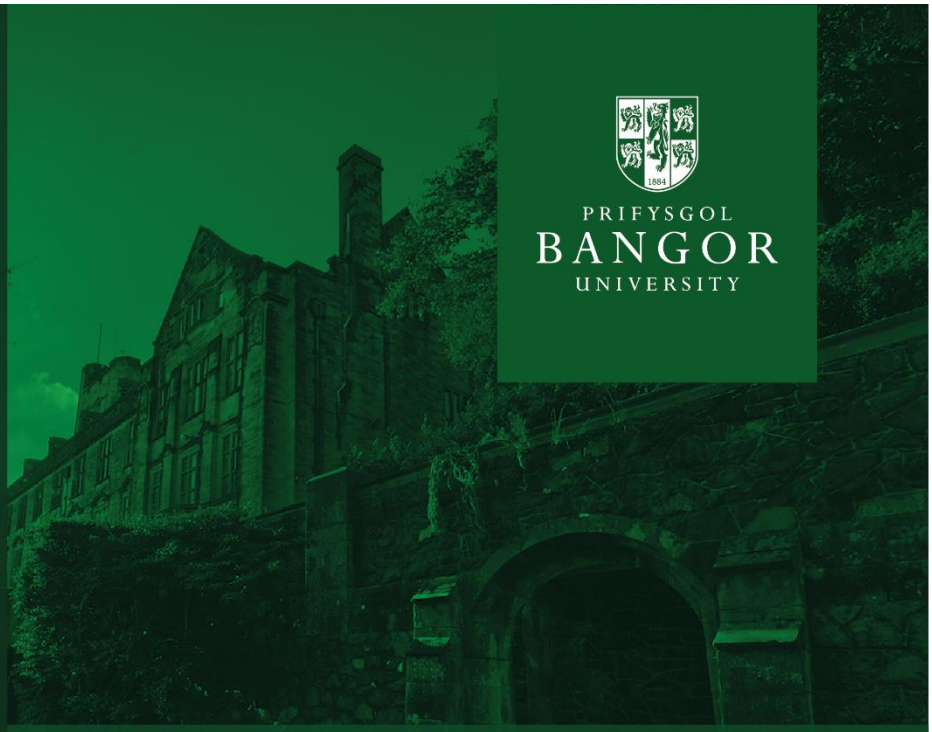

PRIFYSGOL
BANGOR
UNIVERSITY

Environmental Management System Annual Report

October 2020
(for the Academic Year 2019/20)

Bangor University's Campus
Environmental Performance Team

bangor.ac.uk/sustainability

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1. Introduction

Welcome to Bangor University's 2020 Annual Environment Report.

The University produces an Environmental Report every year as a part of its Environmental Management System procedures and to help demonstrate compliance with the ISO14001:2015 standard.

This report presents a review of the University's environmental performance over the course of the 2019/20 academic year ("the reporting period").

Bangor University is committed to being *the* Sustainable University and integrating all aspects of sustainability into daily operations – as detailed in the 2015-2020 Strategic Plan.

The 2019/20 academic year has been an unusual one in all respects, as a result of the global Covid-19 pandemic which led to significant changes in daily life and the operations of the University. This has obviously had implications for our environmental performance and the contents of this report. Following the recommendation of the UK Government on March 16th, Bangor University advised on March 17th that all staff who were able to work from home to do so. From 5pm on Friday 20th March, most non-residential University buildings had restricted or no access including all sports facilities most catering outlets. Teaching moved to online only delivery from Monday 23rd March, with students being permitted to leave Bangor and return home if they wished.

As such, the University was in a state of significantly reduced activity and operation from the end of March 2020. In terms of this report, it is considered that one third of the academic year was significantly impacted by measures put in place to manage and reduce the impact of Covid-19. This should be kept in mind at all times whilst considering the contents of this report as it has implications across the range of areas covered.

1.1 Acronyms and Abbreviations

CEPT – Campus Environmental Performance Team

DECs – Display Energy Certificates

EAUC – Environmental Association of Universities and Colleges

EMS – Environmental Management System

FTE – Full-time Equivalent

GHGs – Greenhouse Gases

HESA – Higher Education Statistics Agency

CO_2e –Carbon Dioxide equivalent (a standard measure of greenhouse gas emissions)

PaCS – Property and Campus Services

SSG – Sustainability Strategy Group

UNSDGs – United Nations Sustainable Development Goals

1.2 The Management Review

The compilation of this report, and its presentation to the Sustainability Strategy Group (SSG) as part of the Management Review Meeting, are undertaken as requirements of the ISO14011:2015 standard for Environmental Management Systems.

The purpose of the Management Review is to review the Environmental Management System (EMS) to ensure it remains suitable, adequate and effective, and to evaluate the University's environmental performance.

Bangor University has determined that a Management Review Meeting will be held annually in October, to review the University's environmental performance over the previous academic year.

During the Annual Management Review Meeting, the Campus Environmental Performance Team (CEPT) will present information relevant to the University's overall environmental performance, the functioning of the EMS and recommendations for any changes required to ensure continual improvement. The role of the Sustainability Strategy Group is to;

- consider the recommendations of CEPT
- provide their approval for the report
- ensure the Annual Report and outcomes of the Management Review meeting are communicated to the University Executive
- ensure feedback from the University Executive is communicated back to SSG and CEPT

The meeting will be conducted in accordance with the following format:

- Status of Actions from previous Management Review
- Environmental Policy
- Compliance
    - ISO14001:2015 Certification Status
    - Legal Compliance Status
    - Environmental Incidents
    - Internal Audits
- Changes in circumstances relating to the EMS
    - Environmental Aspects & Impacts
    - Risks & Opportunities
    - Needs & Expectations of interested parties
    - Documentation changes
- Environmental Performance
    - Awards & League rankings
    - Performance against Objectives & Targets
    - Review of Objectives & Targets
- Communications, including complaints, from interested parties
- Adequacy of resources
- Opportunities for Continual Improvement

2. Environmental Policy

The University's Environmental Policy was previously reviewed annually by CEPT as part of their schedule of EMS documentation audits, this has been changed to once every three years due based on an assessment of risk.

The Policy has also been updated to reflect the change from Sustainability Task Group to Sustainability Strategy Group. The revised Policy is presented to the Sustainability Strategy Group for approval.

3. Compliance

3.1 ISO14001:2015 Accreditation

In order to gain and retain ISO14001:2015 certified status, the University's EMS is subject to external audits by a UKAS accredited external auditing body.

The University's EMS was externally audited against the ISO14001:2015 standard in a three-day recertification audit in December 2019 and was successfully recertified. No non-conformities were raised by the auditor. A copy of the auditor's report is available upon request.

Whilst certification is valid for 3 years, the EMS is subject to annual "surveillance audits". The next two-day surveillance audit is due to be completed before the end of 2020.

3.2 Compliance Status

Ensuring understanding of and compliance with legal and other relevant obligations is one of the central principles of an Environmental Management System.

In order to manage its environmental obligations, the University has developed and maintains a "Register of Legal Requirements and Other Compliance Obligations" as part of its EMS documentation. The up-keep of this document and oversight of compliance with legal and other relevant obligations is the responsibility of CEPT, led by the CEPT Compliance Coordinators, who sit within the University's Health & Safety team. This includes ensuring the relevant environmental permits, licences, registrations and authorisations are in place, up-to-date and accurate.

3.3 Environmental Incidents

An environmental incident is an event that causes, or has the potential to cause harm to any aspect of the environment (air, water, land, wildlife). This can include, but is not limited to; fly-tipping, oil or chemical spill, escape of waste, sewage leak, air pollution.

The University has an official procedure, and associated report form, for the reporting of Environmental Incidents – available online to all staff and students via the University website.

During the 2019/20 academic year two environmental incidents were recorded.

One case of fly-tipping of domestic waste in the Dean Street car park, all waste was properly disposed of by PaCS staff and the matter investigated by Security staff. The other incident was waste dumped in an internal compound by our own staff. An investigation by PaCS ensued as to who had access to the compound, and staff were informed as to the correct skips to be used for each type of

waste in the future. The PaCS facilities team ensured the waste was correctly categorised into the relevant skips for disposal off site.

3.4 Internal audits

The new system for electronic auditing has worked well during the year and a wider range of internal auditors have been utilised too.

Due to all non-essential staff being required to work from home, not all the internal audits were completed during the 2019/20 academic year. The audits not completed represented themed audits and it was felt the majority represented areas where reduced activity and reduced staff and students on site rendered the audit non-essential. Where essential services and activities remained, for instance from oil storage and delivery, PaCS maintained their regular schedule of inspections throughout the lockdown period and no issues were identified. Any uncompleted audits will be rescheduled to the next academic year if Covid-19 restrictions and internal procedures allow.

4. Changes relating to the EMS

4.1 Aspects & Impacts

Environmental aspects are ways in which the operations of an organisation interact with and impact upon the environment. The identification and evaluation of all the University's environmental aspects is a key undertaking of the Environmental Management System.
The University maintains a "Register of Environmental Aspects" detailing all identified aspects, their potential impacts, control measures and associated risks and opportunities.

The ISO14001:2015 standard requires organisations to take actions to address their most significant environmental aspects. As such, all identified environmental aspects are evaluated to determine their overall significance; the most significant aspects are those which pose the greatest environmental risk. Significance is determined by a combination of the severity of the consequences brought about by the aspect (on a 12-point scale) combined with the likelihood of the consequences occurring (on a 9-point scale). The most significant aspects were determined to be those receiving more than 50 points in the evaluation of consequence and likelihood (out of a possible total of 108). The EMS document "Evaluation of Environmental Aspects" includes details of this assessment and of those aspects deemed to be most significant. For further details of the assessment please refer to the "Evaluation of Environmental Aspects" document.

Both the Register and Evaluation of environmental aspects were reviewed by CEPT in 2018.
In total, 42 environmental aspects were identified and evaluated as part of this review. Of these, 13 were identified as being significant (further details in Appendix 2);

- Use of air-conditioning
- Use of chemical materials
- Use of biological materials
- Use of refrigerators, freezers and cold stores
- Storage of chemicals and disposal of chemical waste
- Storage of biological materials and disposal of biological waste
- Fuel oil
- Procurement of construction works and materials

- Procurement of goods
- Business travel by bike, car, minibus or van
- Business travel by airplane
- Commuter travel by staff and students
- Student travel to and from the University from their original home address

In order to ensure the University is taking action to address these significant, objectives and targets have been set in relation to energy use, waste, procurement, construction, travel.

Procedures are in place for ensuring the proper management of chemical and biological materials and for preventing pollution. These are monitored and managed through the internal auditing process.

The Register is due for review before the end of the 2020/21 academic year.

4.2 Risks & Opportunities

The Risks and Opportunities associated with the EMS are detailed within the "Register of Environmental Aspects" document. As already stated, the document is due to be reviewed before the end of the 2020/21 academic year.

4.3 Needs & Expectations of interested parties

Information pertaining to the needs and expectations of interested parties can be found in EMS Document "Context of the Organisation", last updated in March 2019. Currently the document is not scheduled for review until 2022.

4.4 Documentation changes

As stated above, the Environment Policy has been updated in line with the change from the Sustainability Task Group to the Sustainability Strategy Group.

5. Sustainability & Environment Leagues

5.1 People & Planet University League

In 2019, Bangor University was ranked 20th of the 154 UK institutions assessed. This was an improvement on the previous assessment published in 2017, when Bangor placed 29th.
Due to Covid-19 the 2020 assessment by People & Planet has been postponed to 2021.

During the last Annual Management Review meeting, there was significant discussion about how People & Planet assessed and awarded marks for not having investments in fossil fuels. Although Bangor University has not had investments in fossil fuels since 2016, the Ethical Investment Policy did not explicitly state that the University would never invest in fossil fuels, as required by People & Planet.
During the 2019/20 academic year the Executive & the Vice-Chancellor agreed to sign the People & Planet Fossil Fuel Divestment Pledge, including the commitment to never invest in fossil fuels. At the time of writing, the People & Planet website has not been fully updated to reflect this – the issue has been raised with People & Planet.

5.2 UI Green Metric

The 2019 UI Green Metric assessed the environmental and sustainability performance of 780 Universities and Colleges from all over the world (the ranking includes institutions from every continent with the exception of Antarctica).

Bangor University was ranked as 10th in the world and 4th in the UK.

Despite receiving a slightly higher score than in 2018, Bangor dropped 2 places in the global rankings. This seems to be due to the fact that other institutions are improving at a faster rate. Of the nine institutions ranked above Bangor in 2019, the average increase in score compared to 2018 was 272 points, whereas Bangor's score only increased by 25 points.

As can be seen in the table below, the scoring from UI Green Metric shows quite a lot of variability. Unfortunately, UI Green Metric do not provide detailed feedback on submissions, only scores by section, so it is difficult to provide a lot of insight into the cause of some of the variation.

The Director of Sustainability and the Energy co-ordinator participate in the UK UI Green Metric Group, which meets several times a year to discuss the challenges associated with the lack of clarity on reporting and to share best practice between ourselves.
Full details of the 2019 Rankings, and results from previous years, can be found on the UI Green Metric webpage.

Year	Global Rank	UK Rank	Total Score	Setting & Infrastructure	Energy & Climate Change	Waste	Water	Transport	Education & Research
2019	10th ↓	4th =	83.5% ↑	68.3% ↓	79.8% ↑	95.8% ↑	42.5% =	94.4% =	100% =
2018	8th =	4th ↑	83.3% ↑	83.3% ↑	71.4% ↑	91.7% ↓	42.5% ↓	94.4% ↑	100% ↑
2017	8th ↑	5th ↑	68.8% ↓	69.6%↓	68.4% ↓	100% ↑	65% ↑	59% ↑	49.3% ↓
2016	16th	6th	69.3%	78.3%	69.6%	94.5%	60%	37.5%	73%

***Table 1**. Bangor University performance in the UI Green Metric*

6. Objectives & Targets 2019/20

Objective	Target	Status
Remain compliant with relevant legislation and other obligations	T1. Ensure compliance with all relevant legislation and obligations associated with our activities and prevent the pollution of the natural environment and demonstrate compliance	**Achieved**
Manage waste through reduction, re-use, energy recovery and the promotion of recycling	T2. Achieve 60% reuse and recycling by July 2020	**Achieved**
Minimise resource consumption	T3 a) Reduce energy use by 3% compared to the previous year, as a function of i) m^2 useful floor area and ii) FTE students & staff	**Achieved**
	T3 b) Reduce water consumption by 2% compared to the previous year, as a function of i) m^2 useful floor area and ii) FTE students & staff	**Achieved**
Reduce the contribution of University business travel on the environment	T4 a) Update the Sustainable Travel & Transport Plan	**Not Achieved**
	T4 b) Achieve and annual reduction in vehicular business travel CO_2 emissions	**Achieved**
Reduce the University's contribution to global climate change	T5. Achieve year-on-year reductions in greenhouse gas emissions (Scope 1, 2 & 3) associated with University operations as a function of i) m^2 useful floor area and ii) FTE students & staff	**Achieved**
Enhance biodiversity of the University estate	T6 a) Promote biodiversity conservation & improvement across the University estate	**Partially Achieved**
	T6 b) Increase unimproved grassland/wildflower meadow area across the University estate	**Partially Achieved**
	T6. c) Create a University Biodiversity Action Plan	**Partially Achieved**
Embed sustainability within the procurement process	T7 a) Conduct Sustainability Risk Assessments for all contracts over the value of £25,000 and use Community Benefit Measurement Tool data for all contracts over the value of £1 million	**Partially Achieved**
	T7. b) Where appropriate, ensure contracted suppliers have their own EMS	**Partially Achieved**
Raise environmental awareness and awareness of the UN Sustainable Development Goals amongst students and staff through improved communication and involvement	T8. a) Increase level of digital engagement	**Achieved**
	T8. b) Establish a baseline for non-digital/face-to-face engagement	**Achieved**
	T8. c) Increase student awareness of the Sustainability Lab and environmental/sustainability related events & opportunities from surveys	**Not Achieved**
	T8. d) Increase number of departmental/school/service webpages that refer to sustainability and link to the Sustainability Lab and/or CEPT & EMS webpages	**Not possible to report**
Embed the environment and sustainability in the curriculum across the University	T9. Establish the number of courses and modules validated which refer to the environment to obtain a baseline	**Partially Achieved**
Minimise the impact of the University estate, and any development activities, on the environment	T10. Set environmental objectives for all major construction projects (those over the value of £100,000) and evaluate the effectiveness of these following completion	**Partially Achieved**

***Table 2**. Summary of performance against Targets for 2019/20*

7. Performance against Targets (2019/20)

7.1 Compliance

Objective: Remain compliant with relevant legislation and other obligations

Target 1. Ensure compliance with all relevant legislation and obligations associated with our activities and prevent the pollution of the natural environment and demonstrate compliance

Compliance Headlines 2019/20

- ISO14001:2015 recertified for 3 years in 2019
- The University remains compliant with relevant environmental legislation and obligations

7.1.1 Performance against Target 1

Performance against Target 1	**Achieved**

The University remains compliant with all relevant legislation and obligations. Related documents including the "Register of Legal and Other Obligations" is accurate, up-to-date and monitored regularly as part of the schedule of internal EMS documentation audits.

- Radiation audits and inspections have been undertaken with no significant adverse findings.

- EMS auditing and reviews include evaluation of flood risk, municipal and catering waste and composting, with no significant adverse findings.

- The University's radiation control measures are robust and tightly controlled and is overseen by both an external specialist and a Sub-Committee. Level of awareness amongst radiation workers is high.

- The schedule of auditing and the local controls offers reassurance that license requirements are being met and are understood.

A more robust depository for waste transfer notes for all staff involved in the process would improve reporting.

7.1.2 Continual Improvement

CEPT and the trained internal auditors will continue to work to promote continual improvement in environmental performance through the programme of scheduled audits and document reviews.

7.2 Waste

Objective: Manage waste through reduction, re-use, energy recovery and the promotion of recycling

Target 2. 60% reuse and recycling target July 2020

Waste Headlines 2019/20

- Target Achieved
- 60.81% of total waste recycled or reused
- Zero Waste to Landfill for the second year running
- New Lab Plastic Recycling implemented
- Progress made towards rolling out new semi-segregated recycling system
- Bangor University ranked 7th in the World for Responsible Consumption & Production (UN Sustainable Development Goal 12)

7.2.1 Performance against Target 2

	2019/20	2018/19	Percentage Change
Total Waste Generated	616.77 tonnes	812.61 tonnes	-24.1%
Total Reused or Recycled (weight in tonnes and percentage of total)	375.04 tonnes (60.8%)	473.48 tonnes (58.3%)	+4.4%
Total Sent to Energy Recovery during (weight in tonnes and percentage of total)	241.69 tonnes (39.2%)	339.13 tonnes (41.7%)	-6.1%
Total Sent to Landfill (weight in tonnes and percentage of total)	0.04 tonnes (0.0%)	0 tonnes (0.0%)	N/A
Progress against Target 2	**Achieved**		

Table 3. *Summary of data for Target 2*

** The baseline year for waste reporting is 2006/07 as this is the earliest date for which data is available*

As in previous reports, the data presented here does not include waste generated on the St Mary's Student Village site. In part this is due to the fact that the site is managed by a third party but is also influenced by the lack of data available for the site.

The 2019/20 data includes additional data from Wrexham that has not been available previously. Through a new waste collection arrangement, Wrexham now has dry-recycling and food-recycling services in addition to general waste.

The target of achieving 60% reuse & recycling by the end of the 2019/20 academic year was achieved. There has been significant focus on waste management and improving the rate of recycling in recent years, with increased interest from both students and staff.

In September 2019, a new waste collection service was implemented with plastic waste from laboratories being collected and taken for recycling. The scheme was very well received by students

and staff and has also generated interest from other Universities who are keen to follow in our footsteps.

Waste Awareness Week 2019, in October 2019, also saw the launch of new on-the-go recycling bins for drinks cans, as part of the "Every Can Counts" national campaign aimed at increasing aluminium recycling. The eight new bins were purchased with the assistance of funding from the "Every Can Counts" campaign and Alupro, which covered the majority of the cost.

The "Think Before You Drink" campaign, highlighted in last year's report, was a finalist at the Green Gown Awards 2019. "TBYD" is a collaborative campaign between the Sustainability Lab, Undeb and University Catering Services, promoting the use of reusable items such as cups, bottles and spoons to reduce the amount of waste the University produces through single-use disposable items. The campaign launched in April 2019 and remains an active and ongoing campaign. Although the campaign did not win, it received very favourable feedback from the judges, particularly with regard to the large impact it had within such a short time from launch.

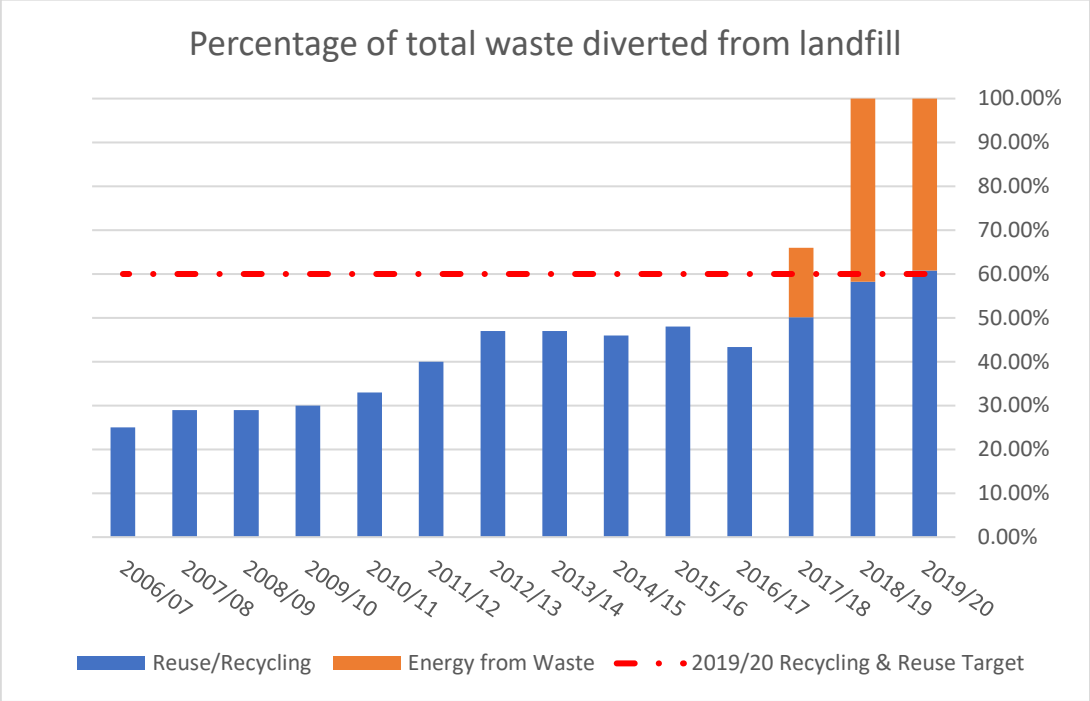

***Figure 1**. Percentage of total waste diverted from landfill*

7.2.2 Semi-segregated recycling

As was reported in the 2019 Environment Report, the University is due to be moving from its current co-mingled recycling arrangements to a semi-segregated system. The University currently collects all dry recyclable materials (other than glass) together in a single bin. A semi-segregated system will require materials to be separated at the point of disposal (paper & card; plastic, cans & tetra-pak; glass) in addition to general waste and food waste. This change in intended to improve recycling rates by decreasing the amount of contamination of recycling producing cleaner, higher-quality recycling with a greater likelihood that the recyclates will be utilised here in Wales or the UK, contributing to the circular economy.

The Waste Coordinator, CEPT and PaCS have been working closely together throughout 2019/20 to prepare for the roll-out of the new system. This included submitting an application for funding to the

Welsh Government Circular Economy Capital Fund 2019-20. The application was successfully awarded £124,599 to cover the cost of the new bins required in offices and learning spaces plus an electric vehicle to be used in the collection and transportation of waste on site. New bins for Halls of Residences are being funded by Commercial Services.

The new bins purchased were selected specifically because they were made from 100% recycled plastic. Purchasing products made from recycled materials is an essential part of the circular economy, ensuring there is a viable market for recycled materials.

In addition to the new bins, plans are being developed to make more of a feature of recycling points around the University to encourage people to dispose of their waste responsibly. Options are being developed by the Waste Coordinator, Communications and Engagement Coordinator, PaCS representatives and a designer.

Initially it had been planned to roll-out the new system in June 2020, however the restrictions in place as a result of Covid-19 have meant this has had to be delayed until 2020/21.

7.2.3 Waste Awareness Week 2019 (#WAW19)

The Waste Awareness Week campaign ran for its third consecutive year in 2019. Seventeen waste related events were held over nine days from Saturday 28th September to Sunday 6th October, including visits to 311 flats across Ffriddoedd and St Mary's sites to discuss recycling and waste with new students. Other events included visits to student properties in the wider community, two litter picks plus one beach clean visit, a waste-themed film night, a careers session for students with an interest in working in waste management and a talk at Treborth on sustainable alternatives to plastic plant pots.

In total, 865 people attended the events and 149,307 were reached through the online/social media messages. Additional details on this will be given in the section 7.9 Awareness & Communication.

7.2.4 Continual Improvement

As already reported, the new semi-segregated recycling system will be rolled-out during the 2020/21 year, as conditions allow. This will be accompanied by promotional messaging to inform students and staff about the changes and why they are being implemented.

Waste Awareness Week 2020 (#WAW20) will be held for the fourth year from 5th-9th October. The 2020 event will be different to previous years being wholly online and without the ability to conduct the usual Halls of Residence visits.

Further developments in waste management at the University will be at least partially dependent upon changes in Covid-19 restrictions and the extent of the return to on-site learning/working. The Sustainability Lab and CEPT plan to hold other events throughout the year in a format suitable to the restrictions at the time.

7.3 Energy Consumption

Objective: Minimise resource consumption

> **Target 3 a:** Minimise consumption of Energy – reduce consumption of energy by 3% compared to the previous year as a function of a) m^2 useable floor area and b) FTE students & staff

Energy Headlines 2019/20

- Targets achieved
- 100% Renewable Electricity supply from October 2019
- First year reporting location-based and market-based emissions for electricity
- Covid-19 restrictions and the move to online-teaching and working from home have had an impact on total energy consumption

In the context of this report, "Total Energy Consumption" refers to the total combined consumption of electricity, gas, heating oil and LPG, as reported below.

7.3.1 Electricity

In October 2019, the University Executive approved a proposal to switch to a guaranteed 100% renewable electricity supply. The supply is guaranteed as 100% renewable through the Renewable Energy Guarantee of Origin (REGO) Scheme, administered in the UK by the energy regulator Ofgem.

Although under our new guaranteed renewable electricity supply the carbon emissions from our electricity use are technically zero, reporting standards, and UK Government recommendations, require us to report both the emissions from our specific market arrangement (Market-based method) and using the national carbon factors based on average UK carbon intensity for grid electricity (location-based method).

As such, there are two carbon emission figures reported below and there will be two figures for our total emissions reported later in section 7.6 Emissions.

Total Electricity Consumption 2019/20	14,044,324.32 kWh
Change in total electricity consumption compared to 2017/18	-15.22%
Change in total electricity consumption compared to 2005/06	-9.09%
Total Emissions (Location-Based Method)	3,555.88 tonnes CO_2e
Total Emissions (Market-Based Method)	0 tonnes CO_2e

***Table 4**. Summary of total electricity consumption*

7.3.2 Gas

During 2019/20 it was discovered that there had been significant issues with meter readings used for billing purposes for Neuadd Garth dating back to 2017. The discovery and correction of this issue resulted in a dramatically larger bill for Neuadd Garth in October 2019 that was not reflective of actual consumption.

Given the size of the "correction" within the bills for Garth during October 2019, it was decided to adjust the data in-line with the manual readings to prevent the 2019/20 gas consumption being overstated by roughly 1,100,000kWh, or nearly 6%. The adjustment process has meant gas consumption for 2018/19 was higher than reported, as detailed in Appendix 1.

The data presented below are the adjusted figures, as per the explanation in Appendix 1. This report and future reports will use these figures as the best representation of actual gas consumption during the 2018/19 and 2019/20 years.

Total Gas Consumption 2019/20 (adjusted)	18,356,671.00 kWh
Total Gas Consumption 2018/19 (adjusted)	20,991,999.07 kWh
Change in total gas consumption compared to 2018/19	-10.5%
Change in total gas consumption compared to 2005/06	-36.45%
Total Emissions CO_2e 2019/20	3,375.24 tonnes CO_2e

***Table 5**. Summary of total gas consumption (data revised to correct billing errors for Neuadd Garth)*

7.3.3 Heating Oil & LPG

Total Heating Oil consumption 2018/19	618,858.40 kWh
Change in total Heating Oil consumption compared to 2017/18	+57.48%
Change in total Heating Oil consumption compared to 2005/06	-70.70%
Total Emissions CO_2e	158.87 tonnes CO_2e

***Table 6**. Summary of total Heating Oil consumption*

Total LPG Consumption 2018/19	24,601.72 kWh
Change in total LPG consumption compared to 2017/18	-67.84%
Change in total LPG consumption compared to 2011/12*	-72.35%
Total Emissions CO_2e	5.28 tonnes CO_2e

***Table 7**. Summary of total LPG consumption*

*The baseline year for use of LPG is set as 2011/12 as the University did not use LPG before this year

As was reported in the 2019 Annual Environment Report, there have been some issues with the recording of oil & LPG purchases/deliveries that may have decreased the accuracy of reporting on these fuels. A register of delivery notes received has been established, however the level of detail was not sufficient to inform this report. Procurement were able to supply a list of purchases of Oil and LPG from the UB4W accounting system, which was more useful but did not include dates of purchases.

As can be seen in the graphs above, the data suggest a large increase in purchases of heating oil during the 2019/20 year, and a large decrease in the purchases of LPG

The majority of the increase in purchases/use of heating oil can be attributed to Treborth Botanic Garden. Available records show that in 2018/19 the garden purchased 8,466 litres of heating oil, but in 2019/20 purchased 35,539 litres, a 320% increase. See Appendix 2 for further information.

It is possible that this variation is related to the replacement of the boiler at Treborth between September 2018 and January 2019. Whilst a temporary oil boiler was in place during the replacement, there was also need for additional heat from electric heaters – it is not known how much reliance there was on the electric heat as opposed to the temporary boiler. Energy data does seem to show an increase in electricity use at Treborth during the replacement period (within the 18/19 academic year) and a reduction in oil use.

It is recommended that oil consumption at Treborth be more carefully monitored to see if increased use continues and if further investigation is required.

7.3.4 Performance against Target 3a

	2019/20	Compared to 2018/19	Compared to 2005/06
Total Energy Consumption	33,044,455.43 kWh	-12.0%	-25.6%
a) Energy consumption **per m²**	144.2 kWh/m²	-11.9%	-44.3%
Progress against Target 3a		**Achieved**	
b) Energy consumption **per FTE**	2779.4 kWh/FTE	-13.1%	-44.4 %
Progress against Target 3a		**Achieved**	

***Table 8**. Summary of data for Target 3a*

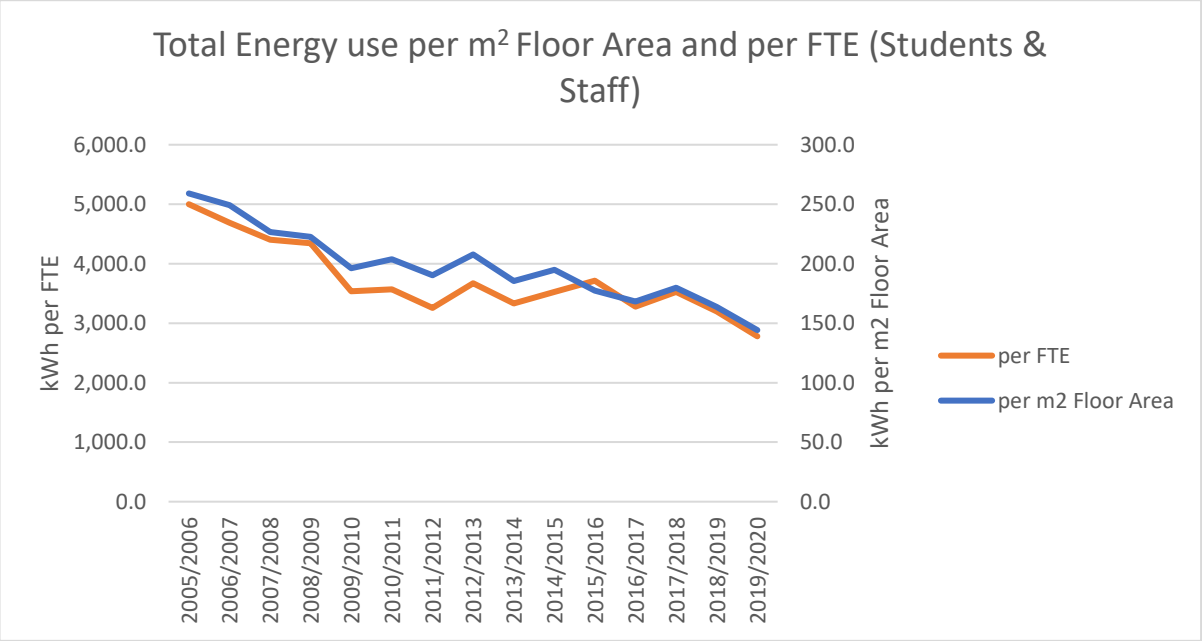

***Figure 2.** Graph of Total Energy Consumption as a function of a) m² Floor Area and b) FTEs (students & staff)*

7.3.5 Performance within the sector

The Higher Education Statistics Agency (HESA) collects data on environmental performance of Higher Education Institutions in the UK, including energy consumption. Data for the 2019/20 academic year is not yet available, but based on the 2018/19 data set, Bangor was 15th lowest user of the 159 institutions for which data was available for energy per m2 floor area and was also below the sector average. This is illustrated in the graph below.

For context, in 2017/18, Bangor was 13th lowest.

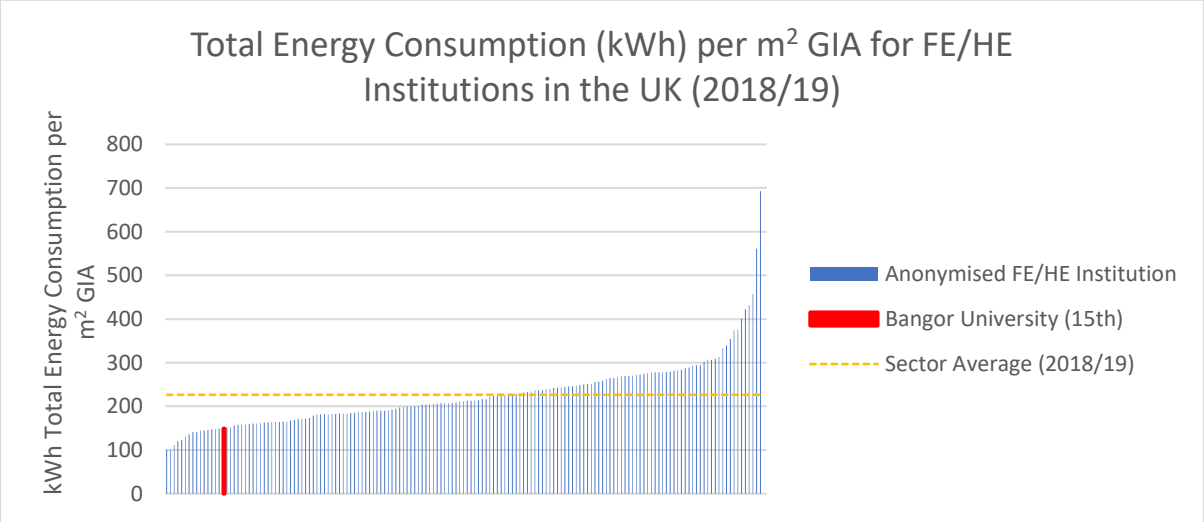

***Figure 3**. Bangor University's performance within the sector on total energy consumption (kWh) per m^2 Floor Area*

For energy consumption per FTE, Bangor University was 102nd of the 159 institutions for which data was available, and only fractionally below the sector average. This is illustrated in the graph below.

For context, in 2017/18, Bangor was 75th.

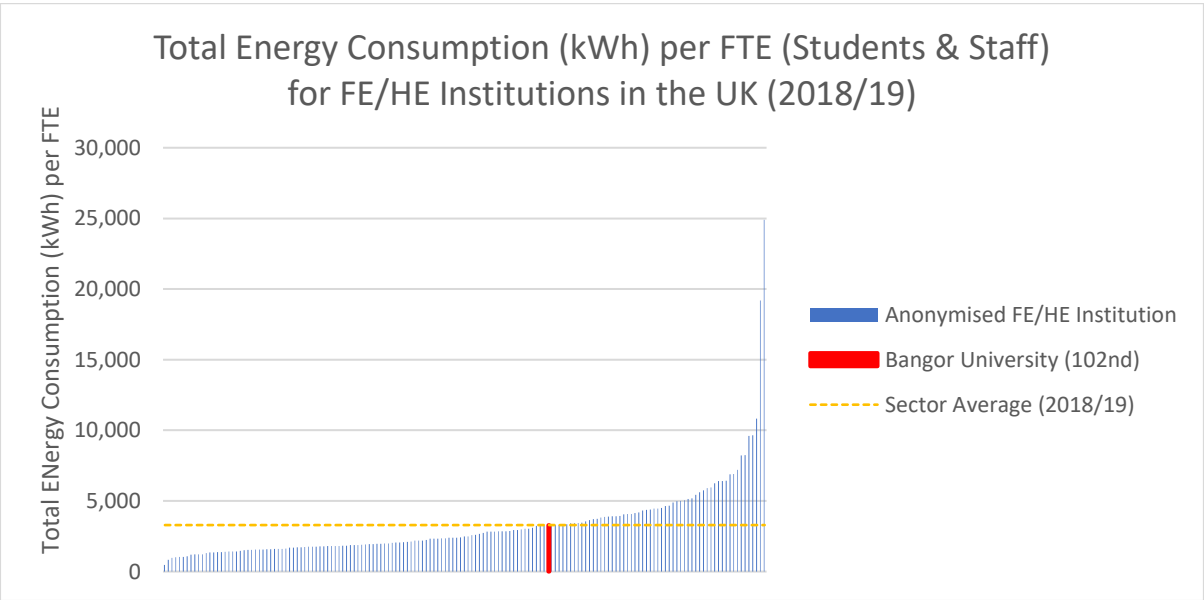

***Figure 4**. Bangor University's performance within the sector on total energy consumption (kWh) per FTE (students & staff)*

7.3.6 On-site Generation

Solar Photovoltaics

The on-site solar generation capacity of the University was significantly increased during the 2018/19 academic year with the installation of new solar arrays on four buildings as part of the ReFit energy efficiency programme. Due to delays in the process of getting planning permission, a fifth array funded through ReFit, on the roof of the New Arts Library, was only finalised during the 2019/20 academic year.

	Reported Electricity Generation
2018/19	87,221 kWh
2019/20	67,090 kWh

***Table 9**. Electricity generation by On-Site Solar Photovoltaics*

As can be seen in the table above, the reported electricity generation across the seven solar PV installations was actually lower in 2019/20 than in 2018/19, despite the addition of the New Arts Library array.

Two key factors have been identified as contributing to this decrease:

1. Issues with the reporting platforms
   Electricity generation from the five ReFit installations is monitored through an online platform called Solar Edge.
   During 2019/20, monitors on three of the five arrays stopped transmitting data (see table below). This loss of reporting was not picked up until after the Covid-19 restrictions came into effect, which caused delays in the ability of the necessary engineers to visit site and resolve the issue.
   Reporting was restored in July 2020, however any electricity generated during the period when reporting was lost does not seem to have been recovered by the monitoring system. It should be stressed that this is very much a loss of data, not a loss of generation – the panels remained functional and continued to generate and provide renewable electricity to their buildings, it is just not possible to say how much electricity was generated.
   It is recommended that more regular checks of the functionality of the monitoring system is undertaken as the electricity generation not only has implications for Display Energy Certificates, this report, HESA and environmental/sustainability leagues but is an important component of the ongoing monitoring and verification of the ReFit measures to ensure they are delivering against their promised savings.

Array	Data collection lost	Data collection restored	Total Days without data	% of year lost
Thoday	24.03.2020	24.07.2020	122	33.33%
Wheldon	06.03.2020	24.07.2020	140	38.25%
New Arts Library	07.02.2020	15.07.2020	159	79.90%*

***Table 10.** Summary of data loss from Solar PV remote monitoring*

*Percentage of year lost for New Arts Library has been calculated out of 199 days, not 366 (2020 was a leap year) as for the other two arrays, as the New Arts Library panels weren't fully commissioned until 15.01.2020

As a separate but related issue, data from the AMMT monitor for the solar array on the Marine Centre Wales shows much reduced generation compared to previous years; 4,564kWh in 2019/20 compared to 7,006kWh in 2018/19. Additionally, the daily reported generation from the AMMT system looks abnormal – highly variable and with extended periods of zero generation. This may be due to an issue with the monitor or the panels

themselves – the matter has been raised with PaCS as a matter for further investigation when conditions and resources allow.

2. The conversion of Canolfan Brailsford to Ysbyty Enfys
   During the 2019/20 academic year, Canolfan Brailsford was converted into Ysbyty Enfys; a Covid-19 field hospital to increase NHS capacity to care for people needing hospital care as a result of Covid-19 infection.
   Having closed as a sports facility on 20th March 2020, in response to the national lockdown to limit the spread of Covid-19, the conversion process commenced on the 4th April 2020. As part of the conversion process it was necessary to install an emergency back-up generator to power medical equipment in case of loss of mains power. The solar array on Canolfan Brailsford was incompatible with this set-up, as such the array was cut off from the building on 12th May 2020 (based on data from the monitoring system).
   As such, the Canolfan Brailsford array generated less electricity during 2019/20 than during 2018/19 as it was out of service for two and a half months, at a time of year when a large amount of electricity would have been generated due to increased levels and hours of sunlight.

Combined Heat and Power (CHP)

The University also has three gas-fired Combined Heat and Power units (CHPs). CHPs burn gas to generate electricity but also use the heat created by this process to provide heating and hot water in connected buildings. This is more efficient than a standard gas boiler which only generates heat for hot water and heating.

The University's three CHPs are located in ECW, Pontio and St Mary's Student Village. Currently, only the unit in St Mary's is in operation. The CHP in ECW was formerly in use but was switched off as it was deemed to be uneconomical for the amount of hot water and heat required in the building. The unit in Pontio has never been used as no service contract was set up for its operation. PaCS have been making enquiries as to if and how the CHP in Pontio could be brought into operation.

It should be noted that, as the carbon intensity of grid electricity falls as a result of increased renewable generation capacity, gas-fired CHP is becoming less attractive as it can potentially be generating electricity with a higher carbon footprint than grid electricity. This is even more pertinent in relation to the University's 100% renewable electricity supply.

The University's ability to monitor the performance of the St Mary's CHP system is limited. The AMMT system provides details of how much gas the unit has used, but the amount of electricity and heat produced is not monitored and can only be calculated based on the designed efficiency of the system, which assumes the system is functioning at its optimal efficiency.

7.3.7 Energy Performance of Buildings

Display Energy Certificates (DECs) present an assessment of the energy performance of public buildings. It is a legal requirement to have DECs and accompanying advisory reports produced for all buildings over 250m^2 and accessible to the public. For buildings with a useful floor area of more than 1000m^2, each DEC is valid for a period of 12 months, with advisory reports being valid for 7 years. For buildings between 250m^2 and 1000m^2, DECs and advisory reports are both valid for 10 years.

Valid DECs must be displayed in a prominent place within the relevant building while advisory reports must be kept on file.

Summary of 2019/20 DEC performance

DECs rate the energy performance of buildings on an A-G scale, with A being the most efficient and G being the least efficient.

Overall, the University's buildings performed slightly better in 2018/19 compared to the previous year.

- Twelve buildings improved their banding including ECW which has improved from an F in 2018, to an E in 2019 and now a D in 2020.
- Five buildings received a lower banding in the 2020 assessment compared to 2019, with Deiniol Library being downgraded from a C to a D.
- The average rating across all relevant University buildings has remained a Band C, although the average score has improved by 2.6 points.
- The best performing building was the Gymnasium/Sports Hall on Normal Site, which was rated A.
- The worst performing building was Marine Centre Wales in Menai Bridge, which is still rated G.

Rating	Number of buildings in 2019/20	Percentage of buildings in 2019/20	Number of buildings in 2018/19	Percentage of buildings in 2018/19	Change in number of buildings between
A	1	1.82%	2	3.64%	-1
B	17	30.91%	13	23.64%	+4
C	27	49.09%	26	47.27%	+1
D	8	14.55%	11	20.00%	-3
E	0	0.00%	1	1.82%	-1
F	1	1.82%	1	1.82%	0
G	1	1.82%	1	1.82%	0

	2019/20		2018/19		2017/18	
Average Rating	C	62.45	C	65.05	C	70.24

***Table 11**. Summary of 2020 Display Energy Certificates*

7.3.8 Continual Improvement

CEPT, in particular the Energy Coordinator, and PaCS are working together closely on the development of proposals to reduce the University's carbon footprint to zero by 2030, in accordance with the new carbon reduction target approved this year. The proposals will focus on both reducing energy demand and developing on-site generation where feasible.

To make significant progress on reducing energy consumption and the associated carbon emissions, the University will need to be willing to invest in energy saving technology and improvements across the estate.

7.4 Water

Objective: Minimise resource consumption

Target 3 b: Minimise the consumption of Water – reduce consumption of Water by 2% compared to the previous year as a function of a) m^2 useable floor area and b) FTE students & staff

Water Headlines 2019/20

- Target achieved
- 22.5% reduction in water consumption per m^2 floor area
- 23.6% reduction in water consumption per FTE

7.4.1 Performance against target 3b

		2019/20	Compared to 2018/19	Compared to 2005/06
Total Water Consumption		118,212.00 m^3	-22.6%	-27.2%
a) Water consumption **per m^2** useful floor area		515.8 litres	-22.5%	-42.9%
Performance against Target 3b			**Achieved**	
b) Water consumption **per FTE** (students & staff)		9,943.00 litres	-23.6%	-42.9%
Performance against Target 3b			**Achieved**	

***Table 12**. Summary of data for target 3b*

Total water consumption during 2019/20 fell by 22.6% compared to 2018/19. This could, in part, be attributed to the reduction in on-site operations and activities as a result of Covid-19 restrictions. However, in comparing the pre-Covid period of 1st August 2019 – 31st March 2020* with the same period during the 2018/19 academic year, water use was still nearly 21% lower during the 2019/20 period (see table below).

Water Consumption during the period 1st August – 31st March*	2019/20	2018/19	% Change
Total Water Consumption	91,684 m^3	115,817 m^3	-20.84%
c) Water consumption **per m^2** useful floor area	400.07 litres	665.46 litres	-39.88%
d) Water consumption **per FTE** (students & staff)	7,711.67 litres	13,008.71 litres	-40.72%

***Table 13**. Water Consumption for the period 1st August - 31st March*

*Although restrictions came into effect between one and two weeks prior to 31st March 2020, the data available from water bills covers whole months and so including the whole month of March made this analysis simpler.

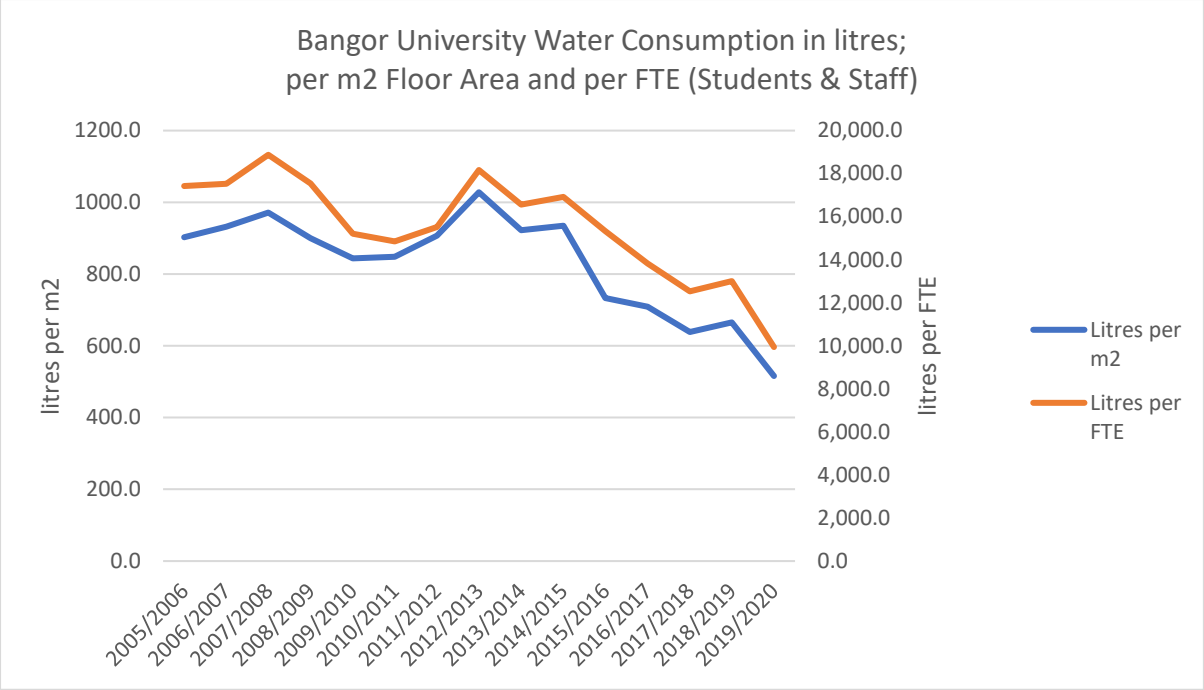

***Figure 5**. Water consumption (litres) as a function of a) m^2 floor area and b) FTE (students & staff)*

7.4.2 Performance within the sector

The Higher Education Statistics Agency (HESA) collects data on environmental performance of Higher Education Institutions in the UK, including water consumption. Data for the 2019/20 academic year is not yet available, but based on the 2018/19 data set, Bangor was the 72nd lowest user of water per m^2 floor area of 158 institutions for which data was available and was also below the sector average. This is illustrated in the graph below.

For comparison, in 2017/18 Bangor was 60th.

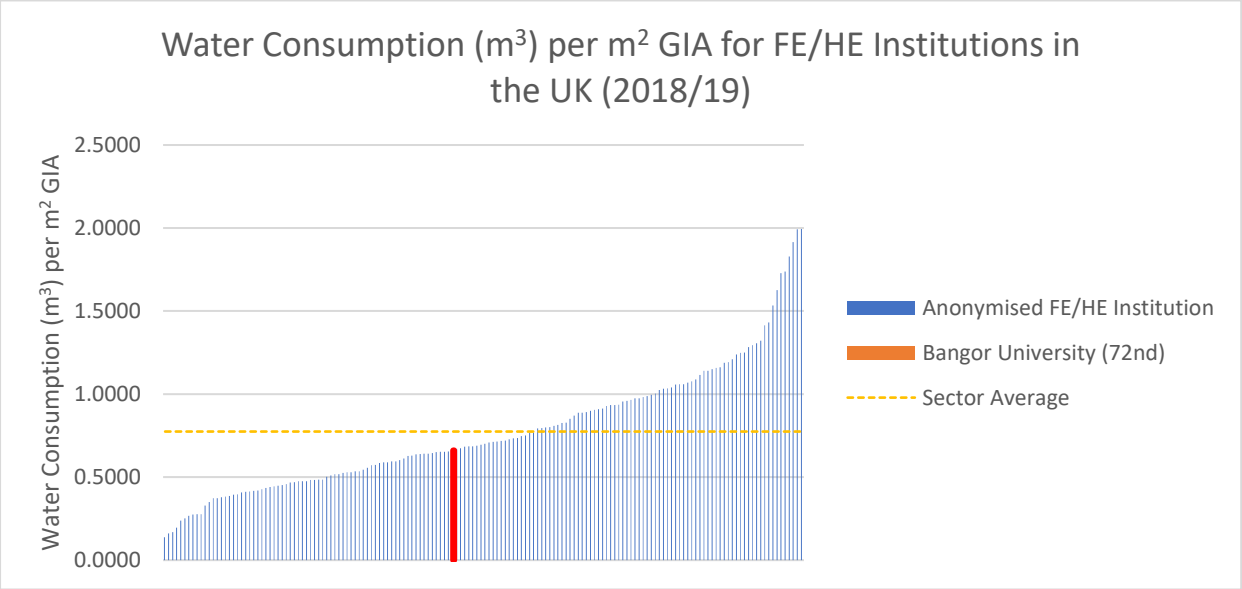

***Figure 6**. Bangor University's performance in the sector for water consumption (m^3) per m^2 Floor Area*

For water consumption per FTE, Bangor University was 121st of 158 institutions for which data was available (i.e.. Only 37 institutions used more water per FTE than Bangor). Bangor University also used more water per FTE than the sector average. This is illustrated in the graph below.

For comparison, in 2017/18 Bangor was 103rd.

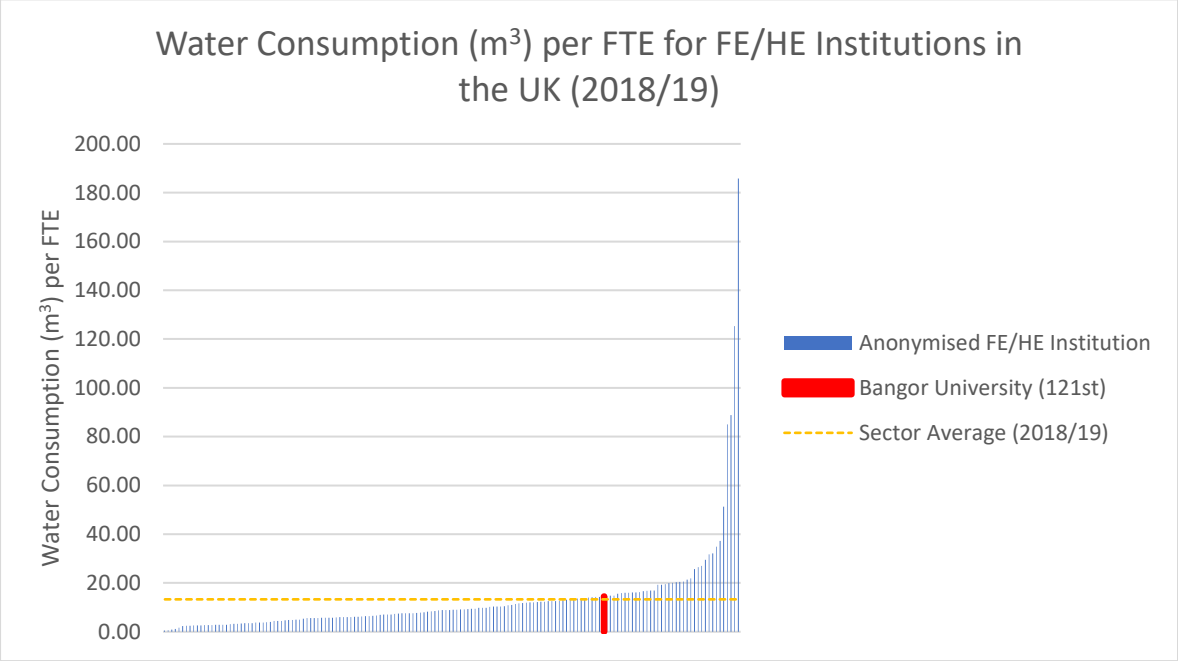

***Figure 7**. Bangor University's performance in the sector for water consumption (m^3) per FTE (students & staff)*

7.4.3 Continual Improvement

Water use has not received as much attention in recent years as other areas including waste, energy and emissions. Although water use did fall during 2019/20, Bangor is falling behind in the sector.

Improved metering and monitoring would be beneficial to help pinpoint areas where water use may be excessive and where reduction measures may be most effective. At present we are largely reliant on bills for consumption data, which in some cases cover the supply to multiple buildings, particularly in the case of Halls of Residence.

7.5 Travel & Transport

Objective: Reduce the contribution of University business travel on the environment

Target 4 a. Update the Sustainable Travel & Transport Policy and Plan

Target 4 b. Achieve an annual reduction on vehicular business travel CO_2 emissions

Travel & Transport Headlines 2019/20

- Target 4a not achieved
- Target 4b Achieved
- 33.2% reduction in emissions from road-based business travel
- Covid-19 had significant impacts on travel and attitudes to travel that may bring about long-term changes

7.5.1 Performance against target 4a

Update the Sustainable Travel & Transport Policy and Plan

Performance against Target 4a	**Not Achieved**

As was reported in the 2019 Annual Environment Report, further development of a Sustainable Travel & Transport Policy and Plan was paused pending decisions related to the development and implementation of a new Estate Strategy.

The development of an Estate Strategy is still ongoing and as such, it has not been possible to make any advancements with a Travel Policy/Plan.

CEPT and Sustainability Lab are collaborating with the Director of PaCS in the creation of the Estate Strategy, ensuring that sustainability is embedded across all elements, including travel.

A travel survey was conducted with both students and staff between December 2019 and January 2020, looking at how people commute to the University for work and study. Response rates were good, with 24% of staff and 5.28% of students completing the survey. At present, the usefulness of the data gathered will depend on how significant the long-term impact of Covid-19 will be on work and travel patterns. For example, as people have adapted to working-from-home and the necessary technology to support that, there may be a long-term shift towards more home-working and digital attendance at events such as conferences or international meetings. It would likely be advisable that a travel survey be run again, either in semester 2 of the 2020/21 year, or semester 1 of 2021/22, depending on how situations change/settle.

7.5.2 Performance against target 4b

Achieve an annual reduction on vehicular business travel CO_2 emissions

This target was not reported against in the 2018/19 Annual Environment Report due to issues and concerns with the data available. Whilst these issues have not been wholly resolved, it is possible to present data relevant to the target this year.

	2019/20	Compared to 2018/19	Compared to 2005/06
Business Mileage (from Expenses)	672,256	986,454	1,987,778
Petrol & Diesel Purchased* (litres)	63,477	94,490	196,390
GHG Emission (kg)CO2e	150,824	225,707	477,469
Percentage Change (2019/20)		-33.2%	-68.4%

***Table 14**. Summary of data for Target 4b*

*The data presented here for litres of petrol and diesel purchased only related to those fuels purchased for the purposes of road transport, in accordance with the target. Petrol & diesel are also purchased for off-road vehicles and machinery, this has not been properly captured before

Performance against Target 4b	**Achieved**

The changes to activities and operations cause by the Covid-19 restrictions had a notable impact on travel. In previous years, the months of April-July would generate roughly 1/3 of all business miles and petrol and diesel purchases. For 2020, April-July saw only 5.6% of annual mileage claims, 5.7% of petrol purchases and 15% of diesel purchases.

Using data from August-March (pre-Covid-19 restrictions) and the assumption that the affected time period (April-July) would normally have generated one third of all claims/purchases, it was determined that we would still have achieved a reduction in CO2e emissions even if Covid-19 restrictions not come into place. This simulation suggested total CO2e emissions in a non-Covid-19 situation would have been in the region of 207,441kg, 8.1% lower than the previous year.

7.5.3 Continual Improvement

CEPT and Sustainability Lab will continue to work with PaCS through the development process for the Estates Strategy and will provide the necessary input around sustainable travel as an element of that strategy. At such a time as is appropriate, work will resume on the Sustainable Travel Plan/Policy.

The impact of Covid-19 on travel may have long-term implications for both commuting and wider business travel, but this will have to be monitored as the situation progresses.

CEPT would like to create a toolkit and/or decision guide for making travel choices, particularly related to business travel, as a basis for an institution-wide conversation about how we travel for business.

Data Issues

As was discussed in last years report, there are a number of ways in which travel data could be improved to help present both a more accurate and more complete picture of travel related emissions.

1. Inclusion of miles travelled in mileage/expenses claims

The current system relies on a large amount of data processing to derive an approximation of miles travelled based on the financial value of expenses claims, in order to then calculate carbon emissions. Accuracy of reporting would be improved if the number of miles travelled (and ideally the means of travel) were recorded alongside the financial cost of mileage expenses

2. Inclusion of litres in fuel purchases

As with mileage, the current system involves a backward calculation from the financial value of an expenses claim for purchases of petrol/diesel based on an average cost per litre, in order to derive litreage and be able to calculate carbon emissions.

3. Separate recording of fuels purchases by use

Currently all petrol/diesel purchases are recorded under the two cost codes 810 for petrol and 811 for diesel, regardless of the intended use of the fuel. This means that the fuel could be for road vehicles, agricultural vehicles, machinery, boats or potentially for heating – there have been a few large purchases coded under 811 for Diesel that appear to be for heating oil at Henfaes paid for using a purchase card. These are currently being filtered out manually as the different uses, particularly heating, have different implications for reporting.

4. Generally having more details on expenses claims

Some claims just contain a date range and some include details that make it seem like the claim has been miscoded. For example, Visa Application and Wood Stakes were both claims made against the Petrol cost code 810.

5. Ensuring we have a complete picture

a) Boats. To date, reporting has excluded fuel used for boats. Whilst the Prince Madog is out of the scope of the EMS, the University owns and uses other boats that use fuel and contribute to the University's carbon emissions – in future this data should be captured and reported on. It is not immediately clear how or where this data is recorded – there are some Petrol claims obviously for boats, but it is not clear if this is all encompassing.
b) Non-road based travel. Equally, business travel not made by road has not been reported on to date. This means business travel by coach, train, ferry or aeroplane are not included within the University's business travel emissions. As an institution that has declared a Climate Emergency, this is not good enough. In order for these modes of travel to be properly reported from and environmental/emissions perspective, it would be necessary to make the changes detailed above regarding the detail included in claims. The financial value of a train or plane ticket cannot be converted to carbon, but would instead require mileage or at least start and end destinations.
c) Departmental Vehicles. It is assumed that any departmental vehicle use is being captured through claims for fuel purchases, but clarification on this would be beneficial.

7.6 Emissions

Objective: Reduce the University's contribution to global climate change

> **Target 5.** Achieve year-on-year reductions in greenhouse gas emissions (Scope 1, 2 & 3) associated with University operations as a function of i) m^2 useful floor area and ii) FTE students & staff

Emissions Headlines 2019/20

- Target Achieved
- 16.93% reduction on 2018/19 (absolute) using the location-based method
- 57.13% reduction on 2018/19 (absolute) using the market-based method
- Carbon Zero by 2030 Target Approved

7.6.3 Performance against target 5

The table below provides details of emissions by Scope.

- **Scope 1 emissions** are those generated directly from sources in the control of the reporting organisation. This includes combustion of fuel such as gas, oil and LPG, petrol and diesel.
- **Scope 2 emissions** are those generated indirectly from energy generation, primarily from the production of electricity.
- **Scope 3 emissions** are those generated indirectly from other activities and includes emissions associated with water treatment, waste disposal, grey-fleet and procurement/supply-chain emissions. Based on the questionable nature of the procurement emissions available at this time, these are not being included in the total emissions reported below.
- The table also includes emissions from agricultural activities undertaken by the University, which fall within Scope 1 as being in direct control of the reporting organisation, and carbon sequestered by University land holdings. These figures were calculated a number of years ago and would benefit from reassessment.

The emission sources included in the total reported here are as follows:

Scope 1 Emission by Source	
Gas Consumption	3,375.24 tonnes CO_2e
Oil Consumption	158.87 tonnes CO_2e
LPG Consumption	5.28 tonnes CO_2e
Petrol Consumption[1]	33.29 tonnes CO_2e
Diesel Consumption[1]	45.29 tonnes CO_2e
Agricultural Activities	695.95 tonnes CO_2e
Scope 1 Total	4,313.62 tonnes CO_2e
Scope 2 Emissions by Source	
Electricity Consumption (Location-based Method)[2]	3,555.88 tonnes CO_2e
Electricity Consumption (Market-based Method)[2]	0 tonnes CO_2e
Scope 3 Emissions by Source	
Water Consumption	40.66 tonnes CO_2e
Wastewater Produced	75.86 tonnes CO_2e

Waste[3]	11.56 tonnes CO_2e
Grey Fleet	150.82 tonnes CO_2e
Scope 3 Total	278.91 tonnes CO_2e
Sequestration by land holdings	
Sequestration	-800 tonnes CO_2e
Total Reported Emissions	
Total with location-based electricity	7,348.41 tonnes CO2e
Total with market-based electricity	3,792.53 tonnes CO2e

***Table 15**. Summary of emissions by Scope*

1. Petrol and diesel consumption includes road vehicles, off-road vehicles, machinery and equipment but does not include boat fuel
2. See below for explanation of location-based and market-based emissions for electricity
3. Waste emissions presented here are a total of all emissions arising from the different waste streams (e.g. recycling, composting, anaerobic digestion, energy recovery)

Emission sources that are not currently included in the total emissions figure presented here are Procurement/Supply-chain emissions due to uncertainty regarding the reliability of the data available at this time. Further explanation, and the currently available data, are presented below in section 7.6.2 Procurement-related Emissions.

Travel emissions other than those associated with business-miles by car (and reclaimed through expenses) or with the purchase of petrol or diesel, are not included in this report due to a lack of data. It is not currently possible to calculate emissions for business-related travel by bus, train, boat or aeroplane. For further detail, see section 7.5.3 Continual Improvement (Travel & Transport).

Location-based and Market-based Emissions

As previously discussed in section 7.3 Energy Consumption, in October 2019, the University Executive approved a proposal to switch to a guaranteed 100% renewable electricity supply.

Although under our new guaranteed renewable electricity supply the carbon emissions from our electricity use are technically zero, reporting standards, and UK Government recommendations, require us to report both the emissions from our specific market arrangement (Market-based method) and using the national carbon factors based on average UK carbon intensity for grid electricity (location-based method).

As such, there are two carbon emission figures reported for the 2019/20 year.

With "location-based" electricity emissions

	2019/20	Compared to 2018/19	Compared to 2010/11*
Total Reported Greenhouse Gas emissions (tonnes CO_2e)	7,348.31	8,845.66	16,916.00
2019/20 Percentage Change		-16.93%	-56.56%
a) Greenhouse gas emissions **per m²** useable floor area ($kgCO_2e$)	32.07	-16.85%	-62.12%
Progress against Target		**Achieved**	
b) Greenhouse gas emissions **per FTE** (students & staff) ($kgCO_2e$)	618.09	-18.01%	-58.29%

Progress against Target 5		**Achieved**	

***Table 16**. Summary of data for Target 5 (with location-based emissions)*

*2010/11 is the baseline for total greenhouse gas emissions as this is the earliest date for which sufficient data is available

With "market-based" electricity emissions (ie. Accounting for our 100% renewable supply)

	2019/20	Compared to 2018/19	Compared to 2010/11*
Total Reported Greenhouse Gas emissions (tonnes CO_2e)	3,792.53	8,845.66	16,916.00
2019/20 Percentage Change		-57.13%	-77.58%
a) Greenhouse gas emissions **per m²** useable floor area (kgCO_2e)	16.55	-57.09%	-80.45%
Progress against Target		**Achieved**	
b) Greenhouse gas emissions **per FTE** (students & staff) (kgCO_2e)	318.99	-57.69%	-78.48%
Progress against Target 5		**Achieved**	

***Table 17**. Summary of data for Target 5 (with market-based emissions)*

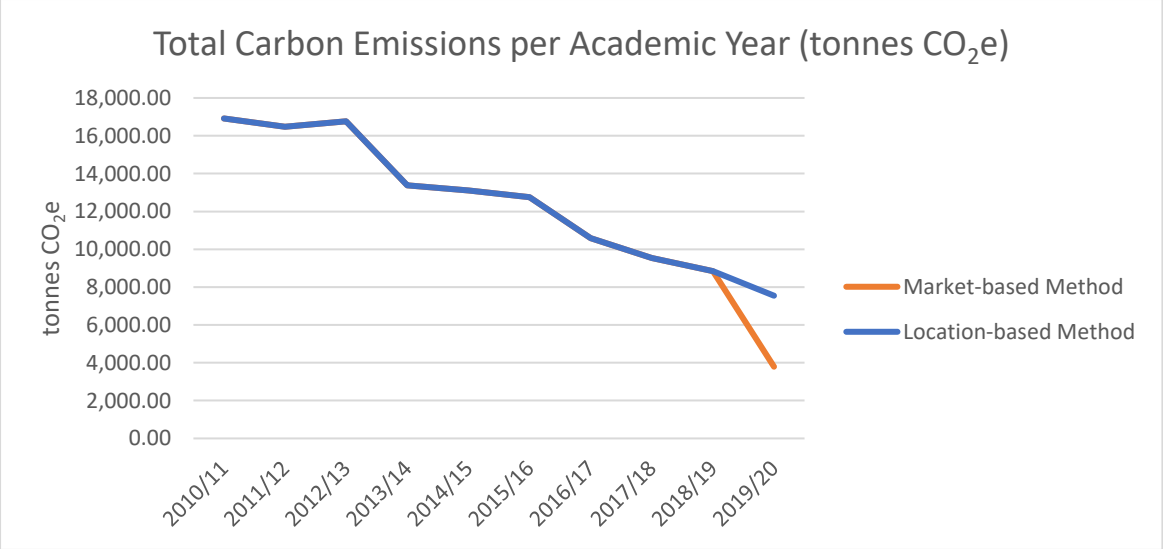

***Figure 8.** Total carbon emissions (tonnes CO_2e) by academic year*

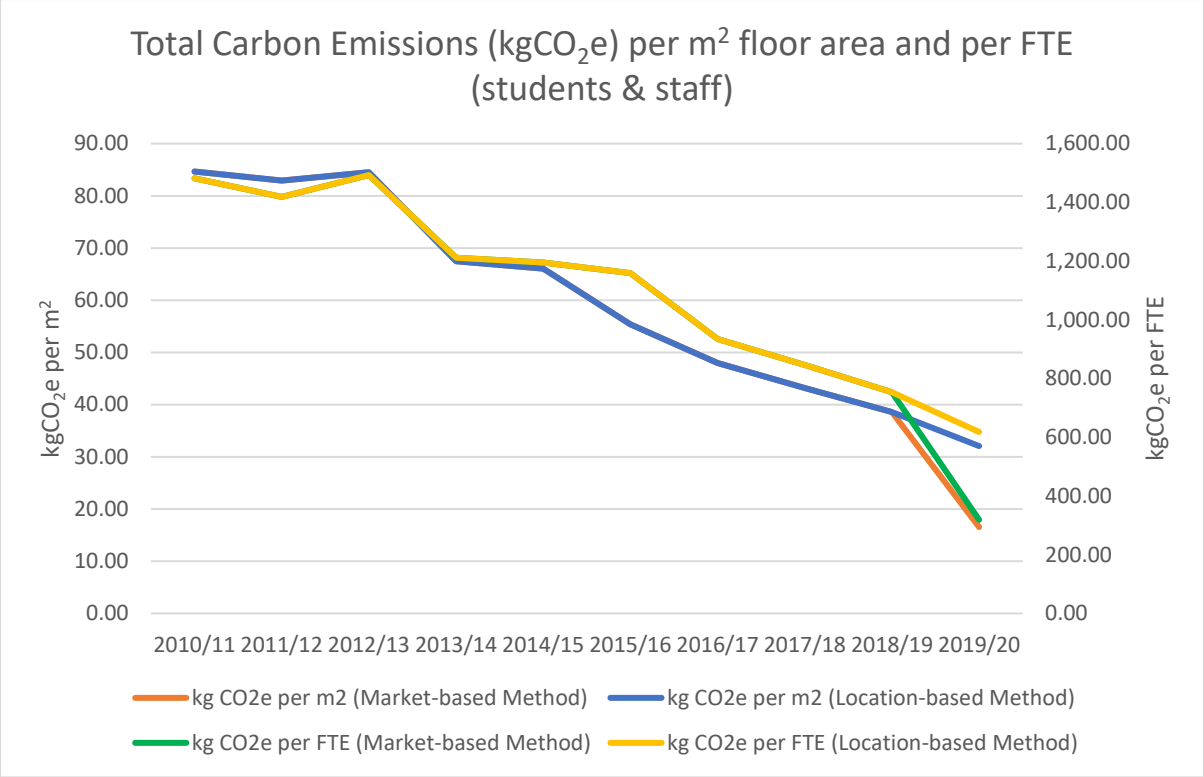

Figure 9. *Total carbon emissions (tonnes CO_2e) as a function of a) m^2 floor area and b) FTE (students & staff)*

7.6.4 Procurement-related Emissions

As was reported last year, our accounting of Scope 3 (indirect) emissions is in need of improvement. Currently, our Scope 3 emissions reporting is limited to water use, sewage disposal, waste disposal and business travel (as far as it is currently recorded).

Procurement-related emissions are completely unaccounted for in our current reporting. This is in part due to the scale and complexity of procurement-related emissions and the process of calculating them.

The University is provided with a report each year detailing emissions generated from procurement activities (HESCET - Higher Education Supply Chain Emissions Tool). The tool has been subject to increasing criticism from the sector as the carbon factors used in the calculations have not been updated since 2011 – as such it is unlikely that the tool presents a realistic representation of current emissions. There is pressure on those behind the tool to update the carbon factors in order to make the tool more relevant.

Despite this, HESCET is the closest representation of procurement-related emissions available to us at this time. The report is usually received in December, as such the report for the 2019/20 academic year is not yet available, however, the report for 2018/19 shows procurement related emissions to be 13,884 tonnes CO2e. It should be noted that this figure almost certainly contains some double counting of emissions that are already reported within this report, such as energy, water and waste, but cannot be easily unpicked from the tool as a whole.

The table below shows the outputs from the HESCAT tool in recent years, all with the probability of some double counting. Construction emissions are presented separately to other emissions by convention due to the highly variable nature of construction projects.

Although the specifics may not be wholly accurate, the data provided by HESCET and presented in the table below serve to illustrate how significant emissions from procurement are, particularly in comparison to other emission sources. The total procurement-related emissions for 2018/19 as calculated by HESCET are nearly 90% higher than the University's energy related emissions, using the location-based method (not accounting for renewable electricity tariff), and more than 3.6 times more than he University's energy related emissions, using the market-based method (accounting for renewable electricity tariff).

	Procurement-related emissions from HESCET (excluding construction)	Construction emissions from HESCET	Total procurement-related emissions from HESCET
2018/19	12,472 tonnes CO2e	1,412 tonnes CO2e	13,884 tonnes CO2e
2017/18	21,497 tonnes CO2e	6,436 tonnes CO2e	27,934 tonnes CO2e
2016/17	18,237 tonnes CO2e	6,902 tonnes CO2e	25,139 tonnes CO2e
2015/16	19,590 tonnes CO2e	1,438 tonnes CO2e	21,028 tonnes CO2e
2014/15	20,908 tonnes CO2e	2,029 tonnes CO2e	22,937 tonnes CO2e

***Table 18**. Summary of procurement-related emissions as calculated by HESCET*

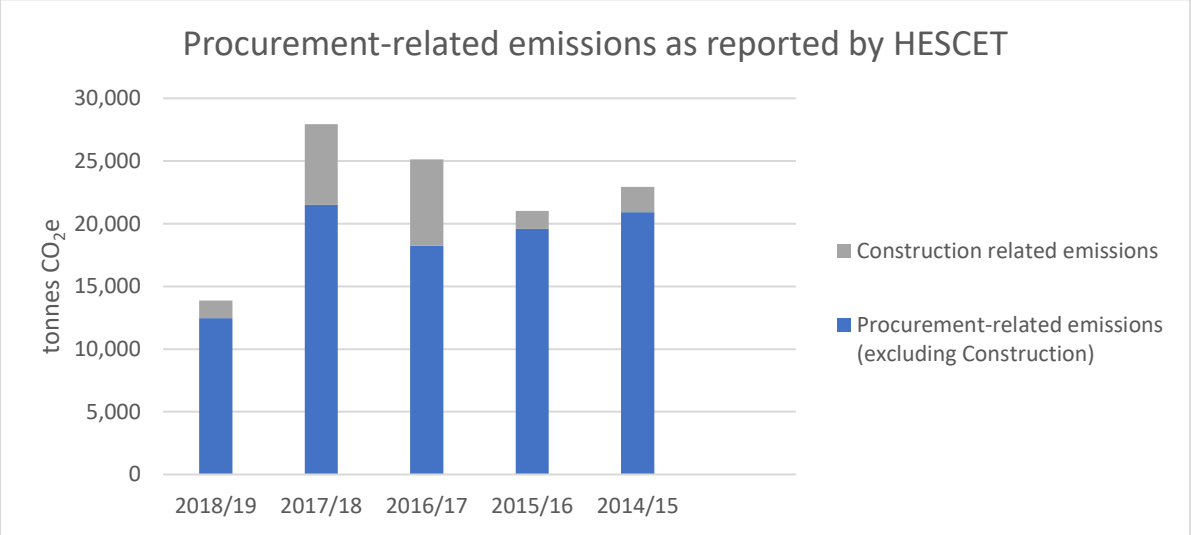

***Figure 10**. Procurement-related emissions (tonnes CO_2e) as reported by HESCET*

7.6.5 Climate Emergency

In June 2019, Bangor University followed the UK, Welsh and Scottish Governments, as well as many local authorities and other Higher Education Institutions, in declaring a "Climate Emergency". Understanding of exactly what declaring a "Climate Emergency" means or what action it would require varies. The EAUC, in their call encouraging all Further and Higher Education institutions to declare a Climate Emergency, determined that it means committing to adopting a target of net-zero emissions by 2050 at the latest, in line with the recommendations of the Committee on Climate Change. Additionally, the Higher Education Funding Council for Wales (HEFCW) has also encouraged Welsh Universities to join public bodies in efforts to achieve carbon neutrality by 2030.

As a result, in June 2020, the Sustainability Strategy Group approved implementing a target to achieve net-zero carbon (Scope 1 & 2) by 2030, which was also approved by the University Executive.

This now needs to be backed up with an action plan including more significant carbon-reduction targets for each year between now and 2030. The Sustainability Lab, CEPT and PaCS are working to develop an action plan. Discussions around reduction targets will be presented separately to this report.

7.6.6 Continual Improvement

As previously discussed in Section 7.3 Energy, CEPT and PaCS are working on the development of proposals to reduce the University's carbon footprint to zero by 2030. The proposals will focus on both reducing energy demand and developing on-site generation where feasible.

Equally, as outlined above in Section 7.6.5 Climate Emergency, there is need to develop an action plan and schedule of annual emission reduction targets to ensure we are able to deliver on the net-zero by 2030 target.

To make significant progress on reducing energy consumption and the associated carbon emissions, the University will need to be willing to invest in energy saving technology and improvements across the estate.

7.7 Biodiversity

Objective: Enhance biodiversity of the University estate

Target 6 a. Promote biodiversity conservation and improvement across the University estate

Target 6 b. Increase unimproved grassland/wildflower meadow areas across the University estate

Target 6 c. Biodiversity Action Plan

Biodiversity Headlines 2019/20

- Biodiversity progress hampered by Covid-19 restrictions
- As much progress as was possible in the circumstances has been achieved
- New Biodiversity Enhancement Plan requires approval by SSG

Bangor University is classed as a "public authority" by the Environment (Wales) Act 2016, and has a duty under Section 6 of the Act (Biodiversity & resilience of ecosystems) to "*seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems*"".

The Act also requires public authorities to "*embed the consideration of biodiversity and ecosystems into their early thinking and business planning, including any policies, plans, programmes and projects, as well as their day to day activities.*"

In December 2019, the University published their report on what has been done so far to comply with this duty. The report can be found on the Environmental Management webpage. Reporting against the Section 6 duty is required every three years, as such, the next Section 6 report will be published before the end of 2022.

7.7.1 Performance against target 6a

Promote biodiversity conservation and improvement across the University estate

Performance against Target 6a	**Partially Achieved**

The ability to deliver against all elements of the biodiversity targets have been impeded by the Covid-19 restrictions. Biological surveys were still undertaken at Treborth Botanic Garden by dedicated surveyors and public citizen science volunteers, in the period prior to the restrictions. Results of surveys undertaken are shared with Cofnod North Wales Environmental Information Service and are publicly available. Highlights of surveys are also shared through social media.

Since Covid-19 restrictions came into force, the curator of Treborth Botanic Garden has been very proactive in sharing updates from the garden on social media, including tours of specific collections and how-to videos.

Treborth Botanic Garden has 930 followers on Instagram, 922 followers on Twitter and 1,961 followers on Facebook, and uses these platforms to promote the positive biodiversity work being done at the Garden and across the University.

No surveys of students, staff or visitors took place during the 2019/20 academic year due to Covid-19 restrictions.

***Figure 11**. Photographs from a "Fungus Foray" event at Treborth Botanic Garden*

***Figure 12**. Survey activities have included dragonfly surveys and pond surveys*

7.7.2 Performance against target 6b

Increase unimproved grassland/wildflower meadow areas across the University estate

Performance against Target 6b	**Partial Progress**

Despite a lot of work to identify sites with potential for expanding wildflower meadow areas around University sites in both 2018/19 and 2019/20, the timing of the Covid-19 restrictions meant it was not possible to prepare any new sites.

The existing meadows were surveyed during the 2019/20 academic year, identifying more than 150 species of flowering plants which provide for a huge range of wildlife including fungi, bees, flies, beetles, spiders, moths, butterflies, reptiles, amphibians, small mammals, bats and birds.

The wildflower meadows are a very visual sign of biodiversity at the University and are popular with students, staff and visitors.CEPT receive regular queries about the possibility of converting mown grass to wildflower areas from students and staff alike. As such, the expansion of wildflower/unmown areas will continue to be a priority for biodiversity enhancement at the University.

7.7.3 Performance against target 6c

Create a Biodiversity Action Plan

Performance against Target 6c	**Pending Approval**

The Biodiversity Co-ordinator has completed a Biodiversity Enhancement Plan (BEP) for the University which now requires the approval of the Sustainability Strategy Group prior to publication and implementation.

The BEP sets out a number of biodiversity related targets categorised by nine themes and three priority levels. Pending approval of the BEP as a whole, a delivery plan for the targets will need to be developed, including timescales for delivery and a framework for reporting.

Assuming the BEP is approved, the targets it contains will supersede those presented here. Further discussion of changes to targets will be presented in a separate document.

7.7.4 Continual Improvement

Once approved, the new Biodiversity Enhancement Plan will create a stronger focus on biodiversity preservation and enhancement across the University estate and improve reporting of biodiversity achievements.

7.8 Procurement

Objective: Embed sustainability within the procurement process

Target 7 a. Conduct Sustainability Risk Assessments for all contracts over the value of £25,000 and use Community Benefit Measurement Tool data for all contracts over the value of £1 million

Target 7 b. Where appropriate, ensure contracted suppliers have an Environmental Management System

Procurement Headlines 2019/20

- Targets 7a & 7b Partially Achieved
- Good examples of positive sustainability practices in procurement not otherwise captured by the targets

7.8.1 Performance against target 7a

Conduct Sustainability Risk Assessments for all contracts over the value of £25,000 and use Community Benefit Measurement Tool data for all contracts over the value of £1 million

Performance against Target 7a	**Partially Achieved**

A total of 27 tenders were undertaken during the financial year 2019/20 with SRAs being completed for two of these.

The Sustainable Risk Assessment was modified in November 2019 to try and simplify completion. The two SRAs undertaken were completed following the introduction of the new form. As in previous years, the main barrier to completion is time, with many tendering exercises considered urgent.

There were no contracts with an estimated value of over £1m, however, community benefit clauses were included in the Deiniol building redevelopment project with an estimated value of £800,000. We are still awaiting confirmation of the benefits achieved.

7.8.2 Performance against target 7b

Where appropriate, ensure contracted suppliers have an Environmental Management System

Performance against Target 7b	**Partially Achieved**

An EMS was stated as a requirement in 3 contracts. There were potentially 10 contracts where it might have been acceptable to select a supplier with an EMS. However, a number of these contracts were for specialist research equipment and it is difficult to judge whether an EMS would have been appropriate or not.

It is not always possible or practicable to ask suppliers to demonstrate that they have an Environmental Management System e.g. sole traders, small consultancy firms or where a market is particularly limited.

7.8.3 Examples of Good Sustainable Procurement Practice

Over the course of the 2019/20 year, environmental/sustainability principles have been applied in procurement exercises in ways that are not sufficiently captured by the targets set out above.

- Prospectus Printing Service – Bidders were requested to provide details on sustainability processes e.g. use of paper sourced from sustainable sources, use of quality vegetable-based inks, recycling practices for waste products. They were also asked to provide certification with regards to any environmentally friendly practices.

- Supply and maintenance of gym equipment – bidders were asked how the environmental impact of vehicles, waste and similar could be reduced and how the proposed gym equipment could assist the University to reduce its carbon emissions.

7.8.4 Continual Improvement

The University's Procurement Strategy is due for renewal; however, a new strategy will not be developed until after the publication of a new University Strategic Plan. The Procurement team have been familiarising themselves with ISO20400, a non-certified international standard for Sustainable Procurement. It is hoped they will be able to develop a new Procurement Strategy around this standard.

New Procurement Targets have been discussed and any proposed changes will have been circulated separately to this report.

7.9 Awareness & Communication

Objective: Raise environmental awareness and awareness of the UN Sustainable Development Goals amongst students & staff through improved communication and involvement

Target 8a. Increase level of digital engagement

Target 8b. Establish a baseline for non-digital/face-to-face engagement

Target 8c. Increase student awareness of the Sustainability Lab and environmental/sustainability related events & opportunities from surveys

Target 8d. Increase number of departmental/school/service webpages that refer to sustainability and link to the Sustainability Lab and/or CEPT & EMS webpages

Awareness & Communication Headlines 2019/20

- Targets 8a and 8b Achieved
- Targets 8c and 8d not achieved
- Staff have mixed awareness of environmental management and sustainability at the University
- Launch of Papur Gwyrdd

7.9.1 Performance against target 8a

Increase level of digital engagement

	2019/20	2018/19	% Change
'Unique Pageviews' for Sustainability Lab Website	6,763	5,894	+14.74%
Twitter "Impressions"	171,046	159,556	+7.20%
Twitter New Followers	120	127	-5.51%
Twitter Total Followers	885	756	+17.06%
Facebook "Reach"	48,081	12,929	+271.88%
Facebook "Engagement"	4372	1514	+188.77%
Facebook "Engagement Rate"	9.09%	11.71%	Decreased
Facebook "Followers"	374	271	+38.01%
Instagram "Reach"	12,987	Data Unavailable	N/A
Instagram "Engagement"	664	Data Unavailable	N/A
Instagram "Likes"	272	Data Unavailable	N/A
Instagram "Followers"	285	Data Unavailable	N/A

Performance against Target 8a	**Achieved**

***Table 19**. Summary of data for Target 8a*

Digital engagement and communication became more important than ever during the 2019/20 academic year, with the move to online-only teaching and working due to Covid-19 restrictions.

The Sustainability Lab increased their followers, reach and engagement on both Twitter and Facebook, and also had increased traffic on the Sustainability section of the Bangor University website.

The two major events held each year by the Sustainability Lab, Waste Awareness Week in October and Carnifal in February, were both early enough in the academic year to be unaffected by Covid-19. Although these were "in-person" events, they both had a strong digital marketing and engagement element.

The Waste Awareness Week 2019 hashtag, #WAW19, reached a total of 446,847 people across Facebook, Twitter and Instagram, an 408% increase on #WAW18 in 2018/19. For more information about WAW, refer to section 7.2 Waste or see the following webpages;

- Waste Management (Resource Efficiency)
- Sustainability Campaigns

Carnifal 2020 was also used its own hashtag, #Carnifal20, to promote, coordinate and engage people with the 82 events that were held under the Carnifal20 banner. In total, #Carnifal20 reached 1,274,827 people across Facebook, Twitter and Instagram, an increase of 73.16% on Carnifal19 in 2018/19.

	2019/20	2018/19	% Change
Waste Awareness Week	446,847	87,962	+408%
Carnifal	1,274,827	736,216	+73.16%

***Table 20**. Number of people/accounts reached by hashtags associated with sustainability events/campaigns*

Online sustainability campaigns are well supported by partners across the University, including Campus Life, Catering, Undeb and the International Office.

The collaborative campaign "Think Before You Drink", encouraging students, staff and visitors to move from disposable to reusable cups, water bottles and spoons, was launched in April 2019. To date the hashtag #TBYD has reached 6636 people on Facebook, 2636 people on Instagram, 5384 people on LinkedIn and 58,534 people on Twitter. The campaign has also received notable praise for how well it works in both Welsh and English.

7.9.2 Performance against target 8b

Establish a baseline for face-to-face engagement

Due to Covid-19 restrictions, the definition of face-to-face engagement has been altered slightly to remove the term "non-digital". Since the implementation of restrictions on social gatherings and the access to use the University site, it has not been possible to run many events that would otherwise have gone ahead. As the situation became more stable, it was possible to adapt some events to be

held virtually through Microsoft Teams. As these events were still "live" and allowed for attendees to interact with presenters/speakers, they have been included within the scope of "face-to-face" interactions. Despite this, Covid-19 restrictions have decreased the number and scope of events that have been able to be held and it is felt that both the number of events and number of people engaged will be lower than that they would otherwise have been.

Fortunately, most of the large face-to-face engagement events were scheduled prior to April 2020 and so were able to go ahead.

A total of 126 events were held during the 19/20 academic year, including two which were held as live sessions through Microsoft Teams. Number of participants was not available for all events held, but for those where figures were provided a total of 1075 people were engaged.

Some of the biggest and most successful events included Waste Awareness Week (#WAW19) in October 2019, which engaged 687 people across 17 events (see Section 7.2 Waste for more details), and Carnifal20 in February 2020, which featured a total of 82 separate events over the course of the month.

Other events included;

- Welcome Week Talks on sustainability for new students (September 2019)
- Sustainability Lab stand at Serendipity 2019
- Climathon 2019 (October 2019)
- Contributions to the Bangor Climate March Q&A session in Pontio (November 2019)
- Contributions to the Youth Climate Summit organised by the School of Education (February 2020)

The Sustainability Lab's regular monthly discussion sessions, formerly known as Sustainability Think Tanks, were held prior to the Covid-19 restrictions, although attendance was low. An online session was run in May 2020 via Microsoft Teams, which attracted 21 participants. It is hoped to continue running these events through Microsoft Teams in the 2020/21 academic year.

	2019/20
Number of Events held	126
Number of people engaged	1184
Target	Achieved

Table 21*. Summary of data for target 8b.*

7.9.3 Performance against target 8c

Increase student awareness of the Sustainability Lab and environmental/sustainability related events & opportunities from surveys

During the 2019/20 academic year Undeb made changes to the questions included in the Undeb Student Survey, as such some comparisons with previous years are not possible.

	2019/20	2018/19	2017/18
I'm aware of the sustainability activities that are available to me during my time at University	46.19%[1]	54%	34%

I have heard of the Sustainability Lab	No Data[2]	38%	34%
I am aware of Waste Awareness Week	59.4%	60%	N/A
Target	Not Achieved		

***Table 22**. Results from sustainability questions included in the Undeb student survey*

1. This figure is an average from a number of questions asking about awareness of specific events
2. Unfortunately, this question was not included in the 2019/20 survey

Staff Survey

During the 2019/20 academic year, a survey of staff was undertaken assessing opinions, experiences and awareness across a wide range of topics, including sustainability and the environment. Results from the sustainability questions presented a mixed picture.

The majority of staff who responded reported that they were taking actions to contribute to improve the University's Environmental Performance, including recycling, reducing unnecessary resource use and reducing unnecessary travel.

	Positive/Affirmative Responses
I contribute to improving the University's Environmental Performance by reducing unnecessary resource use (e.g. no unnecessary printing)	93%
I contribute to improving the University's Environmental Performance by recycling	97%
I contribute to improving the University's Environmental Performance by reducing unnecessary travel	88%
I contribute to improving the University's Environmental Performance by increasing my use of video conferencing/Skype etc	74%

***Table 23**. Results of sustainability questions in the 2019 Staff Survey*

More than half of staff reported that they were aware of the work of the Sustainability Lab and of the University's Environment Policy.

	Positive/Affirmative Responses
I am aware of Our Environmental Policy and its aims	53%
I am aware of the work of the Sustainability Lab (e.g. Waste Awareness Week, #Carnifal)	56%

***Table 24**. Results of sustainability questions in the 2019 Staff Survey*

Less positively, less than half of staff were aware of the University's Environmental Management System or how to report an environmental incident.

	Positive/Affirmative Responses
I am aware of Our Environmental Management System (ISO14001)	36%
I know who to report and environmental incident or problem to	45%

***Table 25**. Results of sustainability questions in the 2019 Staff Survey*

Whilst information on the University's EMS, Environment Policy and reporting Environmental Incidents is all available on the University's Environmental Management webpages, proactive promotion and signposting has clearly been lacking.

Due to the very low level of awareness of the EMS and Environmental Incident reporting, the Sustainability Lab and CEPT utilised one of the monthly "Putting the World to Rights" sessions (formerly Sustainability Think Tanks) to give an introduction to the EMS. Twenty-one people attended, primarily staff, making the session the best attended "Putting the World to Rights" event of 2019/20. Further online sessions on the EMS and related issues are being planned for the 2020/21 year with intentions to record the sessions and make them available online after the "live" event for those who were unable to attend.

7.9.4 Y Papur Gwyrdd/The Green Paper

Partly in response to the outcomes of the staff survey, the Sustainability Lab launched Y Papur Gwyrdd, The Green Paper in July 2020 – a digital magazine bringing together news, events, case studies and other articles relating to sustainability, the UNSDGs, Wellbeing Goals and environmental management at Bangor University.

The first edition of Y Papur Gwyrdd was distributed by email to students and staff on 22nd July 2020 and was read 791 times in English and 224 times in Welsh. The publication was well received and was praised for both its content and design.

It is intended that the publication will contain regular features on the UNSDGs, Environmental Management at the University (waste, energy, water, biodiversity etc), the EMS and its functions and procedures as well as news about sustainability events and developments from across the range of services, colleges and departments.

7.9.5 Performance against target 8d

Increase number of departmental/school/service webpages that refer to sustainability and link to the Sustainability Lab and/or CEPT & EMS webpages

Progress against Target 8d.	Not possible to report

It is not possible to report on progress against target 8d due to a lack of data. The primary limitation for reporting on this target is the lack of a baseline against which to measure any increase. Additionally, due to ongoing work to redevelop the University website has rendered this target largely redundant until such a time as the new website is launched and a baseline could be established.

7.9.6 Continual Improvement

The 2020/21 academic year will be challenging for communications and engagement as Covid-19 restrictions mean the vast majority of communications on the environment, and across the University, will be digital in some way. This is a new situation in which we need to learn how to best get messages across without people becoming overloaded, exhausted or disengaged with digital interactions and engagement.

The Sustainability Lab and CEPT will continue to promote environmental messages, activities and news to students and staff via social media and email. Changes to social media platforms, primarily Facebook, may hamper the ability to promote content. Facebook has made changes that favour paid advertising, which is already impacting our reach and engagement. In order to ensure we are still

able to have an impact on these platforms there will need to be an allocated and defined sustainability/environment marketing budget.

Promoting environmental/sustainability messages internally has previously been most successful via email to the all-staff and all-student lists. Recent changes to University rules on the use of the all-staff list are expected to negatively impact readership of environmental/sustainability messages, such as the Papur Gwyrdd, and attendance at events. Experience suggests greater readership/attendance is generated by our direct emails than inclusion in the Staff Bulletin.

Intentions are to continue publishing Y Papur Gwyrdd monthly, along with a new programme of monthly “Putting the World to Rights” sessions.
Based on the outcomes of the staff survey, it is clear that there needs to be more communication around the EMS and related procedures – it is a requirement of the ISO14001 standard that staff are kept informed about the EMS and how it may relate to them and their roles. These messages can easily be incorporated into both Y Papur Gwyrdd and the “Putting the World to Rights” sessions, the challenge is around encouraging engagement. It is also hoped that recording of sessions related to the EMS, and other environmental topics can be created and made available online.

It will remain to be seen whether moving events such as WAW to be online only decreases overall engagement, or if people who would not attend in-person events are actually more inclined to engage virtually.

7.10 Curriculum

Objective: Embed the environment and sustainability in the curriculum across the University

Target 9. Establish the number of courses and modules validated which refer to the environment to obtain a baseline

Curriculum Headlines 2019/20

- New modules/courses relating to the environment are being developed
- Methodology needs revising
- The target should be redefined within the broader context of sustainability
- The School of Law is leading the way in mapping their curriculum against the UNSDGs

7.10.1 Performance against target 9

Performance against Target 9	**Partial Progress**

Establishing a definitive baseline for the number of courses and modules which refer to the environment has proven more challenging than anticipated. In part this is due to the large number of courses/modules on offer, more than 1000, and the fact that not all courses/modules that are relevant to the environment can be easily identified based on course titles and key words.

The table below shows the results based on examination of course/module titles and key words.

Courses and modules at Bangor University	**2018/19**	**2019/20**
Courses referring to 'environment'	16	16
Courses referring to 'sustainable'	2	2
Total courses referring to 'sustainable' and 'environment'	**18**	**18**
Modules referring to 'environment'	19	20
Modules referring to 'sustainable'	3	4
Modules referring to 'green'	2	2
Total modules referring to 'sustainable', 'environment' and 'green'	**24**	**26**

As can be seen in the figures above, two additional modules referring to "environment", "sustainable" or "green" were implemented during 2019/20. In addition, a further two modules have been developed to be delivered to students during the 2020/21 academic year:

- QXP 3012 Writing and Environments

  This module will explore creative responses to wilderness, the non-human and environmental challenges, drawing on a range of ecological writings including creative non-fiction, novels and poetry.

- KAH00002: Arts, Humanities & the future

People working in the humanities work on "wicked problems", issues that have no simple or straightforward solution, problems that require creative, evidence-based, critical application. In this module you will learn to apply critical and creative thinking from a history, media, law, literature, philosophy and other humanities disciplines to the challenges our society faces in the 21st century, including those identified by the United Nations as its seventeen "Sustainable Development Goals", challenges such as gender equality, energy needs and climate change, peace, justice, and biodiversity.

The number of courses/modules presented above is, of course, an underestimate, resulting from the limitations of the data and the methodology. There are many more courses and modules that offer complimentary courses with similar themes e.g. conservation, ecology, climate change, that haven't been included in the basic audit of the curriculum above. Equally, it may not be unreasonable to assume that all courses/modules within Schools such as Natural Sciences and Ocean Sciences are in some way relevant to the environment, but this is not being picked up in using the current approach.

The work in this area over the past year has highlighted two important points;

- There is a clear need to redevelop the methodology and better define what we are trying to achieve. A more systematic and structured approach is required. Working closely in collaboration with colleagues in the Colleges and Schools, to undertake a more comprehensive and in-depth review of modules/course content will be critical to ensuring success.
- There has been increasing interest in identifying how courses/modules relate to sustainability with reference to the Welsh Government's Wellbeing Goals and the UNSDGs. Rather than developing two overlapping workstreams it seems more sensible to pursue the identification of sustainability within the curriculum, as this will also include environment as one pillar of sustainability.

The School of Law have already begun the process of mapping their curriculum content against the UNSDGs and it is hoped that their experience will help guide other Schools in undertaking the same exercise.

To begin the journey of becoming more sustainability-oriented in all facets of the Law School's work, a review of the legal curriculum in undergraduate and postgraduate programmes was devised and commenced in November 2019 by Dr. Tara Smith and Dr. Hayley Roberts[1]. At its inception, four phases of the project were envisaged.

Phase 1 – Preliminary Mapping Exercise
Phase 2 – Engagement with Module Leaders
Phase 3 – Enhancing Sustainability in the Legal Curriculum
Phase 4 – Sharing best practice across the institution

[1] For further information on the methodology and progress contact, in the School of Law:

Dr. Tara Smith, Director of Impact, Sustainability and Equality and Director of Research

Dr. Hayley Roberts, Co-Director of Teaching and Learning

Phase 1 was successfully concluded as follows:

Phase 1 – Preliminary Mapping Exercise (Nov - Dec 2019)
Phase 1 of the project involved preparing a preliminary map of all undergraduate and postgraduate modules against the UN Sustainable Development Goals (SDGs). The aim of this phase was to assess the information on PIP related to each module to determine the extent to which the existing legal curriculum aligned with or explicitly addressed one or more of the 17 identified goals to be achieved globally by 2030. This phase of the project was carried out on time and the results of the mapping exercise can be found here.

Unfortunately, the Covid-19-related disruptions that have occurred since March 2020 have necessitated changes being made to the original methodology and time-frame, but ultimately the project is likely to result in a better overall outcome as a result of these changes. Phase 2 and Phase 3 will be re-designed in the Autumn 2020 to foreground and integrate sustainability into internal reviews of all undergraduate and postgraduate programmes occurring over the next 18 months. Through the School's re-validation exercise, and through the work of the School's Postgraduate Task and Finish Group and the Solicitors' Qualifying Exam Review Group, sustainability in the curriculum will be a key consideration in discussions and decisions made. This whole-of-School approach to enhancing sustainability in the legal curriculum, rather than a module-by-module approach that was originally envisaged, will result in a legal curriculum being delivered by the School of Law which responds strongly to the interests and expectations of future law graduates.

7.10.2 Continual Improvement

As a result of what has been learnt from work to identify the environment within the curriculum over the past two years, and increasing interest in mapping the curriculum against sustainability criteria/goals, it is recommended that changes are made to this target going forward.

Specific recommendations on changes to the target will follow in a separate document.

It is hoped that the work with the School of Law will continue and that other Schools will be able to use their experience and example to conduct their own reviews.

Being able to clearly demonstrate how courses/modules/degree programs at Bangor relate to sustainability could be a key tool in promoting the University both nationally and internationally. Once the work has been done to map this it should be promoted widely, including being incorporated into the prospectus and websites.

7.11 Construction & Refurbishment

Objective: Minimise the impact of the University estate, and any development activities, on the environment

Target 10. Set environmental objectives for all major construction projects (over £100k) and evaluate the effectiveness of these following completion of the projects

Construction & Refurbishment Headlines 2019/20

- Ongoing monitoring and verification for the ReFit project
- Working with PaCS on the Estates Strategy

7.11.1 Performance against target 10

Performance against Target 10	**Partially Achieved**

The ReFit energy efficiency programmes installation phase was completed at the end of 2019. The project has now moved into the monitoring and verification stage, where the performance of the measure installed is monitored and assessed against the savings projected by the contractor.

The significant change in operations and activities brought about by the Covid-19 restrictions has made the process of reporting on delivered savings much more difficult. All initial savings projections were based on the assumption of ongoing normal operating conditions. Work is ongoing with the contractors to ensure that reporting is valid and accurate, and that the objectives set out for the project are met.

Further to this, and as previously discussed,CEPT, Sustainability Lab are working with PaCS to ensure that sustainability and the environment are at the core of the new Estates Strategy.

7.11.2 Continual Improvement

CEPT, Sustainability Lab and PaCS will continue to work together on projects related to the built environment, including the development of the Estates Strategy and proposals for a pathway to net-zero emissions.

8 Proposals for 2020/21 Targets

Proposals for the 2020/21 targets will be circulated separately.

9 Communications

Communications relating to environmental management at the University are primarily received via email, either to the environment@bangor.ac.uk or sustainability@bangor.ac.uk email addresses, or directly to specific members of CEPT. Some messages are also received via social media.

During the 2019/20 year a total of 59 enquiries were received by email, mostly from students but also from staff and external organisations or individuals.

Of these 39 were questions, enquiries or other requests for information in relation to events, campaigns or other elements of environmental management and sustainability at the University. This included one Freedom Of Information request on a wide range of environmental/sustainability topics and two emails from members of staff who are also members of Extinction Rebellion, again with a wide range of environmental/sustainability questions.

Nine emails received were criticisms or complaints, six from members of staff, two from students and one external.
Three were concerning overheating in the Main Library after the new EcoPilot heating control system had been fitted – this was raised with the manufacturer/installer and rectified.
Other concerns raised included access to bicycle parking behind Thoday, poor heating control and windows in Thoday and smells from the waterless urinals in Pontio.

Five emails were complimentary, all related to the announcement of the 100% renewable electricity supply.

Other emails were suggestions of areas students or staff would like Bangor to investigate or improve on, largely related to waste, recycling and sustainability of promotional freebies.

The Sustainability Lab and CEPT have also sent out a large number of communications across a range of platforms and in-person over the course of the 2019/20 year;

- Talks to new students as part of Welcome Week
- Stand at Serendipity
- Waste Awareness Week, promotion and events
- Carnifal, promotion and events
- Training for all domestic staff on waste management
- Waste & Recycling session for International Students
- Reminders for key staff on environmental incident reporting
- “Putting the World to Rights Sessions” on topic including waste, the Climate Emergency, Bangor’s Sustainability Achievements and the EMS
- Student and Staff travel survey
- Combined announcement of being Green Gown Awards Finalists and information on the nominated campaign – Think Before You Drink
- UNSDG sessions for European Funded projects

- Sustainability and the Wellbeing of Future Generations Act sessions for KESS students
- Climathon, promotion and events
- Youth Climate Summit, organised by the School of Education
- Announcement of our 100% renewable electricity supply
- Earth Hour and World Environment Day
- Contribution to lectures on courses including Strategic Environmental Management and Product Design
- Papur Gwyrdd launch

10 Adequacy of Resources

As reported last year, the collection, retention and provision of data continues to be a barrier to the production of this report and, as such, effective environmental management at the University. Improvements to data collection would have benefits beyond the production of this report.

Covid-19 has put additional demands on many members of staff, particularly across PaCS and Health & Safety, both departments with key roles in environmental management at the University. Some tasks have been taken up by other members of CEPT, but capacity to absorb additional work is limited.

There are certain training needs related to environmental management that have been identified, particularly on the matter of Waste Transfer Note completion and verification.

A budget for environmental/sustainability marketing and communications would be beneficial for ensuring students and staff are aware of the University's environmental and sustainability achievements.

Additionally, the draft Biodiversity Enhancement Plan highlights the need for a budget to support biodiversity works across the University.

Appendix 1.

Explanation of Garth Gas billing errors and corrections

In October 2019, the size of the gas bill for Neuadd Garth raised concerns. The bill for October 2019 put the gas consumption for Garth at 100,829 m^3, when records showed Garth had only consumed 6,101m^3 during the whole of 2018/19. On investigation it became clear that the large bill received in October 2019 was the result of a correction for underbilling, seemingly caused by meter reading issues, dating back to 2017.

Looking at bills dating back to August 2017, it appears that at some point during that month a problem occurred which prevented the collection of data from the meter by the supplier. As a result, Garth was billed on the basis of 0m^3 gas consumption from September 2017 until May 2019 – a total of 20 months. Cross-checking against the manual readings taken by PaCS confirmed that this must be the case, as the manual reads showed consumption throughout this period, totalling nearly 1,035,000kWh.

Although bills began showing consumption again from May 2019, it seems that data being received by the supplier was still incorrect in some way as it did not reflect the missed consumption and consumption recorded was still lower than manual readings of the meter were suggesting.

	Garth Gas Consumption as reported from incorrect bills	Adjusted Garth Gas consumption figures calculated from manual reads
2017/18	11,662 kWh	608,461 kWh
2018/19	67,799 kWh	550,204 kWh
2019/20	1,450,047 kWh	369,479 kWh

Given the size of the “correction” within the bills for Garth during October 2019, it was decided to adjust the data in-line with the manual readings to prevent the 2019/20 gas consumption being overstated by roughly 1,100,000kWh, or nearly 6%. The adjustment process has meant gas consumption for 2018/19 was higher than reported, as set out in Table X below.

Previously reported Total Gas Consumption 2018/19	20,509,594.07 kWh
Adjusted Total Gas Consumption 2018/19	20,991,999.07 kWh
Difference	+482,405 kWh (+2.35%)

Unadjusted Total Gas Consumption 2019/20	19,437,239.00 kWh
Adjusted Total Gas Consumption 2019/20	18,356,671.00 kWh
Difference	-369,479 kWh (-5.89%)

Going forward, the adjusted figures for 2018/19 and 2019/20 gas consumption will be used for reporting purposes as they more accurately reflect actual consumption.

Appendix 2

An addendum to the 2019/20 Annual Environment Report

Re: Oil consumption at Treborth Botanic Garden

Section 7.3.3, pages 19-20

This addendum has been produced as it has been highlighted that the Annual Environment Report does not sufficiently represent the situation regarding the consumption of heating oil at Treborth.

For the avoidance of doubt, the available data for oil deliveries to Treborth over the past three years are shown below.

	2017/18	2018/19	2019/20
Heating Oil (litres)	44,212	8,466	35,539

As shown in the table, the reported oil consumption for 2019/20 is significantly higher than reported consumption for 2018/19, but still less than 2017/18.

From discussions with the Curator at Treborth, it seems the 2018/19 figure is likely to be a case of misreporting, or lack of data capture. Across all sites still using heating oil, reported consumption was down by 55% in 2018/19 compared to 2017/18.

Rather than suggesting an issue with oil consumption at Treborth, this reinforces the issues highlighted in the report regarding the availability and quality of data. Oil and LPG has been a particularly challenging area when it comes to data collection and retention, but it is not the only area of the report affected by such issues.

There are a number of possible ways in which the oil & LPG data issue could be resolved. In the first instance, asking the supplier whether it is possible to get electronic invoices/delivery notes instead of the paper versions currently supplied, would make a notable difference. If this is not possible, it may be possible to enable those on-site accepting the oil deliveries to enter information from delivery notes into a database directly, rather than going through the process of paper delivery notes being sent on to PACS for a member of the PACS team to enter into the same database.

This should form part of the wider discussion on how to improve the accuracy of data capture and reporting.