and suspended solids has provided greater assurance that current discharge consents can be more easily complied with.

Plans for 2013/2014:

- Further extend the coverage of automatic metering
- Work with Anglian Water to investigate water saving opportunities
- Further improve the operation of the sewage works

Waste

Reduce absolute total waste by 5% by the end of 2018 and 10% in 2020 against a 2010 baseline

Increase segregated waste reused or recycled to 50% of waste in 2015 and 75% in 2020

- Clearer signage and information
- Simplified recycling options
- Improved recycling bins
- Green moveout for students leaving

Over 20 different waste streams are segregated on campus for reuse, recycling or remanufacture and our general waste is further sorted at a Materials Recovery Facility resulting in an overall 70% recycling rate. Typically, the University sees a peak in landfill waste around the last two weeks of the academic year as students vacate their accommodation and leave behind 'unnecessary' items. The Green Moveout scheme was a new initiative introduced in 2012 which aimed to divert these items from landfill to be reused and resold by a local homeless charity Emmaus (unwanted bedding was donated to local animal charities). The scheme was a huge success and with the help of over 40 volunteers and Estates personnel Cranfield donated 270 bags of unwanted student goods to charities saving 1.7 tonnes of waste going to landfill.

	2010/11	2011/12	2012/13
Total waste (tonnes)	1159	1130	1134
Segregated on site (tonnes)	317	397	423
Total Recycled (tonnes)	492	796	803

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

Plans for 2013/2014:

- More recycling bins
- New waste recycling centre in B114 yard
- Develop zero bin policy in offices
- Centralised data for non-contracted waste options
- On-line recycling/re-use exchange scheme

Travel

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

- Implementing the new Travel Plan
- Proposal for cycle path
- Cycle shelters installed
- Improvements to footpath north of airfield

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 commute to work by car on their own, a further 14% car share but only 3% use a bus and 4% cycle. However, a count in Spring 2013 suggested that the amount of car sharing was over reported the previous year with only 6% of cars driving onto site having more than one occupant and 82% having just the driver. A greater proportion of students commute by bus, or if accommodated on site rely on buses to reach local shops and facilities. A number also walk or cycle from the village.

	2006/07	2011/12	2012/13
Single occ. car use	86%	76%	82%

To reduce car use and increase options for students in particular actions have focused 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. This has involved trialling a new partnership model with a public bus company to provide staff and student discounts and to increase routes and frequency. This was then tendered with the aim to establish a new a longer term partnership with new buses and further improved service.

Improvements were made to the footpath to village around the north of the airfield and support given to Central Bedfordshire Council to bid for a new cycle path to the village around the south of the airfield. A number of cycle shelters were also installed around the technical site area of the campus.

Plans for 2013/2014:

- New bus service [achieved September 2013]
- New cycle path to village (south of airfield) [achieved January 2014]
- Cycle training

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 working group established

A Fairtrade Working Group was established with representatives responsible for the retail and catering outlets on Campus. This included Residential Services, the Cranfield Students' Association and Schools and Services. This group then developed a Fairtrade Policy and pulled together the necessary evidence for an application to be made for University Fairtrade Status. Whilst Fairtrade goods are available in retail outlets on site Fairtrade status also requires Fairtrade drinks to be available at all official meetings.

There has been no substantive progress to achieve the level two for the Government Sustainable Procurement Action Plan. However it remains an aspiration of the University to improve the sustainability of its procurement practices.

Plans for 2013/2014:

- Submit application for Fairtrade status [achieved October 2013]
- Identify resource to progress sustainable procurement target

Biodiversity

Produce a Biodiversity Action Plan for the Cranfield Campus in 2015

- Biodiversity working group
- Conservation areas
- Wildflower meadows
- Bird boxes
- Baseline survey

Cranfield is privileged to be located in a beautiful rural setting and the main focus in 2013 has been to look at options for protecting and enhancing the rich array of biodiversity on campus. A basic baseline survey identified the following:

“Currently, the entire habitat found on site is common and widespread. The botanical records provided suggest potential for more orchids, particularly Bee Orchids (the County flower for Bedfordshire). The hedgerows and scrub have potential for bird use, however no nests were found. Field corners, beetle banks and blocks or strips of nectar rich/flower rich margin would encourage farmland birds. There are many buildings for Bats and potentially roosts. Bat boxes could be put up in the woodland or on some of the larger trees, away from night time lights. Trees near the storm lagoon would be particularly suitable due to insect loads near water.”

Working with the Kempston Centre in Bedford, a charity providing opportunities to people with learning disabilities and complex needs, eight bird boxes for the University which were made and installed across the campus. As part of a national research project Biodiversity & Ecosystem Service Sustainability (BESS) two sites on campus are now being used for wildflower meadow trial plots. A series of lunchtime walks for staff and students has increased awareness of biodiversity on Campus, a number of small areas have been designated as conservation areas which are mown less frequently to allow Bee Orchid to flourish.

Plans for 2013/2014:

- To map the existing biodiversity and potential of the campus.
- To develop smart targets for biodiversity on campus
- Increase conservation areas

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

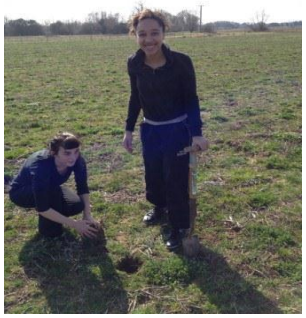
- Green Champions
- Carbon contest
- Student switch-off
- Green Moveout
- Community Forest

Our annual student intake are proactively involved in switch-off campaigns and recycling initiatives in their accommodation. Staff and students join forces in the research and teaching buildings to act as Green Champions and take part in regular events such as our annual Christmas Shutdown contests.

	2012/13
Number of Champions/Volunteers	275
Percentage of Staff and Students	6.5%

Each year a Green Officer is elected to the Student Executive and a new Student Green Team established. This year they organised a tree planting session with the local community forest. Supported the roll out of new recycling bin system in halls of residence and also awareness raising for the student switch-off contest.

Green Week was moved to November this year to encourage greater involvement from students.



Plans for 2013/2014:

- Recruitment of more Green Champions
- Improved communications
- More events and participation
- Green Week
- Green Gown Award application [Highly Commended in the Continuous Improvement: Institutional Change category November 2013]

Sustainable Buildings and Infrastructure

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

- District heating development
- Refurbishment of Stafford Cripps to BREEAM Excellent standard
- Investment in automatic metering for electricity, gas, heat and water
- Refurbishment of houses and flats with improved fabric insulation

The refurbishment of the Stafford Cripps Building into a Learning & Teaching Centre was entered for BREEAM Excellent (a premier environmental standard for buildings) for this building refurbishment project which has been awarded the 'Best Education Development' in the 2013 LABC (Local Authority Building Control) Building Excellence Awards.

A major upgrade of the District Heating involved the replacement of a large part of the leaking steam with a new link to the low temperature hot water heating. This was facilitated with a Salix Energy Efficiency Loan (SEEL). It also included the installation of a large buffer tank to make more effective use of heat produced by the CHP unit.

Further improvements were made to the insulation of houses and halls of residence Salix loan funding.

Plans for 2013/2014:

- Improved energy efficiency standards for new builds and refurbishments
- Improved on site generation to provide greater resilience

1. **Notes:** 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

2. Base Year Recalculation Policy: Cranfield University will ensure that its Green House Gas 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.

3. 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.

4. 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

5. 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..

6. 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.

Back Cover

Contacts:

For further formation look for our environmental pages on our intranet website: https://intranet.cranfield.ac.uk/EnergyEnvironment/Pages/default.aspx If you have any queries or would like to provide us with feedback on anything in this report please contact the Energy & Environment Team at green@cranfield.ac.uk