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Property and Campus Services

Environmental Management System Annual Report 2017

Ricky Carter
Environmental Manager

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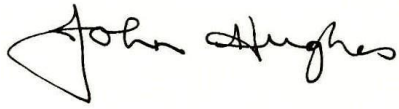
Vice Chancellor's Statement

Once again I am pleased to present Bangor University's Annual Environmental Management Report. It is now eight years since we first embarked upon our Environmental Management System, and I am delighted with the progress that we continue to make in preserving and enhancing the quality of our environment. In the last year we have again achieved some remarkable successes in our journey to become ***the*** Sustainable University. As well as retaining our ISO 14001:2004 certification, we were, in July 2016, the first organisation in the UK to achieve certification to Level 5 of the new Green Dragon: 2015 environmental standard. Subsequently, we climbed 12 places in the only Green Metric Ranking of World Universities, and are now placed at 16th position, which, in a table of 516 participating Universities from across the world, is a tremendous achievement; putting us in the top 4% of participating Universities. The establishment of our Sustainability Lab as the focal point for sustainable development, has in particular, facilitated our effective management of the wider sustainability agenda, and has led to a number of remarkable achievements. We were first in both the Sustain Wales Awards (Higher /Further Education Category), and the Chartered Institution of Waste Management Sustainability and Resource Awards, as well as achieving "Highly Commended" in the Environmental Association of Universities and Colleges' annual Green Gown Awards. In addition, our Student Union achieved three prestigious awards for their sustainability work at the National Union of Students (NUS) Green Impact Awards. In addition to achieving the highly coveted "Gold Award", they were named Union of the Year (non-commercial), and were presented with the Green Impact Special Award for their sustainability partnership work with Makerere University Student Guild in Uganda

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 2015/16 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 2015/16 Academic Year, Bangor University:

Consumed:

- **17,727,492 kWh** of mains electricity
- **22,510,382 kWh** of natural gas
- **441,179 kWh** (42,958 litres) of heating oil
- **68,429 litres** of transport fuel
- **161,781 cubic metres** of mains water
- **55,770 kWh** of LPG

Generated:

- **149,950 cubic metres** of sewage
- **691 tonnes** CO_2e from our agricultural activities

Sent to Landfill:

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

Recycled:

- **412 tonnes** of waste (48% of total)

Travelled:

- **1,907,244 miles** on business travel by road

Sequestered:

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

These activities generated a total of **12,750 tonnes of $CO_{2\,(e)}$** from our activities as a University, which represents a **2.80% decrease** on the previous academic year, and a decrease of **3.06%** for each member of staff and student at the University.

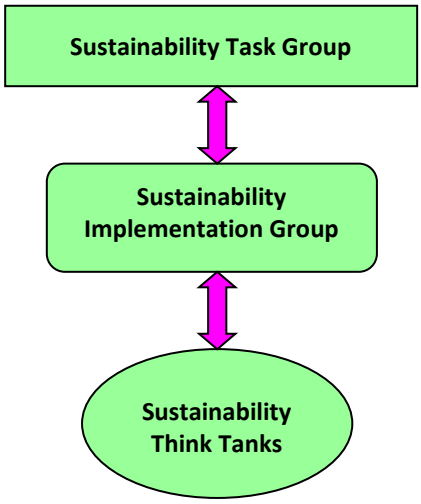
1. Introduction

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 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, 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 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 14001:2004 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 the Task Group with a comprehensive report to enable an effective review of the EMS to be undertaken. The Group will address 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. The most recent Annual Management Review was undertaken on 22nd May 2017.

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).

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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, 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.

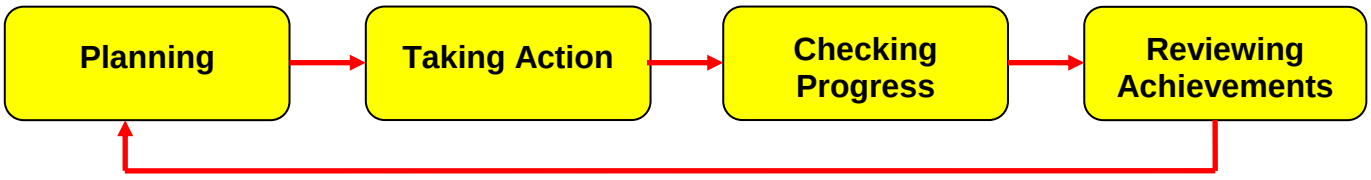
Approved by:

(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 / winter.

Our progression through the Green Dragon and ISO14001:2004 certifications 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 28th April 2017)
- June 2014 – Green Dragon Level 5
- July 2015 – Green Dragon Level 5
- November 2015 – ISO14001 Surveillance Audit
- July 2016 – Green Dragon Level 5
- December 2016 -ISO14001 Annual Renewal Audit (valid until 15th September 2018)

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 and other compliance obligations. As such, we have developed a "Register of Legal Requirements and Other Compliance Obligations" applicable to the University's activities (EMS Document BUEMS 2A). The register is kept up to date by the Environmental Manager who is responsible for ensuring that relevant environmental licences, registrations, and authorisations 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. The University has recorded no unauthorised contravention of environmental legislation, and has not been responsible for any pollution incidents during the reporting period.

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 2016/2017

From the Aspects and Impacts assessment, we have derived the following objectives and targets for the current academic year (ending 31st July 2017):

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 (*)
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 an annual reduction in vehicular business travel CO2 emissions
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 **T6 B)** Undertake annual Procurement Fitness Checks. Achieve Level 2 of the Welsh Procurement Maturity Model by 2020. **T6 C) –** Monitor progress against sustainability performance indicators and targets set within the Procurement Strategy.
T7) Enhance Awareness and Communication	**T7 A)** Implement programmes and schemes to raise awareness of the wider sustainability agenda amongst staff, students, visitors and contractors
T8) Promote Biodiversity	**T8 A)** Ensure that biodiversity considerations are wherever practicable, incorporated in University activities

(*) 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

These Objectives and Targets were approved by the Sustainability Task Group at its Annual Review Meeting on 24th May 2016, and a report of performance against the targets will be incorporated in the 2018 Annual Environmental Report.

8. Annual Performance: Objectives and Targets 2015/2016 Review

Performance in terms of our objectives and targets for the reporting period are as follows, and summarised in Table 3.

Objective T1: Energy and Greenhouse Gas Emissions

The University's energy related emission data is reported in accordance with 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. These targets are assessed against two normalising factors, i.e. **i)** the total operational floor area of the University's estates, and **ii)** the total staff and student population of the University, expressed in "Full Time Equivalents" (FTEs).

In addition to the normalising factors, the total energy consumption and associated carbon emissions (CO_2e) are monitored and reported annually.

2015/16 saw a considerable expansion in the University's estate, as the Pontio Arts and Innovation Centre, the Marine Centre Wales building, and the St Mary's "Student Village" became operational, and this has inevitably had an impact on energy use. In terms of overall energy, consumption rose by 5.33% compared with the previous year, however associated carbon emissions fell by 2.66%. Whilst an increase in energy consumption and a reduction in carbon emissions may appear anomalous, this is entirely due to the annual variance in the DEFRA conversion factor for electricity as a result of a significant decrease in coal generation.

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 £1.9 million.

Figure 1 demonstrates that despite annual anomalies, we are making good progress in reducing our energy use and associated carbon emissions over the longer term. In terms of our long term target (a 40% reduction in our base year carbon emissions by 2020), Figure 2 shows that we remain on target to achieve this.

Fig 1: Total Energy and Carbon Emission trends

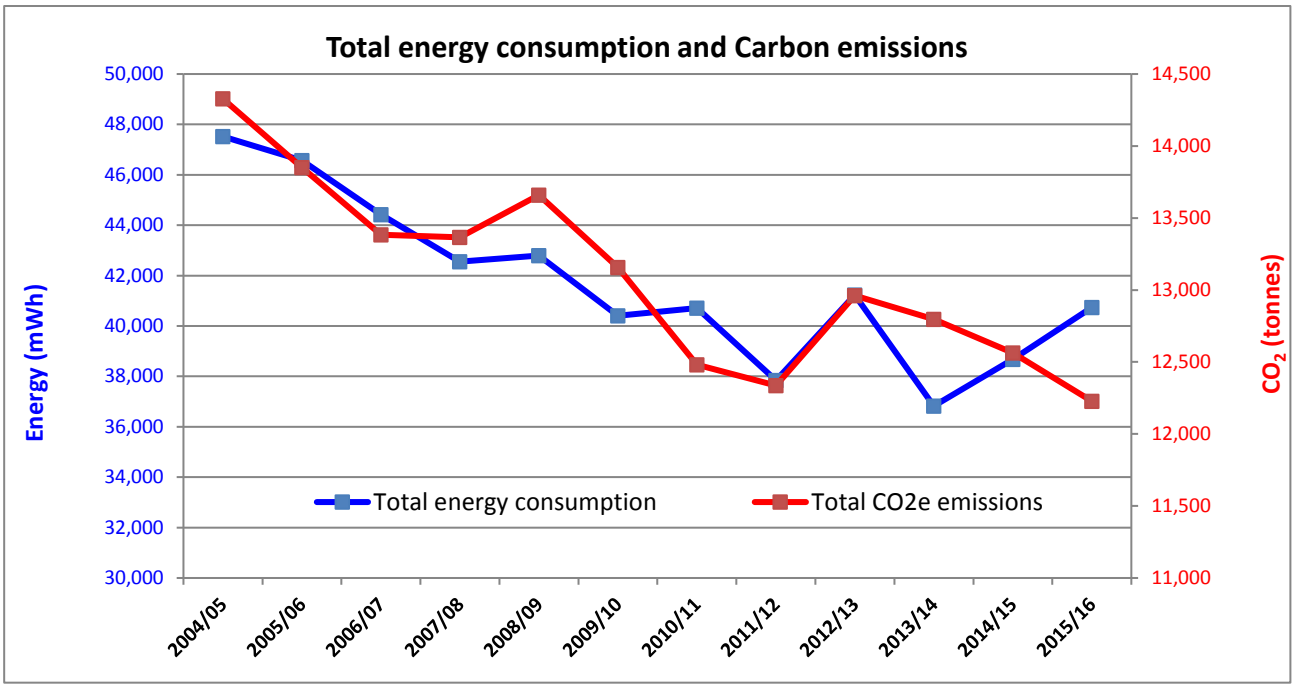
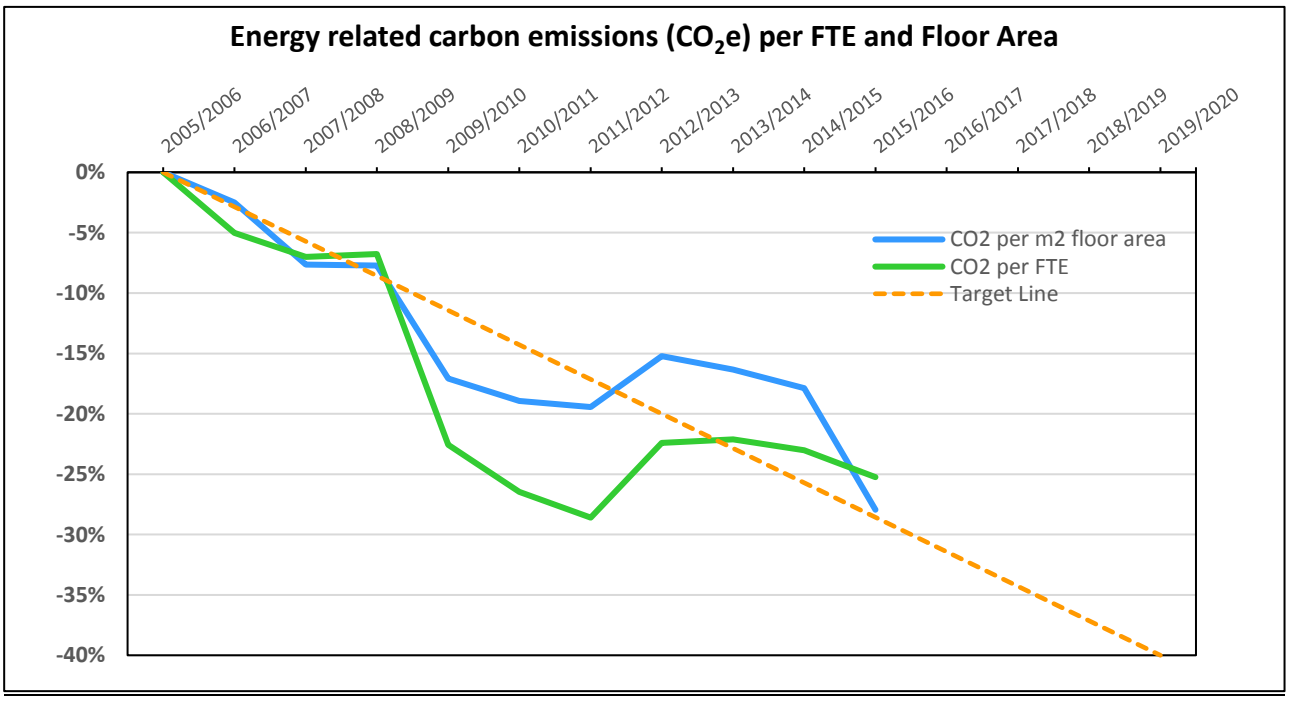


Fig 2: Normalised Energy and Carbon Emission trends since 2005/2006



With regard to Target T1(c), Table 1 provides a summary of the University's overall Scope 1,2, and 3 Greenhouse Gas (GHG) emissions in terms of the normalised reporting metrics referred to above.

Table 1: Scope 1, 2, and 3 emissions summary

Objective T1(c) : Summary	**2014/15**	**2015/16**
Overall Scope GHG emissions (kg CO_2e)	13,117,853	12,749,895
Total staff / Student FTEs	10,973	11,002
Total Operational floor area (m^2)	198,533	220,268

Reporting Metric	**2014/15**	**2015/16**	**Variance**
kgCO2e/FTE	1,195.47	1,158.87	-3.06%
kgCO2e/m^2	66.07	57.88	-12.40%

Under the UK Government's "Carbon Reduction Commitment- Energy Efficiency Scheme" (CRC) 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 rose to £16.60 per tonne in 2016/17. The current cost of allowances to the University is in excess of £200,000, however the CRC scheme is to be abandoned in 2018 in favour of an increase in the Climate Change Levy which will take effect from April 2019.

In terms of our energy usage and greenhouse gas emissions, Figures 3 and 4 demonstrate that Bangor University is performing favourably within the sector, being placed within the lower quartile for each of these categories[1].

[1] Source: Higher Education Statistics Agency Ltd. (www.hesa.ac.uk)

Fig 3: Higher Education Sector: Energy Consumption per m² floor area (2015/16)

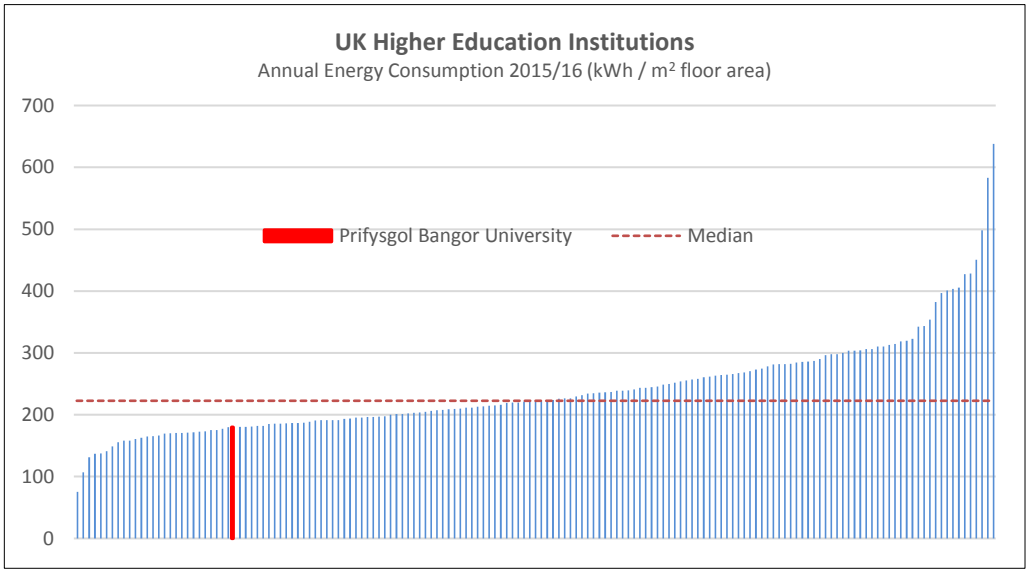
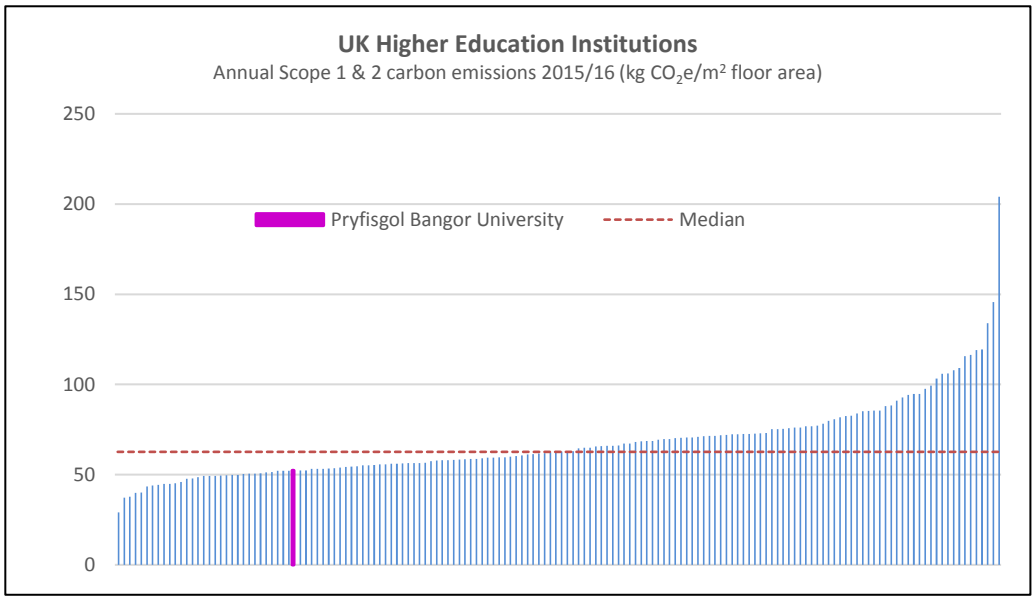


Fig 4: Higher Education Sector: Greenhouse gas emissions per m² floor area (2015/16)



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. In recent years, achievement of this target has been challenging, and in no small part due to leakages from an aging subsurface infrastructure. However following a proactive programme of identification and reparation of a number of leaks, as well as implementation of water efficiency measures including water efficient shower heads, and waterless urinals, consumption during the reporting period fell to its lowest level since 2005/06. This is considered to be a significant achievement given the increase in the size of the estate as referred to above.

Figures 5 and 6 show that despite significant annual variances in recent years, our annual consumption in terms of the size and population of the University, has become realigned with our stated target. Figure 7 illustrates that our performance is marginally below the median when compared with the Higher Education Sector in the UK.

Fig 5: Total Annual Water Consumption

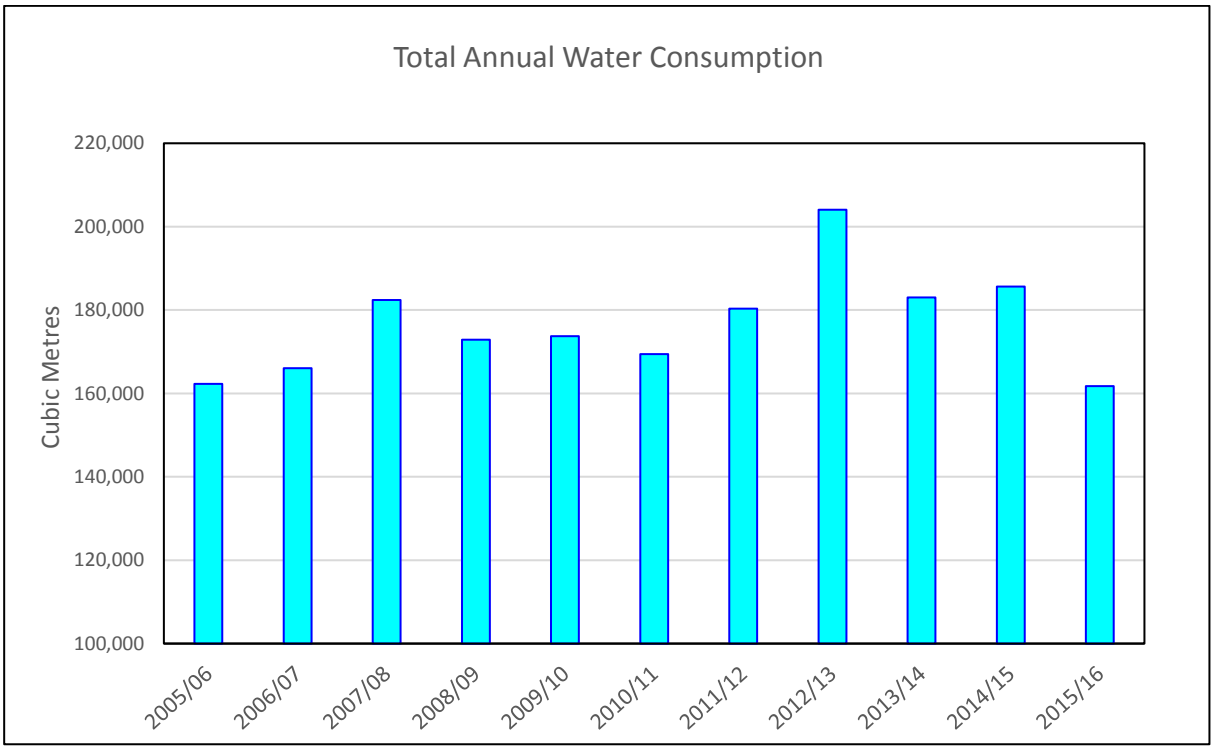


Fig 6: Normalised Water Consumption since 2005/2006

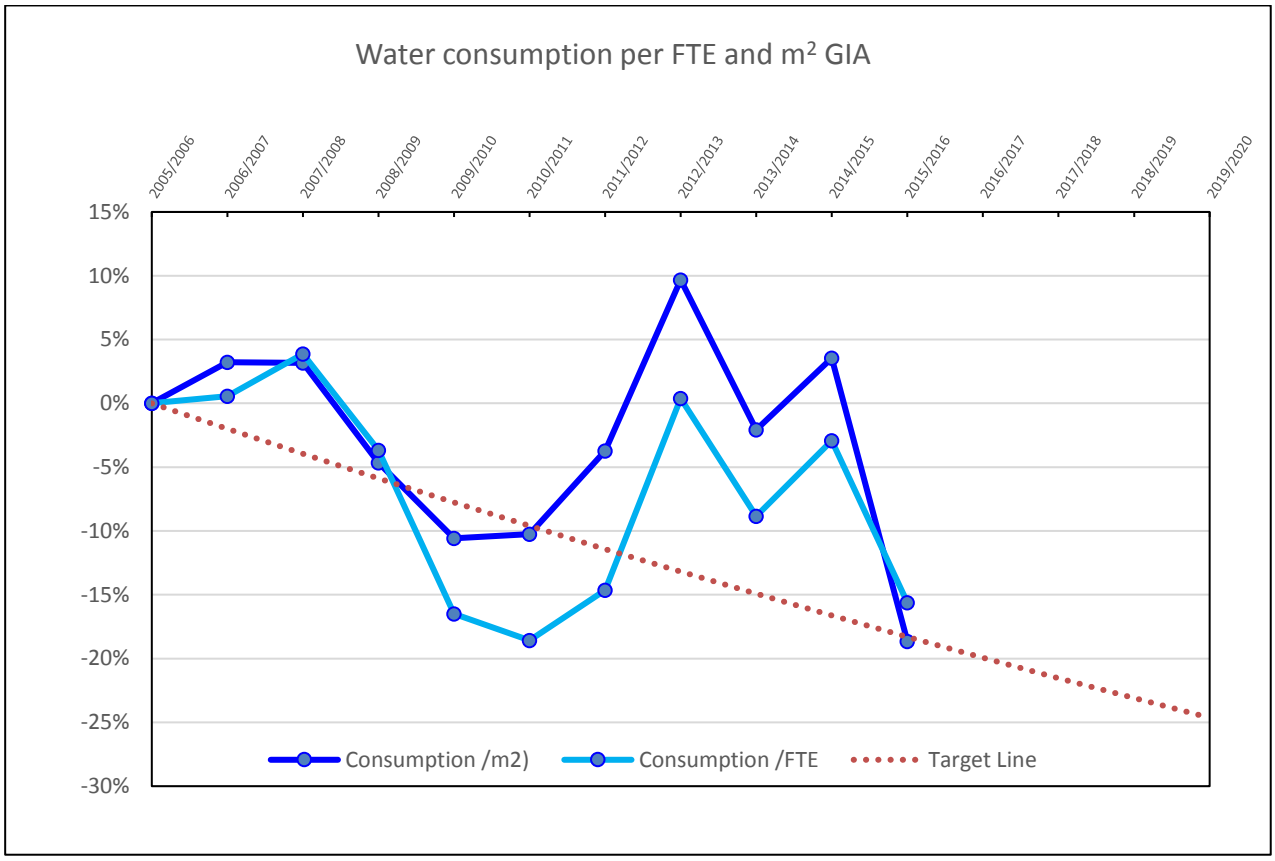
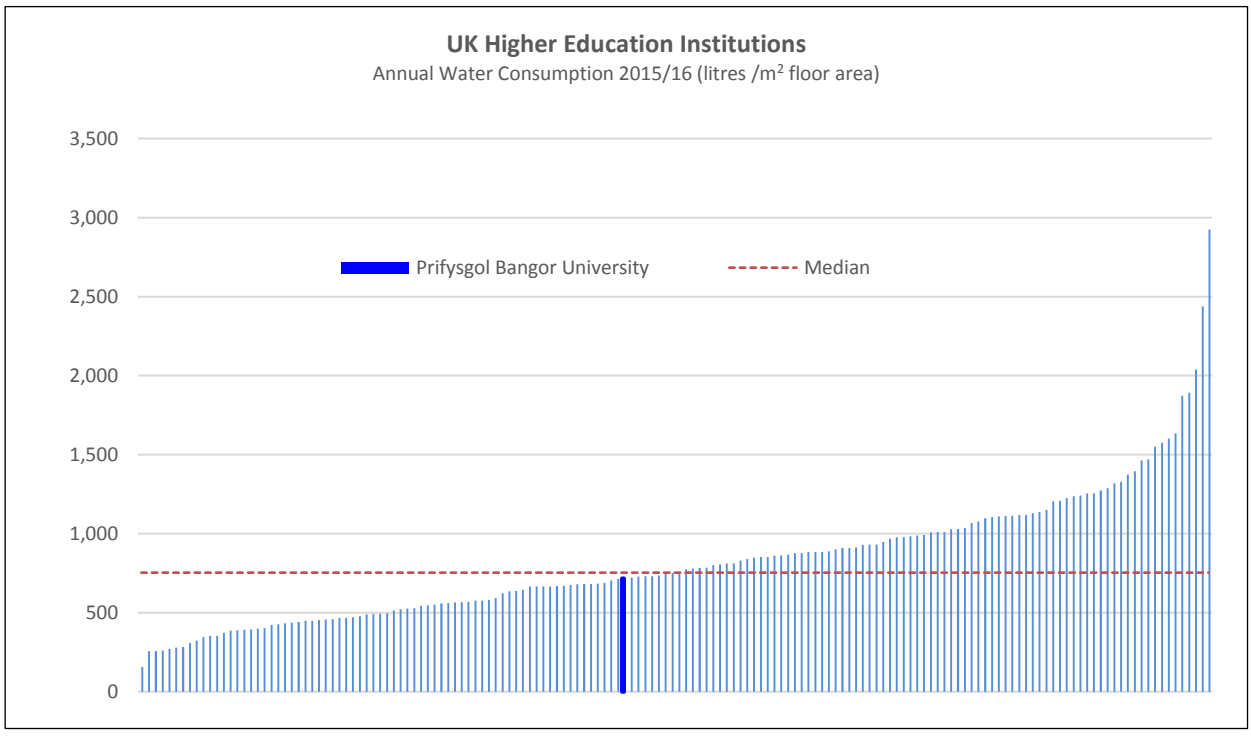


Fig 7: HE Sector Water Consumption 2015/16



Objective T3: Prevention of pollution

There were no spillages or pollution incidents during the reporting period, and considerable effort continues to be made to reduce such risks. All of our heating oil storage facilities have been 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 mains gas or lpg, which not only reduces our carbon footprint, but also removes a potential source of pollution. The purchase of heating oil is now 20% of the 2005/06 base year levels and to date we have removed oil heating from Ardudwy, Ynys Faelog, Meirion, Henfaes Farmhouse, and the Normal Site. All of our discharges to controlled waters are, where required, subject to appropriate Environmental Permits.

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

During the reporting period, we recycled or reused 48% of our total waste. Although this is the highest diversion rate we have achieved, it is slightly short of our target of 50%. An ongoing initiative contributing to our improved performance, is the introduction of the "binless" office across the University. This requires staff to segregate their own wastes into mixed recyclates, food waste, and general (landfill), and deposit them in centrally located recycling hubs. Cleaning staff no longer empty individual deskside bins, which not only encourages staff to take ownership of their own wastes, but also leads to more efficient working practices within our Support Services,

Our current waste statistics are summarised in Figures 8 and 9.

Fig 8: Waste (Diversion from Landfill) Statistics

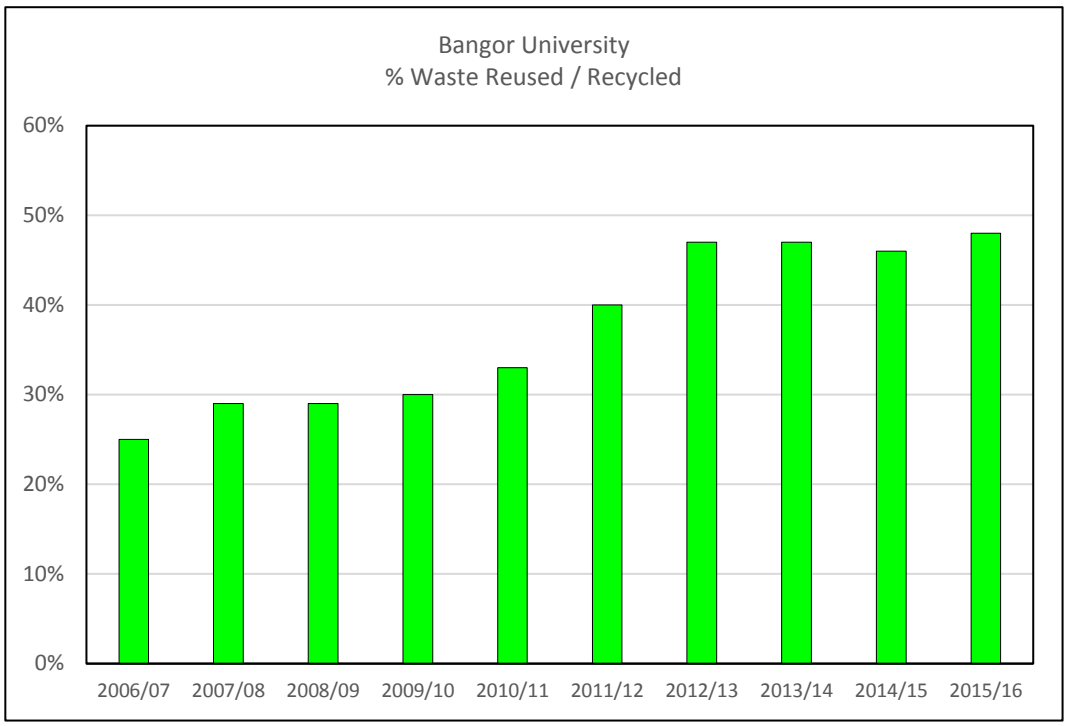
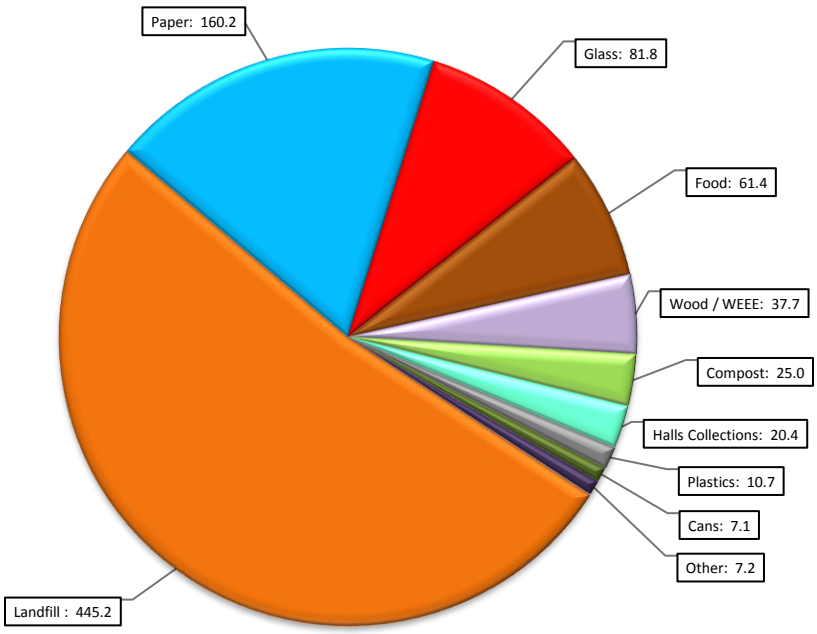


Fig 9: Bangor University Waste Streams 2015/16 (tonnes)



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 was achieved. Our Campus Travel Plan 2015 – 2020, 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 a Cycle to Work Scheme, initially launched during 2012, is made available to staff during three periods each year. To date, 285 staff members have purchased a bike through the scheme; this equates to £200,160 worth 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 are members of the Arriva "Employers Club", which enables staff to access discounted bus travel on Arriva bus routes. Following an initial trial in 2015, the Property and Campus Services department has now expanded its fleet of electric vehicles to four vans, three of which are utilised by the Maintenance Department, and one by the Post Team. Consideration is 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[2], which assesses the carbon emissions associated with expenditure on 75 key commodities. Using this methodology, we developed Target T6A to reduce procurement related greenhouse gas emissions annually. Performance is summarised in Table 2, however these data **exclude** the procurement of construction and electricity, since, a) construction activity varies significantly from year to year, and b) the reporting tool utilises a standardised conversion factor (i.e. kg CO_2/£ expenditure) for each commodity. Whilst this is

[2] *HESCET - Higher Education Supply-Chain Emissions Tool*

considered acceptable for the majority of the commodities listed, the actual emissions associated with mains electricity vary significantly from year to year depending principally on the amount of coal fired generation. Conversion factors are released by Defra annually, however these variations are not currently taken into account in the HESCET reporting tool, which has used the same conversion factor since 2012.

Table 2: Procurement Related Carbon Emissions

2012/13		2013/14		2014/15		2015/16	
Expenditure (£million)	CO2e (tonnes)	Expenditure (£million)	CO2e (tonnes)	Expenditure (£million)	CO2e (tonnes)	Expenditure (£million)	CO2e (tonnes)
£42.4	21,827	£44.8	23,666	£47.9	22,266	£45.2	22,114
			8.4%		-5.9%		-0.7%

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 and the Students' Opportunities Fair (Serendipity 2)
- Induction training on sustainability for wardens and campus life co-ordinators in Halls
- Inclusion of sustainability issues within the Welcome Week presentation for new students. In 2016 The Sustainability Lab staff presented at 18 events reaching around 1000 students
- Contribution to teaching – e.g.
    - An "Environmental Management at Bangor University" module for second year Environmental Management students.
    - An introduction to Sustainability for the SENRGy 'Agriculture and Society' distance learning module
    - 'Today's student, tomorrow's global citizen' module for the Bangor Employability Award (BEA)
    - Contribution to a lecture/practical sessions for the Applied Behaviour Change module in the School of Psychology.
    - Training sessions for central services e.g. the Library Services team, Halls teams, Undeb Sabbatical officers and staff
    - Career opportunities in Environmental management for 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. Topics have included:
    - Buying Green – sustainable procurement at Bangor University
    - Environmental Management at Bangor University
    - What's Happening Waste Wise?
    - The Sustainability Think Tank's chance to influence Government - have your say on how we will be measuring the success of the Future Generations Act – Mike Palmer Welsh Audit Office
    - Love Your Clothes
    - Promoting Sustainability and Well-being across continents: Developing the Bangor-Makerere Students Link
    - An opportunity to discuss Love Your Clothes and for the local community to hear more about the University's Sustainability projects.
    - Patient and Public Involvement in research: how could these principles be applied to the University's well-being and sustainability agenda
    - Food Poverty and Sustainability
- Student Switch-off – an inter-Hall energy competition for students in University accommodation and training of SSO student ambassadors
- "Snap it Off"- encouraging students to upload photographs of energy wastage onto the web, and seeking resolution by University staff
- Delivered Recycling Presentation to International Students
- Fairtrade Fortnight
- Communication on sustainability in the student International Newsletter
- Communicating sustainability activities and raising awareness of sustainability at Bangor University through the Sustainability Lab 'Sustainability@Bangor' Newsletter sent to all staff and students:

    - Sustainability@Bangor Summer Newsletter 2015
    - Sustainability@Bangor Christmas Newsletter 2015
    - Sustainability@Bangor Summer Newsletter 2016

- Partnership between Bangor University and Halls of Residence with British Heart Foundation to run the 'Pack for Good' campaign in halls to get students to donate their unwanted items to the charity at the end of the term.
- Love Your Clothes – a partnership between Bangor University's' Sustainability Lab, the Students' Union and WRAP challenging university students, staff and Bangor's wider community to donate one tonne of unwanted clothes for local charities as part of 'Love Your Clothes Bangor' – a series of events running in March 2016 to highlight the environmental impacts of clothing.

  Continual communication and awareness raising of sustainability and EMS through the Environmental Management website pages[3] and the Sustainability Lab website[4]

Objective T8: Biodiversity

Considerable work is undertaken across the University to protect and enhance our natural environment and promote its biodiversity. This is primarily led by activities at our Botanic Gardens in Treborth, and our agricultural holding at Henfaes both of which are havens for biodiversity and where proactive steps are taken to protect native flora and fauna, and to control invasive species. Within the development of our estate, we are also taking opportunities to promote biodiversity; 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 we are working closely with the North Wales Wildlife Trust in installing swift nesting boxes on our buildings. Wildflower seeding and insect "hotels" have also been introduced where practicable, as well as student led pond restorations, tree planting and organic garden programmes.

Our original Biodiversity Policy was revised and approved by the Sustainability Task Group in September 2016. The Policy sets out our plans to establish a Biodiversity Action Plan, and a representative Working Group to coordinate the range of actions we are taking to promote biodiversity across campus.

[3] www.bangor.ac.uk/eo/environment

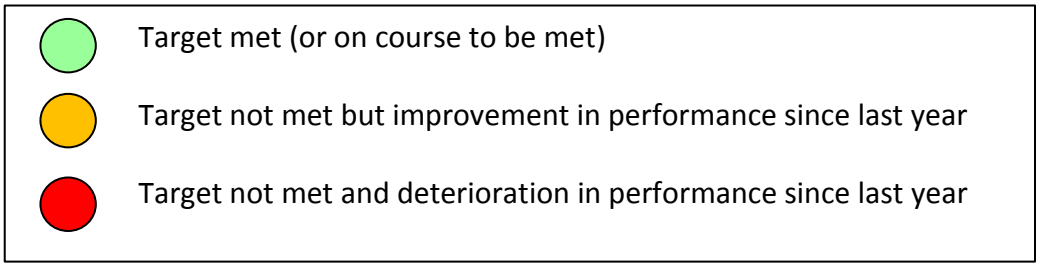
[4] planet.cymru/en

Table 3: Summary of Performance against 2015/2016 Targets

Ref	Objective	Targets	Status	Notes
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 (*)		**Summary**: total energy consumption increased by 5.33% compared with the previous year, whilst associated carbon emissions fell by 2.66%
				Emissions/m^2 of operational floor area fell by 12.27%
				Emissions/staff and student FTE fell by 2.92%
		T1 B) Achieve a 40% reduction in energy associated greenhouse gas emissions (CO_2e) by 2020, (based on 2005/06 base year) (*)		**Summary:** Total energy use is now 12.53% lower than during the base year; associated carbon emissions have fallen by 11.71%.
				Emissions/m^2 of operational floor are now 27.95% lower than in the base year
				Emissions/staff and student FTE are now 25.26% lower than in the base year
		T1 C) Reduce overall Scope 1,2 and 3 greenhouse gas emissions (CO_2e), by 3% each year (*)		Emissions/m^2 of operational floor area fell by 12.4%
				Emissions/staff and student FTE fell by 3.06%
T2	Maximise efficient use of water	T2 A) Reduce total annual water use by 2% per year (*)		**Summary**: total water consumption is 9.1% lower than in the previous year
				Consumption/m^2 of operational floor area fell by 21.6% *(Target 2% reduction)*
				Consumption /staff and student FTE fell by 9.4% *(Target 2% reduction)*
T3	Prevent pollution from University activities	T3 A) Zero pollution incidents recorded		There have been no pollution incidents at the University. The greatest risk remains that 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 20% of that purchased in the 2005/06 base year.
T4	Minimise waste to landfill.	T4 A) Recycle / divert from landfill 50% of all municipal waste generated by the University		Recycling /diversion from landfill during the year reached 48%, compared with 46% the previous year.
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).		Emissions are currently 32% lower than base year. As such the 2016 target has been achieved. In future years this target will be t revised to seek an annual year on year reduction in emissions.

T6	**Embed a process for consideration of Sustainable Procurement issues within the wider procurement process**	**T6 A) Reduce procurement related carbon emissions annually**		During the reporting period, total procurement related emissions fell by 0.7% (NB: this excludes construction and electricity usage for reasons outlined in the following section).
T7	**Enhance Awareness and Communication**	**T7 A) Implement programmes and schemes to raise awareness of Environmental Sustainability amongst staff, students, visitors and contractors**		A number of awareness campaigns have been held throughout the year as summarised below.
T8	**Promote Biodiversity**	**T8 A) Ensure that biodiversity considerations are wherever practicable, incorporated in University activities**		Ongoing biodiversity management plans are continuing at Treborth, and Henfaes, and a number of activities have been implemented across campus.

Key to Table 3



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 2015/2016 reporting year (calculated as CO_2 equivalents) are summarised in Table 4.

Table 4 : Greenhouse Gas Emissions associated with Bangor University Activities 2015/2016

Source	Quantity	Units	Conversion(*)	Emissions	
SCOPE 1 - DIRECT EMISSIONS					
Natural Gas consumption	**22,510,382**	kWh	**0.18400**	**4,141,910**	$kgCO_2e$
Heating Oil purchased	**42,958**	litres	**2.53232**	**108,783**	$kgCO_2e$
Diesel Fuel purchased	**35,336**	litres	**2.6116**	**92,284**	$kgCO_2e$
Petrol purchased	**33,093**	litres	**2.1970**	**72,704**	$kgCO_2e$
LPG	**55,770**	kWh	**0.21458**	**11,967**	$kgCO_2e$
IMPORTED POWER :Scope 2&3					
Electricity consumption	**17,727,492**	kWh	**0.44932**	**7,965,317**	$kgCO_2e$
SCOPE 3 INDIRECT EMISSIONS					
Municipal Wastes	**223**	tonnes	**421**	**93,715**	$kgCO_2e$
Commercial Wastes	**223**	tonnes	**199**	**44,297**	$kgCO_2e$
Recycled Wastes	**412**	tonnes	**21**	**8,642**	$kgCO_2e$
Mains Water consumed	**161,781**	m^3	**0.344**	**55,653**	$kgCO_2e$
Wastewater generated	**149,950**	m^3	**0.708**	**106,165**	$kgCO_2e$
Indirect Transport (Grey Fleet)				**157,808**	$kgCO_2e$
Other					
Agricultural (est.)				**690,650**	$kgCO_2e$
Sequestration (Henfaes est.)				**-800,000**	$kgCO_2e$
Total Greenhouse Gas Emissions:				**12,749,895**	**$kgCO_2e$**
	Variance on Previous Year			**-2.8%**	

(Conversion Factors from DEFRA Greenhouse Gas Conversion Factor Repository 2016)*

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.

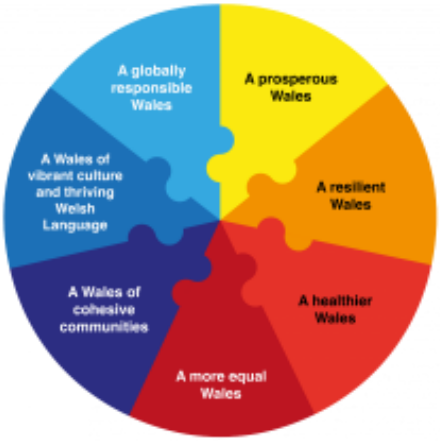
Our Estates Strategy is currently being reviewed, and will incorporate sustainability as an integral consideration in the future development of the University, and all of our new buildings will be designed to achieve the BREEAM "Excellent" rating as a minimum. Recently completed developments achieving this rating are the multi-million pound Pontio building, the Marine Centre Wales in Menai Bridge, and the St Marys "Student Village".

The introduction of the new ISO 14001:2015 Environmental Standard will have implications for our Environmental Management System, and we are currently in the process of making the required transition arrangements.

Significant development of the University's "Science Quarter" on Deiniol Road is proposed, whilst the Menai Science Park in Gaerwen, currently under construction, is due for completion in January 2018. We are also embarking on an ambitious "Invest to Save" energy efficiency programme as we seek to achieve our long term objectives and targets.

The Well-being of Future Generations (Wales) Act 2015 places a statutory duty on certain public bodies in Wales to carry out their duties in a sustainable way. Although Higher Education Institutions are not specifically listed in the Act, we have publicly stated that Bangor University will apply the principles set out in the Act (summarised in Figure 10) to all of our work.

Fig 10. Well-being of Future Generations (Wales) Goals



This work is being led by our Sustainability Lab (http://planet.cymru/en/) and will involve us applying the "Five Ways of Working" set out in the Act, namely:

1. *Long term thinking*
2. *Prevention*
3. *Integration*
4. *Collaboration*
5. *Involvement*

The Sustainability Task Group is committed to ensuring that sustainability is at the heart of the University's future, and as such, our Environmental Management System will be a key factor in influencing and achieving this commitment.

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