

Annual Environmental Report 2014 / 2015



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Statement



Professor Simon Pollard
Chair, Board for Energy and Environment

Cranfield University is a global leader for education and transformational research in technology and management. Key to our mission is delivery of a sustainable estate that reflects our aspirations. Here, the Board for Energy and Environment (BEE) reports progress on our environmental objectives. We continue to improve, but also have the ongoing challenges of managing our energy and waste more closely and effecting behavioural change to deliver sustained environmental performance within our business. Detailed explanations for individual targets follow in the main body of this report. In 2014/15 we:

- Installed our new Higher Education Funding Council for England (HEFCE)-funded biomass boiler, following a successful pilot trial.
- Retained our ISO 14001 certification for our environmental management system.
- Launched the cycle path between Cranfield village and the University.
- Increased the number of Green Champions through high participation in the Student Switch Off campaign and establishment of a University Green team

We remain indebted to our staff and students that contribute to our on-going improvements, and to our Energy and Environment Team and BEE working group members who lead and coordinate our combined efforts. We are grateful to the on-going support of our contractors.

Key performance indicators

Issue	Description	Progress	Target	When
Carbon	Scope 1 & 2 emissions ¹	22%	50% reduction	2020 ²
Waste	Total weight produced	-6%	10% reduction	2020
Recycling	Segregated on-site	50%	75% of total waste	2020
Travel	Single occupancy car use	3%	10% reduction	2017
Water	Consumption volume	26%	30% reduction	2020
Biodiversity	Conservation area	40%	50% increase	2015
Community	'Green' Volunteers	7%	10% of staff & students	2015
Discharges	Ammonia	88%	50% below consent levels	2020
Discharges	Biochemical oxygen demand	46%	50% below consent levels	2020
Discharges	Suspended Solids	2%	50% below consent levels	2020

¹Scope 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.

²In this report, the year refers to the University's financial year. 2020 is from August 2020 to July 2021.

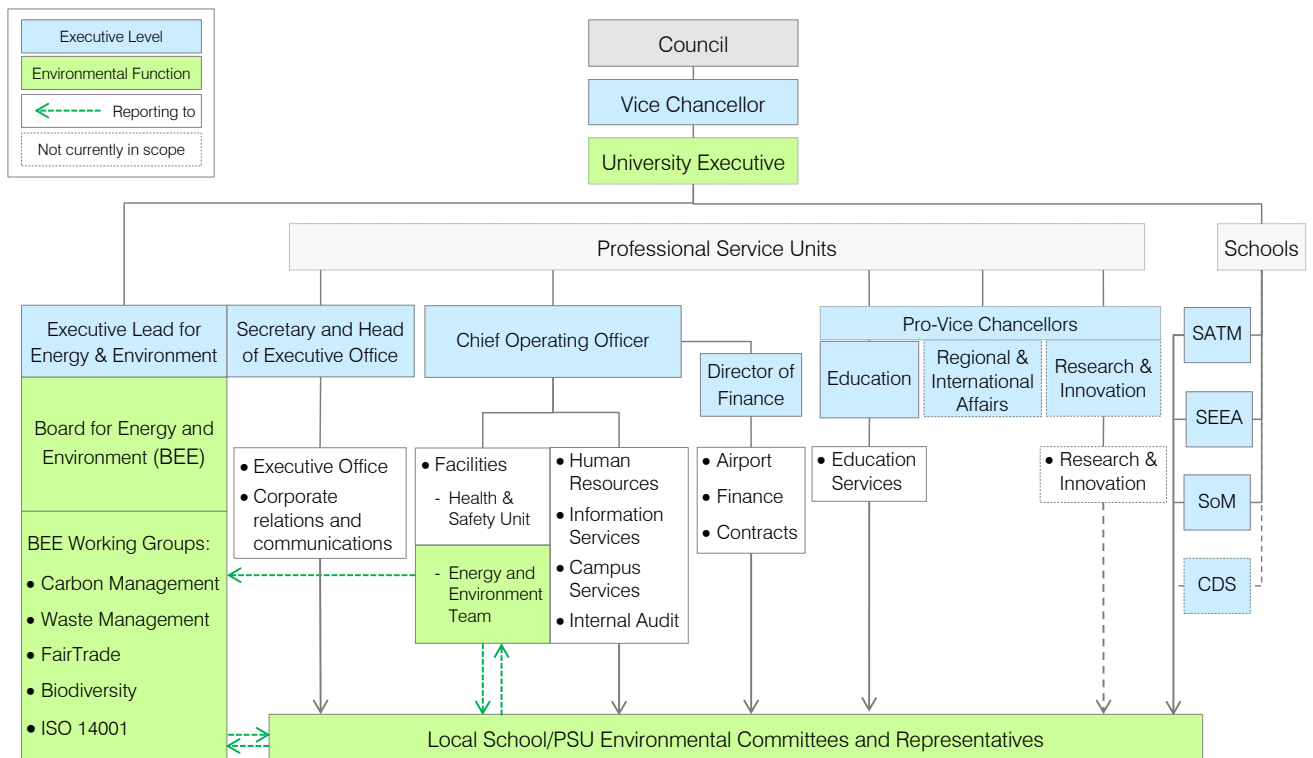
Environmental objectives

Focus	Objectives	Rationale for action
Carbon & energy	Reduce absolute Scope 1 & 2 carbon emissions by 30% in 2015 and 50% in 2020 from a 2005 baseline	Contributes to the HEFCE sector carbon reduction target; supports Plan 415i, reducing operating costs
Waste & recycling	Reduce absolute total waste by 5% in 2017 and 10% in 2020 against a 2010 baseline Increase segregated waste reused or recycled to 50% of waste produced in 2015 and 75% in 2020	Improves resource efficiency; demonstrates best practice to staff and students; supports Plan 415i, reducing costs
ISO 14001	Extend University certification to Cranfield Defence and Security, including at Cranfield Ordnance Test and Evaluation Centre, by December 2015	Primary means for continuous improvement; supports commercial bidding and Plan 415i, demonstrating best practice to staff and students
Travel	Reduce staff commuting in a single occupancy car by 10% in 2017 from a 2012 baseline	Reduces local road congestion; travel emissions and supports Plan 415i.
Water, emissions & discharges	Reduce Cranfield campus water consumption by 30% by 2020 from a 2009 baseline Discharge treated effluent from the sewage works which is, on average, 50% below permitted consent levels for ammonia, biochemical oxygen demand and suspended solids by 2017	Maintains legal compliance and supports Plan 415i, reducing operating costs and demonstrates best practice to staff and students.
Fairtrade & sustainable procurement	Incorporate sustainability considerations within scoring criteria for all tenders over £250,000 in value by 2015	Contributes towards ethical procurement and Plan 415i, reducing operating costs and demonstrating best practice to staff and students
Sustainable buildings & infrastructure	Achieve BREEAM Excellent for new buildings and all major refurbishments from 2012	Supports carbon reduction and resource efficiency and Plan 415i, reducing operating costs and demonstrating best practice to staff and students
Biodiversity	Increase farmland bird species on University grounds by 10% by end of 2015 academic year from 2013 baseline Increase area set aside on University grounds for conservation by 50% by 2015 from 2013 baseline.	Supports Plan 415i, improving the wellbeing of staff and students
Community involvement	Ensure at least 90% of staff complete the environmental awareness e-learning module by 2014 To encourage environmental volunteering with 10% of staff and students participating in 2015	Supports 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 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 a number of working groups, with members drawn from operational and academic staff and students, to progress key environmental targets. A dedicated Energy and Environment team facilitates delivery of the energy and environment objectives and reports progress to the Board on a regular basis. The Board 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 Themes on environmental best practice. In 2014 Cranfield University adopted a new Governance structure as outlined below:



Scope of reporting

The environmental objectives on page 4 encompass activities taking place on the Cranfield Campus, including subsidiary companies and tenants on site (*Note 1 on page 15*). The University’s operation at the Cranfield Ordnance Test & Evaluation Centre (COTEC) is included. Reporting for the Shrivenham Campus, where we are a tenant, is not included at this stage (*Note 1, page 15*).

ISO 14001

Cranfield University operates a campus-wide environmental management system - a framework for managing and reducing our environmental impacts, for establishing programmes to achieve our environmental objectives, and for reporting on environmental incidents. We are proud to have achieved campus-wide certification of this system to ISO 14001 standards and we secured successful recertification in June 2015. In a climate of continuous improvement, the foundation of ISO 14001, we encourage the reporting of all environmental incidents and near-misses to learn and advance. Forty-five environmental incidents were reported in the year to July 2015. These included:

- 2 incidents related to inappropriate waste storage or disposal;
- 13 spills/leaks, mainly due to laboratory or workshop equipment failure;
- 29 reports of nuisance odours, predominantly associated with aviation activities;
- 1 incident relating to animals;
- 2 minor non-compliances with regards to the operation of the sewage treatment works when slight failures in sampling against in environmental permit conditions occurred. Improvements to the monitoring equipment were made during the year to prevent such occurrences in the future.

Other reporting

In line with the Higher Education Statistics Association (HESA) requirements, the University submits environmental data as part of the annual estate management reporting statistics. This data attempts to exclude tenant data and differs slightly from the data that appears in this report. As part of the Carbon Reduction Commitment (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 the HESA return. Data submitted to HESA is also used by the 'Green League' (a student-led, people and plant voluntary league table of University environmental performance) which requests supplementary information. In support of sector concerns over changes to the Green League methodology, Cranfield chose not to participate in the 2014 survey, a position we will keep under active review. As an alternative means of promoting our improvements, a detailed overview of Cranfield's environmental credentials has been made available through the University's website, a short hard copy summary of which is available for dissemination.

Base year recalculation policy

Our base year figures for reporting are reviewed from time to time to 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 (*Note 2, page 15*).

Carbon and energy



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

- Biomass boiler installed and tested successfully
- District heating control improved
- Energy efficiency investment – £152,979 spent on Salix energy projects (101% of available funds)
- 'Energy Awards 2014' for behaviour change



In 2007, 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. We have made solid progress with the obvious and easier to implement management actions. To date, our carbon emissions are 22% less than they were in 2005.

Carbon	2005*	2006	2007	2008	2009	2010	2011	2012	2013	2014
'000 tCO ₂ e	18.5	18.1	20.8	19.7	17.8	16.3	14.6	15.7	14.9	14.4

(*HEFCE require a carbon reduction target against a 2005 baseline year. Note 4, on page 15 for further details)

In this last reporting year, a colder winter, failure of the steam system (boiler corrosion) and an increase in the turnover of the University put upwards pressure on our emissions. However, the new biomass boiler, improved operation of the district heating and a wide range of energy efficiency measures, including further work on behaviour change, helped reduce emissions by 4% compared with the previous year.



Plans for 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 Photovoltaic and District Heating)

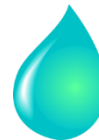
Water, emissions and discharges



Reduce Cranfield campus water consumption by 30% in 2020 from a 2009 baseline

Discharge treated effluent from the sewage works which is, on average, 50% below permitted consent levels for ammonia, biochemical oxygen demand and suspended solids in 2017.

- Further Investment in the Sewage Works to prevent effluent discharge above permit levels
- On going review of water mangement with Anglian Water



We had already exceeded our previous target to reduce water consumption by 10% from a 2009 baseline, so have set a new target this year to reduce water consumption by 30% by 2020. The research work on automatic metering has come to an end and this means the University will need to invest in a new system of automatic metering.

Water use	2009	2010	2011	2012	2013	2014
Water use '000 m ³	185	168	156	161	135	136

Discharges (average % below permit level)	2013	2014
Ammoniacal nitrogen	87%	88%
Biochemical oxygen demand (BOD)	57%	46%
Suspended solids	22%	2%

(Note 5, page 15)

The University's sewage treatment works encompasses a leading edge pilot hall facility used by staff and students on campus. Continuous improvements need to be made to the sewage works to make sure discharges are kept below consent level. This year suspended solids have been an issue and work is ongoing to address this.

Plans for 2015

- Replace automatic metering of water consumption
- Continued investments in sewage works infrastructure



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 on external bin compounds
- Further roll out of recycling bin stations and withdrawal of under desk bins
- Family house waste collections transferred from council to University improving service



At Cranfield we are undertaking important work to further the circular economy. As one contribution to this, we seek to demonstrate the responsible management of our own waste effectively. We make sure we have the correct facilities in place to encourage re-use and recycling, and we work with charities who take our unwanted items for re-use. Where possible, items of furniture and stationery are re-used internally. Our on-site segregation of recycling has increased to 51% from 27% in 2010, a substantive achievement.

Waste Indicators	2010	2011	2012	2013	2014
Total waste (tonnes)	1159	1130	1134	1206	1233
Segregated on site to recycle (tonnes)	317	397	423	509	613
Total recycled overall (tonnes)	492	796	803	865	772

(Note 6, page 15)



Plans for 2015

- Review waste arisings in light of increased scope (Martell House, Technology Park, tenants etc.)
- Link in food waste disposal with on-site anaerobic digestion research facility and investigate option to increase food waste collection
- Introduce improved litter bins with recycling collection
- Completion of waste yard refurbishment which will include capture of bin weight data for individual buildings

Travel



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

- Bus service expanded to give half hourly service Sept 2014
- Three double decker buses introduced March 2015
- Extra bus services to shopping centres at weekend
- Car share workshops held
- Official opening of cycle path Nov 2014
- Cycle repair and resale sessions



The priority target in the Travel Plan is to reduce single occupancy car use by 10% over the next five years. No surveys were conducted in the year of this report. However the numbers using the bus service were recorded. Bus ticket sales in November 2014 were 11,000/month compared with 7,000/month with the previous service in 2012.

Objective	2006	2012	2013	2014
Single occupancy car use	86%	76%	73%	N/A

To increase use of 'green' travel options, further work is required. This coming year, the focus will be on improving the experience of using the UNO bus service, upgrading and increasing cycling facilities and promoting car sharing further, especially for those unable to use other means of transport.

Plans for 2015

- Improve bus shelters on campus
- Lift share website upgrade
- Improve / increase facilities for cyclists on campus
- More monitoring of progress



Fairtrade and sustainable procurement



Incorporate sustainability considerations within scoring criteria for all tenders over £250,000 in value by 2015

- Fairtrade University status renewed until 2016
- More events held during Fairtrade fortnight 2015 with a visit from the Fairtrade Foundation
- More Fairtrade fruit and vending machines on campus
- Fairtrade/local food stalls included in our Christmas Fayre



The Fairtrade working group has maintained Fairtrade status to September 2015. Despite a successful Fairtrade fortnight, which included a visit from the Fairtrade Foundation and Palestine Fairtrade olive farmers, many students remain unaware of the Fairtrade mark. This was reflected in a survey carried out by Campus Services. More needs to be done to educate students on what the Fairtrade mark stands for. Questions on sustainability have been included for all tenders over £250,000 this year. The Corporate Procurement Team have undertaken training on Ethical Procurement and Supply and achieved CIPS (Chartered Institute of Procurement & Supply) accreditation.



Plans for 2015

- Look into providing Fairtrade cotton products
- Investigate suitability of adopting Soil Association Catering Mark
- Examine ways of increasing awareness/education of Fairtrade Mark across campus

Biodiversity



Increase farmland bird species on University grounds by 10% by 2015 from 2013 baseline

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

- Conservation areas extended
- Second Bioblitz event held with Bedfordshire Natural History society
- Popular biodiversity walks
- Fedden House garden project prioritised native plants



Conservation areas have been set aside on the campus and designated as ‘*Biodiversity Action Areas*’. These are areas of grassland, trees, hedgerows or watercourses which have special biodiversity action in place. This includes simple actions like changing mowing regimes of grassland and letting our native species, including our beautiful Bee Orchid flower, thrive. We are also keen on encouraging vulnerable species such as bees and certain farmland birds on campus by planting native flowers and creating wildlife corridors. We wish to continue to expand our database on biodiversity with support from GIS software and further develop our Biodiversity Action Plan (CUBAP).

Biodiversity indicators	2012	2013	2014
No. farmland bird species	13	13	N/A
Campus conservation areas m ²	1320	1470	2060

Plans for 2015

- Develop ‘*Living Lab*’ opportunities on campus
- Develop GIS mapping of campus



Community involvement



Ensure at least 90% of staff complete the environmental awareness e-learning module by 2014

Encourage environmental volunteering, including through the Green Teams network, with 10% of staff and students participating by 2015

- Successful energy saving campaign
- Successful Student Switch Off campaign
- 'Green Move-out' rebranded 'Big Cranfield Clear-out'
- E-learning 'Environmental Awareness' module completed by 83% staff
- New University-wide Green Team



The number of Green Champions increased this year due to a high participation in the Student Switch Off campaign, and establishment of a University Green team. During the winter quarter, significant energy savings were achieved by engaging staff in more focused carbon saving workshop sessions and a new web portal called 'Cranfield Green'. We also won an award during 'Energy Awards 2014' for the category on 'engagement and behaviour change'.

Community indicators	2012	2013	2014
Number of champions / volunteers	275	238	291
Percentage of staff and students	6.5%	5.3%	6.76%

During Green Week a number of presentations and tours were held with an aim to raise awareness of environmental issues, showcase environmental research projects and encourage 'Green' behaviour. In March 2015, a Wildlife Trust volunteering event proved popular with student volunteers.



Plans for 2015

- Closer working with the University Green Team on behaviour change
- Complete roll out of environmental awareness training
- Green Week 2015
- New approach to the Carbon Saving contest

Sustainable buildings and infrastructure



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

Develop 'zero carbon' standard for University buildings by 2014

- Campus Master plan being implemented
- Design for the Aerospace Integration Research Centre well advanced and incorporating BREEAM excellent
- Design for new building for FAAM agreed and construction about to start to BREEAM excellent



The zero carbon standard is still under review in light of changes in Government policy in this area. There has been further investment in energy efficient lighting and more efficient equipment using the Salix revolving fund. The biomass boiler has been installed and thoroughly tested. The control of the district heating system continues to be developed and optimised to improve comfort levels in buildings and also save energy and carbon. The first few buildings of the new Masterplan are being developed in accordance with the BREEAM excellent standard.

Plans for 2015

- Review of Zero Carbon standard for new buildings
- Further development of District Heating scheme



Notes

1. **Objectives:** Baseline and target years refers to the financial/academic year August to July (for example, for the Carbon target, the baseline year 2005 is financial 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 between what is and is not a direct impact to 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, this may become easier to distinguish. Additionally, the University is providing utility and other services to tenants and 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 to the University. The converse applies to the University's Campus at Shrivenham. Here the University is a tenant on a Ministry of Defence (MOD) site. 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 reporting is up to date, accurate and consistent with current Government guidance. In particular, when there are structural changes that have a significant effect on the baseline and the reported progress towards targets, 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 are applied to the previous figures as well as current figures.
Structural changes may 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 the Department for Environment, Food and Rural Affairs (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 the 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 the key performance indicator for recycling is waste segregated on site. However, the waste contractor further segregates waste at their depot. This elevates our overall recycling performance and it is this figure which is reported in the HESA Estates Management Reporting. We are working closely with local charities and organisations, collecting reusable goods from students as they leave the University and passing these on to a local homeless charity, Emmaus, to re-sell.
7. **Academic expertise:** Wherever possible, the University is making use of its 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 School of Engineering students and School of Energy, Environment and Agrifood laboratories sampling local discharges. The new Combined Heat and Power (CHP) unit is regularly use as a real life demonstration for teaching.

Key Contacts

Board for Energy and Environment:

- Chair, Professor Simon Pollard, PVC Energy, Environment and Agrifood
- Director of Finance, Mr Ian Sibbald
- Director of Facilities, Mr John Street
- Energy & Environment Manager, Mr Gareth Ellis
- Environment Advisor, Mrs Alice Golightly (Ginny Ford, from September 2015)
- Board Member, Mr Gio Lusignani, Director of Information Services
- Board Member, Dr Frederic Coulon, Senior Lecturer, Energy Theme
- Board Member, Miss Becky Shepherd, Environment Officer
- Board Member, Dhruvesh Sheth, Green and Residential Officer, Cranfield Students Association (2014/15)
- Board Member, Miss Savina Velotta, Executive Officer (Board Secretary)

Working groups:

- Biodiversity Chair, Professor Jim Harris
- Carbon Management Chair, Mr Gareth Ellis (from June 2015, Dr Nazmiye Ozkan)
- Fairtrade Chair, Mr Ian Sibbald
- ISO 14001 Chair, Mrs Alice Golightly (Ginny Ford, from September 2015)
- Waste Management Chair, Dr Philip Longhurst

Further Information

For further formation please visit our environmental pages on the University Website:

<http://www.cranfield.ac.uk/about/governance/corporate-responsibility/>

or the University Intranet:

<https://intranet.cranfield.ac.uk/EnergyEnvironment/Pages/default.aspx>

If you have any questions on any other topics outlined within this report or would like to provide us with any feedback please contact the Energy & Environment Team at

green@cranfield.ac.uk