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Property and Campus Services

Environmental Management System Annual Report 2016

Ricky Carter
Environmental Manager

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Vice Chancellor's Statement

Once again I am pleased to present Bangor University's Annual Environmental Management Report.

It is now seven years since we first embarked upon our Environmental Management System, and I am delighted with the progress we have made, and are continuing to make, in preserving and enhancing the quality of our environment both locally and globally. The last year has seen us not only retaining our ISO14001 and Green Dragon Level 5 status, but also climbing 6 places in the only Green Metric Ranking of World Universities. The league now places Bangor at 22nd position, which, in a table of 407 participating Universities from across the globe, is a tremendous achievement. Our accomplishments are a clear demonstration that our University is taking its environmental responsibilities very seriously indeed, and are a tribute to the commitment of our staff and students who are working together to manage, protect and enhance the natural environment in, around, and beyond Bangor University.

Professor John G. Hughes,
Vice-Chancellor Bangor University

Executive Summary

This report is a review of our environmental performance during the 2014/15 academic year (the "reporting period") and a summary of 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 2014/15 Academic Year, Bangor University:

Consumed:

- **17,072,052 kWh** of mains electricity
- **20,955,024 kWh** of natural gas
- **522,230 kWh** (50,850 litres) of heating oil
- **72,305 litres** of transport fuel
- **177,876 cubic metres** of mains water
- **124,495 kWh** of LPG

Generated:

- **160,133 cubic metres** of sewage
- **691 tonnes** CO_2e from our agricultural activities

Sent to Landfill:

- **402 tonnes** of mixed municipal / commercial waste

Recycled:

- **346 tonnes** of waste (46% of total)

Travelled:

- **2,037,197 miles** on business travel by road

Sequestered:

- **800 tonnes** CO_2e at our landholdings at Henfaes Farm

These activities generated a total of **13,117 tonnes of $CO_{2\,(e)}$** from our activities as a University, which represents a **2.03% decrease** on the previous academic year, and a decrease of 1.33% for each member of staff and student at the University.

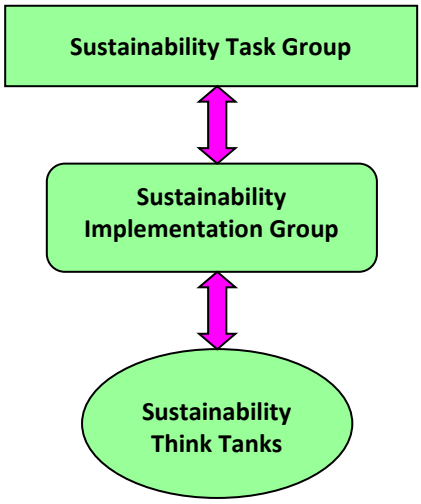
1. Introduction

Bangor University is committed to excellence. Our mission statement describes our overarching aim to be a "*strong, confident institution recognised regionally, nationally and internationally as a centre of excellence for its varied portfolio of teaching and research, and for the unique, multicultural, inclusive experience it provides for its staff and students".*

Within our Sustainability Policy, the University's Vice Chancellor, Professor John G Hughes describes our sustainability vision: *"At Bangor University, sustainability is not a matter of procedures or processes. At Bangor University sustainability is part of everything we do. Sustainability is how we function and sustainability is why we function."*

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",* and that *"we will not only protect our natural environment at both local and regional levels, but will actively seek opportunities to enhance it"*.

These publicly stated aims reflect the minimum expectations of our stakeholders, notably our staff, students and alumni; employers, funders, partners, suppliers, regulators and the wider community. In this respect we have established the following structure for implementing our sustainability agenda:



The Sustainability Task Group, chaired by the Deputy Vice Chancellor, is tasked with overseeing the evolution and implementation of a sustainability agenda for the University and for reporting to the University Executive Committee. Specific actions are developed through the multifunctional Sustainability Implementation Group, supported by the newly established Sustainability Lab, with input from the Sustainability Think Tanks which are open to all staff and Students.

The University's Environmental Management System (EMS) is an integral component of our sustainability agenda, and through which we will demonstrate our commitment to achieving continual environmental improvement.

2. Senior Management Review

In May each year, the suitability of the University's Environmental Management System is assessed at an Annual Management Review meeting. Historically, the review was undertaken by the Sustainability Management Board, although following restructuring, this will in future fall within the remit of the Sustainability Task Group chaired by the Deputy Vice Chancellor. The review meeting is undertaken to the requirements of the Green Dragon Level 5 and ISO 14001 environmental standards, and is used as the pivotal means of ensuring that the Environmental Management System is fully implemented and effective. The 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 is responsible for providing Senior Management with a report to enable an effective review of the EMS to be undertaken. The Management Review Group will addresses any issues arising from the report, and determine whether there is a need for any changes to the environmental policy), the objectives and targets, or any other element of the EMS. The minutes of the review are maintained as an EMS record and are available from the Environmental Manager.

3. Environmental Policy

The University's current Environmental Policy (below) is valid until 31st July 2017 (subject to annual review by the Sustainability Task Group).

PRIFYSGOL BANGOR UNIVERSITY

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, and to meeting the requirements of both ISO 14001, and the Green Dragon environmental standards. 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
- To establish environmental objectives and targets and report progress on an annual basis

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

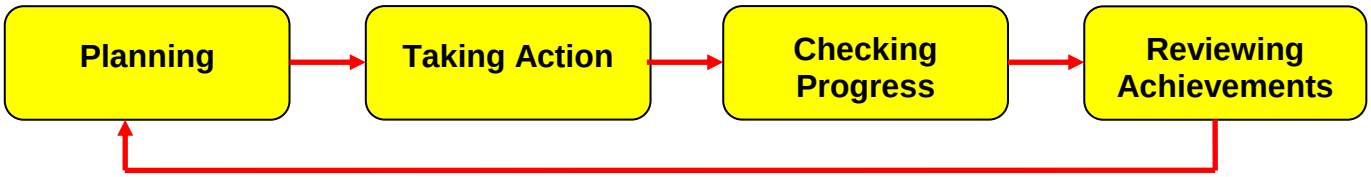
Approved by: 

(Professor John Hughes, Vice-Chancellor, Bangor University)

EMS Document 1C: Environmental Policy; Issue 8
Date of issue: 1st June 2016 Valid until: 31st July 2017

4. Environmental Management System

Our EMS has been designed in accordance with the criteria set out in the ISO14001:2004, and Green Dragon Environmental Standards. The structure of the EMS follows the five tiered Green Dragon approach each stage of which incorporates the cyclical process of:



to achieve the key principles of:

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

Both the Green Dragon and ISO 14001 Certificates are verified by externally appointed UKAS accredited bodies. Green Dragon certification is subject to an annual reassessment each July, whilst our ISO 14001 certification is valid for 3 years subject to annual "surveillance audits" during Autumn.

Our progression through the Green Dragon and ISO14001:2004 Environmental Management Standards is summarised below:

- May 2009 – Green Dragon Level 3
- May 2010 – Green Dragon Level 3
- May 2011 – Green Dragon Level 4
- May 2012 – Green Dragon Level 5
- June 2013 – Green Dragon Level 5
- March 2014 – ISO14001 Certification (valid until 2017)
- June 2014 – Green Dragon Level 5
- July 2015 – Green Dragon Level 5
- November 2015 – ISO14001 Surveillance Audit

Our ISO 14001:2004 Certification is valid until March 2017, and we are currently planning the transition to the new 2015 Standard which will be assessed by our external auditors in November 2016.

Our EMS currently applies across the entire University estate in North Wales, with the exception of the Prince Madog Research Vessel, a joint venture with P&O which has separate environmental auditing arrangements.

In addition to the formal "Annual Review" referred to above, the Environmental Management System is subject to ongoing monitoring and improvement by both the Sustainability Implementation Group, and the Sustainability Task Group throughout the year.

5. 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 (EMS Document BUEMS 2A). The register is updated by the Environmental Manager who is responsible for ensuring that relevant environmental licences, registrations, and authorisations (our "compliance criteria") are in place, and for evaluating compliance with relevant legislation and other requirements. The majority of the University's formal authorisations currently relate to the Environmental Permitting Regulations and the Energy Performance of Buildings Regulations. During the reporting period the University's application for two Environmental Permits were determined by Natural Resources Wales; these permits formalise the discharges of abstracted seawater back into the Menai Strait from the School of Ocean Sciences in Menai Bridge. The University has recorded no unauthorised contravention of environmental legislation, and has not been responsible for any pollution incidents during the year.

6. 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.

Our "Significant Aspects" have been determined as our:

- Energy consumption and associated carbon emissions
- 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 Task Group.

7. Objectives and Targets 2015/2016

From the Aspects and Impacts assessment, we have derived the following objectives and targets for the current academic year (ending 31st July 2016):

Objective	Target
T1) Maximise efficient use of energy, and reduce greenhouse gas emissions.	T1 A) Reduce annual energy associated greenhouse gas emissions (CO_2e) by 3% each year (*)
	T1 B) Achieve a 40% reduction in energy associated greenhouse gas emissions (CO_2e) by 2020, (based on 2005/06 base year) (*)
	T1 C) Reduce overall Scope 1, 2 and 3 greenhouse gas emissions (CO_2e), by 3% each year (*)
T2) Maximise efficient use of water	T2 A) Reduce total annual water use by 2% per year (*)
(*) these are "intensity targets" and performance will be assessed against the following normalising factors: *a) total operational floor area of the University's estate, and* *b) total staff and student FTEs* *The University will continue to monitor absolute variances on an annual basis*	
T3) Prevent pollution from University activities	T3 A) Zero pollution incidents recorded
T4) Minimise waste to landfill.	T4 A) Recycle / divert from landfill 50% of all municipal waste generated by the University
T5) Reduce business mileage	T5 A) Achieve 20% reduction in vehicular business travel CO_2 emissions by the end of the 2015/16 academic year (relative to 2005/06 base year).
T6) Embed a process for consideration of Sustainable Procurement issues within the wider procurement process.	T6 A) Reduce procurement related GHG emissions (excluding construction related emissions) annually
T7) Enhance Awareness and Communication	T7 A) Implement programmes and schemes to raise awareness of Environmental Sustainability amongst staff, students, visitors and contractors
T8) Promote Biodiversity	T8 A) Ensure that biodiversity considerations are wherever practicable, incorporated in University activities

These Objectives and Targets were approved by the Sustainability Management Board at its Annual Review Meeting on 5th May 2015, and a report of performance against the targets will be incorporated in the 2017 Annual Environmental Report.

8. Annual Performance: Objectives and Targets 2014/2015 Review

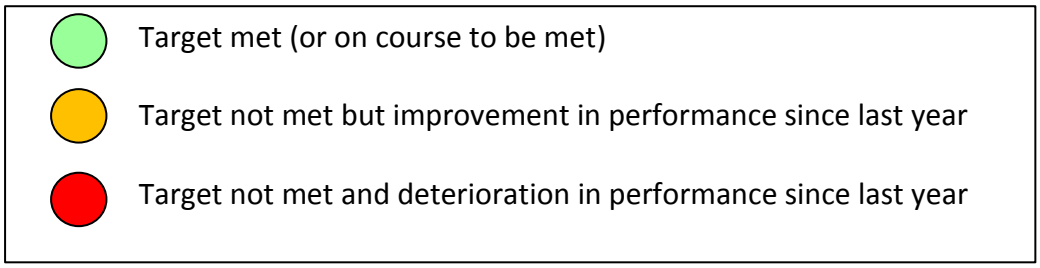
Performance in terms of our objectives and targets for the reporting period is summarised in Table 1 below.

Table 1: Summary of Performance against 2014/15 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.		Actual energy related carbon emissions decreased by 1.8% since the previous reporting period.
		B) Reduce energy associated CO_2 emissions by 40% of 2005/06 (base year) levels by 2020		Energy consumption is now 17% below the base year. This equates to a 9.3% reduction in CO_2 over the same period.
		C) Reduce overall greenhouse gas emissions (CO_2 equivalent), by 3% per FTE (staff and student) per year. (Base Year: 2010/11)		Annual variance was -1.33%
T2	**Maximise efficient use of water**	A) Reduce total annual water use by 2% per year.		Water consumption increased by 1.3%
T3	**Prevention of pollution**	A) Minimise pollution risks at the University		There have been no pollution incidents at the University. The greatest risk is from heating oil, which is gradually being replaced with gas where practicable. As a result the University's purchase of heating oil has fallen to 30% of that purchased prior to the replacement strategy.
T4	**Minimise waste to landfill.**	A) Recycle/divert from landfill 40% of all municipal waste generated.		Recycling /diversion from landfill during the year reached 46%, slightly below the 47% recorded the previous reporting period.
T5	**Reduction in business travel undertaken by University staff and students.**	A) Achieve 20% reduction in vehicular business travel CO_2 emissions by July 2016 (relative to 2005/06 base year).		Emissions are currently 22% lower than 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. Following developments in Welsh public procurement policy, future sustainable procurement performance will be measured on an annual basis against the Welsh Public Sector Procurement Maturity Model

		B) Reduce procurement related carbon emissions by 3% each year		During the reporting period, total procurement related emissions (excluding construction) fell by 3.4%.
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 as summarised below.
T8	**Biodiversity**	**A) Ensure Biodiversity considerations are incorporated in University activities**		Ongoing biodiversity management plans are continuing at Treborth, and Henfaes. A Biodiversity Action Plan associated with Pontio has been developed and the Grounds and Gardens Team are actively promoting biodiversity in their day to day activities. Other activities include the installation of swift boxes at Craig Mair and the Music Building.

Key to Table 1

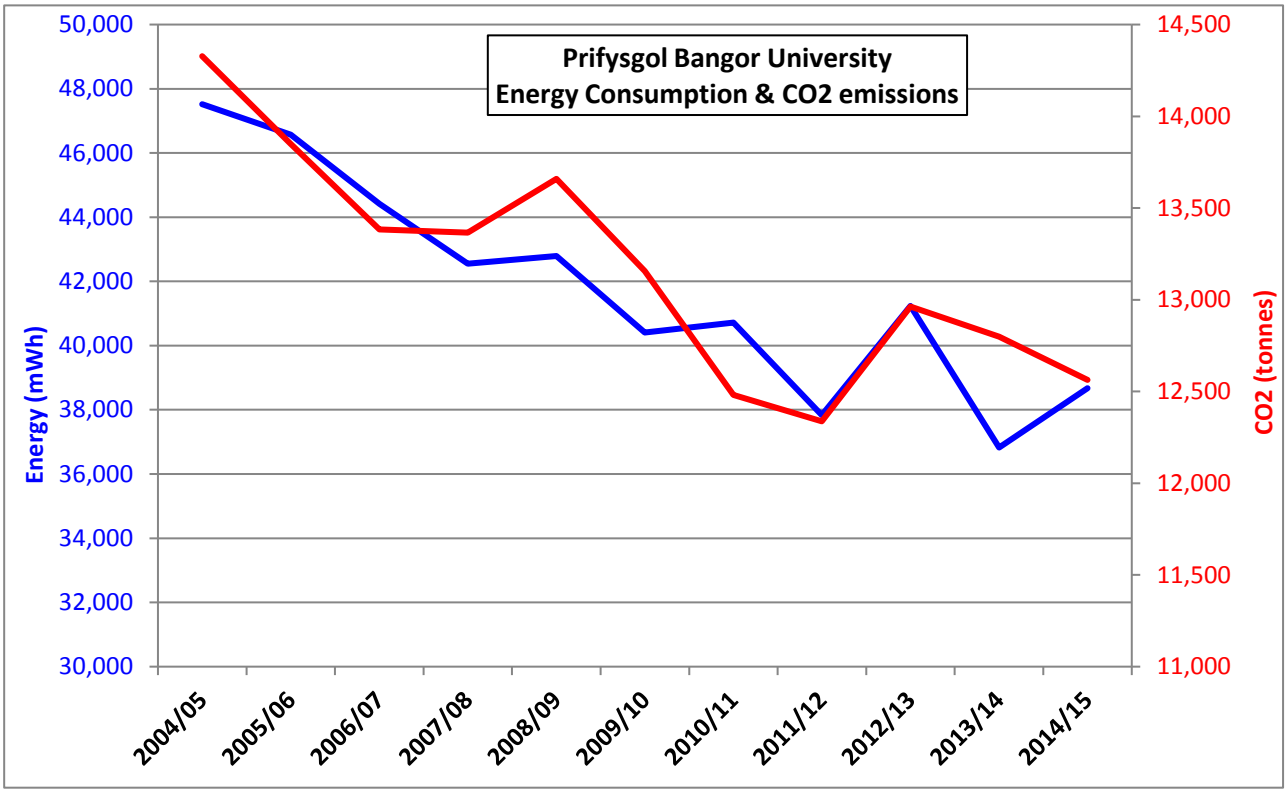


Further details associated with our performance are discussed below.

Objective T1: Energy and Greenhouse Gas Emissions

The University's energy related emission data is reported in accordance with new DEFRA guidelines, and as such is calculated using the DEFRA conversion factors published each year. We aim to reduce our energy related CO_2 emissions by 3% each year, and by 40% of our 2005/06 base year emissions by 2020. Whilst good progress continues to be made, the colder winter and spring of 2014/15 saw a 5% increase in total energy used compared with the previous year. When "normalised" to allow for the colder conditions, energy usage actually decreased by 5.5% compared with the previous year. Absolute energy related carbon emissions (CO_2 equivalent) fell by 1.8% since the previous reporting period. In addition to the environmental benefits associated with energy and carbon reduction, the financial savings can be significant. At today's energy prices, the cumulative savings to the University since the base year amount to more than £1.8 million. Figure 1 below demonstrates that despite annual anomalies, we are making good progress in reducing our energy use and associated carbon emissions over the longer term.

Fig 1: Energy and Carbon Emission trends



We continue to 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. The installation of such meters is now specified requirement in all new capital projects, for example more than 150 meters have been installed in the new Pontio development. Additional meters are also being installed retrospectively wherever practicable, for example in the Ffriddoedd building, where we are now able to monitor the relative electricity usage associated with the first floor offices, and the ground floor bar and restaurant (Bar Uno) independently. A Strategic Energy and Water Management Group within the Property and Campus Services Department oversees an annual "Invest to Save" Action plan that allocates funding to projects with a favourable payback. During the reporting year this was utilised for a number of schemes, including:

- specialist horticultural LED lighting within the Memorial and Henfaes greenhouses,
- LED lighting replacement in the Cemlyn Jones laboratory, the Normal Site Gym, and the Main Arts display cabinets.

- Additional metering and voltage optimisation trial in the Ffriddoedd Building.
- the purchase of the first electric vehicle in the Estates department.

Previous Invest to Save Projects continue to be monitored; the replacement of the inefficient oil heating system with mains gas on the George Site resulted in a cost saving of over £30,000 during the reporting year, and a reduction in our carbon footprint of over 40 tonnes CO2(e).

In accordance with the Energy Performance of Buildings Regulations, we have placed Display Energy Certificates (DECs) in the foyer / reception areas of 53 of our buildings. These DECs provide a publicly available indication of the energy efficiency of the building. This information enables us to identify the least efficient buildings and prioritise efficiency measures accordingly.

The Regulations also require formal inspection and certification of air conditioning units exceeding 12kW; all relevant systems at the University have valid Inspection Certificates which are valid until 2017. Our energy and associated emissions are summarised in Tables 2 and 3 below.

Table 2: Energy Consumption

Academic Year	Energy Consumption (kWh)					Annual Variance	Variance on Base Year
	Electricity	Gas	Burning Oil	LPG	Total		
2005/06	15,447,781	28,883,921	2,237,660		46,569,362	Base Year	
2006/07	15,613,647	26,972,176	1,830,143		44,415,966	-4.62%	-4.62%
2007/08	15,524,732	25,172,241	1,853,113		42,550,086	-4.20%	-8.63%
2008/09	16,294,314	24,509,823	1,985,899		42,790,036	0.56%	-8.12%
2009/10	16,510,229	21,906,655	1,988,009		40,404,893	-5.57%	-13.24%
2010/11	15,954,994	22,868,122	1,894,549		40,717,665	0.77%	-12.57%
2011/12	16,822,639	19,244,758	1,683,248	88,975	37,839,620	-7.07%	-18.75%
2012/13	17,596,934	21,762,870	1,827,832	43,595	41,231,231	8.96%	-11.46%
2013/14	16,780,122	18,726,407	1,273,304	45,593	36,825,426	-10.69%	-20.92%
2014/15	17,072,052	20,955,024	522,230	124,495	38,673,801	5.02%	-16.95%

Table 3: Energy Related Carbon Emissions

Academic Year	CO2 Equivalent (tonnes) from Energy Use					Annual Variance	Variance on Base Year
	Electricity	Gas	Burning Oil	LPG	Total		
2005/06	8,010	5,303	537		13,850	Base Year	
2006/07	7,992	4,952	439		13,383	-3.37%	-3.37%
2007/08	8,300	4,622	444		13,366	-0.13%	-3.49%
2008/09	8,683	4,500	476		13,660	2.19%	-1.37%
2009/10	8,658	4,022	477		13,157	-3.68%	-5.01%
2010/11	7,829	4,199	454		12,482	-5.13%	-9.88%
2011/12	8,350	3,564	404	19	12,337	-1.16%	-10.92%
2012/13	8,509	4,005	438	9	12,962	5.07%	-6.41%
2013/14	9,019	3,464	305	10	12,798	-1.27%	-7.59%
2014/15	8,542	3,865	129	27	12,563	-1.84%	-9.29%

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 CO_2, and our first payment (for the year ending 31st March 2012), amounted to £146,000. This rate per tonne rose to £15.60 in 2014/15 resulting in a carbon cost of over £226,000; the cost will rise further to £16.10 per tonne in 2015/16.

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 our target is to reduce our water consumption by 2% each year. Despite a number of water efficiency measures being implemented, water consumption continues to increase; during the reporting period, consumption rose by 1.3% since the previous year. As such water conservation remains a priority for future action.

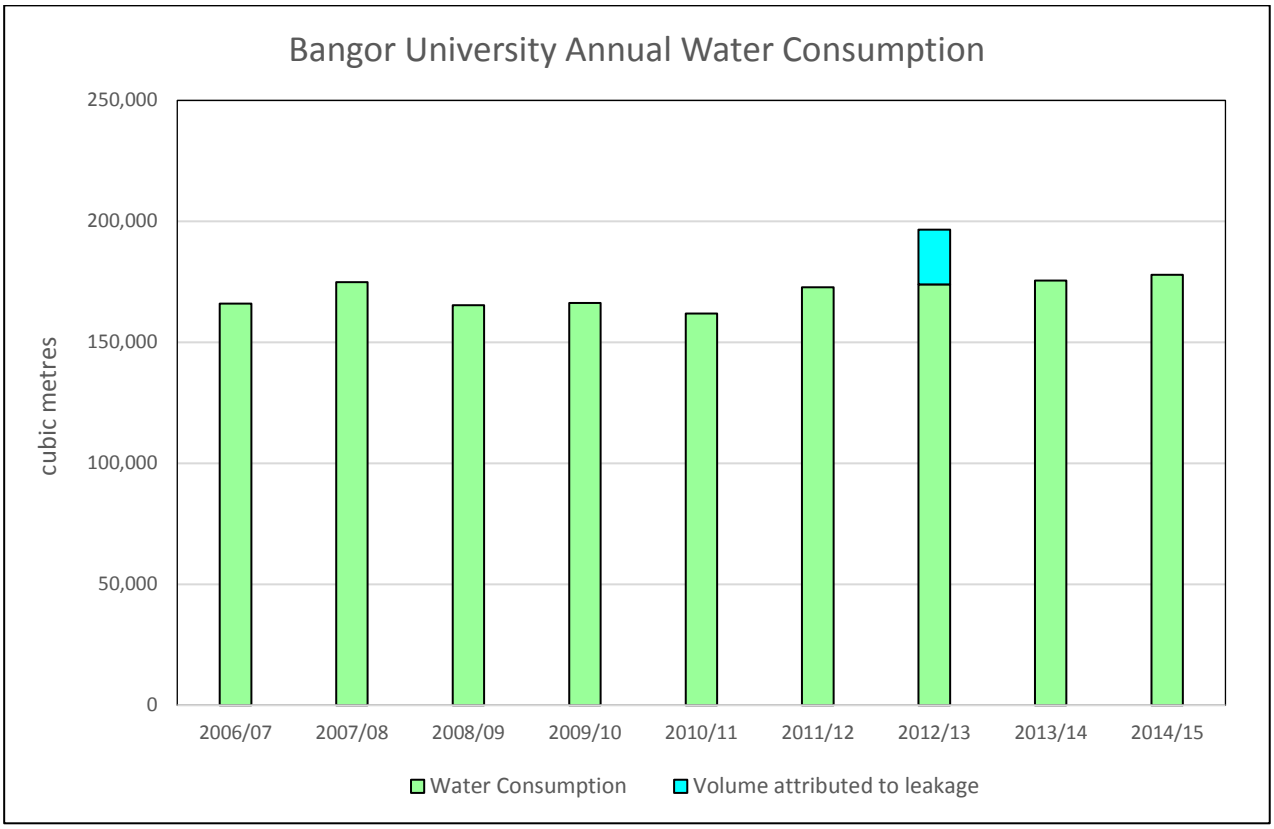
We have further expanded our use of waterless urinals following successful trials in the Estates Department; further units have been installed as part of the major refurbishment of our sports centre Canolfan Brailsford, as well as in the new Pontio development. A total of 1,800 replacement water efficient shower heads have also now been installed in our halls of residences, reducing water consumption within the buildings by up to 14%.

Water consumption is summarised in Table 6 and Fig 2 below:

Table 6: Water Consumption

Water Consumption	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Cubic metres	166,054	174,937	165,396	166,267	161,950	172,821	196,537	175,528	177,876
Annual Variance		5.35%	-5.45%	0.53%	-2.60%	6.71%	13.72%	-10.69%	1.34%

Fig 2: Water Consumption Trend



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 bunded, 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, Merion, Henfaes Farmhouse, and the Normal Site. The package sewage treatment plant installed on the Ynys Faelog site in 2012 removed our only crude sewage discharge to the Menai Strait; the discharge has the benefit of an Environmental Permit issued by Natural Resources Wales and is routinely monitored by Estates staff.

During the reporting period, the University applied for two Environmental Permits for discharges of seawater from the School of Ocean Sciences' Menai Bridge site. Natural Resources Wales subsequently determined the applications and, Permits were issued in July 2015. An application has also been submitted to Dwr Cymru Welsh Water for the discharge of trade effluent from the site to the public sewerage system; a decision regarding this application is awaited.

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, as well as receiving a Health, Safety and Environment induction prior to the commencement of work.

Objective T4: Minimisation of Waste sent to landfill

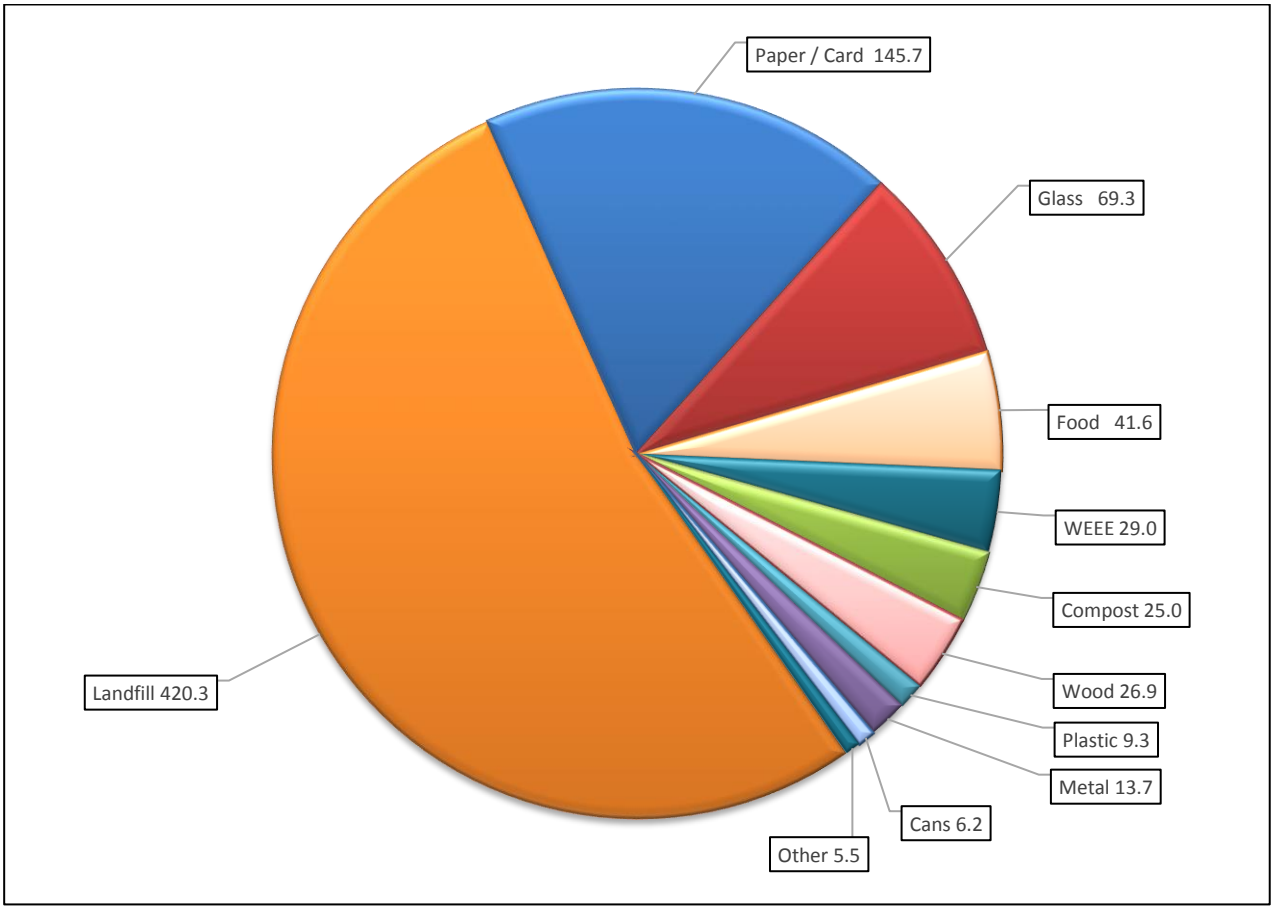
Our target to recycle / divert from landfill 40% of our municipal waste was met for the first time in 2011/12, and this has been achieved in each subsequent year. During the reporting period, we achieved a diversion rate of 46%, slightly below the preceding year.

Our current waste statistics are summarised in Table 7 and Figure 2 below.

Table 7: Waste Statistics

Waste Generated (tonnes)	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Landfill	624	715	781	820	575	459	409	420	402
Recycled	211	297	320	346	285	310	360	372	346
Total	**835**	**1,012**	**1,101**	**1,166**	**860**	**769**	**769**	**792**	**748**
% Waste Recycled	**25%**	**29%**	**29%**	**30%**	**33%**	**40%**	**47%**	**47%**	**46%**

Fig 2: Bangor University Waste Streams 2014/15 (tonnes)



Objective T5: Travel and Transport

Our target to reduce our vehicular business travel emissions by 20% of the 2005/06 base year by 31st July 2016 has already been achieved. Our Campus Travel Plan 2015 – 2020, launched at the end of the reporting period describes our aspirations to reduce the environmental impacts of single occupancy car journeys by promoting sustainable means of travel, focussing specifically on walking, cycling, and public transport. Achieving these objectives will not only enhance the local environment through reduced vehicle emissions, but will alleviate the undesirable impacts on the local community from congestion and parking problems.

A travel hierarchy has been established within our Sustainable Travel and Transport Policy, and staff and student travel surveys are undertaken every two years. A Cycle to Work Scheme, initially launched during 2012, is made available to staff during three periods each year. To date, 220 staff members have purchased a bike through the scheme; this equates to £154,000 of bikes and cycling equipment being purchased since its launch.

We have successfully worked with Arriva Buses Wales to negotiate staff and student discounts, and have now joined the Arriva "Employers Club, which enables staff to access discounted bus travel on Arriva bus routes. For the past four years we have also offered free Arriva bus travel for staff and students during Climate Week in March. As referred to above, the Estates and Facilities department introduced its first electric vehicle to its fleet during the reporting period. The success of this acquisition (used by the Post Team) has since resulted in the purchase of a further two vehicles for the Maintenance Team, with consideration being given to further additions as and when existing fleet vehicles become due for replacement.

Objective T6: Sustainable Procurement

Sustainability is a key strategic objective of the University with the aim of embedding sustainability across all functions. For that reason, the University will no longer produce a separate Sustainable Procurement Policy but will incorporate sustainability objectives into the procurement process as standard and the procurement team will contribute to the University's Sustainability Strategy and Action Plan.

A methodology for reporting on greenhouse gas emissions associated with procurement has been developed within the Higher Education sector with an initial assessment carried out in 2012/13. Using this methodology, we developed Target T6A to reduce procurement related greenhouse gas

emissions (excluding those associated with construction) annually. Table 8 below indicates that this has been achieved since the initial assessment.

Table 8: Procurement Related Carbon Emissions

Procurement & Scope 3 Emissions (Non-construction)	2012/13		2013/14		2014/15	
	Expenditure (£million)	CO_2e (tonnes)	Expenditure (£million)	CO_2e (tonnes)	Expenditure (£million)	CO_2e (tonnes)
Expenditure / Emissions	£45.6	**37,101**	£47.5	**36,514**	£54.3	**35,263**
Annual CO2(e) Variance				-1.6%		-3.4%

Objective T7: Training, Awareness and Communication

Training awareness and communication are an integral part of our Environmental Management System. During the reporting period a number of initiatives were undertaken including:

- A Sustainability stall at Serendipity during Freshers Week
- Annual "Switch Off This Christmas/Easter" energy saving campaigns
- 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.
- Ongoing training of Domestics in Environmental Awareness, Environmental Incident Reporting and Waste Management.
- Inclusion of environmental requirements in all new job descriptions
- Continuation of a programme of monthly Sustainability "Think Tank" sessions involving staff and students.
- Student Switch-off – an inter-Hall energy competition for students in University accommodation
- Snap it Off- encouraging students to upload photographs of energy wastage onto the web, and seeking resolution by University staff

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 Botanic Gardens in Treborth, and our agricultural holding at Henfaes where proactive steps are being taken to enhance biodiversity and control of invasive species. As part of the Pontio development on the Deiniol Road site a bespoke Biodiversity Action Plan for the College Park and surrounding area has been prepared. A purpose built bat roost has been developed on the St Marys site to facilitate the refurbishment and construction of the new Student Village development, and nesting boxes for swifts, a declining species, have been installed on the Craig Mair building in Menai Bridge.

9. Greenhouse Gas Emissions

The Kyoto Protocol describes six key greenhouse gases, namely:

Carbon dioxide (CO_2); Methane (CH4); Nitrous oxide (N2O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); Sulphur hexafluoride (SF6)

Bangor University's greenhouse gas emissions for the 2014/15 reporting year (calculated as CO_2 equivalents) are summarised in Table 8 below.

Table 8: Greenhouse Gas Emissions associated with Bangor University Activities (2014/15)

Source	Quantity	Units	Conversion(*)	Emissions	
SCOPE 1 - DIRECT EMISSIONS					
Natural Gas consumption	**20,955,024**	kWh	0.18445	**3,865,154**	$kgCO_2e$
Heating Oil purchased	**50,850**	litres	2.53215	**128,760**	$kgCO_2e$
Diesel Fuel purchased	**34,077**	litres	2.6024	**88,682**	$kgCO_2e$
Petrol purchased	**38,228**	litres	2.1914	**83,773**	$kgCO_2e$
LPG	**124,495**	kWh	0.21468	**26,727**	$kgCO_2e$
IMPORTED POWER: Scope 2&3					
Electricity consumption	**17,072,052**	kWh	0.50035	**8,542,001**	$kgCO_2e$
SCOPE 3 INDIRECT EMISSIONS					
Municipal Wastes	**201**	tonnes	459	**92,259**	$kgCO_2e$
Commercial Wastes	**201**	tonnes	93	**18,693**	$kgCO_2e$
Recycled Wastes	**346**	tonnes	21	**7,266**	$kgCO_2e$
Mains Water consumed	**177,876**	m^3	0.344	**61,189**	$kgCO_2e$
Wastewater generated	**160,133**	m^3	0.708	**113,374**	$kgCO_2e$
Indirect Transport (Grey Fleet)	**2,037,197**	miles	*emissions estimated from T&S reimbursement*	**199,325**	$kgCO_2e$
Other					
Agricultural (University Farm, Henfaes)				**690,650**	$kgCO_2e$
Sequestration (University Farm, Henfaes)				**-800,000**	$kgCO_2e$
Total Greenhouse Gas Emissions:				**13,117,853**	**$kgCO_2e$**
	Variance on Previous Year			**-2.03%**	

(Conversion Factors from DEFRA Greenhouse Gas Conversion Factor Repository 2015)*

10. Future Plans

Bangor University's Strategic Plan 2015-2020 was approved by Council in December 2014. Sustainability is a prominent enabler as follows:

"SUSTAINABILITY: Deliver a financially, socially and environmentally sustainable University

The University operates in a region with unique environmental attributes and places sustainability at the heart of its activities: we aim to become, in all aspects, 'the Sustainable University'. Our ambition embraces not only the infrastructure and operation of university sites and operations, but how the University plans for growth and our role for Wales and beyond. We are not alone in recognising the changes needed to reduce our impact on the world in which we and future generations will live, and for our students to become 'global citizens', but we aim to be at the forefront."

We are committed to achieving an international and 'best in class' reputation for our commitment to sustainable development, and ensuring that our graduates will have a demonstrable knowledge of sustainable development practices gained from their studies and wider experiences of the University. We will enable students, staff, partners, businesses, alumni, and the wider community to implement positive change within their spheres of influence and ensure that the University is positioned at the forefront of global sustainable change.

Our 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 as a minimum. Recently completed developments achieving this rating are the multi-million pound Pontio building, the Marine Centre Wales in Menai Bridge, and the St Marys "Student Village".

We are now embarking on a wider Property and Campus Development Strategy that will see significant development of the University's "Science Quarter" on Deiniol Road, and the Menai Science Park in Gaerwen. The Sustainability Task Group is committed to ensuring that sustainability is at the heart of all future development at the University, and as such, our Environmental Management System will be a key factor in influencing and achieving this commitment.

PRIFYSGOL
BANGOR
UNIVERSITY

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Environmental Statement/Report Validation

The information contained within this Environmental Statement/Report has been sampled and validated by the Green Dragon auditor and found to be a fair and accurate assessment of the organisation's activities and environmental performance over the past year within the organisation's defined scope.

Lead Auditor:  **(Robert A Williams)**

Auditing Organisation: YGC

Date of audit: 20th July 2016

Valid until: 19th July 2017

Validation of the Environmental Statement/Report does not confirm certification of the organisation's Environmental Management System to the Green Dragon Standard. Confirmation of certification can be made by obtaining a copy of the organisations valid Green Dragon certificate or visiting the Green Dragon website at www.greendragonems.com