PRIFYSGOL
BANGOR
UNIVERSITY

Environmental Management System Annual Report

October 2018
(for the Academic Year 2017/18)

Bangor University's Campus
Environmental Performance Team

Contents Page

Executive Summary

This report is a review of our environmental performance during the 2017/18 academic year (the "reporting period") and a summary of the actions currently being undertaken by Bangor University to achieve continual environmental improvement. This report 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 2017/18 Academic Year, Bangor University:

Consumed:

- **14,931,525 kWh** of mains electricity
- **19,495,827 kWh** of natural gas
- **881,450 kWh** (80,867 litres) of heating oil
- **57,438 litres** of transport fuel
- **141,203 cubic metres** of mains water
- **149,192 kWh** of LPG

Generated:

- **129,531 cubic metres** of sewage
- **695,600 tonnes** CO_2e from our agricultural activities

Sent to Landfill:

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

Recycled (including EfW):

- **547.58 tonnes** of waste (65.95% of total)

Travelled:

- **1,193,486 miles** on business travel by road

Sequestered:

- **800,000 tonnes** CO_2e at our landholdings at Henfaes Farm

These activities generated a total of **8,811.24 tonnes of $CO_{2\,(e)}$** from our activities as a University, which represents a **16.72% decrease** on the previous academic year.

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 will not only seek to protect our natural environment, but also actively pursue opportunities to enhance it, promote a culture of environmental stewardship amongst our staff and students and work towards the goals of sustainable development."*

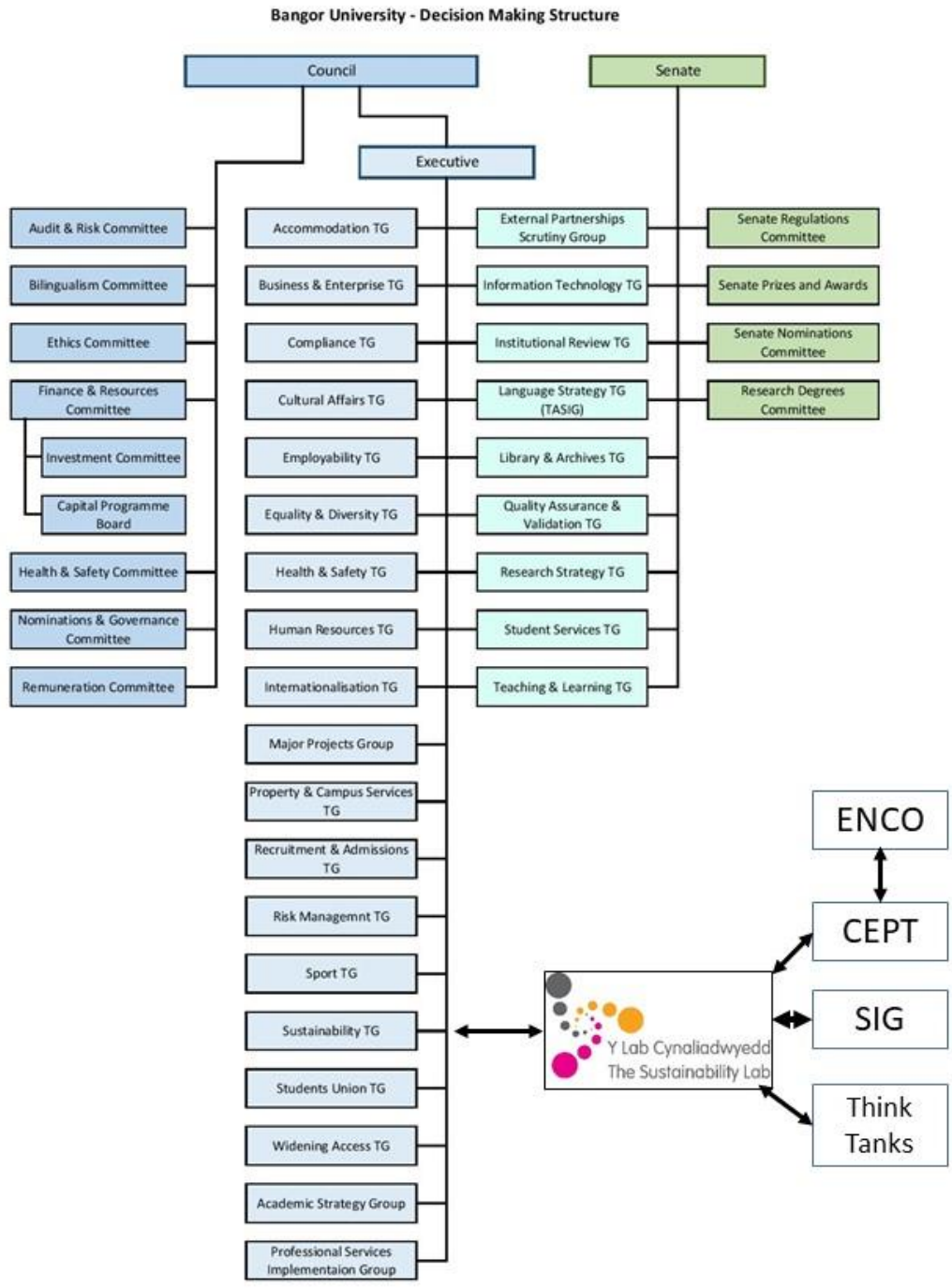
These publicly stated aims reflect the minimum expectations of our stakeholders, notably our staff, students and alumni; employers, funders, partners, suppliers, regulators and the wider community. In this respect we have established the structure for implementing our sustainability agenda.

The Sustainability Lab is the high-profile focal-point to leading on sustainability within the University. Since August 2018 it has been incorporated into Corporate Services alongside the Planning, Governance and HR teams, to reflect the importance of sustainability in terms of strategic planning, business intelligence, compliance issues, policy development and partnerships. The Director of Sustainability reports to the Director of Corporate Services who also holds the role of University Secretary. The Campus Environmental Performance Team (CEPT) is co-ordinated by the Sustainability Lab. The Environmental Co-ordination group (ENCO) ensures collaboration between The Sustainability Lab, CEPT and the Property and Campus Service (PaCS) teams.

The Sustainability Task Group 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

(SIG), supported by the Sustainability Lab, with input from the Sustainability Think Tanks which are open to all staff and Students as follows (Box 1):

Box 1



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 discussed at an Annual Environmental Management Review meeting of the Sustainability Task Group. The review meeting is undertaken to the requirements of the ISO 14001:2015 environmental standard, 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 for this year; the CEPT intends to review this and amend as necessary:

- 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

In May 2018 the Campus Environmental Performance Team (CEPT) comprised of the Director of Sustainability, the Campus Waste Co-ordinator, Campus Energy, Water and Travel Co-ordinator, Biodiversity Co-ordinator, Legal Compliance Co-ordinator and Digital Community communications co-ordinator reported for the first time and from then on is the group responsible for reporting on the EMS.

The Sustainability Task 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 CEPT internal drive and can be provided on request from the Legal

Compliance Co-ordinator. The most recent Annual Management Review was undertaken on 17th May 2018.

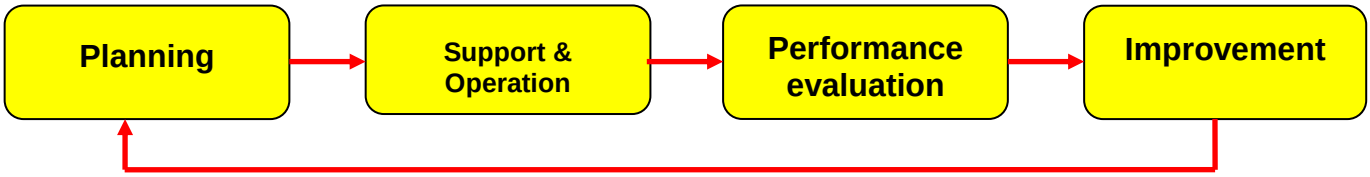
During that meeting it was noted that the data for the report referred back to the academic year 2016/17 and largely out of date. As a result it was agreed that a second report would be prepared in October 2018 reporting on the data from the Academic year 2017/18 and that Annual Management Reviews would subsequently be scheduled for October to report to the University Council in its November/December meeting. This is the first of the October reports, reporting on the Academic year 2017/18

3. Environmental Policy

The University's Environmental Policy is reviewed annually and changes suggested by CEPT approved by the Sustainability Task Group. The current draft for approval by the executive is in Appendix 1.

4. Environmental Management System

Our EMS has been designed in accordance with the criteria set out in the ISO14001:2015. The structure of the EMS follows the Plan-Do-Check-Act model, which provides the basis of an iterative approach to achieve continual improvement:



To achieve the key principles of:

- **Continual environmental performance**
- **Compliance with legal and other requirements**
- **Achieving environmental objectives**
- **Communicating with all stakeholders**

The ISO 14001:2015 Certificate is verified by an externally appointed UKAS accredited body. Certification was successfully audited to the new 14001:2015 criteria in August 2017, with the latest certificate valid for 3 years and subject to annual "surveillance audits". The next audit is scheduled for 31st October/1st November 2018.

Our EMS currently applies across the entire University estate in the north of 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 the Campus Environmental Performance Team with any updates or queries passed on to the Sustainability Task Group throughout the year.

Since the last reporting period CEPT, led by the Legal Compliance Co-ordinators from the Health & Safety team, has undertaken a root and branch review of the EMS documentation and the proposed approach will be presented to the STG during the October 2018 Annual Review for approval.

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.

Environmental Legislative compliance are overseen by the University's Health and Safety team, part of Governance & Compliance, with the Register kept up to date by the Campus Environmental Performance Team. **We are working towards ensuring that this is available on line with the relevant parts publicly available**.

Responsibility for ensuring relevant environmental licences, registrations and authorisations are in place and for evaluating compliance with relevant legislation. Other requirements are delegated across the risk-owners, with the Health and Safety team overseeing delivery and performance. 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 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 42 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 2017/18 (no change)

From the Aspects and Impacts assessment, we have derived the following objectives and targets for the current academic year (ending 31st July 2018):

Table 1: Environmental Objectives and Targets

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 CO_2 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 17th May 2018, and a report of performance against the targets will be incorporated in the 2018 Annual Environmental Report.

8. Annual Performance: Objectives and Targets 2017/18 Review

Performance in terms of our objectives and targets for the reporting period are as follows, and summarised in Table 4.

Objective T1: Energy and Greenhouse Gas Emissions

Target T1 A)	**Reduce annual energy associated greenhouse gas emissions (CO_2e) by 3% each year (*)**
Target T1 B)	**Achieve a 40% reduction in energy associated greenhouse gas emissions (CO_2e) by 2020, (based on 2005/06 base year) (*)**
Target T1 C)	**Reduce overall Scope 1, 2 and 3 greenhouse gas emissions (CO_2e), by 3% each year (*)**

(*) Normalised by both Operational Floor Area (m^2) and Staff and Student Numbers (Full Time Equivalents)

The University's energy related emission data is reported in accordance with the DEFRA conversion factors published each year. We have set targets to reduce our energy related CO_2 emissions by 3% year-on-year, and by a total of 40% from our baseline year (2005/2006) by 2020.

Total energy consumption and associated carbon emissions (CO_2e) are monitored and reported annually. In addition, to account for changes in the overall size of the estate and staff and student numbers, our reduction targets are set and assessed against two normalising factors, i.e. i) the total operational floor area of the University estate, and ii) the total staff and student population of the University, expressed in "Full Time Equivalents" (FTEs).

For the academic year 2017/2018, total energy consumption (electricity, gas, heating oil and LPG) amounted to **34,529,271.78 kWh**; a **decrease of 7.1%** compared with the previous year. Energy related carbon emissions **fell by 16.6%**. Compared to the baseline year, total energy consumption has **fallen by 25.9%** and associated emissions by **39.2%** (Fig 1).

The continuing decarbonisation of UK electricity production is contributing the greater decline in our energy related carbon emissions compared to the reduction in energy consumption. However, we are making good progress in reducing our consumption of energy, in absolute terms and in relation to floor area and staff and student numbers.

In relation to our intensity based reduction targets;

- Carbon emissions per m^2 operational floor area fell by **16.6%** compared to the previous year and have decreased by **50.6%** from our baseline year 2005/2006
- Carbon emissions per FTE (staff & students) have also fallen, by **16.0%** compared to the previous year and **49.8%** from the baseline year

In both cases we have far exceeded our target of a 3% annual reduction and have also surpassed our 2020 target of a 40% reduction in emissions (as a factor of floor area and FTE) from our baseline (Fig 2).

We also perform well in the context of the wider UK Higher Education Sector (Fig 3 & Fig 4), being below the average in terms of both energy consumption and carbon emissions per m^2 Floor Area.

Fig 1: Total Energy Consumption and Carbon Emission trends 2017/18

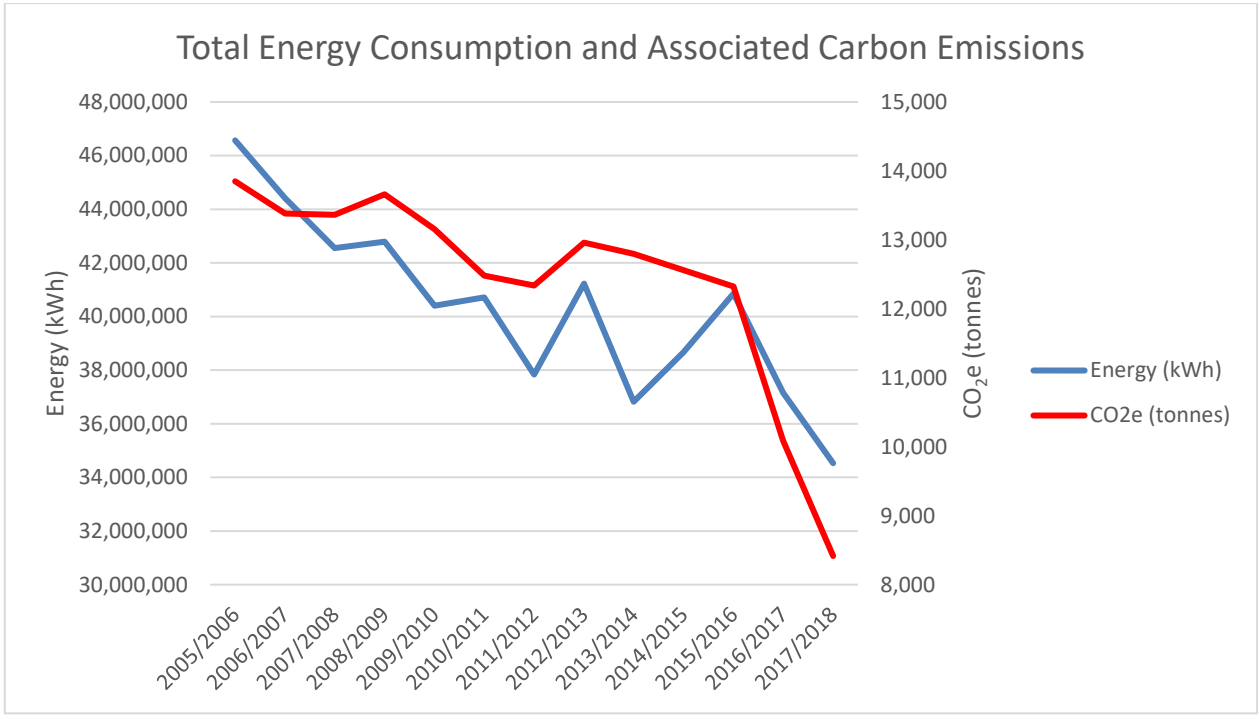


Fig 2: Energy and Carbon Emission trends as a factor of Floor Area and FTEs 2017/18

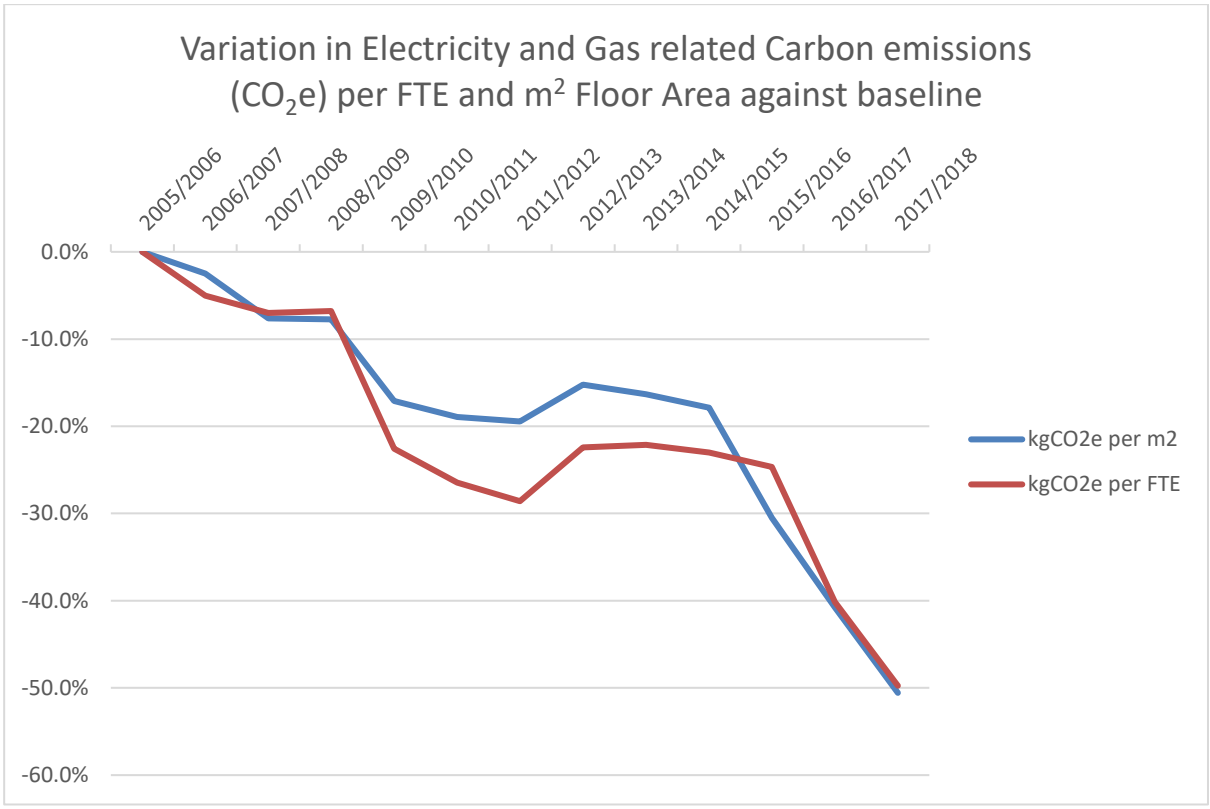


Fig 3: Higher Education Sector: Energy Consumption per m² floor area (2016/17)

*no more recent data is currently available from HESA

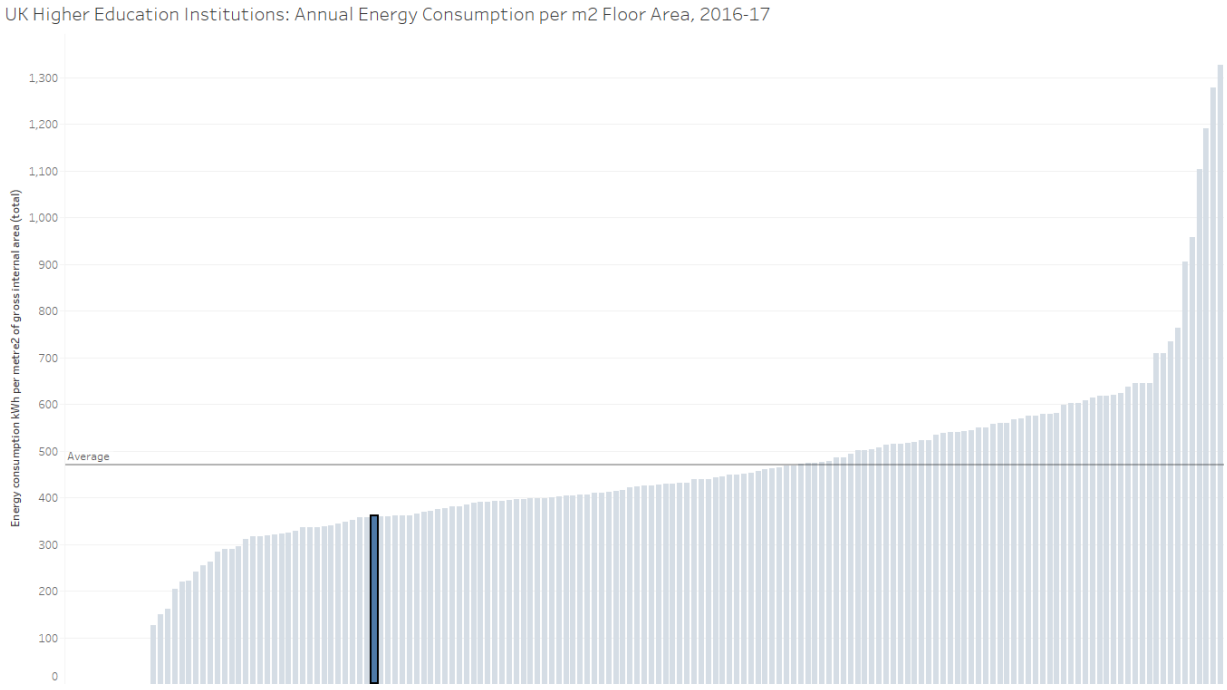
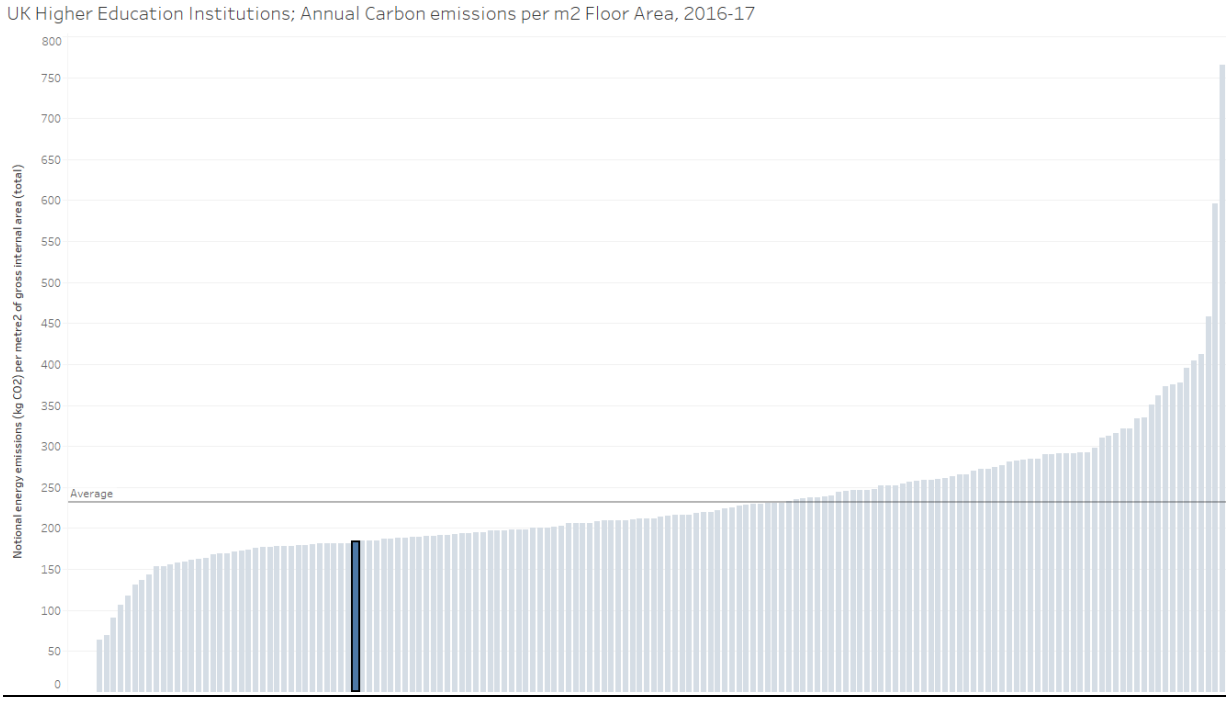


Fig 4: Higher Education Sector: Greenhouse gas emissions per m² floor area (2016/17)

*no more recent data is currently available from HESA



Total Scope 1, 2 and 3 emissions have also **fallen by 16.67%** compared to the previous year to **8,811,237.80 kgCO_2e**. When considered in the context of the normalising factors, emissions have

fallen by 16.21% per FTE and **16.72%** per m^2 operational floor area. These results significantly exceeds the target of a 3% reduction year-on-year.

As these takes into account all emissions from energy and transport as well as emissions arising from waste and waste water disposal, this significant reduction is a reflection of the positive results we are achieving in reducing our environmental impacts across the board.

It should also be noted that the volumes of Heating Oil and LPG consumed during the 2017/18 period seem to be significantly higher than the previous year. This is thought to be due to previously poor reporting and record keeping rather than an actual increase in consumption.

Table 2: Greenhouse Gas Emissions

Objective T1(c) : Summary	**2017/18**	**2016/17**
Overall Scope GHG emissions (kg CO_2e)	8,811,0238	10,580,578
Total staff / Student FTEs	11,264	11,333
Total Operational floor area (m^2)	220,982	220,982

Reporting Metric	**2017/18**	**2016/17**	**Variance**
kgCO2e/FTE	782.25	933.61	-16.21%
kgCO2e/m^2	39.87	47.88	-16.72%

Objective T2: Water

Target T2 A) **Reduce total annual water use by 2% per year (*)**

(*) Normalised by both Operational Floor Area (m^2) and Staff and Student Numbers (Full Time Equivalents)

Our use of mains water impacts upon the environment both through the depletion of a globally scarce natural resource and through managing the resulting wastewater. Wastewater requires management and treatment in order to minimise negative impacts on aquatic ecosystems. Such management, treatment and any disposal of sewage is an energy intensive process and so has an associated carbon footprint.

In view of this we set our target to reduce our water consumption by 2% year-on-year.

In previous 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 for a third consecutive year to its lowest level since our baseline was set in 2005/2006 (Fig 5). Water consumption for the 2017/18 academic year totalled **141,203 m^3**, a **decrease of 9.9%** against the previous year and **13.0% lower** than the baseline. This is considered to be a significant achievement given the increase in the size of the estate and tackling leak issues.

In relation to our intensity based reduction targets for water consumption (Fig 5);

- Annual water consumption per m^2 of operation floor area **fell by 9.9%** compared with the previous year, and by a total of 29.2**%** from the baseline year
- Annual water consumption per FTE (Staff & Students) **fell by 9.4%** compared with the previous year, and by a total of 28.1**%** from the baseline

In both cases we have surpassed our target to reduce water consumption by 2% year-on-year and have reduced overall water consumption for the third year running.

With a view to the wider UK Higher Education Sector, our consumption per m^2 of floor area is less than the sector average however use is higher than average on a per FTE basis (Fig 6).

Fig 5: Total Annual Water Consumption

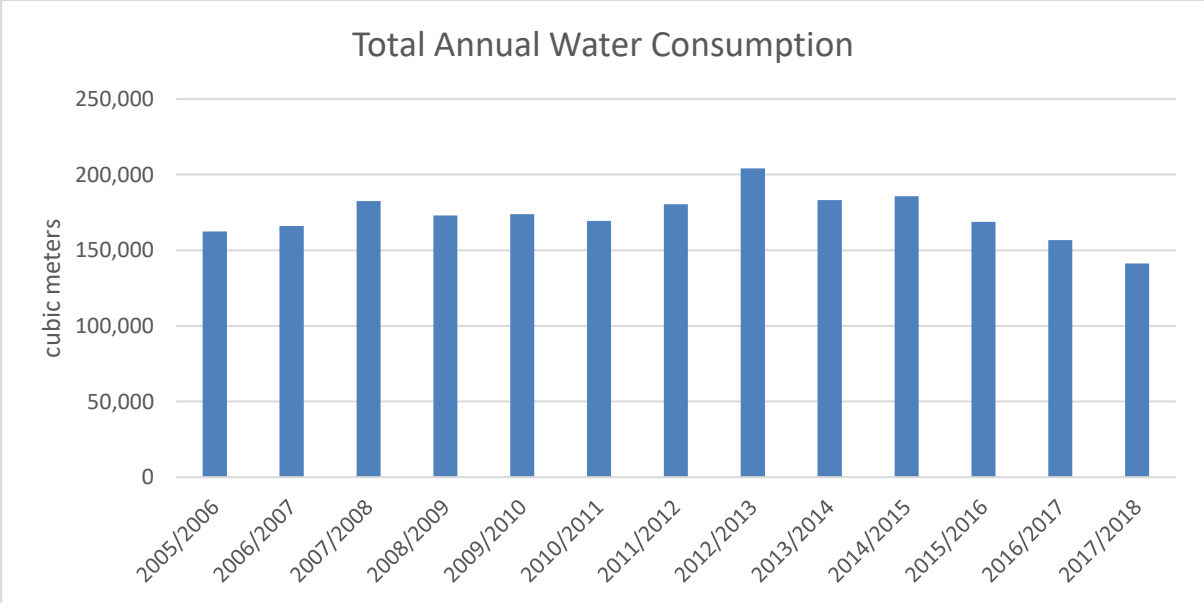


Fig 6: Water Consumption normalised by floor area and FTEs since 2005/2006

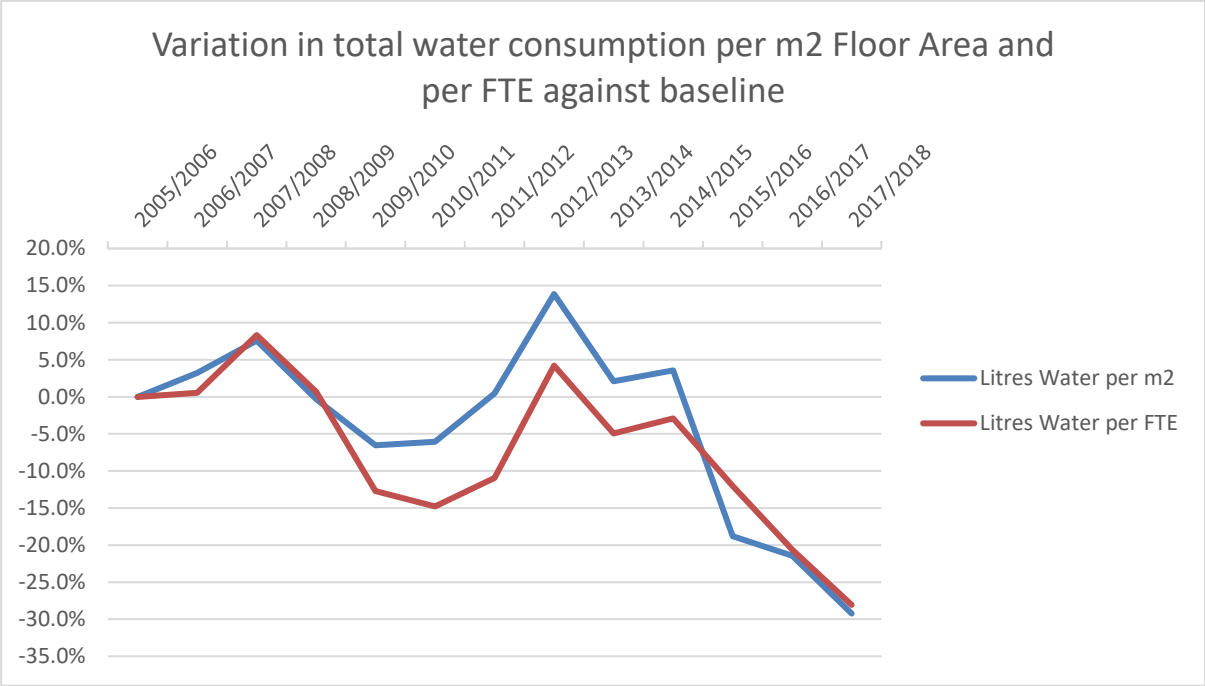


Fig 7: HE Sector Water Consumption per m² operational floor area 2016/17

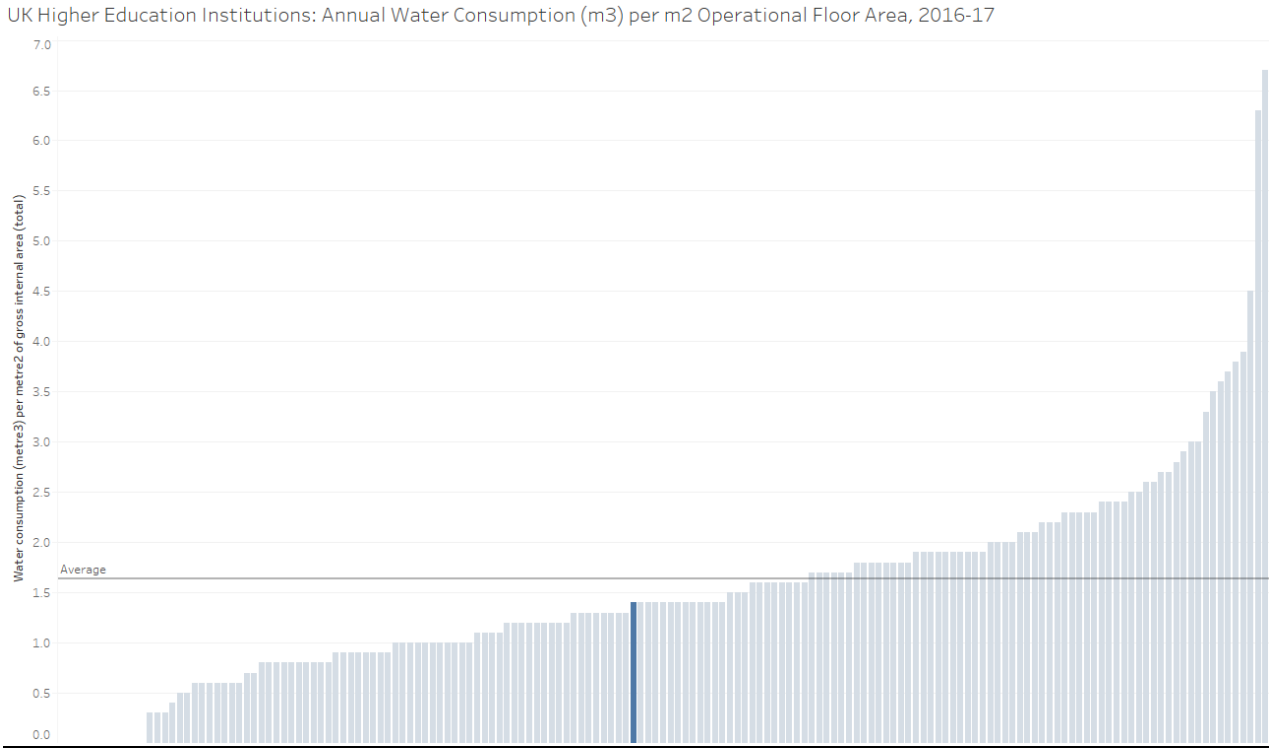
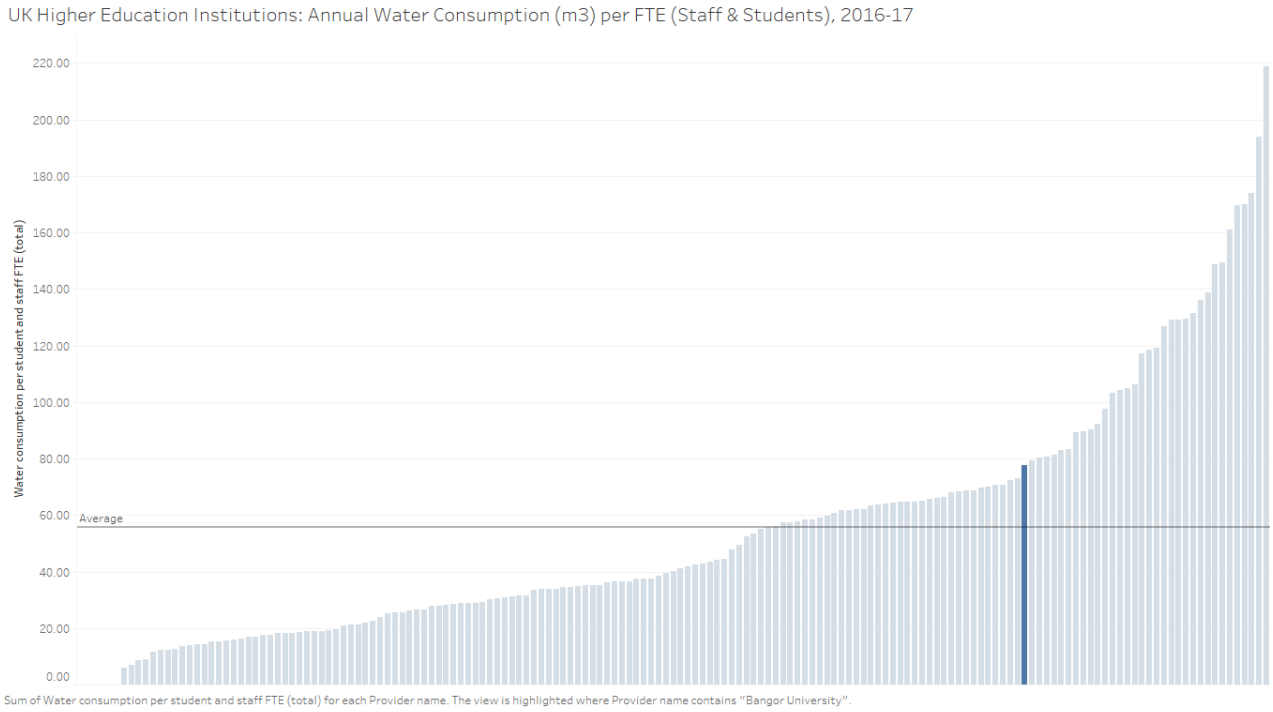


Fig.8: HE Sector Water Consumption per FTE 2016/17

*no more recent data is currently available from HESA



Objective T3: Prevention of pollution

Target T3 A) **Zero pollution incidents recorded**

There were no spillages or pollution incidents during period.

All of our heating oil storage facilities have been replaced with modern integrally bunded polyethylene tanks. 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. For the academic year 2017/18, the total volume of heating oil purchased by the University has fallen to less than 20% of that purchased in the 2005/06 baseline year.

Our Pollution Prevention Plan 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

Target T4 A)	**Recycle / divert from landfill 50% of all municipal waste generated by the University**

As previously reported, a wholesale review of our waste management procedures, including reporting of waste data, was initiated during the 2017/18 period and is still ongoing.

Based on the data received from our waste carriers, the reuse and recycling[1] rate for the reporting period stands at 50.11%[2] (Fig 9). This is an increase of 9.98% compared to the previous year, and an improvement of 100.43% compared with the baseline year (2005/06). This is the first year Bangor University has reached its 50% reuse and recycling target.

Furthermore, it is the first year that a proportion of our general waste has been sent to an Energy from Waste plant as part of a pilot programme implemented by our primary waste carrier, Gwynedd Council. The pilot has only been in place since April, which is why only 131.56 tonnes of our general waste, 31.76% of our overall general waste, has been sent for energy generation during the reporting period. As such, we are classifying this portion of our general waste along with our recycling and reuse as 'Waste Diverted from Landfill'. Doing so raises our total percentage of 'Waste Diverted from Landfill' to 65.96%, with only 34.04% of the waste generated being landfilled. As energy recovery is lower down the waste hierarchy than recycling, we are not categorising any of this waste as recycling. The breakdown of waste by means of disposal can be seen in Fig. 10.

The carbon emissions associated with our waste disposal have also decreased, by 33.06% compared to 2016/17, to 159.93 tonnes CO2e. The current calculation methodology splits total waste between Municipal and Commercial classifications on a 50:50 basis, in line with HESA reporting methods.

Whilst the decision had been made previously to exclude data on the waste generated in St Mary's from our reporting (as the site is managed by a third party), we had intended to display this data

[1] Recycling includes Anaerobic Digestion and Composting.

[2] 2.84% of that 50.11% is reuse whilst the remaining 47.27% is recycling.

in an appendix. Unfortunately, this data is not available as the waste has not been weighed or reported on to date.

Waste Management has been a focus for the Campus Environmental Performance Team over the past 12 months, with student training sessions, presentations and workshops being delivered throughout the year, our first ever University-wide waste campaign (Waste Awareness Week) being implemented, along with operational changes, projects, pilots and initiatives. These array of activities will be repeated and improved on over the next reporting period. A new waste contract will also commence in February 2019, and the 'Eco-Office' Initiative will be rolled-out at the same time.

Fig 9: Percentage of waste diverted from landfill

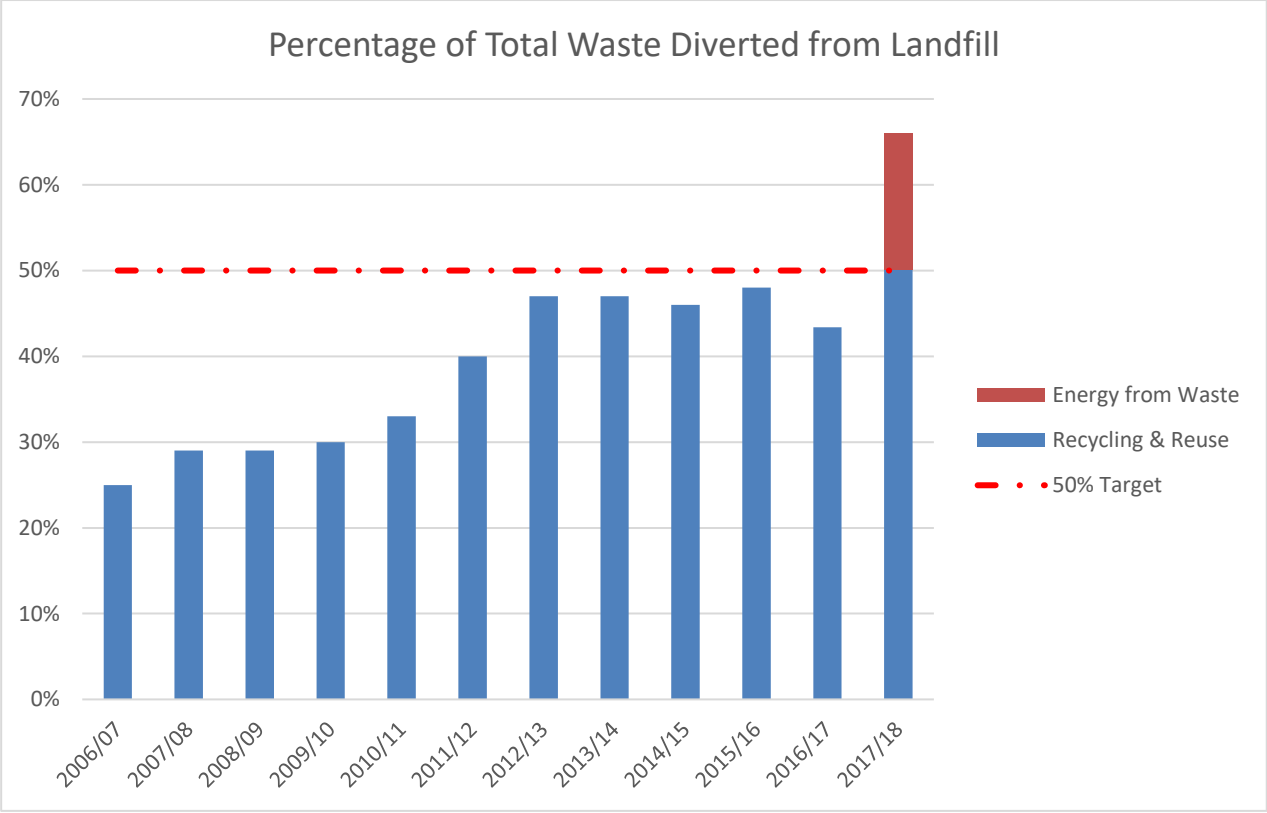
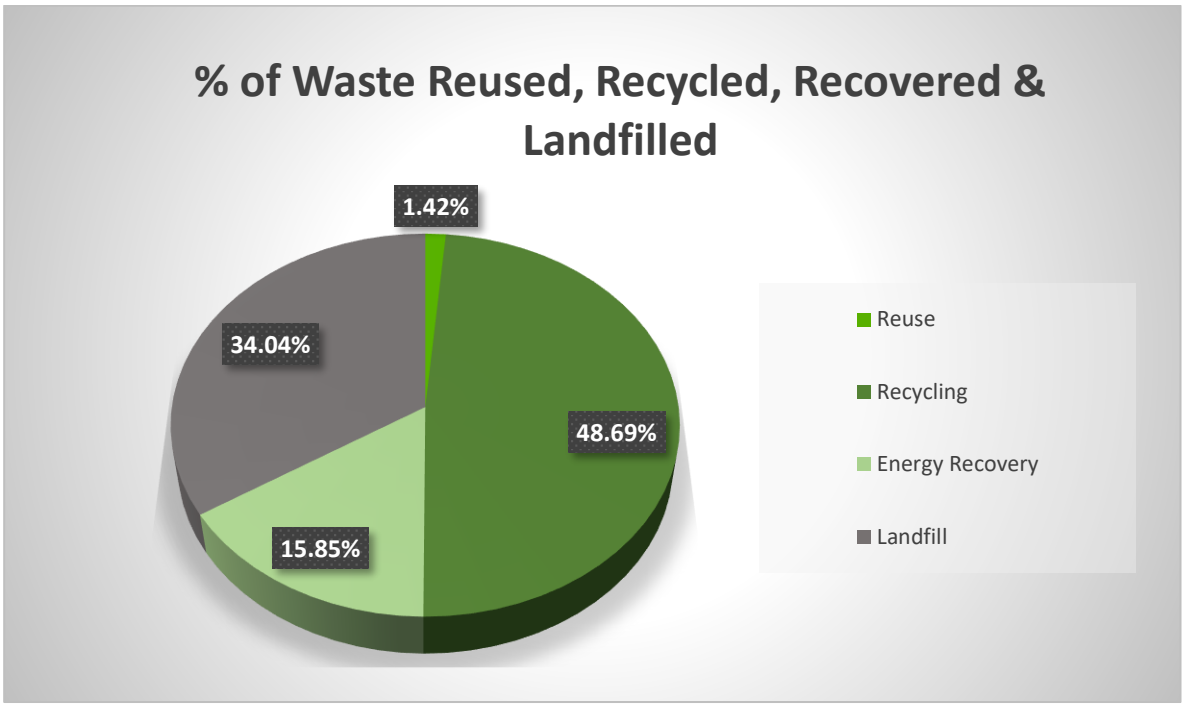


Fig 10: Percentage of Waste Reused, Recycled, Recovered and Landfilled



Objective T5: Travel and Transport

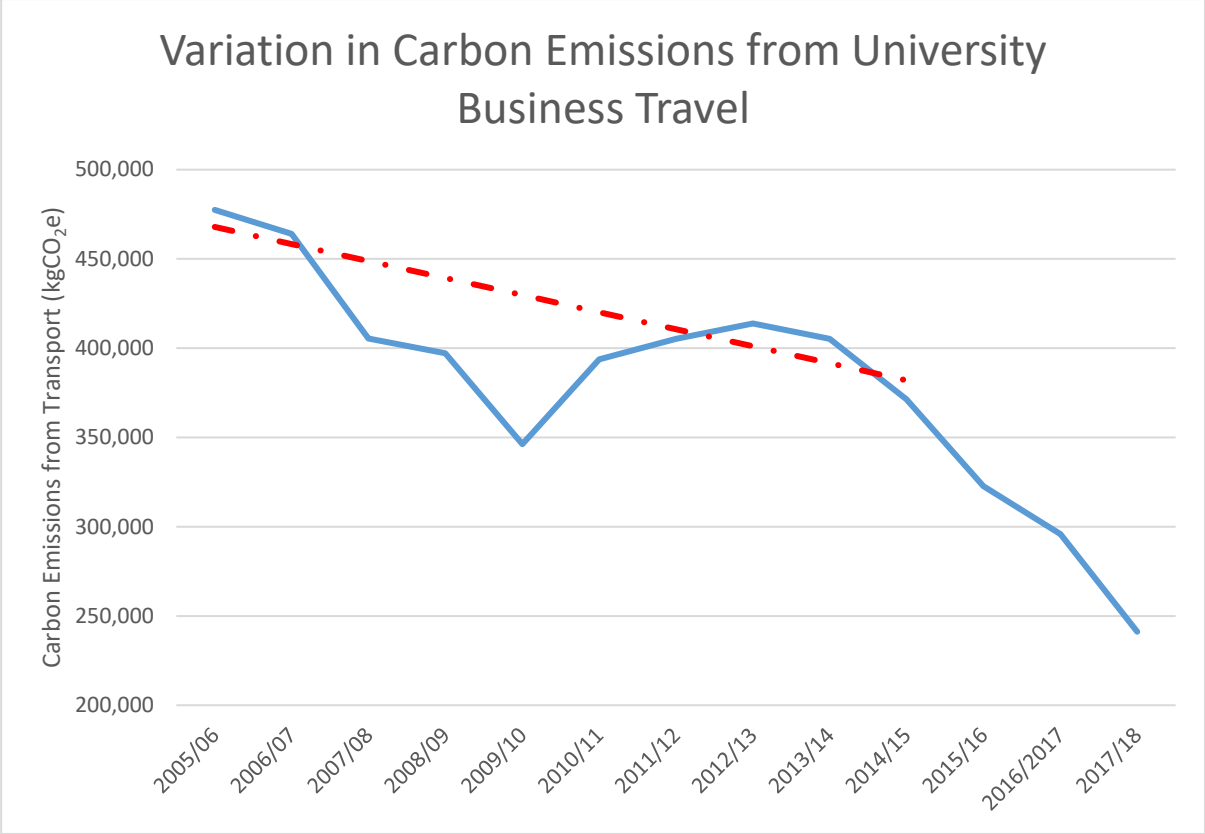
Target T5 A) **Achieve an annual reduction in vehicular business travel CO_2 emissions**

The previous target to reduce our vehicular business travel emissions by 20% of the 2005/06 base year by the end of the 2015/16 academic year was achieved and a new target to continue with annual reductions was set at the last Annual Review Meeting in 2017. The new target was met for the 2017/18 academic year, with total emissions arising from business travel were **18.5% lower** than in the previous year (16/17) and **49.5% lower** than the baseline (Fig 11).

These figures take into account purchases of Petrol and Diesel as well as vehicle hire and mileage claims for business travel by car.

There is some concern that, while we have made significant reductions without much intervention, the recent financial situation of the University may have some bearing on expenses such as transport and that this trend could be reversed once the financial situation stabilises.

Fig 11. Carbon emissions arising from business travel



The Campus Travel Plan 2015 – 2020, whilst still in-date, is in need of revisiting to assess which initiatives have been successfully implemented, which haven't and why, and how appropriate the Plan remains to the new University structure.

The Cycle to Work Scheme, initially launched during 2012, continues to be made available to staff. To date, 317 staff members have purchased a bike through the scheme; this equates to £226,928 worth of bikes and cycling equipment being purchased since its launch.

We have also 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.

The Property and Campus Services department continues to make use of its fleet of four electric vehicles, three of which are utilised by the Maintenance Department, and one by the Post Team. The performance of these vehicles including cost of operation, carbon emissions and user satisfaction needs to be assessed – recommendations on expanding the fleet may be made based on the outcome of such as assessment.

Objective T6: Sustainable Procurement

Target T6 A)	**Reduce procurement related GHG emissions (excluding construction related emissions) annually**
Target T6 B)	**Undertake annual Procurement Fitness Checks. Achieve Level 2 of the Welsh Procurement Maturity Model by 2020**
Target T6 C)	**Monitor progress against sustainability performance indicators and targets set within the Procurement Strategy**

Sustainability is a key strategic objective of the University with the aim of embedding sustainability across all functions. For that reason, the University no longer produces 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[3], 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 3 below, 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 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.

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

Table 3: 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%

2016/17	
Expenditure (£million)	CO2e (tonnes)
£43.4	21,928
	-0.8%

T6 B Undertake annual Procurement Fitness Checks. Achieve Level 2 of the Welsh Procurement Maturity Model by 2020

Following the Welsh Government's Fitness Check assessment in 2014/15, the University developed an action plan to ensure that the University could achieve Level 2 on the Procurement Maturity Model in any subsequent follow-up assessment. (The original score achieved was 1.4.) Almost all of the actions identified on Bangor University's Action Plan have now been implemented. The outstanding actions relate to undertaking a procurement training needs analysis for Corporate Procurement Staff and the continuing roll-out of electronic procurement.

It is considered that reassessment would now place the University as operating at Level 2 of the Procurement Maturity Model as a minimum, and moving towards Level 3.

T6 C Monitor progress against sustainability performance indicators and targets set within the Procurement Strategy

Sustainability risk assessments were completed for 10 tender exercises this year. This assessment is intended to ensure that environmental, social and economic issues are assessed, understood and managed in all key procurement decisions that relate to the procurement of goods and services. The aim is to apply the tool to the procurement process to reduce adverse impacts / improve sustainability, which ultimately contributes to the sustainability objectives of the University.

The University to reports on the community benefits delivered from its contracts on an annual basis. Community benefits are contractual clauses that cover topics such as workforce, supply chain, community, educational and environmental initiatives, along with equality and diversity.

In this financial year, community benefits were delivered on three contracts. Firstly, a number of social value projects were undertaken as part of the Msparc building project, which is being constructed by Willmott Dixon. The list below provides a sample of the projects undertaken this year:

- Community bulb planting day in Gaerwen.
- Three apprenticeships from the Princes Trust for an initial 6 weeks. Two of them have now had full time posts on the Msparc project.
- Seven internships provided.
- Donation of changing rooms (old site cabins) to Gaerwen Football Club.
- Workshops and training events for BU Property Staff in Building Information Modelling (BIM).
- Tanio Arts Project – aimed to develop community links and to develop the STEAM agenda.
- Troi Project – 12 students undertook a 2 day crash course on site with professionals working on the Msparc Project.

The Msparc Team continue to work closely with Willmott Dixon to deliver further benefits.

Secondly, as part of a contract to demolish the W Charles Evans & Memorial buildings, the appointed contractor, Kier, arranged to paint a scout hut in Caernarfon. The project was co-ordinated by Kier, with materials being donated by Johnstones Paint, Travis Perkins and GTB Demolition.

Thirdly, the University's appointed Measured Term Contractor for Electrical and Mechanical Services, Owen & Palmer, have provided the following:

- Installation of the Christmas Lighting at Llanfairfechan (free of charge).
- employed 2 apprentices who are attending an electrical course at Coleg Menai;
- work experience for 4 electricians who are also attending Coleg Menai on a 2 day release rota.

Objective T7: Training, Awareness and Communication

Target T7 A)	**Implement programmes and schemes to raise awareness of Environmental Sustainability amongst staff, students, visitors and contractors**

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

- Sustainability Lab staff were present at Serendipity during Welcome Week to talk to students about sustainability at the University
- 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
- Contribution to teaching – e.g.
    - Providing data and guidance to inform student assignments and research projects
    - Guest lectures for the MSc Strategic Environmental Management module
- Ongoing training of Domestics in Environmental Awareness, Environmental Incident Reporting and Waste Management.
- Continuation of a programme of monthly Sustainability "Think Tank" sessions for staff and students. Topics have included:
    - Waste & Recycling at Bangor
    - Energy at Bangor
    - Plastic Free Bangor
    - Sustainable Travel Planning
- Carnifal Cynaliadwyedd/Sustainability Carnival for the whole month of February, showcasing the vast and diverse array of sustainability events that occur in Bangor
- 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:
- Continuation of the 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. In June, one day 'Donation Station' events were held on both Ffriddoedd and St Mary's Halls sites to encourage students to donate unwanted items in June and additional BHF donation bins were located around the Halls campuses accommodate an increase in the level of donations.

  Continual communication and awareness raising of sustainability and EMS through the Environmental Management website pages[4] and the Sustainability Lab website[5]

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

[5] planet.cymru/en

Objective T8: Biodiversity

Target T8 A) Ensure that biodiversity considerations are wherever practicable, incorporated in University activities

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 Treborth Botanic Garden and Henfaes University Farm, both of which are havens for biodiversity and where proactive steps are taken to protect native flora and fauna, and to control invasive species.

The Careers and Employability department has provided a Bangor Employability Award (BEA) funded student internship for a Biodiversity Action Plan Officer each year, managed by the CEPT Biodiversity Coordinator. This is a strategic position and the student will work with CEPT to promote biodiversity within the student community, mobilise volunteering projects, student dissertations and student societies, helping to create a calendar of biodiversity events and workshops throughout the year.

The CEPT Biodiversity Co-ordinator has formed a 'Biodiversity Team' in collaboration with PaCS' Grounds and Gardens team, whose expertise, knowledge and corporate memory of the Estate is invaluable for our biodiversity targets. Central funding through the Sustainability Lab budget will be required to resource the activities and to allow the Grounds and Gardens' team to employ sub-contractors for work outside the Grounds and Garden team's expertise.

The Biodiversity Action Plan for 2018/19 focusses on increasing unimproved grassland/wildflower meadow areas across the university estate. Meadows such as the areas managed at Treborth Botanic Garden (perennial meadows) and Environment Centre Wales (annual meadow) have unparalleled plant diversity, providing the life support for a huge range of wildlife including fungi, bees, flies, beetles, spiders, moths, butterflies, reptiles, amphibians, small mammals, bats and birds. They are also an intrinsic part of our cultural heritage - rich in landscape character, farming, folklore and history. Managing some of our lawned spaces as meadows will reduce the reliance on regular mowing from March – September for the Grounds team. Local provenance green hay from Treborth (FOC) can be laid onto prepared ground late summer, containing over 150 native wildflower species.

The Biodiversity team is also working with Pontio Arts and Innovation on greening the building, inside and out. Pontio have funded potted plants in the main foyer and Gorad restaurant, and Undeb would like to work with students and the Grounds team to increase trees and shrub cover on the terraced lawns to the right of the building. The team are also discussing the possibility of green walls and roofs, and organising an industry expert to speak to PaCS about the benefits of greening your buildings.

The University continues to be committed to the conservation of red squirrels and to the management of invasive grey squirrel populations across the Estate. The Friends of Treborth Botanic Garden provide funding for grey squirrel control through the Red Squirrel Trust Wales.

Table 4: Summary of Performance against 2016/2017 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 (*)**	
			Emissions/m^2 of operational floor area **fell by 16.6%**
			Emissions/staff and student FTE **fell by 16.0%**
		T1 B) Achieve a 40% reduction in energy associated greenhouse gas emissions (CO_2e) by 2020, (based on 2005/06 base year) (*)	Total energy use is now **25.9%** lower than during the base year; associated carbon emissions have **fallen by 39.2%.**
			Emissions/m^2 of operational floor are now **50.6% lower** than in the base year
			Emissions/staff and student FTE are now **49.8% lower** than in the base year
		T1 C) Reduce overall Scope 1,2 and 3 greenhouse gas emissions (CO_2e), by 3% each year (*)	Total Scope 1, 2 & 3 Emissions per m^2 of operational floor area **fell by 16.7%** from the previous year
			Total Scope 1, 2 & 3 Emissions per staff and student FTE **fell by 16.18%** from the previous year
T2	Maximise efficient use of water	**T2 A) Reduce total annual water use by 2% per year (*)**	Total water consumption was **9.9% lower** than in the previous year and **13.0**% lower than the baseline
			Consumption per m^2 of operational floor area **fell by 9.9%** from the previous year and **29.2%** from the baseline
			Consumption per staff and student FTE **fell by 9.4%** from the previous year and **28.1%** from the baseline
T3	Prevent pollution from University activities	**T3 A) Zero pollution incidents recorded**	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 less than 20% of that purchased in the 2005/06 base year.

				There were no pollution incidents at the University during the 2016/17 academic 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 was 65.95% compared with 43.43% the previous year
T5	**Reduce business mileage**	**T5 A) Achieve an annual reduction in vehicular business travel CO2 emissions**		Emissions were **49.5% lower** than base year and 18.5% lower than the previous 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**		Data is not currently available to report on this target
		T6 B) Undertake annual Procurement Fitness Checks. Achieve Level 2 of the Welsh Procurement Maturity Model by 2020.		Data is not currently available to report on this target
		T6 C) – Monitor progress against sustainability performance indicators and targets set within the Procurement Strategy.		Data is not currently available to report on this target
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 in the report
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.

(*) 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

Key to Table 2

	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

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 5.

Table 5 : Greenhouse Gas Emissions associated with Bangor University Activities 2015/2016

Source	Quantity	Units	Conversion(*)	Emissions	
SCOPE 1 - DIRECT EMISSIONS					
Natural Gas consumption	**19,495,827**	kWh	**0.18396**	**3,586,452.33**	$kgCO_2e$
Heating Oil purchased	**80,867.00**	litres	**2.62694 & 2.97049**	**213,410.00**	$kgCO_2e$
Diesel Fuel purchased	**29,208.22**	litres	**2.62694**	**76,728.23**	$kgCO_2e$
Petrol purchased	**28,229.96**	litres	**2.20307**	**62,192.58**	$kgCO_2e$
LPG	**149,192.00**	kWh	**1.51906 & 0.94857**	**29,618.00**	$kgCO_2e$
IMPORTED POWER :Scope 2&3					
Electricity consumption	**14,931,524.78**	kWh	**0.30720**	**4,586,964.41**	$kgCO_2e$
SCOPE 3 INDIRECT EMISSIONS					
Municipal Wastes	**141.33**	tonnes	**586.5313**	**82,894.47**	$kgCO_2e$
Commercial Wastes	**141.33**	tonnes	**99.7729**	**14,100.90**	$kgCO_2e$
Recycled Wastes (inc EfW)	**547.58**	tonnes	**21.3842**	**10,055.10**	$kgCO_2e$
Mains Water consumed	**141,203.00**	m^3	**0.34400**	**48,573.83**	$kgCO_2e$
Wastewater generated	**129,531.40**	m^3	**0.70800**	**91,708.23**	$kgCO_2e$
Indirect Transport (Grey Fleet)				**112,889.40**	$kgCO_2e$
Other					
Agricultural (est.)				**695,650**	$kgCO_2e$
Sequestration (Henfaes est.)				**-800,000**	$kgCO_2e$
Total Greenhouse Gas Emissions:				**8,811,237.8**	**$kgCO_2e$**
	Variance on Previous Year			**-16.72%**	

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

10. Future Plans

Sustainability is a prominent enabler in Bangor University's Strategic Plan 2015-2020:

"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."

The University is building upon the commitments made during 2016/17:

- The Campus Environmental Performance Team is now established and working closely with Property and Campus Services. The relationship will be formalised further in 2018/19
- The Sustainability Lab started the process of transitioning into the Planning and Governance Team reporting directly through the Director of Planning and Governance (who is also the University Secretary) to the VC and the Executive.
- The team continued to refer to the Well-being of Future Generations (Wales) 2015 Act as a framework for sustainability and guiding principles.

We are committed to 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 (as reflected in our People and Planet University League and UI Green Metric positions).

The Property and Campus Services department is currently being reviewed, and will incorporate sustainability as an integral consideration in the future development of the University. All of our new buildings, such as the Science Quarter (development on hold), will be designed to achieve the BREEAM "Excellent" rating as a minimum.

The introduction of the new ISO 14001:2015 Environmental Standard has had implications for our Environmental Management System and during the second half of 2017/18 intensive work was conducted by CEPT to review the documentation.

The Sustainability Lab and CEPT are involved in the ambitious 'Re-fit' invest to save energy efficiency programme ensuring that the successes of meeting objectives and targets are fully captured and communicated.

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 to all of our work as follows:

There is ONE Principle

We must act in a manner which seeks to ensure that the needs of our students are met without compromising the ability of students in the future to meet their own needs.

When making decisions we as individuals (whatever our position) and a University need to make sure that we take account of the impact we could have on current and future Bangor students and staff (and the people living their lives in Wales … the world)

There are FOUR Pillars

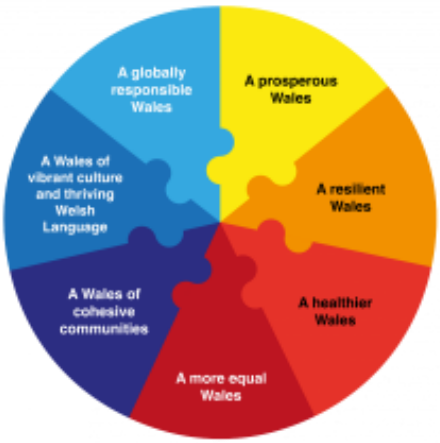
We need to consider improving the **financial, social, environmental and cultural well-being** of the university.

There are **FIVE principles in decision making:**

- Balancing short-term v **long term**,
- Will the decision **prevent** problems from occurring or getting worse,
- What impact will a decision have on people and the ability to deliver on BU aspirations
- **Integration** not fragmentation
- **Collaboration** to meet well-being objectives, and
- **Involving** all individuals to reflect the diversity within the organisation

These will help us work towards the **SEVEN goals (figure 10)**

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



The University is also recognises the United Nations Sustainable Development goals (Fig 11) and is working to contribute to these goals, which map on to the WFG goals.

Figure 11: The United Nations Sustainable Development Goals

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.

PRIFYSGOL
BANGOR
UNIVERSITY

Contact Details:

Campus Environmental Performance Team
E-mail: environment@bangor.ac.uk
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Appendix 1

PRIFYSGOL BANGOR UNIVERSITY

Environmental Policy

Bangor University has around 10,000 students and 2,000 members of staff located within an estate of some 100 buildings across 300+ hectares. Our core business is to provide high quality teaching and research whilst taking good care of our staff, students, community and environment.

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 ISO 14001:2015 environmental standard. We will not only seek to protect our natural environment, but also actively pursue opportunities to enhance it, promote a culture of environmental stewardship amongst our staff and students and work towards the goals of sustainable development.

Bangor University will minimise our adverse environmental impacts by:

i. ensuring compliance with all relevant legislation and obligations associated with our activities
ii. managing waste through reduction, re-use, and the promotion of recycling
iii. minimising energy and water consumption
iv. promoting sustainable transport initiatives
v. reducing our contribution to global climate change by making year on year reductions in our greenhouse gas emissions
vi. promoting and increasing biodiversity conservation and improvement across the University estate
vii. embedding sustainability within the procurement procedures
viii. undertaking to prevent the pollution of the natural environment
ix. raising environmental awareness and awareness of the UN Sustainable Development Goals amongst staff and students through improved communication and involvement
x. embedding sustainable development and awareness of environmental issues in our curricula across the University
xi. establishing environmental objectives and targets and report progress on an annual basis

This Environmental Policy will be reviewed annually by the Campus Environmental Performance Team, 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.

Signed by:

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