

2020/2021



# Bangor University SDG Progress Report

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# SUSTAINABLE DEVELOPMENT GOALS



# Introduction

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## The Sustainable Development Goals

**"Everything we do during and after this crisis [COVID-19] must be with a strong focus on building more equal, inclusive and sustainable economies and societies that are more resilient in the face of pandemics, climate change, and the many other global challenges we face."**

António Guterres Secretary-General, United Nations

Sustainability is at the heart of Bangor University and is central to our University Strategy 2030:

*"A globally connected University, realising opportunities for success through transformative, innovative, impact-driven research and teaching, with a focus on sustainability: safeguarding the environment, revitalising society's health, and promoting economic, social, bilingual, and cultural vibrancy."*

As a University community, we must act in a manner which ensures that the needs of our students, staff and local community are met, without compromising the ability of those in the future to meet their own needs.

Bangor University's aims are to educate and inspire the next generation, conduct leading research, be a great employer, and to take an active role in the community. We also want the University to be around for at least another 140 years: we want it to be sustainable. To achieve this, we need to use all manner of resources now, and ensure similar resources are still available in the coming decades.

## Sustainability Strategy 2030

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## Sustainability reports are not just about looking back

This Report presents our second annual published SDG report to show a small sample of the many ways in which we are contributing through research, public engagement, learning and students, and operational elements, towards the 17 UN Sustainable Development Goals. This SDG Report is a continuous work in progress - a way for Bangor University to track its impact and improvements over time.

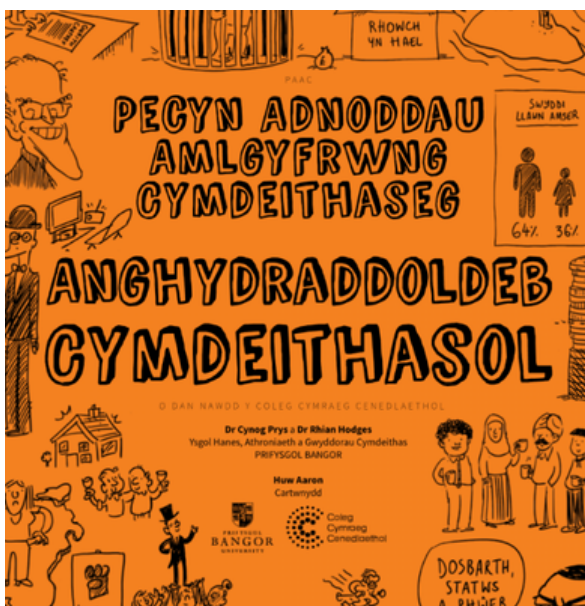
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## RESEARCH

### Cumulative research produces Social Inequalities ebook for students

Addressing the link between poverty and educational attainment, the [resource](#) cites research by Bangor academics and discusses the relationship between educational achievement and poverty in rural areas of Wales. It notes that tackling poverty in Wales is complex and requires consideration of a number of issues including cultural factors, aspirations of parents, benefits culture, the fact that many parents are working long hours in low-paid jobs, and suggests ways of supporting children and improving attainment.



*Multimedia eBook on Social Inequalities*

## Goal: End Poverty in All Its Forms Everywhere

## PUBLIC ENGAGEMENT

### Festival of Social Sciences

Bangor University's 2020 Festival of Social Sciences held sessions that explored and addressed events that are happening in society today, such as; Inequality and Homelessness, Covid-19 and Food Banks, BLM and Institutional Racism; and Climate Change. The aim is to show how social science analysis and research are crucial in explaining and finding solutions.

### Third edition of 'Social Policy for Welfare Practice in Wales' published

'[Social Policy for Welfare Practice in Wales](#)', edited by Bangor University colleagues, examines twenty years of the Welsh Assembly, now the Senedd, and reflects on the social policy successes and challenges of the last two decades.

It considers traditional social policy fields such as health and poverty as well as areas of growing importance, including the environment and human rights and provides a rich resource for social welfare practitioners in their training and as they carry out their work in a distinctly Welsh social welfare context.

### Homelessness - a Comparative Analysis

This [event](#), with a Q&A session and live discussion, sets out to showcase how social science research and analysis can help explain events and offer evidence-based solutions, with a specific focus on Wales. A range of academic staff, guest speakers, and postgraduates were invited to contribute to various aspects of the topics to showcase the importance and influence of social sciences.

## LEARNING AND STUDENTS

### Study

Poverty and Inequality, run by the School of History, Law and Social Sciences, considers many aspects including gender and poverty; ethnicity and poverty; crime and poverty, and regional poverty. It also has a focus on global poverty and the billion people living on less than 2 dollars a day.

### Long-Term Continuation of the Period Poverty and Dignity Pilot Scheme

2020-21 saw the Students' Union launch and evaluation of a Period Poverty and Dignity Pilot Scheme and Campaign, funded by the Higher Education Council for Wales (HEFCW). The main aim of this scheme was to provide all students who menstruate with access to free period products across most male and female toilets on campus in addition to inspiring, educating, and empowering them around menstruation. Building on success further, two free giveaways were also organised by the Students' Union.

### Housing Campaign

The annual housing campaign provides support to students when looking for private housing. The project raises awareness of potential online scams regarding paying fees, provides checklists and information on changing national renting policies, and information on ensuring housing is safe and suitable.



*Students' Union Housing Campaign*

## OPERATIONS

### 350 students benefit from our Digital Hardship Fund

The University's new Digital Hardship Fund has enabled students to purchase digital equipment or internet provision and access online learning provided by the University.

### Scholarships, Studentships, and Bursaries

Bangor University offers a range of bursaries and scholarships to new and returning undergraduate students and postgraduates funded by the University and our Academic Schools. In addition, the International Education Centre also supports international students through a range of awards for international students.

The University also offers a number of scholarships for students classified as refugees, internally displaced, or have otherwise been affected by conflict.

### Sport

Students have free-at-the-point-of-entry sports clubs - subsidised by the University - so the student does not need to pay to access the associated University facilities. Additionally, a limited number of local bursaries are available to athletes of excellence to enable them to use the facilities for free as part of their training programmes.

### Bangor elite athletes Sports Scholarships

Every year, Bangor University supports students with sporting ability by offering a number of Sports Scholarships awarded to recognise and support sporting excellence and achievement. They are aimed at helping talented and high performance students to combine their academic study and sporting performance to assist them in achieving their full potential. This year saw 16 students receive scholarships totalling over £20K for a wide range of sports.





## PUBLIC ENGAGEMENT

### Enterprise by Design: Student Teams Saving the Planet Virtually

The challenge this year was to “act locally, think globally”. By teaming up with Ysbyty Gwynedd hospital, nonprofit organisation Growing for Change, and entrepreneur and farmer Emlyn Williams the groups looked at ways to expand existing enterprises, creating proposals and a media campaign for an enterprise that maintained a healthy planet, reduced food waste, providing local opportunities and food options, and ultimately combating the growing food poverty issue. The ultimate aim was to prove local food enterprises are able to help bring economic regeneration, employability, community support, volunteer opportunities, and more to north Wales.

### Land, Food, and Power

Bangor University hosted the bilingual 4th Dialogues in Decolonising Food Geographies, a collaborative series organised by the Food Geographies Research Group. Speakers addressed decolonising practice and policy by exploring past coloniality, present concerns, and future challenges. Unheard voices informed the inclusive dialogue shaped by the commitment of decolonising practice and inclusivity within food and farming community.

## Goal: End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture

## RESEARCH

### New research reveals anaerobic digestion could undermine UK net-zero emissions

Research by Bangor University reveals that, contrary to industry claims, anaerobic digestion (AD) has a limited role to play in a sustainable future. While it compares favourably to the most environmentally damaging methods of energy generation and waste disposal, there is a raft of alternatives to AD that can better mitigate the UK’s carbon emissions, whilst making more food available.

### University's eco-friendly green packaging for Uganda could soon be on our shelves

Eco-friendly packaging developed by scientists at Bangor University to help women farmers in one of Africa’s poorest countries could soon be on supermarket shelves in the UK. The team and partners in Uganda have been using waste from one of the country’s most important cash crops – maize – for the project which could help cut the use of plastics here.

In Uganda using maize stover – the stalks left after harvesting – could reduce high levels of waste of up to 60 percent from fruit and vegetables and help the country’s subsistence farmers, the vast majority of them women.



*Grass-based packaging*

## LEARNING AND STUDENTS

### Hungry Dragons

Hungry Dragons is a student-led sustainable food project aiming to tackle food waste at Bangor University. Surplus produce is collected from local stores and converted into preserves, which are then sold, with profits donated to food waste-related charities and food banks. The project further raises awareness by providing recipes for students to utilise food scraps, and encouraging them to grow their own produce with step-by-step guides on planting.

### Mindful Chef

The Mindful Chef project provides students with a box of free ingredients each week and a corresponding plant-based online cooking class. This programme ensures students have access to inclusive and healthy food sources; whilst further improving knowledge and confidence in the kitchen.



*Mindful Chef Live Cooking Classes*

### Agroforestry and Food Security MSc

This course provides students with a detailed understanding of the principles and processes of agroforestry as part of a sustainable food production system.

## OPERATIONS

### Foodbank Donations

Efforts have been made to raise awareness within the University of urgent food bank appeals and how year-round donations from students and staff may in turn benefit our student community who use the food bank.

Student Volunteering Bangor's Big Give takes place during May and June and enables students leaving for the summer to donate any unwanted food. Volunteers collect and donate the food to the Bangor Cathedral Food Bank, who distributes it as a 3-day emergency food parcel to those in need.



*Y Rhoi Mawr / Big Give Campaign*

### Sustainable Food and Drink

The University has a Sustainable Food Policy and is committed to delivering tasty, great-value food using fresh and where possible, local ingredients. We use fish from sustainable sources and all our eggs are free range, we offer and support Fairtrade-accredited products in all our outlets, and are working towards the 2021-23 Fairtrade Universities and Colleges Award programme.

Significant purchasing for catering is with suppliers from the TUCO (The University Caterers Organisation) framework which promotes supply chain sustainability and provides extensive information, resources, and networks for us to keep abreast of the latest developments in sustainable catering.



## 3 GOOD HEALTH AND WELL-BEING



### RESEARCH

#### Student makes an impact with vital vitamin campaign

A Bangor University PhD student has had her campaign on making injectable vitamin B12 available over the counter from pharmacies heard in Jane Hunt MP's speech during a Westminster Hall debate.

#### Cost-effectiveness of treatments in neurological diseases

Colleagues at the Centre for Health Economics and Medicines Evaluation, School of Health Sciences, have recently published the results of three clinical trials of interventions in epilepsy and sciatica. Professor Dyfrig Hughes commented: "Our economic assessments support the clinical results in that treatments which were less effective were also not cost-effective. These findings should lead to a change in clinical practice."



## Goal: Ensure Healthy Lives and Promote Well-being for All at All Ages

### PUBLIC ENGAGEMENT

#### 'Well Me' – Improving Health Literacy in Schools

This project run by a practicing GP and medical students from Bangor University works with local school children, aiming to help to improve their self-management of minor health conditions and increase their ability to recognise serious illnesses to build personal resilience.

Improving health literacy at an early age is widely agreed to be crucial in improving Child Health and Development.



*Project C21 medical students at a local school*

#### Twenty Years of Mindfulness at Bangor

Twenty years ago, the Centre for Mindfulness Research and Practice (CMRP) was founded at Bangor University. Over the last two decades, CMRP has pioneered the development of training methods for mindfulness-based teachers. In May 2021 the Centre launched a new book titled 'Essential Resources for Mindfulness Teachers' which represents a gathering of the resources developed over the last two decades to support MBP teachers on their journey.

## LEARNING AND STUDENTS

### Study

The module Music in Health and Well-Being run by the School of Arts, Culture and Languages provides students an opportunity to consider the impact that music can have in a psychological, emotional, and social context, and the connections between music, health, and well-being from a variety of historical and cultural perspectives. Students learn about some of the main areas in which music is used to promote well-being and consider the ways in which music is used in a wide variety of therapeutic contexts, as well as the effectiveness of music in treating physical and mental health conditions.

### Opportunities to Support Students' Mental Health and Well-being

To support students' mental health and well-being during the challenging Covid-19 pandemic, the Students' Union delivered a number of campaigns and events. This included activities as part of Healthy Living Month, Give it a Go campaign, Canine Calming sessions for students during study periods, Emotional Resilience Training, and Well-being Walk and Talks - the success of this particular project resulted in "Volunteering Project of the Year" for the 2020/2021 period.



*Canine Calming session for students*

## OPERATIONS

### Student Well-being Services

The Student Support and Well-being Service has a range of free mental health support offered through the well-being service including individual counselling, individual support from a mental health adviser, and specialised group sessions including dialectical behaviour training to support emotional skills.



*Student Walk and Talk Sessions*

### Staff Health and Well-being

In addition to an in-house Occupational Health Practitioner, Bangor has a free Employee Assistance Program (EAP) to help staff and their families deal with work-life stressors, family issues, financial concerns, relationship problems, and other wider concerns. Well-being Champions, training, and promotional opportunities help encourage good health.

### Sport Bangor

Our indoor and outdoor on-site sports facilities offer a range of activities and services to students, staff, and members of the public. Approximately 70 local clubs and groups use the site for their activities and the University hosts the majority of local school's athletics events and finals.



## RESEARCH

### **Creative Writing, Translation and Cross-Cultural Understanding: Placing Wales in the World**

Bangor University's pioneering research into translation, award-winning creative writing, and poetry criticism from Wales has preserved, enhanced, and transformed the global understanding of English writing from and about Wales, influencing translation as creative practice; raising local and international audiences' awareness of Wales' bilingual literature in innovative and powerful ways, and contributing to a sense of local and international community through cross-cultural understanding.

Beneficiaries include the general public in Wales and the UK, as well as writers and translators in Wales, Europe, Latin America, and other anglophone countries.



*Leap into Literacy program*

**Goal: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All**

## PUBLIC ENGAGEMENT

### **Leap Into Literacy**

Leap into Literacy (LEAPS) is a short six-week program run by the Miles Dyslexia Centre. The project pairs student volunteers with a child and they work together during six Saturday sessions run by specialist teachers. LEAPS is designed to enhance reading, writing, and spelling skills. Children also engage in oral activities including listening to stories, learning vocabulary, and working with words, all of which will support their reading development.

### **Languages for All**

Six language courses are available for staff, students, and the public from beginners to learners who may want to brush up on rusty language skills and/or continue from GCSE/A-level studies.

### **Bangor University launches the Intensive Learning Academy (ILA) - to drive global healthcare revolutions**

This makes Wales the first country in the world to launch specialised ILAs that will deliver transformation across preventative health, value-based health and care, and innovations in health and social care.

A £9m investment has seen leading Welsh universities create a range of flexible courses that include degree-level opportunities within these growing fields. They are open for professionals from the health and social care, and life sciences sectors across the globe to learn together, and will train and prepare the next generation of global leaders supporting health and social care systems.



## LEARNING AND STUDENTS

### **Bangor young entrepreneur puts words into action with public speaking venture**

A [Bangor University student](#) has built on her love of public speaking to launch a business that helps children to develop confidence skills from a young age.

Practice What You Speak, provides public speaking workshops to young people across the UK. The workshops are targeted at three age ranges, 7-11 years, 12-17 years, and ages 18-24, and are aimed at children who are already comfortable with speaking in public but want to hone their skills or children who lack confidence and need additional support. Through activities including tongue twisters, pronunciation practice, and debating games.

### **Coleg Cymraeg appoints new Higher Education Ambassadors from Bangor University**

Coleg Cymraeg has appointed five new ambassadors from [Bangor University](#) to make some noise and encourage more prospective students to take an interest in Welsh-medium higher education. Their main role will be to encourage more learners from schools and further education colleges to pursue their studies through the medium of Welsh and explain the benefits of doing so.



*Coleg Cymraeg ambassadors*

## OPERATIONS

### **CaBan Teacher Education at Bangor University awarded prestigious five-year national accreditation**

[CaBan Teacher Education programmes at Bangor University](#) have been awarded accreditation to provide initial teacher education (ITE) for the next 5 years. The accreditation includes a new and innovative cross-phase pathway for Welsh medium teachers which gives trainee teachers experience in both the Primary and Secondary phases.

The undergraduate and postgraduate CaBan accredited teacher qualifications, housed at the University's School of Education and offered through the CaBan Bangor partnership, have received accreditation from the Educational Workforce Council, the body responsible for accrediting initial teacher education programmes in Wales.

### **Treborth Botanic Garden**

[Treborth Botanic Garden](#) maintains a strong programme of educational outreach activity and engagement with the local community. It hosts field excursions, educational workshops, specialist seminars, technical training sessions, and social events for over a hundred local organisations and societies.

In addition, as the Wales Coastal Path winds all through our woodland interaction with the garden is increased by the public. The footfall on the path was approximately 62,800 during 2020/2021.

The Garden is a haven for biodiversity, from native plant species, 165 species of fungi, many species of marine, woodland and garden birds, breeding red squirrels, a heronry, a plethora of small mammals and orders of invertebrates. In 1997, the Friends of Treborth Botanic Garden was founded, with a remit to help improve the gardens and facilities.

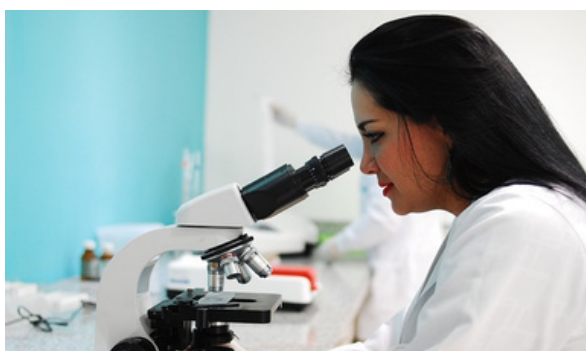


## RESEARCH

### Enhancing spatial ability to help close the gender gap in STEM

Bangor University is to contribute expertise to a new [Europe-wide project](#) to improve children's spatial abilities, with the aim to help close the gender gap in science, technology engineering, and mathematics (STEM). Pupils with high levels of spatial ability are much more likely to succeed in STEM subjects, enjoy doing them and select them for further education and careers compared to those with low spatial ability.

Over four years SellSTEM will recruit and train 15 PhD students to develop innovative and practical approaches to improve spatial ability among young people in Europe, so they are better prepared for learning science, technology, engineering, and mathematics (STEM) subjects.



*Europe-wide STEM project*

## Goal: Achieve Gender Equality and Empower All Women and Girls

## PUBLIC ENGAGEMENT

### Mapuche-Indigenous organisations and female leadership: Becoming a 'presidenta' in Santiago de Chile

This [public lecture](#) explores the challenging prospects that restricted urban Indigenous women to a domestic realm, either as domestic workers (nanas) or mothers in rural Chilean communities. The presentation explores the leadership trajectories from male to female leadership roles.

### Celebrating International Women's Day

Our [International Women's Day](#) session was an insight into Marian Wyn Jones, the University's first female Chair of Council personally reflects on her career journey to date, reflecting on the ways in which she has chosen to challenge and inspire change at different stages of her career, drawing out some of the lessons learned along the way. She will also talk about her role as Chair of the University's Council and how continuing to challenge is key to ensuring the University achieves gender equality.

### Women in STEM Event

STEM (Science, Technology, Engineering and Maths) and gender equality are both vital for the achievement of the 2030 Agenda for Sustainable Development and [eight speakers retold their Careers in STEM](#). The event was a collaboration between M-SParc and five Bangor University STEM projects: the Digital Signal Processing (DSP) Centre of Excellence, Smart Efficient Energy Centre, Centre for Photonics Expertise, Centre for Environmental Biotechnology and TrioSciCymru.



## LEARNING AND STUDENTS

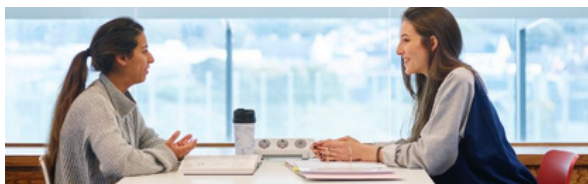
### Study

A range of modules at Bangor University are concerned with issues of gender equality, encouraging students to reflect on the cultural construction of gender and its social, economic, and political impacts from the Medieval period to the present. Modules include [QXE-1013 Reading, Thinking, Writing](#), [QXE-1014 The Gothic in Literature and Film](#), and a range of period-based second-year and third-year modules including [QXE-3096 Medieval Women's Literature](#), [QXE-3107 EM Lit: Sex, Sects, and Scandal](#), and [QXE-3110 Neo-Victorian Fiction](#), among others.

### Equality & Diversity Scholarships 2020/21 Awarded

Three '[Equality & Diversity Scholarships](#)' have been awarded to exceptional Bangor University 2020 graduates.

The University's Equality & Diversity scholarships, which cover the full course fees, are to support graduating students in continuing their studies at Bangor - particularly in areas where there is an underrepresentation of certain groups at postgraduate level, and/or a loss of women across the career pipeline.



### Student Data 2020/2021

Women continue to make up the majority of students studying at Bangor with [61.6% of all students identifying as female](#), higher than the UK figure of 57% and Wales figure of 56.4%.

There are also small gender differences in outcomes, with more female students graduating with a first-class degree.

## OPERATIONS

### Athena SWAN

We are focused on achieving real cultural change within the University and our individual Schools and Departments. Our [Athena Swan awards](#) demonstrate an ongoing commitment to the advancement of gender equality and diversity: representation, progression, and success for all.

In recognition of this, the University already holds a Bronze Institutional Award and the following Schools have all been awarded Athena Swan Bronze in recognition of their ongoing commitment to gender equality for staff and students: [Computer Science and Electronic Engineering](#), Psychology, Business, Ocean Sciences, Natural Sciences, Health Sciences, Sports, Health and Exercise Sciences.



### Athena Swan Gender Charter

### Gender Pay Gap Reports

Equality, diversity, and inclusion are central to our strategy and activity. Since we first [reported](#) on gender pay gaps four years ago, the University's median gender pay gap has reduced by almost 5.5%. Our Gender Pay Gap continues to decrease, with our median gender pay gap standing now at 5.7%, down from 7.2%, and 10.8% in 2020 and 2019 respectively.

### Employee Support Policies and Procedures

Bangor University has an extensive suite of [employee support policies](#), such as maternity, adoption, and parental leave, time off for dependants and emergencies, and flexible and dynamic hybrid working.



## PUBLIC ENGAGEMENT

### **“Love our Bogs” - scientist helps create artwork for Edinburgh Science Festival**

A piece of virtual artwork has been created for the Edinburgh Science Festival encouraging people to love bogs, which help keep our drinking water clean and can help control flooding events.



*Holly McKelvey artwork - Love Our Bogs*

### **School of Health Sciences MOOC shortlisted for Nursing Times Award 2020**

A MOOC (Massive Open Online Course), developed by staff at the School of Health Sciences, has been shortlisted for the Nursing Times Awards. The MOOC is a distance learning course that offers bite-size learning units focusing on enhancing knowledge about the principles of infection prevention, leadership, behaviour change, championing, and the workplace context.

## **Goal: Ensure Availability and Sustainable Management of Water and Sanitation for All**

## RESEARCH

### **UK's biggest microplastic citizen science project at Bangor University**

The UK's largest citizen science project of its kind looking at plastic pollution is underway at Bangor University.

Water samples from all over the country are being examined to see how many microplastic fragments they contain. The water, from rivers and lakes, has been collected by an army of volunteer outdoor swimmers.

### **Global study finds nature sanitizes 41.7 million tons of human waste a year**

The first global-scale assessment of the role ecosystems play in providing sanitation finds that nature provides at least 18% of sanitation services in 48 cities worldwide. The study estimates that more than 2 million cubic meters of the cities' human waste is processed each year without engineered infrastructure.

Wastewater treatment infrastructure that converts human feces into harmless products is an important tool for global human health. However, more than 25% of the world's population did not have access to basic sanitation facilities in 2017, and another 14% used toilets in which waste was disposed of onsite.



*Pit latrine. Credit: Simon Willcock*

# LEARNING AND STUDENTS

## Drinking Water

All University catering outlets can refill reusable water bottles for free, and there are also water dispensers located around campus.



Waterbutts at Treborth Botanic Garden

## Study

Water, air & soil pollution, is an undergraduate module run by the School of Natural Sciences. It looks at understanding how manmade pollutants affect the biosphere and the impact on humans, and also their impact on plants. It deals with major global environmental topics such as heavy metals, microplastics, pesticides, human pathogens, biodiversity loss from rivers, acid rain, salinity, and water scarcity.

The module Freshwater Ecosystems & their Goods & Services looks at the actual and potential human impacts on freshwaters and their Ecosystem Goods & Services. This includes understanding the available options for conservation and management of freshwater ecosystems and the context in which any decisions must be made, and looks at the relationships between chemical, physical and biological components of these systems.

# OPERATIONS

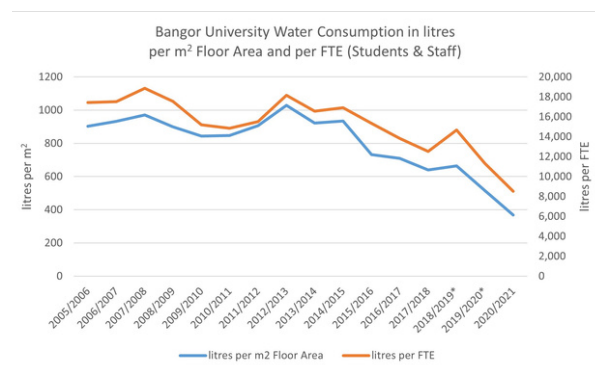
## Reducing Water Consumption

Site refurbishment programmes over the past few years have meant the installation of some higher water efficiency low flow taps, low flush toilets, waterless urinals, and the use of automatic sensors. Treborth Botanic Garden and Henfaes Research Centre/Bangor Forest Garden all make use of waterbutts to collect rainwater for the purposes of watering plants. Within our Halls of Residence showerheads are efficient models that reduce water consumption by more than 18%.

Our Environment Centre Wales building was designed with a rainwater harvesting system. The water collected by the building is used to supply water for all the toilets in the building. Modelling based on the roof area of the building and average annual rainfall project that the building will collect 315,000 litres of water per year.

## Water Management

During the 2020/21 academic year, Bangor University used more than 83,710 cubic meters of water. The University sets itself targets to reduce water use as part of its Environmental Management System. Between 2005 and 2021, total water use was reduced by 59.3% per m<sup>2</sup> floor area. The University sets itself targets to reduce water use as part of its Environmental Management System. Our annual target aims to reduce water consumption by 2% compared to the previous year.



Bangor University's Water Consumption



## 7 AFFORDABLE AND CLEAN ENERGY



### RESEARCH

#### Ocean scientists use seabed mapping to help position giant windfarm

Scientists at Bangor University are playing a critical role in paving the way for one of the world's biggest wind farms off the coast of north Wales.

They are working with German renewable energy giant RWE on the siting of the Awel y Môr extension which will more than double the size of the Gwynt y Môr wind farm, already the world's fifth largest. Their expertise in 3-D mapping the seabed is crucial in plotting the location of the giant turbines and in helping plan for the next generation of deep-water wind farms off the coast of north Wales and will play a key role in the Government's green ambitions to power every home in the country with wind energy by 2030.



*Seabed mapping on wind farms*

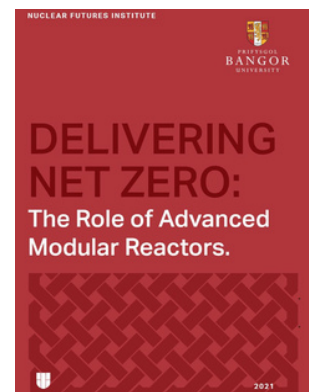
### Goal: Ensure Access to Affordable, Reliable, Sustainable and Modern Energy

### PUBLIC ENGAGEMENT

#### Nuclear Futures Institute (NFI)

Bangor University is to become a world-leading nuclear research site after a £3 million Welsh Government investment in 15 new science posts. The new investment will help NFI expand into the fields of nuclear medicine, using radioactive chemicals to diagnose and treat heart disease and many cancers, structural materials, preventing radioactive leaks from nuclear reactors, and nuclear fusion.

The delivery of carbon Net Zero will depend on the successful deployment of a range of low-carbon technologies – including nuclear. The Government's Ten Point Plan for a green industrial revolution includes growth in renewable technologies, and green hydrogen as well as delivering new and advanced nuclear power for electricity production and other suitable applications.



#### *Advanced Modular Reactor Report*

Delivery of the first Small Modular Reactor (SMR) and Advanced Modular Reactor (AMR) demonstrators is targeted to be in place in the early 2030s. Given this ambitious target, NFI hosted a workshop to discuss the role that AMRs can play in the delivery of the Government's plan.

## LEARNING AND STUDENTS

### Study

Bangor's investment in future energy sustainability goes beyond research and the University is training the next generation of world-leading engineers and researchers. Bangor teaches several courses that equip students with these skills.

Sustainable Renewable Energy, run by the School of Computer Science and Electronic Engineering aims to provide students with an understanding of renewable energy supplies, the engineering that supports them, and related concerns.

Renewable Energy, run by the School of Natural Sciences provides an overview of global energy supply and demand. It studies the most common renewable energy technologies and their role as alternatives or supplements to energy use involving finite fossil fuel resources.

Marine Renewable Energy, in the School of Ocean Sciences gives an in-depth understanding of the marine renewable energy industry, including the current status and challenges facing the industry.

The University also runs a four-year integrated undergraduate Masters (MEng) in Control and Instrumentation Engineering, which lies at the heart of Nuclear and Renewable power generation.

The University is making a particular contribution to advancing the higher-level nuclear skills agenda. Bangor has a distinct opportunity to contribute to the nuclear skills agenda as its research advances and new academic capacity becomes available. Its partnership with Horizon Nuclear Power has given rise to career workshops and opportunities for student Interns to visit Horizon's parent company Hitachi-GE Nuclear Energy Ltd at Hitachi City in Japan.

## OPERATIONS

### Energy Use at Bangor

During the 2020/21 academic year, Bangor University used around 34 million kWh (34 GWh) of energy. That's equivalent to the annual energy use of around 2,281 average UK homes. Most of this energy (20.3 million kWh, approximately 59.7%) was in the form of natural gas for heating buildings and providing hot water. Carbon emissions associated with the University's use of natural gas totalled 3,718 tonnes CO<sub>2</sub>e for 2020/21.

### Energy and Carbon Emissions

As a University, we understand that our use of fossil-fuel-derived energy is contributing to global climate change. In 2019, the University declared a Climate Emergency and in 2020 approved a target to reach net zero carbon Scope 1 and 2 by 2030.

Since 2005, the University has been working to reduce energy use and associated carbon emissions. Between 2005 and 2021, we reduced our total energy use per m<sup>2</sup> floor area by 42.4%. With the introduction of our renewable electricity tariff, we reduced our reported carbon emissions by 79.7% between 2010 and 2021 (per m<sup>2</sup> floor area).

### Solar Photovoltaic Panels

The University now has 7 buildings fitted with rooftop solar panels. The panels are expected to generate more than 180,000 kWh of electricity per year.



*Solar Photovoltaic Panels installed on the roof of Canolfan Brailsford*



## 8 DECENT WORK AND ECONOMIC GROWTH



### RESEARCH

#### **New initiative to help Welsh SMEs innovate to recover**

Knowledge Transfer Partnerships (KTPs) are a core component of Wales' R&D and innovation offered to businesses. The aim of this initiative is to make KTPs more accessible and cost-effective for SMEs and encourage more businesses to benefit from the programme. With the current difficult economic environment, Welsh Government have announced that they will contribute 75% towards the total costs of KTP projects that meet the eligibility criteria and are approved for participation in the KTP programme. SME businesses are usually expected to contribute 33% of the total project costs, but eligible businesses in Wales will now only have to contribute 25%.

#### **Post-Covid shift away from global supply chains could boost north Wales economy**

A backlash against globalisation in the wake of the Covid-19 crisis can kick-start north Wales's powerful manufacturing sector with a boom in cutting-edge technologies like 3D printing boosting the recovery. A Bangor University economics lecturer, predicts more businesses and governments will want to have their supplies closer to home as they emerge from months of unprecedented lockdown.

**Goal: Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All**

### PUBLIC ENGAGEMENT

#### **M-SParc launches Skills Academy to help plug the digital talent gap**

Continuing to find innovative and exciting ways to help grow the north Wales economy and develop exciting career opportunities, M-SParc has recently pressed the launch button on a scheme designed to assist young people into careers in the digital sector.

There is still significant demand for skilled people in digital roles in north Wales. Challenges companies across Wales face in recruiting to the digital sector are well known. Bangor University's M-SParc, working with the Regional Skills Partnership, hopes to help tackle those issues by forming this academy, offering people the work experience and guidance to take advantage of the well-paid careers available in the sector.

#### **Graduates gain employment during 20-year business relationship**

A biotechnology company and the University are celebrating more than two decades of a partnership that has resulted in multiple employment opportunities for graduates. Bee Robotics and Bangor University first started working together in 1998 and the relationship has proved vital for both organisations.

In addition to securing jobs with an innovative local employer, students have benefitted from work placements and feedback on their work and skills at meet-the-employer events. Bee Robotics, has been able to bring in additional resources to help focus on new areas and activities to support growth.

## LEARNING AND STUDENTS

### Skills and Employability Service

Enterprise and entrepreneurship support for students and graduates is delivered through [B-Enterprising](#). The support includes one-to-one business mentoring, test trading opportunities, access to funding, networks, support, and webinars. 2020 highlights include: 70 students received £36,300 of funding to test trade or do market research to develop an idea, 34 students started their own businesses during the year, 115 business mentoring advice meetings were held, and 9 students and graduates were offered a desk at the Santander Universities Incubation space at M-SParc.

### Bangor University and Coleg Cambria sign new Collaborative Relationship

A [Joint Statement of Intent](#) has been signed which sets out aspirations to work together across the skills levels and to link the skills agenda across north Wales. The collaboration seeks to target those sectors most affected by the Covid-19 pandemic and the need to help the workforce re-skill and upskill in priority areas such as software engineering, manufacturing, engineering, and support for the nuclear sector. Some targeted projects are already being developed and both organisations are committed to working with regional employers and learners to ensure agile and relevant education and skills across the levels for north east Wales.

### New employability programme for autistic students

Bangor University has joined The Employ Autism Higher Education Network. The [nationwide programme](#) will enable autistic students and graduates studying at Bangor to access paid internships and tailored careers support and advice. It will also ensure local businesses can benefit from neurodiverse talent within their workforces.

## OPERATIONS

### Living Wage Employer

Bangor University is a [Living Wage employer](#), accredited by the Living Wage Foundation. The Real Living Wage rates are independently calculated based on what people need to live on.

### Undergraduate Internship Scheme

The University's annual [Undergraduate Internship Scheme](#) is fully funded allowing University colleagues who wish to provide an opportunity in their School/Department for an undergraduate student. All internships are project-based and last 80 hours.

### Slavery and Human Trafficking Statement

Bangor University recognises that it has a responsibility to take a robust approach to slavery and human trafficking. The [University is committed to preventing slavery and human trafficking](#) in its corporate activities, and seeks to ensure that its supply chains are free from slavery and human trafficking.

### Non-profitmaking Nursery

[Tir na n-Og Nursery](#) is open to university students and staff and members of the public, with part-time and full-time places available for the Babyroom, Toddler Room, and Playroom/Classroom. They also provide staff with parental responsibilities and more affordable childcare via our salary exchange arrangement.



*Tir na n-Og Daycare - outdoor space*

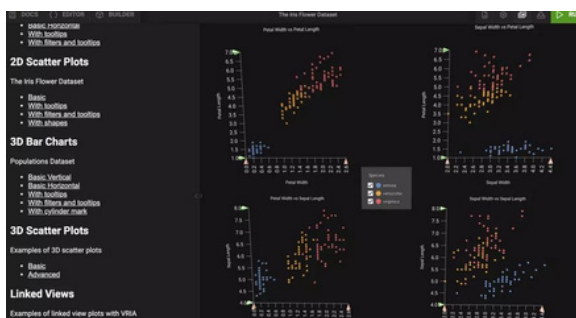
# 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



## RESEARCH

**Revolutionising the way we interact with data**

A new Web-based virtual reality 3D information system could revolutionise how we see and interact with our data, according to the computer science experts from Bangor University who have pioneered it. They are enabling the immersive presentation and exploration of data insights in scientific research and our everyday lives, all from within a Web browser on desktop, mobile and virtual reality platforms.



*Virtual Reality Immersive Analytics tool*

The system can be used to create computer-generated and data-driven informational layers, which can be seen on top of our physical world, through a smartphone, or a see-through head-mounted display. For example, users can see the energy profile of a property they are about to rent, or the crime data on that street - as computer graphics displayed on top of the house, or the street.

**Goal: Build Resilient Infrastructure, Promote Sustainable Industrialisation and Foster Innovation**

## PUBLIC ENGAGEMENT

**Celebrating 10 years of investment to build a greener economy**

The BEACON project which promotes collaboration to grow the economy and create green jobs has, since its launch in 2010, built up a strong skill base in the bio business sector, by providing collaborative R&D support for green Welsh businesses; and has positioned Wales as a leader in world-class research and innovation into the low carbon economy.

Developing products and services which are sustainable is helping Wales to meet international targets for tackling climate change and recycling. The focus is on developing new green products and services from natural sources and creating added value from waste and residues from bio-industrial processes. Products include bioplastics, food additives, building materials, fuel, cosmetics, and pharmaceuticals.

BEACON has worked successfully with hundreds of companies, enabling them to develop and trial ideas on an industrial scale, and to get their products and services closer to market.



*BEACON Project facilities*

## LEARNING AND STUDENTS

### Study

The third-year module QXE-3109 Victorian Networks encourages a critical stance on historical infrastructures, asking students to engage on contemporary access to infrastructures, and the debate about privatised infrastructures vs infrastructures as public goods. In particular, students focus on communication and transport infrastructures and are encouraged to question the global North's taken-for-granted access to running water, electricity, etc.

### Bangor Graduates launch platform set to change how we learn languages

Two Bangor University graduates have created the very first data-driven language-learning platform, using the power of data science. The University supported the venture through B-Enterprising, the Welsh Government's Youth Entrepreneurship Programme, and Santander Universities, with the provision of free Incubation space at M-SParc and funding to allow them to develop and test their business ideas.

### Bangor Entrepreneur awarded in Santander Universities Emerging Entrepreneurs Awards 2020

With over 80 entries, MSc student Jan Lloyd Nicholson was one of four semi-finalists to represent Wales but the only one to succeed in scooping an Award. Henry's Cushion, a non-verbal educational aid, was born out of a conversation with Jan's autistic son Henry.



*Jan Lloyd Nicholson with Henry's Cushion*

## OPERATIONS

### Business Engagement

Bangor University has a successful track record of working in partnership with businesses to develop people, products and processes.

### Consultancy / Access to Facilities

The University offers direct access to academics and research groups through bespoke consultancy projects. Consultancy allows businesses to access University expertise to find solutions to specific problems in a highly focussed and efficient manner. Consultancy services include but are not limited to; advisory, analysis, testing, expert opinion, expert witness, and training.

### Pontio Innovation

This is an inspirational business development hub which nurtures outstanding ideas and helps to make them a reality. We work with a network of members, from individuals to SMEs and larger enterprises. We help our members to identify new thinking, methods and processes which will help them to develop and succeed.

### Training and Continuing Professional Development (CPD)

Bangor University's training programmes and short courses are aimed at individuals looking to enhance their own skills and employers looking to develop their workforce.

The **20Twenty Business Growth Programme** develops and enhances business growth and leadership skills.

The **ION Leadership Programme** develops and enhances leadership skills.

**fabLAB** gives businesses access to training and self-help prototyping. It takes an idea and makes it real, prototype it, develop products, start a business, make a crowd-funding video, collaborate, inspire and learn.





## RESEARCH

### Large international survey to ask informal caregivers about their experiences

Researchers at Bangor University's School of Psychology are leading a work package within a larger collaborative European Union Horizon 2020 research and innovation programme project (ENTWINE). This project, involving leading health researchers in the Netherlands, Italy, Sweden, and Israel, is collecting multi-national data on positive and negative experiences of both caregivers and care recipients, and on the kind of personal and social factors that influences their experience.

The information drawn from this will feed into other work packages which will develop and measure the effectiveness of various different levels and types of innovative support for these vital, unpaid, and often largely unsupported care providers in our communities.



*ENTWINE Survey on Informal Care*

## Goal: Reduce inequality within and among countries

## PUBLIC ENGAGEMENT

### Changing Blood Donation Policies

Bangor University staff and students have contributed to changing policies for Blood Donations. Researchers at the School of Health Studies have welcomed changes to the UK blood donor selection policy, from being one based on sexuality to one based on individual sexual behaviour.

As a result of the review, and ministerial approval, men who have sex with men in a long-term relationship will be able to donate blood in a change to be implemented across the UK in Summer 2021. The move sees the UK become one of the first countries in the world to adopt a more individualised risk-based approach to donor selection criteria.



*Blood donation expansion*

### Widening Access Centre

The Widening Access Centre was established in 2012 to promote the University's presence and work in the community that is such an integral part of it. They aim to promote and safeguard fair access to higher education, including identifying individuals with the greatest potential from disadvantaged backgrounds, raising educational aspirations, and developing skills that prepare students from underrepresented groups for higher education.



## LEARNING AND STUDENTS

### Study

Bangor University introduces students to a diverse and challenging range of reading materials in our commitment to teaching and reducing inequalities. Students encounter texts that critique inequality and, in some cases, imagine radical solutions in various modules, including [QXE-4042 Revolution/Modernity 1790-1930](#), [QXE-3114 Dystopian Fiction](#), and [QXE-3110 Neo-Victorian Fictions](#).

### Student Data 2020/2021

19.4% of all [Bangor University students](#) identified as Black, Asian, and Minority Ethnic in 2020/21.

22.5% of Bangor University students registered during the period 2020/21, were recorded as having a disability. This is much higher than the UK figure of 14.9% and the Wales figure of 15.8%.

### LGBT+ Society

The [Students' Union's Bangor LGBT+ Society](#) provides a safe and welcoming environment for members of the LGBT+ community. As well as focusing on social aspects, they also run campaigns and collaborations with various other societies at Bangor University.



*Bangor LGBT+ Society*

## OPERATIONS

### The Strategic Equality Plan 2020 – 2024

The University continues to support and promote equality, diversity, and inclusion. To do this we have worked closely with staff and students to support our diverse community to deliver an outstanding student experience and excellent teaching and research.

The [Strategic Equality Plan 2020 – 2024](#) was published after consultation with staff and students about their views regarding equality in the University and what actions they wish to see implemented. The Plan has four themes: The Whole University, Student-focused, Staff-focused; and Community and Civic.

### Mandatory Training

The University requires all staff to undertake mandatory training on Equality and Diversity and Unconscious Bias, to identify, tackle and eradicate unlawful discrimination, and to help the University develop an inclusive workplace.

### Staff Data

In 2020/21 6.86% of [staff identified as BAME](#), and 9.59% identified as disabled. We continue to be a Disability Confident Employer and work with the DWP and others to improve access to workplaces for disabled staff.



*Disability Confident Employer*

### Student Support

The [Student Services](#) team consists of many services and support for Disability, Dyslexia and other specific learning differences, Chaplaincy and Faith, mature students and families, International Societies, and an International Education Centre.

## 11 SUSTAINABLE CITIES AND COMMUNITIES



### RESEARCH

#### **Bangor team's Real Ice machine featured as part of global 'for tomorrow' initiative**

A north Wales company, formed by a team of graduates and current students at Bangor University, has invented a revolutionary ice-making machine powered by renewable energy to replenish melting polar ice caps in the battle against climate change.

The machine will create new layers of sea ice that the wildlife and the people of the region need to survive. The plan is for the indigenous Inuit people to own the machines, maintain them, and move them to new areas regularly while earning carbon credits which can then be sold to companies to offset their fossil fuel use, enabling them to sustain their communities.

#### **Children's rights and technology in the digital age**

A Bangor University Professor contributed two sessions, one on the role of emotional AI in education, and another on AI, emotion, and toys to a course 'Children's Rights and Technology in the Digital Age' for the Global Campus on Human Rights. Fellow lecturers included Edward Snowden (US surveillance whistleblower), Joe Cannataci (UN Special Rapporteur on the right to privacy), and Mary Jo Madda (Google), among others.

## **Goal: Make Cities Inclusive, Safe, Resilient and Sustainable**

### PUBLIC ENGAGEMENT

#### **Pontio and Maes Ni reach final for North Wales Police Grant**

BLAS, Pontio's youth participation programme, alongside Maes Ni community hub located in the Maesgeirchen estate in Bangor, has reached the final round of the North Wales Police's Your Community, Your Choice Grant. Pontio and Maes Ni's aim is to take art activities 'to the streets' for Bangor's young people, in a safe and fun environment.



*BLAS, engaging young people with the Arts*

#### **Civic Mission: working with our community**

Bangor University has a long history of working with our community to raise aspirations and improve quality of life, through sharing knowledge through social and public engagement. Some examples include Pontio Arts and Innovation Centre, Canolfan Brailsford sports facilities, M-SParc Science Park, Treborth Botanic Garden, Parc y Coleg, Student Volunteering, Bangor 1876 football club, Rygbi Gogledd Cymru, North Wales Dragons community football team, Festivals, shows and the Eisteddfod, International Education Centre, Confucius Institute, Print Unit, Library Services, Centre for Mindfulness Research and Practice, Archives and Special Collections service, and a Museum and Art Gallery.

## LEARNING AND STUDENTS

### Student-led Volunteering Projects

The Coronavirus Pandemic and its associated restrictions inspired the creation of a number of new environmental, student-led volunteering opportunities at the Students' Union.



*Elderly Tea Parties at the University*

These included Elderly Tea Parties, gardening for kids at the student-led Healing Gardens, Monitoring the Dragons, and the Dynamic Dunescapes Project. Some volunteering projects even worked together to offer intergenerational and cross-project activities, connecting different communities.

The Snowdonia Donkey Sanctuary provides three projects for students; conservation and land management and walking the donkeys with elderly members of the community. It also enables children from the local community to visit to get them involved and build confidence around animals.



*Walking donkeys with the elderly community*

## OPERATIONS

### Dynamic Working

The Covid-19 pandemic had a profound impact on the way in which we work. We have now moved to a dynamic working approach, giving a balance where staff are in the office for some of the week and at home for the remainder.

### Green Spaces and Greener Travel

Cycle racks and showers are available near every building on site for use by staff, students, and the public.

To reduce traffic to parts of the campus, we have mapped and encouraged walking, and also encourage all to access our 18 hectares of free grounds at Treborth Botanic Garden which also houses a section of the Wales Coastal path through the mixed woodland.

### College Park Project

A park for Bangor, a park for everyone. Historically, the park has been treated as an isolated space with its use and purpose unclear, now plans are underway to make this park a more welcoming place for everyone to enjoy.

### Library and Archives Service

Bangor University has two open-access libraries, covering a wide range of topics. Anyone can visit us during our staffed service hours and browse our collections on a reference basis without charge. Items are free of charge through local or national reciprocal borrowing schemes.

Our Archives and Special Collections hold many unique manuscripts, printed material, and rare books. Our collections are open to the public and can be consulted in the Archives Reading Room or Education Room for group visits. In addition free online exhibitions also take place a few times a year.

## 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



### PUBLIC ENGAGEMENT

#### Trash Free Trails – in Snowdonia

An innovative two-year research project between Trash Free Trails, a non-profit organisation, and Bangor University to reduce litter and single-use pollution has been launched with representatives from Bosch eBike Systems, Natural Resources Wales, Snowdonia National Park, Trek Bikes, British Cycling, the National Trust, professional athletes, and more.

Litter has become a hot topic in the marine environment and beach cleans have become a valuable tool for raising awareness and generating data on the sources of pollution in our seas. The Trash Free Trails mission is to bring the 'beach clean mentality' to our beautiful inland wild spaces.

#### North Wales rapeseed waste for beauty products, burgers, and building panels

Scientists from Bangor University are working on a 3-year scheme to save millions of tons of waste from food production being dumped in landfill or fields. The Bio-composites Centre is collaborating with public and private sector partners, including Mars and Tate and Lyle, from 6 different EU countries. The project aims to add value to a range of residues from crops grown in the EU, including rapeseed, oranges, tomatoes, and olives.

### Goal: Ensure Sustainable Consumption And Production Patterns

### RESEARCH

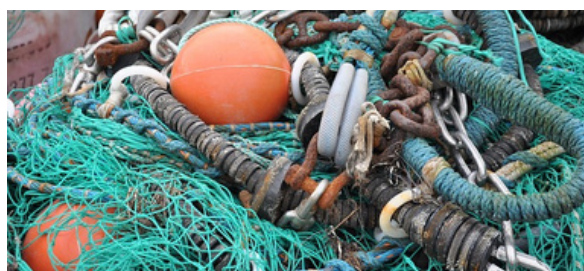
#### Microbial enzymes for sustainable detergents, textiles, and cosmetics

More environmentally friendly consumer products, from detergent to textiles and cosmetics will be manufactured as a result of work by Bangor University scientists and their project partners in the EU-funded multidisciplinary research consortium FuturEnzyme, "Technologies of the future for low-cost enzymes for environment-friendly products".

#### Project seeks bait bag alternative to reduce plastic pollution

A unique partnership of marine conservation committed organisations, drawn from the education, NGO, and private sectors have launched a project to prevent a particular source of plastic from entering the marine environment.

Marine conservation charity, Sea Trust Wales, together with the largest shellfish supplier in Europe, Macduff Shellfish, and the BioComposites Centre, a specialist research centre at Bangor University, seek to find a sustainable alternative to woven, plastic bait bags that are used by shellfish fishermen and in seafood processing factories. If successful, it may have broader applications across aquaculture, agriculture and food production.



*Marine pollution reduction project*



## LEARNING AND STUDENTS

### Repair Café Wales

The Students' Union works with Repair Café Wales by encouraging responsible consumption and production. The operation of repair cafés, as part of Waste Awareness Week, encourages students to repair damaged items as opposed to disposing of them. This includes technology devices such as laptops and phones, bikes, and clothing.



*Repair Cafe learning sessions*

### Study

Undergraduate and postgraduate students explore and discuss the subject of consumerism, the way in which materials and images are used and re-used within various different forms of art through film. Agnes Varda's 2000 *Les Glaneurs et la Glaneuse* documentary has been introduced to look at the lives of people living on the fringes of society who use or consume things that have been discarded by others.

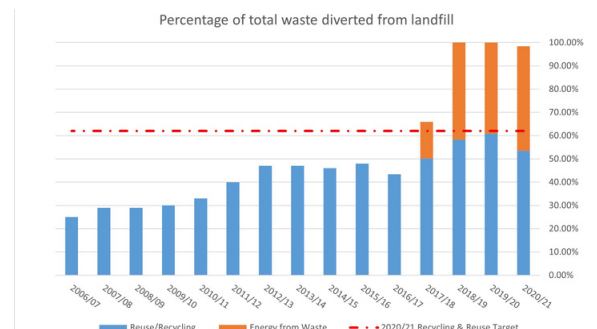
### Sustainable Manufacturing Management

provides students with an appreciation of the concerns that manufacturing on an industrial scale faces with regards to environmental impact, waste, and efficiency which all factor into whether a process is sustainable.

## OPERATIONS

### Waste Data

In 2020/21 Bangor University diverted 99.98% of its waste from landfill. Out of the waste diverted, 1.52% was reused, 53.43% was recycled and 45.03% was recovered. 513T of waste was generated in total, a 103T (16.8%) reduction from the previous year. We aim to reuse/recycle 70% of our waste by July 2025, as laid out in Wales' overarching waste strategy - Towards Zero Waste.



*Bangor University's waste data*

### Waste Awareness Week

Waste Awareness Week, the University's annual waste campaign, increases awareness about waste reduction, reuse, and recycling, engaging students and staff in resource efficiency events and activities, this year's themes included making your own washable face covering and recycling clothing options.



*Waste Awareness Week 2020*





## RESEARCH

### **Arctic sea ice is being increasingly melted from below by warming Atlantic water**

Several [scientific studies](#) from Bangor University have looked at why sea ice was melting in the eastern Arctic Ocean. Data shows that the influence of heat from the interior of the ocean has now overtaken the influence of the atmosphere. In addition, currents in the upper Arctic ocean were increasing which, when combined with declining sea ice and the weakening of the boundaries between layers of warm and cold water, was potentially stirring more warm water from the heat blob toward the surface.

The combined impact may be feeding into ever more extreme climate change in the Arctic.

### **Improved management of farmed peatlands could cut 500m tonnes of CO2**

Substantial cuts in global greenhouse gas emissions could be achieved by raising water levels in agricultural peatlands, according to a [study by scientists from Bangor](#). They estimated the potential reduction in emissions by restoring all global agricultural peatlands. However, because large populations rely on these areas for their livelihoods, it may not be realistic to expect all agricultural peatlands to be fully rewetted and returned to their natural condition in the near future.

## **Goal: Take Urgent Action to Combat Climate Change and Its Impacts**

## **PUBLIC ENGAGEMENT**

### **Research into Low Carbon Energy and Environment enters a new phase**

The [Low Carbon Energy and Environment Research Network Wales](#) is a pan-Wales research initiative supporting Wales' world-leading research in low-carbon energy, nature-based solutions to environmental challenges, the bioeconomy, and sustainable food production.

Several networking events and conferences are held each year to develop innovation and research.



*Coetir Anian*

### **Bangor research informs International Conservation Guidelines**

A [Bangor University expert](#) has contributed her considerable expertise to new international policy guidelines on rewilding.

Whilst rewilding has become increasingly popular, it is still very novel and sometimes contested. The International Union for Conservation of Nature's Rewilding Taskforce has been working on this challenge over the last two years undertaking extensive international research and consultation among leading rewilding practitioners and experts.

# LEARNING AND STUDENTS

## Study

International Climate Change Law & Policy, gives an understanding of the UN Framework Convention on Climate Change and associated parallel legal frameworks and policies at the international level, including international human rights law. The module aims to bring to the fore the high stakes involved in climate change and the reality of a climate crisis that is already impacting the lives and livelihoods of communities around the world.

Life in a Changing Climate covers how climate change and aspects of zoology and biodiversity are connected and interact. Case studies focus on taxonomic groups, and ecosystems. Relevant, and emerging, national and international policy is covered, along with potential conservation and management practices needed to cope with a changing climate.

Climate Change: Science and Impacts gives a wide and thorough knowledge of the concept of climate change, and knowledge of recent developments in the understanding of historical and future climate change including issues with greater social, cultural, and economic emphasis.

The Oceans, Atmosphere, and Climate introduces us to the response of the climate system to forces over different timescales and at varying frequencies, to appreciate the complexity of the climate response of the Earth system and in particular, feedback that characterises this complexity.

Living with our Changing Climate discusses environmental change and its drivers – including land use change, climate change, tipping points, ecosystem service, livelihoods, coping strategies and also migration and social networks.

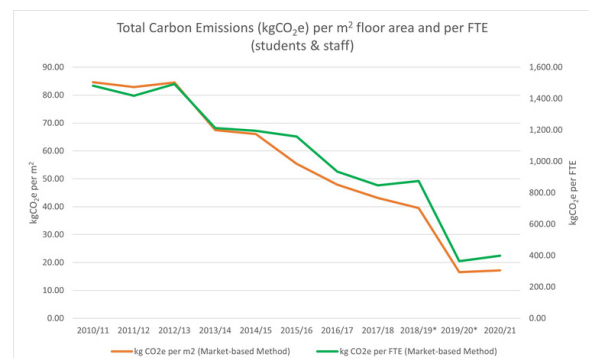
# OPERATIONS

## Carbon Management

The University approved a target to reach net-zero Scope 1 and 2 carbon by 2030, and eliminate any Scope 1 and 2 carbon offsetting by 2050.

We invest many hundreds of thousands of pounds in carbon reduction, with a dedicated annual budget of 5% (circa £120,000) of our energy bills set aside for specific projects and initiatives each year, for items not addressed through the maintenance budget for replacing assets due to normal wear and tear.

For the 2020/21 academic year, the University's carbon emissions were calculated to be 6,904.88 tonnes CO<sub>2</sub>e\*. This is a reduction of 16.67% in absolute terms, compared to 2018/19.



## Bangor University's Carbon Emissions

## Earth Hour

Each year the University participates in Earth Hour by switching off the floodlighting on our iconic Main University Building for the hour and encouraging staff and students to join in by taking what action they can.



2021 Earth Hour campaign



## PUBLIC ENGAGEMENT

### Creation of a new app to recognise sealife

Researchers at Bangor University have teamed up with the Sea Watch Foundation and tidal energy technology developer Nova Innovation to develop Sea Watcher, a free mobile phone app that allows anyone to recognise and register a sighting of whales, dolphins, and other megafauna spotted from land or a boat in UK waters.

The information collected by the Sea Watcher app will help improve knowledge about where and when marine mammals visit areas and potentially what they are doing to aid both management and conservation.

### Lee Waters, Deputy Minister for Climate Change at the BlueFish conference

The conference, led by Bangor University focuses on cross-border collaboration, climate change, and community engagement. It summarised the BlueFish project research and output recognising that climate change has many potential implications for coastal fisheries, aquaculture, and the coastal communities within the Irish and Celtic Seas. Through the combination of art and science BlueFish has set out to demystify climate change, build resilience and raise awareness of the effects on the coastal communities.

## Goal: Conserve and Sustainably Use the Oceans, Seas and Marine Resources For Sustainable Development

## RESEARCH

### Native oysters restored to Conwy Bay

1,300 native oysters have been returned to waters in River Conwy as part of an ambitious restoration project to bring back these 'ocean superheroes' from the brink of extinction.

The project has partnered locally with the School of Ocean Sciences at Bangor University, a local project officer will help to monitor and care for the newly placed oysters as part of The Wild Oysters Project.



*Oyster restoration at Conwy Bay*

*Credit: Celine Gamble / ZSL*

### Mauritius oil spill: how coral reefs, mangroves, and seagrass could be affected

Sometimes bad things happen in the worst possible places. A paper by Bangor University explores what the oil spill off the southeast coast of Mauritius close to a nature reserve island, a marine park, and an internationally important wetland area means to the environment there.

It shows the effects of oil spills are often more severe than they might first appear, and only by monitoring and protecting each ecosystem can there be any hope for long-term recovery.

# LEARNING AND STUDENTS

## School of Ocean Sciences

Our School of Ocean Sciences is one of the largest university Marine Science departments in Europe, located on the shores of the Menai Strait, with a long-established tradition of excellence in research and teaching in marine science.

Undergraduate degrees are available in Ocean Science, Geological Oceanography, Applied Terrestrial and Marine Ecology, Marine Biology, Marine Science and Conservation, Marine Vertebrate Conservation, and Physical Oceanography. Postgraduate students can study Applied Marine Geoscience, Marine Biology, Marine Environmental Protection, Marine Renewable Energy, and Physical Oceanography.

The School has access to a state-of-the-art, purpose-built research vessel, which enables UK marine scientists to study the biology, chemistry, geology, and physics of our seas. Designed to take up to 10 scientists and 20 students, it can be used as a teaching platform, training the next generation of marine scientists. The School also has several workboats to suit a variety of tasks and sea conditions. This fleet of smaller vessels enables biological, chemical, oceanographic, and geological sampling in shallower inshore waters that cannot always be accessed by the Prince Madog.



*The Mya survey boat in the foreground, and the Prince Madog Research Vessel docked*

# OPERATIONS

## Recycling our Laboratory Plastic

We aim to divert 100% of our waste from landfill and reuse/recycle 70% of our waste by July 2025, as laid out in Wales' overarching waste strategy - Towards Zero Waste. The University is continually looking at recycling more specialist waste streams, which are currently being sent to energy recovery.

All our labs across the University are heavily dependent on plastics. Whilst there is a great deal of single-use plastic that is discarded, there is also a great deal that is washed and reused across most of our labs, and we would like to ensure this is common practice. When reusing is not an option, students and staff are now able to recycle lab plastics, using a local waste contractor.



*Lab Plastic recycling*

## Catering and Conferencing

Our overarching objective in Catering Services is to achieve continual improvement in the sustainability of our services, in particular, we aim to procure food from suppliers who are proactively operating in a sustainable way, maintain the availability of seasonal & local produce within our menus, maintain the availability of fish from the MCS "Fish to Eat" list, never serving any fish from the 'fish to avoid' list, work to reduce single-use materials including plastics in catering, and reduce the use of disposable cups in favour of crockery and glass.





## PUBLIC ENGAGEMENT

### **'Tropical Forests and Climate Change' – public lecture**

A public lecture presented in conjunction with the United Nations Association, Menai Branch entitled 'Why any solution to climate change must include tropical forest conservation and why it is so difficult to achieve' was led by Professor Julia Jones, Professor in Conservation Science, Bangor University and leader of the Forest4Climate&People project, which aims to ensure that forest carbon programmes are more effective and avoid negative impacts on the poor.

Any solution to climate change must involve tropical forests. Drawing on 20 years of experience carrying out applied research in the eastern rainforests of Madagascar, Professor Jones explored the problems with Reducing Emissions from Deforestation and forest Degradation and examined why it is so important that these issues are addressed.



*Bees - important to a healthy environment*

**Goal: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, Halt and Reverse Land Degradation, and Halt Biodiversity Loss**

## RESEARCH

### **Pollution-loving plants hold key to predicting environmental change**

A team of researchers led by Bangor University has shown that a common wildflower, the sea campion has managed to rapidly adapt to high levels of toxic heavy metals in the soil from mining. This has happened on at least three separate occasions in Wales, England, and Ireland within 250 years.

Predicting which species will be able to adapt quickly is far from straightforward, but an unassuming coastal plant may just hold the key to understanding how species adapt quickly to man-made habitats.

### **Speedbumps saving Zanzibar red colobus monkeys from road traffic accidents**

New research quantifies the numbers of a rare and endemic primates killed in collisions with vehicles and the benefit of installing speedbumps near protected forest areas in Zanzibar.

### **Exposure to multiple pesticides increases bee mortality**

Bees are routinely exposed to a combination of environmental stressors such as pesticides, parasites, and poor nutrition. A new study has confirmed that bees exposed to multiple agricultural chemicals have significantly higher mortality rates than would be predicted from their combined impact.

## LEARNING AND STUDENTS

### Steve Backshall joins the teaching team at Bangor University

TV presenter and explorer, [Steve Backshall](#), is set to give a series of lectures at Bangor University. Known for programmes such as *Deadly 60*, *Expedition*, and *Blue Planet Live*, Steve Backshall will teach students about conservation, zoology, and the wildlife filming industry.

### Healing Gardens in Upper Bangor

The student-led Healing Gardens at the heart of Upper Bangor for health and wellbeing are a well-utilised resource for volunteering and participation opportunities for students. All Bangor students and staff are welcome at the garden by getting involved with gardening or just appreciating nature and using it as a space on campus.

### Hedgehog Friendly Campus

This [project](#) started at Bangor University in 2020 and since then they have held many successful events including litter picks, online fundraisers collecting money for the British Hedgehog Preservation Society (BHPS), an online survey workshop for hedgehog tracking, and an in-person hedgehog house building workshop.

### Bangor University Zoology alumnus to share his passion for conservation in a Channel 4 documentary

The programme follows wildlife cameraman and [Bangor alumnus Hamza Yassin](#) as he endeavours to capture iconic species like red deer, pine martens, white-tailed sea eagles and puffins that live on his doorstep. The programme features the Ardnamurchan peninsula on the west coast of Scotland, which is one of the most spectacular wildlife locations on the planet.

## OPERATIONS

### Plant Conservation

Treborth Botanic Garden covers an area of 18 hectares on the shores of the Menai Strait and has been owned by Bangor University since 1960. The garden is comprised of 15ha of native woodland, 2ha of species-rich unimproved grassland, and 1ha of managed orchard and many mature trees and shrubs. There are also six glasshouses of varying temperatures, with special collections including orchids, cacti, succulents, and carnivorous plants.

The Garden has several [Plant Conservation Projects](#), such as Wych Elm Project, Wild Contoneaster, Great Orme Conservation Project, Welsh Heritage Fruit Orchard, and *Salvia pratensis* – Meadow Clary.



*Red Squirrel at Treborth Botanic Garden*

### Special Species and Habitats

[Biodiversity surveys](#) of University sites are undertaken by Biodiversity staff, students, and volunteers. Regular surveys include; Macromoths, Unimproved grassland surveys, Orchid surveys, Red Squirrel monitoring, Wildlife pond water monitoring for aquatic flora and fauna, and Dormouse activity monitoring.

We have [annual targets](#) to promote biodiversity conservation and improvement and increase unimproved grassland and wildflower meadow areas across the University estate.



## PUBLIC ENGAGEMENT

### **Bangor Law School scoop Access to Justice Foundation Award**

As part of the Law Works and Attorney General Student Pro Bono Awards, [Bangor Law School won the Access to Justice Foundation Award](#).

The Law School was recognised for its CYMUNED initiative, which provides all students with the opportunity to contribute to access to justice through activities including public legal education, access to justice research, volunteering, internships, and more recently working with the North and Mid-Wales Law Clinic. It was also recognised for joint staff-student research into public law and administrative justice in Wales, and the impact of this work within the Senedd Cymru and Welsh Government.

### **The Regulation of Insurance in China**

A [new book](#) by a Professor within Bangor Law School has recently been published. The book entitled “The Regulation of Insurance in China” provides a comprehensive and systematic analysis of rules of law and administrative regulations on China’s insurance industry and insurance market, covering four levels of regulatory hierarchy.

**Goal: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels**

## RESEARCH

### **Research on powerful CEOs and money laundering on bank performance**

[New research](#) concluded that banks with powerful CEOs warrant the particular attention of regulators engaged in anti-money laundering efforts, especially when boards of directors are small and not independent. The study is believed to be the first to show that money laundering is also a significant driver of bank risk, alongside banks’ business models and ownership structures, the regulatory and supervisory framework, and market competition.



*Research into bank risk and enforcements*

### **Study shows that the Banking Union has contributed to reduced bank risk in Europe**

The Banking Union and its centralised banking supervision mechanism have reduced the riskiness of the European banking sector, according to [research led by Bangor University](#). In response to the financial crisis, the European Commission pursued a number of initiatives to create a safer financial sector for the single market. Researchers concluded that the results shed light on the superior effectiveness of centralised supervision compared to a decentralised model in the European context.

# LEARNING AND STUDENTS

## Clinical Legal Education

Thanks to a new partnership with Citizens Advice services and 30 law firms, Bangor Law students now have the opportunity to develop and use their legal knowledge in a real-life setting, making a tangible difference in people's lives.

The North & Mid-Wales Law Clinic project ensures students are trained in key areas such as family, community care, and employment with work overseen by experts from legal firms. This experience not only helps students to develop essential legal and people skills but also gives them invaluable real-life experience that greatly improves their employability prospects in the future.

## Study

Criminology and Criminal Justice's core modules gives a firm grounding in the substantive, methodological and theoretical components of Criminology as well as related aspects of the disciplines of law, sociology, and psychology.

At the Bangor Law School, you can study LLB Law degree courses that are SQE facing, meaning they cover material that is tested as part of the Solicitor's Qualifying Exam. Our LLB degree courses also meet the requirements of the Bar Standards Board for entry onto the Bar Practice Course, the vocational training course required to qualify as a barrister.

Bangor University offers an undergraduate degree in Professional Policing, licensed by the College of Policing. This introduces students to the skills required to work as a police officer.

Degrees in Politics, give an understanding of government and society and the workings of political systems.

# OPERATIONS

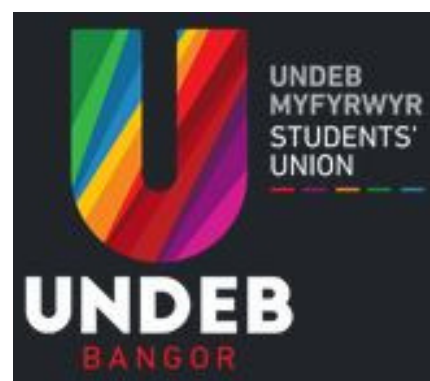
## Stakeholder Engagement

The Bangor University Liaison Group has been set up as an important way of connecting the University with our communities, discussing areas for collaboration, working together on issues of common interest, and developing our civic engagement. The Group provides a platform to discuss the University's strategic aims and how it can work with a range of partners to improve the well-being of communities across north Wales.

Court, the stakeholder group for Bangor University, provides a forum in which members of the community can interact with the University. It includes representatives from local authorities, members of parliament and members of the Senedd, the local health board, University alumni representatives, as well as other key stakeholders.

## Students' Union

Undeb Bangor is the voice of the students and the home of student life at Bangor and is led by elected student representatives working to enrich and enhance the student experience. A team of dedicated elected Sabbatical Officers (Sabbs) work to ensure student voices are heard and that the kind of activities that are needed are being developed. They run the Sports Clubs, Societies, Volunteering Projects, UMCB (Welsh Union), Undeb Bangor Course Reps and Student Council.



*Undeb Bangor - Students' Union*



# 17 PARTNERSHIPS FOR THE GOALS



## PUBLIC ENGAGEMENT

### POLAR - Food Waste

Bangor University is proud to be a part of THE KITCHEN and POLAR Network which will co-create a new platform to identify building blocks with transformative power to end our waste of food.

Stepping into the future of food, Faculty, Associates, Alumni, and Students from the Network will seek to transform University Canteens, working in partnership with the Swiss Federal Office for the Environment to reduce food waste.



*The Polar Kitchen Project*

### Resolving tensions between global development goals and local aspirations

This paper and study discussed trade-offs between the 17 SDG goals and concluded the goals must be contextualised, and embedded in a firm understanding of how people live and, how they would like to live.

**Goal: Strengthen the means of implementation and revitalise the global partnership for sustainable development**

## RESEARCH

### Bangor University academics team up with Brazil to tackle world problems

Academics from Bangor University are sharing their expertise with collaborators at the Federal University of São Paulo (UNIFESP) in São Paulo State, Brazil, to address some of Brazil's most pressing social and environmental problems.

They hope that bringing experts from different subject areas together using different approaches and techniques will be key in developing new solutions to challenges under global agendas such as OneHealth, Agenda 2030, and the UN Ocean Decade.



*São Paulo City, Brazil*

### Tracking COVID-19 and other viruses in wastewater

Bangor University has been instrumental in the development and application of Covid-19 monitoring in wastewater, and this is providing real-time evidence of levels of community infection.

We are now working on a project funded by the UK Government's Global Challenges Research Fund (GCRF) and the Newton Fund to monitor the prevalence of Covid-19 in communities in Nigeria and South Africa.

# LEARNING AND STUDENTS

## Study

This undergraduate module Arts, Humanities, and the Future introduces students to a new topic every 2 weeks, based on issues included in the UN SDGs.

Students engage with those issues by applying theory and critical methods with sessions by staff from across academic disciplines (media, literature, modern languages, linguistics, criminology, history, journalism, and others) on how their areas contribute to the sustainability goals.

## Community Engagement

Bangor University is active in its engagement with the local community and is involved in a wide variety of projects, some led by the Students' Union and others by University staff in dedicated departments.

Student Volunteering Bangor (SVB) has been providing community projects in and around the Bangor area since 1952. Since then SVB has grown to over 50 regular volunteering projects, split into the following subcategories; Mental Health Projects, Children's Projects, Environmental Projects, Elderly Projects, and Community and Sports Projects.

SVB collaborates with Keep Wales Tidy on beach cleans, litter picks, and waste awareness projects.



*Student volunteering beach cleans*

# OPERATIONS

## Education for Sustainable Development

Bangor University is committed to Education for Sustainable Development in learning, teaching, and research. In 2021 the College of Environmental Sciences and Engineering mapped all their modules to the Sustainable Development Goals (SDGs).

## SDG Accord

The University is a signatory of the SDG Accord, the purpose of which is to "inspire, celebrate and advance the critical role that education has in delivering the Sustainable Development Goals (SDGs) and the value it brings to governments, business, and wider society". It also shows our commitment to do more to deliver the goals, and to annually report our progress, whilst openly sharing on a national and international platform.



*The Students' Union Healing Garden*

## Community Projects

Bangor University plays a major role in the local area and is one of the largest employers in the region. Since its foundation in 1884, partially as a result of the subscriptions of local quarrymen and agricultural workers, the University has been conscious of its debt to the region in which it is located. Equally, the university is recognised by the people of north Wales as a major asset, helping to build the economic, cultural, and social future of the region. Bangor University is active in its engagement with the local community and is involved in a wide variety of projects, some led by the Students' Union and others by University staff in dedicated departments.