



PRIFYSGOL
BANGOR
UNIVERSITY



Environmental Management System

Annual Report 2013

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Vice Chancellor's Statement



I am delighted to present Bangor University's 2013 Annual Environmental Report.

One of the key priorities of our Strategic Plan is to position ourselves as a global University, with a reputation for sustainability. We recognise that sustainability embraces people and planet as well as ensuring that we operate on a sound financial basis, and in November 2011 we signed the Welsh Government's "Sustainable Development Charter" to publicly demonstrate our commitment to becoming a more sustainable University.

Our stated ambition within this commitment was to develop and implement our Environmental Management System (EMS) and attain Level 5 of the Green Dragon Environmental Standard. I am delighted to report that this was successfully achieved in May 2012.

In order to ensure that we are meeting our obligations to the environment our EMS incorporates a thorough review of our impacts with the principal aim of achieving continuing environmental improvement year on year. The consequences of this are already becoming apparent as demonstrated by our number one position in the Welsh University Green League in 2012. Our aspiration is now to build on our commitment to the environment by achieving the internationally recognised environmental standard ISO 14001, and I am pleased to announce that work will commence on this objective during 2013.

Our achievements are a tribute to the commitment of the many staff, students, and members of the local community who are working in partnership to manage, protect and enhance the natural environment in and around our University.

A handwritten signature in black ink that reads "John Hughes". The signature is written in a cursive style, with the first name "John" and the last name "Hughes" clearly legible.

**Professor John G. Hughes,
Vice-Chancellor,
Bangor University**

Executive Summary

This report relates to our environmental performance during the 2011/12 academic year (the “reporting period”) and to the actions we are currently taking at Bangor University to achieve continual environmental improvement. It describes our environmental monitoring data and key performance indicators in those areas where we have the greatest potential to impact upon on the environment. Our energy usage, water consumption, waste generation, and transport emissions are summarised, and performance is assessed in terms of compliance with the objectives and targets we had established for the reporting period.

Key Findings

During the 2011/12 Academic Year, Bangor University:

- consumed **16,822,639 kWh** of mains electricity
- consumed **19,244,758 kWh** of natural gas
- consumed **158,797 litres** of heating oil
- consumed **68,717 litres** of transport fuel
- landfilled **459 tonnes** of mixed municipal waste
- recycled **310 tonnes** of waste (40% of total)
- consumed **172,821 cubic metres** of mains water
- produced **164,180 cubic metres** of sewage
- drove **2,089,006 miles** on business travel, generating 405 tonnes CO₂e
- generated **3,250 tonnes CO₂e** from staff and student commuting
- produced **571 tonnes CO₂e** from our agricultural activities
- sequestered **800 tonnes CO₂e** at our landholdings at Henfaes Farm

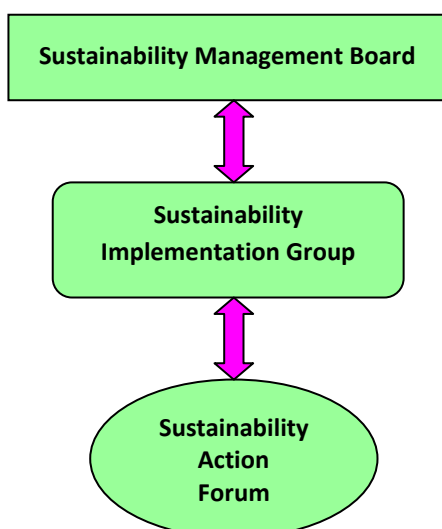
These activities generated a total of **16,482 tonnes of CO₂** equivalent from our activities as a University. This represents a **2.6% reduction** on the previous academic year.

Introduction

Bangor University is committed to excellence. Our mission statement describes our overarching aim to be a *“leading research-led University with an international reputation for teaching and research, that fosters the intellectual and personal development of its students and staff, provides a supportive multicultural environment, promotes widening access and inclusiveness, and supports the economic, social and cultural well-being of Wales and the wider community it serves. Bangor University will be recognised regionally, nationally and internationally as a centre of excellence for a varied portfolio of academic programmes and for the high quality of the experience it provides for its students and staff”*.

Our Environmental Policy states that we aspire to be sustainable by means of a balanced consideration of financial matters, our staff and students, the local community and of the environment around us. We have over 11,000 students and 2,000 members of staff located within an estate of 210 buildings across 346 hectares. We are committed to the highest quality of teaching, research, knowledge transfer and enterprise and reaching out to the community, whilst at the same time taking good care of our staff and students. We will not only protect our natural environment at both local and regional levels, but will actively seek opportunities to enhance it.

In accordance with our Environmental Policy we aim to develop a culture of environmental stewardship amongst our staff and students. We understand that our activities have an impact on the environment, and are committed to continual improvement in our environmental performance. In this respect we have established the following structure for implementing our sustainability agenda:



The Sustainability Management Board is tasked with overseeing the evolution and implementation of a Sustainability Agenda for Bangor University and for reporting to the University Executive Committee. Specific Actions are achieved through the multifunctional Sustainability Implementation Group, supported with input from the wider Sustainability Action Forum. All three groups include both staff and student representation. In addition we have informal Sustainability Think Tanks which meet monthly.

Senior Management Review

An Annual Management Review meeting is used as the pivotal means of ensuring that the Environmental Management System is fully implemented and effective. This meeting is undertaken to the requirements of Green Dragon Level 5 / ISO 14001: 2004 and all pertinent aspects are reviewed and actions taken as required. The review meeting is structured in accordance with the following agenda:

- Introduction
- Actions from Previous Meeting
- Environmental Policy
- Significant Environmental Aspects
- Objectives and Targets
- Current Performance
- Improvement Opportunities / Invest to Save Initiatives
- Environmental Incidents /Corrective and Preventative Action
- Internal Audits
- Legal Compliance
- Communications (Internal / External)
- Training and Awareness
- Recommendations

The Environmental Manager provides suitable information to allow an effective review to be undertaken and the review will address the possible need for changes to the policy, objectives and targets, and any other element of the system in the light of the audit findings, changes in circumstances and the commitment to continual improvement. The minutes of the review are maintained as an EMS record.

At the Senior Management Review meeting held on 23rd May 2013, members resolved to:

- endorse this report, and current EMS documentation
- approve the objectives and targets for the forthcoming year
- support the progression towards ISO14001 certification

Environmental Policy



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Environmental Policy

Bangor University has over 11,000 students and 2,000 members of staff located within an estate of 210 buildings across 365 hectares. This includes significant activities undertaken outside the city of Bangor, particularly in Menai Bridge and in Wrexham. We are committed to providing teaching and conducting research of the highest quality whilst simultaneously taking good care of our staff and students. We aim not only to protect our natural environment both locally and regionally, but to actively seek opportunities to enhance it.

Additionally, we aim to develop a culture of environmental stewardship amongst our staff and students. We understand that our activities have an impact on the environment, and are committed to continual improvement of our environmental performance, working to meeting the requirements of the Green Dragon Environmental Standard. This is fundamental to achieving our goal of becoming a leader in effective environmental management within the higher education sector in Wales.

We will adopt the following key principles within our approach:

- To minimise our environmental impacts and work towards the goals of sustainable development
- To ensure compliance with all relevant legislation and regulations associated with our activities
- To manage waste through reduction, re-use, and the promotion of recycling
- To reduce energy and water consumption, and promote green transport initiatives
- To reduce our contribution to global climate change by making significant reductions in our greenhouse gas emissions
- To work with suppliers who themselves have sound ethical environmental and sustainability policies
- To undertake all necessary steps to prevent the pollution of the natural environment
- To raise environmental awareness amongst staff and students through improved communication and involvement
- To embed sustainable development and awareness of environmental issues in our curricula across the University

This Environmental Policy will be reviewed annually by the Sustainability Implementation Group, endorsed by the Sustainability Management Board, and reported to the University Executive. It will also be communicated to the wider University population and is publicly available.

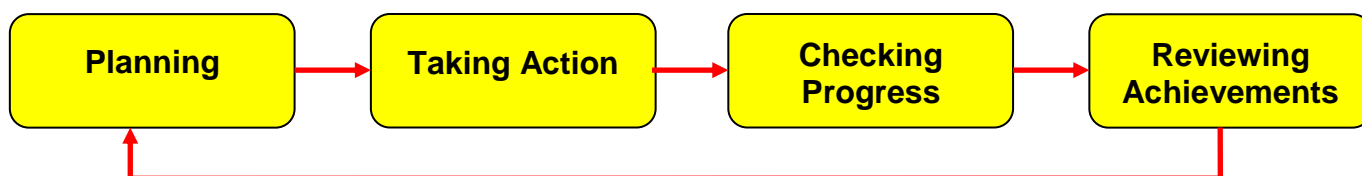
Signed:  (Professor John G. Hughes, Vice-Chancellor, Bangor University)

Date: 10 February 2012.

Issue 4: February 2012

Environmental Management System

Our EMS has been designed in accordance with the criteria set out in the Green Dragon Environmental Standard. This is a five tiered approach to environmental management that enables organisations to develop a phased approach to their EMS. Each tier incorporates the cyclical process of:



to achieve the key principles of:

- **Continual Environmental Improvement**
- **Compliance with Environmental Legislation**
- **Pollution Prevention**
- **Communication of Environmental Issues.**

Our progression through the Green Dragon levels is summarised below:

- May 2009 – Level 3
- May 2010 – Level 3
- May 2011 – Level 4
- May 2012 – Level 5

Our EMS currently applies across the University estate, with the exception of the Prince Madoc Research Vessel and the Centre for Advanced Software Technology (CAST) Ltd.

The Environmental Management System is subject to ongoing monitoring by the Sustainability Implementation Group, and is reviewed annually by the Sustainability Management Board.

Legislation

The foundation of any Environmental Management System is an understanding of, and compliance with, relevant environmental legislation. As such, we have developed a register of legislation that is applicable to the University's activities. The register is updated by the Environmental Manager who is responsible for ensuring that relevant environmental licences, registrations, and authorisations are in place. The majority of these currently relate to the Environmental Protection Act, the Environmental Permitting Regulations, the Energy Performance of Buildings Regulations, and to our involvement in the Carbon Reduction Commitment Energy Efficiency Scheme.

Aspects and Impacts

Our EMS incorporates an assessment of all aspects of the University's activities that have the potential to impact upon the environment. A total of 41 discrete aspects have been identified and have been evaluated in terms of their potential environmental impact (which may be positive or negative). The criteria used for evaluation are described within the EMS and relate to the potential consequences associated with each aspect, and the likelihood of such an occurrence. This includes a consideration of relevant legislation, potential environmental damage, current controls, and risk of emergency situations. From this exercise, those Aspects that have the greatest potential to adversely impact upon the environment have been identified, and appropriate objectives and targets developed to minimise those impacts. The significant Aspects include:

- Energy consumption
- Water Consumption
- Oil and Chemical storage and use
- Waste generation
- Travel and Transport

The impacts associated with these aspects relate to the use of natural resources, greenhouse gas emissions, pollution risk, and the decreasing availability of landfill sites.

The Aspects and Impacts register and evaluation process is reviewed annually by the Sustainability Implementation Group, and reported to the Sustainability Management Board.

Objectives and Targets 2012/2013

From the Aspects and Impacts assessment, we have derived the following objectives and targets for the current academic year (ending 31st July 2013):











T1:	Reduce annual energy associated CO2 emissions by 3% each year. Reduce energy associated CO2 emissions by 25% of 2005/06 levels by 2014 Reduce overall greenhouse gas emissions (CO2 equivalent), by 3% per FTE (staff and student) per year.
T2:	Reduce water consumption by 2% annually
T3:	Minimise pollution risks at the University
T4:	Recycle 40% of municipal wastes generated at the University
T5:	Reduce business travel related emissions to 20% of 2005/06 levels by 2016
T6:	Reduce procurement related carbon emissions by 3% each year.
T7:	Enhance awareness of environmental sustainability amongst staff and students
T8:	Ensure that biodiversity considerations are, where applicable, incorporated in University activities

A report of performance against these targets will be incorporated in the 2014 Annual Environmental Report.

Annual Performance: Objectives and Targets 2011/2012 Review

Performance in terms of our objectives and targets for the reporting period is summarised in Table 1 below.

Table 1: Summary of Performance against 2011/12 Targets

Ref	Objective	Targets	Status	Notes
T1	Maximise efficient use of energy, and reduce greenhouse gas emissions.	A) Reduce annual energy associated CO ₂ emissions by 3% each year. Performance to be based on Higher Education Estates Management Statistics (HEEMS)		A reduction of 2.31% was achieved.. This has been attributed to an increase of 5% in electricity consumption since gas consumption reduced by 16% of the previous year.
		B) Achieve a 15% reduction in energy related CO ₂ emissions, based on 2005/06 base year by August 2012.		A reduction of 12.8% was achieved
		C) Reduce overall greenhouse gas emissions (CO ₂ equivalent), by 3% per FTE (staff and student) per year. (Base Year: 2010/11)		Target exceeded (4.3% reduction)
T2	Maximise efficient use of water	A) Reduce total annual water use by 2% for 3 years from 2007/08 academic year. Performance to be based on Higher Education Estates Management Statistics (HEEMS)		A 6.7% increase was recorded. Investigations are ongoing to establish the cause, which is attributed largely to the Ffriddoedd Halls of Residences but may also be the result of a leak.
T3	Prevention of pollution	A) Minimise pollution risks at the University		No pollution incidents reported.
T4	Minimise waste to landfill.	A) Recycle 40% of all municipal waste generated.		Target met (40% of waste was recycled during the year).
T5	Reduction in business travel undertaken by University staff and students.	A) Achieve 20% reduction in vehicular business travel CO ₂ emissions by 2016 (relative to 2005/06 base year).		Emissions 15.1% lower in 2011/12 than in base year.
T6	To embed a process for consideration of Sustainable Procurement issues within the wider procurement process	A) Achieve Level 3 of the Public Sector Sustainable Procurement Action Framework (SPAF)		Level 3 achieved
T7	Awareness and Communication	A) Enhance awareness of Environmental Sustainability amongst staff and students		A number of awareness campaigns have been held throughout the year
T8	Biodiversity	A) Ensure Biodiversity considerations are incorporated in University activities		Biodiversity plans in place in specific areas, notably Henfaes and Treborth.

Key to Table 1



Target met (or on course to be met)



Target not met but improvement in performance since last year



Target not met and deterioration in performance since last year

Further details associated with our performance are discussed below.

Objective T1: Energy and Greenhouse Gas Emissions

We aim to reduce our energy related CO₂ emissions by 3% each year, and had established a target to reduce our 2005/06 base year emissions by 15% by the end of the 2011/12 academic year. Although good progress continues to be made, these targets are challenging, and due to continuing developments at the University, have not been met in full. We are actively monitoring our energy and water usage using the Automated Metering and Monitoring and Targeting facility that records consumption in our main buildings on a half hourly basis, and we are committed to investing in energy and water efficiency measures to achieve our short and longer term targets. Since establishing our targets, we have undertaken a range of “Invest to Save” initiatives including:

- Installation of Solar Thermal Water Heating in the Estates, Treborth Pavilion and Thoday buildings
- Loft insulation in Main Arts and many other buildings
- Lighting upgrades including LED and PIR detection
- Replacement of 13 aging gas and oil boilers with modern efficient condensing boilers
- Replacement of oil heating in many areas with gas / lpg

In addition we have undertaken a major upgrade of our Building Management System which will enable the Estates department to more effectively control heating and cooling in our main buildings and carry out adjustments according to user needs.

In accordance with the Energy Performance of Buildings Regulations, we have placed Display Energy Certificates (DECs) in the foyer / reception areas of 45 of our largest buildings (i.e. those exceeding the 1,000 m² floor area threshold specified in the Regulations. These DECs provide a publicly available indication of the energy efficiency of the building. This information will enable us to identify the least efficient buildings and prioritise efficiency measures accordingly. From January 2013, DECs will also be required for an additional 8 Bangor University buildings, due to the reduction in the threshold to 500m².

The Regulations also require formal inspection and certification of air conditioning units exceeding 12kW; all relevant systems at the University have valid Inspection Certificates. We are working closely with external partners to identify the actions necessary to reduce our energy related emissions, and in conjunction with the Carbon Trust have produced a “Carbon Routemap” to complement our Carbon Management Strategy.

We are using the Display Energy Certificate ratings the Carbon Routemap, and our half-hourly Automated Metering System to prioritise our future actions associated with energy efficiency. For example, working closely with building users, our Estates and Facilities Department is making significant reductions in the energy use and carbon emissions (and therefore costs) in our “BREEAM Excellent” Environmental Centre Wales (ECW) building. We will be applying the same methodology to other buildings in the future.

Our energy and associated emissions are summarised in Tables 2 and 3 below.

Energy and Emissions – Key Statistics

Table 2: Energy Consumption

Energy	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Electricity (kWh)	16,168,354	15,447,781	15,613,647	15,159,976	15,851,415	16,007,982	15,423,994	16,270,747
Gas (kWh)	29,238,718	28,883,921	26,972,176	25,172,241	23,495,748	20,674,199	21,487,388	17,901,966
Burning Oil (litres *)	199,258	211,100	172,655	174,822	187,349	187,548	178,731	158,797
LPG (kWh)								88,975
Total Energy (kWh)	47,519,207	46,569,362	44,415,966	42,185,330	41,333,062	38,670,190	38,805,931	35,944,936
Annual Variance		-2.00%	-4.62%	-5.02%	-2.02%	-6.44%	0.35%	-7.37%
Variance on Base Year			-4.62%	-9.41%	-11.24%	-16.96%	-16.67%	-22.81%

(* 1 litre oil = 10.6 kWh)

Table 3: Energy Related Carbon Emissions

CO2 (Tonnes)	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Electricity	8,482	8,104	8,191	7,953	8,316	8,398	8,092	8,467
Gas	5,368	5,303	4,952	4,622	4,314	3,796	3,945	3,316
Burning Oil	507	537	439	444	476	477	454	404
LPG								19
Total	14,357	13,944	13,582	13,019	13,106	12,671	12,491	12,206
Annual Variance		-2.88%	-2.59%	-4.14%	0.67%	-3.32%	-1.42%	-2.29%
Variance on Base Year			-2.59%	-6.63%	-6.01%	-9.13%	10.42%	-12.47%

Since 2010, the Management Development Centre (MDC), a wholly owned subsidiary of the University, has been incorporated within the Environmental Management System. Energy consumption and emissions associated with subsidiaries are specifically excluded from the University's annual reporting for the Higher Education Statistics Agency (HESA) on which our objectives, targets and monitoring were initially based. In order to allow year on year comparison, the total energy use and emissions associated with of Bangor University buildings and its subsidiaries are shown in Tables 4 and 5 below>

Table 4: Energy Consumption (including Management Centre)

Energy	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Electricity (kWh)	16,168,354	15,447,781	15,613,647	15,524,732	16,294,314	16,510,229	15,954,994	16,822,639
Gas (kWh)	29,238,718	28,883,921	26,972,176	25,172,241	24,509,823	21,906,655	22,868,122	19,244,758
Burning Oil (litres*)	199,258	211,100	172,655	174,822	187,349	187,548	178,731	158,797
LPG (kWh)								88,975
Total Energy (kWh)	47,519,207	46,569,362	44,415,966	42,550,086	42,790,036	40,404,893	40,717,665	37,839,620
Annual Variance		-2.00%	-4.62%	-4.20%	0.56%	-5.57%	0.77%	-7.07%
Variance on Base Year			-4.62%	-8.63%	-8.12%	-13.24%	-12.57%	-18.75%

(* 1 litre oil = 10.6 kWh)

Table 5: Energy Related Carbon Emissions (including Management Centre)

CO ₂ (Tonnes)	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Electricity	8,482	8,104	8,191	8,145	8,548	8,662	8,370	8,754
Gas	5,368	5,303	4,952	4,622	4,500	4,022	4,199	3,564
Burning Oil	507	537	439	444	476	477	454	404
LPG								19
Total	14,357	13,944	13,582	13,211	13,525	13,160	13,023	12,722
Annual Variance		-2.88%	-2.59%	-2.74%	2.38%	-2.69%	-1.04%	-2.31%
Variance on Base Year			-2.59%	-5.26%	-3.01%	-5.62%	-6.60%	-8.76%

Under the UK Government's "Carbon Reduction Commitment- Energy Efficiency Scheme" Bangor University is required to purchase carbon allowances for every tonne of energy related carbon we produce. The scheme is intended as a financial incentive for organisations to reduce their carbon emissions, and therefore contribute to the UK's statutory reduction targets set out in the 2008 Climate Change Act, i.e. an 80% reduction in 1990 greenhouse gas emissions by 2020.

The initial cost of allowances was set at £12 per tonne of CO₂, and our first payment (for the year ending 31st March 2012), amounted to £146,000. This rate will continue until 2014/15 when the unit cost for emissions will increase to £16 per tonne of CO₂.

Objective T2 : Water

The use of mains water has implications for a natural resource, which, unless controlled can impact on aquatic ecosystems. In addition the energy used in the treatment and distribution of water, and in sewage disposal has an associated carbon footprint. In view of this we aim to reduce our water consumption by 2% each year. This is challenging given the increasing number of students and we will continue to work with both staff and students in raising awareness of the need to conserve water. A number of water efficiency measures have been implemented, however despite these interventions our water consumption has increased by more than 6% since the previous year. Much of this appears to be associated with the Ffriddoedd residential site, and investigations are ongoing to establish the underlying cause. During the forthcoming year we will be installing over 1,000 water efficient shower heads in our Halls of Residences. This initiative has been jointly funded with Dŵr Cymru Welsh Water, and will realise significant reductions in both water and energy consumption.

Following a successful trial in the Estates Office, we will also be considering expanding our use of waterless urinals.

The Psychology Department is actively working with students on behaviour change methodology to raise awareness of time wasted in the shower (as well as wasted water) and also during cleaning teeth. This is now embedded into the Applied Behaviour Change module.

Water consumption is summarised in Table 6 below:

Table 6: Water Consumption

Water Consumption	2006/2007	2007/2008	2008/2009	2009/2010	2010/11	2011/12
Cubic metres	166,054	174,937	165,396	166,267	161,950	172,821
Annual Variance		5.35%	-5.45%	0.53%	-2.60%	6.71%

Objective T3: Prevention of pollution

No pollution incidents were reported during the period, and considerable effort continues to be made to reduce such risks. All of our heating oil storage facilities have now been banded, or replaced with modern double skinned polyethylene tanks, and all oil and chemical storage areas have been provided with spill kits and defined spillage procedures. We are, wherever practicable, replacing oil heating with gas or lpg, which not only reduces our carbon footprint, but also removes a potential

source of pollution. To date we have removed oil heating from Ardudwy, Ynys Faelog, and Merion buildings, and plan to replace the main oil heating system on the Normal Site with mains gas by 2014.

An annual inspection of oil tanks, bunds and spill kits has been formalised, and records retained within the EMS. All of our bulk chemicals are stored in a purpose built chemical/solvent store which underwent a major refurbishment in 2010, and well defined procedures are in place to minimise the risk of pollution.

Our Pollution Prevention Plan, which is available on our website, includes an Environmental Incident Reporting Procedure for anyone discovering an environmental incident such as pollution, or fly tipping on University premises.

Contractors working on the Estate are required to sign a declaration to comply with a range of “Contractor Standards and Working Practices” which includes conditions for protection of the environment during works.

Objective T4: Minimisation of Waste sent to landfill

We aim to recycle 40% of our municipal waste and have made considerable progress in this area, meeting this target for the first time in 2011/12, as shown in Table 7 below. The quantity of waste sent to landfill is also at its lowest level, thereby reducing costs associated with the landfill tax, Recycling banks are now available in all academic and residential buildings, and food waste recycling collections are now also available in many academic and admin buildings as well as all halls of residence and catering outlets. We are also planning to extend the “binless office” approach, by reducing the number of desk-side bins and installing recycling banks in central locations. The implementation of a “Managed Print Solution” during 2012 is anticipated to significantly reduce the amount of paper wastage (as well as energy consumption), by requiring users to log onto centralised multifunctional devices to collect printouts.

During 2010 we signed up to Waste and Resources Action Programme (WRAP) “Halving Waste to Landfill Commitment” by playing our part in halving the amount of construction, demolition and excavation waste going to landfill by 2012. This will support national policy goals (i.e. ‘Toward Zero Waste’ by 2050 in Wales; ‘Halving Waste to Landfill by 2012’ adopted in England by the Government’s Strategy for Sustainable Construction, and the ‘Zero Waste Scotland’ policy objective), and will be achieved by reducing waste, recovering more materials and using more recovered material in new build.

Specific targets associated with this initiative are to:

- implement Site Waste Management Plans that not only meet any minimum regulatory requirements, but exceed these requirements by setting project specific targets for waste reduction and recovery and measuring performance;
- recover a minimum of 70% of construction materials and packaging;
- recover a minimum of 80% of demolition and strip-out materials; and
- ensure that at least 10% of total material value derives from reused and recycled content in new build

In this respect the demolition of the Student Union and Theatre Gwynedd buildings during 2010 generated nearly 8,000 tonnes of waste, 98% of which has been recycled, or will be utilised in the construction of the new Pontio development.

The Psychology Department is also involved in raising awareness in this area and a WRAP funded 'talking bin' scheme will be initiated over the coming months to encourage increase in recycling rates

Table 7: Waste Statistics

Municipal Waste (tonnes)	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/12
Landfill	624	715	781	820	575	459
Recycled	211	297	320	346	285	310
Total	835	1,012	1,101	1,166	860	769
% Waste Recycled	25%	29%	29%	30%	33%	40%

Objective T5: Travel and Transport

We aim to reduce our vehicular business travel emissions by 20% of the 2005/06 base year by 2016. A travel hierarchy has been established within our Sustainable Travel and Transport Policy, and greater use of video/telephone conferencing is actively encouraged. Although not formally adopted, the various actions identified within our draft Travel Plan are being implemented and monitored by means of a biannual staff and student travel survey. A Cycle to Work Scheme was launched during 2012, and we are continuing to work closely with the local authority to identify opportunities to encourage the use of public transport and improved cycle routes. Discussions are currently in progress regarding the practicalities of providing a shuttle bus for staff and student use. Emissions associated with business mileage are currently calculated from fuel purchases and expense claims. We have established a target to develop procedures to more accurately calculate this aspect of our carbon footprint.

We have successfully worked with Arriva Buses Wales to negotiate staff and student discounts, and our Health and Safety Services team successfully applied for grant funding for a range of sustainable travel initiatives. This funding contributed to the purchase of bicycles and shelters and to a 'Travel the World' competition challenging Schools and Departments to compete both against

each other, and against Aberystwyth University, in recording the total distance travelled through walking, cycling and swimming activities.

Objective T6: Sustainable Procurement

We have developed a discrete Sustainable Procurement Policy and Strategy that aims to ensure that a thorough assessment of the environmental and social as well as the financial implications is undertaken during the procurement of goods and services. This will be achieved through the use of the Environment Agency's "Sustainable Risk Assessment", and through training of key procurement staff.

We have achieved our target of attaining Level 3 of the SPAF, and have developed an Action Plan to deliver further improvement. SPAF is being replaced this year and we intend to adopt the successor to SPAF with the same enthusiasm.

We have now established a methodology to report on greenhouse gas emissions associated with our supply chain, and aim to reduce such emissions by 3% annually from a 2007/08 base year. Progress regarding this target will be reported on in the 2014 Annual Environmental Report.

Objective T7: Training, Awareness and Communication

Training awareness and communication are an integral part of our Environmental Management System. SIG has produced a discrete "Communications Strategy", and is working to raise the profile of environmental issues wherever practicable. Recent examples include:

- A presentation to the University's Executive, where they endorsed the strap line "Bringing Sustainability to *Life*"
- A sustainability "Maps and Compasses" session for new staff
- An annual "Switch Off This Christmas" energy saving campaign and competition
- A Sustainability stall at Serendipity during Freshers Week
- An Energy and Environment Week
- A Sustainability Pledge, which to date has been signed by over 2,000 staff and students
- Inclusion of sustainability issues within the Welcome Week presentation for new students
- An "Environmental Management at Bangor University" module for second year Environmental Management students, and for the new MBA in Environmental Management.
- Training of Domestic Staff in Waste Awareness
- Training of Estates and Property Staff, and "Measured Term Contractors" in Waste Awareness and Environmental Incident Reporting.
- Workshop on sustainability for the Catering and Conferencing team who are developing and promoting a self accredited "Sustainable Events" standard
- Inclusion of environmental requirements in all new job descriptions

- The launch of a programme of monthly Sustainability “Think Tank” sessions involving staff and students.
- An Eco-champs group with the objective of establishing a cluster of champs in each building
- A range of behavioural change projects in conjunction with the School of Psychology
- Workshops on Sustainability as part of the Bangor Employability Award.
- Sustainability workshops for English Language Course for Overseas Students (ELCOS)
- Integration of sustainable development into all Knowledge Economy Skills Scholarships (KESS) Gradschools for PhD and Masters students (led by Bangor University)

Following training of 15 Environmental Auditors by BSI in January 2012, we have developed a programme of internal audits. To date, fourteen such audits have been carried out, and many recommendations to enhance performance have been agreed with auditees. The auditees themselves on many occasions have provided valuable insight into environment management and our systems have been much enhanced following the introduction of internal audits.

Objective T8: Biodiversity

We have an established Biodiversity Policy, and considerable work is undertaken in many areas of our Estate to enhance biodiversity in particular at our Botanical Gardens in Treborth, and at our agricultural holding at Henfaes. The Pontio development on the Deiniol Road site will incorporate a bespoke Biodiversity Action Plan for the College Park and surrounding area.

Greenhouse Gas Emissions

The Kyoto Protocol describes six key greenhouse gases, namely:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulphur hexafluoride (SF₆)

Bangor University’s greenhouse gas emissions for the 2011/12 reporting year (calculated as CO₂ equivalents) are summarised in Table 8 below.

Table 8: Greenhouse Gas Emissions 2011-2012

Source	Quantity	Conversion	Emissions	
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SCOPE 1 - DIRECT EMISSIONS

Natural Gas consumption (kWh)	19,244,758	0.1852	3,564,322	kgCO ₂ e
Heating Oil purchased (litres)	158,797	2.5443	404,027	kgCO ₂ e
Diesel Fuel purchased (litres)	38,043	2.6769	101,837	kgCO ₂ e
Petrol purchased (litres)	30,674	2.3144	70,992	kgCO ₂ e
LPG (kWh)	88,975	0.21455	19,090	kgCO ₂ e

SCOPE 2 - IMPORTED POWER

Electricity consumption (kWh)	16,822,639	0.52037	8,753,997	kgCO ₂ e
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SCOPE 3 INDIRECT EMISSIONS

Municipal Waste landfilled (tonnes)	459	290	133,110	kgCO ₂ e
Mains Water consumed (cubic metres)	172,821	1.0526	181,911	kgCO ₂ e
Indirect Transport (Grey Fleet - personal vehicles)			232,339	kgCO ₂ e
Indirect Transport (Commuting)			3,250,000	kgCO ₂ e
Agricultural			571,000	kgCO ₂ e

Sequestration (Henfaes)			800,000	kgCO ₂ e
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Total Greenhouse Gas Emissions:			16,482,625	kgCO₂e
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Future Plans

We aim to realise continual environmental improvement through the defined procedures and protocols set out in our Environmental Management System, and to ensure that the wider issues of sustainability are incorporated into the goals and plans of every dimension of the University's activities. Our new Estates Strategy incorporates sustainability as an integral consideration in the future development of our Estate, and all of our new buildings will be designed to achieve the BREEAM "Excellent" rating, the most notable being the multi-million pound Pontio (Deiniol Road) and Seacams (Menai Bridge) developments both of which are due for completion in 2014.

We are, however, aware that a BREEAM Excellent rating is valid at the point of delivery and does not refer to post-occupancy performance. For example, the BREEAM rating is not necessarily indicative of energy efficiency, as has been demonstrated in the Environment Centre Wales building. Based on experience with the ECW building, we will be in a better position to ensure that effective commissioning minimises 'teething trouble' optimising efficiency from day one.

As members of the Gwynedd Local Service Board (LSB) we aim to contribute towards significant carbon reductions in the County as described in our Carbon Management Strategy, which is complemented by specific Action Plans relating to energy, waste and transport.

Our strategic aim is to proactively further the social and economic, as well as the environmental, aspects of sustainability throughout the University, including:

- Improving the dissemination of issues relating to sustainability and the environment throughout the University's staff and student population.
- Developing further our "One Planet Living" approach to sustainability, including a discrete "Bringing Sustainability to Life" website
- Embedding sustainability training in staff development
- Retaining Level 5 of the Green Dragon Environmental Standard
- Working towards ISO14001 Certification
- Developing a cross cutting curriculum for all students, irrespective of background or discipline. Each department and school will be challenged to identify the contribution their particular expertise makes to the wider "sustainability" dialogue
- Continuing to make a recognised contribution to the body of research associated with sustainability and sustainable development
- Cataloguing and formalising biodiversity assets and the ecosystem services they provide
- Promoting integrated transport issues in partnership with Gwynedd Council and other public bodies

The success of these future plans can only be realised by maximising the participation of all staff, students, and external stakeholders, and through improved communication and reporting of all applicable issues.



Contact Details:

Ricky Carter
Environmental Manager
Bangor University
Estates and Facilities Department
Victoria Drive
Bangor
LL57 2EN

Tel: 01248 383597

E-mail: r.carter@bangor.ac.uk

Web: www.bangor.ac.uk/eo/environment