



**Northumbria
University**
NEWCASTLE

Annual Sustainability Report 2024 – 2025



Contents

- Introduction (Page 3) - A welcome from Professor John Woodward
- Supporting the United Nations' Sustainable Development Goals (Page 4 – 42).
 - Examples of activity from the year that have supported the United Nations' SDGs



Page 6



Page 8



Page 10



Page 12



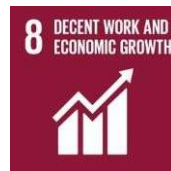
Page 14



Page 16



Page 18



Page 20



Page 22



Page 25



Page 26



Page 29



Page 30



Page 30



Page 35



Page 38



Page 39

Introduction

I am delighted to introduce Northumbria University's Annual Sustainability Report for 2024–25. This report highlights our operational achievements against targets in the Environmental Performance Review section and showcases the wide-ranging initiatives across the University that support the United Nations' Sustainable Development Goals (SDGs).

Over the past year, we have continued to make strong progress on our carbon reduction journey, building on a more than 60.5% reduction against our 2014/15 baseline. Decarbonising our energy systems remains a priority, and we are exploring further innovations in renewable energy, energy efficiency and sustainable building solutions. These efforts are complemented by our wider work embedding sustainability across teaching, research and operations, demonstrating Northumbria's holistic approach to addressing global challenges.

Our research continues to make a tangible impact, from understanding climate tipping points in extreme environments to developing practical solutions for sustainable energy, disaster resilience and skills development. Equally, our educational and operational achievements reflect the dedication of staff and students to driving sustainability in every aspect of University life.

This report provides a snapshot of our work supporting the SDGs and demonstrates the depth and breadth of sustainability activity across Northumbria. I hope you enjoy reading it as much as I have. There is a huge amount happening, involving many colleagues from across the University, and the sustainability team will continue to engage even more people in advancing our ambitions in the coming year.



Professor John Woodward
Pro Vice-Chancellor International, Chair of University Sustainability Management Group



Progress Against our Objectives 2024-25

Our commitment to sustainability and environmental stewardship remains a core pillar of the University Strategy 2024–2030. We recognise the urgent challenge of climate change and the need to safeguard natural resources for future generations. Guided by the UN’s global sustainability goals, we are dedicated to creating a positive environmental impact while embedding sustainability across our teaching, research and campus operations.

We are ranked 53rd in the global Times Higher Education Impact league, which ranks 2526 universities from 130 countries, evidencing the international reach of our research and education, and were delighted to receive Highly Commended *in the Green Gown Awards* for our research in renewable energy.

Northumbria’s decarbonisation programme is progressing well, with the commissioning of our Coach Lane Air Source Heat Pumps (ASHPs) and the installation of a renewable energy solar array, funded through a Public Sector Decarbonisation Scheme (PSDS) grant. In addition, projects funded by a further PSDS grant have now commenced, expanding ASHP installation across additional buildings and supporting our long-term ambition to fully remove gas-fired heating from our estate.

Complementing our energy and emissions work, we have launched a new Biodiversity Action Plan and implemented a range of initiatives to green the campus, including tree planting and enhanced green spaces.

Northumbria strengthened its commitment to sustainable travel by achieving Cycle Friendly Employer status and hosting its first-ever Bike Week. The event promoted cycling as a healthy, low-carbon mode of transport through guided rides, maintenance workshops, used bike sales, safety sessions and engagement activities highlighting initiatives such as our Cycle-to-Work scheme and campus facilities. Well attended and positively received, Bike Week is set to become an annual fixture, supporting our ambition to reduce emissions and encourage active travel.

The University continues to deliver against its Environmental Sustainability Policy, earning recognition as a ‘*First Class University*’ in the People & Planet University League, where we rank 10th Nationally and are the highest-ranked institution in the North East. We also maintained our ISO 14001 certification following rigorous external recertification audit, underlining the strength of our Environmental Management System. These accolades are a testament to the collective effort across the University and set a high benchmark for the year ahead. Looking forward, Northumbria will continue to advance its sustainability agenda, setting high standards for the sector.

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

SUSTAINABLE DEVELOPMENT GOALS	Publications		RAI World		RAI UK		International Co-authorship (%)		FW Citation Percentiles Top 10% (%)		FWCI		Open Access %	
	Count	Bar	Value	Bar	Value	Bar	Value	Bar	Value	Bar	Value	Bar	Value	Bar
GOAL 1: No Poverty	119		2.26		1.35		42.0		16.0		1.38		79.0	
GOAL 2: Zero Hunger	105		0.73		0.80		58.1		15.2		1.37		82.9	
GOAL 3: Good Health and Well-being	1008		0.56		0.52		57.2		18.2		1.86		86.4	
GOAL 4: Quality Education	260		1.65		1.38		32.3		15.4		1.19		68.8	
GOAL 5: Gender Equality	204		2.23		1.26		39.7		20.1		1.53		69.6	
GOAL 6: Clean Water and Sanitation	127		0.66		1.09		83.5		23.6		1.90		69.3	
GOAL 7: Affordable and Clean Energy	770		1.41		1.89		80.8		26.9		2.21		69.7	
GOAL 8: Decent Work and Economic Growth	285		1.49		1.27		57.5		21.8		1.74		68.8	
GOAL 9: Industry, Innovation and Infrastructure	576		1.78		1.79		67.5		24.1		2.16		65.1	
GOAL 10: Reduced Inequality	341		2.13		1.29		40.8		14.7		1.38		71.8	
GOAL 11: Sustainable Cities and Communities	375		1.46		1.57		52.8		16.5		1.64		72.5	
GOAL 12: Responsible Consumption and Production	258		1.50		1.53		70.2		22.9		2.85		69.4	
GOAL 13: Climate Action	343		1.77		1.35		78.1		30.9		2.52		73.5	
GOAL 14: Life Below Water	69		0.67		0.64		73.9		15.9		1.94		81.2	
GOAL 15: Life on Land	155		1.14		0.96		68.4		22.6		1.95		76.8	
GOAL 16: Peace, Justice and Strong Institutions	450		3.05		1.60		34.9		17.1		1.32		71.6	
<p>All data is from the Scopus database and the year range 2019 - 2023 (5 year window).</p> <p>Publications are mapped to SDGs using the same methodology applied in the Times Higher Education Impact Rankings 2023. More information can be found here: http://doi.org/10.17632/y2zyy9vwzy.1</p>		<p>Number of publications with a Northumbria University affiliation, mapped to queries used in the Times Higher Education Impact Ranking 2023.</p>		<p>Relative Activity Index (RAI) is defined as the share of an institute's output in a subject relative to the national/global share of outputs in the same subject. (1.00 = as expected)</p> <p>For example, Northumbria published 3.04% of its outputs in SDG 10, while the World published 1.43% of its outputs in the same SDG, the RAI for Northumbria in SDG 10 is therefore $3.04\%/1.43\% = 2.13$. In this case, it would indicate that Northumbria is twice more specialised in SDG 10 compared to the global average.</p>		<p>The proportion of outputs in each SDG that have at least one international co-author.</p>		<p>Field-Weighted Outputs in Top Citation Percentiles indicates the extent to which an entity's publications are present in the most-cited percentiles of a data universe, i.e. how many publications are in the top 10% of the most-cited publications?</p>		<p>FWCI is an attention indicator and is centred on citations. It gives us an indication of how the number of citations received by an entity's publications compares with the average number (1.00) of citations received by all other similar publications.</p>		<p>A publication is defined 'open access' when there are no financial, legal or technical barriers to accessing it, thus increasing the visibility and reuse of academic research results. Providing open access also ensures publications are freely accessible to society.</p>		



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 University Leads Global Research on Volunteering to Tackle Poverty And Inequality

Northumbria has been selected as the lead research partner to work with United Nations Volunteers (UNV) on the next State of the World's Volunteerism Report, SWVR 2026. This flagship United Nations' publication strengthens global understanding of volunteering, demonstrating how it contributes to peace, development and community resilience in the twenty-first century.



The forthcoming SWVR 2026 will be led by researchers from Northumbria's Centre for Global Development (CGD). The Centre brings together academics, practitioners, policy makers and students to create knowledge, insights and awareness of key issues around volunteering, humanitarian crises and development, with a particular focus on how communities respond to poverty, inequality and vulnerability.

The 2026 report will focus on how volunteering is measured worldwide, analysing the latest evidence on the social and economic contributions of volunteers. This work will explore the ways in which volunteering strengthens communities, particularly in contexts where poverty and inequality are most acute. By developing better methods of measuring volunteering, the report aims to capture its diverse contributions, from improving access to essential services, strengthening livelihoods, to supporting social protection systems in times of crisis.

Key questions guiding the report include: What is the relationship between volunteering and individual wellbeing? How do volunteers contribute to community resilience in contexts of

poverty? And how can the economic and social value of volunteering be measured in ways that ensure communities and volunteers themselves are not undervalued?

Working in partnership with the University of Pretoria in South Africa and the International Labour Organization (ILO), the Northumbria team will lead on research chapters that draw on global networks of partners and researchers. This collaborative approach will ensure that perspectives from across regions and communities are reflected, particularly those most affected by poverty and marginalisation.

Northumbria University academics are creating a world-leading hub of research expertise, knowledge exchange and learning on volunteering in humanitarian crises and development contexts. Their work is supported through significant funding from UK research councils, leading global humanitarian agencies and NGOs in the UK and internationally.

Discover more [here](#) about Northumbria's involvement in the State of the World's Volunteerism Report (SWVR) 2026.

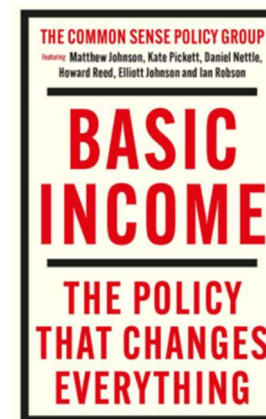
Exploring Basic Income as a Pathway to End Poverty and Inequality

Our Public policy experts, whose research focuses on welfare reform as a means of tackling poverty and inequality, have published a new book which examines the case for the introduction of a Basic Income.

Containing the latest research, analysis and insights from real-world trials on the policy which involves a regular cash payment from government to all citizens, regardless of circumstances, the book called *Basic Income: The Policy That Changes Everything* is the latest publication by the [Common Sense Policy Group](#).

The group, featuring Northumbria researchers as well as academics from other universities, policymakers, third sector leaders, community representatives and people with lived experience, is chaired by Professor Matthew Johnson from the University's [Department of Social Work, Education and Community Wellbeing](#). Members are actively involved in a number of [high-profile pilot proposals and research projects](#) across the United Kingdom, gathering the latest evidence on the use of Basic Income as a transformative welfare policy.

Drawing on international research and real-world trials, the book explores the ripple effects of financial security on people's lives. Beyond lifting individuals out of poverty, Basic Income can improve health, education, and housing security, while fostering stronger communities and enabling



meaningful work and entrepreneurship. By ensuring access to essentials, it offers a foundation of stability that helps people break free from cycles of deprivation.

The publication argues that Basic Income provides not only a practical response to immediate needs but also a long-term investment in wellbeing and prosperity. It demonstrates how financial security reduces health inequalities, removes barriers to employment and participation in society, and enhances resilience. Evidence from pilot schemes in countries such as Germany reinforces the case that welfare reform can generate wide-ranging benefits for both individuals and governments.

This book follows the group's earlier work, *Act Now: A vision for a better future and a new social contract*, published in 2024 as a blueprint for policy reform in Britain. The new volume builds on that foundation, showing why Basic Income could be a vital solution to today's crises of poverty, inequality and insecurity.

To launch the book, members of the author team took part in a series of events, including a reception at the House of Commons in June, where they met MPs to discuss research findings and policy implications.



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.

Northumbria University Launches Summer Activities to Support Delivery of Holiday Activities and Food Programme

Our research has played a pivotal role in securing £600 million of government funding for the Holiday Activities and Food (HAF) programme, ensuring that children who rely on free school meals continue to have access to nutritious food and enriching activities during school holidays. The announcement underlines a national commitment to tackling food insecurity and supporting young people's health and wellbeing, directly contributing to SDG 2: Zero Hunger.



The HAF programme provides children and young people in receipt of means-tested free school meals with healthy food and opportunities to engage in sport, cultural activities and skills development outside term time. For over two decades, Northumbria's Healthy Living Lab has been at the forefront of research into food provision in schools and communities, including holiday programmes, breakfast clubs, and school meals. The research team, led by Professor Greta Defeyter OBE, has delivered clear evidence outlining the huge benefits HAF brings to children, young people and their families, from improved nutrition and physical activity to stronger social connections, educational attainment and family wellbeing.

The Healthy Living Lab's research has already shaped significant government policy and funding decisions. Their work supported the Department for Education's earlier investment of over £200 million per year in HAF, as well as the recent £315 million rollout of a National School Breakfast programme reaching an additional 500,000 children. The latest findings, including a national survey of almost 19,000 parents, further highlighted the essential role HAF plays in reducing food insecurity and enabling families to cope during holiday periods. Parents

overwhelmingly supported continued funding, citing benefits such as reduced financial pressure, improved child nutrition and better opportunities for social engagement.

To extend the reach of the programme, Northumbria researchers co-designed HAF Plus, a tailored variant for teenagers who were less likely to participate in traditional HAF provision. Developed in partnership with young people, HAF Plus offers sports, skills-building, enterprise activities and healthy cooking sessions, alongside access to nutritious meals. Pilots of the programme have been successfully rolled out in Newcastle, Gateshead, Birmingham, Northumberland and London, with Northumbria providing its own campus facilities to host activities and meals.

The impact of HAF and HAF Plus goes beyond nutrition. Research has shown that programmes reduce isolation, enhance school readiness, improve health outcomes and foster social mobility. For every £1 invested, HAF generates an estimated £8 in social return, demonstrating the value of investing in food and activity programmes for children and young people.

By evidencing the effectiveness of holiday food and activity programmes, and by working directly with young people to co-create solutions, Northumbria University is shaping national policy on child nutrition and wellbeing. This work not only reduces food insecurity and hunger in disadvantaged communities but also creates long-term pathways to healthier, more equitable futures—supporting the delivery of SDG 2: Zero Hunger.



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.

Northumbria University Leads Major Study to Tackle NHS Fraud

Northumbria is leading a major new study designed to safeguard the NHS from fraud, ensuring that vital resources are used to improve patient care and strengthen public confidence in healthcare. The SCAN: Strengthening Counter Fraud across the NHS in England study, funded by the National Institute for Health and Care Research (NIHR), will explore how to build more effective and coordinated counter-fraud systems across the NHS.

Fraud is estimated to cost the NHS up to £1.3 billion every year, diverting resources that could otherwise be invested in frontline services, innovation, and patient wellbeing. The risks range from procurement fraud, such as inflated contracts or failure to deliver goods, to patient and employee fraud, including false claims, falsified qualifications and manipulated timesheets. Each instance undermines the financial sustainability of the health service and reduces capacity to deliver high-quality care.

The SCAN project brings together researchers from Northumbria, Cardiff and Manchester universities with expertise in law, medical sociology, criminology, and business studies. Their work will assess how fraud prevention is currently delivered across the NHS and identify best practices for strengthening systems nationally, regionally, and locally. The project will examine policies, training programmes and operational approaches, using surveys, interviews and focus groups to generate evidence-based recommendations.

A central focus of the study is collaboration. NHS staff, policymakers, fraud prevention specialists, and members of the public will all play a role in shaping the research findings through a Public Stakeholder Advisory Group. This will ensure that the recommendations are both practical and aligned with the needs of patients and the workforce.



The research findings, due to be published by autumn 2027, will be shared widely with policymakers, NHS leaders, and fraud prevention experts. Ultimately, the project seeks to contribute to a healthcare system that is financially secure, trusted by the public, and better equipped to deliver high-quality care, directly advancing the goals of SDG 3: Good Health and Wellbeing.

Targeted Research Offers Hope for Aggressive Childhood Brain Cancer



Northumbria researchers have helped identify a critical subgroup of medulloblastoma, an aggressive childhood brain cancer, which is currently near-incurable with standard therapies. Led by Dr Ed Schwalbe, the work is part of the £5 million INSTINCT programme, a collaborative effort to better understand the genetic drivers of high-risk Group 3 medulloblastomas and develop targeted treatment approaches. Medulloblastoma is among the most common malignant brain tumours of childhood cancer and is responsible for around 5 to 10% of childhood cancer deaths. The tumour is driven by the presence of a gene called MYC which triggers rapid disease growth and often results in treatment failure.

The studies analysed the largest cohort of MYC-amplified tumours ever examined, revealing that patients with multiple copies of the MYC gene and other high-risk features face extremely poor outcomes under current chemotherapy and radiotherapy. By contrast, other patient groups without these high-risk features remain treatable with existing therapies. This diagnostic refinement allows clinicians to better guide treatment decisions and have informed discussions with families, improving patient management and quality of life.

Funded by Children with Cancer UK, Cancer Research UK, The Brain Tumour Charity, and other family-led charities, the INSTINCT programme demonstrates how collaborative, patient-centred research can drive scientific discovery and improve clinical care, aligning with SDG3's goal of ensuring healthy lives and promoting well-being for all.

Papers from the INSTINCT programme can be read in the journal [NeuroOncology](#).



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.

New Research Could Enhance the Future of Teaching in Higher Education

A major new study led by Northumbria is set to explore how higher education can move beyond traditional lectures and exams to embrace more interactive, experiential and playful approaches to teaching. The project aims to enhance student learning and better equip graduates with the skills needed to thrive in a rapidly changing world where employers increasingly value resilience, creativity, teamwork and problem-solving alongside academic knowledge.



Many degree programmes continue to rely heavily on lectures and written assessments, but the RE:PLAY project (Researching the Effectiveness of Playful Learning in Higher Education) will investigate how approaches such as role play, simulations, games, digital tools and hands-on activities can enrich learning. With almost £800,000 of funding from the Economic and Social Research Council (ESRC), and £1 million in total including partner contributions, RE:PLAY will be the first large-scale, systematic study into the impact of playful learning in universities.

The project is being led by Professor Nic Whitton, Professor of Digital Learning and Play at Northumbria University, who explained that playful learning is not about making education frivolous but about creating environments where students feel safe to experiment, fail and learn from their mistakes. She added that by demonstrating what works and why, the project aims to challenge outdated teaching norms and better prepare graduates for the challenges of tomorrow.

Over three years, the study will map how playful learning is currently used and perceived by university leaders, investigate its benefits and barriers for staff and students, and develop a research-backed framework and toolkit for designing effective experiences. The final phase will assess the impact on students, looking at outcomes such as motivation, confidence, creativity and sense of belonging.

The research brings together academics from Northumbria, Durham, Anglia Ruskin, Sussex, Coventry and the University of the Arts London, with additional support from six partner institutions including the University of Edinburgh, University of Exeter and Teesside University. This collaboration will ensure that findings reflect a wide range of contexts and disciplines across the UK.

Northumbria STEM Outreach Project Marks Major Milestone

For more than a decade, Northumbria University's NUSTEM outreach group has been inspiring children and young people across the North East and beyond to see themselves as future scientists, engineers and innovators. In that time, the team has recorded over 170,000 interactions with children, families and teachers, making STEM education more inclusive, engaging and relatable.

NUSTEM was established to break down barriers and ensure that children from all backgrounds could access opportunities in science, technology, engineering and mathematics. Led by Professor Carol Davenport, the group works closely with schools to co-develop resources and activities that challenge stereotypes and highlight the breadth of STEM careers. By helping children and their families recognise how their own personal characteristics align with those of people working in STEM, young people begin to see a career in the sector as genuinely attainable.



From pre-school through to secondary school, NUSTEM has delivered thousands of hours of hands-on engagement. A flagship initiative, STEM Person of the Week, introduces pupils to professionals such as satellite engineers, marine biologists and polar scientists, encouraging them to associate STEM with diverse personal attributes rather than narrow stereotypes. Research has shown that this approach not only broadens children’s perceptions of STEM workers but also increases their own curiosity and aspirations.

The impact on schools has been transformative. Toby Hutton, Deputy Headteacher at New Delaval Primary School in Blyth, described how NUSTEM’s work has boosted engagement across year groups, leading the school to embed the approach throughout its teaching. With the Port of Blyth nearby—a hub for renewable energy—Hutton sees STEM education as vital for preparing pupils for the engineering roles of the future, noting that the outreach not only raises aspirations but also challenges stereotypes and widens access.

Over the past ten years, NUSTEM has built long-term partnerships with 63 schools, many in areas of deprivation, and collaborated with more than 100 external organisations, from local institutions like the International Centre for Life to national bodies including the Institute of Physics and the British Science Association.



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 University Awarded Athena Swan Silver for Advancing Gender Equality

Northumbria University has been awarded the Athena Swan Charter Silver Award by Advance HE in recognition of its commitment to promoting and achieving gender equality.



The [Athena Swan Charter](#) was set up in 2005 to recognise commitment to advancing the careers of women. It is a framework used worldwide to support and transform gender equality within higher education and research. It uses a targeted and robust self-assessment framework to support applicants to identify areas for positive action and act on any institutional and cultural barriers. Prior to the successful Silver application, the University held a Bronze Award from 2015.

Northumbria's achievement of a Silver award gives recognition to the University's commitments to advance progress and strive for greater achievements, including making their processes more inclusive to help attract and retain women at all levels of the organisation.

The judging panel commended the evidence of success to date in addressing gender inequalities, including the improved maternity and paternity benefits and the improvement in the gender pay gap at senior levels.

Researchers Explore an Alarming Rise in Digital Violence Against Women

Digital technologies have transformed the way people live, work, and connect. But they have also created new avenues for violence and abuse, with women increasingly targeted online. Recognising the urgent need to address this issue, Northumbria is leading an international research project worth more than £1 million to investigate the scale, impact, and support needs of women experiencing digital violence across Europe.



The three-year study, directed by [Dr Stephanie Fohring](#), Assistant Professor in [Criminology](#) at Northumbria, represents the largest survey of its kind on the continent. Dr Fohring explained that while the problem is escalating at a worrying pace, there is limited research into its true extent. Digitalised violence against women and girls is an emerging and deeply concerning issue and the impact on victims can be devastating. It is believed that online abuse isn't as serious as we understand it to be. We know the impact can be severe for individuals affected, but more generally, it can also have a negative impact on women and girls' safe access to online spaces.

The rise in cases is stark. Calls to the UK's Revenge Porn Helpline increased by 106 per cent in a single year, highlighting how forms of abuse such as harassment, non-consensual image

sharing, upskirting, and deepfakes are becoming alarmingly common. Yet, as Dr Fohring noted, many survivors struggle to be taken seriously or to access adequate support, underlining the importance of raising awareness and addressing systemic barriers.

The research will not only document the frequency and types of abuse women are experiencing but will also assess how it affects wellbeing, how survivors engage with support services, and how law enforcement responds. By doing so, the project aims to create the evidence base needed for effective policies and interventions.

The researchers stress that no single discipline can solve the complex problem of gendered violence and abuse. Through interdisciplinary collaboration, they are examining the social, political, cultural and technological structures that allow such harms to persist, and seeking new ways to challenge them.



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.

Extent Of Microfibre Pollution from Textiles to Be Explored at New Research Hub

Microfibres from clothing are an emerging environmental challenge, with tiny fibres released during washing, drying, and everyday wear entering waterways, soil, and air, causing harm to wildlife and ecosystems. To tackle this, Northumbria has established the Fibre-fragmentation and Environment Research Hub (FibER Hub) in the heart of Newcastle, marking a major step forward in understanding and reducing textile-related pollution.

The hub is the result of a strategic partnership between Northumbria University and The Microfibre Consortium (TMC), designed to measure the extent of microfibre loss across a wide range of fabrics and explore the environmental impacts throughout their lifecycle. Dr Alana James, Principal Investigator for the project, explained that the hub embodies the core aim of the IMPACT+ Network: to focus on microfibres as an overlooked and unmeasured environmental pollutant. She highlighted that interdisciplinary collaboration with both design and environmental science experts will allow the research team to address fibre shedding at the source, while embedding the findings directly into industry practice.

Based in the Northumbria School of Design, Arts and Creative Industries, the FibER Hub is equipped with state-of-the-art tools to track fibre shedding from manufacture through to everyday use. Even natural fabrics such as cotton can contribute to environmental pollution because chemical dyes and finishes are added during production. The hub's research will expand on prior studies focused on domestic laundering, assessing fibre loss in a broader range of environmental settings.



The collaboration with TMC brings together expertise in textile science and forensic analysis to ensure the research is both scientifically rigorous and practically relevant for industry. Dr Kelly Sheridan, CEO of TMC and Associate Professor in Forensic Science at Northumbria, described the project as a unique opportunity to generate comprehensive, lifespan-wide data on fibre fragmentation. The partnership allows the research team to produce actionable guidance for industry partners and signatories of the Microfibre 2030 Commitment, supporting meaningful reductions in microfibre pollution.

The FibER Hub is part of the broader IMPACT+ project, a multi-disciplinary initiative funded by UK Research and Innovation's Circular Fashion and Textile programme, NetworkPlus. The project brings together academics from Northumbria, King's College London, and Loughborough University alongside industry leaders such as Barbour, Montane, and ASOS, sustainable clothing companies like Agogic and This is Unfolded, and advocacy organisations including Fashion Revolution and WRAP. Regional partners, including Newcastle City Council and the Newcastle Gateshead Initiative, are also involved, ensuring the research responds to both local and global sustainability priorities.

Through this combination of academic research and industry collaboration, the FibER Hub aims to produce actionable solutions that reduce microfibre pollution from textiles. The project will help create more sustainable clothing and supply chains, protect water quality, and mitigate the environmental impacts of microfibres, supporting cleaner waterways and healthier ecosystems for future generations.



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.

Business Students Help Power Growth of Green Energy Firm

A team of final-year students from Northumbria University's Business Clinic has played a key role in helping a pioneering renewable energy company expand its operations and capitalise on the emerging e-methanol market. Lhyfe, a producer and supplier of green hydrogen, combines hydrogen with carbon dioxide to create e-methanol, a low-carbon fuel primarily used in the maritime sector. Hydrogen produced by the company also has potential applications in industries such as glass, chemicals, cement, steelmaking and transport, including buses and trucks.

Headquartered in Nantes, France, Lhyfe employs around 200 staff and operates a site in Wallsend, aiming to become a major regional supplier of green energy in the North East of England. The Business Clinic students were initially asked to develop a business strategy for supplying hydrogen to the UK e-methanol market. After further research, led by student project lead Ross Bell, they identified opportunities to expand the scope of the project to include northern European markets, noting that competitors such as Shell and European Energy were already developing similar initiatives in the Netherlands and Denmark.

Their analysis highlighted priority sites for investment, including the Port of Tyne, the Port of IJmuiden near Amsterdam, and the Port of Gothenburg in Sweden. The Port of Tyne, an independent trust port, reinvests all profits to benefit stakeholders, providing a strong foundation for green energy infrastructure development. Its alliance with the Port of IJmuiden has created a "green corridor," a fully decarbonised shipping route between the two ports, offering Lhyfe strategic advantages at both ends. The Port of Gothenburg, as the largest port in the Nordics, was also identified as a key hub for imports and exports, making it an attractive investment.



The students' research and recommendations are designed to deliver tangible benefits to client organisations both in the short and long term. Through this engagement, Northumbria students are helping to advance sustainable energy solutions, support regional economic growth, and equip the next generation of business leaders with the skills and experience needed to tackle the green energy challenges of the future.

Global Recognition for Groundbreaking Green Battery Technology



A biodegradable battery developed by researchers at Northumbria University has won a major international prize for its potential to transform the future of sustainable energy.

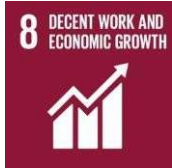
Northumbria researchers have achieved international acclaim for the development of a fully biodegradable battery, the BioPower Cell, which has the potential to transform sustainable energy storage. The innovation won a prestigious [Green Product Award 2025](#), selected from around 2,000 entries from over 60 countries, celebrating products and ideas that combine sustainability, innovation, design, and commercial potential.

The BioPower Cell represents a clean and eco-friendly alternative to conventional batteries, using only biodegradable materials and avoiding lithium, cobalt, nickel, or rare earth metals—substances that are difficult to recycle and environmentally damaging to extract. At the end of its life, the battery can be safely repurposed as a fertiliser, improving soil health while reducing waste.

The project, led by [Dr Ulugbek Azimov](#), Associate Professor in Mechanical Engineering, demonstrates Northumbria's commitment to tackling the environmental challenges posed by traditional batteries. Dr Azimov explained that the BioPower Cell addresses two pressing issues: the environmental impact of conventional batteries and the growing global demand for energy storage. By using organic waste as a raw material, the battery can reduce battery waste by 50%, energy costs by 80%, and carbon emissions by 60%, offering an accessible, green solution at scale. He also highlighted that the world could face a shortfall of over one million tonnes of lithium by 2030, making alternatives like the BioPower Cell increasingly vital.

Funding for the project was secured through Northumbria University and a [Northern Accelerator](#) proof-of-concept grant, part of a collaborative effort by universities in the North East to commercialise research and stimulate regional economic growth. The innovation has also received support from Innovate UK, with Dr Azimov selected for their competitive ICURe and ICURe Exploit programmes, designed to help university-led research reach the market.

Building on this recognition, Dr Azimov and his team are now working to launch a spinout company to bring the BioPower Cell to market, reinforcing Northumbria University's leadership in environmentally focused research and its broader mission to advance sustainable, climate-conscious technologies. The award and associated developments showcase the University's ongoing commitment to SDG7: Affordable and Clean Energy, demonstrating how innovative research can deliver practical solutions for global energy challenges.



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).

Multi-Million-Pound Investment Tackles Healthcare Workforce Challenges and Supports Decent Work

Northumbria academics are part of a landmark £5 million research initiative aimed at addressing workforce challenges in healthcare, particularly in remote and socially deprived areas. Workforce sustainability remains a pressing issue for UK health and social care services, with over 106,000 unfilled posts in secondary care and more than 131,000 vacancies in social care.

The National Institute for Health and Care Research (NIHR) has awarded this funding to a partnership led by Newcastle University to explore innovative strategies for recruitment, retention, and workforce planning. The research seeks to create healthier and more stable working environments, enabling a sustainable workforce while improving patient care and service delivery. By optimising workforce planning and reducing reliance on temporary staff, the project has the potential to generate cost savings for the NHS and better meet future patient needs.



Northumbria University is a key partner in this programme, leading five of the seven work streams. The interdisciplinary team brings together expertise in nursing, allied health professions, implementation science, occupational psychology, design, and knowledge mobilisation. The project uses co-design

principles to actively involve healthcare staff in shaping workforce solutions, ensuring that interventions reflect real-world challenges and have lasting impact.

The Newcastle Workforce Research Partnership (WRP) will focus on underserved areas, including GP and maternity services, where geographical isolation and social deprivation contribute to workforce shortages. Working closely with staff and patients, the research will identify barriers to workforce sustainability and develop evidence-based interventions to improve working conditions, organisational systems, and policy frameworks. Evaluations will include qualitative and quantitative methods, as well as assessments of economic impact.

The partnership also includes researchers from Oxford, Birmingham, and York universities, alongside NHS Integrated Care Boards, Healthwatch networks, and advisory groups comprised of staff, patients, the public, and senior NHS and policy figures. Over its five-year duration, the WRP will share data, insights, and best practices nationally to support workforce improvements and enhance patient care.

£2.5 Million Investment Boosts North East Space Sector and Jobs

The North East's reputation for world-class space research has been strengthened by a £2.5 million award from the Engineering and Physical Sciences Research Council (EPSRC) to support the North East Space Communications Accelerator (NESCA). This collaboration brings together Northumbria, Durham and Newcastle universities, the North East Combined Authority, Space North East England, the North East Space Leadership Group and 14 industry partners.



NESCA aims to drive economic growth, high-skilled employment, and innovation in the UK space sector by linking academic research with industry expertise. Over the next four years, the initiative will focus on developing resilient space communications technology, commercialising new ideas, promoting the region nationally and internationally, and providing skills development—from student summer schools to professional training for existing industry employees.

Professor Vincent Barrioz of Northumbria University highlighted that NESCA will transform the region’s industrial landscape by aligning university innovation with regional needs, ensuring research leads to market-ready products. The North East Combined Authority noted the potential for 10,000 new jobs in the sector by 2030, emphasising the region’s talent and ambition to become a global space industry hub.

NESCA’s funding will support three core strands—innovation, place, and people—backed by world-class research facilities and initiatives such as Northumbria University’s £50 million [Space Skills and Tech Centre should be North East Space Skills and Technology Centre \(NESST\)](#) developed with the UK Space Agency and Lockheed Martin. This investment strengthens the North East’s position as a centre for sustainable economic growth and high-skilled employment in the space sector.



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.

Northumbria University Launches Centre for Responsible AI to Drive Innovation and Inclusive Growth

Northumbria University has launched a pioneering centre of excellence in responsible artificial intelligence (AI) research and expertise. The [Northumbria Centre for Responsible AI](#) is set to be a “go-to” trusted voice in the region for knowledge and advice on key aspects of AI deployment.



The Centre brings together academics, policymakers, government, and industry leaders to advance AI research, education, and policy solutions, ensuring that the benefits of AI are accessible to all and that no one is left behind in a rapidly evolving digital landscape.

Building on the University’s established strengths in Responsible AI, the Centre focuses on citizen-centred AI, AI in law enforcement, public sector governance, and digital education. Emerging research areas also include the environmental impact of AI, its applications in education, and its effects on the creative industries. By addressing these issues, the Centre aims to foster innovation while promoting sustainable, socially responsible technological development.

The Centre emphasises the importance of responsible AI to drive economic growth, innovation, and societal benefit. Northumbria academics are working with public sector bodies, including police forces, to ensure AI is deployed transparently, ethically, and inclusively. The Centre is

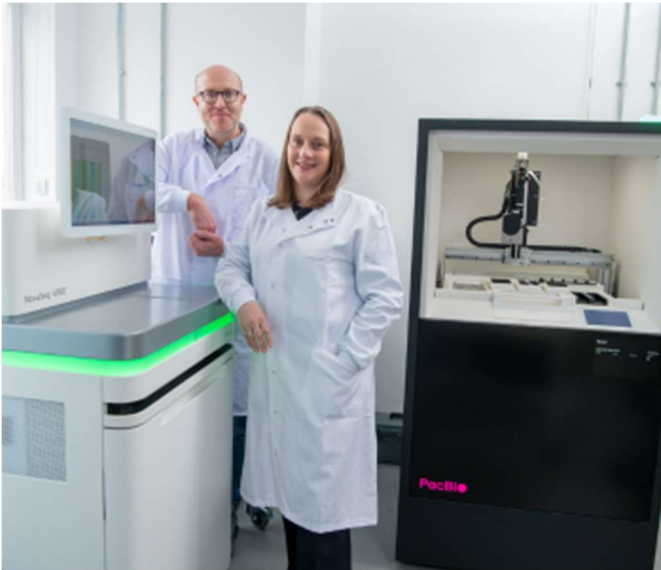
expanding research into the environmental and societal implications of AI, helping organisations navigate complex technological, ethical, and regulatory challenges.

Positioning the North East as a leader in AI-enabled innovation is a key objective. By supporting regional stakeholders in the adoption of AI, the Centre contributes to sustainable industrial growth, regional economic development, and enhanced public services. The Centre also aligns with the UK Government’s AI Opportunities Action Plan, fostering collaboration between academia, industry, and policymakers to equip businesses, public services, and individuals with the skills and knowledge necessary to harness AI responsibly.

Beyond research, the Centre is a hub for AI education and training, ensuring that students, professionals, and policymakers develop the literacy needed to thrive in an AI-driven world. Northumbria University is committed to embedding responsible AI into curricula, enabling future generations to innovate ethically and inclusively.

Supercomputer Investment will Power World-Leading Research and Innovation

Northumbria has made a multi-million-pound investment in its first university-wide high-performance computing (HPC) facility, the Higgs cluster, designed to support cutting-edge research across a range of scientific disciplines. Developed in partnership with global technology providers Lenovo and Logicalis, the Higgs cluster positions Northumbria at the forefront of technological innovation and strengthens the University's capacity for world-leading research.



Higgs will power world-leading research at Northumbria in areas including DNA sequencing and genomics, solar and space physics, glaciology and climate science, and biotechnologies for renewable energy and sustainable materials. By providing researchers with the computational power to handle large datasets at high speed, the cluster fosters innovation, accelerates discovery, and enhances the University's contribution to knowledge-driven economic growth. The facility is named in honour of Nobel laureate Professor Peter Higgs, reflecting Northumbria's commitment to pioneering research that transforms our understanding of the world.

Over the next five years, the cluster's Lenovo ThinkSystem hardware, AMD EPYC™ processors, and Ubiquity software will be regularly upgraded to meet evolving research needs, ensuring long-term adaptability and capacity for innovation. The Higgs cluster will support existing facilities, including Northumbria's NU-OMICS DNA sequencing lab, which played a key role in the national COVID-19 response, providing genomic data to support regional public health and national studies. Researchers using the cluster will be able to process genome sequencing data more efficiently, enabling faster

results and enhancing student learning through exposure to a research-rich environment.

10 REDUCED INEQUALITIES



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.

Associate Professor recognised by Advance HE as a National Teaching Fellow.



Dr Elisabeth Griffiths, who is based at the Northumbria Law School was awarded the National Teaching Fellowship for her outstanding and sustained impact on inclusive legal education, particularly her innovative work enhancing disability inclusion, employability, and sector-wide policy through collaborative, real-world and equity-focused teaching practices.

The National Teaching Fellowship Scheme (NTFS) recognises, rewards and celebrates individuals who have made an outstanding impact on student outcomes and the teaching profession.

The NTFS was launched in 2000, by the Higher Education Academy, which subsequently became Advance HE. Recognised following a highly competitive process in which only 55 awards are made each year, Elisabeth joins a group of almost 1,200 National Teaching Fellows across the UK.

Elisabeth has taught Law to both undergraduate and postgraduate students for nearly 30 years. Through her NTFS claim she was able to reflect on her approaches to enhancing disability inclusion and to demonstrate how her work has impacted education in higher education, within Northumbria and beyond. As a qualified solicitor (now non-practising) she was also able to reflect on how that real-world experience brings learning to life in a subject like law.

Elisabeth's consistent, high quality and dedicated approach to her Higher Education practice has enabled her to make a positive impact on legal education at Northumbria. Her inclusive practices were recognised by Northumbria in 2023 with the award of a Distinguished Teaching Fellowship and by Advance HE through award of Principal Fellowship status in 2024.

The award recognises Elisabeth's contribution to developing education practices at Northumbria, contributing to our commitment to deliver an outstanding experience for all students. Through engagement with external initiatives, Elisabeth ensures our students, and particularly those from non-traditional and widening participation backgrounds, have access to opportunities within the profession of Law.



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.

Northumbria Architecture Students Achieve Top Awards for Innovative and Sustainable Urban Design

Northumbria Architecture students have continued a successful run of accolades, winning the RIBA North East Student Awards for both RIBA Part 1 and Part 2, alongside recognition at the Architects for Health Student Design Awards and the RIBA/Future Architects Film Competition 2025. These awards celebrate excellence in architectural design and highlight the University's commitment to shaping sustainable, resilient, and innovative urban environments.

Final-year BA student Ian Dominguez received the Part 1 Award for his project *The Engine Wharf*, which proposed a new ferry terminal as part of a broader regeneration strategy for the former Hawthorn Leslie shipyard in Hebburn. His design draws on the site's maritime heritage, reinterpreting the scale and materiality of historic ships while integrating high-tech systems inspired by steam turbines. The project demonstrates how architecture can reconnect communities with their heritage, foster sustainable transport infrastructure, and contribute to the regeneration of urban waterways. Judges praised Ian's imaginative and methodologically innovative approach, noting how his models and drawings created a tangible understanding of the building's user experience and its response to contemporary challenges such as climate change.

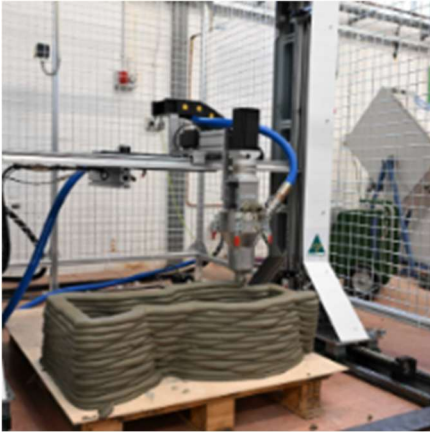


Degree Apprenticeship student Lee Thackray won the Part 2 Award for *Momentum*, a visionary design for a Museum and Innovation Centre that positions Newcastle as a hub of innovation and sustainable urban development. The building incorporates adaptable exhibition technologies, renewable energy generation through tidal turbines, and carbon-sequestering infrastructure, exemplifying the integration of environmental technology within urban design. The project also enhances connectivity and public space, with flexible start-up zones, event areas, and a funicular connecting the Quayside to the upper town, addressing historical access challenges. The scheme demonstrates how architecture can simultaneously celebrate heritage, foster innovation, and improve the liveability and resilience of urban spaces.

In addition, Amelia Swaby, a third-year degree apprentice and Architectural Designer at P+HS Architects, was highly commended in the Architects for Health Student Design Awards for her project *The Nature of Therapy*. The design proposes a rehabilitation facility that uses nature to support mental health and addiction recovery, reinforcing the importance of inclusive and therapeutic urban environments that strengthen community well-being.

Through these award-winning projects, Northumbria's Architecture students are demonstrating the University's commitment to SDG 11 by designing buildings and urban spaces that are sustainable, socially inclusive, and responsive to the environmental and cultural needs of communities.

Northumbria University Secures EU Funding for Sustainable 3D-Printed Construction Research



Northumbria has been awarded a prestigious Marie Skłodowska-Curie Actions (MSCA) Fellowship to lead cutting-edge research into low-carbon, 3D-printed construction materials. The [MSCA Fellowships](#), part of the [Horizon Europe](#) programme, support postdoctoral researchers to expand their expertise through advanced training and cross-disciplinary, international collaboration.

The fellowship will enable postdoctoral researchers to explore sustainable, waste-derived activators for geopolymer mortars. This work aims to significantly reduce the environmental impact of construction while advancing innovative building technologies.

The project focuses on developing 3D-printable geopolymer mortars using agricultural and industrial waste. By replacing carbon-intensive Portland cement, the research advances low-carbon construction solutions that are faster, more efficient, and environmentally responsible. The study will examine material properties such as setting time, workability, compressive strength, and durability, alongside a full Life Cycle Assessment to evaluate environmental performance.

This project builds on Northumbria's longstanding strengths in civil and structural engineering, digital manufacturing, and international research collaboration. With the University's recent installation of advanced 3D construction printing technology, in partnership with Luyten 3D and ChangeMaker 3D, Northumbria is establishing itself as a hub for sustainable, innovative, and circular construction solutions, contributing directly to SDG 11 by promoting sustainable cities and resilient communities.



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.

Helping Businesses Turn Waste Streams into New Products



Northumbria is helping businesses transform waste into valuable resources, supporting both sustainability and profitability. Building on its role in the £4.7 million government-funded Transforming Foundation Industries Research and Innovation (TransFIRe) Hub, the University is working with companies across chemicals, cement, ceramics, glass, metals, and paper industries to commercialise waste streams and improve efficiency.

Led by Professors Justin Perry and Matt Unthank from the Department of Applied Sciences, Northumbria's research has demonstrated that zero-value waste can be converted into profitable feedstocks for other sectors. One collaboration with coatings specialist AkzoNobel and plastics recycler Jayplas highlights this potential. By advancing PET recycling technology, the team transformed currently unrecyclable plastic waste from bottles into a sustainable, high-performance protective coating for industrial use. With global consumption of protective coatings exceeding one million tonnes annually, this innovation shows how waste can feed new markets and reduce reliance on virgin resources.

Banana Waste to Power Textiles and Energy in Rural Pakistan

A new project led by Northumbria University aims to convert banana-growing waste in rural Pakistan into sustainable textiles and renewable energy, potentially providing electricity for communities that currently live off-grid. Pakistan's agricultural sector generates millions of tonnes of waste annually, including from bananas, and much of the country's rural population relies on fossil fuels for energy.



Northumbria University academics, in partnership with the UK-based waste-to-energy company Eco Research Ltd and Pakistan's National Textile University and Prime Eurotech, are developing a two-part system. The first stage uses innovative technology to convert banana waste into textile fibres, while the second stage transforms the by-products into renewable energy. This approach could reduce the environmental impact of Pakistan's textile industry, supply clean electricity to off-grid communities and improve soil fertility through biofertilizer production.

Dr. Jibrán Khaliq, a materials scientist at Northumbria University, explained that Pakistan's textile sector contributes significantly to greenhouse gas emissions, water pollution and microplastics. While the National Textile University has already developed a method to convert banana waste

into fibres, a lack of electricity in rural Sindh has limited its application. The SAFER project (Improving Access to Sustainable Energy in Rural Pakistan Using Food and Fibre Agro-Waste as a Renewable Fuel), funded with approximately £300,000 from Innovate UK's Energy Catalyst scheme, will address this by developing waste-to-energy technology to produce affordable, clean electricity.

The banana industry in Pakistan generates an estimated 80 million tonnes of waste annually, which could yield over 57,488 million cubic meters of syngas—a synthetic gas suitable for electricity generation—and 30 million tonnes of nitrogen-rich biofertilizers. Dr. Muhammad Saghir, Director at Eco Research Ltd, highlighted that the project exemplifies how sustainable practices and technological innovation can transform agricultural by-products into textiles, support local job creation, and contribute to the UK's net zero agenda.



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.

Innovative Project Awarded £2.8 Million to Develop Energy-Efficient Cooling Solutions

Northumbria is leading a £2.8 million international initiative to tackle the growing threat of extreme heat through energy-efficient, low-carbon cooling technologies. The S2Cool project, funded by UK Research and Innovation (UKRI) through its Ayrton Challenge Programme, brings together more than 30 partners from academia, industry and government in the UK and Pakistan.



The need is urgent. In June 2023, Pakistan recorded temperatures above 52°C, causing devastating loss of life and billions in economic damage. Traditional air conditioning systems are energy-intensive, costly to maintain and reliant on harmful refrigerants, creating further strain on fragile energy systems.

S2Cool is pioneering a Novel Indirect Evaporative Cooler (NIEC) that overcomes the limitations of current technologies. By using advanced conductive materials to separate streams of dry and humid air, the system cools supply air through water evaporation without chemical refrigerants. It can be scaled up through modular design, powered by solar photovoltaic energy with battery storage and optimised with AI to adapt to local needs.

The potential benefits are transformative:

- Up to 65% energy savings compared with conventional air conditioning.
- 50% lower purchase costs and 65% lower running costs for domestic systems.
- Elimination of harmful refrigerants.
- An estimated 23 million tonnes of CO₂ savings over a decade – equivalent to 23 million barrels of imported oil.
- Significant public health benefits, reducing heat-related illnesses and saving lives.

With global air-conditioning demand expected to triple by 2050, S2Cool represents a scalable, sustainable alternative. The project not only addresses urgent climate and health risks in Pakistan but also offers solutions with worldwide relevance.

Early trials at Northumbria, supported by Northern Accelerator, have shown promising results. Alongside technology development, the project will create an International E-Centre for Sustainable Cooling to deliver training, community-based initiatives, and policy support. Together, they are creating a blueprint for sustainable cooling that can be deployed in vulnerable regions worldwide.

Researchers to Investigate Critical Climate Tipping Points in Antarctica

The UK Centre for Polar Observation and Modelling (CPOM), based at Northumbria, has been awarded more than £400,000 by the European Space Agency (ESA) to study climate tipping points in Antarctica's cryosphere. These tipping points represent thresholds where ice loss could accelerate irreversibly, driving rapid sea level rise and triggering cascading changes in the global climate system.

The CryoTipping project, led by Dr Inès Otosaka from Northumbria's Department of Geography and Environmental Sciences, will combine state-of-the-art satellite data with advanced numerical modelling to detect signs of marine ice sheet instability. The team will focus on the Amundsen Sea sector of West Antarctica, home to the vulnerable Thwaites Glacier—often described as the “Doomsday Glacier” due to its potential to destabilise the West Antarctic Ice Sheet.

By contrasting satellite observations of present-day retreat with models spanning the past 20,000 years, the project aims to develop early-warning methods for detecting instability. Key indicators such as grounding line shifts, ice velocity, and surface elevation will be used to investigate whether Thwaites Glacier's retreat could become irreversible in the coming centuries.

The work will draw on datasets developed by ESA's Antarctic CCI+ Project and will be delivered in collaboration with Northumbria's world-leading ice research community, the Potsdam Institute for Climate Impact Research, the Max Planck Institute of Geoanthropology, ENVEO IT GmbH, and the German Aerospace Center (DLR).

As part of CPOM, a national partnership of six universities and the British Antarctic Survey, this research will strengthen global capacity to monitor polar change. By improving predictions of sea level rise and its global impacts, the project will provide vital knowledge to help governments and communities prepare for a warming world.





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.

Real Lessons from the Frontlines of Plastic Recovery

Northumbria University has played a key role in the launch of the Flipflopi Toolkit: Recycling Solutions for Remote Communities, a new resource designed to help organisations set up resilient plastic recovery and recycling schemes worldwide.



The toolkit builds on the work of the Flipflopi Project, an East Africa-based circular economy initiative best known for building the world's first dhow sailing boat from recycled plastic, including more than 30,000 discarded flip flops collected from Kenya's coastline. The project promotes plastic recovery, recycling, and sustainable livelihoods in coastal and island communities, combining education, policy engagement and practical innovation.

Recycling initiatives in remote regions often face high costs, technical barriers and limited market access. Drawing on real-world experience since 2017, Northumbria's Simon Scott-Harden, along with colleagues Dr Phil Hackney and Johnny Hayes, helped develop the toolkit to share proven strategies and best practice. It offers step-by-step guidance covering local outreach, waste collection, recycling processes, enterprise development, and impact tracking, alongside advice on scaling initiatives through research, training, partnerships, policy engagement, and campaigning.

By making lessons learned openly available, the toolkit empowers communities to tackle plastic pollution while delivering environmental, social, and economic benefits. Supported through the Sustainable Manufacturing and Environmental Pollution (SMEP) programme—a partnership between the

UK Foreign, Commonwealth and Development Office and UNCTAD—the toolkit concludes the Flipflopi Mitigating Plastic Pollution through Heritage Boat Building project (2022–2025).

Northumbria's contribution also included supporting a new heritage boat building training centre in Kenya, where traditional skills are now combined with innovative recycling methods to transform single-use plastics into functional sailing vessels.

Through practical, adaptable guidance, the toolkit strengthens global efforts to reduce marine plastic waste and supports the transition to circular economies in vulnerable coastal regions—directly contributing to SDG 14: Life Below Water.

Research Reveals How Volcanic Activity Shaped Early Marine Life

New research led by Northumbria's Dr Ashley Martin has uncovered how volcanic activity may have fuelled the development of early marine ecosystems more than 2.5 billion years ago.

An international team analysed fossilised stromatolites from southern Zimbabwe to study nitrogen cycling before the Great Oxidation Event—the period when photosynthesis first drove oxygen into Earth's atmosphere. Nitrogen is essential for life, but in Earth's early oceans it existed mainly in reduced forms that needed to be made bioavailable.

The team found unusually high nitrogen isotope values in shallow-water stromatolites compared with deeper sediments. This suggests that ammonium accumulated in the deep ocean and was brought to the surface by nutrient-rich upwelling, creating conditions that supported microbial growth. Volcanic and hydrothermal activity likely played a key role in sustaining this nitrogen reservoir, providing a crucial nutrient source that may have paved the way for the evolution of oxygen-producing life.

These findings, published in *Nature Communications*, shed new light on the chemical and biological conditions of early oceans. They suggest that volcanism, exceptionally active 2.75 billion years ago, not only shaped Earth's geology but also influenced the trajectory of life in marine environments.

By deepening understanding of ancient nutrient cycles, this work helps explain how early oceans supported life and how marine systems respond to major environmental change—knowledge that informs today's efforts to protect and sustain life below water (SDG 14).





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 through our research expertise and engagement.

OLED Materials Could Help Detect Pesticides in Farming

Researchers from Northumbria University and the Federal University of Santa Catarina in Brazil have received £200,000 from the Royal Society to develop new ways of detecting pesticides and herbicides in food production.

Brazil, one of the world's largest agricultural exporters, uses vast quantities of pesticides—more than 720,000 tonnes of active ingredients in 2021 alone. Studies have shown that over half of food samples contain pesticide residues, with nearly a quarter exceeding legal limits or including banned chemicals. Contamination has also been found in water supplies that still meet national safety standards, raising concerns for ecosystems, human health and biodiversity.



To address this, the project will adapt organic light-emitting diode (OLED) materials—commonly used in phone and TV screens—into highly sensitive sensors. These materials emit light that can change in brightness, colour, or timing when they come into contact with pesticide molecules, making residues easier to detect on crops. The research will focus on two types of materials: those that glow more intensely when clustered (aggregation-induced emission) and those that emit light at a delayed timescale (aggregation-induced delayed fluorescence).

By creating portable, affordable detection systems, the team aims to provide farmers and regulators with early-warning tools to reduce contamination across food, water and soil. This approach not only strengthens food security and export quality in Brazil but also offers solutions with wider global applications for sustainable farming.

The project is supported by HORIBA, a leader in fluorescence spectrometry and sensor technology, which will provide technical expertise and equipment. Researchers will also benefit from international collaboration, with Brazilian scientists working alongside UK partners to share knowledge and develop practical solutions.

Pioneering Collaboration Will Create New Green Corridors in the North East

Northumbria University is part of a £3 million partnership to establish three new Green Corridors across the North East of England, transforming 35 miles of urban, suburban, and rural landscapes. The initiative aims to increase biodiversity, connect people with nature and heritage, and enhance wellbeing in Gateshead, Durham and South Tees.

The three North East routes include:

- Tyne Derwent Way – linking Gateshead Riverside Park, Dunston Staiths, the Metro Centre, and Gibside via the Tyne and Derwent rivers.
- Durham Route – connecting Durham city centre to Crook Hall Gardens and over 1,000 hectares of green and blue space, including Brasside Ponds and Finchale Priory, with links to Camino Ingles and Weardale Way.
- Tees to Topping – running from Middlesbrough and the Tees Estuary to the North York Moors and Roseberry Topping, connecting parks, forests, and cultural landmarks along the way.

Northumbria's Dr Rebecca Prescott, Assistant Professor in Entrepreneurship, is a Co-Investigator on the project. Building on her work in collaborative placemaking, she is helping shape research that encourages cross-sector partnerships and supports policies that reflect the needs of local communities.

Funded through the Arts and Humanities Research Council's Mission Awards, the project champions team-based approaches to research and community engagement. It brings together a wide network of regional partners, including local councils, wildlife trusts, heritage organisations, and Natural England.

By connecting habitats, improving access to green spaces, and fostering collaboration between communities, researchers, and policymakers, the Green Corridors North East project contributes directly to SDG 15: Life on Land, ensuring people and nature can flourish together.

“Drowning” Mangrove Forests in Maldives Signal Global Coastal Threat

Northumbria researchers have found that mangrove forests in the Maldives – vital ecosystems that protect coasts and sustain biodiversity – are drowning as a result of accelerated sea level rise and an extreme climate event known as the Indian Ocean Dipole.

Since 2020, more than a quarter of Maldivian islands with mangrove forests have experienced widespread dieback, with some islands losing over half their mangrove cover. Satellite imagery and field studies revealed that the trees, stressed by rising salinity, could no longer keep pace with rapidly rising seas.

Mangroves normally adapt by trapping sediment, allowing them to grow in line with gradual sea level rise. But between 2017 and 2020, seas around the Maldives rose more than 30mm per year—a rate too fast for the trees to withstand. Limited tidal flushing in basin areas meant forests became permanently flooded, leading to salinity levels beyond even mangroves' natural tolerance.

Researchers warn that this is not just a local issue. Mangroves provide critical coastal protection against storms and flooding, act as nurseries for fish, crabs and prawns, and support livelihoods and food security in coastal communities worldwide. They also store up to five times more carbon per area than tropical rainforests, making their loss a major threat for climate regulation.



The study shows how climate extremes can push ecosystems past their tipping points, with cascading impacts for people and nature. Similar dieback has already been recorded in the Seychelles and Madagascar, raising concerns that small island developing states are on the frontline of a global challenge. The findings highlight the urgent need for adaptive conservation strategies, both to protect mangroves and to safeguard the communities that depend on them. The Maldives – the world's lowest-lying nation – may be the early warning of what awaits other coastal regions as climate change intensifies.

The full study, *Sea-level rise and extreme Indian Ocean Dipole explain mangrove dieback in the Maldives*, is published in *Scientific Reports*.



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.

Northumbria Research Supports Effective Use of Digital Forensics in Criminal Justice



Northumbria academics in collaboration with the University of Derby and the Home Office, have conducted research to guide UK policymakers on the use of digital forensics and evidence in the criminal justice system.

The interdisciplinary research team drew on their combined legal and forensic expertise to examine how digital evidence is currently applied across policing, prosecution, and courts. Their report, *Digital Forensics within the Criminal Justice System: Use, Effectiveness, and Impact*, provides evidence-based recommendations for improving policy and practice.

The study involved officers and specialists from regional police forces, the National Crime Agency, counter-terrorism units, police Digital Forensics Units, the Crown Prosecution Service, the HM Prison and Probation Service and independent legal

practitioners. The team found that digital forensics now plays a role in 90% of criminal investigations and prosecutions. By synthesizing interviews, focus groups, and surveys, the research highlighted challenges and opportunities in using digital evidence, fostering collaborative dialogue across professional and institutional boundaries.

The findings have informed the Home Office-led Forensic Science Reform Programme and demonstrate how research can strengthen institutions, enhance the rule of law, and support fair and effective criminal justice systems.



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.

Partnership Provides a Boost for North East Community Health Research



A pioneering partnership between Northumbria and community health charity Healthworks is tackling health inequalities across the North East while shaping national approaches to rehabilitation and care.

The collaboration began during the Covid-19 pandemic, when Northumbria, Healthworks and Newcastle NHS Foundation Trust launched one of the UK's first community-based long Covid rehabilitation programmes. Funded by Northumbria, the six-week initiative delivered impressive results: 85% of participants reported reduced fatigue and over half improved lung function, with recovery strengthened through an innovative peer-support model.

This early success not only influenced national health strategies but also secured Northumbria's role in broader UK-wide research consortia. Today, Healthworks acts as a delivery site for major studies such as PERFORM, which explores rehabilitation for people with multiple long-term health conditions. Together, the partners also investigate issues ranging from hypertension and stroke recovery to cancer screening and lifestyle interventions. The partnership extends into education and workforce development. Healthworks regularly hosts placements for Northumbria undergraduates and postgraduates, with many graduates moving into roles at the charity, the NHS, or wider health sectors.

Recognised as an NIHR research site, Healthworks provides Northumbria with vital infrastructure for funding applications, patient recruitment and the delivery of real-world impact. This community-embedded model reflects NHS ambitions to decentralise healthcare, making services more accessible while improving outcomes.

The strength of this partnership was showcased at Healthworks' 30th anniversary Research and Innovation in Health event, which brought together researchers, NHS partners, students and community members to reflect on achievements and explore future opportunities. Discussions centred on how to expand co-produced, evidence-based interventions that address health inequalities while supporting workforce development.

By combining academic expertise, NHS collaboration and community-led delivery, Northumbria and Healthworks are demonstrating how partnerships can unlock innovation, address regional health challenges and create scalable models with national impact.

New Partnership to Unlock Skills Capacity in the North East

Northumbria University and Education Partnership North East (EPNE) have announced a major new partnership to strengthen skills, education, and career pathways in the built environment. Central to this collaboration is the Housing Innovation and Construction Skills Academy (HICSA), a £20 million technical centre of excellence in Sunderland.

HICSA will train and upskill local people in housebuilding, commercial construction, modern methods, green building, and home retrofit. Located at Riverside Sunderland, the Academy will combine state-of-the-art facilities—including immersive technology suites and full-scale training environments—with on-site graduate researchers and expertise from Northumbria.

The partnership commits to aligning further and higher education systems to create seamless progression routes for learners. Students will benefit from guaranteed pathways into advanced qualifications and employment, backed by joint projects in pedagogy, research, and international best practice.

HICSA is part of a wider ecosystem involving Sunderland College, Gentoo Housing, Bishop Chadwick Catholic Education Trust, Sunderland City Council, and industry stakeholders such as Homes England and Brims Construction. Training will be available from age 14 to adulthood, with targeted programmes to attract underrepresented groups into construction careers. Learners will also gain hands-on experience through work placements and site visits with industry partners.

By uniting education, industry, and local government, this initiative aims to provide the skills pipeline needed to support regional regeneration and accelerate growth in the housing and construction sectors. It demonstrates the transformative potential of partnership to deliver sustainable opportunities, build resilience in the workforce, and strengthen the North East economy.

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 2024/25	Notes
Environmental Management System	Maintain ISO14001:2015 certification.	2024/25	Ongoing	Successful 3yr Recertification Audit.
Energy and Carbon	5% year-on-year reduction in Scope 1 & 2 emissions from 2023/24	2024/25	15.8% reduction	Significant reduction in gas usage and lowering of carbon intensity for electricity.
	Minimum DEC rating of D	2025	Ongoing	All campus buildings DEC rating D or above, except Trinity which is rated E.
	80% reduction in scope 1, 2 and 3 carbon emissions from 2015/16	2030	63.9%	Against baseline
Waste and Resource Management	15% reduction in total waste produced (tonnes) from 2015/16 (1235 tonnes 15/16)	2030	33% reduction	Total waste generation 852 tonnes in 24/25.
	2% reduction in total waste produced (tonnes) from 2023/24 (1003 tonnes 23/24)	2024/25	17% reduction	
	65% of total waste sent for reuse, composting, anaerobic digestion or recycling	2030	38.1%	45.3% Non-res, 23.3% Res Working with accommodation providers to increase recycling.
	0% of non-hazardous waste sent to landfill (excluding third party contractors)	2024/25	0%	Residual waste sent for energy recovery.

Target		Deadline	Result for 2024/25	Notes
Water Management	40% reduction in total mains water consumption from baseline year 2016/17 (230,592m ³).	2030	24.32% reduction	
	2% year-on-year reduction in total mains water consumption from 2023/24.	2024/25	3.51% decrease	
Travel	20% reduction in emissions from Business Travel (CO ₂ e) from 2015/16 (4616t CO ₂ 2015/16).	2030	61.6% reduction (1769T CO ₂)	
	Achieve Cycle Friendly Employer status.	2024/25	Silver	Bike Week held in May & October 25.
Biodiversity	Increase in metres of space considered medium or high value for biodiversity (m ²).	2024/25	Ongoing.	Works ongoing to deliver new Biodiversity Action Plan. Next biodiversity audit due 2026.
	Hedgehog Friendly Campus Gold certification	2024/25	Complete	Maintained Gold Status.
Sustainable Buildings	Average DEC rating of C.	2024/25	C	
	All projects to achieve a SKA rating.	2024/25	Ongoing	
Discharges	0 significant spills.	2024/25	0	No major spills

Target		Deadline	Result 2024/25	Notes
Education for Sustainable Development	Determine baseline for number of programmes embedding learning about one or more SDGs.	2024/25	Ongoing	
Research & Living Lab	Maintain United Nations Academic Impact membership.	2024/25	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.	2024/25	Ongoing	
Reputation Sustainability	for Top 20 in the People and Planet University League.	2024/25	16 th in Dec 2025	
	Top 100 in the THE Impact League.	2024/25	53 rd in June 2025	
	Green Gown Awards	2024/25	Highly Commended Research with Impact Category.	