University of East Anglia

SUSTAINABLE WAYS

2014 ENVIRONMENTAL REPORT

Contents

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Cover Photo:
Crome Court, our new 232 bed student residence, opened in September 2014. The building's living wall expresses our environmental ambitions. Read more on page 11.

Forewords

Professor David Richardson
Vice-Chancellor

As the new Vice Chancellor I am very pleased to introduce a report which demonstrates our on-going commitment to environmental sustainability. Having celebrated 50 years of successful innovation, creativity and academic prowess, we are now in the process of developing a new corporate plan. We are consulting widely on what UEA should be in 2030 and sustainability has figured highly in these debates.

With Britain's greenest building, the Norwich Research Park Enterprise Centre, about to open on campus, we continue to demonstrate we are at the cutting edge of sustainable development. This inspirational workspace will add to our already well recognised quality student experience and to the regional economy through green enterprise.

My colleagues and the student community are integral to building the resilience needed to ensure UEA thrives in an uncertain future: A future where our interdisciplinary ethos and ability to shape new disciplines that respond to the grand challenges facing the world will produce graduates who are skilled, confident, and conscious change agents.

I am inspired and excited by the opportunities and challenges to come.

Professor Philip Gilmartin,
Dean of Faculty of Sciences and Chair of UEA Sustainability Board

Our fifth, annual environmental report demonstrates we continue to have much to be proud of in the area of environmental sustainability.

We are one of only 16 universities from across the UK to currently hold the top, 'platinum' status in the EcoCampus environmental management system programme.

Our campus boasts some of the lowest carbon buildings in the UK – with the Enterprise Centre, the UK's greenest commercial building, opening in June.

We have cut water consumption by a fifth in the last five years, halved the amount of waste we send to landfill and levelled our carbon emissions, despite considerable expansion in estate size and student numbers during that period.

The biodiversity and variety of natural environments of our campus, which includes the largest natural landscape of any UK university, continues to increase through habitat creation and careful management.

Our recently expanded Risk and Sustainability Team demonstrates our commitment to engage our community more effectively in further reducing our environmental impact: Embracing UEA's sustainable ways.

About Us

The University of East Anglia (UEA) is a research-led, campus university located just outside historic Norwich city centre in Norfolk[1].

We undertake internationally renowned teaching and research, involving a community of 14,602 students (an increase of over 400 on 2013) and over 3,700 staff (full and part-time) working across four faculties and 28 schools.

We rank in the top 1% of Higher Education institutions in the world[2] and are a leading member of the Norwich Research Park, one of Europe's biggest concentrations of researchers in the fields of environment, health and plant science.

Our celebrated campus includes iconic listed buildings, the Sainsbury Centre for Visual Arts, and world-leading low energy buildings. It occupies 150 hectares of accessible land, supporting five County Wildlife Sites and red list, Biodiversity Action Plan and notable species.

About this Report

This report is presented in the same format as in previous years in order to aid comparison of data over time.

It illustrates our progress and highlights during the period Jan to Dec 2014, using standardised key performance indicators in accordance with the principles of the Global Reporting Initiative (GRI) G4 guidelines. Our greenhouse gas (GHG) emissions are reported according to the GHG Protocol (see figure 1 below). We have reported imported electricity transmission and distribution losses (T&D) (Scope 3) for the first time. Generated electricity T&D losses are included in the scope 2 total.

The majority of data is reported for August 2013 to July 2014 to tie in with Estates Management Statistics submitted annually to the Higher Education Statistics Agency (HESA): It is indicated where this is not the case. The data sources used to monitor performance remain the same as in our 2012 report.

Our activities are unchanged but our floor area increased by 0.1% in 2014 (235,963m^2), with 36% residential space.

About Our Environmental Impacts

We take a comprehensive approach to environmental sustainability, demonstrating real commitment, and reflecting our cutting-edge position in the field of environmental research and as a low carbon exemplar.

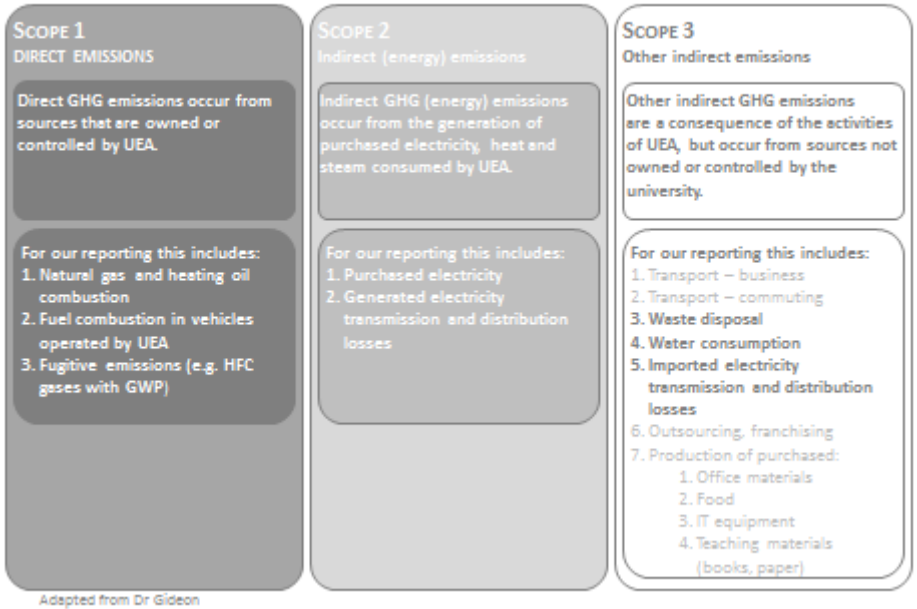
A full review of all our activities in 2009 established our baseline environmental impacts, these relate to:

- Climate change
- Learning, teaching and research
- Resource use
- Emissions and pollution control
- Biodiversity

Since then we have been implementing controls to reduce negative impacts and promote positive impacts. Our objectives are to:

- Minimise our consumption of non-renewable energy and emissions of greenhouse gases
- Embed sustainability into teaching, learning and research
- 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
- Maintain and enhance the biodiversity of the estate
- Manage environmental risks from accidents, incidents and emergencies.

Fig.1 Greenhouse Gas Emissions Reporting



Adapted from Dr Gideon Middleton 2011©
g.middleton@uea.ac.uk

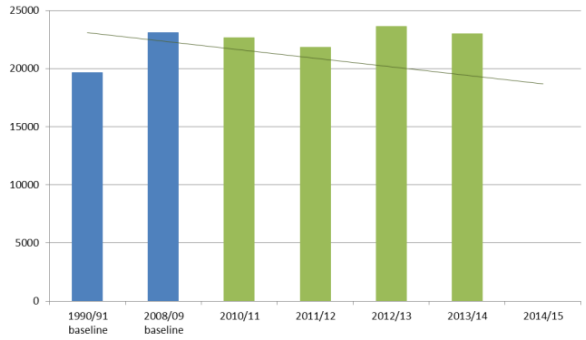
[1] University Campus Suffolk (est. 2005) is a joint venture but is not included in the scope of our environmental management activity as it runs its own EMS.
[2] Times Higher Education World Rankings 2013-14

Our Headline Performance

Carbon Emissions

3% year on year reduction, but 17% above baseline.

Fig.2 Scope 1 and 2 GHG Emissions (tonnes CO_2e)



	Total scope 1 and 2	Scope 1 emissions	Scope 2 emissions
2013/14	23,023	14,140	8,883
2012/13	23,629	15,485	8,144
2011/12	21,845	15,580	6,274
2010/11	22,648	15,539	7,109
2008/09 baseline	23,100	15,380	7,720
1990/91 baseline	19,650	-	-

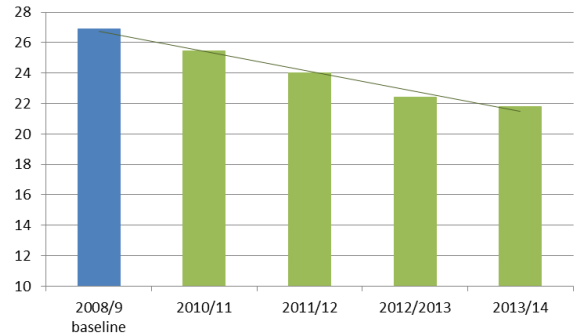
Table 1 Scope 3 GHG Emissions (tonnes CO_2e)

	Waste emissions	Water and wastewater emissions	Imported electricity transmission /distribution losses
2013/14	1,984	293	776.78
2012/13	2,103	295	641.48
2011/12	2,189	291	459.37
2010/11	2,123	325	559.67
2008/09 baseline	Not available	344	566.45

Water

Reduction in consumption of 19% since 2008

Fig.3 Water Consumption per Student (m^3)

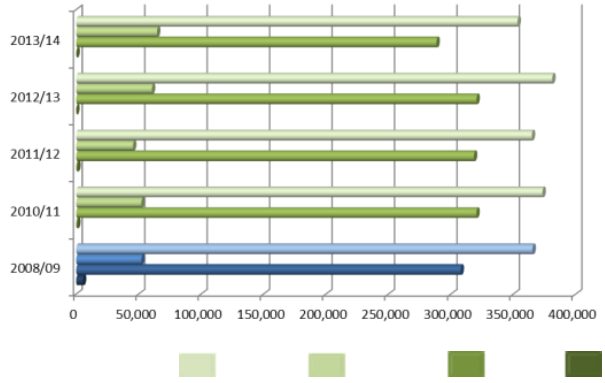


	Total water used	Water used/ student
2013/14	318,031	21.78
2012/13	318,660	22.44
2011/12	324,535	24.01
2010/11	362,097	25.45
2008/09 Baseline	382,987	26.88

Energy Use

3.4% reduction in total energy imported

Fig.4 Energy Use (Gigajoules)

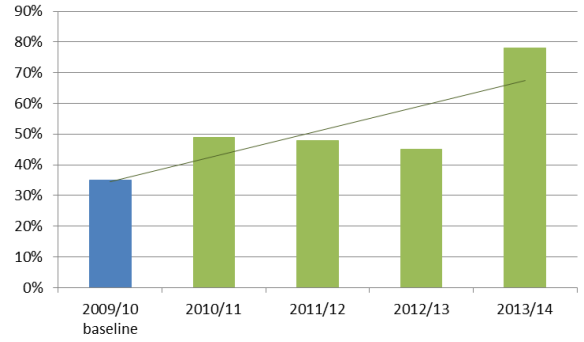


	Total energy imported	Electricity used (National Grid)	Gas used	Oil used
13/14	353,350	64,702	288,437	211
12/13	381,117	60,628	320,488	1
11/12	364,807	45,507	318,412	888
10/11	373,325	52,157	320,411	757
08/09 baseline	365,328	52,154	307,794	5,380

Waste

78% landfill diversion rate; target achieved one year early

Fig.5 Waste Diverted from Landfill (%)



	Total waste produced (tonnes)	Waste reused/ recycled (tonnes)	Waste recovered (EfW) (tonnes)	Waste to landfill (tonnes)
2013/14	1,238	590	380	268
2012/13	1,252	561	n/a	691
2011/12	1,310	621	n/a	689
2010/11	1,213	588	n/a	625
2009/10 baseline	1,012	359	n/a	653

Table 2 Construction Waste

	Landfill diversion	Recycled/ reused (tonnes)	Landfill (tonnes)
2013/14	96.6%	2,418	86
2012/13	98.0%	7,889	177
2011/12	88.4%	35	5
2010/11	85.5%	3,691	628

Table 3 Summary of Other Key Performance Indicators

Key Performance Indicator	2008/9	2010/11	2011/12	2012/13	2013/14	On-target?	Reporting Period	pg
% electricity used generated on site (yearly average)	n/a	68	69	70	53	Target not achieved	Aug-Jul	8
GJ electricity use/m^2	0.511	0.516	0.512	0.529	0.512	Not on target	Aug-Jul	8
[3]GJ heat use/m^2	0.600	0.593	0.578	0.601	0.606	Not on target	Aug-Jul	8
Tonnes CO_2e/student	1.621	1.592	1.617	1.664	1.576	n/a	Aug-Jul	8
Tonnes CO_2e/m^2	0.102	0.098	0.094	0.101	0.098	n/a	Aug-Jul	8
Job specific environmental training (hours, number of staff trained)	Not available	86 hours 162 staff	71 hours 112 staff	152 hours 99 staff	282 hours 149 staff	n/a	Jan-Dec	-
Emissions of Ozone depleting substances CO_2e[4]	50 tonnes	0 tonnes	38 tonnes	42 tonnes	76 tonnes	On target	Aug – Jul	10
Emissions of Ozone depleting substances (CFC-11 equivalent)	1.5kg	0kg	1.2 kg	1.3 kg	2.3kg	On-target	Aug – Jul	10
Number of environmental complaints	Not available	25	20	16	12	n/a	Jan-Dec	-
Number of environmental compliments	Not available	18	17	6	8	n/a	Jan-Dec	-
% sustainable catering spend	Not available	45% of total spend	65% of total spend	69% of total spend	Not available	Target not achieved	Jan-Dec	16
Fuel used in fleet vehicles (petrol)	Not available	Not available	Not available	3,910 litres	To be confirmed	New target	Aug – Jul	15
Fuel used in fleet vehicles (diesel)	Not available	Not available	Not available	31,173 litres	To be confirmed	New target	Aug – Jul	15
Travel to work: single occupancy car journeys	Not available	Not available	33% staff 9% students	30% staff 10% students	Format of data collection changed	New target to be agreed	Aug – Jul	15
Area of habitats protected with documented plan	0%	100%	100%	100%	100%	n/a	Jan-Dec	18
Number of IUCN Red List Species and national conservation list species on site	Not available	157	156	162	162	n/a	Aug-Jul	18
Number of significant environmental incidents[5]	Not available	Not available	5	1	10	Target not achieved	Jan-Dec	20
Environmental fines from regulator	£0	£0	£0	£0	£0	Target achieved	Jan-Dec	20

[3] Heat used for heating normalised against Degree Days
[4] Historic data amended. Previously reported figures related to all refrigerants; data already reported under scope 1 emissions.
[5] An environmental incident is a failure to implement required environmental controls that may lead to environmental pollution, contamination or damage, or that has potential to do so. A 'Significant Incident' is an incident that has caused such environmental damage, pollution or contamination.

Sustainable Environmental Management

The 2014 Higher Education Academy and National Union of Student's 2014 (4th consecutive) survey into student attitudes towards sustainable development in UK higher education, found that 80% of students believe that sustainable development should be actively promoted and incorporated by UK universities. This belief has been shown to increase as they progress through their studies.

Our environmental policy commitments:

- Implement an Environmental Management System certified to ISO14001 via the EcoCampus scheme
- Develop the sustainability agenda at UEA
- Empower and motivate staff to support EMS implementation
- Effectively communicate to share knowledge and learning

Our approach

Since completion of our Initial Environmental Review in 2009, a coordinated and systematic approach to sustainable environmental management has been implemented by a team of experts led by the Director of Sustainability and guided by our Environmental Policy and related plans.

We are one of only 16 universities to have currently achieved the Platinum EcoCampus award. By implementing a formal Environmental Management System (EMS) we can ensure we continually improve; minimise environmental risk and liability through controls and performance improvement; achieve resource efficiency with resultant cost savings; and, receive external recognition of our actions e.g. evidence of effective environmental management is becoming increasingly important in research grant applications.

Our Corporate Plan is currently being updated and sustainability has remained high on the agenda during current consultations.

Target 2014	Progress		Target 2015
Achieve certification to ISO14001 by May 2015		Platinum Award achieved March 2014. Target date for ISO14001 changed due to availability of external auditor	**Achieve certification to ISO14001 by May 2015**
Accommodate 100 students in Green Flats by Oct 2014		Achieved - 106 students residing in Green Flats Oct 2014	**Accommodate 200 students in Green Flats by Oct 2015**
18 Green Impact Award Teams across campus by Oct 2015	NEW	There were 8 Green Impact Teams in 2013/14. Focus of target changed to drive engagement action more effectively. New project to use School of Biological Sciences as a trial	**Deliver 5% energy saving attributable to engagement by July 2020**

Green Flats

Over 100 students joined the ground-breaking Green Flats network for the 2014-15 academic year. Now in its third year, students interested in environmental and ethical issues are able to choose to live together in on-campus accommodation.

Successful applicants received a hamper of eco goodies on arrival, including washing balls (saving water and money, and reducing emissions of chemicals to water), a solar mobile phone charger, Ecover washing-up liquid, a shower timer (helping to reduce wasted water), and dryer cubes (helping to aerate clothes needing to be tumble dried, reducing dryer time and energy costs as a result).

The Green Flats will grow to bigger and better things in 2015-16, with residents receiving early notification of upcoming events and competitions and encouraged to become Green Ambassadors in their halls. Over the years the network has provided a number of CarbonCrew Student members, biodiversity and carbon-reduction volunteers across the University, and an Environmental Officer to the Student Union. As the network grows, Estates and Accommodation hope to take the 'Green Flats' ethos into the private accommodation sector, working with the Homerun housing search to help connect Green Flat and other interested students in finding places to live together off-campus.

The new Sustainability Team

The Risk and Sustainability Team welcomed two new members in 2015. The new Environmental Officer, Catrin Darsley, and Energy Officer, Vikki Rees, will support the University's aims to become more sustainable.

Vikki Rees, a former student of the School of Environmental Sciences, joined UEA from Aviva. Working with Richard Bettle, the Head of Energy and Utilities, Vikki's monitoring of buildings' energy use will be key to evidence-led interventions to help reduce energy wastage across the campus. Vikki's work as part of the Energy and Carbon Reduction Programme will be instrumental in helping the University to meet its 35% carbon reduction target.

Catrin Darsley joined UEA from the University of Cambridge, where she managed the sustainability team's website, social media presence, and legal compliance with various environmental risks. She will be managing the Sustainability Network of environmental champions, as well as reviewing our sustainability communications strategy and future campaigns.

The new Sustainability Network

The CarbonCrew have been the cornerstone of our environmental engagement activities since 2010, and 2014 saw successful CarbonCrew student campaigns from chocolate giveaways on Valentine's Day to a UEA Pledge Day, which included a low carbon gig performed through a bicycle powered P.A. The group have also undertaken a study on paper usage in lectures.

Our staff have continued to engage in local action with 8 teams gaining Green Impact Award certificates presented by Pro. Vice Chancellor Prof. Dave Petley. The results were impressive, with three teams achieving Gold Awards, one Silver Award and two Bronze awards and two Bronze Lab awards. A special award was presented to IT and Computing Services for improvements made on the energy performance of the IT suite.

The Carbon Crew Christmas Chocolate Drop engaged with over 1000 staff, thanking them for undertaking energy saving actions over the festive season.

CarbonCrew
Reducing Our Impact

The CarbonCrew is being renamed and revitalised to give new, improved opportunities for staff and students to champion environmental and energy issues in their school or department.

Sustainability Champions are now working with UEA's new Environmental Officer, Catrin Darsley, and the Risk & Sustainability team in Estates to support environmental initiatives across the University. They are feeding into a new logo and range of posters, which are being developed alongside a new website and new 'SustainableUEA' social media platforms. Lighting reviews by several Champions have already identified a number of opportunities for the UEA to save energy, reducing both environmental impact and the cost of utilities.

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For more information, email Catrin at c.darsley@uea.ac.uk.

New network members are always welcome, and can contact Catrin to find out more. With ongoing support, members become part of an active network who share knowledge and best practice. They provide a local focus point for environmental and energy issues, and help encourage their colleagues to make small changes to everyday practices on campus that will collectively make a difference across the University.

Ground-breaking Open Energi

Our commitment to sustainable energy management extends beyond the campus boundary. As a result we have adopted a dynamic approach to electricity demand, becoming the first university to install a unique energy management technology across its campus, helping National Grid to keep the lights on and cutting UK CO_2 emissions.

Grid balancing is vital to maintain power supplies. If electricity supply is greater than demand, equipment could start to fail. If demand is greater than supply, the lights could go out.

Working with Open Energi, we have equipped air handling units (AHUs) totalling up to 1 MW across campus with an innovative form of demand response which can switch the fan speed off or on instantaneously to help National Grid balance electricity supply and demand on a second-by-second basis. Typically the AHUs are only switched controlled for a few minutes at a time and are always kept within their own performance boundaries, so students and staff feel no impact from the service.

As part of a 10-year agreement, the technology, called Dynamic Demand, will be rolled out to large chillers and student accommodation blocks.

The technology should earn in excess of £50,000 over the next three years which will be invested in future sustainability projects, and will help to cut CO_2 emissions from power stations.

"Open Energi's technology provides a cleaner and more efficient answer to balancing the grid than ramping a power station's output up and down. We provide access to our loads within strictly controlled boundaries and in return we get paid." Martyn Newton, Assistant Director of Estates - Risk and Sustainability

"As more of our energy comes from less predictable, renewable sources balancing electricity supply and demand is going to get trickier. UEA is helping to provide the kind of demand-side flexibility National Grid so urgently needs." Ged Holmes, Open Energi's Commercial Director

The UEA Open Energi scheme was highly commended in the 2014 Green Gown Awards, Technical Innovation for Sustainability category

Energy and Climate Change

UEA campus has been a leader in the field of Combined Heat and Power (CHP) generation since 1999. We normally generate around 70% of our own energy using high efficiency CHP generators, utilising an absorption chiller and district chilled water main to maximise use of previously waste heat.

99% of emissions covered by our headline carbon reduction target (scope 1 and 2) are building related, with over half resulting from electricity use and a third from heat use. Thus, reducing energy consumption is a high priority for reducing our carbon footprint.

Our environmental policy commitment:

- Minimise consumption of non-renewable energy and emissions of greenhouse gases

Our approach

We act to achieve the UK Government mandate of 80% reduction in CO_2e by 2050 from a 1990 baseline (enshrined within the Climate Change Act 2008) and HEFCE (Higher Education Funding Council for England) emissions reduction targets.

We are also obligated to the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme.

Our Carbon Reduction Plan is currently being updated and a new energy and carbon reduction programme for 2015-2020 is being established.

Our strategy focuses on energy minimisation and renewable generation: Generating more of our own energy via natural gas and solar power. Action is driven by our cross-departmental Carbon Reduction Team.

Target 2014	Progress	Target 2015
Reduce $kgCO_2e$ from direct emissions (scope 1 and 2) by 44% (absolute emissions) over 2008/9 levels by July 2020 (35% compared to 1990 baseline)	Target not on track - Footprint is 23,023 CO_2e. This is a 3% year on year reduction and 0.3% below our 2008/09, baseline but is 17% above our 1990 baseline	**Reduce $kgCO_2e$ from direct emissions (scope 1 and 2) by 44% (absolute emissions) over 2008/9 levels by July 2020 (35% compared to 1990 baseline)**
Generate at least 70% of electricity used on the main campus averaged over each academic year	Target not met - 53% achieved due to boiler refurbishment; engine replacement now also required	**Generate at least 70% of electricity used on the main campus averaged over each academic year**
Reduce electricity used on the main campus/m^2 by 15% compared to a 2008/09 baseline by Jul 2020	Target not on track– Energy intensity is level with baseline, and there has been a 3.4% reduction year on year (2008/9 baseline 0.511 GJ/m^2)	**Reduce electricity used on the main campus/m^2 by 15% compared to a 2008/09 baseline by Jul 2020**
Reduce heat used/m^2 for heating (normalised against Degree Days) and hot water by 10% compared to a 2008/09 baseline by July 2020	Target not on track – Energy intensity is 0.1% higher than baseline (2008/9 baseline 0.600 GJ/m^2)	**Reduce heat used/m^2 for heating (normalised against Degree Days) and hot water by 10% compared to a 2008/09 baseline by July 2020**
Implement ISO50001 by December 2015	Preliminary work on implementing a monitoring and targeting package is underway	**Implement ISO50001 by December 2015**

Meeting our carbon reduction target

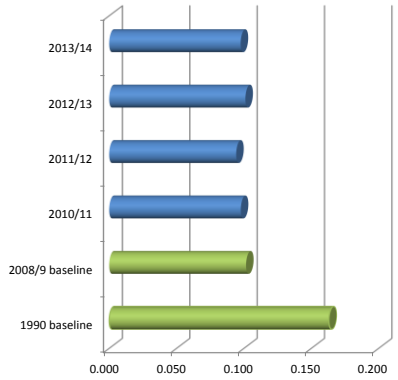
A number of exciting projects during 2014 have resulted in a levelling out of our carbon emissions. In 2013/14, we emitted 23,023 tonnes of carbon – this is a year-on-year reduction of 3% despite an ongoing growth in student numbers and the size of our estate (see figure 6 below).

Boiler refurbishment

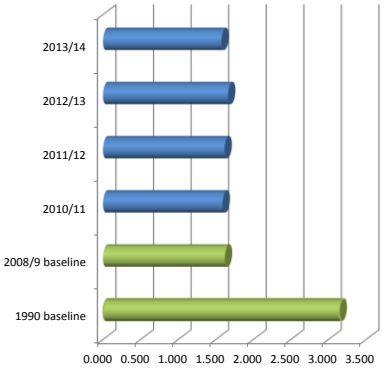
Our CHP (Combined Heat and Power) engines continue to provide electricity for the campus by burning natural gas – a cheaper and lower-carbon alternative to using grid electricity, with the added benefit of simultaneously providing heating and cooling for the site. They reduce our annual carbon footprint by around 5,000 tonnes, saving around £1m per year.

Fig. 6 Carbon Intensity

Scope 1 and 2, tonnes CO_2e/m^2



Scope 1 and 2, tonnes CO_2e/student



In 2014 our main backup boilers (in place to guarantee service continuity in the event of a problem with our CHP engines), were replaced with three new models. Not only will these provide a more efficient and reliable service (having replaced the original 1964 models), but they will also increase our capacity to manage estate growth.

We also made a successful bid for funding to add thermal stores to our district heating system. This will enable us to operate our CHP engines more efficiently; running our boilers less and capturing excess heat for later use. These are due to be installed in 2015 thanks to £580,000 from Salix Finance.

Low carbon technology installations

We have installed photovoltaics on the Julian Study Centre, at its peak providing 22 kW of solar energy. The system on our new accommodation block, Crome Court, will also produce in the region of 21kW. This is in addition to the 34 kW system installed on ZICER in 2002. Each of these systems will produce around 20,000kWh equating to around £2,000 per year. Due to the advancement in technology over the past 10 years, our systems become more efficient with each installation.

The 34kW photovoltaic system on the ZICER building

Boosting budgets

As part of the University's ongoing maintenance programme, the carbon reduction budget has boosted existing funding plans and increased the environmental credentials of a number of projects. As we replace the old flat roofing across campus we are increasing the level of insulation to well above building standard requirements. By also coordinating with small works repairs we are also able to minimise both the cost and disruption to building users.

The ongoing re-roofing strategy will continue to see Richard Bettle, Head of Energy and Utilities, boosting insulation across campus as new projects come on-line. This is an example of one of the 2015 review strands of the Energy and Carbon Reduction Programme (see below), where we will work to connect ongoing, planned maintenance of the campus with our own agenda.

Seeing the light

We carried out a number of lighting projects this year. Energy efficient lighting replacements in corridors in the School of Chemistry significantly enhanced the space for users, who were pleasantly surprised at the difference.

Behind the scenes in the Boiler House, LEDs have replaced fluorescent bulbs. The old system provided poor-quality light and required scaffolding to be erected every time a bulb needed changing. The new system has provided a brighter, improved working space. Unfortunately, the sudden improved visibility meant a spring clean was needed!

Meanwhile, in the Library stairwells, LEDs have replaced old T12 fluorescent tubes. This has had an impact on brightness as well as temperature: Previously wasted energy emitted as heat made the stairwells too hot. It has also reduced energy consumption by around 90%, equating to £8,500 and 30 tonnes of carbon per year

.

Looking forward

Over the next 12 months, we will continue to look at the feasibility of re-glazing the Grade II listed Teaching Wall; an original part of the University designed by Denys Lasdun. The challenge is to improve thermal comfort while retaining all features necessary for planning consent. This will be a multi-million pound project which will benefit a significant proportion of the University's population together with a significant energy saving.

The energy team will be hunting down the last of the halogen spotlights and T12 fluorescent tubes on campus; replacing these with more efficient lights and completing our campaign against our most inefficient lighting systems.

In a significant move, we aim to demonstrate the benefits to comfort levels and energy savings which can be achieved by recommissioning our buildings. Working with the Dean of Sciences we are piloting a programme in the School of Biology, with the aim of rolling this out across campus. In combination with a heightened awareness and engagement campaign, we have high hopes for this project.

The School of Biology building uses 3300kWh by 4pm every day!

Table 4 Energy Generation and Use (Gigajoules)

	2008/09 baseline	2010/11	2011/12	2012/13	2013/14
Total electricity generated	74,709	79,290	86,627	73,715	67,104
Total heat generated	141,520	145,668	134,458	157,001	130,317
Total energy used	280,426	286,998	277,670	302,798	275,937
Total electricity used	121,883	125,276	125,539	129,185	126,366
Total heat used	133,384	137,183	126,672	146,240	122,629
Electricity used (National Grid)	52,238	52,154	45,507	60,628	64,702
Total gas used	307,794	320,411	318,412	320,488	288,437
Total oil used	5,380	757	888	1	211
Renewable energy generated	Not available	72	82	76	79
Electricity sold back to National Grid	84	919	1,641	140	567

Emissions to Air

Other emissions to air which cause significant environmental impacts such as damage to the Ozone layer and acid rain also need to be controlled. There are legal requirements regarding general air quality and management of specific emissions.

Our environmental policy commitment:

- Prevent pollution

Our approach

Our most significant activity is the use of refrigerants and we have planned maintenance schedules to ensure we minimise our emissions of all refrigerant gases. We aim to use our district chilling system to reduce our need and have also prioritised phase out of all systems containing Ozone-depleting substances (ODS), namely R22 (HCFC22).

Refrigerants also contribute to GHG emissions and our strategy is to choose substitutes which minimise these, wherever possible.

Target 2014	Progress	Target 2015
Achieve zero emissions of HCFC-22 (R22) refrigerant by July 2016	42.2kg of R22 were emitted, equivalent to 2.3kg CFC-11e or 76 tonnesCO_2e. 10 units were de-commissioned	**Achieve zero emissions of HCFC-22 (R22) refrigerant by July 2016**

Table 5 Refrigerant Gas Emissions (kg)

Refrigerant Loss (kg)	HCFC-22	HFC-134a	R404a	R407c	R410a	R417a	R422d	R508b
2013/14	42.20	0.74	15.83	50.30	13.8	0.5	2.6	0
2012/13	23	1	15	26	7	0	0	0.3
2011/12	21	2	23	89	5	0	0	0
2010/11	0	1	6	91	1	0	0	0
2009/10	67	0	0	219	3	0	0	0
2008/09	28	6	18	36	0	0	0	0
GWP[6]	1,810	1,430	3,922	1,774	2,088	2,346	2,729	13,396

Our district chilled water via absorption chilling from waste heat

[6]Global Warming Potential (GWP) is an index which refers to the extent to which a substance contributes to global warming, using CO_2 as the reference value. Where CO_2 has a GWP=1. See Fluorinated greenhouse gases (F gas) regulations 2015.

The Built Environment

99% of our direct carbon emissions are building related and since 1990 we have almost doubled our floor space. This means we need to control the impacts of our new build and refurbishment projects and effectively manage the use of our buildings over their occupied lifetime if we are to reduce our potential exposure to climate change risks.

Heating our buildings constitutes the main source of our CO_2e emissions and by designing them in an intelligent and forward thinking manner we can help to reduce the environmental burden of use, maintenance and continued infrastructural development.

Our environmental policy commitment:

- Effectively control the environmental impacts of facilities maintenance, campus development and refurbishments

Our approach

The UEA campus has been a leader in the field of low energy buildings for twenty years. These buildings have been the recipients of major awards and the subject of numerous studies.

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

Using BREEAM (Building Research Establishment Environmental Assessment Method) provides an environmental benchmark to which buildings can be measured. Providing impartial certification to the level of design and construction we employ.

Our Building Management System allows us to monitor building performance and environmental champions in our projects and maintenance departments are improving operational practices on a day to day basis.

Target 2014	Progress		Target 2015
All new build projects to achieve BREEAM excellent or above, on-going target	✗	Not achieved 2014 (Bob Champion Research & Education Building achieved BREEAM Good). Other new buildings are on track to achieve at least a BREEAM Excellent rating. The NRP Enterprise Centre is on track for BREEAM Outstanding and Passivhaus certification	**All new build projects to achieve BREEAM excellent or above, on-going target**
Review BREEAM refurbishment model by Dec 2014	✓	Target date extended. Trial of model to be undertaken during 2015	**Review BREEAM refurbishment model by Dec 2015**

Crome Court

In August 2014, our new 232 room, BREEAM 'Excellent' rated accommodation block was delivered under budget and in record time (22 months from concept to completion).

The use of Building Information Modelling (BIM) informed a whole life costing approach, crucially enabling both speedy delivery and integration of sustainable principles from the very earliest stages. This delivered BIM Level 2 6D, winning 'Collaboration Project of the Year' at the Construction Computing Awards 2014.

The use of cross laminated timber (CLT) panels has reduced the embodied carbon of the project, with secondary benefits of smaller foundations and good airtightness. It also enabled rapid construction; the CLT frame was erected in an impressive 13 weeks!

Prefabricating the panels in factory conditions allowed waste to be reduced and re-used. They arrived on site ready for immediate erection, with all door, window and service openings etc. pre-cut. Together with the use of pre-fabricated shower room pods, this reduced the noise and disturbance to other campus users, with only one noise complaint being received during the whole project: Impressive when occupied residences are only 10m away!

Constructed from approximately 1,750m^3 of timber, it stores 1,395 tonnes of $C0_2$ (carbon dioxide absorbed from the atmosphere during growth). The overall effect is carbon negative and it will take approximately 4 years of continued use before the building's carbon emissions match the carbon stored within the structure.

Additional features which contributed to the Excellent BREEAM rating include:

- distinctive coloured glass fins providing solar shading
- Green-wall system
- Photovoltaics producing around 21kW of solar energy
- Grey water recycling for WC flushing and green wall irrigation
- Inbuilt screens in every kitchen showing energy data for the block and relevant flat.

The Blackdale accommodation development, the 'big brother' of Crome Court is due to come online in 2016 and will also use BIM technology.

The quality of Crome Court has already been recognised, by being the RICS Regional Winner; receiving a Green Apple Gold Medal and the NAA Craftsmanship Award. It has also been shortlisted for the RICS National Award, Green Gown Award and BIM Project of the Year

Enterprise Centre – from inception to starting the built project

Development of the concept
At its earliest stage, the Enterprise Centre was an academic exercise. What would Britain's greenest commercial building look like? How could this idea be delivered, given location and cost restraints? What new skills and materials could add to the project's targeted minimal-carbon usage.

Adapt Low Carbon Group, an affiliate consultancy business to UEA, drove forward the concept and design. Its Centre for the Built Environment (CBE) focussed this through the idea that "there is another way to build". They decided to look beyond low energy in use; the typical 'low-carbon building'. By also considering the carbon impact of construction it was hoped that new ways of thinking could add to the industry's existing developments in this area. Localism – the use of local products – and using products that could be grown rather than intensively processed was one starting point.

Examples of local materials identified include hemp and local timber. Thetford and Brandon Forest timber was found to be limited to use for low-quality 'green timber' projects such as fencing and not being used in construction. A report commissioned by CBE identified that it had significant potential for the project and construction industry generally.

A new South Norfolk project created a use and promotion for hemp as a new material. When mixed with lime, the resulting hempcrete can be used in place of the much higher carbon-intensity concrete option. In its fibrous form, hemp is good for insulation and can be formed into blocks or walls. To encourage this new industry, Adapt commissioned a hemp harvester, a new machine to enable more efficient farming.

The harvester is one example of the wider ramifications of the Low Carbon Innovation Fund – with a target of creating 250 new jobs, guaranteed longevity for 60 jobs and thereby saving those jobs over time, and providing 600 companies with training on low carbon, Adapt and the Enterprise project aimed to inject money into the region but in a self-generating, ripple-effect way. The Fund was set up to fund loans that might not otherwise be successful, and focused on high risk ideas such as the hemp project.

Project beginnings
The Enterprise project inception started in 2007 with funding secured in 2009; the ground breaking ceremony took place in November 2013; and, the low carbon hempcrete base was poured in July 2014. The building is to demonstrate the use of different materials, low carbon materials in construction, and the potential for localism in the Norfolk & East Anglian region. For example, why do we bring glulam timber from Norway, Sweden and Austria when there is potential in neighbouring forests?

The project has been developed and built to the Passivhaus standard, which is recognised as the most stringent low 'energy in use' standard. It moves beyond our previous low carbon buildings through improved insulation, an improvement in air tightness and there will be strong controls on the energy used within the building once teams move in. The triple-glazed windows and the building's orientation will maximise natural light and minimise heat loss. It is also targeting BREEAM Outstanding, a challenging, holistic measure of a building's attention to sustainable measures.

The Enterprise Centre is part-funded or supported by: UEA; ERDF (European Regional Development Fund); BRE; BBSRC; NALEP & Norwich Research Park; Adapt Low Carbon Group.

The installation of highly innovative thatched cassettes cladding is a world construction first

Education for Sustainable Development (ESD)

Research conducted by the National Union of Students and the Higher Education Academy (HEA)[7] has consistently shown over the last three years that over two-thirds of students expect their institutions to implement sustainable development in their courses.

The Quality Assurance Agency (QAA) has published guidance[8] asking Higher Education Institutions (HEIs) to demonstrate that sustainability has been embedded in curriculum and engagement.

Our environmental policy commitment:

- Embed sustainability into teaching, learning and research

Our approach

Developed from a series of funded projects, the UEA Future Skills Initiative aims to ensure that our students are able to contribute practically and conceptually to bringing about a more sustainable world. By integrating sustainability 'perspectives' into learning and teaching activities across the University we aim to improve the student experience, raise the profile of the University and address the increasing emphasis placed on Education for Sustainable Development within the HEA and the wider HE sector.

The Learning and Teaching Strategy commits to promoting international citizenship, 'equipping our students to address contemporary global issues and challenges'. A working group of the Learning and Teaching Quality Committee led by the Academic Director of Taught Programmes delivers the Future Skills Initiative.

Target 2014	Progress		Target 2015
Develop a student-staff handbook on 'how to get sustainability skills into your degree programme' by June 2014	✓	National handbook workshop held February 2014. Three student interns employed to develop content. Target date extended as currently being reviewed by staff to embrace: QAA guidelines	**Develop a student-staff handbook on 'how to get sustainability skills into your degree programme' by December 2016**

Preparing future doctors

As part of the Sustainable Healthcare Education network[9], UEA is leading on a project to prepare tomorrow's doctors to respond to the health effects of climate change-and reduce carbon emissions.

New challenges increasing the strain on healthcare systems include the impact of flooding and heatwaves, new infections such as dengue fever, and changes in atmospheric pollution that exacerbate respiratory conditions. The NHS is also the largest public sector emitter of carbon, and its Carbon Reduction Strategy sets stringent goals for an 80% reduction in carbon emissions by 2050.

The project's key achievement to date is the creation of a set of curriculum additions[10]. These are already being trialed at UEA.

The new topics include how the environment and human health interact and how climate change can influence human health in future.

Students also need to demonstrate the skills needed to improve the environmental sustainability of the health sector-from recycling to reducing waste and better prescribing practices, all of which leave a heavy carbon footprint.

"Climate change is primarily a health issue. Doctors need to lead on adapting to, and preventing, the health threats it poses as part of their duty to protect and promote the health of the public". Lead researcher, Stefi Barna, (Norwich Medical School)

Medical students are also driving a national campaign to create climate-conscious healthcare. UEA represent one of the two student-led branches of Healthy Planet UK, influencing the medical curriculum on a local level.

The group aims to raise awareness about the links between health and global environmental change, hosting interactive discussions to show students that they have the power to influence what happens in the coming years.

UEA Healthy Planet's first event, "a planet out of control" seminar, delivered by Prof. Andrew Watkinson, a leading climate science researcher and professor of the School of Environmental Sciences and Director of the Living with Environmental Change Programme[11]

[7] Drayson, R., Bone, E., Agombar, J. and Kemp, S. (2013), Student attitudes towards, and skills for, sustainable development, HEA. York. UK
[8] QAA (2014), Education for Sustainable Development: Guidance for UK Higher Education Providers, QAA. Gloucester. UK
[9] sustainablehealthcare.org.uk/sustainable-healthcare-education
[10] 'Learning objectives for sustainable health care' The Lancet, November 28, 2014
[11] http://www.lwec.org.uk/

Sustainable Procurement

Over 60% of organisations' carbon emissions are estimated as stemming from purchasing products and services[12] leaving all organisations vulnerable to potential exposure to climate change risks within their supply chains.

Estimating carbon emissions from purchasing is complex but these risks can be reduced by making purchasing decisions that minimise resource use and waste disposal impacts.

Target 2014	Progress	Target 2015
Achieve a minimum of 60% of total catering food spend on sustainable produce on an on-going basis	Data not currently available due to changes in data collection methods with implementation of new finance system	Target under review
10% reduction in A4 copier paper consumption on 2013/14 levels by Dec 2016	Baseline established: 23,038,750 sheets, £97,414 Oct 2013 – Sept 2014. A print management survey (June/July 2015) will inform actions to meet this target	**10% reduction in A4 copier paper consumption on 2013/14 levels by Dec 2016**

Our environmental policy commitment:

- Minimise consumption of non-renewable and environmentally sensitive resources by embedding integrated life-cycle approaches in decision making

Our approach

Our Procurement Policy sets out our commitment to protecting the environment and society through our purchasing decisions, with processes managed via the DEFRA approved Flexible Framework; (developed for Government by the Sustainable Procurement Task Force) and .guidance provided in our buyers guides.

Our Sustainable Food Policy sets out specific purchasing goals for our Catering Department.

Our recent affiliation to the Worker Rights Consortium means we are specifically working to ensure the garments we buy are manufactured in an ethical manner.

We also work with the Southern Universities Purchasing Consortium (SUPC) to apply market pressure for the increased production of other sustainable products and services.

We have established Purchasing and Sustainable Food Implementation Teams to ensure these policies are implemented.

Worker Rights Consortium

In November 2014, UEA became one of only 15 Higher Education institutions in the UK (185 across the world) to affiliate to the Worker Rights Consortium (WRC)[13]. WRC are an independent labour rights monitoring organisation supporting workers in the garment industry in defending their workplace rights. The WRC is recommended by People & Planet, the student activist network, as a credible, honest and open organisation which has been developed particularly for universities.

Affiliation was driven by UEA students. A four-year campaign by the People & Planet society and the Union of UEA Students included mass petitioning, ongoing lobbying and the largest 'nearly naked protest' in the country: An exciting example of how the University and students can work together to change policy.

The result of affiliation is the ability to bring transparency to our supply chains and work towards ensuring the factories we procure from are compliant with the code of conduct. The code also commits us to conducting our business affairs in a socially responsible and ethical manner consistent with our educational, research and/or service missions, and to protect and preserve the global environment.

WORKER RIGHTS CONSORTIUM

The WRC conducts independent investigations in factories and reports on working conditions. Where violations are identified, it makes recommendations on what actions need to be taken and works collaboratively to achieve these e.g. UEA is able to use its power as a purchaser and stakeholder, in collaboration with other Universities within the Consortium to put pressure on suppliers to clean up their practices on working conditions.

WRC launches factory assessments in direct response to worker complaints and also initiates assessments on a proactive basis. The WRC also maintains a searchable, on-line database of factories engaged in the production of collegiate goods.

WARPit

UEA has launched WARPit, an online resource sharing portal, to exchange or get rid of unwanted furniture and other work-related items. WARPit allows Schools and individuals to exchange items, avoiding procurement costs as well as waste. University assets remain within the University system, and we save carbon as well as waste. Register, and share with colleagues and office managers, to see how you can get involved:
https://www.warp-it.co.uk/uea

warpit reuse network

[12] Sustainable Development Commission (2008) NHS England Carbon Emissions Carbon Footprinting Report
[13] http://www.workersrights.org/

Transport

Around a quarter of domestic GHG emissions in the UK come from transport (DoT 2012). At UEA, limited car parking availability on campus also presents a significant challenge.

New research[14] (Sept 2014) by health economists at Norwich Medical School and the Centre for Diet and Activity Research (CEDAR) found that as well as physical health benefits, walking or cycling to work is better for people's mental health than driving. Experts also found that travelling on public transport is better for people's psychological wellbeing than driving.

Our environmental policy commitment:

- Minimise consumption of non-renewable energy and emissions of greenhouse

Our approach

The UEA Travel Plan sets out our commitment to reducing use of motor vehicles for commuting, particularly for single occupancy car journeys. The plan will be reviewed during 2015.

We continue investment in public transport, cycling and walking and monitor progress via an annual travel survey, undertaking a detailed survey every five years. Delivery of the plan is overseen by our Travel Coordinator, assisted by a Transport Implementation Team with members from across the University.

The contribution of fleet vehicles to our scope 1 carbon emissions is small compared to that of buildings and reducing fleet vehicle use and business travel (scope 3) is challenging due to decentralised management; but this is a priority due to the significant potential cost savings and requirements of the new Energy Savings and Opportunities Scheme.

Target 2014	Progress		Target 2015
Achieve single occupancy car journeys: 44% staff and 5% students by July 2014	✗	Indicative findings only due to change in format of travel survey: 50% staff and 17% student respondents drive without a passenger on inbound journey at least once a week. 37% staff and 8% students drive without a passenger 3 or more times per week (22% response rate)	**Target under review**
Investigate feasibility of implementing reliable carbon emissions monitoring systems for business travel and commuting by December 2014	✗	Not achieved – 2014 baseline of 71,231.19 kgCO2e for business travel (estimated between 15% and 35% of total UEA air and train travel). Insufficient data collected via travel survey to estimate commuting baseline	**Target under review**
Reduce fleet vehicle fuel use by 35% over 2008/09 levels by July 2015	NEW	Target revised against 2012/13 baseline (see table 6 below) and target date extended in line with scope 1 carbon reduction target	**Reduce fleet vehicle fuel use by 35% over 2012/13 levels by July 2020**

Continued investment in cycling

In 2014 we spent around £60,000 on cycle related initiatives. Additional cycle parking was created across campus; with extensions to existing parking areas and a new covered space for 60 cycles.

Norwich Bicycle Repair Co-operative (NBRC) which runs the UEA subsidised 'Doctor Bike' scheme celebrated their first year on campus having made over 3000 repairs to student cycles and created four full time jobs.

"First and foremost we offer a quality repair service and sell bikes that have been donated at an affordable price. But we also offer loads of advice to students on how to maintain bikes and keep their cycling costs down. In 2015, we hope to start offering cycle proficiency training and maintenance workshops for which there is a great demand amongst the student population". Joanne Chitty, co-founder of NBRC

Table 6 Fleet Vehicle Fuel Use (litres)

	Petrol	Diesel
2013/14	TBC	TBC
2012/13 baseline	3,910	31,173

Launched in May 2014 the First Bus Season E-Ticket enables season ticket holders to buy tickets on-line and store them on their smartphone-making it easier and speeding up boarding times.

[14] Does active commuting improve psychological wellbeing? Longitudinal evidence from eighteen waves of the British Household Panel Survey', Preventive Medicine, September 15

Waste and Recycling

Waste means that important natural resources have gone into making a product that is now defunct and that will take up important areas of our countryside if sent to landfill; causing localised environmental problems, GHG emissions as a result of waste transport and processing operations, and other environmental impacts.

There are a number of regulatory requirements relating to managing waste, including applying the waste hierarchy; resource efficiency; and, reduction in carbon emissions (scope 3). Disposal costs for landfill are also rising fast (landfill tax is currently over £80/tonne).

Our environmental policy commitment:

- Minimise the production of waste through reduction, reuse and recycling

Our approach

Having re-tendered all our waste services in late 2014 we will be developing a new Waste Strategy to coordinate activity in line with our environmental policy and the extensive array of waste regulation.

As with our last strategy, it will promote good waste management practices and focus on avoiding waste at multiple stages through the waste hierarchy; by e.g. reducing packaging from suppliers, by re-using furniture elsewhere in the University, and by recycling more materials.

Our Waste Manager coordinates implementation of the strategy, supported by a Water and Waste Implementation Team, comprising staff from across the University.

Target 2014	Progress	Target 2015
Achieve 70% landfill diversion of UEA waste (excluding construction waste) by July 2015	78% achieved July 2015 (main contract landfill bins now going to energy from waste)	**Achieve a 60% recycling rate of UEA waste (excluding construction waste) by July 2017 (2013/14 baseline 48%)**
Achieve an 85% landfill diversion of UEA construction waste by July 2015	98% achieved July 2015 (data incomplete due to limited returns from small works)	**Achieve an 85% landfill diversion of UEA construction waste by July 2015**

Wasters

As part of her final year research project[15], Charlotte Hedgecock, an undergraduate in the School of Environmental Sciences, conducted waste audits[16] to determine the composition of the general waste bins used by the residences. Undertaking analysis of waste composition and weight, the research found approximately 16kgs of food waste in each residential 1100L general waste bin, for every collection[17].

Despite these figures our food waste composting has increased year on year since it was introduced in 2012.

The general compositional data collected can be used as a snapshot indicator of practice (figure 7) and clearly demonstrates the need to raise student awareness of good waste management practices. This is a challenging task due to the rapid turnover of students, but will have significant cost and carbon benefits.

Preventing avoidable disposal

A Taste of UEA Residences is a collaborative cookbook of tasty recipes, placed in every residence kitchen and available online[18]. Produced by the Dean of Students' in collaboration with past student residents and our Catering Division, the cookbook aims to reduce waste and save students money. All the meals can be made using the equipment provided in UEA accommodation.

Fig. 7 Contents of Average Residences General Waste Bin

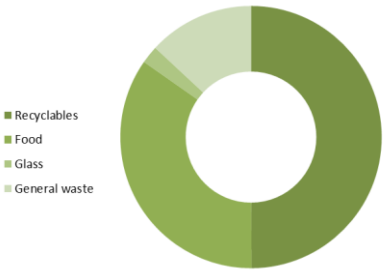


Table 7 Hazardous Waste Production (kg)

	2010/11	2011/12	2012/13	2013/14
Fridges/ freezers	4,230	10,366	11,500	11,750
WEEE	8,817	28,510	25,500	17,250
Batteries	1,350	1,170	6,800	1,600
Tubes/ lamps	2,287	1,710	1,570	1,370
Printer cartridge	800	540	600	750
Chemical waste	3,242	17,050	7,506	9,700
Asbestos	962	7,560	43,390	53,350

[15] Hedgecock, C. (2014) A business case approach to on-site food waste treatment: A case study of the University of East Anglia
[16] Following internationally accepted practice (Defra, 2008b) previously used by University staff for waste characterisation reports
[17] Extrapolated from 10 waste audits, not accounting for seasonality
[18] https://portal.uea.ac.uk/accommodation/living-in-residences

Water

East Anglia is the driest region in the country making water conservation a high priority and long term supply a concern. Awareness of the vulnerability of UK water supply has been heightened by water shortages in recent years.

Significant cost and carbon savings can be made through resource efficiency. UEA water supply and disposal costs are approximately £750,000 together with the unknown potential costs of exposure to climate change risks.

There are a range of legal requirements relating to the protection of water resources thus prevention of water pollution is also an imperative.

Our environmental policy commitments:

- Minimise consumption of non-renewable and environmentally sensitive resources by embedding integrated life-cycle approaches in decision making
- Prevent pollution

Our approach

We have already reduced our water consumption by 19% per student since 2008/9, and are currently drafting a new Water Management Plan (2015) to set out the actions needed to reduce this even further. This will also address continued improvements in pollution prevention practices.

The Plan focuses on water efficient appliances and equipment and awareness-raising.

Action is coordinated by the Waste Manager supported by a Water and Waste Implementation Team, comprising staff from across the University.

Target 2014	Progress	Target 2015
Reduce water consumption by 20% per student over 2008/9 levels by July 2014	19% achieved July 2014	**Reduce water consumption by 25% per student over 2008/9 levels by July 2016**

Water conservation

Our newest buildings are taking advantage of grey water recycling and rainwater harvesting to reduce their water demand.

Three-quarters of the showers from the new residences-Crome Court-provide enough 'grey' water to flush all the toilets in the building. This recycled water, with added and controlled nutrients, is also used to water the green wall (see page 11). The filtering and ultra-violet cleansing of the waste grey water has a much lower energy-intensity than mains water.

The entire roof of the Enterprise Centre is used to reduce the building's environmental impact through rainwater harvesting. Each toilet cistern is fed from a number of internal tanks of recycled rainwater, with large rooftop 'collection ponds' used to top these up as required. Rainwater run-off from the rooftop social space runs through a flint bed feature before being fed through a reed bed natural filtration system.

#gowiththeflow

It caused international debate over 'to pee or not to pee', but the two students behind the thought-provoking #gowiththeflow campaign will be taking a trip of a lifetime to the Amazon Rainforest, after winning npower's Future Leaders competition.

Deborah Torr and Christopher Dobson receiving their award from Lord Selborne, Chair, House of Lords Science and Technology Committee

The challenge was to create a project that has a positive environmental impact and a lasting legacy at their university campus. #gowiththeflow sparked global debate by encouraging people to wee while taking their daily shower to save the 12 litres of water used each time a toilet is flushed. They calculated that if every UEA student urinated in their morning shower, rather than using the toilet, the University would save £18,000 and enough water to fill 26 Olympic sized swimming pools every year. What's more, if everyone in the UK were to 'go with the flow', we could save around 720 million litres of water every year.

After being shortlisted as finalists in June, the duo had five months to trial their idea which saw the #GoWithTheFlow campaign receive international attention, reaching over 40 million people globally as media from around the world debated the idea.

"The campaign has been really divisive- people either seem to love it or hate it. But that's exactly what we want. We're trying to challenge conventional behaviour; to start a debate on a resource that we largely take for granted." Chris Dobson. #gowiththeflow

Saving water – the figures:

- The potential savings were worked out based on the water for an average flush costing 2p. That works out at about £7.30 per year for each person if they were to save one flush per day
- UEA could save £18000 per year if all students on-campus took part
- The Student population could save £125,000 in total per year
- If everyone in East Anglia took part they could save £42.5 million in total per year or 70 million litres of water
- If everyone in the UK took part they could save £430 million in total per year or 720 million litres of water.

Biodiversity and Landscape

Our outstanding 146 hectare campus contains a wide variety of habitat types and rare and protected species.

We have legal obligations to protect this biodiversity, including a responsibility for five County Wildlife Sites and over 3,000 species including 162 red list, Biodiversity Action Plan and notable species.

Our environmental policy commitment:

- Maintain and enhance biodiversity

Our approach

Informed by a comprehensive biodiversity audit and on-going monitoring, our Grounds Maintenance and Conservation Plan (2011) establishes the management principles for all at UEA to follow and respect. Work on delivering the plan is overseen by our Biodiversity Team.

50 hectares of our campus are also within the Higher Level Stewardship Scheme to deliver significant environmental benefits over 10 years.

A coloured zoning system indicates the vulnerability of each ecosystem to potential mismanagement and detailed management plans are in place for the most vulnerable habitats.

Target 2014	Progress	Target 2015
No net loss of species for the campus on an on-going basis	Achieved 2014 (see table 8 overleaf)	**No net loss of species for the campus on an on-going basis**
Reduce nutrient levels in the Water Soldier Pond to those beneficial for nutrient poor plants by September 2014	Target date changed from September 2014 (conservation works not completed over summer)	**Reduce nutrient levels in the Water Soldier Pond to those beneficial for nutrient poor plants by September 2016**
Halt scrub encroachment in University Fen, Bluebell Marsh and Butterfly Meadow (CWS) by December 2015	Target date changed from December 2015 (conservation works not completed due to flooding over winter)	**Halt scrub encroachment in University Fen, Bluebell Marsh and Butterfly Meadow (CWS) by December 2016**
Incorporate biodiversity enhancements in all new build projects by December 2015 - (on-going target)	A Biodiversity Partnership Group is being established to engage in projects earlier on the planning process	**Incorporate biodiversity enhancements in all new build projects by December 2016**

Butterfly and moth diversity

UEA is home to over 750 species of moth, and 29 butterflies (lepidoptera) making it one of the best known and most diverse groups of insects known to inhabit the campus. They range from the smallest at 2mm to the largest with a 12cm wingspan. They can be a good indicator of the health of the local habitat as some are highly specialised, such as the micro moth Aphomia sociella that lives on the honey and comb of bees' nests. The butterflies are monitored each week on a 2km long transect which allows us to see how the populations vary between years and compared to the rest of the country.

UEA has good populations of the more common butterflies such as the meadow brown that feed on grasses and come to thistles to nectar as adults. We also find rarer species such as this white letter hairstreak found in 2014

UEA grassland

The grassland areas of UEA are some of the richest in plant life but also the most heavily used for recreation: Management has always been a compromise between the two uses.

UEA Broad meadow has been managed as a patchwork of long grass interspersed with many paths for the last 5 years and the results of the floral survey are encouraging. There has been a steady increase in biodiversity in these areas, with a reduction in vigorous weeds and replacement by fine grasses and flowers. The Tussocks left over winter provide food and homes for voles, and this fed the kestrel that could be seen all winter in 2014/15 feeding in this area. The end result is the protection of a rarer lowland grassland habitat and a place where all can enjoy!

UEA Broad Meadow

Dragonflies and damselflies

UEA has an impressive list of dragonflies and damselflies living on campus, with 23 species out of the 42 recorded in the UK and 33 in Norfolk. This puts UEA on a par with nature reserves such as Strumpshaw Fen. Recently UEA has been colonised by the willow emerald damselfly.

The population of Norfolk hawkers grows each year with 8 adults seen in 2014 and evidence of breeding (larvae) found all along the River Yare and in one corner of the Broad. This brings obligations to UEA as it is illegal to disturb Norfolk Hawker at any life stages, so management practices have been modified to accommodate our winged residents.

June is the time for spectacular emergences of the Banded demoiselle, a damselfly that can be seen in the hundreds on calm sunny days
(Photo courtesy of S Skipp)

Media relations manager Lisa Horton, and colleagues from UEA's Adapt Low Carbon Group, received the Guardian University Award from writer and broadcaster Victoria Coren

Ashtag success

In Feb 2014 the Communications Office won a prestigious Guardian University Award recognising the communications campaign launching the Ashtag mobile app.

The AshTag project, created by Adapt, allowed users to collect raw data by photographing and sending images of diseased ash trees to experts. The app includes a visual guide to help users recognise symptoms and uses geo-tagging software to provide a precise location. Reports were then mapped on the AshTag.org website with all likely cases passed to the Forestry Commission.

The UEA Communications team gained the support of the public by encouraging everyone from nature lovers to farmers to get snapping quickly-before autumn hit. There were only a couple weeks to spread the word before the leaves would fall, making identification more difficult.

Ultimately, the campaign drove more than 1,000 people to submit photos with more than 70 being classed as 'likely' and relayed to the Forestry Commission. 12,000 people had downloaded the app, and at one stage AshTag became the fifth most downloaded iPhone app ahead of Wikipedia and the Holy Bible.

Table 8 Summary of all Taxa Recorded at UEA

Group	Number of species recorded -2011	Number of species recorded -2012	Number of species recorded -2013	Number of species recorded -2014	Red list, BAP and notable species -2011	Red list, BAP and notable species -2012	Red list, BAP and notable species -2013	Red list, BAP and notable species -2014
Fish	18	18	18	18	1	1	1	1
Amphibians and reptiles	8	7	7	7	4	3	3	3
Birds	206	207	207	207	49	49	49	49
Mammals	35	35	35	35	6	6	6	6
Arthropods (including insects)	1881	2034	2233	2270	95	95	101	101
Plants	318	318	324	326	2	2	2	2
Fungi	350	350	354	354	-	-	-	-
Other lower plants and allies	94	94	94	106	-	-	-	-

Emergency Preparedness

Emergency circumstances can present the most challenging environmental situations for organisations to deal with and can have the most widely recognised environmental impact.

By minimising the risks of pollution, legal compliance can be improved and potential liability from incidents which cause harm to the environment can be avoided.

Our environmental policy commitment:

- Prevent pollution and appropriately manage environmental risks from accidents, incidents and emergencies

Our approach

Our Environmental Emergency Response Plan details how we would respond to any critical situation that could arise and we continue to review the effectiveness of these procedures and to train our staff in competent emergency management techniques.

We have invested in spill kits and other environmental protection equipment and continue to monitor and improve our response to incidents through our reporting process.

An environmental incident is a failure to implement required environmental controls that may lead to environmental pollution, contamination or damage, or that has potential to do so. A 'Significant Incident' is an incident that has caused such environmental damage, pollution or contamination.

Our Incident Reporting Form is available from the Environment and Sustainability web pages:
https://portal.uea.ac.uk/estates/go-green/environmental-emergency

Target 2014	Progress	Target 2015
Zero significant environmental incidents and zero fines from environmental regulators on an on-going basis	10 significant environmental incidents were recorded in 2014 No fines were imposed during 2014	**Zero significant environmental incidents and zero fines from environmental regulators on an on-going basis**

Significant incidents

All the significant incidents in 2014 were reported over the summer and relate to biodiversity:

- Five incidents relating to damage to the Butterfly Meadow County Wildlife Site by contractors machinery
- Three incidents of disturbance to breeding birds by volunteer conservation workers and contractors
- One incident of Environment Agency staff disturbing Norfolk Hawker whilst electro-fishing on the River Yare
- One incident related to bad practice and deviation from the management plan at Sainsbury Centre woods.

A zoned map of the UEA campus is now available to guide implementation of a new permit to work system to reduce incidences of damage to habitats and disturbance to wildlife. This has been supported by refresher biodiversity awareness training for Grounds and Projects Office staff.

Where we go from here…

Our main focus in 2015 will be on engagement and awareness-raising. Our aim is to be more proactive and coordinated in delivering our environmental policy commitments and related targets across the campus.

UEA's Sustainable Ways is a new, facilitated sustainability communications network, led by the Environmental Officer, Catrin Darsley. This exciting project aims to facilitate connections within and between related networks and programmes. It encompasses a new website, sustainability related communications, actions, research, curricular content, strategies and student/staff engagement.

A key element of this integrated approach is a 'Living Laboratory for Sustainability' – a Living Lab: Linking the estate with innovative, sustainable practices and technologies through student projects. Both engaging our students with campus sustainability and providing them with opportunities to develop their skillsets through real world experience.

For more information or to get involved:
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