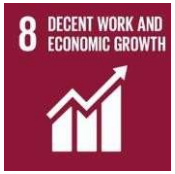
Annual Sustainability Report
2022 – 2023

Contents



Introduction

EXECUTIVE SUMMARY

I am delighted to introduce Northumbria University's Annual Sustainability Report. The report outlines our operational achievements against targets in the Environmental Performance Review section (Appendix 1), and also looks at some of the really exciting things that have been happening across the University to support the United Nations' Sustainable Development Goals.

This year has seen continued global awareness of the urgency with which climate change must be addressed. Within the Extreme Environments theme, our own research in regions such as Antarctica, has informed the global understanding of climate change and potential tipping points relating to sea-level rises. We are, however, also working to find solutions. Examples include: clean and renewable energy sources developed though our new Energy Futures Programme; supporting disaster management in communities around the world; and upskilling graduates and partner organisations so that they have the skills needed to support sustainable development.

This report provides just a snapshot of the work we do to support each of the United Nations' Sustainable Development Goals (SDGs) through our research, teaching, campus and operations. I encourage you to visit our website (www.northumbria.ac.uk/sustainability) should you want to explore our contribution further or to get in touch.

I hope you enjoy reading the report as much as I did. There is a huge amount going on, involving many people from across the University and the sustainability team will be working hard to get even more colleagues engaged in the coming year.

Professor George Marston

Pro Vice-Chancellor Strategic Projects, Chair, University Sustainability Management Group

Progress Against our Objectives 2022-23

Northumbria University's sustainability journey over the past year reflects a steadfast commitment to fostering a greener and more sustainable campus environment, while contributing more broadly at regional, national and global levels through our teaching and research. By implementing a range of initiatives, the University has made significant strides towards achieving its sustainability goals.

As part of our contribution to the UN Sustainable Development Goals (SDGs) and in pursuit of reducing the university's carbon footprint, considerable progress has been made in enhancing energy efficiency and integrating renewable energy sources. Carbon emissions have dropped by over 56 % against our 2015 baseline, in line with the target set out in our Carbon Management Strategy to reduce our emissions by 80% by 2030.

Following the installation of air source heat pumps (ASHPs) at City Campus East in June 2022, we successfully applied for grant funding from the Public Sector Decarbonisation Scheme to install additional ASHPs at our Coach Lane East Campus. ASHPs are a more environmentally-friendly way of heating buildings as they take warmth from the air – even in freezing temperatures – to provide heating to the lecture theatres, offices, cafes and other facilities. In addition, the scheme includes the installation of roof mounted photovoltaic panels and replacement of lighting to LED, the works estimated to save 360 tonnes of carbon emissions annually.

The University continues to make concerted sustainability efforts under our Environmental Sustainability Policy. The University maintains an excellent international reputation in this area, as a 'First Class University' according to the People & Planet University League, ranking 15th within the UK and top in the North East region. We ranked in the top 5% of universities in the THE Impact League, which took submissions from 1561 Higher Education institutions from across the globe. In addition, following a rigorous external audit, we maintained our accreditation of our Environmental Management System certified to the ISO 14001 standard.

Looking ahead, Northumbria is poised to continue its pursuit of excellence in sustainability, setting an example for higher education institutions and the broader community alike.

A summary of our performance can be found in Appendix 1.

SDG 1 - No Poverty

Our staff and students work to not only address poverty with local and global communities, but to also address the needs of our own students.

Northumbria Professor leads research aimed at providing better support for people facing homelessness

Our researchers have been awarded almost £250,000 to work with service providers and community organisations on developing improved data sharing techniques to support people experiencing homelessness.

Working with housing services, NHS providers, charities and community groups, people from across the North East and North Cumbria who have experienced periods of homelessness, will be recruited as experts by experience to guide aspects of the research, led by Professor Monique Lhussier.

The objectives of the nine-month project include the creation of a virtual directory which will map the services and options available for those facing homelessness and associated complex social and healthcare needs as well as being available to the service providers to further develop integrated ways of working.

Information gathered during the research will also be used to build on the existing model of the Joseph Cowen Health Centre in Byker, Newcastle upon Tyne, which is operated by one of the project partners, Tyne Housing. With support from the North East and North Cumbria Integrated Care Board and Newcastle City Council, the centre operates as a health and wellbeing drop-in service for people experiencing homelessness in the city.

Northumbria Professor Gives Keynote Academic Address At Basic Income North Conference

Northumbria's Professor Johnson is working with a number of research partners to compile a body of evidence on the impacts of a regular government-backed payment for all citizens. He gave the keynote academic address at the Basic Income North Conference 2022 which was

organised with support from the Royal Society of Arts (RSA), and included keynote political addresses from Mayor of Greater Manchester, Andy Burnham and Baroness Natalie Bennett, former Leader of the Green Party

First Minister of Wales, the Rt Hon Mark Drakeford, has supported the interim RSA publication *Levelling the mental health gradient among young people: How Universal Basic Income can address the crisis in anxiety and depression*, with a powerful foreword. Projections developed for the interim report by analysing data collected as part of the UK Household Longitudinal Study, involving 40,000 homes in the United Kingdom over a 10-year period, suggest the introduction of a Universal Basic Income could see the number of 16 to 24-year-olds accessing mental health support reduce by between 29,000 and 46,000 every year.

The research was funded by the Wellcome Trust as part of a project called *Assessing the prospective impacts of Universal Basic Income (UBI) on anxiety and depression among 14-24-year-olds*. It serves as a pilot study for a much broader, long-term examination of the role of Universal Basic Income as a public health measure.The project began in August 2021 and has led to a number of articles either published or under review, as well as two reports published by Basic Income Conversation powered by Compass.

Tackling Poverty: the power of a universal basic income, was released in May and *Winning the vote with a universal basic income: Evidence from the 'red wall'*, outlining that idea that a Universal Basic Income is a vote winner in traditional 'red wall' constituencies, is currently being finalised. Professor Johnson will present the findings of the second Basic Income Conversation powered by Compass report at an online event in September.

SDG 2 - No Hunger

We recognise the risk of hunger within our own communities, and through our research we are also championing and informing UK policy to address hunger in communities across the country.

London's Universal Free School Meals Provision Could Come at a Cost To Primary Schools

Plans from the Greater London Authority to deliver universal free school meals to all primary school children across London next year were welcomed when they were announced. Our new report , however, finds that the scheme could result in significant losses in school funding through a drop in pupil premiums.

While the research team welcomes universal free school meals for all families, they expect these lost costs to schools via pupil premiums will increase. They state in the report that they believe schools in boroughs that have higher levels of poverty will be hardest hit by any drop in pupil premiums and are calling on the Greater London Authority and councils to develop plans to mitigate any impact.

The Healthy Living Lab also estimated that, in the same year, families in need with children attending primary schools lost out on £9.6 million towards the cost of a school meal and £7.9 million in secondary schools because their children where not registered to receive free school meals.

The research team recommend that any changes to the school food registration process should be implemented on a phased basis to allow time for implementation. This would ensure that the necessary structures and processes are in place to drive sustainable change and improvements to the school food programme.

Northumbria University's Healthy Living Lab has partnered with the national charity, Feeding Britain, and will be evaluating the implementation of an auto-enrolment process for free school meals across a number of local authorities in the academic year 2023-2024.

The Healthy Living Lab has undertaken extensive research into the provision of school feeding programmes, food insecurity and holiday hunger over the last 20 years. Research findings from the team have been instrumental in ensuring children have access to healthy meals at school, both during term time and holidays, and in the development and expansion of the Department for Education's Holiday Activities and Food programme in England.

SDG 3 - Good Health and Wellbeing

We are committed to delivering education for sustainable development and ensure that all our programmes explore world challenges and seek sustainable solutions - from sustainability in fashion, to tackling global pandemics.

Research Funding Gives Hope For Sight Loss Breakthrough

A team of scientists led by a Northumbria University academic has won funding to research an eye disease suffered by over 190 million people worldwide. The award, from the Academy of Medical Sciences' Springboard scheme, will help fund ground-breaking techniques to study age-related macular degeneration (AMD), a common disease that affects vision, particularly in the elderly.

It is believed that the research, led by Dr Gerrit Hilgen, Assistant Professor in Northumbria's Department of Applied Sciences, has the potential to lead to new treatments for AMD and could also help develop new and faster ways to diagnose and prevent the condition.

The macula is part of the retina at the back of eye that allows you to see fine detail and is responsible for our central vision. Macula cells can deteriorate for a number of reasons, the most common being ageing, but smoking, poor diet, high blood pressure and genetic history can all play a part too.

Scientists Are A Step Closer To Finding a Low Toxicity Treatment For Childhood Leukaemia

Newly published research carried out using synthetic human bone marrow cells is paving the way for the development of safer and kinder treatments for children with leukaemia. Leukaemia is the most common cancer in children under 15, with over 650 children and young adults in the UK affected each year. Research progress over the last few decades has dramatically improved survival rates, which are now over 80%. However, treatment resistance and treatment toxicity remain major clinical challenges that urgently need resolving to further reduce lives lost from leukaemia and to prevent life-altering side effects of drugs used in cancer treatment.

A new study conducted by experts at Newcastle University, Northumbria University, The Princess Máxima Center for Pediatric Oncology and the University of Glasgow has revealed an innovative way of mediating these challenges. By using a low toxicity drug which has not previously been used to treat leukaemia and combining it with dexamethasone – a drug which is routinely given to cancer patients – scientists found that the treatment was more effective in killing leukaemia cells and the combination did not cause any added toxicity.

SDG 4 - Quality Education

We are committed to delivering education for sustainable development and ensure that all our programmes explore world challenges and seek sustainable solutions - from sustainability in fashion, to tackling global pandemics.

Developing Northumberland's Workforce For a New Net Zero Industrial Age

As part of the 21st Century Workforce Development Initiative pilot, sponsored by the Royal Academy of Engineering, Northumbria University is delivering a mini-exec MBA programme to help executive leaders in Northumberland develop both their leadership skills and their knowledge of their county's employer base.

As a leading UK offshore energy support base, the Port of Blyth was chosen to host the first workshop where academics from Northumbria's Business School addressed a cohort of senior leaders from 12 of Northumberland's large employers. The workshops cover high-level material typically found in an Executive MBA programme. The aim is to equip recently promoted senior leaders, or those ready to take on senior roles, with the business skills needed to ensure Northumberland fulfils its potential in the rapidly emerging low carbon economy.

Northumbria Students Inspire Schools and Colleges In National Eco Challenge

Our students have joined forces with TV architect George Clarke's MOBIE charity to support a national challenge to find new ways to make homes more energy efficient. The Ministry of Building Innovation and Education – known as MOBIE – was estabilised by Clarke in 2017 to inspire young people to revolutionise the way we think about homes to drive change in future.

Northumbria University and MOBIE joined forces almost five years ago to drive innovation in designing and delivering homes for the future. Through this partnership, students on Northumbria's Construction Project Management with BIM Advanced Practice Master's course were asked to develop some new tools to educate and inspire young people for MOBIE's national EcoFix Challenge with partners Grimshaw and Mace. The EcoFix Challenge encourages pupils aged between 12-19+ years, including young professionals, to find new ways to upgrade homes or repurpose old or vacant buildings to help to make them more energy efficient. Live industry projects are a key element the Advanced Practice course, helping students to boost their employability and tackle real industry challenges.

SDG 5 - Gender Equality

We are committed to equality and are working hard to ensure that Northumbria University is a fair, equal and welcoming place to study and work, as well as using our education, research and partnerships to promote gender equality beyond our own campus.

Northumbria Research Finds Traditional Male Gender Roles Still Dominate in Entertainment Industry

The characters that actors portray in films, television and on stage conform too closely with traditional gender roles according to new research by academics at Northumbria and Durham universities.

More than 300 actors were questioned about their experiences of being required to conform to traditional gender roles in the course of their work, and the disparity between their acted and ideal characters for the research, which was carried out by Clare Cook and Thomas Pollet of Northumbria University, and Jamie Callahan of Durham University.

Their findings have been published in the American Psychological Association's journal, Psychology of Aesthetics, Creativity, and the Arts.

The academics found that both male and female actors were required to portray traditional gender roles, but that men were required to conform with these traditional notions of gender to a greater extent, resulting in the broadcast of a masculinized ideal. Both male and female actors indicated they would prefer to portray characters that conform less with traditional gender roles than their most recent character.

A Visiting Professor From Northumbria's Faculty Of Engineering And Environment Has Been Recognised As A Pioneering Female Role Model In The Engineering Industry.

Dr Marzia Bolpagni was one of just 50 women to collect a Women in Engineering award at The WE50 awards, held in June 2023. Organised by the Women's Engineering Society (WES), the WE50 awards have been running since 2016 and aim to raise awareness of the skills shortage facing the male-dominated engineering industry. This year's awards ceremony was held to coincide with International Women in Engineering Day.

Bringing her skills and experience to Northumbria University as part of the Royal Academy of Engineering Visiting Professor Programme, Marzia has been supporting the teaching of students on the Construction Project Management with BIM MSc.

Alongside working as Head of BIM International at construction firm, Mace, Marzia has for the last two years been sharing her expertise and knowledge with other Northumbria University staff, and mentoring around 20 students per year, helping to guide them in their next steps as they prepare to graduate.

SDG 6 - Clean Water & Sanitation

We want to minimise the amount of water we use on our campus, minimise pollution risk and support the global target of ensuring that everyone around the world has access to clean water and sanitation.

New Portable System Produces Drinking Water From Just Air And Sunlight

Our researchers have developed a sustainable solution for clean drinking water that can be deployed to rural communities and set up easily without scientific know-how. According to the United Nations, one in three people worldwide still live without access to safe drinking water, sanitation and hygiene services, a problem which is only worsening with climate change, conflicts and population growth.

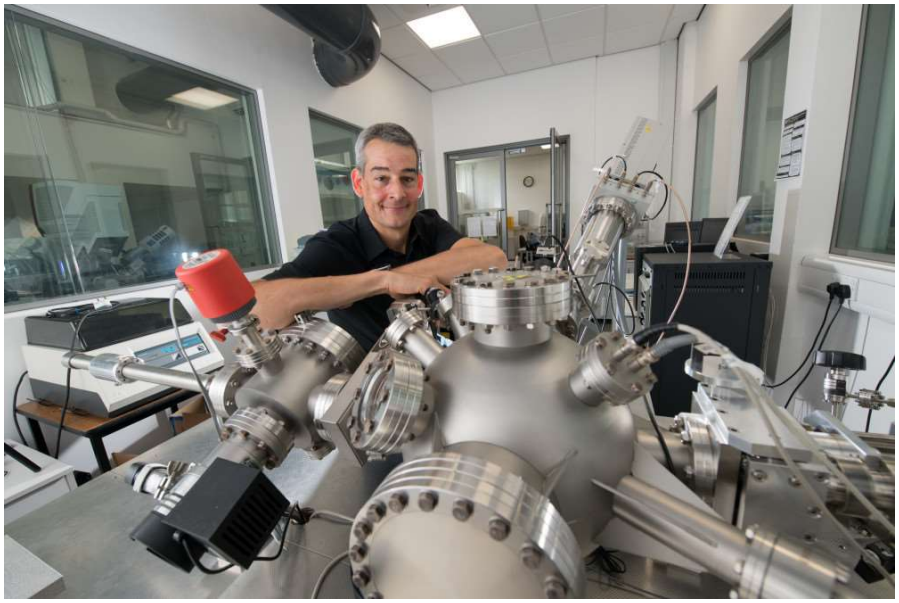
This lack of access to water leaves communities across the globe exposed to water- and sanitation-related diseases, with over 800,000 people estimated to die each year from diarrhoea alone as a result of unsafe drinking water, sanitation and hand hygiene.

Over the last decade, Dr Muhammad Wakil Shahzad, an Assistant Professor from Northumbria's Department of Mechanical and Construction Engineering, has been developing pioneering solutions to help tackle water scarcity. His latest project has seen the creation of 'Solar2Water', an innovative water production unit, which uses solar energy to extract moisture from the air and turn it into clean, safe drinking water. The patented Solar2Water system overcomes the operational limitations of conventional atmospheric water generators, with major advantages including that it can produce a constant amount of water, regardless of the outside air humidity, and that it generates double the amount of water using the same amount of energy.

Running on solar energy alone, the unit features two solar panels, which, once unfolded, begin harnessing energy from the sun to kick-start water production. A battery system that stores energy during the day and releases it at night enables 24-hour operation, producing water for daily usage. No training or experience is required to use the system and its robust mechanical build means it can be operated in any environment. This allows Solar2Water to be deployed quickly and easily to any location, such as disaster zones, field hospitals, offices, refugee camps, army camps and remote communities where there is no grid connection or water availability nearby. It is a water neutral system – it can produce water without the need for a body of water.

SDG 7 - Affordable & Clean Energy

In addition to minimising our own energy usage and supporting cleaner energy provision and use, we have a strong reputation for our outstanding research and education in the field of future energy.



Northumbria Secures Investment in Research Facilities From The Wolfson Foundation

We received a £1 million award from the Wolfson Foundation to support the expansion of engineering and surface science research facilities. Centred around the University's existing Materials Characterisation Suite, the investment forms part of a £3 million package which will transform and upgrade laboratory facilities at City Campus, dedicated to the analysis and development of materials used in the renewable energy, healthcare, biomaterials and engineering sectors.

The Wolfson Foundation is an independent grant-making charity with an emphasis on education and research which provides funding for projects across the UK. The new technology will complement other facilities available within the region's universities while providing a unique concentration of advanced equipment available in one location. The facility will support the research of more than 100 academic staff and students annually.

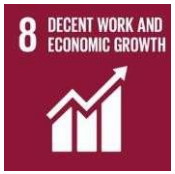
New Technology Can Help Combat Climate Crisis

Our scientists have created a novel technology that can help to tackle climate change and address the global energy crisis. Northumbria's Dr Shafeer Kalathil is among a team of esteemed academics behind the project, which uses a chemical process that converts sunlight, water and carbon dioxide into acetate and oxygen to produce high-value fuels and chemicals powered by renewable energy.

As part of the process, bacteria are grown on a synthetic semiconductor device known as a photocatalyst sheet, which means that the conversion can take place without the assistance of organic additives, creation of toxins or use of electricity. The aim of the project is to curtail the rise in

atmospheric CO_2 levels, secure much-needed green energy supplies and alleviate the global dependence on fossil fuels. A paper detailing the findings of the team's research has been published in scientific journal *Nature Catalysis.*

Dr Kalathil, a Vice-Chancellor's Senior Fellow, is working on the project with Erwin Reisner, Professor of Energy and Sustainability at the University of Cambridge, Dr Qian Wang, associate professor at Nagoya University in Japan, and partners from Newcastle University.



SDG 8 - Decent Work and Economic Growth

We are within the top 15 UK universities for the number of graduates in highly skilled employment (Graduate Outcome survey).

Northumbria Launches Redesigned Entrepreneurship Programme After A Decade Of Producing Young Entrepreneurs

Northumbria University, Newcastle, has relaunched its entrepreneurship programme following 10 years of excellence and experience in the field of enterprise. The newly-designed programme follows a decade of supporting hundreds of students in setting up their own businesses. In the past 10 years Northumbria's Newcastle Business School has supported almost 200 students through its entrepreneurial business programmes who have created over 15 enterprises.This year's graduates alone have created 32 businesses over the three-year programme, with 11 of those carrying on after graduation. In their final year, these students turned over £150,000.

Northumbria University's new BA Business and Entrepreneurship programme is an innovative, course in which students set up their own businesses from day one. Over their three year university studies, students learn about the ups and downs of running their own business, while supporting and coaching each other.

The practical course teaches students the skills needed to run a business by engaging in entrepreneurial activities. Students come up with and develop their business idea from scratch before learning what it takes to bring their business to life. As part of their studies, students get the opportunity to pitch for grant funding as part of the programme which is provided by the Willan Trust, who have agreed to invest up to £33,000 per year into student businesses

The latest Higher Education Business and Community Interaction Survey (HEBCIS, 2021-22) ranked Northumbria University graduate startups as 6th in the UK on estimated turnover (£102.5m). It is also the highest ranked university in the North East for jobs created

by graduate start-ups, with 1172 jobs created. Northumbria has ranked in the HEBCIS top 10 for the last 14 years, holding the top spot for five years.

Since 2003, Northumbria University has supported the creation of 500 businesses, many of which are based in the North East and trading nationally and internationally.

SDG 9 - Industry, Innovation and Infrastructure

Our expertise and work with industry partners is driving innovation across the region and supporting sustainability economies. This drive for innovation is also instilled in our students – a new generation of sustainable, innovative thinkers and designers.

Lockheed Martin and Northumbria University join forces to support the development of space skills, research and technology

Northumbria is collaborating with global aerospace and security company, to support the development of skills, research and technology across the region. Space and solar physics research is an area of excellence at Northumbria University and we have invested heavily in recent years in world class facilities and leading experts to drive its research and education in this area.

Lockheed Martin's investment forms part of a wider £7m investment into engineering facilities for research and teaching at Northumbria, funded by the Office for Students, the UK Space Agency and the University itself.

This investment will help to put Northumbria University and the wider North East in a strong position to be a leader in the global space economy, supporting new research, developing innovative technologies for export, and generating skills for a high growth sector.

Lockheed Martin continues to build plans to expand its manufacturing space operations in the UK and is exploring options to establish a new research, development and satellite manufacturing facility which would support up to 2,300 jobs for the North East.

The collaboration between Lockheed Martin and Northumbria follows a successful Space Skills and Suppliers Summit, which was held in Newcastle in March, in partnership with Invest North East England. The summit brought together potential new partners from industry and academia keen to work on initiatives linked with growing the UK space sector.

SDG 10 - Reduced Inequalities

At Northumbria University we are committed to fostering a culture where diversity is valued and encouraged, where we advance equality of opportunity, and all colleagues and students feel respected.

FUTURE FWD Support Scholarship Opportunity To Advance Equality And Inclusion In Graphic Design

Our graphic design undergraduate students received a scholarship boost from four design studios based in the UK and US. The new FUTURE FWD scholarship at Northumbria continues the progress of the University's successful Higher Education Without Barriers campaign.

Zak Group, Pentagram, Some Days and Fraser Muggeridge announced their support to create a three-year FUTURE FWD scholarship which will enable undergraduate students from under-represented backgrounds to access graphic design education at Northumbria University.

The FUTURE FWD Scholarship was created to advance equality and inclusion in graphic design education. Respected leaders in their sector, design studios Zak Group, Pentagram, Some Days and Fraser Muggeridge boast international profiles and clients.

The scholarship, worth £10,000 per annum, provides maintenance support for a student from a Black, Asian, or other ethnic minority background accepted for the BA Graphic Design degree at Northumbria University. It also includes access to mentorship throughout the course and a paid internship opportunity with one of the studios.

Since 2021, FUTURE FWD has awarded three scholarships to students studying graphic design. The new FUTURE FWD scholarship at Northumbria continues the progress of the University's successful Higher Education Without Barriers campaign. With support from alumni, businesses, and charitable partners, Higher Education Without Barriers provides a range of financial initiatives, mental health and wellbeing services, and community-based projects, to make participation and progression in higher education more achievable for talented students, regardless of their circumstances.

SDG 11 - Sustainable Cities and Communities

As an urban university we are working to reduce the environmental footprint of our campus, but our staff and students are also helping to create thriving and culturally rich communities both locally and around the world.

Parliamentary Briefing Highlights Benefits Of Green Blue Infrastructure

Our environmental scientists have highlighted the social, health and economic benefits of properly planned and managed green spaces in a report to parliament.

PhD researcher Matt Kirby and Professor Alister Scott examined academic research focussing on the impact of Green Blue Infrastructure (GBI) – green spaces and water features which have been designed to provide a range of multifunctional benefits. This includes green walls and roofs; trees in urban areas; sea, ponds, rivers and canals; sustainable drainage systems; and parks and woodlands.

Their report, *Green Blue Infrastructure Impacts on Health and Wellbeing; A Rapid Evidence Assessment*, will be distributed throughout parliament as part of the Research England funded Capabilities in Academic Policy Engagement (CAPE)project, of which Northumbria is one of five partner universities.

CAPE is working to strengthen engagement between academics and policy professionals – including providing decision makers in parliament with evidenced based research to support and inform their policy making.

The report has been published and distributed by the Parliamentary Office of Science & Technology, which provides parliamentarians with impartial, balanced and peer-reviewed briefings.

It is widely accepted that green and blue spaces have a positive impact on people's lives, but there hasn't been a great deal of research carried out about the impact of different types of managed Green Blue Infrastructure on specific mental and physical health conditions. We still need more detailed health data to complement the self-reported data that abounds, however decision makers need to use this intelligence to embed the value of green and blue infrastructure into their policy and decision making.

SDG 12 - Responsible Consumption and Production

We are building staff and student awareness of responsible consumption, not only to impact their day-to-day behaviours, but to develop graduates who are the responsible innovators of the future. This is echoed in the work we do with partners beyond the University.

Clear-Out Collaboration Keeps Newcastle Clean

Students in Newcastle have helped divert tonnes of waste from landfill and raised thousands of pounds for charity as part of a city-wide campaign. Leave Newcastle Happy is a city-wide clean-up and recycling initiative to help students moving out of their accommodation to dispose of their unwanted goods and raise funds for charity.

Students from both universities were encouraged to plan ahead of their move and dispose of their unwanted items responsibly by organising them into household waste, electronic and electrical recycling. For items that could not be reused or recycled, household waste skips were placed in 12 student neighbourhoods. A total of over 10 tonnes of waste was collected, helping to prevent potential fly tipping and overflow of communal bins.

Items that could be reused and were in good condition could be taken to the British Heart Foundation (BHF) donation banks and shops across the city. These donations have been part of the University's involvement with BHF's 'Pack for Good' campaign since its launch in 2012, helping to raise funds for research into heart and circulatory diseases.

In the 2021-2022 academic year, Northumbria students donated well over 2,000 bags of items to BHF; the largest donation of all Newcastle organisations that took part. This equates to 17.6 tonnes being diverted from landfill—the equivalent of 103,642kg CO_2 emissions—and nearly £31,000 was raised for the charity! Along with Newcastle University, Newcastle City Council and private student accommodation providers, donations from around the city diverted 203 tonnes from landfill and raised a total of almost £355,000.

Environmental Impact of the Fashion Industry Under Scrutiny

It is often described as fashion's dirty secret, and in recent years there has been increasing recognition of the global environmental impact of the textile industry, however, the true scale of the problem is still not fully understood.

Now a major project, led by Northumbria University, will address the issue by bringing together a network of academic experts, manufacturers, major fashion brands and consumers to examine how the environmental impact across the fashion and textiles industry is measured and assessed.

The project will be led by Northumbria's Dr Alana James, whose research focuses on creating sustainable change in the future of the fashion industry, has been awarded almost £2m of funding through a joint programme between the Arts and Humanities Research Council (AHRC), Natural Environment Research Council (NERC), and the UK's national innovation agency Innovate UK. The aim of the programme is to fulfil UK Research and Innovation's (UKRI) ambition to transform the circular fashion and textiles sector. A core component of this mission is to fund Networks that bring together different communities to identify, prioritise and develop emerging research and knowledge exchange challenges.

Over the next two years the group will work together to gain a better understanding of how the environmental impact of fashion garments is currently measured, sharing their expertise to get a true picture of the scale of the problem.

The fashion and textile industry is estimated to be worth £21 billion to the UK economy, and provides more than half a million jobs. But globally, the sector causes 8 per cent of global greenhouse gas emissions and 20 per cent of wastewater. Fashion uses more energy than both aviation and shipping combined. The complexity and reach of the industry means true impact on the environment is not fully understood.

SDG 13 - Climate Action

We are committed to delivering education for sustainable development and ensure that all our programmes explore world challenges and seek sustainable solutions - from sustainability in fashion, to tackling global pandemics.

'Superhero' Seagrass Meadows Produce Sand That May Protect Coral Reef Islands From Sea-Level Rise

A research team, led by Northumbria's Dr Holly East of the Department of Geography and Environmental Sciences, studied seagrass meadows and epibionts in the southern Maldives. Seagrass meadows produce large volumes of sediment that can build coral reef island shorelines, increasing the resilience of low-lying reef island nations to future sea level rise, according to new research from Northumbria University.

The new study, which is published in Nature Communications Earth and Environment, provides the first evidence of the volume of sediment produced by a seagrass meadow in a reef island setting.

It has long been known that seagrass provides many valuable societal benefits. Seagrass meadows are biodiversity hotspots, slow climate change by storing carbon, and protect land from coastal erosion. The research highlighted an additional benefit provided by seagrass meadows: they are important sources of sediment that can both build and maintain coral reef islands. Seagrass leaves have tiny living creatures known as epibionts living on them. These epibionts are made of calcium carbonate which creates sand when the seagrass leaves die or when the epibionts fall off the leaves. This sediment is then transported by waves and can be deposited on nearby islands.

Using satellite imagery, the team mapped the different areas of the seagrass meadow and then manually counted the number of seagrass leaves in grids placed on the sea floor to accurately establish the densities of seagrass leaves in the area.

They then analysed hundreds of seagrass leaves in their lab and were able to calculate the size and mass of the epibionts living within the meadow and how much sediment they would create.

Based on the volume of sediment produced, the researchers say that a one square kilometre meadow could produce enough sediment to build an island the size of its neighbour, Faathihutta, in less than 20 years.

Tropical seagrass meadows may help to protect coral reef islands from the impacts of climate change, such as sea-level rise, which is a clear danger to low-lying coral reef island nations, including the Maldives.

Thousands Tuned Into Inspiring Programme At Design For Planet Festival

Northumbria partnered with the Design Council to host the 2022 Design for Planet Festival. Almost 7,000 participants registered for the online event across two days, providing more than 40 virtual events and live broadcasts, to coincide with COP27.

The aim of the festival was to harness the power of the UK's design and business communities to create ways out of the climate crisis, while more than 60 guest speakers from disciplines including energy, food waste, biodiversity, supply chains and design, were on hand to share ways that participants could take action as individuals.

Northumbria staff and students took part in a carefully curated schedule of activities which ran in parallel with the online Design for Planet Festival, embracing the key themes of the event.

A virtual workshop run for students by members of the Design Declares campaign group was followed by a practical banner printing session for those involved.

SDG 14 - Life Below Water

We are taking steps and working with partners to help reduce negative impacts on the world's oceans and waterways.

"Sustainable" Condenser Tumble Dryers Create Hundreds of Tonnes Of Waterborne Microfiber Pollution

A new study has revealed that drying laundry using a condenser tumble dryer leads to hundreds of tonnes of potentially harmful microfibers being released into waterways and oceans across the UK and Europe. Our researchers worked in partnership with scientists at consumer goods giant Procter and Gamble on the study, which is published today (24 May) in the scientific journal PLOS ONE.

The team found that while condenser dryers may reduce the volume of airborne microfibers being released compared to vented dryers, they are still a significant contributor of waterborne microfiber pollution, with more than 600 tonnes of microfibers being poured down household drains.

Both types of tumble dryer produce microfiber pollution. Although recent studies have suggested that moving from vented tumble dryers to condenser dryers could reduce airborne microfiber pollution, their impact on waterborne microfiber pollution has been unknown until now.

While condenser dryers collect moisture from wet clothes into a container, rather than exhausting microfibers into the air as vented dryers do, the researchers found that condenser dryers in the UK and Europe still produce more than 7,200 tonnes of microfiber annually.

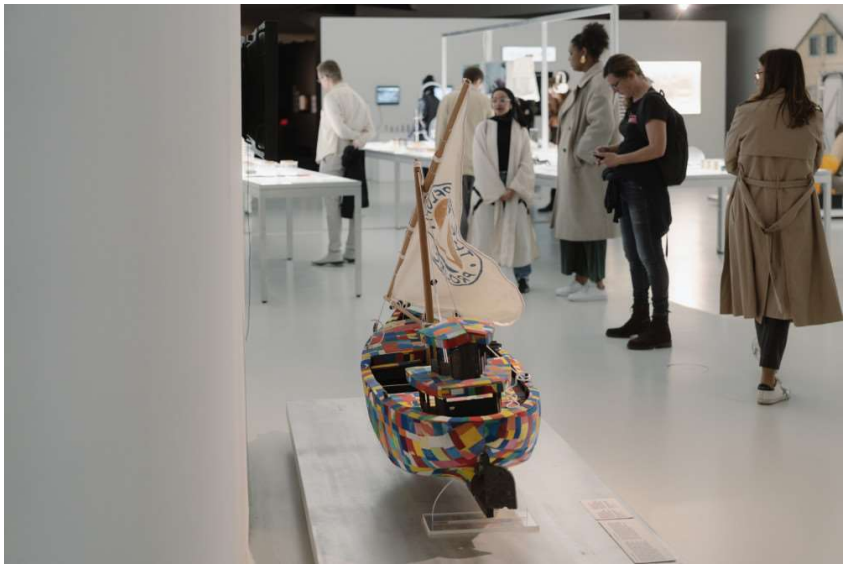
The team is now urging the appliance industry, its trade associations, and legislators to recognise that all types of tumble dryer can be significant contributors to the problem of environmental microfiber pollution. The researchers say that efforts are needed to mitigate this issue through revised usage instructions and improved appliance design.

World Tour For Model Boat Inspiring Citizen Science Against Environmental Pollution

A model sailing boat which represents a key part of a project working to banish single use plastics has embarked on a global tour that will help its message reach thousands more people and communities across the planet.

Supported by our researchers and lecturers, the Flipflopi project, which in the last ten months alone recovered 135 tonnes of post-consumer plastics from the Lamu Archipelago on the Kenyan coast with a population of just 50,000. They built the world's first 100 per cent recycled plastic

sailing boat around four years ago from reclaimed materials found on Kenya's beaches. The materials included 30,000 discarded flip flops, which are ubiquitous in the world's oceans.



After capturing the world's attention on expeditions around East Africa, the Flipflopi project continues to find ways to inspire communities, governments and businesses to take action against environmental pollution.

Now, a model of the traditional 'dhow' style vessel has arrived in Lisbon in Portugal from Dundee in Scotland as part of a travelling exhibition.
The Flipflopi traditional 'dhow' model is part of the Plastic: Remaking Our World exhibition. Photo by Joana Linda © EDP Foundation.

Plastic: Remaking Our World, which will be at the Museum of Art, Architecture and Technology (MAAT) until the end of August, looks at what it calls "the revolutionary and yet deeply controversial" range of synthetic products collectively referred to as 'plastics', opening with a film installation exploring the geological relationship between plastic and nature, and ending with the Flipflopi model as an inspirational example of contemporary efforts to rethink plastic and implement alternatives that reduce production and consumption, as well as encouraging re-use.

The Flipflopi team are continuing their holistic approach to beating plastic pollution through continuous scientific and academic collaborations, and innovation in plastic recycling techniques. They are also passing on indigenous knowledge and plastic boatbuilding skills, through a new heritage boat building training centre, so that more ocean plastics can be recovered and transformed into new products and sailing vessels for the local communities.

SDG 15 - Life on Land

We are supporting biodiversity and life on land not only through management of our own campus and work with local partners, but we are also making significant impacts though our research expertise and engagement.

Moths Threatened By Climate Change In Britain

New research from wildlife charity Butterfly Conservation and Northumbria University has shown that moths adapted to cooler conditions are being lost from parts of Britain as a result of climate change.

Around 10 per cent of the larger, so-called 'macro' moth species in Britain are currently restricted to areas and habitats with cooler climates. Unsurprisingly, most of these species occur in the northern parts of Britain, but some occur in the south too, especially on hills and moors. Most of these moths have declined in distribution over recent decades, leading to concerns that climate change could be driving these species to extinction.

Northumbria scientists have now discovered that increasing the amount of water within habitats could be key to saving these species from rising temperatures. Researchers looked at data gathered over a 40-year period by volunteers of Butterfly Conservation's National Moth Recording Scheme. The results showed that, on average, cool-adapted moths have retreated towards the North West, tracking the changing climate, with some species dying out completely in more southerly and easterly parts. The garden tiger moth (*Arctia caja*) is a typical example of this decline: its numbers fell by some 89 per cent between 1968 and 2002.

The study also showed that, particularly where temperatures were high, the threat to the moths was greatly reduced where the annual rainfall amount was also high. This is believed to be because the plants that the moths' caterpillars rely upon for food survive better under warming temperatures when there is more rainfall, and thus, more water available in the environment.

SDG 16 - Peace Justice and Strong Institutions

We have significant expertise relating to justice, peace and strong, cohesive communities. These not only form the basis of multiple research strengths but are also key components of our degrees and outreach in areas including law and policing.

Putting An End To Coercive Practices In The Criminal Justice System – Promoting Humane Interviewing And Interrogation Techniques

Under international law torture is always illegal, however, it is still regularly used during police and law enforcement interviews in some parts of the world to extract information, confessions or as a punishment.

A Northumbria academic is working to eradicate the use of torture during police interviews by travelling around the world teaching humane, non-coercive techniques.

Professor of Police Science Gavin Oxburgh is working with the global criminal justice watchdog Fair Trials to carry out training with police forces in East Africa and Central America to tackle this issue. Over the last four years Professor Oxburgh has been part of an international steering committee, made up of experts in the fields of interviewing, law enforcement, criminal investigations, national security, military, intelligence, psychology, criminology, and human rights. Led by former United Nations Special Rapporteur on Torture, Professor Juan Mendez, the group have been exploring the immorality and ineffectiveness of torture. Together they compiled 'the Mendez principles' – a set of recommendations outlining international best practices.

Global Experts In Counterfeit Crime At Northumbria Workshop

Global experts in counterfeiting came to Northumbria University for a Workshop to discuss and share their knowledge on measuring and tackling trademark infringement.

The event was part of a series of events being organised by Professor Xuemei Bian from Northumbria's Newcastle Business School. These follow a £79,000 grant she was awarded last year by the British Academy to continue her internationally-recognised research into counterfeit crime and the growing influence of social media.

In partnership with the UK Intellectual Property Office (IPO), the Workshop will explore how research is enabling knowledge exchange, building stronger connections and fostering collaboration between government officials, eminent scientists and business practitioners.

Success for Student Law Office

Northumbria's Student Law Office has won the Pro Bono/Community Initiative category in the highly anticipated Northern Law Awards 2023.

The Northern Law Awards celebrate the great wealth of legal talent and success within the region and is the law event for all those practising and working in the legal industry in the North of England. Winners were presented with their awards at the Hilton NewcastleGateshead.

Northumbria's Student Law Office is known for its a pioneering approach - where law students undertake free legal work under professional supervision to support real clients. It was praised by the judges who described a "highly engaged team offering real support to the community in all aspects of legal advice."

The Student Law Office has managed more than 7,000 enquiries, represented more than 3,000 clients and secured over £1.6 million on their behalf since 2005.

SDG 17 – Partnerships for the Goals

Showcased throughout this report is our work in partnership with organisations and businesses locally, nationally and globally. Through these Partnerships we can maximise our contribution to the SDGs and best deliver outstanding and impactful teaching and research.

International Policing Partnership

Policing experts from Norway and Newcastle have spent time working together as part of a new partnership between the Norwegian Police University College and Northumbria University.

Academics and senior masters students from Oslo travelled to the North East to spend time with their counterparts from Northumbria's Centre for Crime and Policing, as well as with officers from Northumbria Police.

The aim of the visit was to learn more about how police research, teaching, and practice is conducted in both countries, with plans for a return trip to Norway by the Northumbria contingent in the future.

The exchange was organised by Professor of Police Science Gavin Oxburgh, Head of Northumbria's Department of Social Sciences and a visiting Professor of Psychology at the Norwegian Police University College.

During their visit the Norwegian group spent time at Northumbria's Centre for Crime and Policing, where academics carry out world-leading research into the challenges associated with 21st century crime and policing.

New Digital Health Hub across the North East and North Cumbria

Northumbria is part of a groundbreaking £4.17m Digital Health Hub for the North East and North Cumbria (NENC), in collaboration with five regional universities and seven NHS Trusts within the Integrated Care System (ICS) for NENC.

The EPSRC-funded Northern Health Futures (NorthFutures) hub aims to create a world-leading healthcare technology (health-tech) research and innovation ecosystem that addresses health and social inequalities in NENC by supporting: inclusive digital skills training and sharing, responsible health-tech design and development, networking and entrepreneurship.

This three-year project aims to address unmet health needs in the NENC region, including: health and nutrition for children and young people; mental health and wellbeing; monitoring of people before, during and following treatment beyond the hospital; wider application of virtual and augmented reality in training and delivery of clinical care; and ageing well with long-term conditions.

The Hub combines the complementary strengths and resources of over 50 partners: six universities – Northumbria, Newcastle, Cumbria, Durham, Sunderland, and Teesside; seven NHS Trusts; regional, national and global industry partners; health and care providers; local authorities; innovation accelerators; plus voluntary, community, and social enterprise sector organisations.

Environmental Performance Review

Our Environmental Performance Review assesses progress towards our environmental and sustainable development objectives, and in meeting our environmental commitments.

Appendix 1 - Environmental Performance Review

	Target	Deadline	Result for 2022/23	Notes
Environmental Management System	Maintain ISO14001:2015 certification.	2022/23	Ongoing	Successful external audit February 2023.
Energy and Carbon	5% year-on-year reduction in Scope 1 & 2 emissions from 2021/22	2022/23	5% reduction	Significant reduction in Sope 1 gas emissions following commissioning of CCE ASHPs.
	Determine baseline of carbon emissions from IT	2022/23	Complete	
	Minimum DEC rating of D	2025	Ongoing	For 2023, all campus buildings DEC rating D or above, except Ellison which is rated E.
	80% reduction in scope 1, 2 and 3 carbon emissions from 2015/16	2030	56% reduction	Decrease from 61% in 2021/22 due to increase in Scope 3 emissions from flights.
Waste and Resource Management	15% reduction in total waste produced (tonnes) from 2015/16 (1235 tonnes 15/16)	2030	11% reduction	Total waste 1101 Tonnes 22/23
	2% reduction in total waste produced (tonnes) from 2021/22 (1012 tonnes 21/22)	2022/23	8% increase	19.3% decrease on pre Covid levels (1364t 18/19)
	65% of total waste sent for reuse, composting, anaerobic digestion or recycling	2030	On target	
	41% of total waste sent for reuse, composting, anaerobic digestion or recycling	2022/23	38.4%	43.9% Non-res, 22.4% Res Working with accommodation providers to increase recycling.
	0% of non-hazardous waste sent to landfill (excluding third party contractors)	2022/23	0%	Residual waste sent for energy recovery.

Target		Deadline	Result for 2022/23	Notes
Water Management	40% reduction in total mains water consumption from baseline year 2016/17.	2030	34% reduction	
	2% year-on-year reduction in total mains water consumption from 2021/22.	2022/23	5.43% decrease	
Travel	20% reduction in emissions from Business Travel (CO2e) from 2015/16 (4616t CO2 2015/16).	2030	46% reduction (2483T CO2)	
Biodiversity	2% increase in metres of space considered medium or high value for biodiversity (m^2) from 2021/22.	2022/23	Baseline Audit completed September 2023.	Biodiversity Net Gain Assessment also completed to support CHASE Planning Application.
	Hedgehog Friendly Campus Gold certification.	2022/23	Complete	Successful application for Gold Status.
Sustainable Buildings	Average DEC rating of C.	2022/23	**C**	
	All projects to achieve a SKA rating.	2022/23	Ongoing	
	Achieve BREEAM Excellent standard for new build.	2022/23		Standard to be incorporated into CHASE project design process.
Discharges	0 significant spills.	2022/23	0	No major spills

Target		Deadline	Result 2022/23	Notes
Education for Sustainable Development	Determine baseline for number of programmes embedding learning about one or more SDGs.	2022/23	Complete. Repeat survey in 2023/4.	A cross campus working group has been created to investigate links between research, teaching and the SDGs.
	3% increase in the number of modules embedding learning about one or more SDGs from 2021/22.	2022/23	Repeat Survey in 2023/24	
	Maintain Sustainability Ambassadors Programme.	2022/23	Ongoing	
Research & Living Lab	Maintain United Nations Academic Impact membership.	2022/23	Ongoing	
	Develop reporting to capture the multiple ways through which our research supports the UN Sustainable Development Goals and to identify any scope for improvement.	2022/23	Ongoing	
Climate Change	Apply for UN COP Observer Status.		Complete	Application submitted for COP28.
Reputation for Sustainability	Top 20 in the People and Planet University League.	2022	15th in 2022	Improvement from 17th in 2021
	Top 100 in the THE Impact League.	2022	79th in 2022	Successful re-entry into the Top 100 of THE Impact League.