



UEA Environmental Report 2009/10
finding the sustainable way

Authors:

UEA Sustainability Team and
Pro-Vision Environmental
March 2011

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Front Cover: Bush -cricket (*Tettigoniidae*) are close relatives of grasshoppers. They usually eat flowers, and leaves and can often be found on low vegetation at UEA in the summer months and are common in the wilder areas of the campus; by the wildflower meadows and the River Yare.

Photograph courtesy of Dr Iain Barr (School of Biological Sciences).

**Foreword by Vice-Chancellor
Edward Acton**

The University of East Anglia (UEA) has long been a leader in the field of environmental research and training. We aim to replicate this success in how we care for our campus and its surroundings. We also want to make ethical choices in the way we conduct our business.

We have won awards for our low energy buildings (e.g. CIBSE Probe Award, Low Energy Building of the Year Award), dating back to times before 'low carbon' was fashionable, and we are running landmark projects in green power generation. We want to build on these examples to improve further, and we have set targets for achieving excellence in our environmental management. Across the institution we are committed to a further reduction of our environmental impact.

I am pleased to present the first stand-alone environmental report for the University. The report outlines our progress to date, our vision for the future, and how we intend to get there.

Professor Edward Acton
Vice-Chancellor

**Foreword by Pro-Vice-
Chancellor
Trevor Davies**

UEA aims to become an "exemplar low carbon campus" as highlighted in our Corporate Plan (2008). A great deal of work will be required to achieve this goal but we are determined to show that Higher Education does not have to be high carbon and that UEA can develop a leadership role in practical environmental management on our own campus. This will be accomplished through an innovative biomass power generation unit, through low energy buildings and through systemic organisational and cultural change.

We have organised our Environmental Policies into nine key areas covered in this report, corresponding to those used in our Initial Environmental Review (IER) 2009. The completion and publication of our IER has been an important step in understanding and monitoring UEA's impact on the environment.

We now look to reduce this impact through the University's Environmental Management System, which facilitates joined up thinking and systematic progress towards sustainability.

Professor Trevor Davies
Pro-Vice-Chancellor (Research,
Enterprise & Engagement)
and Chair of UEA Sustainability
Board

ABOUT UEA

The University of East Anglia (UEA) was founded in 1960 and admitted its first students in 1963. UEA has long been recognised as one of the top UK universities (achieving a top 20 position in *The Guardian* [2010] University League Tables¹) and top 200 in the Times Higher Education World University Rankings².

As a result of our academic success the University campus has been expanding; we now have over 14,000 students and 2,600 staff (full time equivalent) using over 226,000m² of office, teaching and residential space. Since 1990, we have almost doubled our net floor area (see p. 18).

Our campus is architecturally distinguished. In 2003, the Ziggurats residential accommodation, Teaching Wall, Library and associated walkways (designed by renowned architect Sir Denys Lasdun and built in the late 1960s early 1970s), were given Grade II listed status. Although we are proud to be the stewards of an architecturally important campus, it also presents challenges as these buildings are some of the least energy efficient parts of our estate.

Our campus is largely powered by electricity that we generate ourselves on campus from natural gas. This is currently done through three one-megawatt high efficiency combined heat and power generators (one of the most efficient of its type in the country) and we look forward to the opening of our new biomass system, which will substantially reduce our reliance on non-renewable fossil fuels (see p. 18).



UEA is a single-site campus university just two miles from the centre of Norwich. The campus has won more than twenty architectural awards and boasts iconic buildings such as the Sainsbury Centre for Visual Arts, designed by world-renowned architect Lord (Norman) Foster.

At just over 145 hectares (360 acres) our campus is the largest natural landscape of any UK university, containing five County Wildlife Sites (CWS) recognised as areas of beauty and wildlife interest. This attractive landscape contributes towards our continually impressive student satisfaction ratings (in the National Student Survey).

We have established ‘sustainability’, ‘community’ and ‘citizenship’ as core values as part of our Corporate Plan (2008-2012). We also aim to become an “exemplar of good practice environmentally” and an “exemplar low carbon campus”. A great deal of work will be required to live up to our values and achieve these aims but we are determined to show that higher education does not have to be high carbon and that UEA is a leader in the field of environmental sustainability management.

ABOUT THIS REPORT

We see this report – which is aimed at our staff, students, local community, regulators and all interested parties - as a small step in demonstrating our commitment to the environment and as a follow-up to our Initial Environmental Review (IER) (October 2009) (see p. 4). This first report is an important step in realising the commitment made in our Environmental Policy to “regularly publishing reports on environmental commitments, actions and performance”. There is a wide variety of other reasons for reporting, ranging from internal to international drivers (see Table 1).

This report details UEA’s main impacts on the environment, how these are managed and our ambitious targets for the future. University Campus Suffolk (2005) and the new UEA London campus (2010) are not included in this report because these are joint ventures. It relates to the calendar year 2010. The majority of data is however reported for August 2009 to July 2010 to tie in with Estates Management Statistics submitted annually to the Higher Education Funding Council for England (HEFCE). It has been possible to report some

Table 1. Drivers for UEA environmental reporting

Internal	Aside from publicising our achievements, we know that there are things that we can do better, and committing ourselves to reporting quantitative data enables us to monitor our own progress and target areas for improvement.
Local	We want to inform the local community about our efforts to maintain and improve our grounds. The UEA grounds provide an excellent resource for the local community and are used by a wide variety of people, from children sledging in the snow to regular early morning dog walkers. Our campus means a lot to these people so it is only right that we involve them in our management of this resource.
National	To comply with national regulations and meet carbon reduction targets set by HEFCE. HEFCE has set a Greenhouse Gas reduction target for UK universities that we are obligated to comply with, although we go further than this by setting our own target surpassing what is required. We would like to tell you more about this and this report is one of our tools for doing so.
International	To meet a standard that is commensurate with our international reputation for environmental sciences

¹<http://www.guardian.co.uk/education/table/2010/jun/04/university-league-table>

²<http://www.timeshighereducation.co.uk/world-university-rankings/>

data for Jan-Dec 2010 and it will be indicated where this is the case.

For completeness some prior information has also been included to capture activities undertaken since the IER was completed. We will keep future data standardised to a twelve month period as much as possible.

In some places there is further detail available on our internet site or in earlier publications. This will be indicated and references are also provided at the end of the report.

This is our first report so we do not have data from previous years in some reporting categories. In others e.g. transport, reliable data is limited, but improvements in data collection are on-going. We aim to publish further reports on an annual basis, where our progress towards environmental sustainability can be easily monitored and improvements compared to those of previous years.

What are environmental aspects and impacts?

Environmental aspect is a term used in Standards for Environmental Management Systems (see p. 9) and is an activity we undertake or service we provide which has a potential environmental impact e.g. grounds maintenance, energy generation. Some aspects are relevant to many activities e.g. waste management, transport and energy consumption.

The resulting environmental impacts may be direct or indirect, long, medium or short term, local to global, negative or positive, and affect a range of different media e.g. air, water and soil.

OUR ENVIRONMENTAL IMPACTS

We published our IER and Aspects Register³ (a list of all activities at the University that have a potential environmental impact) in 2009. These are comprehensive documents (primarily compiled by a group of students on the University's EMS and Audit teaching module), and are important first steps in understanding our environmental impact. A summary of our environmental aspects and impacts is shown in Table 2.

By establishing a good baseline from which to develop our environmental and wider sustainability improvements, we have been able to prioritise action, set objectives and targets for improvement, and strategies to achieve them. We are now implementing these strategies, taking changes into account e.g. construction of the Thomas Paine Study Centre and University restructuring.

This report follows the same general structure and discusses both structural and operational issues identified by the IER:

- ✧ *Biodiversity & Landscape*
- ✧ *Built Environment (including Campus Development & Refurbishment)*
- ✧ *Education for Sustainable Development (ESD)*
- ✧ *Energy and Climate Change*
- ✧ *Emissions to Air*
- ✧ *Procurement*
- ✧ *Transport*
- ✧ *Waste Reduction and Recycling*
- ✧ *Water*
- ✧ *Emergency Preparedness & Response*

³ <http://www.uea.ac.uk/estates/environmentalpolicy>

Environmental Aspects	Table 2. Summary of Key Environmental Aspects and Impacts								
	Inputs		Outputs						
	Fuel and energy use	Resources use	Global warming	Emissions and pollution control	Waste	Nuisance (e.g. noise, dust, vibration)	Biodiversity	+ve impact	
	Teaching and Research	Use of non-renewable energy (Gigajoules/year)	Hazardous substances, water, paper, ICT hardware and consumables	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Laboratory flue gases and effluent discharges, hazardous substances storage and use	Hazardous waste, waste to landfill and recycling (%diverted from landfill, tonnes waste to landfill, tonnes waste recycled)			Education for sustainable development
	Administration	Use of non-renewable energy (Gigajoules/year)	Paper, ICT hardware and consumables	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)		Waste to landfill and recycling (%diverted from landfill, tonnes waste to landfill, tonnes waste recycled)			Ethical investment (including environmental criteria)
	Procurement ⁴	Use of non-renewable energy (Gigajoules/year)	Materials, products and services	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)		Hazardous waste (e.g. WEEE) waste to landfill and recycling (%diverted from landfill, tonnes waste to landfill, tonnes waste recycled)		Reduction in global biodiversity resource e.g. purchase of hardwoods	Fairtrade
	Travel and transport	Use of non-renewable fuel (modal shift)		Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Fuel storage Particulates, heavy metals etc.,		Noise, dust, vibration, congestion from traffic		Promotion of sustainable transport options (modal shift)
	Facilities (including catering, student residences, Sainsbury Centre and Sportspark)	Use of non-renewable energy (Gigajoules/year)	Water use (m ³ and m ³ /student) catering supplies, bottled water, hazardous substances e.g. chlorine	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Effluent release – laundry, hazardous substances storage	Hazardous waste, cooking oil Waste to landfill, recycling and food composting (%diverted from landfill, tonnes waste to landfill, tonnes waste recycled)	Noise, litter, light pollution (Sportspark floodlights)		Local sourcing, Fairtrade
	Energy generation (including oil fired boilers, CHP and Biomass)	Use of non-renewable energy and fuels (Gigajoules/year and tonnes/year -fuel oil)	Water use (m ³ and m ³ /student) hazardous substances	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Flue gases, effluent discharges, fuel and other hazardous substances storage	Hazardous waste	Noise		Renewable energy produced (mega joules/year)
	Property maintenance, new build and refurbishment ⁴	Use of non-renewable energy (Gigajoules/year)	Hazardous substances, water, materials (wood, paint etc.)	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Refrigerant and effluent release Hazardous substances storage	Hazardous waste (e.g. solvents), waste to landfill and recycling (%diverted from landfill, tonnes waste to landfill, tonnes waste recycled)	Noise, dust, vibration from maintenance and construction works	Disturbance to local wild flora and fauna (% area of habitats protected with documented plan)	Eco-design, materials recycling
Grounds maintenance	Use of non-renewable energy and fuels (Gigajoules/year and tonnes/year -fuel oil)	Hazardous substances	Production of GHG (kg CO ₂ e and kg CO ₂ e/student)	Fuel and other hazardous substances storage, vehicle washing effluent	Horticultural waste (e.g., composting, burning) hazardous waste	Noise, dust from plant and machinery, litter collection	Disturbance to local wild flora and fauna (% area of habitats protected with documented plan)	Education for sustainable development	

⁴ Including contractors

OUR ENVIRONMENTAL PERFORMANCE

Since 2009 we have been monitoring and documenting a wide range of our activities, enabling us to scrutinise our progress towards environmental sustainability. This document contains some of these initial figures and we look forward to reporting more data in subsequent years. We have made significant progress but there is still much to achieve.

We are pleased with the results of our landmark projects in carbon reduction (e.g. low energy buildings, generating our own renewable energy). We have made significant improvements in waste management and transport but recognise that many small scale changes at an operations level are also required across the institution in order to reach our exemplar goal. Key performance indicators (KPIs) are quantitative metrics (measurable figures) that can be compared with those from other organisations, and from year to year. We use them to publicly report progress against targets. We also use them internally to monitor how effective our interventions are and make changes where necessary.

According to Defra principles (Key Performance Indicator Reporting Guidelines, 2006)⁵ we have reported our environmental performance in quantitative and comparable figures where possible. Where this is not currently feasible we have initiated monitoring processes to obtain baseline figures for subsequent reports. A summary of key indicators is presented in Table 3.

Our choice of KPIs has been directed by the Global Reporting Initiative

(GRI)⁶ and Defra (2006). Defra suggests 22 possible KPIs and recommends the use of three per organisation. The GRI G3 guidelines list 30 environmental performance indicators in its Indicator Protocol for the Environment. As UEA is a complex institution with many different processes and as we are committed to environmental sustainability we have chosen 26 KPIs to report on. These reflect the breadth of our activity and may change as our experience of reporting improves.

How we report our greenhouse gas (GHG) emissions

As GRI recommends, we have reported our GHG emissions in line with the GHG Protocol⁷ to ensure comparability of data with other reporting requirements and organisations. The GHG Protocol is the most widely adopted tool to understand, quantify, and manage greenhouse gas emissions. It provides the accounting framework for nearly every GHG standard and programme in the world, including the UK Carbon Reduction Commitment⁸ to which UEA is obligated.

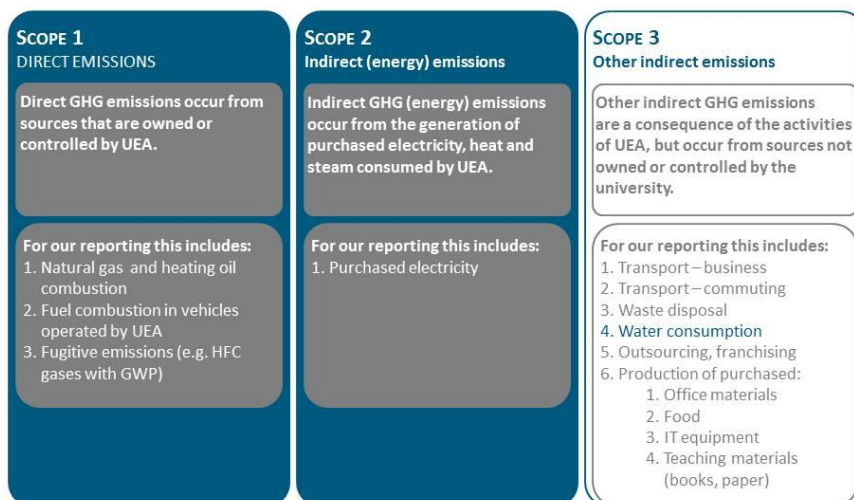
We are currently reporting our emissions of GHGs associated with direct emissions (scope 1), purchased electricity consumption (scope 2) and indirect emissions associated with our water consumption (scope 3). In future years we will increase the scope and accuracy with which we report scope 3 emissions.

The concept of “scope”

Three “scopes” are defined for GHG accounting and reporting purposes to help:

- ✧ Delineate direct and indirect emission sources,
- ✧ Improve transparency, and
- ✧ Provide utility for different types of organisations, different types of climate policies and business goals

Scopes 1 and 2 are carefully defined to ensure that two or more companies will not account for emissions in the same scope. This makes the scopes amenable for use in GHG programmes where double counting matters.



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⁵ <http://archive.defra.gov.uk/environment/business/reporting/pdf/envkpi-guidelines.pdf>

Table 3. Summary of Key Performance Indicators (* comply with Defra and/or GRI guidelines)	2008/9⁹	2009/10¹	↕	page no.	Notes:
Staff given environmental* training	0 %	14%	↑	11	General environmental awareness training pilot, launched to all staff Feb 2011 (Jan-Dec)
Area of habitats protected with documented plan*	0 %	100%	↑	13	Grounds Maintenance and Conservation Plan ¹⁰ (Jan-Dec)
Total GHG emissions (CO₂e) (scope 1 and 2) *	23,348 tonnes	24,085 tonnes	↑	18	Owned transport, buildings (gas, electricity, heat, steam and cooling), refrigerants, imported electricity. Note: floor area increase of 4457m ² in 2009/10.
Scope 1 GHG emissions (CO₂e) *	15,450 tonnes	17,064 tonnes	↑	18	Owned transport, buildings (gas, electricity, heat, steam and cooling), refrigerants
Scope 2 GHG emissions (CO₂e)*	7,899 tonnes	7,021 tonnes	↑	18 & 26	Electricity imported from National Grid
GHG emissions per student (CO₂e)*	1.639 tonnes	1.760 tonnes	↑	18	
Total electricity generated	74,709 gigajoules	84,636 gigajoules	↑	18	Some electricity is exported
Total heat generated	141,520 gigajoules	147,140 gigajoules	↑	18	Some heat is exported
Total energy consumption*	121,883 gigajoules	124,259 gigajoules	↓	18	Electrical, heat, steam and cooling
Electricity used (National Grid)*	52,238 gigajoules	46,359 gigajoules	↓	18	
Fossil fuel used*	313,049 gigajoules	342,885 gigajoules	↑	18	Gas and oil
Renewable energy produced*	Not available	80 gigajoules	n/a	18	ZICER building photovoltaics
Emission of ozone depleting substances * (CO₂e)	193 tonnes	515 tonnes	↑	18	
Emissions of ozone depleting substances* (CFC-11 equivalent)	1.5 kg	3.7 kg	↑	20	
Number of environmental complaints	Not available	61	n/a	20	(Jan-Dec)
Number of environmental compliments	Not available	23	n/a	20	(Jan-Dec)
Fuel used in fleet vehicles*: petrol	4,731 litres	3,997 litres	↓	22	
diesel	11,405 litres	10,627 litres	↓	22	
Travel to work	Not available	See 2009 modal shift data	n/a	22	Travel survey data
Waste diverted from landfill	30%	35%	↑	24	
Waste reused/recycled*	438 tonnes	359 tonnes	↓	24	Excluding construction waste
Waste to landfill*	1,013 tonnes	653 tonnes	↓	24	Excluding construction waste
Construction waste diverted from landfill	2.5%	68%	↑	24	Significant waste from basement excavations of Thomas Paine Study Centre in 2008/9
Total water consumption*	407,433 m ³	404,195 m ³	↓	26	
Water consumption per student*	28.59m ³	28.23 m ³	↓	26	
Number and volume of significant spills	0	0	↔	27	(Jan-Dec)
Environmental fines from regulator*	£0	£0	↔	27	(Jan-Dec)

⁹ All figures quoted are from Aug to Jul, as per Estates Management Statistics unless otherwise stated

¹⁰ <http://www.uea.ac.uk/estates/environmentalpolicy>

SUSTAINABLE ENVIRONMENTAL MANAGEMENT

During 2010 we developed our Environmental Policy and our Environmental Management System (EMS) which is designed to help us achieve our environmental objectives.

Our Environmental Objectives
<p>Strategic Actions</p> <ul style="list-style-type: none"> Implement environmental risk management at a strategic level Implement an EMS certified to ISO14001 via EcoCampus Empower and motivate staff to support EMS implementation Effectively communicate to share knowledge and learning Demonstrate Ethical approach to funding University activities
<p>Biodiversity</p> <ul style="list-style-type: none"> Maintain and enhance biodiversity
<p>Built Environment</p> <ul style="list-style-type: none"> Effectively control the environmental impacts of facilities maintenance, campus development and refurbishments
<p>Education for Sustainable Development</p> <ul style="list-style-type: none"> Embed sustainability into teaching learning and research
<p>Energy and Climate Change</p> <ul style="list-style-type: none"> Implement our carbon reduction plan
<p>Emissions to Air</p> <ul style="list-style-type: none"> Prevent pollution
<p>Procurement</p> <ul style="list-style-type: none"> Develop more integrated life-cycle approaches to purchasing embracing sustainable decision making
<p>Transport</p> <ul style="list-style-type: none"> Promote environmentally sensitive transport practices within the university's overall travel policy
<p>Waste Reduction and Recycling</p> <ul style="list-style-type: none"> Implement the waste management plan
<p>Water</p> <ul style="list-style-type: none"> Develop and implement a long term strategy for reduction in water consumption Prevent pollution
<p>Emergency Preparedness</p> <ul style="list-style-type: none"> Appropriately manage risks from accidents, incidents and emergencies



Environmental Policy Statement:

The University of East Anglia (UEA) undertakes internationally renowned teaching and research delivered by a community of over 2,600 staff and 14,000 students. Our outstanding campus occupies over 320 acres of land which supports wildlife sites of county significance and Biodiversity Action Plan species. It also hosts listed buildings, the Sainsbury Centre for Visual Arts, the UEA Sportspark, and an energy generation plant. We have gained an understanding of the complex and wide-ranging nature of our environmental impacts by conducting a comprehensive Initial Environmental Review (Oct 2009). The Review has enabled us systematically to prioritise these impacts in order to support improvements effectively.

The University has long been a leader in the field of environmental research and we are committed to reflecting this in how we care for our campus and its surrounding environment. We also make ethical choices in how we conduct our business. Through our 2008 Corporate Plan we are committed to becoming an exemplar of good environmental practice and, in particular carbon reduction, in the HEI sector.

The following principles provide guidance on the way we identify and manage our impacts on the environment. We will demonstrate our commitment by integrating these into key business decisions, and by setting objectives and targets to achieve continual environmental improvement. We will:

- Integrate environmental management into day-to-day operations by establishing an Environmental Management System (EMS) certified to ISO14001 for all our operations on campus, via the EcoCampus scheme
- Comply with and, where possible, exceed all relevant environmental legislation and other requirements applicable to the University
- Openly communicate, through sharing knowledge and regularly publishing reports on environmental commitments, action and performance
- Motivate and empower staff, students, members of our local community, and other stakeholders, to support the ongoing development, implementation and evaluation of this policy
- Embed sustainability into teaching, learning and research
- Maintain and enhance the biodiversity of the estate
- Minimise our consumption of non-renewable energy and gross emissions of greenhouse gases
- Minimise the production of waste through reduction, reuse and recycling
- Minimise our consumption of non-renewable and environmentally sensitive resources by embedding integrated life-cycle approaches in our decision making
- Prevent ground and water pollution, and minimise emissions of air-borne pollutants
- Manage environmental risks from accidents, incidents and emergencies

A Sustainability Board, reporting annually to the University Council via the Executive Team, leads implementation of this policy, bringing together those responsible parts of the University (i.e. the Vice-Chancellor's Office, the Estates and Buildings Division, the Finance Division), with representatives from the Students' Union, the School of Environmental Sciences, CRed (the UEA community carbon reduction programme) and other Schools and units within the University. A supporting management structure encompasses all internal stakeholders, facilitating the introduction of these policy issues onto the agenda of staff meetings at all levels.

Signed by:

Professor E.D.J. Acton – Vice-Chancellor

11th February 2011

This policy will be reviewed annually

Our latest environmental policy is the result of a management review of our EMS undertaken by the Sustainability Board in December 2010.

We aim to achieve certification to the ISO (International Organisation for Standardisation) 14001 standard for EMS for all our operations¹¹ by October 2012. Significant progress has been made towards this target and in August 2010 we attained the EcoCampus Bronze Award, marking considerable advancement of our



¹¹ Excluding UEA Campus Suffolk and UEA London

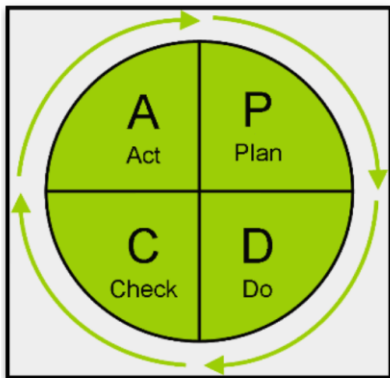
environmental programme¹². The EcoCampus Awards offer a staged system of EMS implementation, progressing towards certification against ISO 14001.

Our environmental programme sets specific time-bound targets (SMART¹³ where quantitative data is available), to progress our objectives. Targets are presented in the following sections.

The ISO14000 Series

This represents the core set of standards used by organizations for designing and implementing an effective EMS (i.e. one which achieves real environmental improvement).

The major objective of the ISO 14000 series is to promote more effective and efficient environmental management and to provide useful and usable tools - ones that are cost effective, system-based, flexible and reflect the best organisational practices available for gathering, interpreting and communicating environmentally relevant information. The core of the system is continual improvement through the, plan, do, check, act cycle.



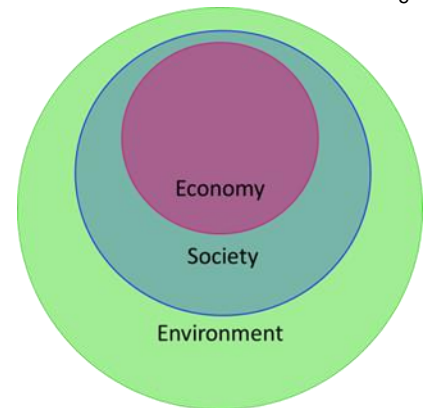
The concept of an environmental management system, evolved in the early 1990s and its origin can be traced back to 1972, when the United Nations organised a Conference on the Human Environment in Stockholm and the United Nations Environment Programme (UNEP) was launched. (Corbett & Kirsch, 2001)

In 2010, UEA gained a 2:1 in the People and Planet Green League¹⁴, a massive step up from the third received in 2009, demonstrating the commitment and action taken to date. UEA also participated in the Business in the Community¹⁵ benchmarking programme, Universities that Count in 2010: A process which highlighted a number of areas for improvement which we are actioning through implementation of our EMS.

We also recognise however, that environmental sustainability cannot be achieved simply through the development of a policy and EMS. That is why we have set up a Working Group to develop a holistic vision of what a truly sustainable campus could look like.

We aim to encompass a broad definition of sustainability in our management systems and have set a specific objective to: 'Establish mechanisms to demonstrate effective Corporate Responsibility' (CR). Our first step in this process is to provide training to the Sustainability Board. We can then define what CR means to UEA and begin to establish joined-up policy, objectives and targets which also embrace social, ethical and economic areas e.g. staff and student welfare. We are already working on our ethical investment policy as a consequence of the related environmental impacts of investment decisions.

During 2010 we established a **Sustainability Team** with the aim of ensuring that we make the best contribution we can to protecting our environment. We have also established an extensive sustainability management



Our model of sustainable development: Human social and economic sustainability can only be achieved within a stable, unpolluted, biodiverse environment; embracing the Bruntland Commission definition of "sustainable development - "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."¹⁶

structure, together with **Environmental Champions** – the CarbonCrew - in every building. The work undertaken by the Sustainability Team is guided by and reports to the University's Executive Team via the **Sustainability Board**, led by Professor Trevor Davies, Pro-Vice-Chancellor for Research, Engagement and Enterprise. The Sustainability Team is fully inclusive and has connections extending throughout UEA, enabling



UEA Sustainability Team (from left to right: Dawn Dewar, Transport Coordinator; Phil Warnes, BMS Technician; Rachel Buckenham, Administrator; Neil Wilson, Carbon Reduction Manager; Martyn Newton, Sustainability Manager; Richard Bettle, Environmental Officer; Andy Watts, Waste Manager; Mike McCormack, Risk Management Advisor; Lois McCormack, Transport Administrator)

¹² <http://www.uea.ac.uk/estates/environmentalpolicy/Environmental+Programme+December+2010>

¹³ Specific, measurable, achievable, realistic and time-bound



¹⁴ <http://peopleandplanet.org/greenleague>

¹⁵ http://www.bitc.org.uk/cr_index/

¹⁶ United Nations General Assembly (1987) Report of the World Commission on Environment and Development: Our Common Future



MSc students from the School of Environmental Sciences undertook an audit of oil storage on site in April 2010

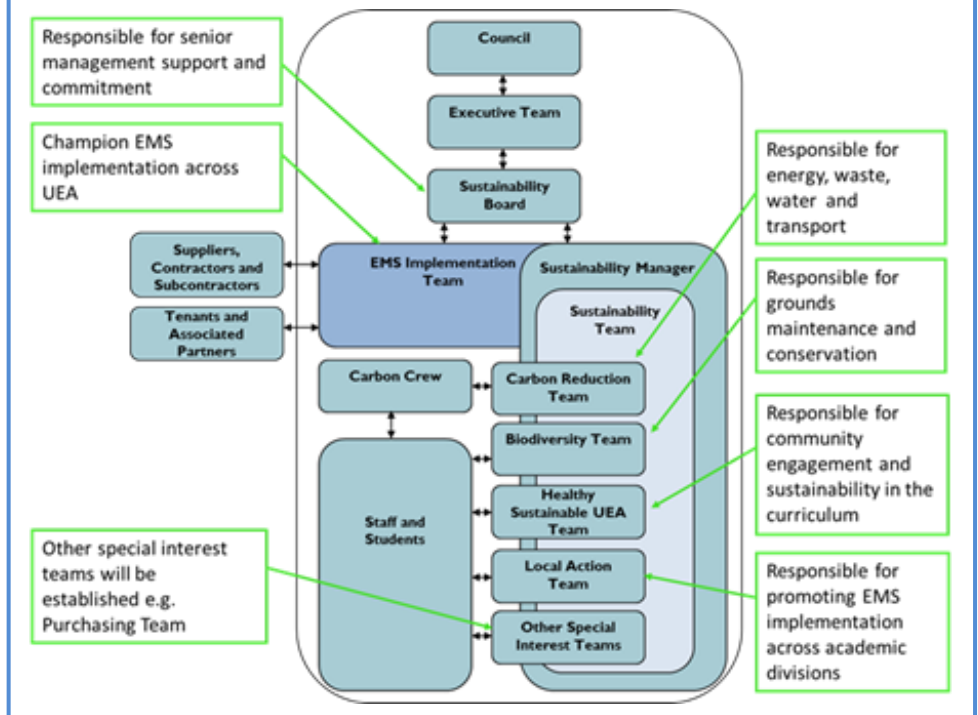
us to achieve the systemic institutional transformation required in effective environmental sustainability management.

Student and staff involvement in decision making is important. We have engaged in staff and student consultation on the development of our Carbon Reduction Plan. Students have helped with our waste audit, have helped us brainstorm our communications strategies, and have played an integral part in the completion of our IER and the on-going collection of biodiversity monitoring data.

The launch of the CarbonCrew in May 2010 established a clear mechanism to improve the level of staff and student involvement. The job of the CarbonCrew is to educate those around them in environmental issues and ensure efficient two-way communication of environmental information between their individual departments and the Sustainability Team

There are now over 130 CarbonCrew volunteers in 18 buildings on campus, including student halls of residence. Anyone can get involved and via quarterly conferences, all members are given the environmental awareness training required to become one of our Environmental Champions. Regular informal lunch time events are also being held where CarbonCrew volunteers and others can pop in and chat about sustainability issues.

Our Sustainability Management Structure:



At the same time our CarbonCrew pledging website¹⁷ was launched. This offers specific carbon reduction pledges for staff, students living on campus and students living off campus. Over 120 staff and students have made over eight hundred pledges to reduce their carbon footprints, so far saving an estimated 45 tonnes of CO₂.

The top five CRed pledges made in 2010	
Switch off room lights	52
Use the stairs	48
Turn off PC at night	44
Print double sided	41
Only boil the water required in the kettle	39

Through the Union of UEA Students (UUEAS) Degrees Cooler¹⁸ programme, UEA is a Green Impact University¹⁹, with the awards successfully driving action for our CarbonCrew. As volunteers enter award teams for buildings rather than departments we are able to



The CarbonCrew CRed pledging website



Green Impact Award winners at the CarbonCrew conference, November 2010. Nine buildings took part in the first awards with one Gold award, four winning Bronze and four working towards bronze



¹⁷ www.carboncrew.uea.ac.uk
¹⁸ <http://www.degreescooler.org.uk/>
¹⁹ http://www.eauc.org.uk/green_impact

report monthly performance data allowing consumption to be closely monitored. From 2011/12 it is hoped that the monetary value of any electrical energy savings will be returned to the Schools/Units within each building.

The CarbonCrew initiative is also linked to the pre-existing Student Switch off campaign²⁰ which has been successfully running at UEA since 2005.

We have ensured close collaboration with the UUEAS by inviting representatives to participate in our implementation teams and Sustainability Board.

Not only do we recognise student voices, we know that many of our current students will grow to be important decision makers and see their involvement in such projects as investment for the future. In order to strengthen this investment, a strategy is currently being developed to ensure 'sustainability perspectives' are taught across the curriculum (see p. 17).

We have developed a staff training programme that includes awareness raising for waste disposal, energy and water usage, details of our sustainability team, and the importance of fighting climate change. This has been piloted amongst staff in the Estates and Buildings Division and the CarbonCrew, and will be given to all staff by December 2011.



Pro-Vice-Chancellor Prof. Trevor Davies was one of the first to pilot the environmental awareness training.

The CarbonCrew in the Registry Building

In 2007 the Registry were invited to run a year-long Energy Efficiency Pilot, in liaison with the Estates and Buildings Division and CRED (Carbon Reduction). This proved to be a big success, leading to a 10% reduction in energy use on the previous year - an amazing saving of around 15,000 kg CO₂e and £2000.

It was agreed that any monetary savings made during the initial year would be fed back into the Registry and staff chose to use this money to install new energy efficient equipment. The Registry went on to successfully continue their Energy Efficiency Scheme after the completion of the pilot and in May 2010 merged into the UEA campus-wide CarbonCrew campaign. Since then the focus of activities has spread from power usage to other areas including transport, water use, and a recent focus on waste.

The CarbonCrew have been brilliant at squeezing carbon reductions from every-day activities. Through encouraging awareness the Registry CarbonCrew has managed to reduce electricity usage year on year since 2007!

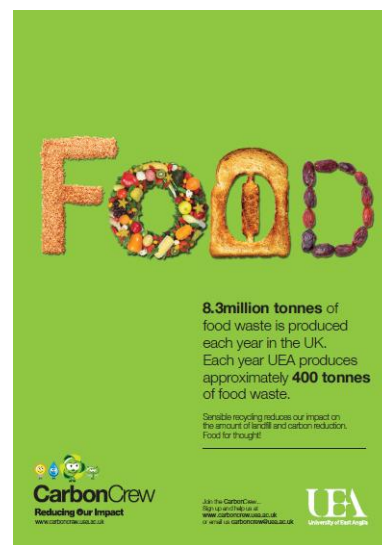
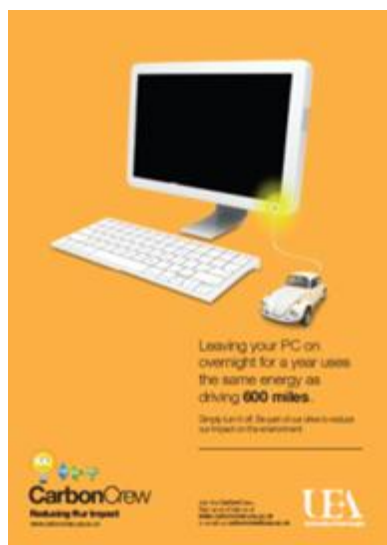
"All these little things have really added up"

Helen Mount (CarbonCrew Member & winner of the UEA Environmental Hero Award)

We send a monthly e-mail to everybody in the building telling them where they could save and giving them news about our current savings and have posters in many locations around the building offering resource saving advice. The week before Christmas CarbonCrew volunteers were encouraged to stay behind after work and leave a thank you note and a chocolate on the desk of those staff that turned off their pc's (see p. 19).

"We've definitely made a difference; we've had really positive results".

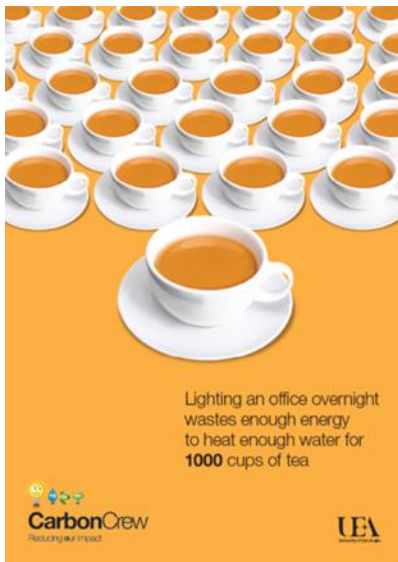
Helen Mount



²⁰<http://www.studentswitchoff.org/>

CUE East is one of six UK university beacons for public engagement, and through this initiative we share our knowledge and experience with the local community. This involves volunteering projects, visits to local schools, as well as community events such as “Low Carbon Day” and “Earth Event”.

Another initiative to raise awareness of sustainability is also under development: UEA Sustainable Way is a campus eco-trail aiming to help our staff, students and local community discover the diversity of our approach to environmental and wider sustainability management.



CarbonCrew volunteers are sent posters to display in key areas, such as kitchens. These are changed fortnightly to stop them becoming seen as wall paper. Once used, they are retained for use in future years.

STRATEGIC ACTIONS

Our 2010 Achievements:

- ✦ Sustainability Team and supporting management structure established
- ✦ Formalised key personnel roles and responsibilities
- ✦ Formalised policy commitments to EMS implementation
- ✦ EcoCampus Bronze Award Achieved
- ✦ Publicly available Initial Environmental Review
- ✦ A CarbonCrew of sustainability champions established
- ✦ Published comprehensive environmental report

Planned Activity for 2011/12:

- We will continue to work towards certification to ISO14001 and aim to achieve EcoCampus Silver by March 2011 and, Gold by January 2012
- We have identified the legal and other requirements that apply to UEA through the development of an environmental legislation register and will implement an action plan to tighten controls and avoid any future non-compliance situations
- We will deliver general environmental awareness training to all staff (including new staff induction); job specific training to those staff whose work has a significant environmental impact; and, Corporate Responsibility training to the Sustainability Board, establishing the groundwork for development of a specific policy and strategy
- Formalise the roles and responsibilities of all staff whose work has a significant environmental impact
- We will formalise and Implement a Communication and Engagement Strategy to ensure we reach all our stakeholders
- We will continue our good practice in staff and student engagement, specifically; running the Green Impact Awards (award ceremony planned for the May CarbonCrew conference); run a Climate Change Week with the aim of raising the profile of the CarbonCrew and recruiting more volunteers, and, establish a UEA Gardening Club in the walled garden site at Earlham Hall (80 10mx5m garden plots)
- We will employ a sustainable purchasing officer (see also p. 21)
- We will establish an ethical investment policy which takes environmental considerations into account

BIODIVERSITY AND LANDSCAPE

We have an outstanding 145 ha (360 acres) campus containing a wide variety of habitat types including five County Wildlife Sites, recognised by Norfolk County Council as areas of local beauty or wildlife interest. These sites comprise The Broad, University Fen, Bluebell Marsh, The Heronry and Violet Grove, and the Butterfly Meadow.

“An organism: water, marsh, slope, trees, meadow, parkland – set in an East Anglian landscape”²¹

(Lasdun (1965) describing the UEA grounds)

As well as having an intrinsic value, biodiversity and landscape are important because they provide direct educational and developmental benefits at all ages, enhance health and well-being and encourage interest from a range of stakeholders.

We are currently undertaking a comprehensive audit of the rich biodiversity of our setting, helped by a wide variety of individuals, from undergraduate classes undertaking mammal trapping through to PhD students cataloguing beetle types. We have a bird ringing programme in operation that catches and rings over 1000 birds every year and also offer regular bat walks to both students and staff.

The 18 month audit is due to be



Kingfisher (*Alcedo atthis*): A distinctive bird of rivers and ponds that nests in high banks. They are amber listed in the UK meaning they are of some conservation concern.

UEA Campus Conservation Project

Staff and students have been keen to assist us in management of our extensive grounds and the launch of the UEA Campus Conservation project (sponsored by Student Bioblitz – an organisation set up to support student activities celebrating the UN Year of Biodiversity 2010) in October 2010 has ensured the additional involvement of local community groups.

Weekly conservation work parties are helping to monitor and maintain the biodiversity of the campus, undertaking conservation work and wildlife surveys and establishing a wildlife trail with information boards and reusable leaflets – work which will equate to over 3000 volunteer hours per year.

“We are creating the trail to help inform and engage people with wildlife in the area”
(Elaine Sheriffs, UEA Volunteers Administrator)

completed in July 2011 (see our interim report²²) when we will be setting ourselves specific improvement targets and undertaking on-going monitoring (see Table 4).

We have always had Kingfishers on site at UEA, and are excited to currently have a breeding pair on The Broad. Otters are a more recent addition, present both on The Broad and River Yare; sightings have increased in the past two years from one a year to four every month! Other rare (listed) species present on campus include: the Yellow Necked Mouse, Water Vole, Long Horned Beetle and Reed Bunting. Our consultation draft Grounds Maintenance and Conservation Plan details how we intend to manage all areas of our campus and sets out clear management principles for all at UEA to follow and respect. We have produced plans to assist with our management. These include guides for grounds staff and a coloured zoning system to indicate the vulnerability of each eco-system to potential mismanagement. The plan has been developed in collaboration with our Grounds Department and School of Biological Sciences and during 2011 we will be



Autumn 2010 – UEA Campus Conservation Project work party learn how to coppice the marshes.

Table 4. Monitoring data collected	
Taxa.	Information Currently Available
Birds	Details of breeding status and population number of all birds on campus Details of nesting records for a lot of birds on campus Ringing details of birds caught on campus- and those that were caught on campus and had been somewhere else- or have gone somewhere else- recoveries Maps of bird distributions on campus Details of nest boxes and breeding success of these.
Mammals	Lists of all mammals recorded on campus Rough estimates of the population size of some species Evidence of rare species- water vole, otter etc. Some detailed studies and quantitative data.
Reptiles and amphibians	Records of all species found on campus
Dragonflies	Records of all species recorded on campus Detailed weekly transect records for some species- e.g. banded demoiselle
Butterflies	Records of all species recorded on campus Two butterfly transects from recent years
Plants	Rough list of the plants on campus Historical records

²¹ UEA Conservation Development Strategy 2006

²² <http://www.uea.ac.uk/estates/environmentalpolicy>

consulting widely with our stakeholders to ensure we achieve the best outcomes for biodiversity. Further information is available on the Environment and Sustainability web pages.



Traffic light zoning of habitats. RED- Habitats of ecological conservation significance, or which support listed species AMBER - Areas where temporary issues may be of concern e.g. nesting birds, or transition areas between conservation and amenity use. GREEN- Areas of amenity value

This year, our Grounds Department have established a partnership with the probation service that now provides 56 hours of nature conservation work every month. This allows a significant amount of conservation work to be undertaken which would otherwise not be possible within the grounds maintenance budget.

We have recently been working on a pruning procedure, which will be in place for the next breeding season. This procedure will ensure minimum possible disturbance to nesting birds by: Restricting pruning times to August-March; conducting visual checks for nesting birds; using hand tools; and, leaving a three metre radius around any nest site discovered.



Two young otter captured by camera trap by MSc students from the School of Biological Sciences.

Waxwing Invasion

Waxwings are regular visitors to Norfolk in small numbers (typically 50 or so a year) and arrive in early winter from their breeding grounds in northern Europe. At UEA they have been recorded in recent decades but only during eruption years- where the birds have had a good breeding season but their main winter food (berries) are in short supply in Scandinavia. When this happens waxwings arrive into the UK in larger numbers.

The winter of 2010-2011 is an eruptive year for this species and flocks of up to 100 birds have been seen on the campus, with flocks seen each week since November 2010. They come here to feed on the abundant berry crops that can be found on campus starting with their favourite- the rowan berry near to the sports pitches. Later in the autumn they eat blackberries, holly, ivy and in early spring they move onto berries provided by exotic shrubs around the buildings. They supplement their diet on warm days by hawking for insects in slow sallying flights from the tops of trees around the broad. They are not shy birds and can be seen feeding very close to humans, along roads, paths and anywhere there might be food.



Buff tip (*Phalera bucephala*). A medium sized moth said to resemble the peeling bark of a birch tree- which the larvae feed on amongst other tree species. It is certainly one of the more unusual moth species seen at UEA



An adult male waxwing being ringed. Here we are measuring the length of its wing. The waxwing gets its name from small red waxy tips on the wing.

BIODIVERSITY

Key objective: To maintain and enhance biodiversity

Our 2010 Achievements:

- ✦ Consultation draft Grounds Maintenance and Conservation Plan developed
- ✦ Comprehensive biodiversity audit instigated and interim biodiversity audit report published
- ✦ Regular biodiversity monitoring programme implemented.
- ✦ UEA Campus Conservation project and Probation Service partnership established

Planned Activity for 2011/12:

- ⊙ We will consult on and implement our Grounds Maintenance and Conservation Plan
- ⊙ We will report the findings of our biodiversity audit
- ⊙ We will set specific biodiversity improvement targets
- ⊙ We will implement the pruning and mowing procedure that includes an incident reporting system

BUILT ENVIRONMENT
(including campus development and refurbishment)

The management of our built environment produces many environmental impacts and controls for activities such as maintenance, asbestos management, cleaning and contractor management are being improved and developed within our EMS to ensure such impacts are minimised. For example, new, environmentally friendly cleaning chemicals are now being used in all our academic buildings. These are produced and supplied locally, and boxes and containers are reused and recycled by the supplier. We also undertake careful monitoring of building performance via our Building Management System (BMS). Campus development and refurbishment projects bring physical changes with both positive (e.g. energy efficiency, landscape and biodiversity improvement, improvement of sewage and drainage systems), and negative environmental impacts (e.g. use of land, noise pollution, landscape degradation, soil erosion, land and surface water continuation).

Project data (for new build and refurbishments) is currently being collated via a pilot project review process. An environmental impact form is completed for all new projects identifying improvement opportunities at an early stage in the



Thomas Paine Study Centre



Thomas Paine Study Centre

Built on the site previously used by the School of Biological Sciences as greenhouses (relocated to a larger, more modern facility on campus), the 4,300m² Thomas Paine Study Centre was constructed over two phases at a cost of £16.6m, (£900,000 under budget) and completed in August 2010. Members of the project User Group considered the project outcome to be remarkable given the time frame within which it was carried out and sets a new quality benchmark for the University. Feedback from teaching staff has been extremely positive and the AV system has been short listed for a national award.

'The lecture theatre feels like a great space'

Prof. of Education Nigel Norris

Energy Efficiency: The building has a high thermal performance with a maximum air leakage of the building envelope of 5.0m³/h/m² of building envelope at 50 Pa, an Energy Performance Asset Rating of 14 and a Building Emission Rate of 4.98 KgCO₂/m². It is connected to our District Heating and Cooling systems provided by on-site generation of heating, cooling and electricity via CHP (see page 18) and linked to our BMS so we can continually monitor occupancy and energy consumption. Based on net internal area, its current carbon footprint is 45 kg CO₂e/m²/yr. This compares with 41 kg CO₂e/m²/yr. for our award winning ZICER building.

Construction Waste Management: 6,435 tonnes of waste was generated. 171 tonnes was reused on site and 544 tonnes recycled. The majority (5,210 tonnes) of the remaining waste came from the basement excavation and was sent to landfill off site. However, good practice was encouraged throughout the project e.g. graded aggregate used for pile matting came from another extension project on campus. It was then stored and used as sub- base for the footpaths and paving, thus being used 3 times!

Community: The logistics of transporting building materials and constructing a large structure within the heart of a busy campus has many impacts on the community – the quality of practice on the project has been recognised by the Considerate Constructors Scheme consideration for a 2010 national award.

As a team building exercise the project team led by main contractor Kier Eastern, participated in a community day. "The garden project" at Eaton Primary School, Norwich, transformed an over-grown area into a wildlife garden and vegetable patch in one day.

Knowledge Transfer: The University's Low Carbon Innovation Centre (LCIC) were engaged in the project throughout and are in the process of producing information to exemplify the technology used in this type of building; identified as future growth opportunities for low carbon knowledge transfer.

Members of the project team also participated in a Norwich Business School research project to understand how members of construction industry networks share knowledge and learn from their network partners.

design process e.g. planning water-saving measures and "grey water" recycling (use of rainwater for some functions). We are also undertaking on-going monitoring of waste arising.

We have a history of developing energy efficient buildings and the Thomas Paine Study Centre (featured above) is the latest to utilise the 'Termodeck' principle. Due to this revolutionary approach it

has, in the past, been difficult to obtain a nationally recognised assessment model that gives credence to the performance of these buildings (e.g. BREEAM and LEED). Hence this has not been undertaken. However as knowledge and understanding of the technology has grown (in part due to the University's research work) this will be adopted in future projects of this nature.



Zuckerman Institute of Connective Environmental Research

Our innovative buildings so far

Our low energy journey began in 1994 with the completion of the Elizabeth Fry Building. This won the Architecture Award 1995, received a Commendation from the Civic Trust in 1997 and won a CIBSE Probe Award for its energy performance and occupier satisfaction score – and remains one of the most energy efficient buildings in the country. The heating capacity needed for the whole of the Elizabeth Fry Building is no more than that of an ordinary semidetached house. The more recent Zuckerman Institute of Connective Environmental Research (ZICER) building won the first Low Energy Building of the Year Award in 2005, and was ‘Highly Commended’ by the RICS Awards for Sustainability



Edith Cavell Building, School of Nursing and Midwifery

Energy Efficient by Design

The Estates Division, who commissions the design and construction of the buildings on behalf of the University, requires buildings that consume low levels of energy through constructing to standards well in excess of current building regulations. This is achieved in-part, through a system called ‘Termodeck’- a principle of using light weight hollow-core concrete floor slabs through which fresh air is circulated into rooms.

To supplement this principle high thermal insulation levels, good air tightness and a highly efficient heat recovery system are utilised. Heat or cooling is retained within the building fabric during periods of low occupation. This energy is released when the building is in use. UEA was a pioneer in the UK constructing education and office buildings utilising the Termodeck principle and now has the highest concentration of this type of energy efficient building in a temperate climate anywhere in the world.

2005. Other buildings utilising the same methodology are Norwich Medical School and the School of Nursing and Midwifery.

We recognise that reducing environmental impact is best achieved through long term planning and our Conservation Development Plan (2006)²³ and Landscape Strategy (2009)²⁴ include details of the integrated development of the Campus.



BUILT ENVIRONMENT

Key objective: To effectively control the environmental impacts of facilities maintenance, campus development and refurbishments

Our 2010 Achievements:

- ✦ Implemented an on-going programme of lunchtime CPD sessions on sustainable building for the Projects Office
- ✦ Implemented a project environmental review process
- ✦ Environmentally friendly cleaning chemicals used in all academic buildings

Planned Activity for 2011/12:

- We will implement appropriate operational controls for maintenance activity and the management of contractors
- We will further improve our project environmental review process
- We will measure our performance in new build and refurbishment against our GHG emissions target (see p. 19).

²³<http://www.uea.ac.uk/estates/construction/Conservation>

²⁴<http://www.uea.ac.uk/estates/construction/Landscape>

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

We have long prided ourselves on the excellence of our teaching. Our schools of Environmental Sciences and International Development (which has a prestigious Queen’s Anniversary Prize for excellence) are both ranked in the top three UK schools for research (Research Assessment Exercise 2008)²⁵ and both offer tuition covering environmental sustainability. We know that a sound knowledge of environmental issues in university graduates paves the way for new thinking, promotes pro-environmental behaviour, and encourages students to be more analytical of sustainability issues in the media and elsewhere.

We have established a Healthy and Sustainable UEA Team (associated to the Healthy Universities Network). With members from across UEA, bringing together and promoting activity to encourage both staff and students to improve and maintain a positive state of wellbeing and sustainable living. The team’s focus falls into three main areas:

- ❖ Student experience
- ❖ Staff Health: Reducing the cost of sickness or absence from work by giving staff opportunities to adopt healthier lifestyles
- ❖ Embedding sustainability in the curriculum: Promoting a low carbon society that is healthier

The team meet quarterly to progress strategy, share good practice and collaborate on joint publications.

We aim to roll out a formal strategy for incorporating ESD into the general curriculum for the start of the 2012 academic year. The aim is for all students who come to UEA to

Strategic Carbon Management MBA (Master of Business Administration)

Carbon reduction not only provides one of the greatest challenges of our lifetime, it also provides one of the greatest opportunities. This innovative MBA course is designed to respond to this need, producing a new generation of managers with a fresh way of thinking. The course aims to give managers:

- ❖ A robust and holistic theoretical and practical knowledge of responsible business practice
- ❖ An in-depth knowledge of the impacts of climate change and the low-carbon economy and how it will define new boundaries, management requirements and opportunities for organisations.

‘Leading the way in cutting Carbon’
The Times

Our first graduations from this course were in 2008 and since then our graduates have gone on to work in the Carbon Trust and Carbon Disclosure Project, as well as a number of national and international consultancy firms.

be exposed to a ‘sustainability perspective’ within their academic discipline. The nature of that perspective (or perspectives) will be determined by each school, department or discipline. A number of models currently exist at UEA:

- ❖ Norwich Medical School’s Sustainable Healthcare Education Network²⁶ is the first of its kind in the world
- ❖ Master’s programme in Environmental Sciences and Humanities - an interdisciplinary collaboration between the Schools of Environmental Sciences, History, Literature and Creative Writing and Philosophy
- ❖ Norwich Business School’s Strategic Carbon Management

MBA (featured above)

- ❖ Interdisciplinarity in the Schools of Environmental Sciences and Development Studies

We have established a programme of activities to promote healthier lifestyles. During November 2010 we ran wellbeing week with themed days aimed at staff and students including a health fair and living library. A mini well-being week is planned in March 2011. We also run University Challenge, a Bi-yearly staff challenge to participate in a 10 week programme of different activities. It is intended that these be part of a more thorough evaluation to improve the health benefits of the working environment.

EDUCATION FOR SUSTAINABLE DEVELOPMENT

Key objective: Embed sustainability into teaching, learning and research

Our 2010 Achievements:

- ✦ Mobilised commitment to ESD and formalised action by establishing a Healthy and Sustainable UEA special interest team

Planned Activity for 2011/12:

- ⦿ We will develop and implement a formal ESD strategy

²⁵ <http://www.rae.ac.uk/>

²⁶ <http://greenerhealthcare.org/sustainable-healthcare-education>



ENERGY AND CLIMATE CHANGE

Energy use produces emissions to air contributing to climate change and air pollution. Our use of refrigerants also contributes to emissions of greenhouse gases.

Greenhouse Gas (GHG) Emissions

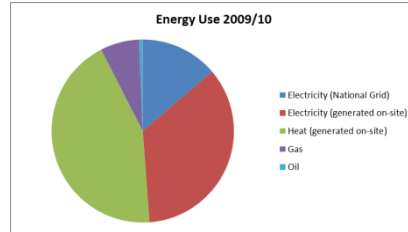
The global climate is changing²⁷. The major cause of this change is increasing concentrations of GHGs, and especially CO₂ produced as a result of human activity (IPCC)²⁷.

We have made major contributions to understanding world climate and combating global climate change and are home to the Low Carbon Innovation Centre (LCIC) and CRed pledging scheme²⁸(see p. 10), the Tyndall Centre for Climate Change Research²⁹ and the Climate Research Unit³⁰.

We aim to make a contribution to responding to this challenge through systemic and comprehensive changes to all our operations.

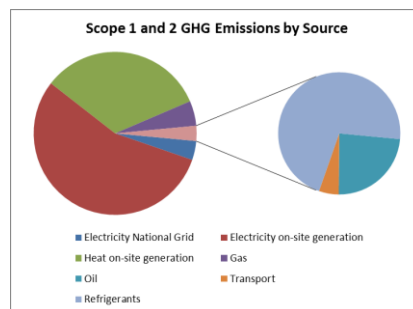
In June 2010 we published our Carbon Reduction Plan³¹ detailing our pathway to carbon sustainability. The UEA campus has been a leader in the field of combined heat and power generation and low energy buildings for the last fifteen years³². We generate enough power to run over 7,000 households each year. Our three, one megawatt natural gas fired combined heat and power generators, commissioned in 1999, operate at an efficiency of 86% compared to the usual 35-40% in commercial power generation.

Installed in 2005, absorption chillers and a district chilled water main have allowed us to maximise use of previously waste heat from power generation. This alone has reduced our emissions of GHGs by 700 tonnes/year.

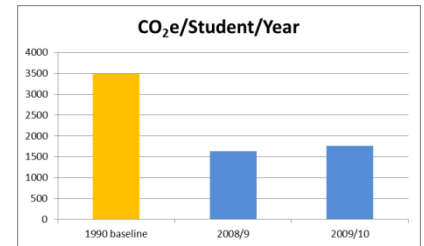


In-house power generation has allowed us to take control of our GHG emissions (and reduce our energy bills), proving that sustainable power can be both environmentally beneficial and financially viable. We are still investing in landmark projects such as our new biomass power plant (the first of any UK university), but we are also investing in changing practices at an everyday operational level through grass roots initiatives such as the CarbonCrew (see p. 10). Recent campus expansion has nearly doubled the University's net floor area (from 109,767 m² in 1990 to 209,755 m² in 2010) so total GHG emissions have also increased, but we have kept this increase down to only 22%.

The University's current carbon footprint is 24,084 tonnes CO₂e/year (2009/10)³³.

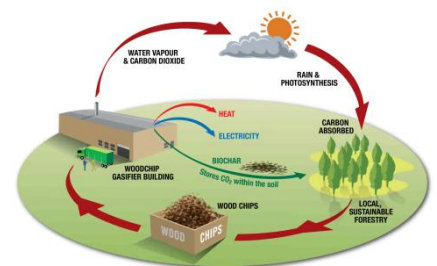


Carbon intensity per student per year has halved from 3489 Kg CO₂e in 1990 to 1760 Kg CO₂e in 2009/10



Our new (currently being commissioned) biomass gasification plant produces a combustible gas to fuel a large piston engine driving an alternator. This will produce 1.7MW of electrical output and 2.0 MW of heat. Biomass gasification is due to begin operation in late 2011 and GHG emissions will be closely monitored.

To minimise resource use, the wood chip used within the biomass process is only sourced locally and is waste from a manufacturing process.



Our biomass gasification system.

²⁷ IPCC Report AR4
²⁸ <http://www.uea.ac.uk/lcic>
²⁹ <http://www.tyndall.ac.uk/>
³⁰ <http://www.cru.uea.ac.uk/>
³¹ <http://www.uea.ac.uk/estates/environmentalpolicy/Carbopn+Reduction+Plan>
³² Chartered Institute of Building Service Engineers (www.cibse.org/)

³³ August to July

CarbonCrew Chocolate Drop

Staff around campus received a special Christmas treat from the CarbonCrew. Volunteers rewarded around 1,500 staff for switching off their office equipment. The thank you note and chocolate (funded from recycling credits received for waste diverted from landfill) raised the profile of the CarbonCrew across campus.



Over 70 projects have been identified in our Carbon Reduction Plan. Here are some we've already implemented (many received funding from HEFCE's Green Revolving Fund):

- ✦ Installing above industry standard roof insulation as part of a re-roofing project across campus – 127 tonnesCO₂e/year saved
- ✦ Plant room valve and joint insulation (see below) – 119 tonnesCO₂e/year saved
- ✦ Library louvered windows treated with quatroseal. This provides a seal between the two pieces of glass, whilst allowing them to be opened – 27.6 tonnesCO₂e/year saved
- ✦ EDU/SYS lighting adapters. All existing T8 tubes (used for corridor lighting) have been replaced with T5 tubes using adapters, allowing the existing fittings to be retained. 6 tonnesCO₂e/year saved

And some we have planned:

- ✦ Replacement of the uninterruptable power supply (UPS) equipment to Computer Centre 1 during the Easter break. This will increase efficiency from 64% to 95%. 250 tonnesCO₂e/year projected saving
- ✦ Multi-functional device (MFD) printing review. An initial print study in the ARTS building identified 231 printers, scanners and copiers that could be replaced by 22 MFDs at an estimated saving of £89,000

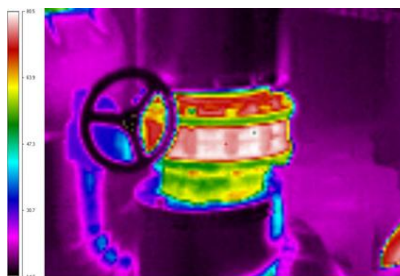
OUR CARBON REDUCTION TARGETS

HEFCE has set targets for carbon reduction that tie in with the Government's five-year carbon budgets but at UEA we aim to go further, setting our own reduction targets for 2016 at 50% compared to the higher education sector wide targets of 35% from a 1990 baseline. **The UEA will reduce its CO₂e emissions from its direct activities by 35% from a baseline of 1990 by March 2015.**

Targets against a 2005/6 baseline from 2011 to 2020 have also been set in line with the HEFCE Carbon Reduction Strategy:

- 22% by 2011/12
- 44% by 2014/15
- 50% by 2016/17
- 60% by 2019/20

Post 2020: The University recognises the need for significant and long term reductions in GHG emissions. As a result we will look to exceed the national GHG emission target of 80% by 2050. The University will set a series of 5 year GHG reduction targets to ensure its carbon footprint is less than 20% of its 1990 footprint by 2050.



Thermal images of insulation covers. BEFORE: No valve/joint insulation in any district heating supplied plant rooms. Surface temp. 76C



AFTER: insulation covers installed in 8 plant rooms. Surface temp 16C. Annual savings estimated at 500,000kWh, payback 1.4 years, 119 tonnesCO₂e/year saved

ENERGY AND CLIMATE CHANGE

Key objective: Implement our Carbon Reduction Plan

Our 2010 Achievements:

- ✦ Refrigerants incorporated in our carbon footprint – our targets remain the same
- ✦ Identified over 70 projects in our Carbon Reduction Plan – these are being evaluated for carbon and cost savings
- ✦ Established detailed monitoring of all electricity meters on campus with building specific data being regularly reported to the CarbonCrew

Planned Activity for 2011/12:

- ⊙ We will extend our carbon footprint to incorporate other scope 3 emission sources e.g. business travel
- ⊙ We will set specific targets to reduce GHG emissions from energy generation and consumption
- ⊙ We will commission our biomass plant

EMISSIONS TO AIR

As well as GHGs, our activities produce other emissions contributing to air pollution e.g. nitrogen oxides, volatile organic compounds (VOCs).

As our CHP and biomass plant have rated thermal input levels below the regulatory threshold, flue gases are not currently monitored. Under normal situations emissions from fume cupboards in laboratories are small and readily diluted. We will be undertaking an assessment of these and other emission sources against air quality standards during 2011/12, and have been working on reducing our environmental impact in the following four key areas.

Our use of refrigerant HCFC-22 contributes to ozone depletion and is categorised as a class II ozone depleting substance (ODS) by the Montreal Protocol³⁴. **During 2009/10 we emitted 3.7 kg CFC-11e of HCFC-22** from leaks. Although we need to tighten up our operational controls in this area, we are

Refrigerant Loss (kg)

	2008/9	2009/10
HCFC-22	28	67
HFC-134a	6	0
R404a	18	0
R407c	36	219
R410a	0	3

Refrigerant ODP GWP

Refrigerant	ODP	GWP
HCFC-22	0.055	1700
HFC-134a	0	1300
R404a	0	3300
R407c	0	1610
R410a	0	1725

ODP is a relative index indicating the extent to which a chemical product may cause ozone depletion. CFC-11 provides the reference point for comparison of emissions from different products, where CFC-11 has an ODP = 1.0. GWP is a similar index which refers to the extent to which a substance contributes to global warming, using CO₂ as the reference value. Where CO₂ has a GWP=1

currently phasing out the use of this gas. Where possible, we do this by connecting to the district cooling system. Where this is not possible due to very low temperature requirements or distance from the district system infrastructure, we choose substitutes with zero ozone depleting potential (ODP). These substitutes do still however, have significant global warming potential (GWP), and we aim to use replacements which minimise future GHG emissions.

Maintenance, refurbishment and construction/demolition activity produce a range of emissions to air e.g. asbestos dust, VOCs, solvent and welding fumes, and nuisance issues such as noise and dust. The performance of contractors is an important factor in managing these emissions as demonstrated by analysis of complaints received.

UEA has an established communication procedure for complaints and compliments through the EST Helpline (ext. 2121). During 2010 we received 61 environmental related complaints of which 31 were related to emissions to air, including nuisance (noise, dust etc.). 26 of these complaints related

specifically to contractors. We also received eight related compliments, two of which were regarding contractors.

We are developing our existing contractor induction process and introducing an audit process to check contractor compliance against our environmental policy.

We produce smoke from burning reed cuttings from our nature conservation work on the University Fen. This activity is undertaken under an exemption to the Environmental Permitting Regulations (2010). We will ensure on-going compliance against this exemption by establishing an audit process.

The accidental release of air pollutants (waste gases, vapours, small particles, chemicals, smoke and other hazardous materials) into the atmosphere from incidents and emergency situations is a significant potential contributor to air pollution. This impact will be dependent on a range of variables including location and weather conditions. Our environmental incident response plan is being developed to address these potential impacts (see p. 27).

EMISSIONS TO AIR

Key objective: Implement our Carbon Reduction Plan

Our 2010 Achievements:

- ✦ Effective monitoring of refrigerants

Planned Activity for 2011/12:

- ⊙ We will undertake an assessment of emissions to air against air quality standards
- ⊙ We will establish a documented maintenance and phase out plan for all systems containing ODS and Fluorinated Gases
- ⊙ We will establish appropriate operational controls/audits for maintenance activity and contractors/sub-contractors
- ⊙ We will ensure compliance against our exemption to burn horticultural waste

³⁴ <http://ozone.unep.org/>

PROCUREMENT

The total non-pay spend in the English higher education sector is £4 billion per annum³⁵. Procurement decisions about works, goods and services affect the rate of consumption of resources, and the productivity of resources, as well as influencing the social and environmental impact of institutions and companies in the supply chain. We consider the impact of our purchasing and have produced a set of principles as a guide for our staff to use when making purchasing decisions. We also have a new publicly available policy³⁶.

A number of sustainable purchasing

Fairtrade

Since UEA achieved Fairtrade status in 2009 the range of Fairtrade products used and sold in our outlets has expanded, led by our Fairtrade Steering Group (chaired by the Head of Communications).

The campus now has its own Café Direct café and we serve Fairtrade products (e.g. coffee, tea and hot chocolate) at all our meetings and in management offices, as do the UUEAS. Fairtrade products are also served to students and their families at arrivals weekends, visit days and open days: Reinforcing our commitment to raising awareness and further expanding the use of Fairtrade products.

A survey is currently underway to establish whether individual Schools and Divisions have increased their use of Fairtrade products. The steering group will be sending a personalised invitation to a taste-test event planned for Fairtrade Fortnight to those who have made little or no improvement.

We also continue to work with our partners (INTO at UEA and the Sportspark) to expand their use of Fairtrade products

pilots have been completed:

- ✧ Purchase of electric-powered vehicles
- ✧ Specification for minimum recycling content and power consumption of photocopiers
- ✧ Waste management tender including food waste collection and composting
- ✧ We are currently in discussion with our PC supplier and users regarding weekly (rather than ad-hoc) deliveries for new PCs

Despite this (and more detailed guidance) our IER identified gaps in purchasing policies, procedures and practices which the new sustainable purchasing officer will begin to address during 2011.

UEA is a member of the Southern Universities Purchasing Consortium, whom we are working in collaboration with to produce a sustainable purchasing action plan.



In May 2010 we bought two electric security vehicles at a cost of £9365 each - Powered by a 4kw 48v ac motor, with a max speed of 40km/h and a range > 100km per charge. They replaced a 1.3 Suzuki petrol van whose emissions in 09/10 were 1591kg CO₂e. We are currently looking into ways of monitoring energy use of the buggies. Other departments and schools have now bought similar vehicles.

Our Purchasing Principles

Protecting human health- includes minimising our use of products that, in themselves or in their manufacture or disposal cause pollution; promoting healthy eating in our catering provision; and encouraging exercise in the design of our buildings and transport arrangements.

Promoting fair working conditions- includes dealing with suppliers (or those who purchase from suppliers) who do not use forced or child labour; pay overtime above a maximum 48 hour week; provide a 'living' wage; provide freedom from bullying, racial or sexual harassment and a healthy working environment.

Promotion of social enterprise and improving local skills- includes encouraging local suppliers (including 'not-for-profit' community projects) to bid for appropriate supplies, works and services by advertising locally, minimising 'red-tape', and encouraging main contractors to use local sub-contractors.

Promotion of the local economy and employment- although under EU legislation it is anti-competitive to favour local suppliers directly, local business can be encouraged by specifying minimum response times in service contracts and fresh produce, where appropriate.

Reducing soil, water and air pollution- by buying products which cause less pollution in their manufacture, use and disposal.

Reducing energy consumption and climate change- by buying products that use less energy to produce and use, and avoid products and processes that generate GHG e.g. methane, HFCs, PFCs SF₆, N₂O and low level ozone.

PROCUREMENT

Key objective: Develop more integrated life-cycle approaches to purchasing, embracing sustainable decision making

Our 2010 Achievements:

- ✦ Publicly available sustainable purchasing policy
- ✦ Extended our range of Fairtrade products sold on campus

Planned Activity for 2011/12:

- ⊙ We will employ a Sustainable Purchasing Officer
- ⊙ We will set improvement targets (e.g. suppliers and number of products sourced using sustainable criteria)
- ⊙ We will develop a formal sustainable food policy for our Catering department

³⁵ www.hefce.ac.uk/pubs/hefce/2005

³⁶ <http://www.uea.ac.uk/fin/purchasing/sustainablepolicy>

TRANSPORT

Historically we have focused on the management of staff and students commuting to the University (single occupancy car journeys in particular). Other transport impacts arising from fleet vehicles and business travel have been prioritised for action through our EMS and we are making progress in establishing specific targets in these areas.

Travel to work: We are serious about reducing car use at UEA. We have invested over £200,000³⁷ per year in sustainable transport to the University since 2002 when we began implementing our Travel Plan³⁸.

A new Transport Policy was drawn up in 2010³⁹ in response to the need to encourage staff and students to make more sustainable travel choices, and the continuing reduction in the number of parking spaces available on campus due to development. Management of car parking at UEA has always been a complex and sensitive issue. It is hoped that the introduction of a new car parking charging system in January 2011 will prove to be equitable.

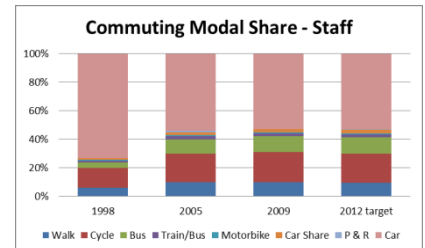
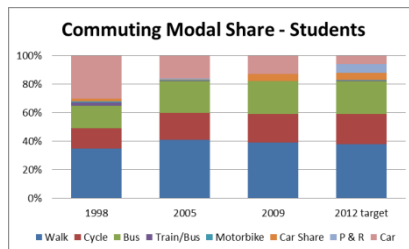
We are continually working to improve the share of green transport used by staff and students e.g. we have created over 2000 cycle parking spaces since 2003, with the majority providing cover and/or security. The University now has twice as much cycle parking than car parking.

Our Travel Plan has helped us to achieve a **reduction in overall car use in commuting to the UEA from**

38% in 1998 to 22% in 2005 (data from full commuter survey of 3954 – 48%- staff and students). **Our target is to reduce single occupancy car journeys to 53% staff and 11% students by 2012.** Our 1998 baseline was 74% staff and 30% students. Data from a small sample survey of 295 staff and students, conducted as part of the PTP evaluation project in



2009 suggested we are very close to meeting this target, with 53% of staff and 13% of students driving to campus. This is significant when set against the growth of the University



Personal Travel Plans

The University has developed an environment which supports sustainable travel with ample cycle parking, improved bus services and foot/cycle paths which are well lit and benefit from CCTV. Market research had shown that whilst infrastructure was an important element the majority of those who drove did so because they did not know what other options exist; had a negative perception of alternatives; or foresaw too many obstacles had to be overcome to achieve change. Providing information in a variety of formats and at information points was helpful only to those who were already committed to change.

To close the information gap, in 2006 the University adopted a direct marketing approach providing individuals with one-to-one travel advice and practical support. This has taken two main forms:

- ❖ “Drop in” sessions & events held in social spaces around campus where people can discuss their particular needs with a member of the travel team
- ❖ “Written” personal travel plans (PTP) now provided as part of the parking permit application process or on request

Information is provided on walking/cycling routes, location of cycle parking & showers, bus times and locations of bus stops and the average weekly cost of using an alternative. The financial and carbon cost of journey by car is also provided enabling the individual to compare expenditure. To address negative perceptions, parking permit applicants are offered opportunities to try cycling through a short term loan bike scheme or use the bus for free.

The success of PTP’s was assessed in 2009 as part of the evaluation of an EU project with the following outcomes:

- ❖ 14% of those who received unsolicited information had made changes to travel behaviour even though they had originally been interested to do so
- ❖ 39 of the 48 who participated in the “try-before-you-buy” bike scheme had gone on to buy a bike and were cycling 2- 3 times each week
- ❖ 122 people had changed their travel behaviour outside of the “commute”
- ❖ Only 4% of those surveyed rated the value of providing PTP’s as of little or no value

These results suggest individuals are prompted to make changes when offered tailored information whether in a written format or in a one-to-one exchange. More importantly this approach works for those who are not necessarily considering making changes. PTPs will be assessed again, in a less direct way, as part of the 2011 Commuter Travel Survey.

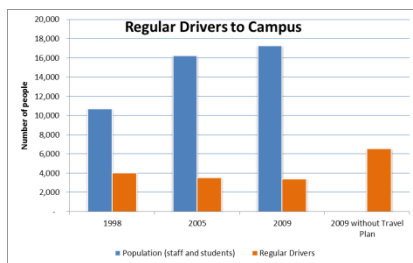
³⁷ Excluding staff costs.
³⁸ <http://www.uea.ac.uk/estates/transport>
³⁹ <http://www.uea.ac.uk/estates/transport/Transport+Policy+2010+-+Consultation+Document>





Carbon Reduction Manager Neil Wilson and his favourite way to get to work

(see p. 18). Assuming the figure of 38% (1999) remained static, if we apply this to today's population then without intervention from the Travel Plan there would be an estimated 3000 additional regular drivers (all motor vehicles) to campus.



A third full travel survey (covering commuting and business travel) is currently being conducted (March 2011) and we will re-consider our next target after analysing the results, making it even more ambitious than before!

Some of our sustainable transport achievements in 2009/10:

- Constructed approximately 2,000 metres of new cycle paths (extension to the Bluebell-Suffolk Rd link) at a cost of £100,000. Widened footpaths and installed additional CCTV across campus
- Provided a permanent home on campus for Dr Bike – our cycle repair specialist
- Issue of Personal Travel plans as part of the car park permit application process
- Further improved existing actions e.g. carshare scheme⁴⁰
- Continued partnership working with First Bus has allowed:
 - ◆ Annual First Bus Season Ticket – The cheapest university ticket in the UK
 - ◆ Improved quality and reliability of services
 - ◆ New fast bus service to Norwich city centre

⁴⁰ <http://www.uea.ac.uk/estates/transport>



Neil Wilson, Carbon Reduction Manager sets the standard for commuting

'I have worked at the UEA since November 2002 and have travelled to the UEA in a variety of ways. I live in Thorpe Marriot and my journey to work is approximately 6.5 miles.

Initially I travelled using a scooter which was very economic and reasonably environmentally friendly; however, I was always wary of the dangers involved in using this type of transport. In 2005 my wife started working for the UEA on a part time basis (8.30 - 2.00pm) which gave me a possible lift to work if required and if she was asked to work until 5.00pm, a lift home too.

In 2005 I purchased a bike through the staff salary sacrifice scheme, which I now consider as my main means of transport to work.

My week now consists of:

- ◆ Mondays - Cycle to and from work
- ◆ Tuesdays - As my wife current works full time on Tuesdays I car share with her
- ◆ Wednesdays - Cycle to and from work
- ◆ Thursdays - Thursday evenings I coach rugby with the UEA Medics Ladies team, which means that I travel with them to their training ground and I get collected from there after training which is approximately 7 miles
- ◆ Fridays - Cycle to and from work

Based upon this being an average week my carbon foot print to travel to work consists of: 5.2 Km x 2 = 10.4 + 11.2 km = 21.6km per week.

My car is a Citroen C4 diesel which produces 115gCO₂/km - 21.6 x 115 = 2482 g of CO₂e per week. Say a 40 week year (2484 x 40) this equals 99360g/year or 99.3kg/year.

Based upon my old car Ford Mondeo 1.8 petrol 185g/km. If I drove to work every day on my own, my annual carbon footprint would be 769600g/year or 769kg/year – we all just need to get on our bikes!

Fleet and Business Travel: Although we have encountered difficulties in collecting baseline and monitoring data for fleet vehicles and business travel, we are already making improvements in these areas e.g. by

purchasing electric fleet vehicles (see p. 21). Our **GHG emissions from our Estates Division fleet vehicles have reduced from 41 tonnes CO₂e in 2008/9 to 38 tonnes CO₂e in 2009/10.**

TRANSPORT

Key objective: Promote environmentally sensitive transport practices within the University's overall transport policy

Our 2010 Achievements:

- ◆ Implemented new transport policy

Planned Activity for 2011/12:

- We will monitor, evaluate and report on progress of the travel plan and modal shift targets
- We will set new targets for commuting and additional transport improvement /GHG reduction targets for fleet vehicles and business travel
- We will issue guidance to staff on all aspects of fleet vehicle management

WASTE REDUCTION AND RECYCLING

In 2010 we employed a waste manager, started collecting food waste, provided hundreds of new recycling bins for the campus, and installed a microchip monitoring system into bins on campus to help us collect more data on our waste. This achieved one of our main 2010 targets of developing baseline waste data and has allowed us to set an ambitious **waste reduction target to divert 70% of our waste from landfill compared to 2009/10⁴¹ levels by March 2015.**

We have chosen a 2009/10 baseline as data up to and including March 2010 is estimated from standard industry figures. Data from April 2010 is based primarily on actual bin weights from our micro-chipped bins.

Waste KPI ⁴²	2008/9 ³¹	2009/10 ³¹
Waste reused/recycled	438 tonnes	359 tonnes
Waste to landfill	1013 tonnes	653 tonnes
Landfill diversion rate	30%	35%

Although the same target applies, we are reporting separately on construction waste. Its production is project dependent and varies significantly.

Construction Waste KPI	2008/9 ³¹	2009/10 ³¹
Waste reused/recycled	260 tonnes	184 tonnes
Waste to landfill	10,168 tonnes	86 tonnes
Landfill diversion rate	2.5%	68%

Construction waste mass for 2008/9 is significantly higher than for 2009/10 due to the waste produced by construction of the Thomas Paine Study Centre (see p. 15). An

extension to the Sportspark will again increase the waste mass figures for 2010/11. A site waste management plan will be in place to ensure reuse/recycling opportunities are maximised.

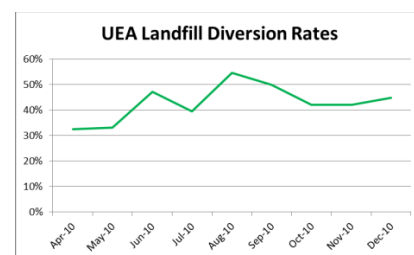
Some of our hazardous waste is sent for recycling via licenced contractors e.g. tubes and lamps, printer cartridges. Chemical waste is incinerated and asbestos is sent to landfill, as per legal requirements.

LCIC are currently undertaking research relating to the production,

Hazardous Waste (kg)	2008/09	2009/10
Fridges/freezers	3640	1785
WEEE	700	650
Batteries	401	1143
Tubes/lamps	800	1898
Printer cartridges	Not available	420
Biochar from Biomass	N/A	1400
Chemical waste	Not available	805
Asbestos	Not available	920

use and validation of biochar⁴³ (a by-product of the biomass gasification process) with biochar to be supplied from our Biomass plant.

Data collected since the start of the new waste contract looks good so far, illustrating an **average landfill diversion rate of 43% per month** (including construction waste). So, we look forward to reporting good progress towards our 70% target but we are also mindful that waste can be reduced in ways other than



General waste management at UEA

When the Sustainability Team took over responsibility for waste management in late 2009, the existing general waste contract was due for renewal. Set up on a pay by lift basis and achieving an estimated 30% recycling rate (using standard industry weights), the minimal data produced provided little guidance on what was in the bins on campus and therefore how UEA could further reduce its waste impacts.

So, student volunteers assisted the Sustainability Team to undertake a waste audit, collecting detailed data on waste streams and quantities; a snapshot of activity which allowed for a radical change in the way waste is managed at UEA.

Our new pay by weight waste contract started in April 2010. Every bin is weighed and detailed data reported monthly, allowing us to monitor activity and continuously improve. Costs have reduced even with the rise in VAT and landfill tax, as we are no longer being charged for emptying bins full of thin air! We know our recycling rates are reliable and other businesses in the area are also benefitting from the ability of the contractor to implement pay by weight contracts.

We have reduced the number of general waste bins, increased recycling bins and glass bottle banks. We now have two recycling zones with collection points for other waste streams and food waste collection bins are being introduced across campus, already successfully segregating 5 tonnes of waste per month for composting at a local facility. Also helped by our CarbonCrew, our recycling rates have increased by over 10% in 6 months.

⁴¹ August to July

⁴² Total waste excluding construction waste, including hazardous waste

⁴³ <http://www.lcic.com/about-biochar>

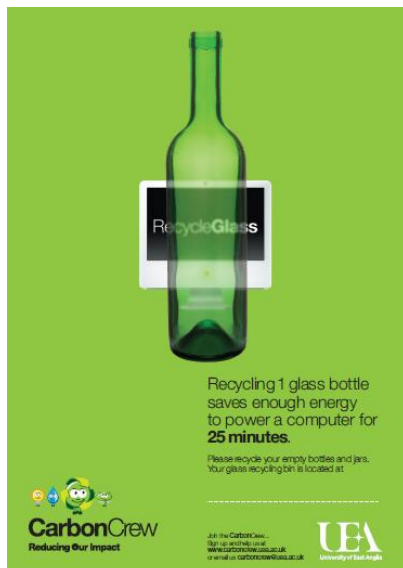
recycling. Preventing waste in the first place and reusing items are more sustainable methods of waste management compared to recycling. Our sustainable purchasing policy includes a goal to reduce waste at source and we are already working on implementing this e.g. cleaning chemical packaging reuse by the manufacturer (see p. 15).

We have also instigated a number of re-use schemes. In June 2010 we set up a furniture re-use scheme, storing unused furniture and cataloguing items, raising awareness of the scheme through the CarbonCrew and University bulletins and newsletters. By Dec 2010 the scheme had re-used 0.5 tonnes of furniture.

‘It’s proving to be more and more successful as staff awareness of the scheme grows’

Andy Watts, Waste Manager

Fly tipping and litter are on-going problems, particularly around The Broad – popular for ‘good weather parties’ - where minimal facilities for waste disposal are currently available. Additional disposal facilities are planned. These will require planning permission and will be in keeping with the natural setting. This summer, we will be siting temporary bins and are



'Big Clean Up' in UEA student residences at the end of 2010 academic year

Every year at the end of term, across the UK, thousands of items are left by students when leaving university accommodation. At UEA, we want to stop throwing these resources away.

The Union’s Environment Officer with the support of UEA’s Sustainability Team and UEA’s Residences and Cleaning Department ran a UEA Big Clean Up campaign. Items recycled include bedding (250 items: distributed to Hillside Animal Sanctuary), clothes and shoes (150 bags going to The Big C), and electrical items and crockery (re-sold to new students at the Union Advice Centre).

This event has been a huge success, saving approximately 2 tonnes of products from landfill disposal, reducing carbon footprint and minimising waste volume. We would like to say a big thank you to all staff and students involved. The initiative is to be repeated in 2011

planning a campaign to raise awareness of the problems and minimise the impact of this regular summer pastime.



Litter from a ‘good weather party’ - a common scene around The Broad.



Waste collected from the Big Clean Up reuse scheme:

WASTE REDUCTION AND RECYCLING

Key objective: Implement our waste management plan

Our 2010 Achievements:

- ✦ Established waste baseline
- ✦ Waste management tender specification
- ✦ Draft waste management plan implemented
- ✦ Improvement targets set
- ✦ Waste Duty of Care records effectively controlled
- ✦ Established furniture re-use scheme and ‘Big Clean up’ campaign
- ✦ WEEE disposal awareness campaign implemented through general environmental awareness training (see p. 11)

Planned Activity for 2011/12:

- ⊙ We will implement glass food waste recycling across campus
- ⊙ We will establish a Waste Duty of Care compliance audit programme
- ⊙ We will review our operational controls for management of construction and refurbishment waste

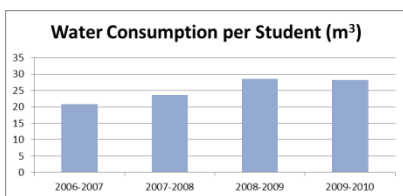
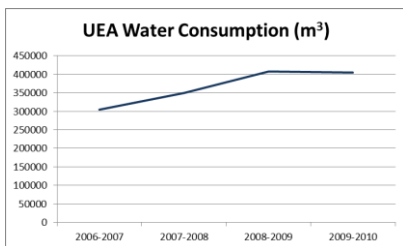
WATER

Water is important. It requires energy and therefore GHG emissions to pressurise and maintain a mains water supply. Reducing water use reduces GHG emissions. There are also local reasons for conserving water; Norwich is one of the driest places in the UK, receiving only half the annual rainfall of Sydney⁴⁴, so water conservation is an important regional issue.

Water consumption at UEA is principally by: residences, catering, CHP plant, Sportspark swimming pool, laboratory research activity, construction and site maintenance. Historically, water efficiency is not something we have focused on. The People & Planet Green League 2010 puts UEA in the bottom quarter of entrants for water consumption, so we have much to do.

Our target is to reduce water consumption by 10% per student over 2008/9 levels by 2013.

In 2008/09⁴⁵ our water use per student was 28.59m³/s/a, this figure has reduced by just 0.36m³ to 28.23m³/s/a in 2009/10.



Our scope 3 GHG emissions (see p. 6) from water use (consumption and wastewater) have reduced

from 368 tonnes CO₂e in 2008/9 to 322 tonnes CO₂e in 2009/10.

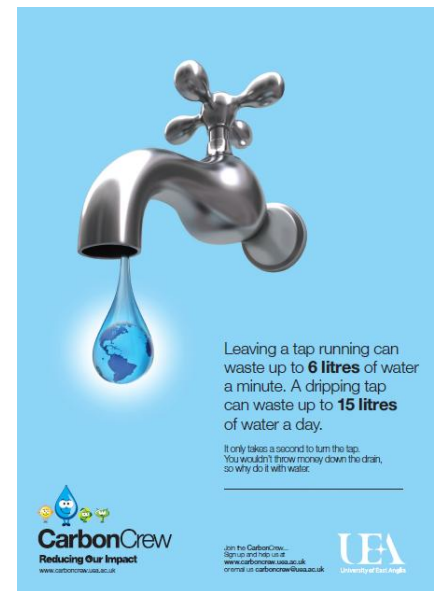
This small improvement hopefully signifies a turning point in our previously increasing consumption trend. We have developed a range of actions to ensure this is the case e.g. CarbonCrew awareness raising initiatives have been on-going since May 2010 and we have planned a leak survey and water meter audit for early in 2011.

To address the water impact of our purchasing decisions, our sustainable purchasing policy⁴⁶ includes a commitment to ‘reduce water consumption’. Investigating techniques such as water footprinting to achieve this goal will be the role of the new Sustainable Purchasing Officer (see p. 21).

We also bear in mind what we put into local water sources and have been working hard to ensure we are controlling our emissions effectively. During 2010/11 we will be implementing an audit programme to ensure practice meets procedure for high risk activities such as oil and chemicals storage (see p. 27). This is particularly important to us considering the proximity of the River Yare, The Broad and related fen habitats.



The campus holds eight effluent discharge consents from Anglian Water. We have been working in partnership with Anglian Water to review these consents and aim to reduce the mercury content of our effluent over the next two years. Our vehicle washing area and biomass plant will require consents once they are operational and the content of the effluent is known.



WATER

Key objective: Develop and implement a long term strategy for reduction in water consumption and prevent pollution

Our 2010 Achievements:

- ✦ CarbonCrew awareness training

Planned Activity for 2011/12:

- ⊙ We will undertake a leak survey and water meter audit
- ⊙ We will establish a compliance audit programme for oil storage areas
- ⊙ We will establish a dedicated vehicle wash area for the Grounds Dept.
- ⊙ We will reduce our discharge consent compliance limit for mercury

⁴⁴ www.worldclimate.com/ and www.foreca.com/

⁴⁵ August- July



⁴⁶ <http://www.uea.ac.uk/fin/purchasing/sustainablepolicy>

EMERGENCY PREPAREDNESS

As with any responsible organisation we aim to safeguard our environment by minimising accidents and being prepared for every eventuality.

Emergency situations can present the largest environmental risk to any business. These include a diverse range of possibilities from fires to chemical or oil spills.

Local soil is highly porous compared to other areas in the UK so there is high potential for accidentally released liquids to permeate down to groundwater. The potential effects of local aquifer/groundwater contamination are long term and over a wide geographical scale. Pollution incidents can also contaminate surface water areas such as the Broad and River Yare.

In order to manage these risks effectively we have developed an Emergency Plan and are currently consulting with staff on a complimentary environmental specific incident response plan.

We have dedicated spill kits located at all 17 oil storage locations on campus and have various spill granule bags at other high risk locations e.g. chemical stores.

We have developed an incident reporting system that will help us check that our control procedures are working effectively. This will be linked to existing health and safety accident reporting procedures and promoted to staff in early 2011.

We have had no significant spills at the UEA over the reporting period and have had no fines from environmental regulators.

A significant spill or ‘major incident’ is defined by The Environment Agency as: “having the most severe impacts, or causing widespread or long term environmental damage.

Minor incidents have only a lesser, localised, or short term impact on the environment”. Minor incidents will be reported in subsequent years as data is collected through our new incident reporting system.



The Broad, a County Wildlife site which supports many protected species, could be significantly impacted by e.g. contamination from fire water run-off or detergent spill. Our main storm water drains discharge into it via oil interceptors. The need for a detailed plan to respond to environmental incidents is clear.

EMERGENCY PREPAREDNESS

Key objective: Appropriately manage environmental risks from accidents and emergencies

Our 2010 Achievements:

- ✦ Spill kits in place around campus
- ✦ Incident reporting system developed, to be promoted in early 2011

Planned Activity for 2011/12:

- ⊙ We will implement an environmental emergency plan and deliver training on environmental response
- ⊙ We will integrate environmental risks into our risk register
- ⊙ We will ensure appropriate operational controls are in place for hazardous operations e.g. oil delivery, refuelling and storage
- ⊙ We will implement an audit programme and incident reporting system

OUR VISION FOR THE FUTURE

At UEA we envision a **low-carbon future** that we invite you to share in. We are a university renowned for our environmental research and are doing all we can to practise what we preach. We have set ambitious and comprehensive targets and, with the support of our Sustainability Team and our systematic environmental management system, we aim to achieve these targets and progress on the road to sustainability.

Thermal image taken of the campus on 7 January 2011 at 2.07pm - The contrast between the new and old buildings can be clearly seen (our new building appearing darker as they emit less heat than our older buildings). This clearly illustrates the long-term challenge of our 1960's buildings, and the importance of a programme of long-term improvement.



KEY DOCUMENTS AND WEBSITES:

- ❖ Initial Environmental Review - <http://www.uea.ac.uk/estates/environmentalpolicy/IER>
- ❖ Procurement Policy- www.uea.ac.uk/fin/purchasing
- ❖ Corporate Plan- www.uea.ac.uk/polopoly_fs/1.74259!corporateplan.pdf
- ❖ Environmental policy- <http://www.uea.ac.uk/estates/environmentalpolicy/Environmental+Policy+2011>
- ❖ Conservation Development Strategy- <http://www.uea.ac.uk/estates/construction/Conservation>
- ❖ Carbon Reduction Plan- <http://www.uea.ac.uk/estates/environmentalpolicy/Carbopn+Reduction+Plan>
- ❖ Aspects Register- http://www.uea.ac.uk/polopoly_fs/1.147141!UEA%20aspects%20register%202009.pdf
- ❖ UEA Environmental Programme- <http://www.uea.ac.uk/estates/environmentalpolicy/Aspects+Register+November+2010>
- ❖ CarbonCrew - <https://uea.cred2.co.uk/CRed/Index.action>
- ❖ Travel Plan - <http://www.uea.ac.uk/estates/environmentalpolicy/traveltransport>
- ❖ Draft Grounds Maintenance and Conservation Plan - <http://www.uea.ac.uk/estates/environmentalpolicy>
- ❖ Draft Waste Management Plan - <http://www.uea.ac.uk/estates/environmentalpolicy>

If you have any comments or questions, please do not hesitate to contact us. Our stakeholder's views are important to us.

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Environment and Sustainability website: <http://www.uea.ac.uk/estates/environmentalpolicy>

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Main switchboard: 01603 456161